

Rosengarten, Smith & Associates, Inc.

Technical Environmental Management

P.O. Box 162545
Austin, Texas 78716-2545

(512) 707-1777
Fax: (512) 707-0501

29 December 2004

Ms. Barbara Smith, Project Manager
RCRA Operations Branch
United States Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

RSA Project No. 2017-18



Re: Submission of In-Situ Remediation Pilot Study Report, GE Railcar Repair facility, Elkton, MD; MDD 078 288 354

Dear Ms. Smith,

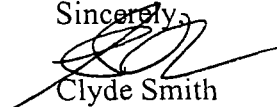
On behalf of GE Railcar Repair Services, enclosed is one original and one copy of the In-Situ Remediation Pilot Study Report Report for the GE Railcar facility in Elkton, Maryland. The results indicate the site is conducive to in-situ groundwater remediation.

It is important to stress that by presenting comparisons of concentrations detected to various federal and state constituent concentrations, GERRS does not intend to imply that any of these various federal or state levels would be an appropriate level upon which to base a remedial action. At the appropriate time in the future, as remedial actions need to be assessed, GERRS intends to pursue discussions with EPA and MDE regarding cleanup goals based on site-specific risk factors and future property usage.

In addition, counsel to GERRS has asked me to state that, consistent with the position that GERRS has always taken since these investigative efforts began, GERRS is pursuing all of this work entirely as a voluntary matter. GERRS continues to believe there is no RCRA corrective action jurisdiction over the site.

If you have any questions or comments, or would like additional information, please contact me at your convenience.

Sincerely,


Clyde Smith

Vice President/Senior Hydrogeologist

cc: Mike Svac, GE Rail Services
Dick Stoll, Foley & Lardner
John Cherry, MDE Voluntary Clean-UP Program

enclosures

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GE Railcar, Elkton, MD
RSA Project No. 2017-18

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Pilot Study Evaluation Report
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**IN-SITU REMEDIATION
PILOT STUDY
EVALUATION REPORT
GENERAL ELECTRIC RAILCAR REPAIR SERVICES FACILITY
TRIUMPH INDUSTRIAL PARK
ELKTON, CECIL COUNTY, MARYLAND**

prepared for:
GE Railcar Services Corporation
161 North Clark Street
Chicago, Illinois 60601

prepared by:
Rosengarten, Smith & Associates, Inc.
P.O. Box 162545
Austin, Texas 78716

December 2004

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1.0 INTRODUCTION

This document presents the results of an in-situ groundwater remediation pilot study (PS) conducted at the General Electric Railcar Repair Services (GE Railcar) facility located in Elkton, Cecil County, Maryland (Figure 1). The PS work plan titled: "In-Situ Remediation Pilot Study Work Plan, General Electric Railcar Repair Services Facility, Triumph Industrial Park, Elkton, Cecil County, Maryland" was submitted to the U.S. EPA, Region III, on March 31, 2003 and approved on April 9, 2003.

As stated in the PS work plan "the purpose of the PS is to collect data that will aid in determining the viability of utilizing innovative in-situ remediation (e.g., biological and chemical) technologies versus historically utilized remediation alternatives (e.g., pump/treat, vapor extraction, excavation) at the subject property." Furthermore, the PS, by design, was completed to determine if the selected technologies could be used immediately to reduce the concentrations of contaminants migrating off-site in the shallow, water-bearing unit.

The PS was completed by using two different types of in-situ groundwater remediation technologies (i.e., enhanced bioremediation and chemical oxidation) as presented in the March 31, 2003 work plan. The remediation mechanisms and the methodologies employed at the GE Railcar facility were described in the work plan and are discussed in this report. These technologies were selected based upon industry (academic, regulatory, and private) published information about similar contaminants of concern, hydrogeologic conditions, and long-term, remediation system operation & maintenance concerns.

The work plan objectives stated that the data collected during the PS would aid in providing information to determine the effectiveness the technologies employed :

- to disperse the treatment solution laterally in the pilot study areas (PSAs)
- to develop an environment conducive for in-situ remediation, and
- to reduce contaminant concentrations in groundwater.

The data from the PS and the evaluation presented herein will be used to aid in development of a cost efficient, effective remedial technology, with minimal time & implementation constraints.

2.0 BACKGROUND INFORMATION

Based upon the results of the Site Investigation conducted in 2001 (2001 SI), monitor wells MW-2 and MW-42 were selected for the PS, for the following reasons:

- ▶ Analytical test results indicated dissolved volatile organic compound (VOC) concentrations in the PS wells were elevated compared to concentrations in other facility monitor wells,
- ▶ VOCs identified in these PS wells were representative of the compounds identified in other wells during the 2001 SI,
- ▶ Sedimentology and hydrogeologic conditions identified at each PS well were representative of the subsurface conditions within the contaminant plumes identified during the 2001 SI activities, and
- ▶ Selected PS wells were located near the facility property boundaries; thus, in-situ PS will aid in evaluating the effectiveness of minimizing, possibly preventing, future off-site migration of dissolved VOCs.

Two different in-situ remediation technologies were utilized in the pilot studies to aid in selecting the optimum remediation method for the facility. In-situ bioremediation technology was used to enhance the anaerobic reduction dehalogenation process¹ of compounds in the MW-2 pilot study area (PSA). In-situ chemical oxidation technology was selected for the MW-42 PSA.

When, favorable in-situ conditions occur (i.e., water quality, contaminant concentrations, stratigraphy, hydraulics, etc.), the selected technologies have been proven within industry to aggressively attack the chlorinated (and non-chlorinated) VOCs present in the PSAs. The in-situ remediation mechanisms break down the compounds present in the groundwater without mechanically bringing contaminated groundwater to the surface. Figure 2 illustrates the chain of compounds resulting from the progressive degradation process with the innocuous end-product molecules of ethane, ethene, water, carbon dioxide, and chloride. The technologies selected utilize two different mechanisms to achieve the same end result (i.e., groundwater remediation).

2.1 MW-2 PILOT STUDY AREA

The objective of the in-situ remediation technology implemented in the MW-2 PSA was to enhance the ability of naturally occurring bacteria to reduce the existing VOCs. Naturally occurring bacteria in the subsurface will degrade VOCs in anaerobic (i.e., oxygen-poor)

¹ Reductive dehalogenation is the process where a halogenated compound (i.e., chlorinated solvent) is converted to another compound or chemical by replacing the chlorine atom(s) with hydrogen atoms.

environments by the process commonly referred to as anaerobic reductive dehalogenation, or dechlorination (ARD). Data collected during the 2001 SI indicated that groundwater in the vicinity of MW-2 exhibited anaerobic conditions. Thus, to further enhance the ARD mechanism, a common food-grade preservative, sodium lactate², was used to act as a catalyst to enhance the ability of the bacteria naturally occurring in the subsurface to attack the VOCs occurring in the MW-2 PSA. The proprietary blend of compounds was mixed with water and metered into MW-2.

An observation well (MW-43) was installed as part of the PS to gather groundwater data. The effectiveness of the sodium lactate in-situ remediation option within the MW-2 PSA was monitored during the course of the PS by collecting groundwater samples from MW-2 and MW-43. A more detailed discussion of the field activities and analytical test results is presented in Sections 3.0 and 4.0, respectively.

2.1.1 Anaerobic Reductive Dechlorination Background

The biochemical reactions between the sodium lactate, bacteria, and VOCs induce and expedite the ARD process. Once introduced into the subsurface, the sodium lactate forms acetate and propionate (i.e., organic acids) which become critical components of the dechlorination process. Acetate and propionate will provide electrons (i.e., food source) to the naturally occurring bacteria which in turn begin grow into a larger community, or biomass. The biomass, as it is dispersed and transported by natural groundwater hydraulic gradients, will utilize the chlorinated VOCs as a food source. Eventually, the ARD mechanism will generate carbon dioxide water molecules and chloride ions as "waste products" much like mammals produce carbon dioxide as a byproduct of respiration.

By evaluating the distribution and time-series behavior of ARD parameters (also known as reduction-oxidation or redox), an understanding of the redox conditions at a site can be derived. The important parameters are evident from a consideration of the biologically mediated redox reactions shown in Figure 2. The free energy yielded by redox reactions varies substantially depending upon the electron acceptor. During respiration, microorganisms will preferentially utilize the electron acceptors yielding the greatest free energy. Figure 3 shows that the order of preference for the most common inorganic electron acceptors is oxygen, nitrate, manganese (IV), iron (III), sulfate, and carbon dioxide. Therefore, the dominant microbial community in a groundwater system is largely dependent upon the distribution of electron acceptors. Where oxygen is plentiful, aerobic bacteria will predominate; where oxygen is depleted, but nitrate is plentiful, nitrate-reducing

² Sodium lactate for bioremediation applications was supplied as the commercial product Wilclear™ that was provided by JRW Technologies, Inc. Information, literature, case studies data evaluation parameters provided at the web site www.jrwtechnologies.com and by North Wind, Inc.

bacteria will predominate; and so on. The importance of electron acceptor utilization patterns to biological communities in groundwater has led to the convention of discussing redox conditions in terms of the dominant "terminal electron acceptor process," or TEAP. The predominant TEAP is often inferred based on electron acceptor and reduced product concentrations, and provides a useful indicator of the overall redox conditions. In general, it can be said that the greater the excess of electron donors (oxidizable organics) relative to electron acceptors, the more reducing the conditions. For oxygen, nitrate, and sulfate, decreased concentrations relative to ambient concentrations indicate they are being utilized as electron acceptors. Reduced products are particularly important in the case of iron reduction because Fe(III) is only sparingly soluble, while Fe(II) has much higher solubility. Thus, elevated concentrations of the metals indicate they are being used as electron acceptors. For reductive dechlorination to occur, sufficient electron donors must be present to drive the system at least to manganese reduction. For optimal dechlorination the system should be sulfate reducing if not methanogenic.

2.2 MW-42 PILOT STUDY AREA

The in-situ remediation technology implemented in the MW-42 PSA utilized an in-situ chemical oxidation (ISCO) process. A proprietary mixture of peroxygen compound containing solution was injected into the subsurface around MW-42. The peroxygen solution selected for this PS is marketed under the name Biox® and has been used in various hydrogeologic frameworks to successfully remediate chlorinated/halogenated and petroleum-based VOCs at numerous sites throughout the country.

An observation well (MW-44) was installed as part of the PS to gather groundwater data. The effectiveness of the peroxygen solution in-situ remediation option within the MW-42 PSA was monitored during the course of the PS by collecting groundwater samples from MW-42 and MW-44. A more detailed discussion of the field activities and analytical test results is presented in Sections 3.0 and 4.0, respectively.

2.2.1 In-situ Chemical Oxidation Background

The peroxygen compound solution process oxidizes the VOCs to form oxygenated organic compounds and carbon-based compounds (e.g., alcohols and other hydroxyl radicals). The byproducts of these organic compounds are readily degraded to carbon dioxide, water molecules and chloride ions by bacteria naturally occurring in the subsurface. After the initial contact with VOCs, the chemical oxidation reaction will continue in the groundwater and naturally degrade the VOCs to water and oxygen until all of the peroxygen solution has been expended.

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The ISCO solution components include stabilized hydrogen peroxide and an iron catalyst that, when introduced into the subsurface concurrently, aggressively attack carbon-based compounds that come into contact with the solution³. This ISCO remediation technology is similar to the commonly used Fenton-based process (i.e., hydrogen peroxide, ferric iron catalyst, and pH <4 to prolong reaction time) in water/wastewater treatment industry. However, the proprietary solution used in the MW-42 PSA does not require an acidic environment (i.e., pH <4) as needed in Fenton-based because of the proprietary iron catalyst used in the process.

³The success of ISCO-type remediation mechanisms depends upon direct contact with carbon-based compounds; whereas, ARD remediation is successful when enhancing existing in-situ microbial community to grow and "remediate" the compounds of concern.

3.0 FIELD ACTIVITIES

Field work was conducted in accordance with the Standard Operating Procedures (SOPs) included in the "Quality Assurance Project Plan" (QAPP), Version 2.0, dated March 31, 2003 and in the PS Work Plan dated March 31, 2003. The SOPs include methods for soil and groundwater sampling, logging, and decontamination. Specific groundwater sampling methods are presented in the "Groundwater Sampling and Analysis Plan" (GWSAAP) prepared for this site and dated August 9, 2001.

3.1 OBSERVATION WELLS

3.1.1 Installation, Construction, and Development

Observation wells (MW-43 and MW-44) were installed near each existing facility monitoring well (MW-2 and MW-42) in the designated PSAs. The observation wells were completed to the same well-construction specifications as the existing monitor wells. Soil boring Logs and Well Construction Diagrams are presented in Appendix 1.

The observation-well pilothole soil samples were collected using a truck-mounted, hollow-stem auger-rig with a split barrel (or split-spoon). The pilotholes were sampled intermittently to verify sedimentology and compare to the sediments encountered in the associated existing PSA monitor well. The pilotholes were terminated after encountering the weathered Saprolite.

Upon recovering the sampler from the boring, a portion of the sample was placed immediately into a clean, resealable, plastic bag. A clean, stainless-steel implement was used to place the soil in the bag. After approximately of ten minutes, the headspace in the bag was measured with an organic vapor analyzer (i.e., photo-ionization or flame-ionization detectors) and the concentration recorded on the boring log. The remainder of the soil sample was divided with the clean implement to inspect for sedimentological content and evidence of contamination. This information was recorded on a field boring log by the supervising geologist (Appendix 1).

The total depths of observation wells MW-43 and MW-44 are 31.3 and 38 feet below ground surface, respectively. As in MW-2, 10 feet of screen was installed in MW-43. Observation well MW-44 was completed with 20 feet of screen (similar to MW-42). The observation wells were constructed of 2-inch ID, PVC, Schedule 40, threaded, flush-jointed casing and 0.01-inch slotted screens. The sand pack was installed around the entire screened interval to a level above the top of the screen. The sand pack was sounded regularly with a weighted measuring tape to ensure accurate placement. A bentonite-chip seal was installed immediately above the completed sand pack. A bentonite-Portland

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cement slurry was tremmied into the boring. Monitor wells were completed with above-grade covers and anchored in concrete pads with locking well caps.

Observation well development activities were conducted in accordance with the SOPS in the QAPP and the PS Work Plan. The wells were developed using an air compressor and diaphragm pump. The pump was used to remove water and sediment from the well casing. Field parameters of pH, temperature, specific conductance (conductivity) and turbidity were monitored during this process. Wells were developed until conductivity and turbidity measurements stabilized and groundwater appeared clear.

After installing and developing the observation wells, both wells in each PSA (i.e. monitor and pilot study wells) were sampled prior to beginning the in-situ remediation injection activity portion of the PS.

Cuttings and spoils generated during the pilot study well (MW-43 and MW-44) drilling and sampling activities were placed in clean, 55-gallon steel drums. Each drum was labeled as to content and staged near the utility building for off-site disposal.

3.1.2 Groundwater Sampling Methods, Frequency and Depth Intervals

Groundwater samples were collected from each well in each PSA (i.e., MW-2/MW-43 and MW-42/MW-44) pursuant to the PS Work Plan. The GWSAAP describes the groundwater sampling protocol that was followed. Sampling personnel wore clean, disposable gloves during each phase of sampling. Samples collected during the sampling events were obtained by using micro-purging, or low-flow, sampling techniques as presented in the GWSAAP and the PS Work Plan.

General field parameters consisting of temperature, conductivity, pH, turbidity, dissolved oxygen (DO), and oxidation/reduction potential (ORP) were recorded during purging and sampling activities to aid in ensuring the effectiveness of purging, and for comparison with later sampling events. The meters were calibrated during each sampling day to ensure accurate measurement results.

To aid in evaluating the effectiveness of the in-situ remediation PS methods within each PSA, multiple groundwater sampling events were conducted. Information provided by the WilClear™ (i.e., sodium lactate) and Biox® (i.e., peroxygen) manufacturers and data collected during similar remediation projects were used to develop the PS groundwater sampling frequency. The sampling frequency is presented below:

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MW-2 PSA

- ▶ prior to initial emplacement of WilClear™ in MW-2; and
- ▶ every 30 days thereafter until 60 days after completing the third metering event.

The total number of groundwater sampling events during the PS of the MW-2 PSA was seven events from May 2003 to November 2003.

MW-42 PSA

- ▶ prior to injecting the Biox® solution near MW-42; and
- ▶ every 30 days after Biox® injection event, coincident to the MW-2PSA sampling events

The total number of groundwater sampling events during the PS of the MW-42 PSA was seven events from May 2003 to November 2003.

The majority of the VOCs identified during the 2001 SI exhibit the characteristic of density greater than water. This characteristic influences the denser than water compounds to exhibit a pronounced vertical migration component in addition to migrating laterally from the source area. Thus, to aid in evaluating the vertical distribution and concentration gradients of the VOCs identified during the 2001 SI activities, groundwater samples obtained prior to the initial injection/metering events were collected from two depths within the screened interval of each PSA well.

Two groundwater samples from MW-2 and MW-43 (screened interval of 10 feet) were collected (i.e., four samples during the pretreatment event). The samples were obtained from depths of one foot and six feet above the bottom of the each well. Two groundwater samples from MW-42 and MW-44 (screened interval of 20 feet) were also collected. The samples were obtained from depths of one foot and eleven feet above the bottom of each well (i.e., four samples during the pretreatment event).

Based on the analytical test results of the first sampling event, groundwater samples collected during the subsequent sampling events were from the one-foot above the bottom of well interval. This interval exhibited the highest VOC concentrations. Four groundwater samples (i.e., one sample from each well) were collected during the each of the six remaining sampling events.

After the groundwater samples were collected, containerized, and labeled, they were stored in a chilled, ice chest. The sample labels included time and date of collection and sample location. This information was transferred onto a chain-of-custody and request-for-analysis form. The coolers were transported to the selected analytical laboratory by private vehicle.

3.1.3 Groundwater Testing

To aid in evaluating the effectiveness of each of the selected in-situ remediation processes water quality parameters were measured in the field as well as analyzed by a fixed-based analytical chemistry laboratory. The field water quality parameters measured and recorded included: pH, temperature, conductivity, DO, and ORP. The groundwater samples submitted to the selected fixed-based laboratory for testing were analyzed by using approved test methods as outlined in the U.S. EPA, Office of Solid Waste and Emergency Response document titled "SW-846, Test Methods for Evaluating Solid Wastes." In addition to analyzing for VOCs, groundwater samples were analyzed for the following redox parameters: total organic carbon (TOC), chemical oxygen demand (COD), sulfates (SO_4), nitrate (NO_3), nitrite (NO_2), iron (ferric and ferrous), chloride, alkalinity, methane, ethane, and ethene. Groundwater samples collected during the first sampling event were also analyzed for perchlorate as part of a different on-site project.

As part of each sampling event for QA/QC purposes, a trip blank and a field blank were analyzed for VOCs. The trip blank(s) were prepared by the laboratory with lab-grade deionized water. The field blank(s) were prepared by sampling team with deionized lab-grade during each sampling event.

Copies of the analytical data report sheets, chains-of-custody and purging/sampling information forms are provided in Appendix 2.

3.2 IN-SITU TREATMENT SOLUTIONS

3.2.1 MW-2 Pilot Study Area

WilClearTM sodium lactate was metered into MW-2 by gravity to create a zone of reducing conditions and stimulate reductive dechlorination of chlorinated VOCs. Injections occurred three times at two month intervals (May, July, and September, 2003). After each injection groundwater was monitored in MW-2 and in MW-43 (13 ft downgradient of MW-2). Groundwater monitoring occurred prior to the first metering event, one month, and two months following each of the subsequent metering events.

The expected communication between MW-2 and MW-43 is important to consider when interpreting the data provided and is estimated here using a simple calculation requiring several assumptions. Calculation of this area of influence using these assumptions will likely estimate an area of influence that is larger than the actual area, because the effect of vertical distribution of the injection solution is underestimated. The following are assumptions for information used to calculate the area of influence:

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- ▶ The MW-2 PS wells are 13 feet apart.
- ▶ The solution volume during each metering event was 550 gallons of water plus a 55 gallon drum of WilClear™ for a total volume of 605 gallons (80.9 ft³).
- ▶ The screened length of MW-2 and MW-43 is 10 feet.
- ▶ The water-bearing unit has a porosity of 25% (silty sand).
- ▶ The volume of influence is a cylinder shaped region
- ▶ The vertical distribution of the metered solution was assumed to be limited to a two foot height.
- ▶ Advective transport of the WilClear™ during injections is the only transport mechanism.

Given these assumptions the following equation was used to calculate the radius of the influenced area.

$$r = ((\text{Volume} \times \text{porosity}^{-1}) / (\pi \times \text{Height}))^{1/2}$$

Where:

Volume = 80.9 cubic feet (ft³) Height = 2 ft Porosity = 0.25

The radius calculated is 7.2 feet, therefore the metered solution must travel an additional 5.8 feet to reach MW-43. Although this may be a gross estimate of the metered solution influence, the results demonstrate that injections of this size into MW-2 would not be expected to influence groundwater at MW-43 immediately after the metering event. However, following the metering event, the sodium lactate would be transported due to ambient groundwater flow in the down-hydraulic gradient direction. Based on previous calculations (2001 SI Report) of groundwater flow velocity in the vicinity (57 to 80 feet per year in MW-23), the lactate was expected to influence MW-43 about two months after each metering event.

3.2.1 MW-42 Pilot Study Area

The ISCO PS activities were based upon the analytical tests results (VOCs) and subsurface hydrogeologic conditions (soil type and saturated thickness) from the 2001 SI. Based on the data evaluation, the ISCO peroxygen reagent solution (BIOX®) was injected into twelve injection points during a one-time event, by using direct-push technology (DPT) equipment. The following list summarizes the pertinent information regarding the MW-42 PS.

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- ▶ The MW-42 PS wells are 15 feet apart.
- ▶ 95 gallons of BIOX® were injected into each of 12 injection points for a total volume of ISCO solution of 1,140 gallons.
- ▶ Injection points were completed in a grid pattern in lateral spacings of 5 feet.
- ▶ BIOX® injected into saturated zone (35 feet below grade to 15 feet below grade) of 20 feet.
- ▶ The lateral distribution of the injected solution was limited to a surface area of about 400 square feet.
- ▶ Positive pressure provided by BIOX® injection system provided initial dispersion mechanism.
- ▶ The transport mechanism post injection event is advection.

The DPT probe point was raised intermittently after injecting between four to five gallons of the peroxygen reagent solution. Treatment interval was from the base of the saturated unit to the approximate depth to top of water measured.

Based upon the grid pattern and saturated zone volume, approximately 290 cubic yards (yd³) of saturated zone media were exposed to the reagent solution.

Several of the injection points influenced MW-42 and MW-43 indicating lateral and vertical transmission of the peroxygen reagent solution occurred. The communication pathways were evidenced by the rise of water column (i.e., decreased depth to top of water) in both wells. Also, evidence was visible at the ground surface at various injection points where the reagent was seen to be effervescing (i.e., foaming/bubbling solution). Near the end of the BIOX® injection event, effervescing foam was noted in the MW-42 well casing. These observations suggest that the peroxygen reagent solution was dispersed throughout the injection point grid.

4.0 **RESULTS OF ANALYSES AND MEASUREMENTS**

This section discusses the analytical test results of groundwater samples collected during the PS and the field measured parameters. Tables 1 and 5 present the VOCs test results for the MW-2/MW-43 and MW-42/MW-44 PSAs, respectively. Tables 2 and 6 summarize the degradation indicator parameter (also known as attenuation parameters) test results for the MW-2/MW-43 and MW-42/MW-44 PSAs, respectively. Tables 3 and 7 present the results of the water quality parameters measured during groundwater sampling activities for the MW-2/MW-43 and MW-42/MW-44 PSAs, respectively. Tables 4 and 8 present a summary of the expected and observed trends and conclusions regarding the observations for the MW-2/MW-43 and MW-42/MW-44 PSAs, respectively. Analytical laboratory data sheets are located in Appendix 2. Charts depicting the concentration trends of VOCs and degradation indicator parameters are provided in Appendix 3. The charts are listed in the same order as presented in the analytical results summary tables.

4.1 **MW-2 PILOT STUDY AREA**

4.1.1 **Volatile Organic Compounds**

The initial sampling event of the MW-2 PS wells identified the presence of 9 VOCs in MW-2 (Table 1). Of these, only acetone (a known laboratory artifact), benzene, chlorobenzene, and 1,1,2,2 tetrachloroethane exceeded the Maryland Department of Environment (MDE) Groundwater Clean-Up Standards for industrial facilities (0.061 milligrams per liter (mg/L), 0.005 mg/L, 0.011 mg/L, and 0.001 mg/L, respectively).

Chlorobenzene was the only compound that exceeded the clean-up standard by an order-of-magnitude. The benzene and chlorobenzene concentrations exceeded the US EPA maximum concentration limits (MCLs) established by the Safe Drinking Water Act (0.005 mg/L and 0.100 mg/L, respectively). MCLs for acetone and 1,1,2,2 tetrachloroethane have not been published. The initial results of MW-43 indicated the presence of only 5 VOCs, with only benzene and chlorobenzene exceeding the MDE clean-up standards and EPA MCLs.

Since most of the concentrations of VOCs identified during the PS sampling events are either at or near the analytical detection limits or are well below the MDE clean-up standards, only chlorobenzene is discussed in detail herein.

A review of Table 1 and the accompanying chart in Appendix 3 indicates an initial decrease in chlorobenzene concentration in MW-2 from 1.48 to 0.55 mg/L following the first metering event. The concentration rebounds to 0.827 mg/L by the third sampling event (immediately before the 2nd metering event). After the 2nd metering event, the concentration of chlorobenzene declines to 0.495 mg/L in the 4th sampling event and then appears to

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rebound again by the 5th sampling event to 0.808 mg/L. After the 3rd metering event the concentration drops to 0.433 mg/L in the 6th sampling event and then rebounds to 0.671 mg/L by the 7th and last, PS sampling event. Two possible reasons for this pattern are suggested: 1) degradation of chlorobenzene occurred or, 2) displacement/dilution of the native groundwater by the addition of the aqueous electron donor solution occurred, followed by an influx of chlorobenzene into the area from the hydraulically up-gradient source.

An initial decline from the 1st to the 2nd sampling event in chlorobenzene concentration in MW-43 is also evident in Table 1 and in the chlorobenzene chart in Appendix 3. This decline and the subsequent rebound is similar to MW-2, however, chlorobenzene in MW-43 continues to increase through the 5th event and then decreases during the 6th sampling event (approximately one-month after the last metering event). This decrease is also coincident to observations of electron donor breakthrough as discussed in Section 4.1.2.

Further inspection of the VOC charts in Appendix 3 show similar patterns of slight fluctuations of constituent concentrations. These fluctuations range in the parts per billion (or micrograms per liter, µg/L) to parts per trillion values. For instance, benzene varies from 17 µg/L in MW-43 before the first metering event and does not decrease below 7.5 µg/L; showing a trend of initial decrease but slowly increasing throughout the PS. Other VOCs (i.e., *cis* and *trans* 1,2-dichloroethene, and 1,1,2,2-tetrachloroethane) show the similar decrease-increase pattern in concentrations before and after the initial and subsequent metering events (Appendix 3 - Charts and Table 1).

As expected, injection of WilClear™ (an electron donor) did not have marked effect on most non-chlorinated VOCs, which are potential electron donors themselves. These other contaminants include: acetone (possibly a laboratory artifact), benzene, 2-butanone, and ethylbenzene. Degradation of these compounds is not enhanced by the addition of an electron donor because utilization of these compounds as electron acceptors is generally not thermodynamically favorable.

4.1.2 Degradation Indicator Parameters

TOC, COD, Alkalinity, and TPH (Electron Donors)

Observation of TOC, COD, and alkalinity trends show a consistent spike in all three parameters in MW-43 in September 2003 (TOC=681 mg/L, COD = 1920 mg/L, and alkalinity = 568 mg/L) (see Table 2). All other measurements are comparatively low. The data suggest a breakthrough in electron donor solution in MW-43 just before the third metering event. The data indicate that transport of electron donors did not reach MW-43 in measurable quantities until after the second metering event (refer to TOC, COD and Alkalinity Charts in Appendix 3).

Alkalinity, COD, and TOC trends in MW-2 appear to support the expected conclusion that biological activity was stimulated during sodium lactate injections. Increasing alkalinity is an indicator of biological growth. As carbon dioxide is produced by biological activity at relatively neutral pH (pH >6 to 7), much of it forms bicarbonate, which contributes to alkalinity. The alkalinity in MW-2 increases following the first metering event and appears to plateau later. This trend indicates biological growth. A general increase of COD is evident following the metering events in MW-2 groundwater; as well as in MW-43 groundwater about two months after the initial metering event and throughout the PS. This indicates degradation of the introduced electron donor, as expected, and is consistent with the increase in alkalinity. TOC reduction is also evident following all metering events which also indicates degradation of the introduced electron donor. TPH results indicate a minimal increase. However, the low concentrations and the slight fluctuation are too minimal to assess treatment effectiveness (Table 2 and Appendix 3 - Charts).

Oxidation-Reduction (Redox) Parameters

The following are observations of redox sensitive parameters. They are discussed in order of preferential utilization during microbial respiration, from the most thermodynamically favorable to the least (see Figure 3).

Nitrate

Nitrate concentrations in both wells were all less than 1 mg/L and most are lower than the detection limit of 0.06 mg/L. This low ambient concentration suggests that nitrate reduction plays an insignificant role in the biological redox reactions occurring in this system. Nitrite was not detected above detection limits.

Iron

Ferrous iron (Fe^{+2}) concentrations in MW-2 become significantly higher than initial concentrations indicating significant iron reduction is occurring due to the sodium lactate injections (refer to charts in Appendix 3). These high concentrations indicate a significant source of bioavailable iron. Ferrous iron concentrations in MW-2 are higher than those observed in MW-43, which is expected when considering the distribution of sodium lactate.

Sulfate

Concentrations of sulfate prior to the initial metering event were much higher than post metering event concentrations (Table 2 and Appendix 3 Sulfate chart). The marked decrease in sulfate concentrations indicate that sulfate reduction occurred in both PS wells. Furthermore, since the sulfate concentration remained below 1 mg/L in MW-2 for more than 2 months, strongly reduced conditions appeared to have existed.

Dissolved Gasses

Inspection of the test results for the dissolved gasses methane, ethane, and ethene, identifies methane as the only compound above detection limits. However, due to the initially very low concentrations of chlorinated VOCs, the results are inconclusive.

4.1.3 Field Water Quality Parameters

To aid in determining thoroughness of purging for each well sampled during the PS, conductivity, dissolved oxygen, oxidation/reduction potential (ORP or Redox), temperature, turbidity, and pH were monitored. Measurements were recorded on the Purging/Sampling Information Forms (Appendix 2) and summarized in Table 3. Once the various water quality parameters had stabilized, the designated well was sampled. As the readings stabilize, studies have shown that water representative of the surrounding formation rather than water from within a well's sand filter (i.e., sand packed around the well screen) is present in the well casing for sampling and analysis.

Conductivity (Specific conductance)

Conductivity in water is a measurement related to the concentration of ions capable of carrying electrical current and is directly related to the total dissolved ions in the water. Conductivity is reported in micromhos per centimeter (umhos/cm) which has been recently renamed as uS/cm (microSiemens per centimeter). Fresh water, or water with low concentrations of total dissolved ions (solids, salts, etc.) will exhibit a low reading (usually below 1.0 uS/cm). As concentration of dissolved ions increase, water becomes more saline, thus more conductive (i.e. higher readings). All of the conductivity readings measured during the MW-2 PS were below 1.0 uS/cm. A slight increase is noted after the initial WilClear™ metering event in MW-2 (0.398 in May 2003 to 0.604 in June 2003) and MW-43 (0.345 in May 2003 to 0.405 in June 2003); however, the readings remained consistent for the duration of the PS.

Dissolved Oxygen (DO)

Dissolved Oxygen, or DO, is the concentration of free (not chemically combined) molecular oxygen (a gas) dissolved in water, usually expressed in mg/L. DO measurements of <1 mg/L indicate an oxygen-poor condition may exist that may be suitable for reductive dechlorination process with DO concentrations of <0.5 mg/L providing the optimum environment. Inspection of the recorded measurements presented in Table 3 shows a noticeable increase in DO after the introduction of sodium lactate solution after the first sampling event (May 2003). The sodium lactate solution appears to have released the oxygen molecules from the compound (sodium lactate = $\text{CH}_3 - \text{CHOH} - \text{COONa}$), thus showing a false positive high DO concentration or possibly causing meter interference. This is particularly evident in the fourth and seventh sampling events (i.e., August and November). Also, probe malfunction during these particular events cannot be discounted

even though the probe was calibrated to the manufacturer's specifications. Nonetheless, the ARD components previously discussed as well as redox (discussed below) point to significant biological activity and development of favorable ARD conditions.

Redox (Oxidation-Reduction Potential)

The redox reading is a measurement of the intensity of oxidizing or reducing conditions within a system. This measurement of electron activity is an indicator of the likelihood of the groundwater containing volatile organic compounds to accept or transfer electrons. Like evaluations of DO concentrations, recognizing redox trends can provide information about possible natural degradation of volatile organic compounds (i.e., aerobic versus anaerobic environments)⁴. Generally, the redox of groundwater ranges from -400 to 800 millivolts (mV) with lower readings down to negative readings indicating a reducing environment and higher values inferring an oxidative environment (Figure 2). When redox values of -200 to -300 mV coincident with DO readings of <1.0 mg/L exist, the in-situ environment is conducive for ARD processes to occur. Basically, redox measurements provide insight to the likelihood of reactions occurring where electrons are gained or lost and new compounds are formed (i.e, ARD).

The redox reading in MW-2 prior to the WilClear™ metering events was -21 mV, which indicates an environment favorable for reductive dechlorination. As the PS progressed, the redox readings continued to decrease (down to -189 mV). Similarly, redox measurements for MW-43 were in the reducing environment range. Further inspection shows a rebound effect in the last sampling event (November 2003) which was two months after the third metering event. The fluctuation when compared to the metering events shows the MW-2/MW-43 PSA was readily influenced by the ARD inducing WilClear™ solution.

Temperature, Turbidity, and pH

Temperature, turbidity, and pH were measured and recorded during the well purging activities. Inspection of the temperature and turbidity readings does not identify any trends in relation to ARD or WilClear™ metering. Prior to collecting samples during the PS, these parameters were monitored until they stabilized. Inspection of the pH readings recorded during the PS show a noticeable trend. The August 2003 sampling (one month after the second metering event) shows an increasing pH toward a more neutral reading in MW-2 and MW-43. The readings show a decreasing trend in the November 2003 sampling event (two months after the third and final metering event). This trend is another indicator tracking the progress, or migration, of the WilClear™ metered into MW-2 as well as a time line of increased microbial activity based on the solution's concentration and metering frequency.

⁴ Wiedemeier et al (1997) states "Redox reaction in groundwater containing organic compounds are usually biologically mediated; therefore, the redox of a groundwater systems depends on and influences rates of biodegradation."

4.2 MW-42 PILOT STUDY AREA

4.2.1 Volatile Organic Compounds

Inspection of the VOC summary table (Table 5) and the VOC charts in Appendix 3 for the MW-42 PS indicates that one non-chlorinated VOC, benzene, and 11 chlorinated VOCs were identified above the detection limits in MW-42 prior to the BIOX® injection event. Of these 12 VOCs, only chlorobenzene, 1,1,2,2 tetrachloroethane (1,1,2,2 PCA), and trichloroethene (TCE) exceeded the MDE Clean-Up Standards (0.011 mg/L, 0.001 mg/L and 0.005 mg/L, respectively). The pre-injection concentrations of chlorobenzene and TCE exceeded the EPA MCLs (0.100 mg/L and 0.005 mg/L, respectively).

The 1,1,2,2,-PCA concentrations in MW-42 decreased after the BIOX® injection event, but plateau above the MDE cleanup standard over the remaining PS sampling events. This may indicate that the BIOX® solution was expended. This decrease and plateau was also recognized in MW-44.

Chlorobenzene concentrations in MW-42 also decreased after the injection event, but rebounded slightly to approximately the clean-up standard of 0.011 mg/L. Chlorobenzene concentrations remained below the clean-up standard in MW-44 for the duration of the PS. Chlorobenzene concentrations remained below the EPA MCL of 0.100 mg/L.

TCE concentrations in both wells increased after the injection event, with the highest concentration in MW-42 during the September 2003 sampling event. This event also corresponded to the lowest measured water levels during the PS in both MW-42 and MW-44. This increasing concentration trend as the water level dropped suggests that drainage of the capillary fringe at the top of the water-table occurred, increasing the concentration of TCE in the groundwater. It is also possible that the effervescent action of the solution when injected enabled additional TCE to be transported downward from the overlying source area.

The *cis* and *trans* 1,2-DCE charts (Appendix 3) and Table 5 show an overall increase in concentrations in MW-42 with no significant fluctuations noted in MW-44 results. This increase may indicate breakdown of chlorinated VOCs with 3 or 4 chloride molecules (i.e. TCE/TCA or PCE/PCA) or, possibly, a flux of contaminated water entering the PSA from the overlying source area.

Table 5 and the corresponding charts (Appendix 3) for the chlorinated compounds 1,1,2-TCA, and vinyl chloride show a slight increase in concentrations after the initial injection event which can be attributed to similar mechanisms discussed above.

4.2.2 Degradation Indicator Parameters

Alkalinity, COD, and TOC trends in MW-42 appear to support the expected conclusion that the saturated unit would be affected by the peroxygen reagent solution injection. The increases suggest that once the BIOX® injection volume oxidized carbon-based compounds, an environment of biological growth began to develop. The increased alkalinity concentrations (in both wells) are good indicators of biological growth. As carbon dioxide is produced by biological activity at relatively neutral pH (pH >6 or 7 S.U.), much of it forms bicarbonate, which contributes to alkalinity. The alkalinity in MW-42 and MW-44 increases following the BIOX® injection event and appears to plateau later. This trend indicates biological growth. The increased COD and TOC concentrations after the BIOX® injection event indicates that considerable conversion of carbon/hydrogen-based compounds to hydroxylated compounds has occurred. These compounds can be biologically reduced by naturally occurring microbial communities once optimum growth and distribution has occurred. A review of the TPH results indicates minimal fluctuations in concentrations during the PS. However, the low concentrations and the slight fluctuations are too low to assess treatment effectiveness (Table 6 and Appendix 3 - Charts).

Inspection of the concentrations and trends of the remaining parameters (Iron, Sulfate, Nitrate, and Nitrite) are too low to assess treatment effectiveness or potential (Table 6 and Appendix 3 - Charts).

4.2.3 Field Water Quality Parameters

To aid in determining thoroughness of purging for each well sampled during the PS, conductivity, dissolved oxygen, oxidation/reduction potential (ORP or Redox), temperature, turbidity, and pH were monitored. Measurements were recorded on the Purging/Sampling Information Forms (Appendix 2) and summarized in Table 7. Once the various water quality parameters had stabilized, the designated well was sampled. As the readings stabilize, studies have shown that water representative of the surrounding formation rather than water from within a well's sand filter (i.e., sand packed around the well screen) is present in the well casing for sampling and analysis.

Conductivity (Specific conductance)

All of the conductivity readings measured during the PS were below 1.0 uS/cm. Conductivity readings decreased slightly in the MW-42 after the BIOX® injection event (0.418 in May 2003 down to 0.183 in November 2003) while readings in MW-44 remained relatively consistent throughout the PS (0.321 in May 2003 to 0.442 in November 2003). These readings suggest that the peroxygen reagent solution did not alter the conductivity.

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Dissolved Oxygen (DO)

Inspection of the recorded measurements presented in Table 7 shows an expected large increase in DO readings after the injecting the peroxygen reagent solution in May 2003. The peroxygen reagent solution appears to have released the oxygen molecules from the compound (hydrogen peroxide - HOOH), thus showing a false positive high DO concentration or possibly causing meter interference (see Table 7). Also, probe malfunction during these particular events may have occurred even though the probe was calibrated to the manufacturer's standards.

Redox (Oxidation-Reduction Potential)

The redox readings in MW-42 and MW-44 prior to the BIOX® injection event were 396 and 263 mV, respectively. These readings indicated an aerobic (or oxygen-rich) environment favorable for oxidation by aerobic microbes (breakdown to end products of carbon dioxide and water). As the PS progressed, the redox readings decreased more (down to -38 mV) in MW-42 samples indicating that the chemical-oxidation solution had likely been expended and the groundwater environment was being converted to an anaerobic environment. This is a typical progression for aerobic biodegradation environments to become oxygen-poor environments once mineralization of the chlorinated or non-chlorinated compounds has begun. Redox measurements for MW-44 remained in the aerobic range throughout the PS.

Temperature, Turbidity, and pH

Temperature, turbidity, and pH were measured and recorded during the well purging activities. Prior to collecting samples during the PS, these parameters were monitored until they stabilized. Inspection of the temperature and turbidity readings does not identify any trends in relation to the BIOX® injection event. Inspection of the pH readings recorded during the PS show a noticeable trend in MW-42 (center of Biox® injection event). The August 2003 sampling shows an increasing pH from below neutral (i.e., slightly acidic, 5 S.U.) toward a more basic reading (10.09 S.U.) in MW-2. Additionally, the readings from MW-44 show a very little fluctuation (5.38 in May 2003 to 4.41 in October 2003 to 5.0 in November 2003). The trend in MW-42 indicates that the injected peroxygen reagent solution effected the groundwater as it degraded during the PS.

Dissolved Gases

Inspection of the test results for the dissolved gasses methane, ethane, and ethene, identifies methane as the only compound above detection limits. These results suggest (in combination with above observations) that due to the initially very low concentrations of non-chlorinated and chlorinated VOCs, the results are inconclusive.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

5.1.1 MW-2 Pilot Study Area Conclusions

Interpretations of the data collected for each of the MW-2 PS parameters are presented in Table 4. This table indicates that most of the expected trends were wholly or partially observed during the PS. Furthermore, when taken as whole, these results indicate that the ARD mechanism can be enhanced by the addition of electron donor reagent solutions (e.g., sodium lactate in the form of WilClear™).

Conclusions based on interpretation of the overall data are:

- ▶ Injections in MW-2 do not immediately affect MW-43; however the combined parameters of groundwater velocity, volume of electron donor solution, and frequency of metering events show MW-43 is affected within two months of the first metering event (as approximated by calculations presented in this report).
- ▶ The data indicate chlorobenzene concentration reduction in the groundwater in the vicinity of MW-2 following WilClear™ metering events. This reduction is followed by a rebound in concentration within two months, suggesting that the system did not become self-sustaining during the PS. Also, the initial decreases in chlorobenzene concentrations may be attributed to dilution and/or dispersal by the "slugs" of sodium lactate introduced to the pilot study area.
- ▶ Biological activity is occurring to a significant extent.
- ▶ Reduction of iron and sulfate is occurring indicating conditions conducive to anaerobic reductive dechlorination. However, methanogenic redox conditions were not measured or did not occur.
- ▶ The presence of significant bioavailable iron might be preventing methanogenesis, which may, in turn, limit chlorinated VOC degradation.
- ▶ Overall, the electron donor solution (i.e., WilClear™) metering events stimulated significant biological activity. The data suggest that to achieve methanogenic conditions at the site, optimal for dechlorination, more frequent and larger volumes of electron donor solution will be necessary to effectively construct an environment conducive to dehalogenation.

Finally, the PS conducted in the MW-2/MW-43 area provided important information to aid in developing an effective groundwater remediation scenario for this portion of the facility. The PS confirmed that the groundwater can be effectively enhanced, or manipulated, for biological treatment. Treatment solutions, if used, will disperse throughout the affected area within a reasonable amount of time (i.e. weeks/months versus years). Degradation of COCs in this area of the facility could be more successful using mechanisms to enhance aerobic degradation conditions rather than anaerobic. Based upon the data gathered during the PS, other available in-situ technologies may be more efficient (implementation and remediation time and amount of treatment product) and cost effective which will address the more immediate matter of reducing/eliminating COC off-site migration. Section 5.2 discusses remediation recommendations.

5.1.2 MW-42 Pilot Study Area Conclusions

Interpretations of the data collected for each of the MW-42 PS parameters are presented in Table 8. This table indicates that most of the expected trends were partially observed during the PS. The conclusions of the data interpretation include:

- ▶ Based upon physical and visible evidence noted during the injection event, lateral and vertical distribution of the peroxygen reagent solution occurred within the saturated, water-bearing zone.
- ▶ Chlorinated VOC concentrations decreased following the injection event and then either remained about the same or increased. Some of the small increases may be attributed to dechlorination of the larger chlorinated molecules, e.g., 1,1,2,2-PCA or TCE, caused by the injected solution, while the increase in TCE is interpreted as a function of the dynamics of the source area itself.
- ▶ Based on the TOC and COD data, oxidation of carbon matter did occur. However, because some biological indicator parameters (i.e., nitrate and ferrous ion) did not appear to be affected, it is likely that most of the carbon matter attacked by the peroxygen solution was naturally occurring rather than hydrocarbon based (i.e., chlorobenzene, 1,1,2,2-PCA, etc.).
- ▶ The peroxygen solution used for this PS appeared to dissipate quickly, thus long-term in-situ effects were not achieved; suggesting that the groundwater environment in this portion of the site may be more amenable to slow release type in-situ solutions.

Finally, the PS conducted in the MW-42/MW-44 area provided important information to aid in developing an effective groundwater remediation scenario for this portion of the facility.

Treatment solutions, if used, will disperse throughout the affected area within a reasonable amount of time (i.e. weeks/months versus years). Depending upon the technology used, degradation of COCs in this area of the facility could be successfully achieved by using aerobic based mechanisms. Based upon the data gathered during the PS, other available in-situ technologies may be more efficient (implementation and remediation time and amount of treatment product) and cost effective which will address the more immediate matter of reducing/eliminating COC off-site migration. Section 5.2 discusses remediation recommendations.

5.2 RECOMMENDATIONS

Based on the PS results in the MW-2/MW-43 area, alternative remediation approaches to address the COC plumes should be used. These alternatives would entail using mechanical/automated means. These methods would "flood" the contaminant plumes with treatment solutions or utilize aqueous based solutions that are "slow release" type to ensure ample contact time via small-diameter wells or piezometers. These approaches are typically more cost effective when compared to the typical "one-pass" approach because the combination of slower groundwater velocity and the large lateral extent of the contaminant plumes requires numerous injection points and very large volumes of treatment solution to ensure effective and thorough treatment.

The PS MW-42/MW-44 area, as well as the remaining southern portion of the facility, exhibits a higher groundwater velocity and thicker groundwater bearing unit compared to the northeastern/east-central portions. Similarly, the contaminant plumes are laterally extensive. Even though the peroxygen solution used in this PSA was somewhat effective, numerous injection points and very large volumes of the treatment solution would be necessary to effectively treat the contaminant plumes. Therefore, as with the MW-2/MW-43 PSA, alternative remediation methods would introduce treatment solutions by mechanical means to attack the contaminant plumes, or through constructing permeable reactive barriers to treat the groundwater plumes as they migrate through the treatment structure.

An effective and industry-proven remediation (US EPA accepted and designated as an Environmental Technology Verification Program (ET) approach) method to treat the various contaminants and the range of concentration levels, would be to bubble or sparge streams of oxygen, ozone, or peroxide or a combination into the contaminant plumes in the MW-2/MW-43 portion of the facility through wells and thereby aerobically degrading the COCs. As has been stated previously, based on information gathered during the PS, the COCs in this portion of the site (benzene, chlorobenzene and TCE) will be more effectively treated via this mechanism. This method will eventually develop a treatment wall or zone that will remediate groundwater within the zone of influence of the treatment wells and groundwater as it migrates into the treatment zone from the hydraulically up-gradient areas.

The treated groundwater as it migrates down gradient will dilute and disperse contaminants that are downgradient of the treatment zone.

The bubble/sparge well approach would effectively and cost efficiently (compared to numerous injection points) address the laterally and vertically extensive groundwater plumes in the southern portion of the site. By bubbling or sparging streams of oxygen, ozone, or peroxide, or a combination, almost all of the COCs would be addressed. To effectively remediate the PCE identified along the western portion of the facility, the bubble/sparge well system would either first or simultaneously introduce an electron donor solution (e.g. propane) to effectively dechlorinate by anaerobic mechanisms. This is easily performed by alternating the bubbling or sparging streams with propane. The propane stream will affect the PCE while the oxygen or ozone or peroxide or a combination stream will attack the remaining COCs (i.e., PCE daughter products, chlorobenzene, 1,1,2,2-PCA, etc.).

An additional industry-proven remediation and cost effective method for the southern portion of the facility would be using a permeable reactive barrier (PRB). The barrier, or trench, would be filled with Zero Valent Iron (or iron filings). The iron is mixed with sand and placed in a trench either by direct pour or by using a bioslurry method (typically used when site condition do not allow trenches to remain open). Contaminated groundwater is treated as it migrates through the iron-filled trench. This technology (developed and trademarked by Waterloo University in Canada and EnviroMetal Technologies Inc.) will effectively treat the various contaminants in the southern portion with the exception of chlorobenzene. The chlorobenzene, if future sampling events show concentrations remain above clean-up standards, can be addressed with other remedial technologies.

Similar to the iron-filled PRB approach, slow release compounds, such as ChitoRem™ or food-grade emulsified edible oil substrate (EOS®), can be used to effectively and cost efficiently treat the various compounds in the southern portion of the facility. These food grade biopolymers slowly degrade and provide electron donors to enhance bioremediation of chlorinated VOCs. An industry-proven method that would work at the facility would include installing rows of injection points (i.e., direct-push technology) filled with the slow release treatment solution or installing well points, whereby the treatment solution would be periodically pumped under low pressure or gravity fed into the points; eventually creating an interlocking wall of slow release treatment solution. Typically, the rows are installed across the width of the contaminant plume, perpendicular to groundwater gradient direction. The rows are spaced throughout the plume area, thus, allowing contaminated groundwater to migrate through the treatment field plume and become progressively treated through each subsequent treatment row. This method is usually is more cost effective compared to canvassing particularly large contaminant plumes (as present on this facility) with a grid pattern type injection plan. The time required to treat the contaminant plume is extended some because existing site characteristics are used to aid in the

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treatment method (i.e., aquifer hydraulic gradient, dispersion and advection). Like an iron-filing PRB, these slow release solutions would not dechlorinate chlorobenzene time-efficiently. The chlorobenzene, if future sampling events show concentrations remain above clean-up standards, can be addressed with other remedial technologies.

Along the same lines of the treatment rows using the slow release solutions presented above, a slow release oxidizing solution that can successfully treat the chlorinated compounds identified at the facility is sodium persulfate (with and iron catalyst) solution. The activated sodium persulfate would be pumped (under low pressure) into the treatment row wells. This approach would allow for utilizing one technology rather than combining several methods to treat the suite of chlorinated and non-chlorinated (i.e., benzene) compounds present in the shallow water-bearing unit underlying the facility.

These approaches can also be constructed and operated downgradient of the facility if necessary. Alternatively, contaminant plume areas located off-site could be addressed with these treatment solutions using the one-pass direct-push technology approach should off-site access be limited by time and available operating space.

Using the data gathered during the course of completing the pilot studies and previous site investigations, experienced contractors will be contacted to assist in developing and implementing an efficient and cost effective approach to remediate the contaminated groundwater at the facility.

As it has been almost three years since the last facility-wide sampling event, the facility monitor wells (on-site and off-site) should be sampled and analyzed for COCs previously detected. Also, groundwater from perimeter wells (on-site and off-site) and select wells within the contaminant plumes should be analyzed for degradation (attenuation) parameters.

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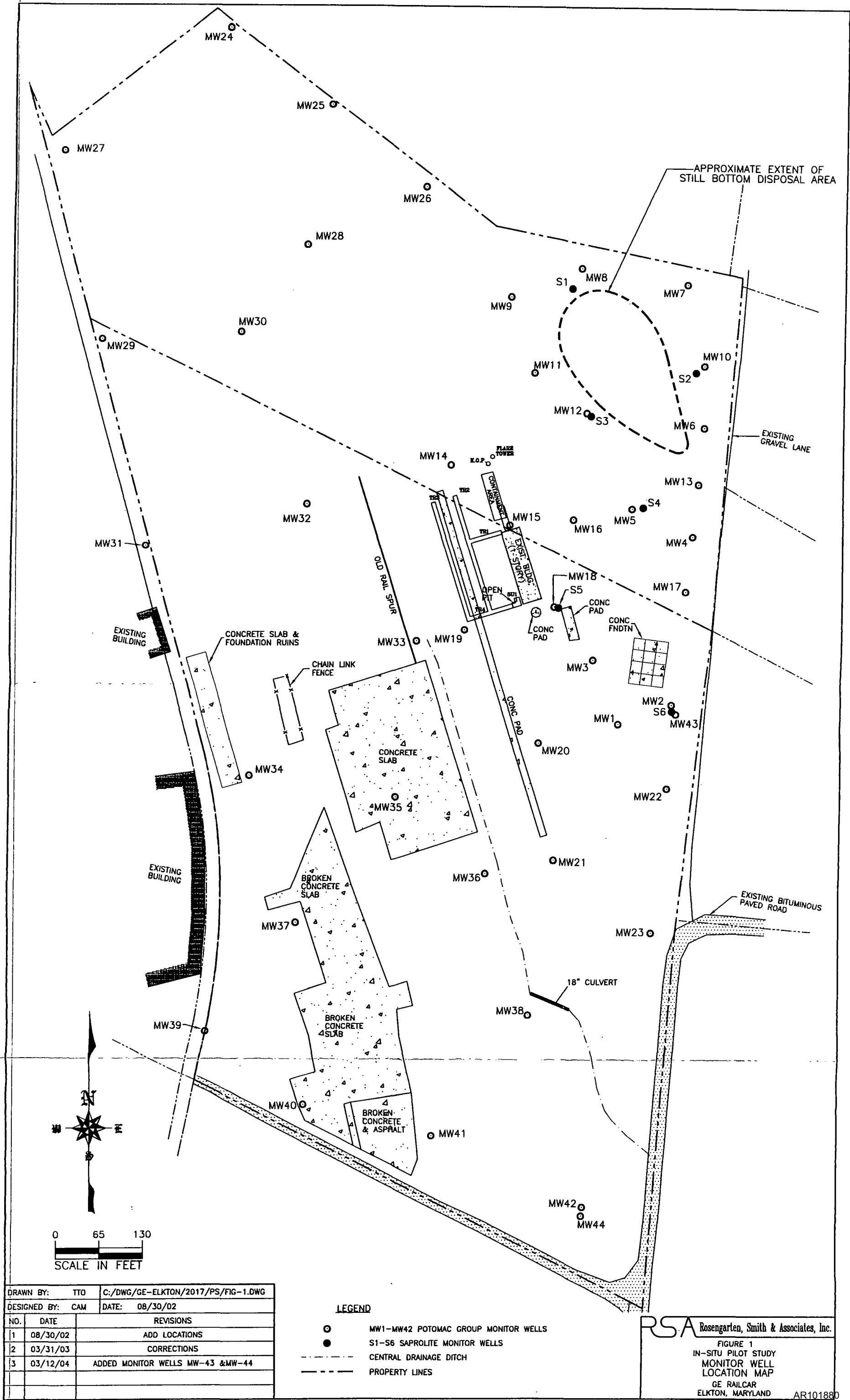
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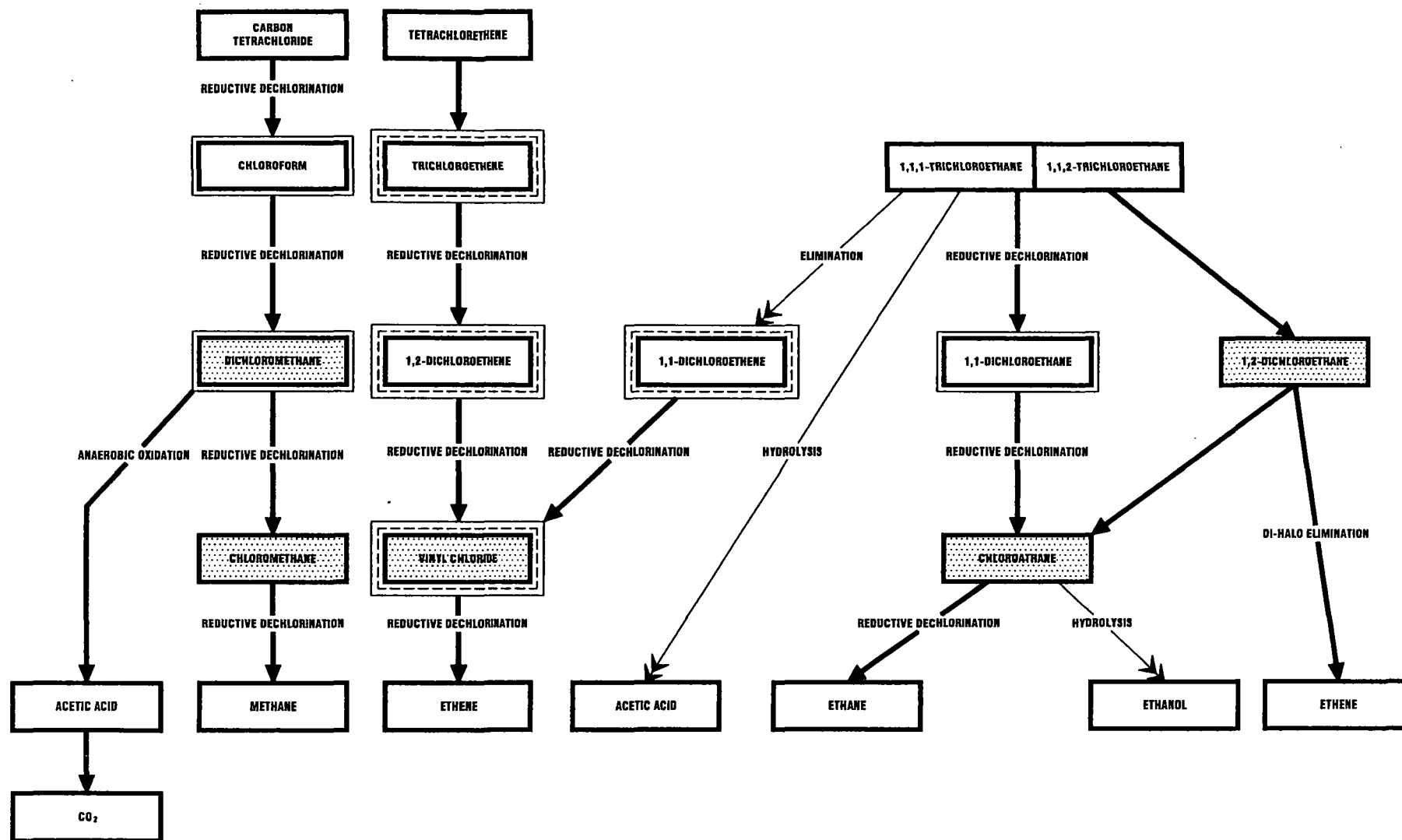
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FIGURES



DRAWN BY: TTO		C:/DWG/GE-ELKTON/2017/PS/FIG-1.DWG	
DESIGNED BY: CAM		DATE: 08/30/02	
NO.	DATE	REVISIONS	
1	08/30/02	ADD LOCATIONS	
2	03/31/03	CORRECTIONS	
3	03/12/04	ADDED MONITOR WELLS MW-43 & MW-44	



LEGEND

- BIOTIC REACTIONS (ANAEROBIC CONDITIONS)
- ABIOTIC REACTIONS (ANAEROBIC OR AEROBIC CONDITIONS)
- ▨ AEROBIC MINERALIZATION TO CO₂
- ▤ AEROBIC COMETABOLISM TO CO₂ IN PRESENCE OF TOLUENE
- ▥ AEROBIC COMETABOLISM TO CO₂ IN PRESENCE OF METHANE

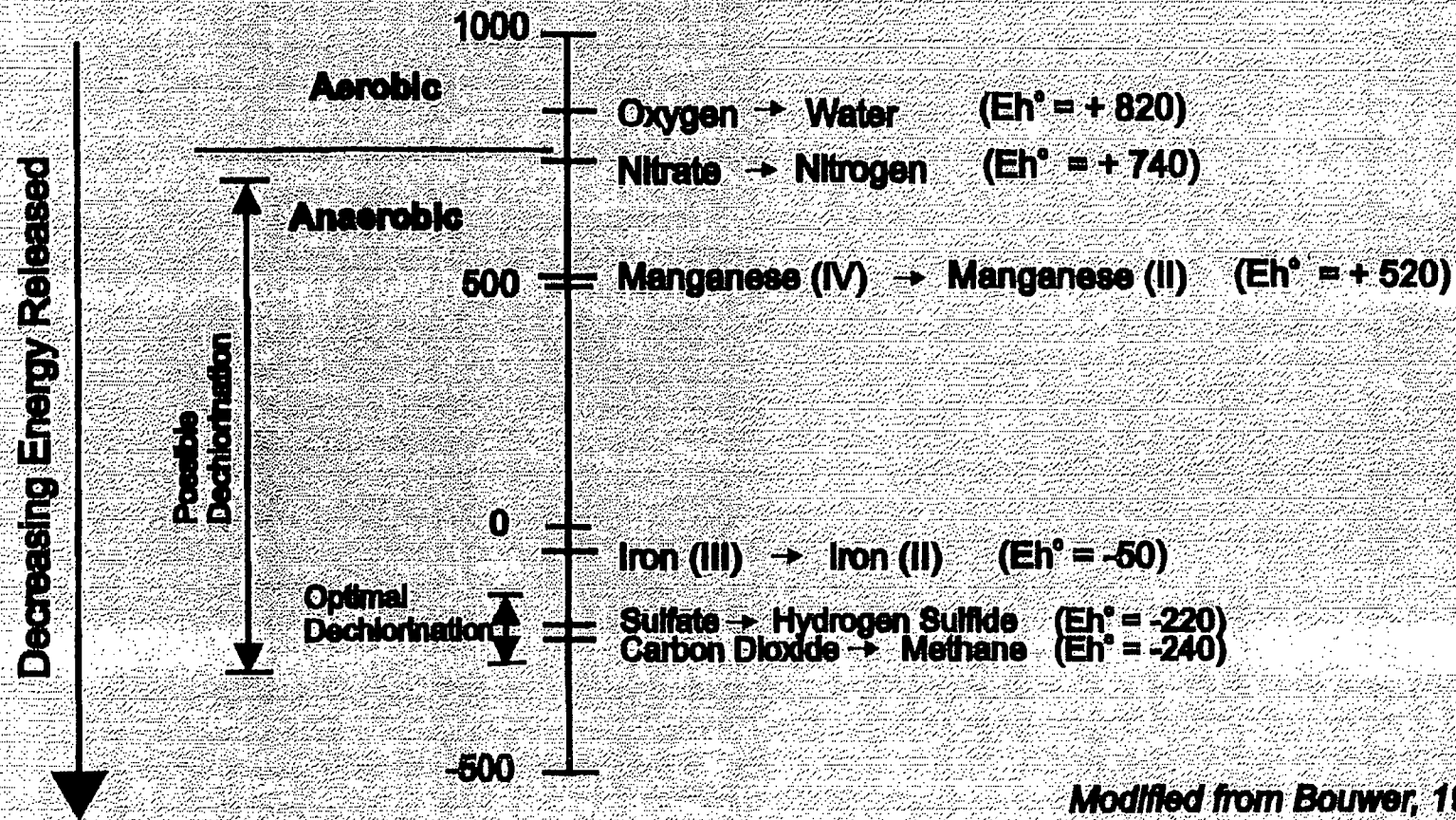
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FIGURE 2
IN-SITU PILOT STUDY
TYPICAL DEGRADATION COMPOUNDS
GE RAILCAR
ELKTON, MARYLAND

SOURCE:
ADOPTED FROM ITRC 1999

DRAWN BY:	TTO	C:/DWG/GE-ELKTON/2017/PS/FIG-2.DWG
DESIGNED BY:	CHS	DATE: 04/08/04
NO.	DATE	REVISIONS
1	-	

Redox Potential (E_h°)
in millivolts at pH = 7
and temperature = 25°C



*Modified from Bouwer, 1994
and Wiedemeier et al., 1996*

RSA Rosengarten, Smith & Associates, Inc.

FIGURE 3
IN-SITU PILOT STUDY
ORDER OF COMMON
INORGANIC ELECTRON ACCEPTORS
GE RAILCAR
ELKTON, MARYLAND

DRAWN BY: TTO		C:/DWG/GE-ELKTON/2017/PS/FIG-2.DWG
DESIGNED BY: CHS		DATE: 04/08/04
NO.	DATE	REVISIONS
1	-	

TABLES

TABLE 1
SUMMARY OF VOC RESULTS IN GROUNDWATER
MW-2 & MW-43 PILOT STUDY AREA
GE RAILCAR, ELKTON, MARYLAND

Volatile Organic Compounds milligrams/liters	MDE Groundwater Clean Up Standards	MW-2* 05/18/03	MW-2 06/24/03	MW-2* 07/22/03	MW-2 08/26/03	MW-2* 09/23/03	MW-2 10/21/03	MW-2 11/21/03	MW-43* 05/18/03	MW-43 06/24/03	MW-43* 07/22/03	MW-43 08/26/03	MW-43* 09/23/03	MW-43 10/21/03	MW-43 11/21/03
Acetone	0.061	0.064	0.039	0.025	0.022	0.344	0.074	0.032	0.0076	<0.0038	0.014	0.0048	0.005	0.084	0.0052
Benzene	0.005	0.022	0.009	0.015	0.0089	0.01	0.0072	0.0098	0.017	0.0075	0.015	0.012	0.021	0.011	0.014
2-Butanone (MEK)	0.19	<0.0025	0.038	0.094	0.206	0.275	0.289	0.179	<0.0025	<0.0025	<0.0025	0.018	0.0025	0.378	<0.0025
Chlorobenzene	0.011	1.48	0.547	0.827	0.495	0.808	0.433	0.749	0.796	0.484	0.623	0.729	0.789	0.539	0.671
Chloroethane	0.0036	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082
Chloroform	0.08	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052	<0.00052
Chloromethane	0.021	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075
1,1-Dichloroethane	0.08	0.001	0.0007	0.0008	0.0011	0.00088	0.0007	<0.00065	0.0012	0.00078	0.0014	0.001	0.0012	0.0009	0.0009
1,2-Dichloroethane	0.005	<0.00055	<0.00055	<0.00055	<0.00055	<0.00052	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055
1,1-Dichloroethene	0.007	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
1,2-Dichloroethene, total		0.0018	<0.0011	<0.0011	0.0019	0.002	0.0018	0.0019	<0.0011	<0.0011	<0.0011	0.00058 J	0.00065 J	0.0006 J	0.0008
cis-1,2-Dichloroethene	0.07	0.00058	<0.00055	<0.00055	0.00089	0.001	0.0009	0.0007	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	0.0008
trans-1,2-Dichloroethene	0.10	0.0012	<0.00059	0.0007	0.001	0.001	0.0009	0.0012	<0.00059	<0.00059	<0.00059	0.00058 J	0.00065	0.0006	<0.00059
Ethylbenzene	0.70	0.0032	<0.00058	0.0013	<0.00058	<0.00058	<0.00058	<0.00058	0.00069	<0.00058	<0.00058	0.00066	0.00051 J	<0.00058	<0.00058
1,1,2,2-Tetrachloroethane	0.001	0.0015	0.0017	<0.00044	0.0025	0.002	0.0028	0.0007	<0.00044	0.0013	<0.00044	<0.00044	<0.00044	0.0009	<0.00044
Tetrachloroethene	0.005	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
1,1,1-Trichloroethane	0.20	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
1,1,2-Trichloroethane	0.005	<0.00059	<0.00059	<0.00059	0.0024	0.00054 J	0.0011	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059	<0.00059
Trichloroethene	0.005	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	0.0007
m,p-Xylene	10	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012
o-Xylene	10	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011
Vinyl Chloride	0.002	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	0.0008	<0.00055	<0.00055	<0.00055	<0.00055

Notes:

* = Injection dates 05/23/03, 07/23/03 and 09/23/03

Numbers in Bold exceed the MDE Groundwater Clean Up Standards.

All samples collected 1ft above the bottom of the well

QA/QC by:	CAM 4/20/04
	CAM 10/15/04

TABLE 2
SUMMARY OF DEGRADATION PARAMETERS IN GROUNDWATER
MW-2 & MW-43 PILOT STUDY AREA
GE RAILCAR, ELKTON, MARYLAND

Attenuation Parameters milligrams/liters	MW-2* 05/18/03	MW-2 06/24/03	MW-2* 07/22/03	MW-2 08/26/03	MW-2* 09/23/03	MW-2 10/21/03	MW-2 11/21/03	MW-43* 05/18/03	MW-43 06/24/03	MW-43* 07/22/03	MW-43 08/26/03	MW-43* 9/23/03	MW-43 10/21/03	MW-43 11/21/03
TPH, Diesel Range Organics	0.10	0.21	0.57	0.20	1.7	0.61	13	<0.10	0.19	0.25	<0.10	<0.10	<0.10	0.15
TPH, Gasoline Range Organics	0.13	0.06	0.29	0.13	0.23	0.30	0.21	0.08	<0.05	0.30	0.12	0.41	0.24	0.23
Total Organic Carbon, Aqueous	3.4	3100	1689	2756	2049	3880	2867	1.9	7.7	7.9	46	681	9.9	12
Chemical Oxygen Demand	<10	7510	4730	7480	6700	6980	8510	11	20	33	134	1920	41	36
Total Alkalinity-Titration	74	1810	3337	3440	2123	2982	2900	84	74	206	135	568	93	76.4
Ferric Iron	59.9	148	159	116	177	139	47.9	26.6	45.7	26.6	60	130	63	63
Ferrous Iron	8.0	50	120	100	3.0	90	5.0	8.0	4.0	30	0.60	10	0.30	0.10
Iron (Total)	67.9	198	279	216	180	229	52.9	34.6	49.7	56.6	60.6	140	63.3	63.1
Sulfate	5.48	5.12	2.09	<0.38	0.779	12.4	8.73	14.8	15	7.01	0.595	2.57	2.09	0.612
Nitrate	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.129	0.09	<0.06	<0.06	<0.06	<0.06	<0.06
Nitrite	<0.02	<0.02	<0.02	<0.02	<0.20	<0.20	<0.50	<0.02	<0.02	<0.02	<0.02	<0.20	<0.02	<0.20
Methane	41	0.018	0.059	0.011	0.018	0.034	0.058	120	0.064	0.056	0.056	0.17	0.10	0.10
Ethane	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Ethene	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003

Notes:

* = Injection dates 05/23/03, 07/23/03 and 09/23/03

All samples collected 1ft above the bottom of the well

QA/QC by:	CAM 4/20/04
	CAM 10/15/04

TABLE 3
SUMMARY OF FIELD PARAMETERS IN GROUNDWATER
MW-2 & MW-43 PILOT STUDY AREA
GE RAILCAR, ELKTON, MARYLAND

	MW-2 05/18/03	MW-2 06/24/03	MW-2 07/22/03	MW-2 08/26/03	MW-2 09/23/03	MW-2 10/21/03	MW-2 11/20/03	MW-43 05/18/03	MW-43 06/24/03	MW-43 07/22/03	MW-43 08/26/03	MW-43 09/23/03	MW-43 10/21/03	MW-43 11/21/03
Specific Conductance (ms/cm)	0.398	0.604	0.57	0.77	0.524	0.691	6.91	0.345	0.405	0.42	0.61	0.485	0.199	0.449
Dissolved Oxygen (mg/L)	0.81	12.63	11.4	>19.9	9.83	8.12	>19.99	1.37	8.45	11.3	>19.9	6.49	7.49	>19.99
Redox (mV)	-21	-165	-189	-183	-61	-36	-7	-32	-78	-104	-129	-87	-45	-32
Temperature (°C)	11.82	13.49	14.6	14.1	14.52	14.44	13.76	12.28	13.32	14.8	14.2	14.42	14.08	13.67
Turbidity (NTU)	67.1	152	370	74	349	168	27.4	86.8	3.1	37	54	80.4	87.7	85.4
pH (SU)	5.95	5.96	5.52	7.24	7.26	7.47	6.17	5.79	5.83	5.44	6.32	7.27	7.4	5.35

Notes:

ms/cm = micro siemens per centimeter

mg/L = milligram per liter

mV = millivolts

°C = degree Centigrade

NTU = Nephelometric Units

SU = Standard Unit

All samples collected 1ft above the bottom of the well

QA/QC by:	CAM 4/20/04
	CAM 10/15/04

TABLE 4
GE RAILCAR, ELKTON MARYLAND
MW-2 & MW-43 PILOT STUDY AREA

Parameter	Expected Pilot Study Trend	Observed Pilot Study Trend	Conclusion of Pilot Study
VOCs ¹	decrease	slight to no decrease	this suggest that a higher concentration or more frequent metering events would likely continue the chlorobenzene and other chlorinated VOCs reducing trend
gasses ³	increase	decreased or not present	inconclusive
TPH ⁴	increase	slight increase	increase suggests that biological activity may be occurring and conducive to ARD ⁵
Alkalinity	increase	increase	increase suggests that biological activity may be occurring and conducive to ARD
COD ⁶	decrease	decrease	decrease suggests that biological activity may be occurring and conducive to ARD
TOC ⁷	increase	increase	increase suggests that biological activity may be occurring and conducive to ARD
Nitrate	decrease	decrease or not present	suggests that nitrate is not a significant component of reductive dechlorination in the PSA
Nitrite	increase	not present	suggests that nitrification is not a significant mechanism for reductive dechlorination in the PSA
Ferric Iron ⁺³	decrease	decrease	decrease suggests that biological activity may be occurring and possibly conducive to ARD
Ferric Iron ⁺²	increase	increase	increase suggests that biological activity may be occurring and possibly conducive to ARD
Sulfate	decrease	decrease	decrease suggests that biological activity may be occurring and strongly reducing conditions likely exist (i.e. ARD can occur)
Dissolved Oxygen	decrease	increase	inconclusive
Redox	decrease	decrease	decrease suggests that anaerobic conditions exist

NOTES:

1 VOCs - volatile organic compounds, 2 PSA - Pilot Study Area, 3 gasses - methane, ethane and ethene,
4 TPH - total petroleum hydrocarbons, 5 ARD - anaerobic reductive dechlorination, 6 COD - chemical oxygen demand,
7 TOC - total organic carbon

TABLE 5
SUMMARY OF VOC RESULTS IN GROUNDWATER
MW-42 & MW-44 PILOT STUDY AREA
GE RAILCAR, ELKTON, MARYLAND

Volatile Organic Compounds milligrams/liters	MDE Groundwater Clean Up Standards	MW-42 05/18/03	MW-42 06/24/03	MW-42 07/22/03	MW-42 08/26/03	MW-42 09/23/03	MW-42 10/21/03	MW-42 11/21/03	MW-44 05/18/03	MW-44 06/24/03	MW-44 07/22/03	MW-44 08/26/03	MW-44 09/23/03	MW-44 10/21/03	MW-44 11/21/03
Acetone	0.061	<0.0038	0.021	0.023	0.015	0.017	0.013	0.012	<0.0038	0.0048	<0.0038	<0.0038	0.0032 J	0.011	0.0041
Benzene	0.005	0.00091	<0.00063	<0.00063	<0.00063	0.001	0.0005 J	0.0009	0.00067	<0.00063	<0.00063	<0.00063	<0.00063	<0.00063	<0.00063
2-Butanone (MEK)	0.19	<0.0025	0.0025	<0.0025	<0.0025	0.002	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025
Chlorobenzene	0.011	0.014	0.0063	0.008	0.0074	0.011	0.0081	0.013	0.0068	0.0053	0.0025	0.0016	0.0018	0.0009	0.001
Chloroethane	0.0036	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082	<0.00082
Chloroform	0.08	0.0013	0.0011	0.001	0.00088	0.001	0.0009	0.0011	0.0015	0.0012	0.001	0.0011	0.001	0.0011	0.001
Chloromethane	0.021	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075	<0.00075
1,1-Dichloroethane	0.08	<0.00065	<0.00065	0.0008	<0.00065	0.0019	<0.00065	0.0015	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065	<0.00065
1,2-Dichloroethane	0.005	0.0012	0.001	0.0013	0.001	<0.00052	<0.00052	0.0019	0.0013	0.0012	0.001	0.0011	<0.00052	<0.00052	0.0009
1,1-Dichloroethene	0.007	<0.00057	0.0015	0.0022	0.0012	0.0036	0.0008	0.0036	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
1,2-Dichloroethene, total		0.056	<0.0011	<0.0011	0.088	0.738	0.094	0.406	0.0074	<0.0011	<0.0011	0.0079	0.0057	0.0034	0.0029
cis-1,2-Dichloroethene	0.07	0.037	0.052	0.121	0.065	0.527	0.07	0.282	0.0054	0.0041	0.0032	0.0056	0.004	0.0026	0.0022
trans-1,2-Dichloroethene	0.10	0.019	0.03	0.049	0.023	0.211	0.024	0.124	0.002	0.0015	0.001	0.0023	0.0017	0.0008	0.0007
Ethylbenzene	0.70	<0.00058	0.0015	0.0013	0.00059	0.00088	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058	<0.00058
1,1,2,2-Tetrachloroethane	0.001	0.054	0.0012	<0.00044	0.0018	0.0062	0.0038	0.0005	0.027	0.018	0.018	0.015	0.016	0.016	0.016
Tetrachloroethene	0.005	0.00073	<0.00067	0.0008	<0.00067	0.0008	<0.00067	0.001	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067	<0.00067
Toluene	1.0	<0.00064	0.0007	0.0012	<0.00064	0.0012	<0.00064	0.0006	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064	<0.00064
1,1,1-Trichloroethane	0.20	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057	<0.00057
1,1,2-Trichloroethane	0.005	0.0022	0.00065	0.0019	0.00087	0.0056	0.0016	0.0061	0.00088	0.0007	0.0006	<0.00059	0.00075	<0.00059	0.0007
Trichloroethene	0.005	0.0093	0.061	0.096	0.05	0.333	0.057	0.246	0.0033	0.0064	0.0058	0.0088	0.0077	0.0053	0.0053
m,p-Xylene	10	<0.0012	0.0044	0.0032	0.0014	0.0019	0.0008	0.0013	<0.0012	<0.0012	<0.0012	<0.0012	0.0008 J	<0.0012	<0.0012
o-Xylene	10	<0.0011	0.0013	0.0012	0.00054 J	0.00094 J	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011
Vinyl Chloride	0.002	0.0013	0.0035	0.0028	0.0013	0.0062	0.0012	0.0056	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055	<0.00055

Notes:

Numbers in bold exceed the MDE Groundwater Clean Up Standards.

All samples collected 1ft above the bottom of the well

QA/QC by:	CAM 4/20/04
	CAM 10/15/04

TABLE 6
SUMMARY OF DEGRADATION PARAMETERS IN GROUNDWATER
MW-42 & MW-44 PILOT STUDY AREA
GE RAILCAR, ELKTON, MARYLAND

Attenuation Parameters milligrams/liters	MW-42 05/18/03	MW-42 06/24/03	MW-42 07/22/03	MW-42 08/26/03	MW-42 09/23/03	MW-42 10/21/03	MW-42 11/21/03	MW-44 05/18/03	MW-44 06/24/03	MW-44 07/22/03	MW-44 08/26/03	MW-44 09/23/03	MW-44 10/21/03	MW-44 11/21/03
TPH, Diesel Range Organics	<0.10	0.20	0.14	0.13	<0.10	<0.10	<0.10	<0.10	0.13	<0.10	<0.10	<0.10	<0.10	<0.10
TPH, Gasoline Range Organics	0.10	0.14	0.34	0.15	0.80	0.12	0.34	<0.10	0.21	<0.10	<0.10	<0.10	<0.10	<0.10
Total Organic Carbon, Aqueous	1.1	103	270	170	148	102	118	<1.0	208	61	30	105	28	17
Chemical Oxygen Demand	<10	333	661	409	331	279	265	<10	461	108	53	155	44	35
Total Alkalinity-Titration	2.9	378	1743	260	238	226	240	4.2	139	69	59	67	63	64.7
Ferric Iron	<0.10	0.345	16.8	3.6	0.18	1.22	0.047	0.184	2.32	1.07	0.899	2.71	1.46	0.662
Ferrous Iron	<0.10	0.10	<0.10	0.40	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Iron (Total)	0.073	0.445	16.8	4.0	0.181	1.22	0.047	0.284	2.32	1.07	0.899	2.71	1.46	0.662
Sulfate	2.89	31.4	25.8	14.5	18.1	13.6	15.8	3.53	9.33	10.1	6.29	8.53	6.51	5.99
Nitrate	1.92	2.46	2.48	19.2	1.99	2.01	1.86	2.06	2.31	2.12	5.15	1.87	1.87	1.89
Nitrite	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methane	40	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	18	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethane	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Ethene	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003

Note:

All samples collected 1ft above the bottom of the well

QA/QC by:	CAM 4/20/04
	CAM 10/15/04

TABLE 7
SUMMARY OF FIELD PARAMETERS RESULTS IN GROUNDWATER
MW-42 & MW-44 PILOT STUDY AREA
GE RAILCAR, ELKTON, MARYLAND

	MW-42 05/18/03	MW-42 06/24/03	MW-42 07/22/03	MW-42 08/26/03	MW-42 09/23/03	MW-42 10/21/03	MW-42 11/21/03	MW-44 05/18/03	MW-44 06/24/03	MW-44 07/22/03	MW-44 08/26/03	MW-44 09/23/03	MW-44 10/21/03	MW-44 11/21/03
Specific Conductance (ms/cm)	0.418	0.238	0.29	0.18	0.216	0.163	0.183	0.321	0.66	0.57	0.49	0.479	0.438	0.442
Dissolved Oxygen (mg/L)	0.2	>19.99	16.7	>19.9	>19.99	12.51	>19.99	0	>19.99	12.6	>19.9	13.04	9.83	>19.99
Redox (mV)	396	-4	-42	-38	-3	3	-8	263	182	239	237	328	287	292
Temperature (°C)	12.66	14.01	15.2	15.2	14.47	14.47	14.31	12.93	14.1	15	14.6	13.84	13.76	13.95
Turbidity (NTU)	8.1	171	990	820	667	565	574	20.2	44	71	150	408	660	27.3
pH (SU)	5.08	6.34	7.81	7.7	8.95	8.75	10.09	5.38	5.39	5.41	4.86	4.81	4.41	5

Notes:

ms/cm = micro siemens per centimeter

mg/L = milligram per liter

mV = millivolts

°C = degree Centigrade

NTU = Nephelometric Units

SU = Standard Unit

All samples collected 1ft above the bottom of the well

QA/QC by:	CAM 4/20/04
	CAM 10/15/04

TABLE 8
GE RAILCAR, ELKTON MARYLAND
MW-42 & MW-44 PILOT STUDY AREA

Parameter	Expected Pilot Study Trend	Observed Pilot Study Trend	Conclusion of Pilot Study
VOCs ¹	decrease	slight to no decrease	initial decrease, slight rebound and then "plateauing" suggests that relatively higher concentration of chemical oxidation solution or more frequent and more closely spaced injection events would likely continue the VOC reduction trend
gasses ³	increase	decreased or not present	probably due to initial low VOC concentration (i.e. insufficient amount of "feedstock" to provide compounds for generation of gasses)
TPH ⁴	increase	slight increase to not present	minimal increase does not provide substantial data to determine effectiveness
Alkalinity	increase	initial increase with decreasing trend	shows residual distribution of oxidation solution and possibly a subsequent environment for biological activity
COD ⁵	increase	initial increase with decreasing trend	shows residual distribution of oxidation solution and possibly a subsequent environment for biological activity
TOC ⁶	increase	initial increase with decreasing trend	increase suggests that naturally occurring carbon compounds may have been released due to initial contact to oxidation solution and then decrease as the solution was spent
Nitrate	decrease	no change or not present	inconclusive
Nitrite	increase	not present	inconclusive
Ferric Iron ⁺³	decrease	initial increase with decreasing trend	shows residual distribution of oxidation solution as the oxidation solution contains iron catalyst
Ferric Iron ⁺²	increase	no change or not present	inconclusive
Sulfate	decrease	initial increase with decreasing trend	inconclusive
Dissolved Oxygen	increase	increase	measurements show a strongly aerobic environment occurring in the PSA
Redox	increase	decrease	increase suggests that groundwater was trending towards an aerobic environment

NOTES:

1 VOCs - volatile organic compounds, 2 PSA - Pilot Study Area, 3 gasses - methane, ethane and ethene,

4 TPH - total petroleum hydrocarbons, 5 COD - chemical oxygen demand, 6 TOC - total organic carbon

RSA Project No. 2017
GE Railcar, Elkton, MD
In-situ Remediation Pilot Study

APPENDICES

RSA Project No. 2017
GE Railcar, Elkton, MD
In-situ Remediation Pilot Study

APPENDIX 1

Soil Boring Logs and Well Construction Diagrams



Rosengarten, Smith & Associates, Inc.
Technical Environmental Management
AUSTIN, TEXAS (512) 707-1777

BORING NUMBER: B-42-A (MW-44)
LOCATION:
SE of MW-42

PROJECT INFORMATION

PROJECT: GE Railcar
SITE LOCATION: Elkton, MD
JOB NO.: 2017
LOGGED BY: Charles A. Montero
PAGE: 1 of 2

DRILLING INFORMATION

DATE DRILLED: 05/15/03
DRILLING METHOD: Hollow-stem auger
DRILLED BY: Chesapeake Geosystems
EXISTING GRADE ELEVATION (FT. AMSL) 48.48
SAMPLE COLLECTION METHOD: Split barrel

DEPTH	USCS	SOIL SYMBOLS	LITHOLOGIC DESCRIPTION	SOIL COLORS	PID ppm	SOIL SAMPLE		REMARKS OR FIELD OBSERVATIONS
						DEPTH	REC.	
0	ML		top soil roots soft brown loam clayey silt fissile, dry/slightly moist yellowish brown laminations (dk gray) rootlets, clay decreases w/depth, granules/pebbles scattered, black nodules, qtz pebbles, low plasticity	10yr 5/4	14.3	0-2	1.0	Background noises from 1.5-3.2 Analysis samples 0.5-1 1528, 4.5-5 1540, 9.5-10 1555, 14.5-15 1625
					13.4/ 16.9	2-4	1.3	
	CL		clayey silt/silty clay lt. olive gray, stiff, slightly moist w/laminations of lt. olive gray clay	5y 4/1	290- 335	4-6	1.35	
	CH		clay, olive gray w/yellow brown seams soft, v. moist, plasticity increases w/depth, dk olive gray/gray seams @ 8ft bgs	5y 4/2	325- 373	6-8	1.9	Headspace sample bags 4-6, 6-8, 8-10, emitted faint organic odors
	CH		silty clay/v. silty clay soft, v. moist, lt. yellowish, plastic, stiffness increases w/depth, lt. gray mottling	10yr 6/4	99.3- 113	8-10	2.0	
10					85.9- 93.4	10-12	1.25	no odor
	SW		gravely sand w/coarse pebble moist/v. moist, brown/strong brown, w/reddish yellow seams, subrounded, qtz, mica, opaques granules/pebbles frequency increase w/depth moisture increases w/depth, poorly sorted-well graded	7.5yr 5/6	14.6- 21.3	12-14	1.6	no odor
						14-16		
15	GW/SW				12.3- 18.9	16-18	1.2	no odor
					67.5- 89.3			gravels 16'-17' poor recovery
	SP		sand vfg saturated, subrounded, mica/qty particles, lt. gray to v. pale brown	10yr 7/2			0.5	no odor
			lt. gray/brownish gray bands/seams			18-20		
				10yr 7/1	54.9- 67.5		1.9	no odor
20				6/17				

AR101894



Rosengarten, Smith & Associates, Inc.
Technical Environmental Management
AUSTIN, TEXAS (512) 707-1777

BORING NUMBER: B-42-A (MW-44)
LOCATION:
SE of MW-42

PROJECT INFORMATION

PROJECT: GE Railcar
SITE LOCATION: Elkton, MD
JOB NO.: 2017
LOGGED BY: Charles A. Montero
PAGE: 2 of 2

DRILLING INFORMATION

DATE DRILLED: 05/15/03
DRILLING METHOD: Hollow-stem auger
DRILLED BY: Chesapeake Geosystems
EXISTING GRADE ELEVATION (FT. AMSL) 48.48
SAMPLE COLLECTION METHOD: Split barrel

DEPTH	USCS	SOIL SYMBOLS	LITHOLOGIC DESCRIPTION	SOIL COLORS	PID ppm	SOIL SAMPLE		REMARKS OR FIELD OBSERVATIONS
						DEPTH	REC.	
30	SP		sand, poorly graded/well sorted, vfg, subrounded, saturated, mica, quartz, lt. gray/white w/yellow brown seams	10yr 7/1-8/1	85.1-99.7	20-22	1.9	
			same as above (lt gray vfg sand)			22.5-24.5		
	SP		yellow brown sand, interbedded w/dk gray wet, sandy clay		61.3-75.7		2	
	CL		gray/gray brown sandy clay alternating w/ lt. gray/yellow brown seams, vfg to fg sand			25-27		
35	SP		vfg/fg sand subrounded/subangular, saturated, mica/opaque lt. yellow brown alternating w/pale brown w/lt. gray		82.3-87		2	
						27.5-29.5		
	SP			10yr 8/3 7/2 6/4	9.9-12.4	30-32	2	
	CL		v. sandy clay, stiff, wet, low plasticity, dusky red laminations alternating lt. gray and pale brown seams, mica and opaques		24.1-35.3		2	
40	SW/GW		gravelly sand yellow/yellow red saturated, subangular/angular	10yr 8/8		32.5-34.5	1.2	
					12.9-15.1			
	CL		v. stiff/dense sandy clay/clayey sand w/dusk, red mottling, wet, yellowish red		7.1-10.4	35-37	0.75	
	CH		gray/greenish gray clay v. stiff, w/red mottling		4.2-6.8	37-39	1.5	ream to 38, sample to 38.5

AR101895

WELL COMPLETION RECORD

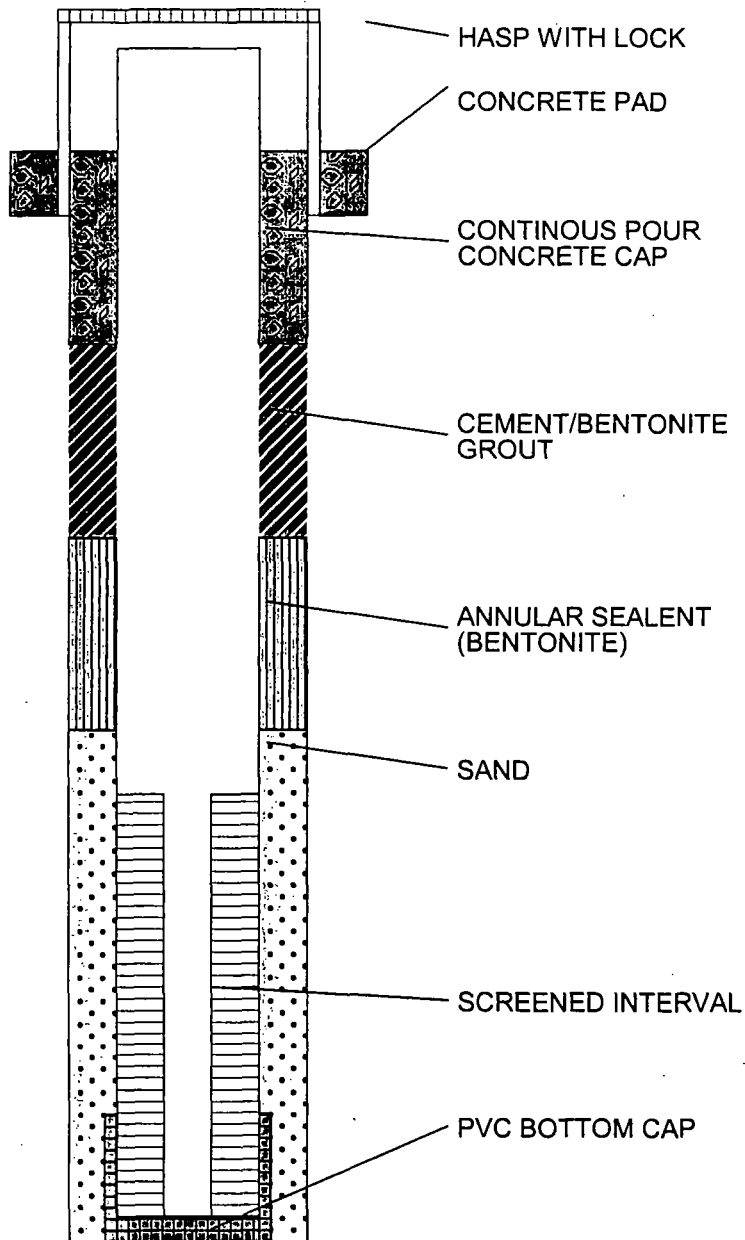
WELL NO. MW-44 (B42-A)

CLIENT: GE Railcar

DRILLER: Chesapeake Geosystems

GEOLOGIST: Charles A. Montero

DATE COMPLETED: 05/15/03



Stick-Up (ft): 2.10

Ground Elevation (ft. msl): 48.48

Top of Casing Elevation (ft. msl): 50.58

Hole Diameter (in): 8

Casing Size (in): 2

Casing Length (ft): 20.10

Casing Material: PVC

Elevation, Top of Cement (ft. msl): 48.59

Elevation, Bottom of Cement (msl):

Cement Placement Method:

Elevation, Top Bentonite Seal (ft. msl):

Elevation, Bottom of Bentonite (ft. msl):

Elevation, Top of Sand Pack (ft. msl):

Elevation, Bottom of Sand (ft. msl):

Sand Placement Method: Gravity

Screen Slot Size (in): 0.010

Screen Length (ft): 19.45

Screen Material: PVC

Elevation, Top of Screen (ft. msl): 30.48

Elevation, Bottom of Screen (ft. msl): 11.03

Total Measured Well Depth from Ground
Surface (ft): 40.31

Elevation, Bottom of Boring (ft. msl): 9.48



Rosengarten, Smith & Associates, Inc.
Technical Environmental Management
AUSTIN, TEXAS (512) 707-1777

BORING NUMBER: MW-43

LOCATION:

15 ft. SE MW-2 7' ESE 5-6

PROJECT INFORMATION

PROJECT: GE Railcar
SITE LOCATION: Elkton, MD
JOB NO.: 2017
LOGGED BY: Charley A. Montero
PAGE: 1 of 2

DRILLING INFORMATION

DATE DRILLED: 05/15/03
DRILLING METHOD: Hollow Stem Auger
DRILLED BY: Chesapeake Geosystems
EXISTING GRADE ELEVATION (FT. AMSL) 56.76
SAMPLE COLLECTION METHOD: Split barrel

DEPTH	USCS	SOIL SYMBOLS	LITHOLOGIC DESCRIPTION	SOIL COLORS	PID ppm	SOIL SAMPLE		REMARKS OR FIELD OBSERVATIONS
						DEPTH	REC.	
0	CL		top soil routlets silty lam	10yr 6/6		0.2	1.0	Background PID
	CL		sandy silt/silty clay dry to sl. n moist brownish y/w, low plas.		2.5-4			0.2-0.7 ppm stabilized to 0.0 ppm during drilling activities w/peaks to 2ppm from exhaust drilling rig
	CL		silty clay/v. silty clay, moist low plasticity, brownish yellow w/pale brown (6/3) seams silty increase w/depth, moisture increase w/depth	10yr 6/6	3.5/ 4.0	2.5-4.5	1.3	
	SC/SP		sand with minor clay vfg subrounded subangular loose moist poorly graded/well sorted	7.5yr/6/6	11.5/ 13	5-7	1.4	5.5 very moist
	CL/CH		lt gray sandy clay/slightly sa. clay stiff, moist moderate plastic w/ylwish red, mod gray laminations, sand & silt decrease depth	5yr 6/1	11.5/ 10.5	7.5-9.5	1.25	slight odor organic?
10	CH		light gray, moist clay stiff high plasticity, pale brown, yellow brown laminations/mottling	10yr 7/1 to 5yr	9.6/ 13.3	10-12	1.0	
	SP		sand w/minor clay/sand loose slightly moist (reddish yellow (7.5yr-6/6) seam laminations) sub rounded vfg, well sorted/poorly graded		4.7/5	12.5-14.5	1.7	
15	SW		sand fine-med. grained, loose slightly moist w/fine pebble size subangular to gravelly sand qtz, mica, opaques, moisture increase depth w/dusky red laminations	10yr 7/4	5/ 6.1	15-17	1.3	
	SW/GW		gravelly sand/sandy gravel wet coarse sand/granule sub gravel	NG 10yr 8/0	10.3/ 11.6	17.5-19.5	1.2	Driller noted gravel layers between 19-20'
20			(begins btw 19.5/20' bgs) gray sand vfg/fg poorly sorted,		5.2/ 6.9			

AR101897



Rosengarten, Smith & Associates, Inc.
Technical Environmental Management
AUSTIN, TEXAS (512) 707-1777

BORING NUMBER: MW-43

LOCATION:

15 ft. SE MW-2 7' ESE 5-6

PROJECT INFORMATION

PROJECT: GE Railcar
SITE LOCATION: Elkton, MD
JOB NO.: 2017
LOGGED BY: Charley A. Montero
PAGE: 2 of 2

DRILLING INFORMATION

DATE DRILLED: 05/15/03
DRILLING METHOD: Hollow Stem Auger
DRILLED BY: Chesapeake Geosystems
EXISTING GRADE ELEVATION (FT. AMSL) 56.76
SAMPLE COLLECTION METHOD: Split barrel

DEPTH	USCS	SOIL SYMBOLS	LITHOLOGIC DESCRIPTION	SOIL COLORS	PID ppm	SOIL SAMPLE		REMARKS OR FIELD OBSERVATIONS
						DEPTH	REC.	
25	SW		loose, subangular to subrounded, saturated y/w bm bands color grades to med/dk gray	N8	5/5.8	20-22	0.8	
	SW		same lithology, saturated sand w/gravel pebble to granule size subangular clayey sand seams (1" thick) intermittent btw 26-27' bgs lt. gray	N3	21.3	22.5-24.5	1.5	slight odor organic?
	SP/CL		sand fg saturated lt. gray w/yellow brown bands sandy clay seams, subrounded	N7	14.8/ 15.9	25-27	1.5	
30	CH		v. stiff clay/saprolite moderate reddish brown, lt gray-med gray olive-gray/green mottled/lamination	N6/10yr8/0	13.7/ 14.9	27.5-29.5	1.3	
					14.6/ 19.3	30-32	1.3	flowing sands @ 29.5 - 30'

WELL COMPLETION RECORD

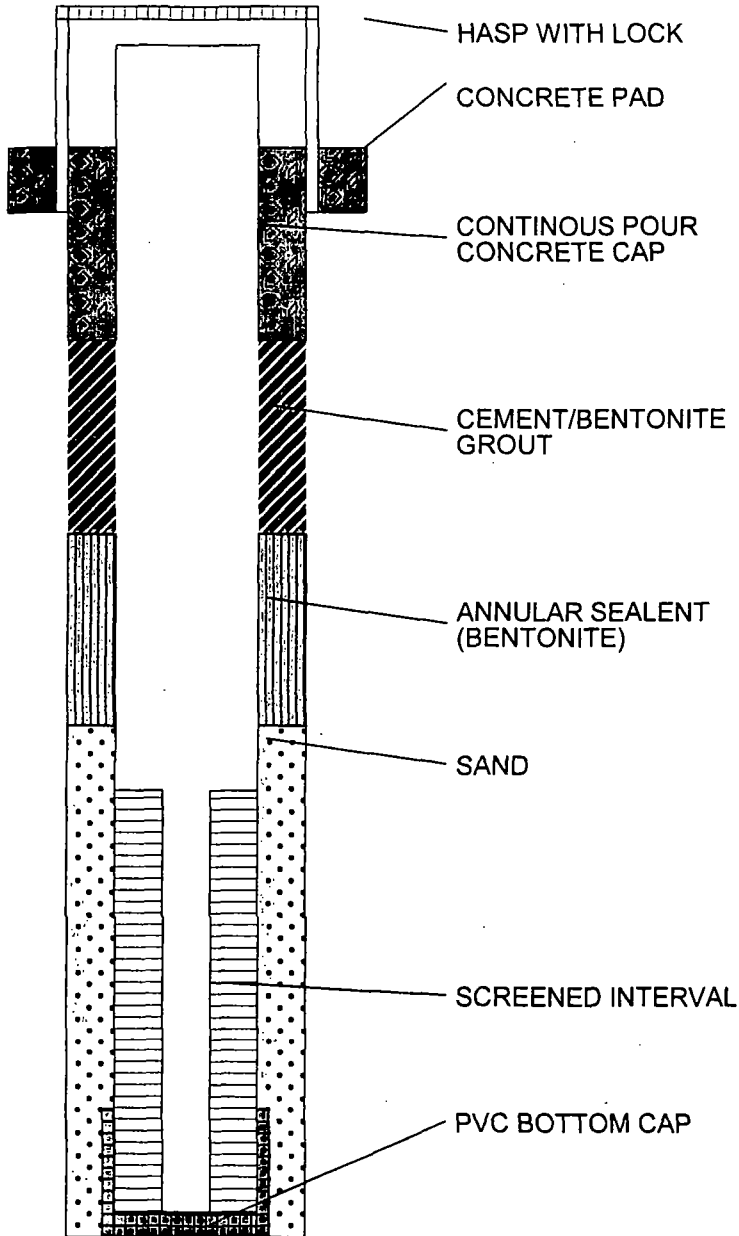
WELL NO. MW-43

CLIENT: GE Railcar

DRILLER: Chesapeake Geosystems

GEOLOGIST: Charles A. Montero

DATE COMPLETED: 05/15/03



Stick-Up (ft): 2.32

Ground Elevation (ft. msl): 56.76

Top of Casing Elevation (ft. msl): 59.08

Hole Diameter (in): 8

Casing Size (in): 2

Casing Length (ft): 22.12

Casing Material: PVC

Elevation, Top of Cement (ft. msl): 57.00

Elevation, Bottom of Cement (msl):

Cement Placement Method:

Elevation, Top Bentonite Seal (ft. msl): 45.58

Elevation, Bottom of Bentonite (ft. msl):

Elevation, Top of Sand Pack (ft. msl): 45.58

Elevation, Bottom of Sand (msl):

Sand Placement Method: Gravity

Screen Slot Size (in): 0.10

Screen Length (ft): 10.60

Screen Material: PVC

Elevation, Top of Screen (ft. msl): 36.96

Elevation, Bottom of Screen (ft. msl): 26.36

Total Measured Well Depth from Ground
Surface (ft): 33.11

Elevation, Bottom of Boring (ft. msl): 27.08

APPENDIX 2

Analytical Laboratory Data Sheets, Chain-of-Custody Forms



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 101947

Order #: 03-05-770
Date: 06/12/03 09:05
Work ID: GE Railcar monitoring wells
Date Received: 05/19/03
Date Completed: 06/11/03
Client Code: RSA

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	MW-2-1
02	MW-43-1
03	MW-2-6
04	trip blank

Sample Number	Sample Description
05	MW-43-6
06	field blank
07	MW-42-1
08	trip blank

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568



Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0305770

Overview:

A set of 8 samples was received from Rosengarten, Smith and Associates and is identified as 0305770. 0305770 consisted of five (5) samples two (2) trip blanks and one (1) field blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per twenty samples as requested by the Rosengarten, Smith and Associates project manager.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 5 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
5/23/03 15:55	None
5/24/03 12:18	None
5/25/03 16:50	None
5/27/03 07:55	None
5/28/03 00:33	Chlorobenzene at 0.6ug/L.
5/29/03 15:20	None

The instrument performance was acceptable as indicated by the tune report for 4-Bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 5/23/03 except for chloromethane, acetone, 2-hexanone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 5/25/03 except for acetone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 5/29/03.

Case Narrative

ACL Order Number 0305770 (Continued)

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards except for the continuing calibration check analyzed on 5/27/03 19:16. This check failed the minimum response factor for bromoform and 1,1,2,2-tetrachloroethane. Bromomethane failed this check for %RSD>25. The samples associated with this continuing calibration check were re-analyzed except for 0305770-02RA. This sample was being re-analyzed for SMC3 failure. The re-analysis also failed SMC3. 0305770-02DL5X was analyzed on 5/29/03, all SMC's passed.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 0305770-02 analyzed on 05/25/03 SMC3, sample was re-analyzed on 05/28/03 SMC3 failed, 05/25/03 data was used for reporting. 0305770-05 failed SMC3. Sample was not re-analyzed due to high chlorobenzene content..

The results of the MS/MSD were within the acceptance limits with the following exceptions. 0305770-07MS and MSD failed low for chlorobenzene. Chlorobenzene ambient level in sample is greater than spike level.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0305770-01:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 05/29/03.

0305770-02:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 05/29/03.

Case Narrative

ACL Order Number 0305770 (Continued)

0305770-07:

1,1,2,2-Tetrachloroethane exceeded the calibration range. Sample was diluted and re-analyzed on 05/29/03.

0305770-03:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 05/29/03.

0305770-05:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 05/29/03.

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

PROJECT NAME GERAILCAR - RSA Inc #2017
COMPANY R. S. Ingarten, Superintendent Assoc. Inc.
ADDRESS 3227 Western Trails #300 AUSTIN TX 78741
PHONE (512) 707-1777
707-0501 FAX



630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)

SAMPLED BY F. Montero FA Zarecky
SIGNATURE F. Montero FA Zarecky
PRINT NAME VE Varius

SAMPLE COLLECTION FEE:

QUOTED PRICE:

ANALYSES

Relinquished by: <i>M. M. White</i>	Date / Time 5/9/03 0707	Received by: <i>Ed. Gzarecki</i>	Relinquished by: <i>Ed. Gzarecki</i>	Date / Time 05/19/03 0742	Received by: <i>Kathleen</i>
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:
Method of Shipment <i>Delivered by Client</i>		Remarks:			YES NO Samples Iced <input checked="" type="checkbox"/> <input type="checkbox"/> Samples Preserved <input checked="" type="checkbox"/> <input type="checkbox"/>

CHAIN OF CUSTODY RECORD

PROJECT NAME GERALD CAR ELKTON MD RSA, INC
 COMPANY Environmental Smith & Assoc Inc
 ADDRESS 777 Monticello Trails Suite 300
 PHONE (SIC) 707-1777 78745



ATLANTIC COAST
 Laboratories, Incorporated

630 Churchmans Road
 Newark, Delaware 19702
 302-266-9121 • 454-8720 (FAX)

SAMPLED BY Ed Bareckey
 SIGNATURE E A Zapecky
 PRINT NAME

SAMPLE COLLECTION FEE:
 QUOTED PRICE:

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER		GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	ANALYSES												COMMENTS
				SIZE	G/P						VOC (no list)	PERCHLORATE	TOC	THALLOIDRO	STANDBY	DDO	NITROGEN	PHOSPHORUS	AMMONIA	AMMONIUM	CHLORIDE	FLUORIDE	
	5/18/03	1418	MW-2-1	✓	GP	✓		11	H ₂ O	HCL, HNO ₃ H ₂ SO ₄	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	5/18/03	1224	MW-43-1	✓	GP	✓		11	H ₂ O	do.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	5/18/03	1338	MW-2-6	✓	GP	✓		11	H ₂ O	do.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	5/18/03		MW-43-6	✓	GP	✓		11	H ₂ O	do.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	5/18/03	0500	TRIP BLANK (MW-2 MW-43)	✓	GP	✓		2	H ₂ O		✓												for a rough guess in ice chest for four sample sets

Relinquished by: <u>E A Zapecky</u>	Date / Time: <u>5/18/03 0707</u>	Received by: <u>Ed Bareckey</u>	Relinquished by: <u>Ed Bareckey</u>	Date / Time: <u>05/19/03 0745</u>	Received by: <u>Ruth Hyle</u>
Relinquished by:	Date / Time:	Received by:	Relinquished by:	Date / Time:	Received for Laboratory by:

Method of Shipment: Chilled

Remarks: 5/19/03

Samples Iced ☒ YES ☐ NO

Samples Preserved ☒ YES ☐ NO



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 101948

Order #: 03-05-771
Date: 06/12/03 09:05
Work ID: GE Railcar monitoring wells
Date Received: 05/19/03
Date Completed: 06/11/03
Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	MW-44-1
02	trip blank

<u>Sample Number</u>	<u>Sample Description</u>
03	MW-42-11
04	MW-44-11

This cover page is an integral part of the analytical report.

Laboratory Certifications:	DE	DE00011	PA	68-335
	MD	138	NJ	DE568

Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0305771

Overview:

A set of 4 samples was received from Rosengarten, Smith and Associates and is identified as 0305771. 0305771 consisted of three (3) samples and one (1) trip blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per twenty samples as requested by the Rosengarten, Smith and Associates project manager. MS/MSD sample for this sample set is 0305770-07.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 5 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
5/23/03 15:55	None
5/24/03 12:18	None
5/25/03 16:50	None
5/27/03 07:55	None

The instrument performance was acceptable as indicated by the tune report for 4-Bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 5/23/03 except for chloromethane, acetone, 2-hexanone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 5/25/03 except for acetone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

Case Narrative

ACL Order Number 0305771 (Continued)

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 0305771-03 analyzed on 05/24/03 failed SMC1, sample was re-analyzed on 05/27/03 passed SMC1, 05/27/03 data was used for reporting.

The results of the MS/MSD were within the acceptance limits with the following exceptions. 0305770-07MS and MSD failed low for chlorobenzene. Chlorobenzene ambient level in sample is greater than spiked amount.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

None

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

704 0307 EN



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)

0305771

SAMPLED BY C. J. Montero PA Zarecky
SIGNATURE C. J. Montero EA Zarecky
PRINT NAME V = VARIOUS

SAMPLE COLLECTION FEE:

QUOTED PRICE:

ANALYSES

[illegible]

Relinquished by: <i>A. Manteno</i>	Date / Time <i>5/19/03 0707</i>	Received by: <i>ca Zarecky</i>	Relinquished by: <i>ca Zarecky</i>	Date / Time <i>05/19/03 0744</i>	Received by: <i>Kuth fgh</i>
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment	Remarks	YES	NO
Express Delivery		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>

2

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 10:18

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	64	3.8	
Benzene	22	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	1480	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.0	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	0.58	0.55	
trans-1,2-Dichloroethene	1.2	0.59	
1,2-Dichloroethene, total	1.8	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	3.2	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	1.5	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	88	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 10:18

Category: GW

Toluene-d8	<u>97</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>99</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/25/03 18:21:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-1

Lab No: 01F

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 10:18

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>41</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 05:50:00ANALYST STLCONC FACTOR 1UNITS ug/L

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 12:24

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	7.6	3.8	
Benzene	17	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	796	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.2	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	0.69	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	93	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 12:24

Category: GW

Toluene-d8	<u>95</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>80 Q</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/25/03 19:05:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02F

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 12:24

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>120</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 05:54:00ANALYST STLCONC FACTOR 1UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-2-6

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 13:38

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	20	3.8	
Benzene	10	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	632	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.72	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	0.62	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	2.8	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	87	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-2-6

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 13:38

Category: GW

Toluene-d8	<u>92</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>87</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/27/03 10:04:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-6

Lab No: 03F

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 13:38

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>47</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 06:00:00ANALYST STLCONC FACTOR 1UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/14/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	118	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/14/03

Category: GW

Toluene-d8	<u>102</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>92</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/24/03 13:46:00ANALYST IMCONC FACTOR 1UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-43-6

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 05/18/03 14:53

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	13	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	684	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.0	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	0.74	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	84 Q	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-43-6

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 14:53

Category: GW

Toluene-d8	<u>96</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>82 Q</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/27/03 10:46:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-6

Lab No: 05F

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 14:53

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>92</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 06:05:00ANALYST STLCONC FACTOR 1UNITS ug/L

TEST RESULTS BY SAMPLE

Sample Description: field blank Lab No: 06A
Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA
Collected: 05/18/03 16:55 Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	101	86 - 118

Order # 03-05-770
06/12/03 08:46

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TEST RESULTS BY SAMPLE

Sample Description: field blank

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 16:55

Category: GW

Toluene-d8	<u>101</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>93</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/27/03 08:38:00

ANALYST IM

CONC FACTOR 1

UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 07A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 17:56

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	0.91	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	14	0.62	
Chloroethane	ND	0.82	
Chloroform	1.3	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.2	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	37	0.55	
trans-1,2-Dichloroethene	19	0.59	
1,2-Dichloroethene, total	56	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	54	0.44	
Tetrachloroethene	0.73	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	2.2	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	9.3	0.65	
Vinyl Chloride	1.3	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	104	86 - 118

Order # 03-05-770

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06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 07A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 17:56

Category: GW

Toluene-d8	<u>99</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>91</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/25/03 19:49:00

ANALYST RJM

CONC FACTOR 1

UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1 MS

Lab No: 07B

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 17:56

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	61	3.8	
Benzene	11	0.63	
Bromodichloromethane	9.4	0.55	
Bromoform	9.2	0.53	
Bromomethane	8.1	2.3	
2-Butanone (MEK)	51	2.5	
Carbon Disulfide	10	0.61	
Carbon Tetrachloride	9.9	0.66	
Chlorobenzene	21	0.62	
Chloroethane	11	0.82	
Chloroform	12	0.52	
Chloromethane	12	0.75	
Dibromochloromethane	9.8	0.51	
1,2-Dibromoethane	9.3	0.52	
1,2-Dibromo-3-Chloropropane	9.0	0.60	
1,2-Dichloroethane	12	0.55	
1,1-Dichloroethane	11	0.65	
1,1-Dichloroethene	11	0.57	
cis-1,2-Dichloroethene	47	0.55	
trans-1,2-Dichloroethene	30	0.59	
1,2-Dichloroethene, total	67	1.1	
Dichloromethane (MeCl2)	10	0.55	
1,2-Dichloropropane	9.9	0.62	
cis-1,3-Dichloropropene	9.3	0.56	
trans-1,3-Dichloropropene	9.9	0.49	
Ethylbenzene	9.9	0.58	
2-Hexanone	19	1.3	
Isopropylbenzene	10	0.52	
4-Methyl-2-Pentanone (MIBK)	22	1.5	
Styrene	9.3	1.1	
1,1,2,2-Tetrachloroethane	69	0.44	
Tetrachloroethene	10	0.67	
Toluene	9.2	0.64	
1,1,2-Trichloroethane	12	0.59	
1,1,1-Trichloroethane	10	0.57	
Trichloroethene	19	0.65	
Vinyl Chloride	12	0.55	
o-Xylene	10	1.1	
m,p-Xylene	20	1.2	
Methyl-tert-butyl ether	11	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	106	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1 MS

Lab No: 07B

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 17:56

Category: GW

Toluene-d8	<u>93</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>99</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/25/03 20:34:00ANALYST RJMCONC FACTOR 1UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1 MSD

Lab No: 07C

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 05/18/03 17:56

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	64	3.8	
Benzene	11	0.63	
Bromodichloromethane	9.3	0.55	
Bromoform	10	0.53	
Bromomethane	8.6	2.3	
2-Butanone (MEK)	55	2.5	
Carbon Disulfide	9.7	0.61	
Carbon Tetrachloride	9.6	0.66	
Chlorobenzene	20	0.62	
Chloroethane	9.8	0.82	
Chloroform	11	0.52	
Chloromethane	10	0.75	
Dibromochloromethane	10	0.51	
1,2-Dibromoethane	9.9	0.52	
1,2-Dibromo-3-Chloropropane	11	0.60	
1,2-Dichloroethane	12	0.55	
1,1-Dichloroethane	10	0.65	
1,1-Dichloroethene	10	0.57	
cis-1,2-Dichloroethene	45	0.55	
trans-1,2-Dichloroethene	28	0.59	
1,2-Dichloroethene, total	73	1.1	
Dichloromethane (MeCl2)	10	0.55	
1,2-Dichloropropane	10	0.62	
cis-1,3-Dichloropropene	9.7	0.56	
trans-1,3-Dichloropropene	11	0.49	
Ethylbenzene	9.3	0.58	
2-Hexanone	24	1.3	
Isopropylbenzene	9.7	0.52	
4-Methyl-2-Pentanone (MIBK)	24	1.5	
Styrene	8.9	1.1	
1,1,2,2-Tetrachloroethane	75	0.44	
Tetrachloroethene	10	0.67	
Toluene	9.1	0.64	
1,1,2-Trichloroethane	12	0.59	
1,1,1-Trichloroethane	9.8	0.57	
Trichloroethene	18	0.65	
Vinyl Chloride	11	0.55	
o-Xylene	9.8	1.1	
m,p-Xylene	19	1.2	
Methyl-tert-butyl ether	12	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	105	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1 MSD

Lab No: 07C

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 17:56

Category: GW

Toluene-d8	<u>96</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>101</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/25/03 21:21:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-1

Lab No: 07L

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 17:56

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>40</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 06:09:00ANALYST STLCONC FACTOR 1UNITS ug/L

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 08A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/14/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	98	86 - 118

06/12/03 08:46

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 08A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/14/03

Category: GW

Toluene-d8	<u>101</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>95</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/27/03 09:21:00ANALYST IMCONC FACTOR 1UNITS ug/L

Digestion Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water	EPA (1983) Method 200.7
RCRA TCLP & groundwater	SW 846 Method 6010
Solids	SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water	EPA Method 200.7
RCRA TCLP & groundwater	SW 846 Method 6010
Solids	SW 846 Method 6010

Chemical Oxygen Demand EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous EPA Method 415.1
SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics
SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)
SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)
SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity SM 2320B (titrimetric)

Nitrite, Ion Chromatography

Drinking water, wastewater	Method 300.0
Groundwater, RCRA wastes	SW-846 Method 9056

Nitrate, Ion Chromatography

Drinking water, wastewater	Method 300.0
Groundwater, RCRA wastes	SW-846 Method 9056

Sulfate, Ion Chromatography

Drinking water, wastewater	Method 300.0
Groundwater, RCRA wastes	SW-846 Method 9056

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 19:27

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	0.67	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	6.8	0.62	
Chloroethane	ND	0.82	
Chloroform	1.5	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.3	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	5.4	0.55	
trans-1,2-Dichloroethene	2.0	0.59	
1,2-Dichloroethene, total	7.4	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	27	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.88	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	3.3	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	111	86 - 118

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 19:27

Category: GW

Toluene-d8	<u>102</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>92</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/24/03 14:31:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-44-1

Lab No: 01F

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 19:27

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>18</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 06:15:00ANALYST STLCONC FACTOR 1UNITS ug/L

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/14/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	114	86 - 118

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/14/03

Category: GW

Toluene-d8	<u>105</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>94</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/24/03 13:02:00ANALYST IMCONC FACTOR 1UNITS ug/L

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: MW-42-11

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 20:20

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	0.85	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	14	0.62	
Chloroethane	ND	0.82	
Chloroform	1.3	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.2	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	29	0.55	
trans-1,2-Dichloroethene	16	0.59	
1,2-Dichloroethene, total	45	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	40	0.44	
Tetrachloroethene	0.72	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	1.7	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	7.4	0.65	
Vinyl Chloride	1.5	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	102	86 - 118

235

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: MW-42-11

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 20:20

Category: GW

Toluene-d8	<u>99</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>87</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 05/27/03 11:29:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-11

Lab No: 03F

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 05/18/03 20:20

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>31</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 05/30/03 06:19:00ANALYST STLCONC FACTOR 1UNITS ug/L

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample Description: MW-44-11

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 05/18/03 21:12

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	0.70	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	6.6	0.62	
Chloroethane	ND	0.82	
Chloroform	1.6	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.3	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	4.8	0.55	
trans-1,2-Dichloroethene	1.6	0.59	
1,2-Dichloroethene, total	6.4	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	27	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.91	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	3.3	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	117	86 - 118

Digestion Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)
Wastewater & drinking water EPA (1983) Method 200.7
RCRA TCLP & groundwater SW 846 Method 6010
Solids SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)
Wastewater & drinking water EPA Method 200.7
RCRA TCLP & groundwater SW 846 Method 6010
Solids SW 846 Method 6010

Chemical Oxygen Demand EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous EPA Method 415.1
SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics
SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)
SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)
SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity SM 2320B (titrimetric)

Nitrite, Ion Chromatography
Drinking water, wastewater Method 300.0
Groundwater, RCRA wastes SW-846 Method 9056

Nitrate, Ion Chromatography
Drinking water, wastewater Method 300.0
Groundwater, RCRA wastes SW-846 Method 9056

Sulfate, Ion Chromatography
Drinking water, wastewater Method 300.0
Groundwater, RCRA wastes SW-846 Method 9056

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06/12/03 08:46

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TEST RESULTS BY SAMPLE

Sample: 01A MW-2-1
Collected: 05/18/03 10:18

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.13	0.05	mg/L	RJM	05/25/03	18:21

Sample: 01B MW-2-1
Collected: 05/18/03 10:18

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03	11:28

Sample: 01C MW-2-1
Collected: 05/18/03 10:18

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	0.10	0.10	mg/L	JSH	05/20/03	23:30

Sample: 01D MW-2-1
Collected: 05/18/03 10:18

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Chemical Oxygen Demand	ND	10	mg/L	YT	06/10/03	08:00
Total Organic Carbon, Aq	3.4	1.0	mg/L	WV	06/09/03	15:10

Sample: 01E MW-2-1
Collected: 05/18/03 10:18

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Ferric Iron - AWWA B407-93	59.9	0.1	mg/L	DED	06/10/03	10:45
Ferrous Iron	8.0	0.1	mg/L	GS	05/27/03	15:00
Ion chromatography	05/19/03		date complete	WV		
Nitrate, Ion Chrom	ND	0.06	mg/L as N	WV	05/19/03	13:15
Nitrite, Ion Chrom	ND	0.02	mg/L as N	WV	05/19/03	13:15
Sulfate, Ion Chrom	5.48	0.38	mg/L	WV	05/19/03	13:15
Total Alkalinity-Titration	74	1.0	mg/L as CaCO3	TLC	05/31/03	09:50

Sample: 01G MW-2-1
Collected: 05/18/03 10:18

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Digestion, Aqueous, 200.2	05/23/03		date digested	AM	05/23/03	11:00
Iron, ICP	67.9	0.009	mg/L	EL	05/24/03	15:25
Metals, ICP/OES	05/24/03		date analyzed			

Sample: 02A MW-43-1
Collected: 05/18/03 12:24

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.08	0.05	mg/L	RJM	05/25/03	19:05

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06/12/03 08:46

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TEST RESULTS BY SAMPLE

Sample: 02B MW-43-1
Collected: 05/18/03 12:24

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03	11:47

Sample: 02C MW-43-1
Collected: 05/18/03 12:24

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	05/21/03	00:18

Sample: 02D MW-43-1
Collected: 05/18/03 12:24

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Chemical Oxygen Demand	11	10	mg/L	YT	06/10/03	08:00
Total Organic Carbon, Aq	1.9	1.0	mg/L	WV	06/09/03	15:10

Sample: 02E MW-43-1
Collected: 05/18/03 12:24

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Ferric Iron - AWWA B407-93	26.6	0.1	mg/L	DED	06/10/03	10:45
Ferrous Iron	8.0	0.1	mg/L	GS	05/27/03	15:00
Ion chromatography	05/19/03		date complete	WV		
Nitrate, Ion Chrom	0.129	0.06	mg/L as N	WV	05/19/03	14:00
Nitrite, Ion Chrom	ND	0.02	mg/L as N	WV	05/19/03	14:00
Sulfate, Ion Chrom	14.8	0.38	mg/L	WV	05/19/03	14:00
Total Alkalinity-Titration	84	1.0	mg/L as CaCO3	TLC	05/31/03	09:50

Sample: 02G MW-43-1
Collected: 05/18/03 12:24

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Digestion, Aqueous, 200.2	05/23/03		date digested	AM	05/23/03	11:00
Iron, ICP	34.6	0.009	mg/L	EL	05/24/03	15:13
Metals, ICP/OES	05/24/03		date analyzed			

Sample: 03A MW-2-6
Collected: 05/18/03 13:38

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.32	0.05	mg/L	RJM	05/27/03	10:04

Sample: 03B MW-2-6
Collected: 05/18/03 13:38

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03	12:06

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TEST RESULTS BY SAMPLE

Sample: 03C MW-2-6
Collected: 05/18/03 13:38

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.10	0.10	mg/L	JSH	05/21/03 11:24

Sample: 03D MW-2-6
Collected: 05/18/03 13:38

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	14	10	mg/L	YT	06/10/03 08:00
Total Organic Carbon, Aq	1.9	1.0	mg/L	WV	06/09/03 15:10

Sample: 03E MW-2-6
Collected: 05/18/03 13:38

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	30.7	0.4	mg/L	DED	06/10/03 10:45
Ferrous Iron	12.0	0.1	mg/L	GS	05/27/03 15:00
Ion chromatography	05/19/03		date complete	WV	
Nitrate, Ion Chrom	0.648	0.06	mg/L as N	WV	05/19/03 14:15
Nitrite, Ion Chrom	ND	0.02	mg/L as N	WV	05/19/03 14:15
Sulfate, Ion Chrom	17.1	0.38	mg/L	WV	05/19/03 14:15
Total Alkalinity-Titration	59	1.0	mg/L as CaCO3	TLC	06/02/03 09:55

Sample: 03G MW-2-6
Collected: 05/18/03 13:38

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	05/23/03		date digested	AM	05/23/03 11:00
Iron, ICP	42.7	0.009	mg/L	EL	05/24/03 15:38
Metals, ICP/OES	05/24/03		date analyzed		

Sample: 04A trip blank
Collected: 05/14/03

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	05/24/03 13:46

Sample: 05A MW-43-6
Collected: 05/18/03 14:53

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.31	0.05	mg/L	IM	05/27/03 10:46

Sample: 05B MW-43-6
Collected: 05/18/03 14:53

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03 12:24

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TEST RESULTS BY SAMPLE

Sample: 05C MW-43-6
Collected: 05/18/03 14:53

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	0.11	0.10	mg/L	JSH	05/21/03	01:53

Sample: 05D MW-43-6
Collected: 05/18/03 14:53

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Chemical Oxygen Demand	ND	10	mg/L	YT	06/10/03	08:00
Total Organic Carbon, Aq	1.6	1.0	mg/L	WV	06/09/03	15:10

Sample: 05E MW-43-6
Collected: 05/18/03 14:53

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Ferric Iron - AWWA B407-93	18.5	0.1	mg/L	DED	06/10/03	10:45
Ferrous Iron	10.0	0.1	mg/L	GS	05/27/03	15:00
Ion chromatography	05/19/03		date complete	WV		
Nitrate, Ion Chrom	0.199	0.06	mg/L as N	WV	05/19/03	14:30
Nitrite, Ion Chrom	ND	0.02	mg/L as N	WV	05/19/03	14:30
Sulfate, Ion Chrom	21.5	0.38	mg/L	WV	05/19/03	14:30
Total Alkalinity-Titration	70	1.0	mg/L as CaCO3	TLC	06/02/03	09:55

Sample: 05G MW-43-6
Collected: 05/18/03 14:53

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Digestion, Aqueous, 200.2	05/23/03		date digested	AM	05/23/03	11:00
Iron, ICP	28.5	0.009	mg/L	EL	05/24/03	15:40
Metals, ICP/OES	05/24/03		date analyzed			

Sample: 06A field blank
Collected: 05/18/03 16:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	05/27/03	08:38

Sample: 07A MW-42-1
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.10	0.05	mg/L	RJM	05/25/03	19:49

Sample: 07D MW-42-1
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03	12:43

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TEST RESULTS BY SAMPLE

Sample: 07E MW-42-1 MS
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Perchlorate	33.1	4.0	ug/L DFW	05/29/03 14:03

Sample: 07F MW-42-1 MSD
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Perchlorate	33.5	4	ug/L DFW	05/29/03 14:22

Sample: 07G MW-42-1
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L JSH	05/21/03 02:41

Sample: 07H MW-42-1 MS
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.35	0.10	mg/L JSH	05/21/03 03:28

Sample: 07I MW-42-1 MSD
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.35	0.10	mg/L JSH	05/21/03 04:16

Sample: 07J MW-42-1
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	ND	10	mg/L YT	06/10/03 08:00
Total Organic Carbon, Aq	1.1	1.0	mg/L WV	06/09/03 15:10

Sample: 07K MW-42-1
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	ND	0.1	mg/L DED	06/10/03 10:45
Ferrous Iron	ND	0.1	mg/L GS	05/27/03 15:00
Ion chromatography	05/19/03		date complete WV	
Nitrate, Ion Chrom	1.92	0.06	mg/L as N WV	05/19/03 14:45
Nitrite, Ion Chrom	ND	0.02	mg/L as N WV	05/19/03 14:45
Sulfate, Ion Chrom	2.89	0.38	mg/L WV	05/19/03 14:45
Total Alkalinity-Titration	2.9	1.0	mg/L as CaCO3 TLC	06/02/03 09:55

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TEST RESULTS BY SAMPLE

Sample: 07M MW-42-1
Collected: 05/18/03 17:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	05/23/03		date digested	AM	05/23/03 11:00
Iron, ICP	0.073	0.009	mg/L	EL	05/24/03 15:43
Metals, ICP/OES	05/24/03		date analyzed		

Sample: 08A trip blank
Collected: 05/14/03

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	05/27/03 09:21

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06/12/03 08:50

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TEST RESULTS BY SAMPLE

Sample: 01A MW-44-1
Collected: 05/18/03 19:27

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	05/24/03 14:31

Sample: 01B MW-44-1
Collected: 05/18/03 19:27

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03 13:02

Sample: 01C MW-44-1
Collected: 05/18/03 19:27

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	05/21/03 05:03

Sample: 01D MW-44-1
Collected: 05/18/03 19:27

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	ND	10	mg/L	YT	06/10/03 08:00
Total Organic Carbon, Aq	ND	1.0	mg/L	WV	06/09/03 15:10

Sample: 01E MW-44-1
Collected: 05/18/03 19:27

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.184	0.1	mg/L	DED	06/11/03 15:15
Ferrous Iron	0.1	0.1	mg/L	GS	05/27/03 15:00
Ion chromatography	05/19/03		date complete	WV	
Nitrate, Ion Chrom	2.06	0.06	mg/L as N	WV	05/19/03 15:00
Nitrite, Ion Chrom	ND	0.02	mg/L as N	WV	05/19/03 15:00
Sulfate, Ion Chrom	3.53	0.38	mg/L	WV	05/19/03 15:00
Total Alkalinity-Titration	4.2	1.0	mg/L as CaCO3	TLC	06/02/03 09:55

Sample: 01G MW-44-1
Collected: 05/18/03 19:27

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	05/27/03		date digested	AM	05/27/03 15:40
Iron, ICP	0.284	0.009	mg/L	LC	06/02/03 13:47
Metals, ICP/OES	06/02/03		date analyzed		

Sample: 02A trip blank
Collected: 05/14/03

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	05/24/03 13:02

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06/12/03 08:50

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TEST RESULTS BY SAMPLE

Sample: 03A MW-42-11
Collected: 05/18/03 20:20

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.08	0.05	mg/L	IM	05/24/03	15:15

Sample: 03B MW-42-11
Collected: 05/18/03 20:20

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Perchlorate	ND	4.0	ug/L	DFW	05/29/03	13:20

Sample: 03C MW-42-11
Collected: 05/18/03 20:20

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	05/21/03	06:38

Sample: 03D MW-42-11
Collected: 05/18/03 20:20

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Chemical Oxygen Demand	ND	10	mg/L	YT	06/10/03	08:00
Total Organic Carbon, Aq	ND	1.0	mg/L	WV	06/09/03	15:10

Sample: 03E MW-42-11
Collected: 05/18/03 20:20

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Ferric Iron - AWWA B407-93	ND	0.1	mg/L	DED	06/11/03	15:15
Ferrous Iron	ND	0.1	mg/L	GS	05/27/03	15:00
Ion chromatography	05/19/03		date complete	WV		
Nitrate, Ion Chrom	1.94	0.06	mg/L as N	WV	05/19/03	15:15
Nitrite, Ion Chrom	ND	0.02	mg/L as N	WV	05/19/03	15:15
Sulfate, Ion Chrom	3.13	0.38	mg/L	WV	05/19/03	15:15
Total Alkalinity-Titration	3.1	1.0	mg/L as CaCO3	TLC	06/02/03	09:55

Sample: 03G MW-42-11
Collected: 05/18/03 20:20

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Digestion, Aqueous, 200.2	05/27/03		date digested	AM	05/27/03	15:40
Iron, ICP	0.087	0.009	mg/L	LC	06/02/03	14:00
Metals, ICP/OES	06/02/03		date analyzed			

Sample: 04A MW-44-11
Collected: 05/18/03 21:12

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	05/24/03	16:00

06/12/03 08:50

TEST RESULTS BY SAMPLE

Sample: 04B MW-44-11
Collected: 05/18/03 21:12

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Perchlorate	ND	4.0	ug/L DFW	05/29/03 13:39

Sample: 04C MW-44-11
Collected: 05/18/03 21:12

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L JSH	05/21/03 07:26

Sample: 04D MW-44-11
Collected: 05/18/03 21:12

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	ND	10	mg/L YT	06/10/03 08:00
Total Organic Carbon, Aq	ND	1.0	mg/L WV	06/09/03 15:10

Sample: 04E MW-44-11
Collected: 05/18/03 21:12

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.138	0.1	mg/L JSH	06/11/03 15:15
Ferrous Iron	ND	0.1	mg/L GS	05/27/03 15:00
Ion chromatography	05/19/03		date complete WV	
Nitrate, Ion Chrom	2.11	0.06	mg/L as N WV	05/19/03 15:30
Nitrite, Ion Chrom	ND	0.02	mg/L as N WV	05/19/03 15:30
Sulfate, Ion Chrom	3.63	0.38	mg/L WV	05/19/03 15:30
Total Alkalinity-Titration	4.1	1.0	mg/L as CaCO3 TLC	06/02/03 09:55

Sample: 04G MW-44-11
Collected: 05/18/03 21:12

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	05/27/03		date digested AM	05/27/03 15:40
Iron, ICP	0.138	0.009	mg/L LC	06/02/03 13:27
Metals, ICP/OES	06/02/03		date analyzed	



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Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 102438

Order #: 03-06-A59
Date: 07/11/03 14:43
Work ID: GE Railcar (2017)
Date Received: 06/25/03
Date Completed: 07/11/03
Client Code: RSA

SAMPLE IDENTIFICATION

Sample Number	Sample Description
01	trip blank
02	MW-43-1
03	MW-2-1

Sample Number	Sample Description
04	field blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Certified By
Warren Van Arsdall

229

Case Narrative

ACL Order Number 0306A59

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0306A59. 0306A59 consisted of four (4) samples, one (1) trip blank and one (1) field blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD samples for this sample set are 0306A59-06DL 5x, 0306A59-02DL 25x and 0306A59-03DL 25x.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 5 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
06/27/03 03:45	None
06/27/03 08:24	None
06/30/03 23:12	None
07/01/03 07:14	None

The instrument performance was acceptable as indicated by the tune report for 4-Bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 6/26/03 except for bromoform and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 06/30/03 except for chloromethane and methylene chloride. A linear regression curve fit (not forced through 0) was used for these compounds.

Case Narrative

ACL Order Number 0306A59 (Continued)

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 0306A59-02 analyzed on 06/27/03 failed SMC3, sample was re-analyzed at a 5x dilution and all SMC's passed. 0306A59-03 analyzed on 06/27/03 failed SMC3, sample was re-analyzed at a 5x dilution and all SMC's passed.

The results of the MS/MSD were all within the acceptance limits.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0306A59-05:

Sample was re-analyzed on 6/30/03 due to possible carryover from prior sample in initial analysis on 6/27/03.

0306A59-02:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/01/03.

0306A59-03:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/01/03.

Case Narrative

ACL Order Number 0306A59 (Continued)

0306A59-06:

Cis-1,2-dichloroethene and trichloroethene exceeded the calibration range. Sample was diluted and re-analyzed on 07/01/03.

0306A59-02DL 5x:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/01/03.

0306A59-03DL 5x:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/01/03.

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.



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REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 102438

Order #: 03-06-A59
Date: 07/21/03 12:49
Work ID: GE Railcar (2017)
Date Received: 06/25/03
Date Completed: 07/11/03
Client Code: RSA


SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	field blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568



Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0306A59

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0306A59 consisting of 4 samples, 1 trip blank and 1 field blank.

Samples were received preserved, cooled to 4° C. Ice was present in the cooler at time of receipt. The temperature at time of receipt was 1° C.

Summary:

Gasoline Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 using P/T GC-MS.

Method Blank was non-detected with an MDL of 0.050 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Diesel Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 (modified).

Method Blank was non-detected with an MDL of 0.100 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Internal standard responses were acceptable.

MS/MSD recovery and precision were acceptable.

The method blank was reanalyzed on 07/02/03 and 07/03/03 due to chromatography and carryover from a previous standard.

Sample 0306A59-06 was reanalyzed on 07/02/03 and 07/03/03 due to chromatography.

Case Narrative

ACL Order Number 0306A59 (Continued)

Methane, Ethane, Ethene - Subcontracted

Subcontractor data package enclosed.

Ion Chromatography

Samples were initially analyzed on 06/25/03 using a 10x dilution. Samples were reanalyzed on 06/30/03 using a 1x dilution.

Continuing calibration verifications were all acceptable.

Laboratory Control Sample was acceptable

Matrix Spike/Matrix Spike Duplicate was acceptable.

Metals Analysis (Total Iron) – EPA6010

Quality Control Sample (QC 19) was acceptable.

Interference A and Interference AB was acceptable.

Initial Laboratory Performance Check was acceptable.

Laboratory Fortified Blank was acceptable.

Matrix Spike/Matrix Spike Duplicate was not valid due to the ambient level of iron being much greater than the spike level.

Alkalinity, Total – Standard Methods 2320B, 19th Edition

Laboratory Blanks were acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Total Organic Carbon – EPA 9060

Laboratory Blanks were acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Laboratory Fortified Blanks were acceptable.

Case Narrative

ACL Order Number 0306A59 (Continued)

Matrix spikes were acceptable.

Chemical Oxygen Demand – EPA 410.4

Method Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Sample duplicates were acceptable.

Matrix spikes were acceptable.

REPORT COMMENTS

PROJECT COMMENTS

1. The high levels of chlorobenzene in samples 0306A59-02 and -03 produced an interference with chlorobenzene-d5, an internal standard. This resulted in the low recovery for the surrogate standard 4-bromofluorobenzene. The recovery for 4-bromofluorobenzene in the diluted samples was within the acceptance criteria.

Digestion Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water	EPA (1983) Method 200.7
RCRA TCLP & groundwater	SW 846 Method 6010
Solids	SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water	EPA Method 200.7
RCRA TCLP & groundwater	SW 846 Method 6010
Solids	SW 846 Method 6010

Chemical Oxygen Demand EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous EPA Method 415.1
SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics
SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)
SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)
SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity SM 2320B (titrimetric)

Nitrate/Nitrite (combined), Ion Chromatography

Drinking water, wastewater	Method 300.0
Groundwater, RCRA wastes	SW-846 Method 9056

Sulfate, Ion Chromatography

Drinking water, wastewater	Method 300.0
Groundwater, RCRA wastes	SW-846 Method 9056

CHAIN OF CUSTODY RECORD

PROJECT NAME GE Railcar (2017)
 COMPANY Resurgent, Smith & Associates, Inc.
 ADDRESS 2222 Western Trails Blvd, #300
 PHONE (512) 707-1777



ATLANTIC COAST
 Laboratories, Incorporated

630 Churchmans Road
 Newark, Delaware 19702
 302-266-9121 • 454-8720 (FAX)

SAMPLED BY Edward Zarecky
 SIGNATURE Edward Zarecky
 PRINT NAME Edward Zarecky

0306A59

SAMPLE COLLECTION FEE:	ANALYSES
QUOTED PRICE:	

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER		GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	ANALYSES										COMMENTS	
				SIZE	G/P						VOC	PRC	CEC	Metane	TOC	ICAD	501/WWalk	Se	Surfactant			
	06/24/03	NA	Trip Blank (Lab Prepared)	V*	G			3	Water	HCl, Ice	X											* V = Various
	06/24/03	1217	MW-43-1	V	G+	X		11	Water	HCl, HNO ₃ H ₂ SO ₄ , Ice	X	X	X	X	X	X	X					
	06/24/03	1409	MW-2-1	V	G+	X		11	Water	HCl, HNO ₃ H ₂ SO ₄ , Ice	X	X	X	X	X	X	X					
	06/24/03	1536	Field Blank	V	G	X		3	Water	HCl, Ice	X											
	06/24/03	1620	MW-44-1	V	G+p	X		11	Water	HCl, HNO ₃ H ₂ SO ₄ , Ice	X	X	X	X	X	X	X					
	06/24/03	1742	MW-42-1	V	G+p	X		11	Water	HCl, HNO ₃ H ₂ SO ₄ , Ice	X	X	X	X	X	X	X					
END OF RECORD																						

Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received by:
<u>Edward Zarecky</u>	06/25/03 0710				
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:
				6/25/03 0710	<u>Wm. [Signature]</u>
Method of Shipment	Remarks:		Samples Iced <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Samples Preserved <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
	Temp 1°C W				

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	102	86 - 118

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03

Category: GW

Toluene-d8	<u>101</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>99</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 06/27/03 09:09:00ANALYST IMCONC FACTOR 1UNITS ug/L

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 12:17

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	7.5	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	484	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.78	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	1.3	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	92	86 - 118

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 12:17

Category: GW

Toluene-d8	<u>97</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>71 Q</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 06/27/03 10:41:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 06/24/03 12:17

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>64</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 07/08/03ANALYST stlCONC FACTOR UNITS

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 06/24/03 14:09

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	39	3.8	
Benzene	9.0	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	38	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	547	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.70	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	1.7	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	94	86 - 118

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 14:09

Category: GW

Toluene-d8	<u>96</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>69 Q</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 06/27/03 11:27:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-1

Lab No: 03C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 06/24/03 14:09

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>18</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 07/08/03ANALYST stlCONC FACTOR UNITS

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: field blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 06/24/03 15:36

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	101	86 - 118

279

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: field blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 15:36

Category: GW

Toluene-d8	<u>101</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>96</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 06/27/03 09:54:00ANALYST IMCONC FACTOR 1UNITS ug/L

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 16:20

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	4.8	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	5.3	0.62	
Chloroethane	ND	0.82	
Chloroform	1.2	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.2	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	4.1	0.55	
trans-1,2-Dichloroethene	1.5	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	18	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.70	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	6.4	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	104	86 - 118

281

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 16:20

Category: GW

Toluene-d8	<u>98</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>91</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 06/30/03 23:53:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-44-1

Lab No: 05C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 06/24/03 16:20

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 07/08/03ANALYST stlCONC FACTOR UNITS

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 17:42

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	21	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	2.5	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	6.3	0.62	
Chloroethane	ND	0.82	
Chloroform	1.1	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.0	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	1.5	0.57	
cis-1,2-Dichloroethene	52	0.55	
trans-1,2-Dichloroethene	30	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	1.5	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	1.2	0.44	
Tetrachloroethene	ND	0.67	
Toluene	0.70	0.64	
1,1,2-Trichloroethane	0.65	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	61	0.65	
Vinyl Chloride	3.5	0.55	
o-Xylene	1.3	1.1	
m,p-Xylene	4.4	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	103	86 - 118

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 06/24/03 17:42

Category: GW

Toluene-d8	<u>94</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>96</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 06/27/03 12:58:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-1

Lab No: 06C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 06/24/03 17:42

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u>---</u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u>---</u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u>---</u>

Notes and Definitions for this Report:

DATE RUN 07/08/03ANALYST stlCONC FACTOR ---UNITS ---

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample: 02A MW-43-1
Collected: 06/24/03 12:17

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.05	mg/L	IM	06/27/03 10:41

Sample: 02B MW-43-1
Collected: 06/24/03 12:17

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.19	0.10	mg/L	JSH	06/30/03 17:26

Sample: 02D MW-43-1
Collected: 06/24/03 12:17

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	20	10	mg/L	YT	07/01/03 08:00
Total Organic Carbon, Aq	7.7	1.0	mg/L	EL	06/26/03 15:18

Sample: 02E MW-43-1
Collected: 06/24/03 12:17

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	45.7	0.1	mg/L	DED	07/10/03 13:30
Ferrous Iron	4.0	0.1	mg/L	GS	07/07/03 14:30
Ion chromatography	06/25/03		date complete	AM	
Nitrate/Nitrite-Ion Chrom	0.090	0.08	mg/L as N	AM	06/30/03 23:44
Sulfate, Ion Chrom	15.0	0.38	mg/L	AM	06/30/03 20:02
Total Alkalinity-Titration	74	1.0	mg/L as CaCO3	TLC	06/30/03 08:39

Sample: 02F MW-43-1
Collected: 06/24/03 12:17

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	06/26/03		date digested	EL	06/26/03 20:30
Iron, ICP	49.7	0.009	mg/L	EL	06/28/03 18:11
Metals, ICP/OES	06/28/03		date analyzed		

Sample: 03A MW-2-1
Collected: 06/24/03 14:09

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.06	0.05	mg/L	IM	06/27/03 11:27

Sample: 03B MW-2-1
Collected: 06/24/03 14:09

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.21	0.10	mg/L	JSH	06/30/03 18:14

07/11/03 14:34

TEST RESULTS BY SAMPLE

Sample: 03D MW-2-1

Category: GW

Collected: 06/24/03 14:09

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	7510	10	mg/L	YT	07/01/03 09:00
Total Organic Carbon, Aq	3100	1.0	mg/L	EL	07/08/03 19:44

Sample: 03E MW-2-1

Category: GW

Collected: 06/24/03 14:09

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	148	0.1	mg/L	DED	07/10/03 13:30
Ferrous Iron	50	0.1	mg/L	GS	07/07/03 14:30
Ion chromatography	06/25/03			date complete	AM
Nitrate/Nitrite-Ion Chrom	ND	0.08	mg/L	as N	AM 06/30/03 23:59
Sulfate, Ion Chrom	5.12	0.38	mg/L	AM	06/30/03 23:59
Total Alkalinity-Titration	1810	1.0	mg/L	as CaCO3	TLC 06/30/03 08:39

Sample: 03F MW-2-1

Category: GW

Collected: 06/24/03 14:09

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	06/26/03		date digested	EL	06/26/03 20:30
Iron, ICP	198	0.009	mg/L	EL	06/26/03 20:30
Metals, ICP/OES	06/28/03		date analyzed		

Sample: 05A MW-44-1

Category: GW

Collected: 06/24/03 16:20

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.21	0.05	mg/L	IM	06/27/03 12:13

Sample: 05B MW-44-1

Category: GW

Collected: 06/24/03 16:20

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.13	0.10	mg/L	JSH	06/30/03 19:02

Sample: 05D MW-44-1

Category: GW

Collected: 06/24/03 16:20

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	461	10	mg/L	YT	07/01/03 09:00
Total Organic Carbon, Aq	208	1.0	mg/L	EL	07/08/03 19:44

Sample: 05E MW-44-1

Category: GW

Collected: 06/24/03 16:20

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	2.32	0.1	mg/L	DED	07/10/03 13:30
Ferrous Iron	ND	0.1	mg/L	GS	07/07/03 14:30

TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ion chromatography	06/25/03		date complete AM	
Nitrate/Nitrite-Ion Chrom	2.31	0.08	mg/L as N AM	07/01/03 00:14
Sulfate, Ion Chrom	9.33	0.38	mg/L AM	07/01/03 00:14
Total Alkalinity-Titration	139	1.0	mg/L as CaCO3 TLC	06/30/03 08:39

Sample: 05F MW-44-1

Category: GW

Collected: 06/24/03 16:20

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	06/26/03		date digested EL	06/26/03 20:30
Iron, ICP	2.32	0.009	mg/L EL	06/26/03 20:30
Metals, ICP/OES	06/28/03		date analyzed	

Sample: 06A MW-42-1

Category: GW

Collected: 06/24/03 17:42

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.14	0.05	mg/L IM	06/27/03 12:58

Sample: 06B MW-42-1

Category: GW

Collected: 06/24/03 17:42

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.20	0.10	mg/L JSH	07/03/03 20:17

Sample: 06D MW-42-1

Category: GW

Collected: 06/24/03 17:42

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	333	10	mg/L YT	07/01/03 09:00
Total Organic Carbon, Aq	103	1.0	mg/L EL	07/08/03 19:44

Sample: 06E MW-42-1

Category: GW

Collected: 06/24/03 17:42

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.345	0.1	mg/L DED	07/10/03 13:30
Ferrous Iron	0.1	0.1	mg/L GS	07/07/03 14:30
Ion chromatography	06/25/03		date complete AM	
Nitrate/Nitrite-Ion Chrom	2.46	0.08	mg/L as N AM	07/01/03 00:29
Sulfate, Ion Chrom	31.4	0.38	mg/L AM	07/01/03 00:29
Total Alkalinity-Titration	378	1.0	mg/L as CaCO3 TLC	06/30/03 08:39

Sample: 06F MW-42-1

Category: GW

Collected: 06/24/03 17:42

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	06/26/03		date digested EL	06/26/03 20:30
Iron, ICP	0.445	0.009	mg/L EL	06/28/03 18:21
Metals, ICP/OES	06/28/03		date analyzed	



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number:

Order #: 03-07-986
Date: 08/18/03 10:13
Work ID: GE Railcar monthly
Date Received: 07/22/03
Date Completed: 08/18/03
Client Code: RSA


SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568



Certified By
Warren Van Arsdall

Case Narrative
ACL Order Number 0307986

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0307986. 0307986 consisted of four (4) samples, one (1) trip blank and one (1) equipment blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD samples for this sample set are 0307987-02, 0307986-06DL 5x and 0307986-02DL 50x.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 25 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
07/23/03 13:45	None
07/25/03 07:47	None
07/25/03 22:35	None
07/27/03 12:04	None
07/28/03 08:08	None

The instrument performance was acceptable as indicated by the tune report for 4-bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 7/23/03 except for 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 07/27/03 except for 4-methyl-2-pentanone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

Case Narrative

ACL Order Number 0307986 (Continued)

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 0307986-06 analyzed on 07/26/03 failed SMC3, sample was re-analyzed on 07/28/03 and all SMC's passed. 0307986-03 analyzed on 07/26/03 failed SMC3, sample was re-analyzed on 07/28/03 and all SMC's passed.

The results of the MS/MSD were all within the acceptance limits.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0307986-02:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/28/03.

0307986-03:

2-Butanone (MEK) and Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/28/03.

0307986-05:

Sample was re-analyzed on 07/28/03 due to possible carryover from previous sample, re-analysis was reported.



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number:

Order #: 03-07-986
Date: 08/18/03 10:13
Work ID: GE Railcar monthly
Date Received: 07/22/03
Date Completed: 08/18/03
Client Code: RSA


SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications:	DE	DE00011	PA	68-335
	MD	138	NJ	DE568



Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0307986

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0307986. 0307986 consisted of four (4) samples, one (1) trip blank and one (1) equipment blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD samples for this sample set are 0307987-02, 0307986-06DL 5x and 0307986-02DL 50x.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 25 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
07/23/03 13:45	None
07/25/03 07:47	None
07/25/03 22:35	None
07/27/03 12:04	None
07/28/03 08:08	None

The instrument performance was acceptable as indicated by the tune report for 4-bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 7/23/03 except for 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 07/27/03 except for 4-methyl-2-pentanone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

Case Narrative

ACL Order Number 0307986 (Continued)

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 0307986-06 analyzed on 07/26/03 failed SMC3, sample was re-analyzed on 07/28/03 and all SMC's passed. 0307986-03 analyzed on 07/26/03 failed SMC3, sample was re-analyzed on 07/28/03 and all SMC's passed.

The results of the MS/MSD were all within the acceptance limits.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0307986-02:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/28/03.

0307986-03:

2-Butanone (MEK) and Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/28/03.

0307986-05:

Sample was re-analyzed on 07/28/03 due to possible carryover from previous sample, re-analysis was reported.

Case Narrative

ACL Order Number 0307986 (Continued)

0307986-06:

Cis-1,2-dichloroethene and trichloroethene exceeded the calibration range. Sample was diluted and re-analyzed on 07/28/03.

0307986-03DL 20x:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 07/28/03.

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.



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REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number:

Order #: 03-07-986
Date: 08/18/03 10:13
Work ID: GE Railcar monthly
Date Received: 07/22/03
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Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Warren Van Arsdall

Certified By
Warren Van Arsdall

FAXED
8/18/03 PD

Case Narrative

ACL Order Number 0307986

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0307986 consisting of 4 samples, 1 trip blank and 1 equipment blank.

Samples were received preserved, cooled to 4° C. Ice was present in the cooler at time of receipt. The temperature at time of receipt was 1° C.

Summary:

Gasoline Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 using P/T GC-MS.

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Diesel Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 (modified).

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Internal standard responses were acceptable.

Insufficient sample for MS/MSD.

Case Narrative

ACL Order Number 0307986 (Continued)

Methane, Ethane, Ethene - Subcontracted

Subcontractor data package enclosed.

Ion Chromatography

Samples were initially analyzed on 06/25/03 using a 10x dilution. Samples were reanalyzed on 06/30/03 using a 1x dilution.

Continuing calibration verifications were all acceptable.

Laboratory Control Sample was acceptable

Duplicate/Matrix Spike was acceptable except for nitrite failing low at 40% for the spiked sample. This may be due to the preservation of the sample. Sulfate was not valid in spiked sample due to the ambient level of sulfate being much greater than the spike level

0307986-03 was re-analyzed on 7/29/03 due to chromatography. Sample was filtered through a cartridge and re-analyzed.

Metals Analysis (Total Iron) – EPA6010

Quality Control Sample (QC 19) was acceptable.

Interference A and Interference AB was acceptable.

Initial Laboratory Performance Check was acceptable.

Laboratory Fortified Blank was acceptable.

Matrix Spike/Matrix Spike Duplicate was acceptable.

Alkalinity, Total – Standard Methods 2320B, 19th Edition

Laboratory Blank on 7/29/03 had a total alkalinity of 1.41 mg/L.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Case Narrative

ACL Order Number 0307986 (Continued)

Total Organic Carbon – EPA 9060

Laboratory Blanks were acceptable except for 08/07/03 CCB that had a TOC result of 1.0 mg/L. The ending CCB for this batch was ND. 08/14/03 CCB had a TOC result of 1.3 mg/L. The ending CCB for this batch was ND.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Laboratory Fortified Blanks were acceptable.

Matrix spikes were acceptable.

Chemical Oxygen Demand – EPA 410.4

Method Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Sample duplicates were acceptable.

Matrix spikes were acceptable.

Digestion

Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA (1983) Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

Chemical Oxygen Demand

EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous

EPA Method 415.1

SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics

SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)

SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)

SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity

SM 2320B (titrimetric)

Nitrate/Nitrite (combined), Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

Sulfate, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

CHAIN OF CUSTODY RECORD

PROJECT NAME RAILCAR - RSA
 COMPANY Environmental Services & Associates, Inc.
 ADDRESS 7777 Western Trails Blvd, Ste 300, Austin, TX 78745-1601
 PHONE (512) 707-1777 (VX)



ATLANTIC COAST
 Laboratories, Incorporated

630 Churchmans Road
 Newark, Delaware 19702
 302-266-9121 • 454-8720 (FAX)

PAGE 1 OF 1

SAMPLED BY J. A. Montero / J. K. AGAN Project # 2017-18

0307986

SIGNATURE Charles A. Montero
 PRINT NAME JASON K. AGAN

SAMPLE COLLECTION FEE:

QUOTED PRICE:

ANALYSES

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER		GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	ANALYSIS										COMMENTS	
				SIZE	G/P						VOL	DRD	GRD	SHOCK	TRIP	SW	WIA	W	W	W		
	7/22/03	0850	MW-2-1	✓	Gp	✓		6	H ₂ O	HCL HNO ₃ H ₂ SO ₄ ICE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	* VARIOUS	
	7/22/03	1045	MW-43-1	✓	Gp	✓		6	H ₂ O	HCL HNO ₃ H ₂ SO ₄ ICE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	7/22/03	1215	MW-42-1	✓	Gp	✓		6	H ₂ O	HCL HNO ₃ H ₂ SO ₄ ICE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	7/22/03	1410	MW-44-1	✓	Gp	✓		6	H ₂ O	HCL HNO ₃ H ₂ SO ₄ ICE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	7/21/03	X	TRIP BLANK	40mL	G	✓		2	H ₂ O	HCL, ICE	✓	ANAL	(CAL)									
	7/22/03	1440	EQUIPMENT BLANK		G	✓		2	H ₂ O	HCL, ICE	✓											
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Relinquished by: <u>Ch. Montero</u>	Date / Time <u>7/22/03 1530</u>	Received by:	Relinquished by:	Date / Time <u>7/22/03 1530</u>	Received by: <u>[Signature]</u>
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment	Remarks	Samples Iced <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Samples Preserved <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--------------------	---------	--	---

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/21/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	109	86 - 118

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/21/03

Category: GW

Toluene-d8	<u>93</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>90</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 07/25/03 08:30:00ANALYST IMCONC FACTOR 1UNITS ug/L

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 10:45

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	14	3.8	
Benzene	15	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	623	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.4	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	0.8	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	101	86 - 118

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 10:45

Category: GW

Toluene-d8	<u>94</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>86</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 07/25/03 23:58:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 07/22/03 10:45

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>56</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 08/04/03ANALYST STLCONC FACTOR UNITS ug/L

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 08:56

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	25	3.8	
Benzene	15	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	94	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	827	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.8	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	0.7	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	1.3	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	91	86 - 118

Order # 03-07-986
08/18/03 10:13

Page 10

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 08:56

Category: GW

Toluene-d8	<u>99</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>89</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 07/28/03 10:56:00

ANALYST IM

CONC FACTOR 1

UNITS ug/L

Sample Description: MW-2-1

Lab No: 03C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 07/22/03 08:56

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>59</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 08/04/03

ANALYST STL

CONC FACTOR

UNITS ug/L

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 14:10

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	0.9	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	104	86 - 118

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 14:10

Category: GW

Toluene-d8	<u>93</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>94</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 07/25/03 09:12:00ANALYST IMCONC FACTOR 1UNITS ug/L

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 14:10

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	2.5	0.62	
Chloroethane	ND	0.82	
Chloroform	1.0	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.0	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	3.2	0.55	
trans-1,2-Dichloroethene	1.0	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	18	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.6	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	5.8	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	101	86 - 118

Order # 03-07-986
08/18/03 10:13

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TEST RESULTS BY SAMPLE

Sample Description: MW-44-1 Lab No: 05A
Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA
Collected: 07/22/03 14:10 Category: GW

Toluene-d8	<u>100</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>97</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 07/28/03 08:50:00
ANALYST IM
CONC FACTOR 1
UNITS ug/L

Sample Description: MW-44-1 Lab No: 05C
Test Description: methane, ethane, ethene Method: Test Code: S_GAS
Collected: 07/22/03 14:10 Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 08/04/03
ANALYST STL
CONC FACTOR
UNITS ug/L

08/18/03 10:13

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 12:15

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	23	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	8.0	0.62	
Chloroethane	ND	0.82	
Chloroform	1.0	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.3	0.55	
1,1-Dichloroethane	0.8	0.65	
1,1-Dichloroethene	2.2	0.57	
cis-1,2-Dichloroethene	121	0.55	
trans-1,2-Dichloroethene	49	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	1.3	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	0.8	0.67	
Toluene	1.2	0.64	
1,1,2-Trichloroethane	1.9	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	96	0.65	
Vinyl Chloride	2.8	0.55	
o-Xylene	1.2	1.1	
m,p-Xylene	3.2	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	97	86 - 118

Order # 03-07-986
08/18/03 10:13

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TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 07/22/03 12:15

Category: GW

Toluene-d8	<u>100</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>95</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 07/28/03 09:32:00

ANALYST IM

CONC FACTOR 1

UNITS ug/L

Sample Description: MW-42-1

Lab No: 06C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 07/22/03 12:15

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 08/04/03

ANALYST STL

CONC FACTOR

UNITS ug/L

Order # 03-07-986
08/18/03 10:13

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TEST RESULTS BY SAMPLE

Sample: 02A MW-43-1
Collected: 07/22/03 10:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.30	0.10	mg/L	RJM	07/25/03	23:58

Sample: 02B MW-43-1
Collected: 07/22/03 10:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	0.25	0.10	mg/L	JSH	07/29/03	19:36

Sample: 02D MW-43-1
Collected: 07/22/03 10:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Chemical Oxygen Demand	33	10	mg/L	YT	07/25/03	09:30
Total Organic Carbon, Aq	7.9	1.0	mg/L	EL	08/07/03	13:09

Sample: 02E MW-43-1
Collected: 07/22/03 10:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Ferric Iron - AWWA B407-93	26.6	0.1	mg/L	DED	08/14/03	15:00
Ferrous Iron	30	0.1	mg/L	GS	07/23/03	16:00
Ion chromatography	07/23/03		date complete	AM		
Nitrate/Nitrite-Ion Chrom	ND	0.08	mg/L as N	AM	07/23/03	14:59
Sulfate, Ion Chrom	7.01	0.38	mg/L	AM	07/23/03	14:59
Total Alkalinity-Titration	206	1.0	mg/L as CaCO3	TLC	07/29/03	12:33

Sample: 02F MW-43-1
Collected: 07/22/03 10:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Digestion, Aqueous, 200.2	07/26/03		date digested	EL	07/26/03	18:20
Iron, ICP	56.6	0.009	mg/L	LC	07/29/03	09:31
Metals, ICP/OES	07/29/03		date analyzed			

Sample: 03A MW-2-1
Collected: 07/22/03 08:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.29	0.10	mg/L	RJM	07/26/03	00:40

Sample: 03B MW-2-1
Collected: 07/22/03 08:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	0.57	0.10	mg/L	JSH	07/29/03	20:23

Order # 03-07-986
08/18/03 10:13

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TEST RESULTS BY SAMPLE

Sample: 03D MW-2-1
Collected: 07/22/03 08:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	4730	10	mg/L YT	07/25/03 10:00
Total Organic Carbon, Aq	1689	1.0	mg/L EL	08/07/03 13:09

Sample: 03E MW-2-1
Collected: 07/22/03 08:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	159	0.1	mg/L DED	08/14/03 15:00
Ferrous Iron	120	0.1	mg/L GS	07/23/03 16:00
Ion chromatography	07/29/03		date complete	AM
Nitrate/Nitrite-Ion Chrom	ND	0.08	mg/L as N AM	07/29/03 16:49
Sulfate, Ion Chrom	2.09	0.38	mg/L AM	07/29/03 16:49
Total Alkalinity-Titration	3337	1.0	mg/L as CaCO3 TLC	07/29/03 12:33

Sample: 03F MW-2-1
Collected: 07/22/03 08:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	07/26/03		date digested	EL 07/26/03 18:20
Iron, ICP	279	0.090	mg/L LC	07/30/03 09:56
Metals, ICP/OES	07/30/03		date analyzed	

Sample: 05A MW-44-1
Collected: 07/22/03 14:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.10	mg/L RJM	07/26/03 01:21

Sample: 05B MW-44-1
Collected: 07/22/03 14:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L JSH	07/29/03 21:11

Sample: 05D MW-44-1
Collected: 07/22/03 14:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	108	10	mg/L YT	07/25/03 09:30
Total Organic Carbon, Aq	61	5.0	mg/L EL	08/14/03 14:58

Sample: 05E MW-44-1
Collected: 07/22/03 14:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	1.07	0.1	mg/L DED	08/14/03 15:00
Ferrous Iron	ND	0.1	mg/L GS	07/23/03 16:00

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08/18/03 10:13

TEST RESULTS BY SAMPLE

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Ion chromatography	07/23/03		date complete	AM	
Nitrate/Nitrite-Ion Chrom	2.12	0.08	mg/L as N	AM	07/23/03 18:15
Sulfate, Ion Chrom	10.1	0.38	mg/L	AM	07/23/03 18:15
Total Alkalinity-Titration	69	1.0	mg/L as CaCO3	TLC	07/29/03 12:33

Sample: 05F MW-44-1
Collected: 07/22/03 14:10

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Digestion, Aqueous, 200.2	07/26/03		date digested	EL	07/26/03 18:20
Iron, ICP	1.07	0.009	mg/L	LC	07/29/03 09:39
Metals, ICP/OES	07/29/03		date analyzed		

Sample: 06A MW-42-1
Collected: 07/22/03 12:15

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Gasoline Range Org.	0.34	0.10	mg/L	RJM	07/26/03 02:02

Sample: 06B MW-42-1
Collected: 07/22/03 12:15

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Diesel Range Organics	0.14	0.10	mg/L	JSH	07/29/03 21:58

Sample: 06D MW-42-1
Collected: 07/22/03 12:15

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Chemical Oxygen Demand	661	10	mg/L	YT	07/25/03 10:00
Total Organic Carbon, Aq	270	1.0	mg/L	EL	08/07/03 13:09

Sample: 06E MW-42-1
Collected: 07/22/03 12:15

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Ferric Iron - AWWA B407-93	16.8	0.1	mg/L	DED	08/14/03 15:00
Ferrous Iron	ND	0.1	mg/L	GS	07/23/03 16:00
Ion chromatography	07/23/03		date complete	AM	
Nitrate/Nitrite-Ion Chrom	2.48	0.08	mg/L as N	AM	07/23/03 18:30
Sulfate, Ion Chrom	25.8	0.38	mg/L	AM	07/23/03 18:30
Total Alkalinity-Titration	1743	1.0	mg/L as CaCO3	TLC	07/29/03 12:33

Sample: 06F MW-42-1
Collected: 07/22/03 12:15

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Digestion, Aqueous, 200.2	07/26/03		date digested	EL	07/26/03 18:20
Iron, ICP	16.8	0.009	mg/L	LC	07/29/03 09:46
Metals, ICP/OES	07/29/03		date analyzed		



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 103519

Order #: 03-08-B26
Date: 09/30/03 14:49
Work ID: GE Railcar Elkton
Date Received: 08/27/03
Date Completed: 09/30/03
Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0308B26

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0308B26. 0308B26 consisted of four (4) samples, one (1) trip blank and one (1) equipment blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD sample for this sample set is 0308B26-03DL 25x.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 25 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
09/02/03 20:21	None
09/03/02 08:23	None

The instrument performance was acceptable as indicated by the tune report for 4-bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 9/02/03 except for chloroethane, 2-hexanone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: None

Case Narrative

ACL Order Number 0308B26 (Continued)

The results of the MS/MSD were all within the acceptance limits.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0308B26-06:

Cis-1,2-dichloroethene and trichloroethene exceeded the calibration range. Sample was diluted and re-analyzed on 09/03/03.

0308B26-02:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 09/03/03.

0308B26-03:

2-Butanone and chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 09/03/03.

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
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WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 103519

Order #: 03-08-B26
Date: 10/02/03 12:58
Work ID: GE Railcar Elkton
Date Received: 08/27/03
Date Completed: 09/30/03
Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Warren Van Arsdall Def

Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0308B26

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0308B26 consisting of 4 samples, 1 trip blank and 1 equipment blank.

Samples were received preserved, cooled to 4° C. Ice was present in the cooler at time of receipt. The temperature at time of receipt was 1° C.

Summary:

Gasoline Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 using P/T GC-MS.

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Diesel Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 (modified).

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Internal standard responses were acceptable.

Insufficient sample for MS/MSD.

Case Narrative

ACL Order Number 0308B26 (Continued)

Methane, Ethane, Ethene - Subcontracted

Subcontractor data package enclosed.

Ion Chromatography

Samples were initially analyzed on 08/27/03 using a 10x dilution. Samples 0308B26-02 and 0308B26-05 were reanalyzed on 09/22/03 using a 1x dilution. Sample 0308B26-03 was not re-analyzed at a 1x dilution due to chromatography.

Continuing calibration verifications were all acceptable.

Laboratory Control Sample was acceptable

Duplicate/Matrix Spike (0308B07) was acceptable except for sulfate failing low at 71.5% for the spiked sample. Sulfate was not valid in spiked sample due to the ambient level of sulfate being much greater than the spike level.

Duplicate/Matrix Spike (0309838) was acceptable except for nitrite failing low at 43.5% for the spiked sample. This is believed to be matrix related due to acceptable LCS results for nitrite.

Metals Analysis (Total Iron) – EPA6010

Quality Control Sample (QC 19) was acceptable.

Interference A and Interference AB was acceptable.

Initial Laboratory Performance Check was acceptable.

Laboratory Fortified Blank was acceptable.

Matrix Spike/Matrix Spike Duplicate was acceptable.

Alkalinity, Total – Standard Methods 2320B, 19th Edition

Laboratory Blank on 09/02/03 had a total alkalinity of 1.13 mg/L.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Case Narrative

ACL Order Number 0307986 (Continued)

Total Organic Carbon – EPA 9060

Laboratory Blanks were acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Matrix spikes were acceptable.

Chemical Oxygen Demand – EPA 410.4

Method Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Sample duplicates were acceptable.

Matrix spikes were acceptable.

Digestion Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)
 Wastewater & drinking water EPA (1983) Method 200.7
 RCRA TCLP & groundwater SW 846 Method 6010
 Solids SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)
 Wastewater & drinking water EPA Method 200.7
 RCRA TCLP & groundwater SW 846 Method 6010
 Solids SW 846 Method 6010

Chemical Oxygen Demand EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous EPA Method 415.1
 SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics
 SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)
 SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)
 SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity SM 2320B (titrimetric)

Nitrite, Ion Chromatography
 Drinking water, wastewater Method 300.0
 Groundwater, RCRA wastes SW-846 Method 9056

Nitrate, Ion Chromatography
 Drinking water, wastewater Method 300.0
 Groundwater, RCRA wastes SW-846 Method 9056

Sulfate, Ion Chromatography
 Drinking water, wastewater Method 300.0
 Groundwater, RCRA wastes SW-846 Method 9056

PROJECT NAME GERAILCAR - Elkton
COMPANY Rosengarten Smith & Assoc. Inc
ADDRESS 2222 Western Trails Blvd #302, Austin TX
PHONE (512) 707-1773

PAGE 1 OF _____



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)

SIGNATURE Charles A Montero
PRINT NAME *IVE VADINS

SAMPLE COLLECTION FEE:

QUOTED PRICE:

ANALYSES

[illegible]

Relinquished by: <i>[Signature]</i>	Date / Time 3/26/03 505 pm	Received by:	Relinquished by:	Date / Time	Received by:
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by: <i>[Signature]</i>
Method of Shipment		Remarks: Cooler Temp 9C			Samples Iced YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> Samples Preserved YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	111	86 - 118

157

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03

Category: GW

Toluene-d8	<u>95</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>96</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/03/03 09:05:00ANALYST IMCONC FACTOR 1UNITS ug/L

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 11:40

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	4.8	3.8	
Benzene	12	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	18	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	729	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.0	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	0.58 J	0.59	
1,2-Dichloroethene, total	0.58 J	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	0.66	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	99	86 - 118

159

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 11:40

Category: GW

Toluene-d8	<u>94</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>87</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/03/03 12:39:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 08/26/03 11:40

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>56</u>	<u></u>	<u>ug/L</u>	<u></u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u></u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u></u>

Notes and Definitions for this Report:

DATE RUN 09/08/03ANALYST stlCONC FACTOR UNITS ug/L

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 08/26/03 09:55

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	22	3.8	
Benzene	8.9	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	206	2.5	
Carbon Disulfide	0.63	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	495	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.1	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	0.89	0.55	
trans-1,2-Dichloroethene	1.0	0.59	
1,2-Dichloroethene, total	1.9	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	2.5	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	2.4	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	106	86 - 118

101

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 09:55

Category: GW

Toluene-d8	<u>101</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>93</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/03/03 14:06:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-1

Lab No: 03C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 08/26/03 09:55

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>11</u>	<u> </u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/08/03ANALYST stlCONC FACTOR UNITS ug/L

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 12:15

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	3.7	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	117	86 - 118

103

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 12:15

Category: GW

Toluene-d8	<u>88</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>91</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/03/03 09:48:00ANALYST IMCONC FACTOR 1UNITS ug/L

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 15:45

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	1.6	0.62	
Chloroethane	ND	0.82	
Chloroform	1.1	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.1	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	5.6	0.55	
trans-1,2-Dichloroethene	2.3	0.59	
1,2-Dichloroethene, total	7.9	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	15	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	8.8	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	115	86 - 118

105

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 15:45

Category: GW

Toluene-d8	<u>92</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>96</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/03/03 10:31:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-44-1

Lab No: 05C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 08/26/03 15:45

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/08/03ANALYST stlCONC FACTOR UNITS ug/L

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 14:45

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	15	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	7.4	0.62	
Chloroethane	ND	0.82	
Chloroform	0.88	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.0	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	1.2	0.57	
cis-1,2-Dichloroethene	65	0.55	
trans-1,2-Dichloroethene	23	0.59	
1,2-Dichloroethene, total	88	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	0.59	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	1.8	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.87	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	50	0.65	
Vinyl Chloride	1.3	0.55	
o-Xylene	0.54 J	1.1	
m,p-Xylene	1.4	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	101	86 - 118

107

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 08/26/03 14:45

Category: GW

Toluene-d8	<u>99</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>93</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/03/03 11:14:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-1

Lab No: 06C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 08/26/03 14:45

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/08/03ANALYST stlCONC FACTOR UNITS ug/L

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample: 02A MW-43-1
Collected: 08/26/03 11:40

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Gasoline Range Org.	0.12	0.10	mg/L	IM	09/03/03 12:39

Sample: 02B MW-43-1
Collected: 08/26/03 11:40

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	09/02/03 19:39

Sample: 02D MW-43-1
Collected: 08/26/03 11:40

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Chemical Oxygen Demand	134	10	mg/L	YT	08/29/03 08:30
Total Organic Carbon, Aq	46	1.0	mg/L	EL	09/04/03 13:36

Sample: 02E MW-43-1
Collected: 08/26/03 11:40

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Ferric Iron - AWWA B407-93	60.0	0.1	mg/L	DED	09/22/03 09:00
Ferrous Iron	0.6	0.1	mg/L	GS	09/02/03 14:45
Ion chromatography	09/22/03			date complete	AM
Nitrate, Ion Chrom	ND	0.06	mg/L	as N	AM 09/22/03 18:13
Nitrite, Ion Chrom	ND	0.02	mg/L	as N	AM 09/22/03 18:13
Sulfate, Ion Chrom	0.595	0.38	mg/L		AM 09/22/03 18:13
Total Alkalinity-Titration	135	1.0	mg/L	as CaCO3	TLC 09/02/03 09:48

Sample: 02F MW-43-1
Collected: 08/26/03 11:40

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Digestion, Aqueous, 200.2	09/03/03		date digested	LC	09/03/03 08:00
Iron, ICP	60.6	0.009	mg/L	LC	09/05/03 14:05
Metals, ICP/OES	09/05/03		date analyzed		

Sample: 03A MW-2-1
Collected: 08/26/03 09:55

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Gasoline Range Org.	0.13	0.10	mg/L	IM	09/03/03 14:06

Sample: 03B MW-2-1
Collected: 08/26/03 09:55

Category: GW

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Diesel Range Organics	0.20	0.10	mg/L	JSH	09/02/03 20:27

09/30/03 14:49

TEST RESULTS BY SAMPLE

Sample: 03D MW-2-1
Collected: 08/26/03 09:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	7480	100	mg/L	YT	08/29/03 09:30
Total Organic Carbon, Aq	2756	1.0	mg/L	EL	09/04/03 13:36

Sample: 03E MW-2-1
Collected: 08/26/03 09:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	116	0.1	mg/L	DED	09/22/03 09:00
Ferrous Iron	100	0.1	mg/L	GS	09/02/03 14:45
Ion chromatography	08/27/03		date complete	AM	
Nitrate, Ion Chrom	ND	0.06	mg/L as N	AM	08/27/03 20:18
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	08/27/03 20:18
Sulfate, Ion Chrom	ND	0.38	mg/L	AM	08/27/03 20:18
Total Alkalinity-Titration	3440	1.0	mg/L as CaCO3	TLC	09/02/03 09:48

Sample: 03F MW-2-1
Collected: 08/26/03 09:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	09/03/03		date digested	LC	09/03/03 08:00
Iron, ICP	216	0.090	mg/L	LC	09/05/03 14:08
Metals, ICP/OES	09/05/03		date analyzed		

Sample: 05A MW-44-1
Collected: 08/26/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.10	mg/L	IM	09/03/03 10:31

Sample: 05B MW-44-1
Collected: 08/26/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	09/02/03 21:15

Sample: 05D MW-44-1
Collected: 08/26/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	53	10	mg/L	YT	08/29/03 08:30
Total Organic Carbon, Aq	30	1.0	mg/L	EL	08/28/03 18:42

Sample: 05E MW-44-1
Collected: 08/26/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.899	0.1	mg/L	DED	09/22/03 09:00

09/30/03 14:49

TEST RESULTS BY SAMPLE

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Ferrous Iron	ND	0.1	mg/L	GS	09/02/03 14:45
Ion chromatography	09/22/03			date complete	AM
Nitrate, Ion Chrom	5.15	0.06	mg/L as N	AM	09/22/03 18:29
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	09/22/03 18:29
Sulfate, Ion Chrom	6.29	0.38	mg/L	AM	09/22/03 18:29
Total Alkalinity-Titration	59	1.0	mg/L as CaCO3	TLC	09/02/03 09:48

Sample: 05F MW-44-1

Category: GW

Collected: 08/26/03 15:45

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Digestion, Aqueous, 200.2	09/03/03			date digested	LC 09/03/03 08:00
Iron, ICP	0.899	0.009	mg/L	LC	09/05/03 14:19
Metals, ICP/OES	09/05/03			date analyzed	

Sample: 06A MW-42-1

Category: GW

Collected: 08/26/03 14:45

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Gasoline Range Org.	0.15	0.10	mg/L	IM	09/03/03 11:14

Sample: 06B MW-42-1

Category: GW

Collected: 08/26/03 14:45

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
TPH, Diesel Range Organics	0.13	0.10	mg/L	JSH	09/02/03 22:03

Sample: 06D MW-42-1

Category: GW

Collected: 08/26/03 14:45

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Chemical Oxygen Demand	409	10	mg/L	YT	08/29/03 09:30
Total Organic Carbon, Aq	170	1.0	mg/L	EL	08/28/03 18:42

Sample: 06E MW-42-1

Category: GW

Collected: 08/26/03 14:45

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Ferric Iron - AWWA B407-93	3.60	0.1	mg/L	DED	09/22/03 09:00
Ferrous Iron	0.4	0.1	mg/L	GS	09/02/03 14:45
Ion chromatography	08/27/03			date complete	AM
Nitrate, Ion Chrom	19.2	0.06	mg/L as N	AM	08/27/03 20:52
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	08/27/03 20:52
Sulfate, Ion Chrom	14.5	0.38	mg/L	AM	08/27/03 20:52
Total Alkalinity-Titration	260	1.0	mg/L as CaCO3	TLC	09/02/03 09:48

Sample: 06F MW-42-1

Category: GW

Collected: 08/26/03 14:45

Test Description	Result	Det Limit	Units	By	Analyzed Dt/Tm
Digestion, Aqueous, 200.2	09/03/03			date digested	LC 09/03/03 08:00

Order # 03-08-B26
09/30/03 14:49

Page 5

TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Iron, ICP	4.00	0.009	mg/L LC	09/05/03 14:11
Metals, ICP/OES	09/05/03		date analyzed	



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Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 103843

Order #: 03-09-A15
Date: 10/14/03 16:39
Work ID: GE Railcar
Date Received: 09/24/03
Date Completed: 10/14/03
Client Code: RSA


SAMPLE IDENTIFICATION

<u>Sample</u> <u>Number</u>	<u>Sample</u> <u>Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample</u> <u>Number</u>	<u>Sample</u> <u>Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568



Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0309A15 (Continued)

Methane, Ethane, Ethene - Subcontracted

Subcontractor data package enclosed.

Ion Chromatography

Sample 0309A15-03 was initially analyzed on 9/24/03 without a dilution. Due to chromatography, the sample was re-analyzed on 9/30/03 at a 10x and 25x dilution, the 10x dilution was reported.

Continuing calibration verifications were all acceptable.

Laboratory Control Sample was acceptable

0309A15-02 Duplicate/Matrix Spike was acceptable

0309C22-02 Duplicate/Matrix Spike was acceptable.

Metals Analysis (Total Iron) – EPA6010

Quality Control Sample (QC 19) was acceptable.

Interference A and Interference AB was acceptable.

Initial Laboratory Performance Check was acceptable.

Laboratory Fortified Blank was acceptable.

Matrix Spike/Matrix Spike Duplicate was acceptable.

Alkalinity, Total – Standard Methods 2320B, 19th Edition

Laboratory Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Case Narrative

ACL Order Number 0309A15 (Continued)

Total Organic Carbon – EPA 9060

Laboratory Blanks were acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Matrix spikes were acceptable.

Chemical Oxygen Demand – EPA 410.4

Method Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Sample duplicates were acceptable.

Matrix spikes were acceptable.

Gasoline Range Organics

Surrogate Recovery Summary

<u>Sample ID</u>	SMC1 <u>%Rec.</u>	SMC2 <u>%Rec.</u>	SMC3 <u>%Rec.</u>
0309A15-01	99	104	117
0309A15-02	97	103	119
0309A15-03	89	104	123
0309A15-04	102	100	113
0309A15-05	103	103	112
0309A15-06	98	101	119

Data File Name SEP3003.D
Data File Path F:\DATA\SEP30\
Operator IM
Acq. Method File BEN
Sample Name VLCS01 10ug/L

RSA GRO LCS Percent Recovery Report

<u>Name</u>	<u>Amount</u>	<u>Spike Amount</u>	<u>Percent Recovery</u>
Benzene	15.14	10	151
Toluene	12.21	10	122
Ethylbenzene	9.84	10	98
m,p-Xylene	19.41	20	97
o-Xylene	10.83	10	108
1,2,4-Trimethylbenzene	10.87	10	109



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REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 103843

Order #: 03-09-A15
Date: 10/14/03 16:39
Work ID: GE Railcar
Date Received: 09/24/03
Date Completed: 10/14/03
Client Code: RSA


SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568



Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0309A15

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0309A15. 0309A15 consisted of four (4) samples, one (1) trip blank and one (1) equipment blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD samples for this sample set includes 0309A15-03, 0309399-43 and 0309399-30.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 25 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
09/29/03 12:03	None
09/30/03 08:52	None
10/02/03 13:36	None
10/02/03 21:09	None
10/03/03 13:07	None
10/03/03 21:22	None

The instrument performance was acceptable as indicated by the tune report for 4-bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 9/29/03 except for acetone and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

Case Narrative
ACL Order Number 0309A15 (Continued)

The average RRF for all compounds was less than 15% for the initial calibration performed on 10/02/03 except for chloromethane, bromomethane, acetone, methylene chloride, 1,1-dichloroethane, cis-1,2-dichloroethane, chloroform, 1,2-dichloroethane, 2-butanone, benzene, 1,2-dichloropropane, 2-hexanone, styrene, 1,1,2,2-tetrachloroethane, and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The average RRF for all compounds was less than 15% for the initial calibration performed on 10/03/03.

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: None

The results of the MS/MSD were all within the acceptance limits with the exception of 0309A15-03MS which failed chlorobenzene recoveries due to ambient level of chlorobenzene in sample. 0309399-43MS benzene recovery was outside QC limits at 134%. LCS and 0309399-43MSD were within acceptable limits for benzene.

The internal standard areas were all within the acceptance criteria with the exception of VLCS01 and BLK01 on 10/02/03. Both of these samples failed the IS4 areas. No samples were analyzed from this batch. A new tune std., calibration std, lcs, blank and additional samples were analyzed after with acceptable area recoveries.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0309A15-06:

Trans-1,2-dichloroethene, cis-1,2-dichloroethene and trichloroethene exceeded the calibration range. Sample was diluted and re-analyzed on 10/03/03.

Case Narrative
ACL Order Number 0309A15 (Continued)

0309A15-02:

Sample was re-analyzed on 10/02/03 due to the possibility of carryover from previous sample.

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 09/30/03.

0309A15-03:

Acetone, 2-Butanone and chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 10/02/03.

0309A15-02RA:

Chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 09/30/03.

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

Digestion Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA (1983) Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

Chemical Oxygen Demand EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous EPA Method 415.1

SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics

SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)

SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)

SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity SM 2320B (titrimetric)

Nitrite, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

Nitrate, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

Sulfate, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

CHAIN OF CUSTODY RECORD

PROJECT NAME GE PAILCAR-EIKTON - RSA INC
 COMPANY Rosengarten, Smith & Assoc., Inc
 ADDRESS 2222 Western Trails # 300 Austin TX 78745
 PHONE (512) 707-1777



ATLANTIC COAST
 Laboratories, Incorporated

630 Churchmans Road
 Newark, Delaware 19702
 302-266-9121 • 454-8720 (FAX)

0309A15

SAMPLED BY CA Montero
 SIGNATURE CA Montero
 PRINT NAME CA Montero

SAMPLE COLLECTION FEE: _____
 QUOTED PRICE: _____

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER		GRAB	COMP	NO. OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	ANALYSES										COMMENTS
				SIZE	G/P						VOCs	THC (C10-C18)	White	Nitros	White	Alkalinity	PO4	Ammonia	Ethanol		
	9/23/03	1110	MW-2-1	✓	G+P	✓			Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	9/23/03	1215	MW-42-1 (CM) MW-43-1	✓	G+P	✓			Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	9/23/03	305 PM	MW-42-1	✓	G+P	✓			Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	9/23/03	3:55 PM	MW-44-1	✓	G+P	✓			Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	9/23/03	1110	EQUIPMENT BLANK	✓	G+P	✓		2	Water	HCL, HNO3 H2SO4	✓										
	9/24/03	/	TRIP BLANK	✓	G+P	✓		2	Water	HCL, HNO3 H2SO4	✓										

Relinquished by: <u>CA Montero</u>	Date / Time: <u>9/23/03 8:10AM</u>	Received by: _____	Relinquished by: _____	Date / Time: <u>9/23/03 8:10</u>	Received by: <u>KR</u>
Relinquished by: _____	Date / Time: _____	Received by: _____	Relinquished by: _____	Date / Time: _____	Received for Laboratory by: _____
Method of Shipment: _____		Remarks: _____		Samples Iced <input type="checkbox"/> YES <input type="checkbox"/> NO Samples Preserved <input type="checkbox"/> YES <input type="checkbox"/> NO	

✓* = various sizes

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/22/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	98	86 - 118

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/22/03

Category: GW

Toluene-d8	<u>102</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>110</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/30/03 09:40:00ANALYST IMCONC FACTOR 1UNITS ug/L

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 12:15

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	5.0	3.8	
Benzene	21	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	2.5	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	789	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	1.2	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	0.65	0.59	
1,2-Dichloroethene, total	0.65 J	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	0.51 J	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	94	86 - 118

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 12:15

Category: GW

Toluene-d8	<u>104</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>115</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/02/03 21:54:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 09/23/03 12:15

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>100</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/30/03ANALYST STLCONC FACTOR 1.0UNITS ug/L

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 11:10

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	344	3.8	
Benzene	10	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	275	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	808	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.88	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	1.0	0.55	
trans-1,2-Dichloroethene	1.0	0.59	
1,2-Dichloroethene, total	2.0	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	2.0	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.54 J	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	88	86 - 118

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 11:10

Category: GW

Toluene-d8	<u>102</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>115</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/30/03 15:32:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-1

Lab No: 03C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 09/23/03 11:10

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>18</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/30/03ANALYST STLCONC FACTOR 1.0UNITS ug/L

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 09/23/03 11:10

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	1.6 J	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	101	86 - 118

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 11:10

Category: GW

Toluene-d8	<u>98</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>106</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/30/03 10:24:00ANALYST IMCONC FACTOR 1UNITS ug/L

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 15:55

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	3.2 J	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	1.8	0.62	
Chloroethane	ND	0.82	
Chloroform	1.0	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	0.93	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	4.0	0.55	
trans-1,2-Dichloroethene	1.7	0.59	
1,2-Dichloroethene, total	5.7	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	16	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.75	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	7.7	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	0.8 J	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	102	86 - 118

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 15:55

Category: GW

Toluene-d8	<u>101</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>103</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/30/03 11:09:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-44-1

Lab No: 05C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 09/23/03 15:55

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/30/03ANALYST STLCONC FACTOR 1.0UNITS ug/L

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 15:05

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	17	3.8	
Benzene	1.0	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	2.0 J	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	11	0.62	
Chloroethane	ND	0.82	
Chloroform	1.0	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	2.4	0.55	
1,1-Dichloroethane	1.9	0.65	
1,1-Dichloroethene	3.6	0.57	
cis-1,2-Dichloroethene	527	0.55	
trans-1,2-Dichloroethene	211	0.59	
1,2-Dichloroethene, total	738	1.1	
Dichloromethane (MeCl2)	0.68	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	0.88	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	6.2	0.44	
Tetrachloroethene	0.8	0.67	
Toluene	1.2	0.64	
1,1,2-Trichloroethane	5.6	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	333	0.65	
Vinyl Chloride	6.2	0.55	
o-Xylene	0.94 J	1.1	
m,p-Xylene	1.9	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	97	86 - 118

399

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 09/23/03 15:05

Category: GW

Toluene-d8	<u>99</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>112</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 09/30/03 11:54:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-1

Lab No: 06C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 09/23/03 15:05

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 09/30/03ANALYST STLCONC FACTOR 1.0UNITS ug/L

10/14/03 16:27

TEST RESULTS BY SAMPLE

Sample: 02A MW-43-1
Collected: 09/23/03 12:15

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.24	0.10	mg/L	IM	09/30/03	12:38

Sample: 02B MW-43-1
Collected: 09/23/03 12:15

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	09/29/03	13:41

Sample: 02D MW-43-1
Collected: 09/23/03 12:15

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Chemical Oxygen Demand	41	10	mg/L	YT	09/26/03	09:30
Total Organic Carbon, Aq	9.9	1.0	mg/L	EL	09/30/03	18:21

Sample: 02E MW-43-1
Collected: 09/23/03 12:15

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Ferric Iron - AWWA B407-93	63	0.1	mg/L	DED	10/14/03	12:00
Ferrous Iron	0.3	0.1	mg/L	GS	10/03/03	14:00
Ion chromatography	09/24/03				date complete	AM
Nitrate, Ion Chrom	ND	0.06	mg/L	as N	AM	09/24/03 22:42
Nitrite, Ion Chrom	ND	0.02	mg/L	as N	AM	09/24/03 22:42
Sulfate, Ion Chrom	2.09	0.38	mg/L	AM	09/24/03	22:42
Total Alkalinity-Titration	93	1.0	mg/L as CaCO3	TLC	10/01/03	11:51

Sample: 02F MW-43-1
Collected: 09/23/03 12:15

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
Digestion, Aqueous, 200.2	10/01/03		date digested	EL	10/01/03	15:30
Iron, ICP	63.3	0.009	mg/L	LC	10/03/03	21:40
Metals, ICP/OES	10/03/03		date analyzed			

Sample: 03A MW-2-1
Collected: 09/23/03 11:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Gasoline Range Org.	0.23	0.10	mg/L	IM	09/30/03	15:32

Sample: 03B MW-2-1
Collected: 09/23/03 11:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed</u>	<u>Dt/Tm</u>
TPH, Diesel Range Organics	1.7	0.50	mg/L	JSH	09/29/03	16:51

Order # 03-09-A15
10/14/03 16:27

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TEST RESULTS BY SAMPLE

Sample: 03D MW-2-1
Collected: 09/23/03 11:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	6700	10	mg/L	YT	09/26/03 10:30
Total Organic Carbon, Aq	2049	1.0	mg/L	EL	10/08/03 11:47

Sample: 03E MW-2-1
Collected: 09/23/03 11:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	177	0.1	mg/L	DED	10/14/03 12:00
Ferrous Iron	3.0	0.1	mg/L	GS	10/03/03 14:00
Ion chromatography	09/30/03		date complete	AM	
Nitrate, Ion Chrom	ND	0.06	mg/L as N	AM	09/24/03 23:25
Nitrite, Ion Chrom	ND	0.20	mg/L as N	AM	09/30/03 20:47
Sulfate, Ion Chrom	0.779	0.38	mg/L	AM	09/24/03 23:25
Total Alkalinity-Titration	2123	1.0	mg/L as CaCO3	TLC	10/01/03 11:51

Sample: 03F MW-2-1
Collected: 09/23/03 11:10

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/01/03		date digested	EL	10/01/03 15:30
Iron, ICP	180	0.090	mg/L	LC	10/06/03 11:58
Metals, ICP/OES	10/06/03		date analyzed		

Sample: 05A MW-44-1
Collected: 09/23/03 15:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.10	mg/L	IM	09/30/03 11:09

Sample: 05B MW-44-1
Collected: 09/23/03 15:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	09/29/03 15:16

Sample: 05D MW-44-1
Collected: 09/23/03 15:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	155	10	mg/L	YT	09/26/03 09:30
Total Organic Carbon, Aq	105	1.0	mg/L	EL	09/30/03 18:21

Sample: 05E MW-44-1
Collected: 09/23/03 15:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	2.71	0.1	mg/L	DED	10/14/03 12:00

TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferrous Iron	ND	0.1	mg/L	GS	10/03/03 14:00
Ion chromatography	09/24/03		date complete	AM	
Nitrate, Ion Chrom	1.87	0.06	mg/L as N	AM	09/24/03 23:39
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	09/24/03 23:39
Sulfate, Ion Chrom	8.53	0.38	mg/L	AM	09/24/03 23:39
Total Alkalinity-Titration	67	1.0	mg/L as CaCO3	TLC	10/01/03 11:51

Sample: 05F MW-44-1

Category: GW

Collected: 09/23/03 15:55

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/01/03		date digested	EL	10/01/03 15:30
Iron, ICP	2.71	0.009	mg/L	LC	10/03/03 21:55
Metals, ICP/OES	10/03/03		date analyzed		

Sample: 06A MW-42-1

Category: GW

Collected: 09/23/03 15:05

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.80	0.10	mg/L	RJM	10/02/03 14:20

Sample: 06B MW-42-1

Category: GW

Collected: 09/23/03 15:05

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	09/29/03 16:04

Sample: 06D MW-42-1

Category: GW

Collected: 09/23/03 15:05

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	331	10	mg/L	YT	09/26/03 10:30
Total Organic Carbon, Aq	148	1.0	mg/L	EL	09/30/03 18:21

Sample: 06E MW-42-1

Category: GW

Collected: 09/23/03 15:05

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.18	0.1	mg/L	DED	10/14/03 12:00
Ferrous Iron	ND	0.1	mg/L	GS	10/03/03 14:00
Ion chromatography	09/24/03		date complete	AM	
Nitrate, Ion Chrom	1.99	0.06	mg/L as N	AM	09/24/03 23:53
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	09/24/03 23:53
Sulfate, Ion Chrom	18.1	0.38	mg/L	AM	09/24/03 23:53
Total Alkalinity-Titration	238	1.0	mg/L as CaCO3	TLC	10/01/03 11:51

Sample: 06F MW-42-1

Category: GW

Collected: 09/23/03 15:05

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/01/03		date digested	EL	10/01/03 15:30

Order # 03-09-A15
10/14/03 16:27

Page 4

TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Iron, ICP	0.181	0.009	mg/L	LC	10/03/03 21:59
Metals, ICP/OES	10/03/03			date analyzed	



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 104368

Order #: 03-10-992
Date: 12/11/03 12:04
Work ID: GE Elkton Railcar
Date Received: 10/22/03
Date Completed: 11/17/03
Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Warren Van Arsdall

Certified By
Warren Van Arsdall

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

Case Narrative

ACL Order Number 0310992

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0310992. 0310992 consisted of four (4) samples, one (1) trip blank and one (1) equipment blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD samples for this sample set includes 0310992-06 and 0310992-02DL 10x.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 25 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
10/23/03 01:11	None
10/25/03 09:09	None
10/27/03 23:41	None

The instrument performance was acceptable as indicated by the tune report for 4-bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 10/22/03 except for 2-hexanone. A linear regression curve fit (not forced through 0) was used for this compound.

Case Narrative
ACL Order Number 0310992 (Continued)

The average RRF for all compounds was less than 15% for the initial calibration performed on 10/27/03 except for 4-methyl-2-pentanone, 2-hexanone, bromoform and 1,2-dibromo-3-chloropropane. A linear regression curve fit (not forced through 0) was used for these compounds.

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 0310992-02 analyzed on 10/25/03 failed SMC2 and was re-analyzed on 10/27/03 with all SMC's acceptable.

The results of the MS/MSD were all within the acceptance limits with the exception of 0310992-06MSD that failed trichloroethene recovery due to ambient level of trichloroethene in sample. 0310992-02DLMS 10x and 0310992-02DLMSD 10x failed chlorobenzene recovery due to ambient level of chlorobenzene in sample.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0310992-02:

2-butanone and chlorobenzene exceeded the calibration range. Sample was diluted at 10x and re-analyzed on 10/27/03. This sample dilution was insufficient to get chlorobenzene inside the calibration range. This result was reported due to no sample vials left for an additional dilution analysis.

Case Narrative
ACL Order Number 0310992 (Continued)

0310992-03:

2-Butanone and chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 10/27/03.

0310992-05:

Sample was re-analyzed on 10/27/03 due to possible carryover from previous sample.

0310992-06:

Trichloroethene and cis-1,2-dichloroethene exceeded the calibration range. Sample was diluted and re-analyzed on 10/27/03.



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REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 104368

Order #: 03-10-992
Date: 11/18/03 12:50
Work ID: GE Elkton Railcar
Date Received: 10/22/03
Date Completed: 11/17/03
Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0310992

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0310992 consisting of 4 samples, 1 trip blank and 1 equipment blank.

Samples were received preserved, cooled to 4° C. Ice was present in the cooler at time of receipt. The temperature at time of receipt was 1° C.

Summary:

Gasoline Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 using P/T GC-MS.

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Diesel Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 (modified).

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Internal standard responses were acceptable.

Insufficient sample for MS/MSD.

Case Narrative

ACL Order Number 0310992 (Continued)

Methane, Ethane, Ethene - Subcontracted

Subcontractor data package enclosed.

Ion Chromatography

Sample 0310992-02 was initially analyzed on 10/22/03 without a dilution. Due to chromatography, the sample was re-analyzed on 10/27/03 at a 10x and for nitrite. Sample 0310992-03 was initially analyzed on 10/22/03 without a dilution. Due to chromatography, the sample was re-analyzed on 10/27/03 at a 10x and for nitrite.

Continuing calibration verifications were all acceptable.

Laboratory Control Sample was acceptable

0310925-02A Duplicate/Matrix Spike was acceptable for all analytes with the exception of nitrate and sulfate. Laboratory fortified blank was acceptable for all analytes.

0310947-08 Duplicate/Matrix Spike was acceptable.

Metals Analysis (Total Iron) – EPA6010

Quality Control Sample (QC 19) was acceptable.

Interference A and Interference AB was acceptable.

Initial Laboratory Performance Check was acceptable.

Laboratory Fortified Blank was acceptable.

Matrix Spike/Matrix Spike Duplicate was acceptable.

Alkalinity, Total – Standard Methods 2320B, 19th Edition

Laboratory Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Case Narrative

ACL Order Number 0310992 (Continued)

Total Organic Carbon – EPA 9060

Laboratory Blanks were acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Matrix spikes were acceptable.

Chemical Oxygen Demand – EPA 410.4

Method Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Sample duplicates were acceptable.

Matrix spikes were acceptable.

Digestion Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA (1983) Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

Chemical Oxygen Demand EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous EPA Method 415.1
SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics
SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)
SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)
SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity SM 2320B (titrimetric)

Nitrite, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

Nitrate, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

Sulfate, Ion Chromatography

Drinking water, wastewater Method 300.0

Groundwater, RCRA wastes SW-846 Method 9056

CHAIN OF CUSTODY RECORD

PROJECT NAME GERAIL CAR - Elktion / RSA, Inc
 COMPANY RSA, INC
 ADDRESS 2222 Western Franks Blvd Ste 300
 PHONE (512) 707-1777 AUSTIN TX 78745



ATLANTIC COAST
 Laboratories, Incorporated

630 Churchmans Road
 Newark, Delaware 19702
 302-266-9121 • 454-8720 (FAX)

Project No / PO No : 2017-18
 SAMPLED BY _____

SIGNATURE CA Montero
 PRINT NAME _____

SAMPLE COLLECTION FEE:

QUOTED PRICE:

ANALYSES

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINER		GRAB	COMP	NO OF CONTAINERS	SAMPLE MATRIX	PRESERVATIVE	ANALYSES										COMMENTS
				SIZE	G/P						VOCS	SVCS	ARTWORK	CHLOR	NITROGEN	1/640	1/640	1/640	1/640	1/640	
	10/21/03	1040	MW-2-1	V ^A	G/P			9	Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	*V = Various Sizes
	10/21/03	1140	MW-43-1	V ^A	G/P			9	Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	10/21/03	1400	MW-42-1	V ^A	G/P			9	Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	10/21/03	1545	MW-44-1	V ^A	G/P			9	Water	HCL, HNO3 H2SO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
	10/21/03	1110	EQUIPMENT BLANK	40ml	G	X		3	Water	HCL	✓										
	10/21/03	N/A	TRIP BLANK	40ml	G	X		2	Water	HCL	✓										

Relinquished by: <u>CA Montero</u>	Date / Time <u>10/22/03 0900</u>	Received by:	Relinquished by:	Date / Time <u>10/22/03 9:00</u>	Received by: <u>[Signature]</u>
Relinquished by:	Date / Time	Received by:	Relinquished by:	Date / Time	Received for Laboratory by:

Method of Shipment	Remarks	Samples Iced <input type="checkbox"/>	Samples Preserved <input type="checkbox"/>	YES <input type="checkbox"/> NO <input type="checkbox"/>
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12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	103	86 - 118

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles;SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03

Category: GW

Toluene-d8	<u>88</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>90</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/25/03 09:53:00ANALYST IMCONC FACTOR 1UNITS ug/L

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 11:40

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	84	3.8	
Benzene	11	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	378	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	539	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.9	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	0.6	0.59	
1,2-Dichloroethene, total	0.6 J	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	0.9	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	114	86 - 118

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 11:40

Category: GW

Toluene-d8	<u>100</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>101</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/28/03 02:41:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 10/21/03 11:40

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>170</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 10/31/03ANALYST STLCONC FACTOR 1UNITS ug/L

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 10:40

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	74	3.8	
Benzene	7.2	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	289	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	433	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.7	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	0.9	0.55	
trans-1,2-Dichloroethene	0.9	0.59	
1,2-Dichloroethene, total	1.8	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	2.8	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	1.1	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	99	86 - 118

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 10:40

Category: GW

Toluene-d8	<u>89</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>91</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/25/03 12:11:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-1

Lab No: 03C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 10/21/03 10:40

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>34</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 10/31/03ANALYST STLCONC FACTOR 1UNITS ug/L

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 11:10

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	103	86 - 118

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 11:10

Category: GW

Toluene-d8	<u>88</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>86</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/25/03 10:38:00ANALYST IMCONC FACTOR 1UNITS ug/L

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 15:45

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	11	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	0.9	0.62	
Chloroethane	ND	0.82	
Chloroform	1.1	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.0	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	2.6	0.55	
trans-1,2-Dichloroethene	0.8	0.59	
1,2-Dichloroethene, total	3.4	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	16	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	5.3	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	114	86 - 118

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 15:45

Category: GW

Toluene-d8	<u>100</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>97</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/28/03 00:26:00ANALYST RJMCONC FACTOR 1UNITS ug/L

Sample Description: MW-44-1

Lab No: 05C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 10/21/03 15:45

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 10/31/03ANALYST STLCONC FACTOR 1UNITS ug/L

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 14:50

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	13	3.8	
Benzene	0.5 J	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	8.1	0.62	
Chloroethane	ND	0.82	
Chloroform	0.9	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.2	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	0.8	0.57	
cis-1,2-Dichloroethene	70	0.55	
trans-1,2-Dichloroethene	24	0.59	
1,2-Dichloroethene, total	94	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	3.8	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	1.6	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	57	0.65	
Vinyl Chloride	1.2	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	0.8 J	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	100	86 - 118

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 10/21/03 14:50

Category: GW

Toluene-d8	<u>89</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>88</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 10/25/03 13:41:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-1

Lab No: 06C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 10/21/03 14:50

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u> </u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u> </u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u> </u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 10/31/03ANALYST STLCONC FACTOR 1UNITS ug/L

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample: 02A MW-43-1
Collected: 10/21/03 11:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.41	0.10	mg/L IM	10/25/03 11:25

Sample: 02B MW-43-1
Collected: 10/21/03 11:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L JSH	10/24/03 20:30

Sample: 02D MW-43-1
Collected: 10/21/03 11:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	1920	10	mg/L YT	10/24/03 09:45
Total Organic Carbon, Aq	681	20	mg/L EL	11/07/03 15:13

Sample: 02E MW-43-1
Collected: 10/21/03 11:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	130	0.1	mg/L WV	11/12/03
Ferrous Iron	10	0.1	mg/L GS	10/31/03 14:00
Ion chromatography	10/28/03		date complete WV	
Nitrate, Ion Chrom	ND	0.06	mg/L as N AM	10/22/03 22:28
Nitrite, Ion Chrom	ND	0.20	mg/L as N WV	10/28/03 01:33
Sulfate, Ion Chrom	2.57	0.38	mg/L AM	10/22/03 22:28
Total Alkalinity-Titration	568	1.0	mg/L as CaCO3 TLC	10/28/03 13:28

Sample: 02F MW-43-1
Collected: 10/21/03 11:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/28/03		date digested MKB	10/28/03 10:30
Iron, ICP	140	0.009	mg/L LC	11/05/03 10:11
Metals, ICP/OES	11/05/03		date analyzed	

Sample: 03A MW-2-1
Collected: 10/21/03 10:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.30	0.10	mg/L IM	10/25/03 12:11

Sample: 03B MW-2-1
Collected: 10/21/03 10:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.61	0.10	mg/L JSH	10/24/03 21:17

12/11/03 12:04

TEST RESULTS BY SAMPLE

Sample: 03D MW-2-1
Collected: 10/21/03 10:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	6980	10	mg/L YT	10/24/03 09:45
Total Organic Carbon, Aq	3880	100	mg/L EL	10/27/03 14:41

Sample: 03E MW-2-1
Collected: 10/21/03 10:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	139	0.1	mg/L WV	11/12/03
Ferrous Iron	90	0.1	mg/L GS	10/31/03 14:00
Ion chromatography	10/28/03		date complete WV	
Nitrate, Ion Chrom	ND	0.06	mg/L as N WV	10/28/03 02:02
Nitrite, Ion Chrom	ND	0.20	mg/L as N WV	10/28/03 02:02
Sulfate, Ion Chrom	12.4	0.38	mg/L WV	10/28/03 02:02
Total Alkalinity-Titration	2982	1.0	mg/L as CaCO3 TLC	10/28/03 13:28

Sample: 03F MW-2-1
Collected: 10/21/03 10:40

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/28/03		date digested MKB	10/28/03 10:30
Iron, ICP	229	0.090	mg/L LC	11/05/03 10:15
Metals, ICP/OES	11/05/03		date analyzed	

Sample: 05A MW-44-1
Collected: 10/21/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.10	mg/L IM	10/25/03 12:58

Sample: 05B MW-44-1
Collected: 10/21/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L JSH	10/24/03 22:08

Sample: 05D MW-44-1
Collected: 10/21/03 15:45

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	44	10	mg/L YT	10/24/03 08:05
Total Organic Carbon, Aq	28	1.0	mg/L EL	10/27/03 14:41

Sample: 05E MW-44-1
Collected: 10/21/03 14:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	1.46	0.1	mg/L WV	11/12/03

TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferrous Iron	ND	0.1	mg/L	GS	10/31/03 14:00
Ion chromatography	10/22/03		date complete	AM	
Nitrate, Ion Chrom	1.87	0.06	mg/L as N	AM	10/22/03 22:56
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	10/22/03 22:56
Sulfate, Ion Chrom	6.51	0.38	mg/L	AM	10/22/03 22:56
Total Alkalinity-Titration	63	1.0	mg/L as CaCO3	TLC	10/28/03 13:28

Sample: 05F MW-44-1

Category: GW

Collected: 10/21/03 14:55

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/28/03		date digested	MKB	10/28/03 10:30
Iron, ICP	1.46	0.009	mg/L	LC	11/04/03 19:29
Metals, ICP/OES	11/04/03		date analyzed		

Sample: 06A MW-42-1

Category: GW

Collected: 10/21/03 14:50

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.12	0.10	mg/L	IM	10/25/03 13:41

Sample: 06B MW-42-1

Category: GW

Collected: 10/21/03 14:50

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	10/24/03 22:52

Sample: 06D MW-42-1

Category: GW

Collected: 10/21/03 14:50

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	279	10	mg/L	YT	10/24/03 09:45
Total Organic Carbon, Aq	102	1.0	mg/L	EL	10/27/03 14:41

Sample: 06E MW-42-1

Category: GW

Collected: 10/21/03 14:50

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	1.22	0.1	mg/L	WV	11/12/03
Ferrous Iron	ND	0.1	mg/L	GS	10/31/03 14:00
Ion chromatography	10/22/03		date complete	AM	
Nitrate, Ion Chrom	2.01	0.06	mg/L as N	AM	10/22/03 23:10
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	10/22/03 23:10
Sulfate, Ion Chrom	13.6	0.38	mg/L	AM	10/22/03 23:10
Total Alkalinity-Titration	226	1.0	mg/L as CaCO3	TLC	10/28/03 13:28

Sample: 06F MW-42-1

Category: GW

Collected: 10/21/03 14:50

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	10/28/03		date digested	MKB	10/28/03 10:30

Order # 03-10-992
12/11/03 12:04

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TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units By</u>	<u>Analyzed Dt/Tm</u>
Iron, ICP	1.22	0.009	mg/L LC	11/04/03 19:32
Metals, ICP/OES	11/04/03		date analyzed	

REPORT COMMENTS

PROJECT NOTES

1. 0310992-02e and 0310992-03e had to be reanalyzed with dilutions due to interferences in the analysis for nitrite-N. 0310992-03e was reanalyzed with a matrix spike to determine retention times since the original analysis had potential retention time problems.



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 104908

Order #: 03-11-939
Date: 12/26/03 12:08
Work ID: GE Railcar monthly groundwtr
Date Received: 11/21/03
Date Completed: 12/24/03
Client Code: RSA

SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications: DE DE00011 PA 68-335
MD 138 NJ DE568

Certified By
Warren Van Arsdall

GLOSSARY OF DATA QUALIFIER CODES (ORGANIC)

- B** = Not detected substantially above the level reported in laboratory or field blanks
- J** = Analyte present. Reported Value may not be accurate or precise
- E** = Analyte present, exceeds calibration range
- U** = Analyte analyzed for, undetected.
- N** = Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.

Case Narrative

ACL Order Number 0311939

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0311939. 0311939 consisted of four (4) samples, one (1) trip blank and one (1) equipment blank.

Matrix Spike/Matrix Spike Duplicates were analyzed at a frequency of 1 per ten samples. MS/MSD samples for this sample set includes 0311939-03, 0311939-06DL 10x and 0311939-03DL 20x.

Samples were received preserved, cooled to 4° C. The hold time for the samples was fourteen days for aromatic compounds and fourteen days for halogenated compounds. Ice was present in the cooler at time of receipt.

Samples were analyzed by Method 8260B and Method 8000B from SW-846, Test Methods for Evaluating Solid Waste. A 25 mL volume was used for analysis.

Summary:

All samples were analyzed within the prescribed hold time.

The following is a summary of contaminants found in the method blank(s) analyzed with this set of samples.

<u>Date</u>	<u>Comments</u>
11/28/03 08:25	None
12/04/03 11:33	None
12/09/03 01:02	None

The instrument performance was acceptable as indicated by the tune report for 4-bromofluorobenzene.

The average RRF for all compounds was less than 15% for the initial calibration performed on 11/26/03 except for 2-hexanone. A linear regression curve fit (not forced through 0) was used for this compound.

Case Narrative
ACL Order Number 0311939 (Continued)

The average RRF for all compounds was less than 15% for the initial calibration performed on 12/04/03.

The average RRF for all compounds was less than 15% for the initial calibration performed on 12/08/03 except for 2-hexanone and chlorobenzene. A linear regression curve fit (not forced through 0) was used for these compounds.

The acceptance criteria for the System Performance Check Compounds and Continuing Calibration Compounds was met for continuing calibration check standards.

The surrogate recoveries were within the acceptable limits in all samples analyzed with the following exceptions: 03111939-04 analyzed on 11/28/03 failed SMC3 and was re-analyzed on 12/04/03 with all SMC's acceptable.

The results of the MS/MSD were all within the acceptance limits with the exception of 0311393-03DLMS 25x and 0311393-03DLMSD 25x that failed chlorobenzene recovery due to high level of chlorobenzene in sample. 0311393-03DLMS 25x and 0311393-03DLMSD 20x failed chlorobenzene recovery due to high level of chlorobenzene in sample.

The internal standard areas were all within the acceptance criteria.

The percent recoveries for the analytes in the Laboratory Control Sample were within acceptable limits.

Major Issues:

None

Minor Issues:

0311939-06:

trans-1,2-dichlorethene, cis-1,2-dichlorethene and trichloroethene exceeded the calibration range. Sample was diluted at 10x and re-analyzed on 12/04/03.

Case Narrative
ACL Order Number 0311939 (Continued)

0311939-06DL 5x:

cis-1,2-dichlorethene and trichloroethene exceeded the calibration range. Sample was diluted at 10x and re-analyzed on 12/04/03.

0311939-02:

Sample was re-analyzed on 12/04/03 due to possible carryover from previous sample.

0311939-02DL 20x:

Sample was re-analyzed on 12/04/03 due to possible carryover from previous sample.

0311939-03:

chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 12/04/03.

0311939-03DL 25x:

Sample was re-analyzed on 12/04/03 due to possible carryover from previous sample.

0311939-02DL 10x:

chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 12/08/03.

0311939-03DL 10x:

chlorobenzene exceeded the calibration range. Sample was diluted and re-analyzed on 12/08/03.

TEST METHODOLOGIES

Digestion

Method 200.2

Iron (Fe) - ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA (1983) Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

ICP (Inductively Coupled Argon Plasma Emission Spectroscopy)

Wastewater & drinking water EPA Method 200.7

RCRA TCLP & groundwater SW 846 Method 6010

Solids SW 846 Method 6010

Chemical Oxygen Demand

EPA Method 410.4 (manual colorimetric)

Total Organic Carbon, Aqueous

EPA Method 415.1

SW-846 Method 9060

Total Petroleum Hydrocarbons, Diesel Range Organics

SW-846, Method 8015, GC/FID (modified)

Total Petroleum Hydrocarbons-Gasoline Range Organics (TPH/GRO)

SW-846 Method 8015 (modified)

Volatile Organics by GC/MS (aqueous)

SW846 Method 8260B (purge & trap, capillary column GC/MS)

Total Alkalinity

SM 2320B (titrimetric)

Nitrite, Ion Chromatography

Drinking water, wastewater

Method 300.0

Groundwater, RCRA wastes

SW-846 Method 9056

Nitrate, Ion Chromatography

Drinking water, wastewater

Method 300.0

Groundwater, RCRA wastes

SW-846 Method 9056

Sulfate, Ion Chromatography

Drinking water, wastewater

Method 300.0

Groundwater, RCRA wastes

SW-846 Method 9056



ATLANTIC COAST
Laboratories, Incorporated

630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)
WWW.ATLANTICCOASTLABS.COM

REPORT OF ANALYSIS

Rosengarten, Smith & Assoc.
2222 Western Trails Blvd.
Suite 300
Austin, TX 78745
Attn: Mr. Charles Montero
Invoice Number: 104908

Order #: 03-11-939
Date: 01/16/04 09:42
Work ID: GE Railcar monthly groundwtr
Date Received: 11/21/03
Date Completed: 12/24/03
Client Code: RSA

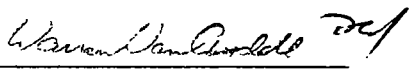
SAMPLE IDENTIFICATION

<u>Sample Number</u>	<u>Sample Description</u>
01	trip blank
02	MW-43-1
03	MW-2-1

<u>Sample Number</u>	<u>Sample Description</u>
04	equipment blank
05	MW-44-1
06	MW-42-1

This cover page is an integral part of the analytical report.

Laboratory Certifications:	DE	DE00011	PA	68-335
	MD	138	NJ	DE568



Certified By
Warren Van Arsdall

Case Narrative

ACL Order Number 0311939

Overview:

A set of 6 samples was received from Rosengarten, Smith and Associates and is identified as 0311939 consisting of 4 samples, 1 trip blank and 1 equipment blank.

Samples were received preserved, cooled to 4° C. Ice was present in the cooler at time of receipt. The temperature at time of receipt was 1° C.

Summary:

Gasoline Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 using P/T GC-MS.

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Diesel Range Organics

All samples were analyzed within the prescribed hold time.

Analysis was performed by modified EPA 8015 (modified).

Method Blank was non-detected with an MDL of 0.10 mg/L.

Laboratory Control Sample recovery was acceptable.

All surrogate recoveries were acceptable.

Internal standard responses were acceptable.

Insufficient sample for MS/MSD.

Methane, Ethane, Ethene - Subcontracted

Subcontractor data package enclosed.

Case Narrative

ACL Order Number 0311939 (Continued)

Ion Chromatography

Sample 0311939-02 and 0311939-05 was initially analyzed on 11/22/03 without a dilution. Due to chromatography, the sample was re-analyzed on 11/29/03 at a 10x dilution for nitrite. Sample 0311939-03 was initially analyzed on 11/22/03 without a dilution. Due to chromatography, the sample was re-analyzed on 11/29/03 at a 10x and dilution for sulfate and nitrite. Due to chromatography nitrite needed to be re-analyzed at a 25x on 12/02/03.

Continuing calibration verifications were all acceptable.

Laboratory Control Sample was acceptable

0310174-01 Duplicate/Matrix Spike was acceptable.

0311306-01 Duplicate/Matrix Spike was acceptable for all analytes with the exception of nitrate. Laboratory fortified blank was acceptable for all analytes.

0312067-01 Duplicate/Matrix Spike was acceptable for all analytes with the exception of nitrate. Laboratory fortified blank was acceptable for all analytes.

Metals Analysis (Total Iron) – EPA6010

Quality Control Sample (QC 19) was acceptable.

Interference A and Interference AB was acceptable.

Initial Laboratory Performance Check was acceptable.

Laboratory Fortified Blank was acceptable.

Matrix Spike/Matrix Spike Duplicate was acceptable.

Alkalinity, Total – Standard Methods 2320B, 19th Edition

Laboratory Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Case Narrative

ACL Order Number 0311939 (Continued)

Total Organic Carbon – EPA 9060

Laboratory Blanks were acceptable.

Laboratory Fortified Blanks were acceptable.

Laboratory duplicates were acceptable.

Matrix spikes were acceptable.

Chemical Oxygen Demand – EPA 410.4

Method Blank was acceptable.

Laboratory Fortified Blanks were acceptable.

Sample duplicates were acceptable.

Matrix spikes were acceptable.

PAGE 1 of 1



630 Churchmans Road
Newark, Delaware 19702
302-266-9121 • 454-8720 (FAX)

QUOTED PRICE:

ANALYSES

V^* various sizes

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/20/03

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	96	86 - 118

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: trip blank

Lab No: 01A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/20/03

Category: GW

Toluene-d8	<u>94</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>94</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 11/28/03 09:09:00ANALYST IMCONC FACTOR 1UNITS ug/L

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260

Method: SW 846 8260

Test Code: V_RSAA

Collected: 11/21/03 08:50

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	5.2	3.8	
Benzene	14	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	671	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	0.9	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	0.8	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	0.8	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	0.7	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	93	86 - 118

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-43-1

Lab No: 02A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 08:50

Category: GW

Toluene-d8	<u>96</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>109</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 11/28/03 12:48:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-43-1

Lab No: 02C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 11/21/03 08:50

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>100</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 12/04/03ANALYST stlCONC FACTOR 1.0UNITS ug/L

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/20/03 15:56

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	32	3.8	
Benzene	9.8	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	179	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	749	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	0.7	0.55	
trans-1,2-Dichloroethene	1.2	0.59	
1,2-Dichloroethene, total	1.9	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	0.7	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	94	86 - 118

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-2-1

Lab No: 03A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/20/03 15:56

Category: GW

Toluene-d8	<u>98</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>108</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 11/28/03 14:15:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-2-1

Lab No: 03C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 11/20/03 15:56

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>58</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 12/04/03ANALYST stlCONC FACTOR 1.0UNITS ug/L

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 12:30

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	ND	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	ND	0.62	
Chloroethane	ND	0.82	
Chloroform	ND	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	ND	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	ND	0.55	
trans-1,2-Dichloroethene	ND	0.59	
1,2-Dichloroethene, total	ND	1.1	
Dichloromethane (MeCl ₂)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	ND	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	ND	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	ND	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	105	86 - 118

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: equipment blank

Lab No: 04A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 12:30

Category: GW

Toluene-d8	<u>103</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>100</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 12/04/03 12:17:00ANALYST IMCONC FACTOR 1UNITS ug/L

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 11:35

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	4.1	3.8	
Benzene	ND	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	1.0	0.62	
Chloroethane	ND	0.82	
Chloroform	1.0	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	0.9	0.55	
1,1-Dichloroethane	ND	0.65	
1,1-Dichloroethene	ND	0.57	
cis-1,2-Dichloroethene	2.2	0.55	
trans-1,2-Dichloroethene	0.7	0.59	
1,2-Dichloroethene, total	2.9	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	16	0.44	
Tetrachloroethene	ND	0.67	
Toluene	ND	0.64	
1,1,2-Trichloroethane	0.7	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	5.3	0.65	
Vinyl Chloride	ND	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	ND	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Cmpd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	98	86 - 118

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-44-1

Lab No: 05A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 11:35

Category: GW

Toluene-d8	<u>96</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>92</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 11/28/03 10:37:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-44-1

Lab No: 05C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 11/21/03 11:35

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 12/04/03ANALYST stlCONC FACTOR 1.0UNITS ug/L

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 10:55

Category: GW

PARAMETER	RESULT	LIMIT	WEIGHT
Acetone	12	3.8	
Benzene	0.9	0.63	
Bromodichloromethane	ND	0.55	
Bromoform	ND	0.53	
Bromomethane	ND	2.3	
2-Butanone (MEK)	ND	2.5	
Carbon Disulfide	ND	0.61	
Carbon Tetrachloride	ND	0.66	
Chlorobenzene	13	0.62	
Chloroethane	ND	0.82	
Chloroform	1.1	0.52	
Chloromethane	ND	0.75	
Dibromochloromethane	ND	0.51	
1,2-Dibromoethane	ND	0.52	
1,2-Dibromo-3-Chloropropane	ND	0.60	
1,2-Dichloroethane	1.9	0.55	
1,1-Dichloroethane	1.5	0.65	
1,1-Dichloroethene	3.6	0.57	
cis-1,2-Dichloroethene	282	0.55	
trans-1,2-Dichloroethene	124	0.59	
1,2-Dichloroethene, total	406	1.1	
Dichloromethane (MeCl2)	ND	0.55	
1,2-Dichloropropane	ND	0.62	
cis-1,3-Dichloropropene	ND	0.56	
trans-1,3-Dichloropropene	ND	0.49	
Ethylbenzene	ND	0.58	
2-Hexanone	ND	1.3	
Isopropylbenzene	ND	0.52	
4-Methyl-2-Pentanone (MIBK)	ND	1.5	
Styrene	ND	1.1	
1,1,2,2-Tetrachloroethane	0.5	0.44	
Tetrachloroethene	1.0	0.67	
Toluene	0.6	0.64	
1,1,2-Trichloroethane	6.1	0.59	
1,1,1-Trichloroethane	ND	0.57	
Trichloroethene	246	0.65	
Vinyl Chloride	5.6	0.55	
o-Xylene	ND	1.1	
m,p-Xylene	1.3	1.2	
Methyl-tert-butyl ether	ND	0.48	
Surr Compd - % Rec - Limits			

SURROGATE	%RECOVERY	LIMITS
Dibromofluoromethane	89	86 - 118

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample Description: MW-42-1

Lab No: 06A

Test Description: GC/MS Volatiles, SW846 8260 Method: SW 846 8260 Test Code: V_RSAA

Collected: 11/21/03 10:55

Category: GW

Toluene-d8	<u>98</u>	<u>88</u>	-	<u>110</u>
4-Bromofluorobenzene	<u>97</u>	<u>86</u>	-	<u>115</u>

Notes and Definitions for this Report:

DATE RUN 11/28/03 11:20:00ANALYST IMCONC FACTOR 1UNITS ug/L

Sample Description: MW-42-1

Lab No: 06C

Test Description: methane, ethane, ethene

Method:

Test Code: S_GAS

Collected: 11/21/03 10:55

Category: GW

PARAMETER	RESULT	LIMIT	UNITS	WEIGHT
Methane	<u>ND</u>	<u>2.0</u>	<u>ug/L</u>	<u> </u>
Ethane	<u>ND</u>	<u>4.0</u>	<u>ug/L</u>	<u> </u>
Ethene	<u>ND</u>	<u>3.0</u>	<u>ug/L</u>	<u> </u>

Notes and Definitions for this Report:

DATE RUN 12/04/03ANALYST stlCONC FACTOR 1.0UNITS ug/L

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample: 02A MW-43-1
Collected: 11/21/03 08:50

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.23	0.10	mg/L	IM	11/28/03 12:48

Sample: 02B MW-43-1
Collected: 11/21/03 08:50

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	0.15	0.10	mg/L	JSH	11/26/03 19:27

Sample: 02D MW-43-1
Collected: 11/21/03 08:50

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	36	10	mg/L	YT	12/05/03 09:45
Total Organic Carbon, Aq	12	1.0	mg/L	EL	12/07/03 17:15

Sample: 02E MW-43-1
Collected: 11/21/03 08:50

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	63.0	0.1	mg/L	WV	12/24/03 14:25
Ferrous Iron	0.1	0.1	mg/L	GS	12/02/03 15:00
Ion chromatography	11/28/03			date complete	AM
Nitrate, Ion Chrom	ND	0.06	mg/L	as N	AM 11/22/03 06:22
Nitrite, Ion Chrom	ND	0.20	mg/L	as N	AM 11/29/03 00:00
Sulfate, Ion Chrom	0.612	0.38	mg/L	AM	11/22/03 06:22
Total Alkalinity-Titration	76.4	1.0	mg/L	as CaCO3	MKB 12/01/03 13:29

Sample: 02F MW-43-1
Collected: 11/21/03 08:50

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	12/09/03		date digested	LC	12/09/03 10:55
Iron, ICP	63.1	0.009	mg/L	LC	12/12/03 09:17
Metals, ICP/OES	12/12/03		date analyzed		

Sample: 03A MW-2-1
Collected: 11/20/03 15:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.21	0.10	mg/L	IM	11/28/03 14:15

Sample: 03B MW-2-1
Collected: 11/20/03 15:56

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	13	0.10	mg/L	JSH	12/09/03 13:27

12/26/03 11:59

TEST RESULTS BY SAMPLE

Sample: 03D MW-2-1

Category: GW

Collected: 11/20/03 15:56

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	8510	10	mg/L	YT	12/05/03 09:45
Total Organic Carbon, Aq	2867	100	mg/L	EL	12/07/03 17:15

Sample: 03E MW-2-1

Category: GW

Collected: 11/20/03 11:56

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	47.9	0.1	mg/L	WV	12/24/03 14:25
Ferrous Iron	5	0.1	mg/L	GS	12/02/03 15:00
Ion chromatography	12/02/03		date complete	AM	
Nitrate, Ion Chrom	ND	0.06	mg/L as N	AM	11/29/03 00:14
Nitrite, Ion Chrom	ND	0.50	mg/L as N	AM	12/28/03 18:38
Sulfate, Ion Chrom	8.73	0.38	mg/L	AM	11/29/03 00:14
Total Alkalinity-Titration	2900	1.0	mg/L as CaCO3	MKB	12/01/03 13:29

Sample: 03F MW-2-1

Category: GW

Collected: 11/20/03 15:56

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	12/09/03		date digested	LC	12/09/03 10:55
Iron, ICP	52.9	0.090	mg/L	LC	12/12/03 09:20
Metals, ICP/OES	12/12/03		date analyzed		

Sample: 05A MW-44-1

Category: GW

Collected: 11/21/03 11:35

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	ND	0.10	mg/L	IM	11/28/03 10:37

Sample: 05B MW-44-1

Category: GW

Collected: 11/21/03 11:35

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	11/26/03 21:02

Sample: 05D MW-44-1

Category: GW

Collected: 11/21/03 11:35

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	35	10	mg/L	YT	12/05/03 09:45
Total Organic Carbon, Aq	17	5.0	mg/L	EL	12/07/03 17:15

Sample: 05E MW-44-1

Category: GW

Collected: 11/21/03 11:35

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.662	0.1	mg/L	WV	12/24/03 14:25

Order # 03-11-939
12/26/03 11:59

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TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferrous Iron	ND	0.1	mg/L	GS	12/02/03 15:00
Ion chromatography	11/29/03		date complete	AM	
Nitrate, Ion Chrom	1.89	0.06	mg/L as N	AM	11/22/03 06:50
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	11/29/03 00:28
Sulfate, Ion Chrom	5.99	0.38	mg/L	AM	11/22/03 06:50
Total Alkalinity-Titration	64.7	1.0	mg/L as CaCO3	MKB	12/01/03 13:29

Sample: 05F MW-44-1
Collected: 11/21/03 11:35

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	12/09/03		date digested	LC	12/09/03 10:55
Iron, ICP	0.662	0.009	mg/L	LC	12/12/03 09:23
Metals, ICP/OES	12/12/03		date analyzed		

Sample: 06A MW-42-1
Collected: 11/21/03 10:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Gasoline Range Org.	0.34	0.10	mg/L	IM	11/28/03 11:20

Sample: 06B MW-42-1
Collected: 11/21/03 10:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
TPH, Diesel Range Organics	ND	0.10	mg/L	JSH	11/26/03 21:49

Sample: 06D MW-42-1
Collected: 11/21/03 10:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Chemical Oxygen Demand	265	10	mg/L	YT	12/05/03 09:45
Total Organic Carbon, Aq	118	5.0	mg/L	EL	12/07/03 17:15

Sample: 06E MW-42-1
Collected: 11/21/03 10:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Ferric Iron - AWWA B407-93	0.047	0.1	mg/L	WV	12/24/03 14:25
Ferrous Iron	ND	0.1	mg/L	GS	12/02/03 15:00
Ion chromatography	11/22/03		date complete	AM	
Nitrate, Ion Chrom	1.86	0.06	mg/L as N	AM	11/22/03 07:04
Nitrite, Ion Chrom	ND	0.02	mg/L as N	AM	11/22/03 07:04
Sulfate, Ion Chrom	15.8	0.38	mg/L	AM	11/22/03 07:04
Total Alkalinity-Titration	240	1.0	mg/L as CaCO3	MKB	12/01/03 13:29

Sample: 06F MW-42-1
Collected: 11/21/03 10:55

Category: GW

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Digestion, Aqueous, 200.2	12/09/03		date digested	LC	12/09/03 10:55

Order # 03-11-939
12/26/03 11:59

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TEST RESULTS BY SAMPLE

<u>Test Description</u>	<u>Result</u>	<u>Det Limit</u>	<u>Units</u>	<u>By</u>	<u>Analyzed Dt/Tm</u>
Iron, ICP	0.047	0.009	mg/L	LC	12/12/03 09:26
Metals, ICP/OES	12/12/03			date analyzed	

PROJECT NOTES

1. 0311939-02e and 0311939-03e had to be reanalyzed with dilutions due to interferences in the analysis for nitrite-N. 0311939-03e was reanalyzed with a matrix spike to determine retention times since the original analysis had potential retention time problems. 0311939-05E was also reanalyzed due to the interference.

RSA Project No. 2017
GE Railcar, Elkton, MD
In-situ Remediation Pilot Study

APPENDIX 3

Purging/Sampling Information Forms

* Pump @ 1 ft
above TD

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017
General Wellhead Condition Normal Top of Casing Elev. (msl / re) 58.47 ft. Weather Cool + Overcast
mid 50's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft bloc) 19.63 TD (ft bloc) 29.75 Previous TD (ft bloc) 29.66 Static Water Level Elev. (msl / re) _____ ft.
Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method NA Obstructed: Yes ☒ No ☐
Top of Screen (ft bloc) _____ Screen Length 10 (ft.) x 0.10 1 maximum drawdown during micropurging
Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/13/03 0950

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 19.63 = Water Column 10.12 ft. x 0.00118 = 0.0119 gallons x 3.785 0.045 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance $\mu S/cm$	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>05/13/03</u>	<u>0951</u>	<u>0954</u>	<u>0.45</u>	<u>removed prior to taking first parameter measurement</u>			
Purge Volume 2		<u>0957</u>		<u>1.25</u>	<u>0.398</u>	<u>2.77/-16</u>	<u>11.89</u>	<u>68.7/5.95</u> Clear/S.O.d.
Purge Volume 3		<u>1000</u>		<u>2.50</u>	<u>0.398</u>	<u>1.62/-19</u>	<u>11.93</u>	<u>64.0/5.93</u> Clear/S.O.d.
Purge Volume 4		<u>1003</u>		<u>4.0</u>	<u>0.398</u>	<u>1.24/-23</u>	<u>11.90</u>	<u>66.5/5.95</u> Clear/m.O.d.
Purge Volume 5		<u>1006</u>		<u>5.5</u>	<u>0.398</u>	<u>1.00/-25</u>	<u>11.91</u>	<u>66.1/5.98</u> Clear/m.O.d.
Purge Volume 6		<u>1009</u>		<u>7.0</u>	<u>0.398</u>	<u>0.90/-24</u>	<u>11.88</u>	<u>66.6/5.99</u> Clear/S.O.d.
Purge Volume 7		<u>1012</u>		<u>8.00</u>	<u>0.398</u>	<u>0.82/-24</u>	<u>11.85</u>	<u>66.0/5.96</u> Clear/m.O.d.
Purge Volume 8		<u>1015</u>	<u>Stop</u>	<u>9.50</u>	<u>0.398</u>	<u>0.80/-21</u>	<u>11.82</u>	<u>67.1/5.95</u> clear/m.O.d.
Purge Volume 9			<u>Purge</u>					
Total Volume								<u>S = slight</u> <u>m = mild</u> <u>st = strong</u>

Sampled @ 1018

SAMPLING DATA

Sample ID No. MW-2-1 Date/Time 05/13/03 1018 Sampled By EAZ/CAM Method low flow Preservative HCl
HNO₃
H₂SO₄ Filtered: yes ☒ no ☐
Ice

FIELD PARAMETERS (After Sample Collection)

Time 1038 Temperature 11.72 (°C) (°F) Specific Conductance 0.394 $\mu S/cm$ pH 6.10 (std units)

ORP -23 Turbidity 53.4
D.O. 0.67

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

* Pump @ 1' above TD

P51

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-43 (New Well) Project No. 2017
 General Wellhead Condition Not Complete Top of Casing Elev. (msl / re) NA ft. Weather Cool & overcast mid 50's
 Static Water Level (ft btoc) 20.14 TD (ft btoc) 33.09 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Bladder Pump Obstructed: Yes ☒ No
 Top of Screen (ft btoc) _____ Screen Length 15 (ft.) x 0.10 1.5 maximum drawdown during micropurging
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03 1111

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 20.14 = Water Column 12.95 ft. x 0.00118 = 0.0153 gallons x 3.785 0.06 liters to remove prior to first parameter measurement
 or 60 mL

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity / pH/Color/ Odor
Purge Volume 1	<u>05/18/03</u>	<u>1132</u>	<u>1133</u>	<u>0.06</u>	removed prior to taking first parameter measurement.			
Purge Volume 2		<u>1137</u>		<u>2.25</u>	<u>0.354</u>	<u>9.52/-61</u>	<u>12.55</u>	<u>294/6.08 Cloudy/m.c</u>
Purge Volume 3		<u>1140</u>		<u>3.0</u>	<u>0.353</u>	<u>8.82/-68</u>	<u>12.48</u>	<u>392/6.19 Cloudy/m.c</u>
Purge Volume 4		<u>1143</u>		<u>3.5</u>	<u>0.353</u>	<u>8.43/-67</u>	<u>12.45</u>	<u>419/6.13 Cloudy/m.c</u>
Purge Volume 5		<u>1149</u>		<u>4.0</u>	<u>0.352</u>	<u>8.80/-61</u>	<u>12.42</u>	<u>507/6.09 Cloudy/s.c</u>
Purge Volume 6		<u>1150</u>		<u>4.50</u>	<u>0.352</u>	<u>3.42/-59</u>	<u>12.42</u>	<u>520/6.02 Cloudy/s.c</u>
Purge Volume 7		<u>1153</u>		<u>5.00</u>	<u>0.351</u>	<u>3.00/-56</u>	<u>12.43</u>	<u>508/5.96 Cloudy/m.c</u>
Purge Volume 8		<u>1156</u>		<u>5.75</u>	<u>0.352</u>	<u>2.75/-55</u>	<u>12.40</u>	<u>462/5.92 Cloudy/m.c</u>
Purge Volume 9		<u>1159</u>		<u>6.25</u>	<u>0.351</u>	<u>2.67/-55</u>	<u>12.40</u>	<u>404/5.92 Cloudy/m.c</u>
Total Volume		<u>1202</u>		<u>7.00</u>	<u>0.351</u>	<u>2.38/-53</u>	<u>12.38</u>	<u>321/5.89 Cloudy/s.c</u>

Sampled @
SAMPLING DATA

Sample ID No. MW-43-1 Date/Time 05/18/03 Sampled By EAZ/CAM Method low-flow Preservative HCl HNO3 42504 Filtered: yes ☒ no
Ice

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature _____ (°C / °F) Specific Conductance _____ (µmhos/cm) pH _____ (std units)

ORP
D.O

Turbidity 0.2
Turbidity

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

* Pump @ 1ft above TD

Pg 2

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-43 (New Well) Project No. 2017
 General Wellhead Condition Not Complete Top of Casing Elev. (msl / re) NA ft. Weather
No Pad

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 20.14 TD (ft btoc) 33.09 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) ft.
 Sediment Thickness NA ft. Sediment Description Sediment Removal Method Bladder Pump Obstructed: Yes / No
 Top of Screen (ft btoc) Screen Length 15 (ft.) x 0.10 1.5 maximum drawdown during micropurging
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03 1111

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 20.14 = Water Column 12.95 ft. x 0.00118 = 0.0153 gallons x 3.785 0.06 liters to remove prior to first parameter measurement
or 60 mL

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	05/18/03	1205		8.0	0.351	2.02/-53	12.38	272 / 5.88 Cloudy/S.od
Purge Volume 2		1208		8.75	0.350	1.74/-52	12.37	220 / 5.87 Cloudy/S.od
Purge Volume 3		1211		9.0	0.349	1.71/-52	12.37	182 / 5.86 Cloudy/S.od
Purge Volume 4		1214		10.0	0.348	1.52/-48	12.35	159 / 5.86 Cloudy/S.od
Purge Volume 5		1217		11.0	0.347	1.51/-44	12.30	108 / 5.84 Cloudy/S.od
Purge Volume 6		1220		11.5	0.346	1.40/-40	12.28	93 / 5.82 Clear/S.od
Purge Volume 7		1223		12.5	0.345	1.37/-32	12.28	86.8 / 5.79 Clear/S.od
Purge Volume 8		1228						
Purge Volume 9								
Total Volume								

Sampled @ 1224
 SAMPLING DATA

Sample ID No. MW-43-1 Date/Time 05/18/03 Sampled By EAZ/CAM Method low flow Preservative HCl HNO3 H2SO4 Filtered: yes / No
s = slight m = mild st = strong

FIELD PARAMETERS (After Sample Collection)

Time 1247 Temperature 12.30 °C (°F) 54 Specific Conductance 0.341 mS/cm (µmhos/cm) pH 5.70 (std units)
ORP ~~1224~~ +6 Turbidity 67.9
P.O 1.28

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102123

* Pump @ 6'
above TD

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017
 General Wellhead Condition Normal Top of Casing Elev. (msl / re) 58.47 ft. Weather Cool & Overcast mid 50's
 FLUID LEVEL/WELL DEPTH MEASUREMENTS
 Static Water Level (ft bloc) 19.60 TD (ft bloc) 29.75 Previous TD (ft bloc) 29.66 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method NA Obstructed: Yes ☒ No
 Top of Screen (ft bloc) _____ Screen Length 10 (ft.) x 0.10 1 maximum drawdown during micropurging
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) _____ Date/Time 05/18/03 1308

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 _____ gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 19.60 Water Column 10.15 ft. x 0.00118 = 0.012 gallons x 3.785 0.045 liters to remove prior to first parameter measurement
OR 45mL

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/ Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>05/18/03</u>	<u>1311</u>	<u>1311</u>	<u>0.045</u>	<u>removed prior to taking first parameter measurements</u>			
Purge Volume 2		<u>1313</u>		<u>0.75</u>	<u>0.385</u>	<u>7.75 / -1</u>	<u>12.16</u>	<u>65.9 / 5.65 Clear / s. odor</u>
Purge Volume 3		<u>1316</u>		<u>2.25</u>	<u>0.384</u>	<u>5.42 / -6</u>	<u>12.03</u>	<u>51.5 / 5.69 Clear / s. odor</u>
Purge Volume 4		<u>1319</u>		<u>4.25</u>	<u>0.383</u>	<u>3.21 / -10</u>	<u>11.95</u>	<u>28.2 / 5.70 Clear / None</u>
Purge Volume 5		<u>1322</u>		<u>6.00</u>	<u>0.382</u>	<u>2.25 / -10</u>	<u>11.99</u>	<u>23.3 / 5.71 Clear / s. odor</u>
Purge Volume 6		<u>1325</u>		<u>7.5</u>	<u>0.378</u>	<u>1.76 / -7</u>	<u>11.98</u>	<u>18.1 / 5.69 Clear / s. odor</u>
Purge Volume 7		<u>1328</u>		<u>9.0</u>	<u>0.372</u>	<u>1.41 / -1</u>	<u>11.94</u>	<u>8.8 / 5.68 Clear / s. odor</u>
Purge Volume 8		<u>1331</u>		<u>10.5</u>	<u>0.366</u>	<u>1.25 / +6</u>	<u>11.95</u>	<u>5.6 / 5.66 Clear / s. odor</u>
Purge Volume 9		<u>1334</u>		<u>12.0</u>	<u>0.360</u>	<u>1.20 / +12</u>	<u>11.90</u>	<u>4.7 / 5.64 Clear / s. odor</u>
Total Volume		<u>1337</u>		<u>13.5</u>	<u>0.355</u>	<u>1.17 / +20</u>	<u>11.91</u>	<u>3.6 / 5.63 Clear / s. odor</u>

Sampled @ 1338
 SAMPLING DATA

Sample ID No. MW-2-6 Date/Time 05/18/03 Sampled By EAZ/CAM Method Low flow Preservative HCl HNO3 H2SO4 Filtered: yes / ☒ no

FIELD PARAMETERS (After Sample Collection)

Time 1357 Temperature 11.79 (°C) / (°F) _____ Specific Conductance 0.334 mS/cm (µmhos/cm) pH 5.59 (std units)

ORP 48 Turbidity 2.7
P.O. 1.41

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

* Pump @ 6' above TD

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-43 (New Well) Project No. 2017
 General Wellhead Condition Not Completed Top of Casing Elev. (msl / re) NA ft. Weather Cool + Overcast
No Pad **FLUID LEVEL/WELL DEPTH MEASUREMENTS**
 Static Water Level (ft bloc) 20.10 TD (ft bloc) 33.09 Previous TD (ft bloc) NA Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Bladder Pump Obstructed: Yes ☒ No
 Top of Screen (ft bloc) _____ Screen Length 15 (ft.) x 0.10 1.5 maximum drawdown during micropurging
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03 1419

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 20.10 Water Column 12.99 ft. x 0.00118 = 0.015 gallons x 3.785 0.06 liters to remove prior to first parameter measurement
or 60 mL

Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance (ms/cm)	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>05/18/03 1426</u>	<u>1430</u>	<u>0.06 removed prior to taking first parameter measurement.</u>				
Purge Volume 2	<u>1436</u>		<u>0.350</u>	<u>0.337</u>	<u>5.57 / +18</u>	<u>12.95</u>	<u>27.1 / 5.76 clear / s. odor</u>
Purge Volume 3	<u>1434</u>		<u>0.750</u>	<u>0.337</u>	<u>3.27 / +17</u>	<u>12.74</u>	<u>12.2 / 5.74 clear / NONE</u>
Purge Volume 4	<u>1437</u>		<u>1.25</u>	<u>0.337</u>	<u>2.61 / +16</u>	<u>12.67</u>	<u>8.5 / 5.74 clear / NONE</u>
Purge Volume 5	<u>1440</u>		<u>2.00</u>	<u>0.338</u>	<u>2.20 / +14</u>	<u>12.64</u>	<u>6.1 / 5.74 clear / NONE</u>
Purge Volume 6	<u>1443</u>		<u>2.25</u>	<u>0.338</u>	<u>1.98 / +13</u>	<u>12.66</u>	<u>6.8 / 5.74 clear / NONE</u>
Purge Volume 7	<u>1446</u>		<u>3.0</u>	<u>0.338</u>	<u>1.73 / +10</u>	<u>12.66</u>	<u>5.6 / 5.74 clear / NONE</u>
Purge Volume 8	<u>1449</u>		<u>3.25</u>	<u>0.338</u>	<u>1.58 / +10</u>	<u>12.67</u>	<u>3.5 / 5.74 clear / s. odor</u>
Purge Volume 9	<u>1452</u>		<u>4.0</u>	<u>0.339</u>	<u>1.59 / +7</u>	<u>12.68</u>	<u>3.6 / 5.74 clear / NONE</u>
Total Volume							

Sampled @ 1453

SAMPLING DATA

Sample ID No. MW-43-6 Date/Time 05/18/03 Sampled By EAZ/CAM Method Low flow Preservative HCl 4NO3 H2SO4 Filtered: yes ☒ no

FIELD PARAMETERS (After Sample Collection)

Time 1525 Temperature 12.40 (°C / °F) Specific Conductance 0.340 (ms/cm) pH 5.71 (std units)

ORP +22
 P.O. 1.25

Turbidity 8.0

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102127

* Pump @ 1 ft.
above TD

BSI

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-42 Project No. 2017
General Wellhead Condition Normal Top of Casing Elev. (msl / re) 51.60 ft. Weather Cool + Overcast
High 40's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft bloc) 16.64 TD (ft bloc) 38.10 Previous TD (ft bloc) 38.40 Static Water Level Elev. (msl / re) _____ ft.
Sediment Thickness NA ft. Sediment Description 4 Sediment Removal Method Bladder Pump Obstructed: Yes
Top of Screen (ft bloc) _____ Screen Length 20 (ft.) x 0.10 2 maximum drawdown during micropurging well riser has kink 1 ft below TOC
Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03 1615

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 _____ gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 16.64 = Water Column 21.46 ft. x 0.00118 = 0.025 gallons x 3.785 0.095 liters to remove prior to first parameter measurement
or 95 mL

Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance (ms/cm)	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1 <u>05/18/03 1718-1720</u> <u>0.095</u> removed prior to taking the first parameter measurement.							
	<u>1722</u>		<u>1.0</u>	<u>0.798</u>	<u>6.04 / 340</u>	<u>13.26</u>	<u>290 / 5.00 cloudy / S. odor</u>
	<u>1725</u>		<u>2.25</u>	<u>0.481</u>	<u>3.05 / 363</u>	<u>12.75</u>	<u>156 / 5.01 cloudy / NONE</u>
	<u>1728</u>		<u>3.75</u>	<u>0.425</u>	<u>1.67 / 376</u>	<u>12.72</u>	<u>50.2 / 4.97 cloudy / NONE</u>
	<u>1731</u>		<u>5.25</u>	<u>0.411</u>	<u>1.01 / 382</u>	<u>12.76</u>	<u>21.0 / 4.98 cloudy / NONE</u>
	<u>1734</u>		<u>6.75</u>	<u>0.412</u>	<u>0.69 / 386</u>	<u>12.80</u>	<u>10.4 / 4.97 cloudy / NONE</u>
	<u>1737</u>		<u>8.25</u>	<u>0.415</u>	<u>0.56 / 389</u>	<u>12.76</u>	<u>6.2 / 4.97 S. cloudy / NONE</u>
	<u>1740</u>		<u>9.50</u>	<u>0.413</u>	<u>0.49 / 391</u>	<u>12.72</u>	<u>6.8 / 5.01 S. cloudy / NONE</u>
	<u>1743</u>		<u>11.0</u>	<u>0.417</u>	<u>0.34 / 390</u>	<u>12.69</u>	<u>6.8 / 5.02 Clear / NONE</u>
	<u>1746</u>		<u>12.0</u>	<u>0.420</u>	<u>0.33 / 392</u>	<u>12.67</u>	<u>0.7 5.04 Clear / NONE</u>

Sampled @ SAMPLING DATA

Sample ID No. MW-42-1 Date/Time 05/18/03 Sampled By EAZ/CAM Method Low flow Preservative _____
HCl HNO₃ H₂SO₄ Filtered: yes no
S = slight m = mild st = strong Ice

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature (°C) °F Specific Conductance _____ (µmhos/cm) pH _____ (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (In.)

Submersible/Diaphragm/Peristaltic Pump

* Pump @ 1 ft above TD

PURGING/SAMPLING INFORMATION FORM

PS2

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-42 Project No. 2017
 General Wellhead Condition Normal Top of Casing Elev. (msl / re) 51.60 ft. Weather Cool + overcast
High 40's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 16.64 TD (ft btoc) 38.10 Previous TD (ft btoc) 38.40 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Bladder Pump Obstructed: ☒ Yes / No
 Top of Screen (ft btoc) _____ Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during micropurging _____
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03 1615
Well riser has
king 1 ft tube
TC

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 16.64 = Water Column 21.46 ft. x 0.00118 = 0.025 gallons x 3.785 0.095 liters to remove prior to first parameter measurement
or 95ml

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance <u>ms/cm</u>	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1		<u>1749</u>		<u>13.25</u>	<u>0.417</u>	<u>0.21 / 392</u>	<u>12.67</u>	<u>5.3 / 5.05 clear / NONE</u>
Purge Volume 2		<u>1752</u>		<u>14.5</u>	<u>0.418</u>	<u>0.21 / 395</u>	<u>12.67</u>	<u>3A / 5.08 clear / 3 odor</u>
Purge Volume 3		<u>1755</u>		<u>15.75</u>	<u>0.418</u>	<u>0.20 / 396</u>	<u>12.66</u>	<u>8.1 / 5.08 clear / NONE</u>
Purge Volume 4								
Purge Volume 5								
Purge Volume 6								
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

Sampled @ 1756 (includes ms/msd samples)
 SAMPLING DATA

Sample ID No. MW-42-1 Date/Time 05/18/03 1756 Sampled By EAZ/CAM Method low-flow Preservative HCl
HNO3
H2SO4
Ice
 Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time 1828 Temperature 12.69 (C) / (F) Specific Conductance 0.419 ms/cm pH 5.19 (std units)

ORP +400
 P.O. C.C

Turbidity 10.0

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

* Pump @ 1 ft above TD

PURGING/SAMPLING INFORMATION FORM

Page 1

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-44 (New Well) Project No. 2017
 General Wellhead Condition Not Complete Top of Casing Elev. (msl / re) _____ ft. Weather Cool + overcast
No Pad
 FLUID LEVEL/WELL DEPTH MEASUREMENTS
 Static Water Level (ft btoc) 15.79 TD (ft btoc) 40.12 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Bladder Pump Obstructed: Yes ☐ No ☒
 Top of Screen (ft btoc) _____ Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during micropurging Whale
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03 18.32

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 15.79 Water Column 24.33 ft. x 0.00118 = 0.029 gallons x 3.785 0.110 liters to remove prior to first parameter measurement
or 110 mL

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance mS/cm	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>05/18/03</u>	<u>1850</u>	<u>1852</u>	<u>0.110</u>	Removed prior to taking first parameter reading			
Purge Volume 2		<u>1853</u>		<u>0.500</u>	<u>0.328</u>	<u>4.44/315</u>	<u>13.09</u>	<u>105/5.31 s. cloudy / None</u>
Purge Volume 3		<u>1856</u>		<u>0.5</u>	<u>0.328</u>	<u>2.43/313</u>	<u>13.00</u>	<u>460/5.37 s. cloudy / s. or</u>
Purge Volume 4		<u>1859</u>		<u>2.25</u>	<u>0.327</u>	<u>1.63/314</u>	<u>12.98</u>	<u>367/5.38 s. cloudy / None</u>
Purge Volume 5		<u>1902</u>		<u>4.00</u>	<u>0.327</u>	<u>0.64/316</u>	<u>12.97</u>	<u>311/5.33 s. cloudy / s. or</u>
Purge Volume 6		<u>1905</u>		<u>5.5</u>	<u>0.325</u>	<u>0.43/305</u>	<u>12.97</u>	<u>311/5.35 s. cloudy / None</u>
Purge Volume 7		<u>1908</u>		<u>7.0</u>	<u>0.322</u>	<u>0.17/293</u>	<u>12.97</u>	<u>205/5.36 s. cloudy / None</u>
Purge Volume 8		<u>1911</u>		<u>8.5</u>	<u>0.322</u>	<u>0.0/290</u>	<u>12.97</u>	<u>128/5.35 s. cloudy / None</u>
Purge Volume 9		<u>1914</u>		<u>10.5</u>	<u>0.322</u>	<u>0.0/284</u>	<u>12.96</u>	<u>59/5.35 clear / None</u>
Total Volume		<u>1917</u>		<u>12.0</u>	<u>0.322</u>	<u>0.0/281</u>	<u>12.96</u>	<u>38.1/5.35 clear / None</u>

Sampled @ 1927

Sample ID No. MW-44-1 Date/Time 05/18/03 1927 Sampled By EAZ/CAM Method low - flow Preservative HCl Filtered: yes ☐ no ☒
4NO3
12.504

FIELD PARAMETERS (After Sample Collection)

Time 1940 Temperature 12.83 (°C / °F) Specific Conductance 0.322 (µmhos/cm) pH 5.40 (std units)

ORP 255
 D.O. 0.0

Turbidity 24.3

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102133

Pump @ 14
above TD

PURGING/SAMPLING INFORMATION FORM

Pg. 2

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-44 (New Well) Project No. 2014
General Wellhead Condition Not Complete Top of Casing Elev. (msl / re) _____ ft. Weather Cool + Overcast
No Pad High 40's slight drizzle
Static Water Level (ft btoc) 15.79 TD (ft btoc) 40.12 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) _____ ft.
Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Shale Pump Obstructed: Yes / No
Top of Screen (ft btoc) _____ Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during Micropurging _____
Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/18/03

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 15.79 = Water Column 24.33 ft. x 0.00118 = 0.029 gallons x 3.785 0.110 liters to remove prior to first parameter measurement
or 110 mL

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance (ms/cm)	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1		<u>1920</u>		<u>13.0</u>	<u>0.321</u>	<u>0.0 / 274</u>	<u>12.95</u>	<u>25.1 / 5.30 clear / NONE</u>
Purge Volume 2		<u>1923</u>		<u>14.75</u>	<u>0.321</u>	<u>0.0 / 266</u>	<u>12.94</u>	<u>20.0 / 5.38 clear / NONE</u>
Purge Volume 3		<u>1924</u>		<u>16.0</u>	<u>0.321</u>	<u>0.0 / 263</u>	<u>12.93</u>	<u>20.2 / 5.38 clear / NONE</u>
Purge Volume 4								
Purge Volume 5								
Purge Volume 6								
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

Sampled @ 1927
SAMPLING DATA

Sample ID No. MW-44-1 Date/Time 05/18/03 1927 Sampled By EAZ/CAM Method low-flow Preservative HCl HNO₃ H₂SO₄ Ice Filtered: yes / No
S = slight
m = mild
st. = strong

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature _____ (°C/°F) Specific Conductance ms/cm (umhos/cm) pH _____ (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) mw-42 Project No. 2017
General Wellhead Condition Normal Top of Casing Elev. (msl / re) _____ ft. Weather _____

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft bto c) 16.64 TD (ft bto c) 38.10 Previous TD (ft bto c) 38.40 Static Water Level Elev. (msl / re) _____ ft.
Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Bladder Pump Obstructed: ☒ Yes / No
Top of Screen (ft bto c) _____ Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during micropurging well riser has kink 14 below top
Measured By EAZ/cam Well Headspace Reading (ppm or %) NA Date/Time 03/18/03

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 16.64 = Water Column 21.46 ft. x 0.00118 = 0.025 gallons x 3.785 0.095 liters to remove prior to first parameter measurement
or 95 mL

Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance $\mu S/cm$	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	05/13/03	1956-1958	0.095	removed prior to taking first parameter measurements			
Purge Volume 2		1959	0.300	0.417	3.81 / 372 ³⁷²	11.90	51.0 / 5.18 clear / NONE
Purge Volume 3		2002	1.50	0.415	1.98 / 389	11.90	34.9 / 5.18 clear / S. color
Purge Volume 4		2005	2.5	0.410	0.75 / 399	11.86	28.3 / 5.04 clear / NONE
Purge Volume 5		2008	3.25	0.395	0.09 / 402	11.85	12.8 / 5.02 clear / NONE
Purge Volume 6		2011	4.0	0.401	0.0 / 403	11.85	20.6 / 5.00 clear / S. color
Purge Volume 7		2014	4.75	0.398	0.0 / 404	11.87	22.3 / 4.99 clear / NONE
Purge Volume 8		2017	5.75	0.397	0.0 / 407	11.94	12.0 / 4.98 clear / NONE
Purge Volume 9		2020	7.00	0.399	0.0 / 408	12.01	10.4 / 4.98 clear / NONE
Total Volume		2023	48.25	0.399	0.0 / 410	11.97	7.3 / 4.98 clear / NONE

Sampled @ 2024
SAMPLING DATA

Sample ID No. MW-42-11 Date/Time 05/18/03 2024 Sampled By EAZ/CAM Method low flow Preservative HCl m = mild
HNO₃ st = strong
H₂SO₄ Filtered: yes/no

Time 05/18/03 1825 (EZ) 2034
Temperature 11.98 (EZ) (°C) / °F
Specific Conductance 0.40 (EZ) mS/cm
pH 5.19 (EZ) (std units)

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

* Pump at 21 ft above TD

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-44 (New Well) Project No. 2017
 General Wellhead Condition Not Complete Top of Casing Elev. (msl / re) _____ ft. Weather Cool + Few clouds
No Pad Low-mid 40's Dark
 Static Water Level (ft btoc) 415.80 TD (ft btoc) 40.12 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description _____ Sediment Removal Method Whale Pump Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during micropurging
 Measured By EAZ/CAM Well Headspace Reading (ppm or %) NA Date/Time 05/13/03

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 _____ gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 15.80 = Water Column 24.32 ft. x 0.00118 = 0.029 gallons x 3.785 0.110 liters to remove prior to first parameter measurement
or 110 mL

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance <u>ms/cm</u>	Dissolved Oxygen/Redox	Temperature (°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>05/13/03</u>	<u>2051</u>	<u>2051</u>	<u>0.110</u>	removed prior to taking first parameter measurement			
Purge Volume 2		<u>2052</u>		<u>0.250</u>	<u>0.321</u>	<u>6.13 / 342</u>	<u>11.71</u>	<u>0.4 / 5.01 clear / S. odor</u>
Purge Volume 3		<u>2055</u>		<u>1.5</u>	<u>0.321</u>	<u>6.65 / 332</u>	<u>11.93</u>	<u>7.0 / 5.06 clear / S. odor</u>
Purge Volume 4		<u>2058</u>		<u>2.25</u>	<u>0.322</u>	<u>0.51 / 316</u>	<u>12.23</u>	<u>0.9 / 5.15 clear / S. odor</u>
Purge Volume 5		<u>2101</u>		<u>4.0</u>	<u>0.322</u>	<u>0.0 / 315</u>	<u>12.61</u>	<u>39.1 / 5.04 clear / NONE</u>
Purge Volume 6		<u>2104</u>		<u>6.0</u>	<u>0.321</u>	<u>0.0 / 310</u>	<u>12.60</u>	<u>10.9 / 5.08 clear / NONE</u>
Purge Volume 7		<u>2107</u>		<u>8.0</u>	<u>0.320</u>	<u>0.0 / 307</u>	<u>12.58</u>	<u>1.5 / 5.10 clear / S. odor</u>
Purge Volume 8		<u>2110</u>		<u>9.5</u>	<u>0.320</u>	<u>0.0 / 300</u>	<u>12.50</u>	<u>3.5 / 5.12 clear / S. odor</u>
Purge Volume 9								
Total Volume								

Sampled @ 2112

SAMPLING DATA

Sample ID No. MW-44-11 Date/Time 05/13/03 2112 Sampled By EAZ/CAM Method low flow Preservative HCl HNO3 H2SO4 Ice Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time 2129 Temperature 12.07 (°C / °F) Specific Conductance 0.320 ms/cm pH 5.20 (std units)

ORP 274
D.O. 0.00

Turbidity N/A

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

Pump set @ 1 ft above TD

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017-
General Wellhead Condition Normal Top of Casing Elev. (msl / re) 58.47 ft. Weather Clear + m.d 70's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 18.31 TD (ft btoc) 29.75 Previous TD (ft btoc) 29.75 Static Water Level Elev. (msl / re) _____ ft.
Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method NA Obstructed: Yes / No
Top of Screen (ft btoc) _____ Screen Length 10 (ft.) x 0.10 1 maximum drawdown during micropurging
Measured By EAZ Well Headspace Reading (ppm or %) NA Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 18.31 = Water Column 10.44 ft. x 0.00118 = 0.013 gallons x 3.785 0.05 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance m/cm	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>06/24/03</u>	<u>1334</u>		<u>0.05</u>	removed prior to taking first parameter measurements			
Purge Volume 2		<u>1337</u>		<u>0.5</u>	<u>9.62</u>	<u>219.99 / -161</u>	<u>15.63</u>	<u>360.0 / 6.44 / cloudy / NA</u>
Purge Volume 3		<u>1340</u>		<u>2.0</u>	<u>9.30</u>	<u>18.2 / -167</u>	<u>14.06</u>	<u>334.0 / 6.41 / cloudy / NA</u>
Purge Volume 4		<u>1343</u>		<u>3.5</u>	<u>8.12</u>	<u>15.49 / -170</u>	<u>13.67</u>	<u>266.0 / 6.31 / cloudy / ST. OD</u>
Purge Volume 5		<u>1346</u>		<u>5.0</u>	<u>7.12</u>	<u>14.18 / -172</u>	<u>13.46</u>	<u>217.0 / 6.22 / cloudy / ST. OD</u>
Purge Volume 6		<u>1349</u>		<u>7.25</u>	<u>6.52</u>	<u>13.10 / -172</u>	<u>13.48</u>	<u>172.0 / 6.14 / CLEAR / m. OD</u>
Purge Volume 7		<u>1352</u>		<u>9.00</u>	<u>6.40</u>	<u>12.49 / -170</u>	<u>13.84</u>	<u>169 / 6.07 / cloudy / m. OD</u>
Purge Volume 8		<u>1355</u>		<u>9.75</u>	<u>6.28</u>	<u>12.47 / -169</u>	<u>13.63</u>	<u>158 / 6.2 / CLOUDY / m. OD</u>
Purge Volume 9		<u>1358</u>		<u>11.00</u>	<u>6.11</u>	<u>12.44 / -166</u>	<u>13.53</u>	<u>159 / 5.99 / cloudy / ST. OD</u>
Total Volume		<u>1401</u>		<u>12.5 (1.5)</u>	<u>6.04</u>	<u>12.63 / -165</u>	<u>13.49</u>	<u>152 / 5.96 / cloudy / m. OD</u>

SAMPLED AT 14:09

SAMPLING DATA

Sample ID No. MW-2-1 Date/Time 06/24/03 Sampled By EAZ Method low flow Preservative HCl HNO3 H2SO4 Filtered: yes 11/97

Time 14:28 Temperature 15.28 (C/F) FIELD PARAMETERS (After Sample Collection) Specific Conductance 5.57 $mhos/cm$ pH 5.93 (std units)

ORP -152

D.O. 14.31

Turbidity p 110

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site _____ Purging/Sampling Point ID (Well No.) mw-2 Project No. _____
 General Wellhead Condition _____ Top of Casing Elev. (msl / re) _____ ft. Weather _____

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity /pH/Color/ Odor
Purge Volume 1	6/24/03	1404	14	14	5.88	12.59 / -163	13.46	146 / 5.94 / Color 20 ST. 20
Purge Volume 2								
Purge Volume 3								
Purge Volume 4								
Purge Volume 5								
Purge Volume 6								
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. _____ Date/Time _____ Sampled By _____ Method _____ Preservative _____ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature _____ (°C / °F) Specific Conductance _____ (µmhos/cm) pH _____ (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102143

PURGING/SAMPLING INFORMATION FORM

Pump 1st above TD

GENERAL INFORMATION

Site Elkton Purging/Sampling Point ID (Well No.) MW-43 Project No. 20-17
General Wellhead Condition Normal Top of Casing Elev. (msl / re) NA ft. Weather Clear + mid 80's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 19.32 TD (ft btoc) 33.09 Previous TD (ft btoc) 33.09 Static Water Level Elev. (msl / re) _____ ft.
Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method NA Obstructed: Yes / No
Top of Screen (ft btoc) NA Screen Length 15 (ft.) x 0.10 1.5 maximum drawdown during micropurging
Measured By EAZ/SK Well Headspace Reading (ppm or %) 263 ppm Date/Time 06/24/03 1129

PURGE DATA

Macro Volume Calculations

Well TD 33.09 - Static Water Level 19.32 = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 19.32 = Water Column 13.77 ft. x 0.00118 = 0.025 gallons x 3.785 0.094 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance (mS/cm)	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	06/24/03	1138	(1138:19)	0.094 removed prior to taking first parameter reading.				
Purge Volume 2		1141		2.0	0.383	18.59/-122	13.59	64.6/6.23/clear/m. cd
Purge Volume 3		1144		3.75	0.381	15.30/-124	13.20	42.1/6.18/clear/m. cd
Purge Volume 4		1147		5.0	0.378	13.50/-123	13.09	37.5/6.15/clear/m. cd
Purge Volume 5		1150		6.75	0.378	12.30/-120	13.17	31.8/6.10/clear/m. cd
Purge Volume 6		1153		8.25	0.378	11.06/-116	13.38	23.9/6.05/clear/m. cd
Purge Volume 7		1156		9.5	0.381	10.50/-111	13.33	19.9/6.00/clear/m. cd
Purge Volume 8		1159		11.0 (2.0)	0.383	9.87/-105	13.30	15.4/5.96/clear/m. cd
Purge Volume 9		1202		12.0 (3.0)	0.387	9.34/-99	13.17	12.0/5.93/clear/m. cd
Total Volume		1205		14.25 (5.25)	0.390	9.27/-91	13.05	9.1/5.89/clear/m. cd

Sampled @
SAMPLING DATA

Sample ID No. MW-43-1 Date/Time 06/24/03 Sampled By EAZ Method Low flow Preservative HCl Filtered: yes/no no
HA03 Ice

FIELD PARAMETERS (After Sample Collection)

Time 1227 Temperature 13.31 (C/F) Specific Conductance 0.406 (mS/cm) pH 5.82 (std units)

ORP -81
DO 7.75

Turbidity 2.9

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102145

PURGING/SAMPLING INFORMATION FORM

Pg. 2

GENERAL INFORMATION

Site _____ Purging/Sampling Point ID (Well No.) MW-43 Project No. _____
 General Wellhead Condition _____ Top of Casing Elev. (msl / re) _____ ft. Weather _____

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>06/24/09</u>	<u>1208</u>		<u>15.75 (6.75)</u>	<u>0.394</u>	<u>8.97 / -83</u>	<u>13.29</u>	<u>7.7 / 5.82 / clear / M. ed</u>
Purge Volume 2		<u>1211</u>		<u>17.0 (8.0)</u>	<u>0.401</u>	<u>8.84 / -77</u>	<u>13.28</u>	<u>4.5 / 5.82 / clear / M. ed</u>
Purge Volume 3		<u>1214</u>		<u>18.5 (9.5)</u>	<u>0.465</u>	<u>8.45 / -78</u>	<u>13.32</u>	<u>3.1 / 5.83 / clear / M. ed</u>
Purge Volume 4								
Purge Volume 5								
Purge Volume 6								
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

Sampled @ 1217
 SAMPLING DATA

Sample ID No. _____ Date/Time _____ Sampled By _____ Method _____ Preservative _____ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature _____ (°C / °F) Specific Conductance _____ (µmhos/cm) pH _____ (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

AR102147

PURGING/SAMPLING INFORMATION FORM

Pump @ 1 ft above TD

PA(2)

GENERAL INFORMATION

Site Elkton Purging/Sampling Point ID (Well No.) MW-44 Project No. 2017
General Wellhead Condition Normal Top of Casing Elev. (msl / re) _____ ft. Weather Clear + 90's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 14.01 TD (ft btoc) 40.12 Previous TD (ft btoc) 40.12 Static Water Level Elev. (msl / re) NA ft.
Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method NA Obstructed: Yes / No
Top of Screen (ft btoc) NA Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during micropurging
Measured By EAZ Well Headspace Reading (ppm or %) 9.7 Date/Time 06/24/03

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 14.01 = Water Column 26.11 ft. x 0.00118 = 0.031 gallons x 3.785 0.117 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance (ms/cm)	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>06/24/03</u>	<u>1525</u>		<u>0.117</u>	<u>removed</u>	<u>prior to first parameter measurement</u>		
Purge Volume 2		<u>1528</u>		<u>0.750</u>	<u>2.48</u>	<u>>19.99 / 70</u>	<u>14.52</u>	<u>315.0 / 5.23 / cloudy / No Odor</u>
Purge Volume 3		<u>1531</u>		<u>2.0</u>	<u>1.40</u>	<u>>19.99 / 4</u>	<u>14.79</u>	<u>335.9 / 5.20 / cloudy / No Odor</u>
Purge Volume 4		<u>1534</u>		<u>2.75</u>	<u>1.29</u>	<u>>19.99 / 122</u>	<u>16.14</u>	<u>421 / 5.88 / cloudy / No Odor</u>
Purge Volume 5		<u>1537</u>		<u>3.5</u>	<u>1.13</u>	<u>>19.99 / 107</u>	<u>15.01</u>	<u>580 / 5.45 / cloudy / No Odor</u>
Purge Volume 6		<u>1540</u>		<u>4.0</u>	<u>.82</u>	<u>>19.99 / 161</u>	<u>14.34</u>	<u>449 / 5.1 / cloudy / No Odor</u>
Purge Volume 7		<u>1543</u>		<u>5.25</u>	<u>.737</u>	<u>>19.99 / 176</u>	<u>14.26</u>	<u>354 / 5.13 / cloudy / No Odor</u>
Purge Volume 8		<u>1546</u>		<u>6.5</u>	<u>.708</u>	<u>>19.99 / 181</u>	<u>14.13</u>	<u>154 / 5.18 / cloudy / No Odor</u>
Purge Volume 9		<u>1549</u>		<u>8.0</u>	<u>.691</u>	<u>>19.99 / 183</u>	<u>14.04</u>	<u>134 / 5.24 / cloudy / No Odor</u>
Total Volume		<u>1552</u>		<u>9.0</u>	<u>.688</u>	<u>>19.99 / 182</u>	<u>14.23</u>	<u>181 / 5.27 / cloudy / No Odor</u>

Sampled @ 1620

SAMPLING DATA

Sample ID No. MW-44-1 Date/Time 06/24/03 Sampled By EAZ Method low flow Preservative HCl 4103 112.50 Ice Filtered: yes (no) s = slight m = moderate strong

FIELD PARAMETERS (After Sample Collection)

Time 1633 Temperature 15.54 (°C) (°F) Specific Conductance 766 (µmhos/cm) pH 5.38 (std units)

ORP 177
DO >19.99

Turbidity
36.5

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

PAGE 2

GENERAL INFORMATION

Site _____ Purging/Sampling Point ID (Well No.) mw 44 Project No. _____
 General Wellhead Condition _____ Top of Casing Elev. (msl / re) _____ ft. Weather _____

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity /pH/Color/ Odor
Purge Volume 1	6/24/03	1555		10.5	.685	>19.99 / 182	14.16	109 / 5.3 / CL0004 / NO CR
Purge Volume 2		1558		11.5	.666	>19.99 / 182	14.02	101 / 5.3 / CL0004 / NO CR
Purge Volume 3		1601		13.90	.683	>19.99 / 181	14.13	87.1 / 5.35 / CL0004 / NO CR
Purge Volume 4		1604	(1.25)	14.25	.67	>19.99 / 180	14.10	81.2 / 5.36 / CL0004 / NO CR
Purge Volume 5		1607	(2.5)	15.5	.67	>19.99 / 181	14.05	70.1 / 5.37 / CL0004 / NO CR
Purge Volume 6		1610	(3.75)	16.75	.667	>19.99 / 181	14.01	61 / 5.38 / CL0004 / NO CR
Purge Volume 7		1613	(5.0)	18.00	.665	>19.99 / 181	14.13	56 / 5.39 / CL0004 / NO CR
Purge Volume 8		1616	(6.25)	19.5	.660	>19.99 / 182	14.10	44 / 5.39 / CL0004 / NO CR
Purge Volume 9		1619						
Total Volume		1622						

SAMPLING DATA

Sample ID No. _____ Date/Time _____ Sampled By _____ Method _____ Preservative _____ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature _____ (°C / °F) Specific Conductance _____ (µmhos/cm) pH _____ (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

bloc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

Pump @ 1 ft above TD

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton, MD Purging/Sampling Point ID (Well No.) MW-42 Project No. 2017
 General Wellhead Condition Normal Top of Casing Elev. (msl / re) NA ft. Weather Clear 90's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 14.91 TD (ft btoc) 38.10 Previous TD (ft btoc) 38.10 Static Water Level Elev. (msl / re) 1 ft.
 Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method NA Obstructed: Yes / No
 Top of Screen (ft btoc) NA Screen Length 20 (ft.) x 0.10 2.0 maximum drawdown during micropurging
 Measured By EAZ Well Headspace Reading (ppm or %) 99.2 Date/Time 06/24/03 1640

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level NA = Water Column NA ft. x 0.17 (2 in.) or 0.66 (4 in.) NA x 3 NA gallons or NA x 5 NA gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 14.91 = Water Column 23.19 ft. x 0.00118 = 0.027 gallons x 3.785 0.104 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance (mS/cm)	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>06/24/03</u>	<u>1655</u>		<u>0.104</u>	<u>Removed prior to first</u>	<u>parameter measurement</u>		
Purge Volume 2		<u>1658</u>		<u>1.0</u>	<u>3.10</u>	<u>>19.98 / -44</u>	<u>15.08</u>	<u>>1000 / 6.42 / Tan / No Odor</u>
Purge Volume 3		<u>1701</u>		<u>2.25</u>	<u>3.01</u>	<u>>19.99 / -41</u>	<u>14.46</u>	<u>>1000 / 6.39 / Tan / No Odor</u>
Purge Volume 4		<u>1704</u>		<u>3.25</u>	<u>2.89</u>	<u>>19.99 / -37</u>	<u>14.10</u>	<u>>1000 / 6.44 / Tan / No Odor</u>
Purge Volume 5		<u>1707</u>		<u>4.75</u>	<u>2.80</u>	<u>>19.99 / -35</u>	<u>14.16</u>	<u>769.8 / 6.47 / Cloudy / No Odor</u>
Purge Volume 6		<u>1710</u>		<u>6.0</u>	<u>2.75</u>	<u>>19.99 / -33</u>	<u>14.57</u>	<u>462.0 / 6.51 / Cloudy / No Odor</u>
Purge Volume 7		<u>1713</u>		<u>7.25</u>	<u>2.71</u>	<u>>19.99 / -29</u>	<u>14.59</u>	<u>370.0 / 6.48 / Cloudy / No Odor</u>
Purge Volume 8		<u>1716</u>		<u>8.25</u>	<u>2.66</u>	<u>>19.99 / -27</u>	<u>14.68</u>	<u>273.0 / 6.48 / Cloudy / No Odor</u>
Purge Volume 9		<u>1719</u>		<u>9.50</u>	<u>2.62</u>	<u>>19.99 / -23</u>	<u>14.71</u>	<u>232.0 / 6.47 / Cloudy / No Odor</u>
Total Volume		<u>1722</u>		<u>10.5</u>	<u>2.57</u>	<u>>19.90 / -20</u>	<u>14.43</u>	<u>189.0 / 6.45 / Cloudy / No Odor</u>

Sampled @ 1742
 SAMPLING DATA

Sample ID No. MW-42-1 Date/Time 06/24/03 Sampled By EAZ Method low flow Preservative HCl, H2O2, H2SO4, Ice
 Filtered: yes no moderate strong

FIELD PARAMETERS (After Sample Collection)

Time 1555 Temperature 15.06 (C/F) Specific Conductance 2.28 (mS/cm) pH 6.35 (std units)

ORP: -5 Turbidity 171.0
 DO: >19.99

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

PG 2.

GENERAL INFORMATION

Site _____ Purging/Sampling Point ID (Well No.) MCW-42 Project No. _____
 General Wellhead Condition _____ Top of Casing Elev. (msl / re) _____ ft. Weather _____

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance mS/cm	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor
Purge Volume 1	04/24/03	1725		11.5 (0.5)	2.53	79.99/-17	14.72	163.0/6.45/Cloudy/No Odor
Purge Volume 2		1728		12.0 (1)	2.49	79.99/-14	14.61	132.0/6.44/Cloudy/No Odor
Purge Volume 3		1731		13.5 (2.5)	2.46	79.99/-11	14.08	145.0/6.41/Cloudy/No Odor
Purge Volume 4		1734		15.0 (4.0)	2.42	79.99/-6	13.99	148.0/6.38/Cloudy/No Odor
Purge Volume 5		1737		16.5 (5.5)	2.38	79.99/-4	14.01	171.0/6.34/Cloudy/No Odor
Purge Volume 6		1740						
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. _____ Date/Time _____ Sampled By _____ Method _____ Preservative _____ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time _____ Temperature _____ (°C / °F) Specific Conductance _____ ($\mu mhos/cm$) pH _____ (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in, = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

AR102155

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017-18
 General Wellhead Condition good Top of Casing Elev. (msl / re) _____ ft. Weather cloudy

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 18.74 TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By JKA Well Headspace Reading (ppm or %) _____ Date/Time 07-22-03

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>7/22/03</u>	<u>8:36</u>	<u>8:43</u>	<u>1.00</u>	<u>1.2</u>	<u>13.3 / -222</u>	<u>14.9</u>	<u>990/5.54/Brown</u>
Purge Volume 2		<u>8:45</u>		<u>2.00</u>	<u>1.2</u>	<u>12.5 / -224</u>	<u>15.8</u>	<u>780/5.52</u>
Purge Volume 3		<u>8:46</u>		<u>3.00</u>	<u>1.1</u>	<u>12.2 / -223</u>	<u>16.0</u>	<u>790/5.50</u>
Purge Volume 4		<u>8:48</u>		<u>4.00</u>	<u>1.0</u>	<u>12.3 / -216</u>	<u>15.1</u>	<u>780/5.53</u>
Purge Volume 5		<u>8:50</u>		<u>5.00</u>	<u>0.69</u>	<u>12.1 / -203</u>	<u>14.4</u>	<u>460/5.53</u>
Purge Volume 6		<u>8:52</u>		<u>6.00</u>	<u>.64</u>	<u>12.0 / -198</u>	<u>14.4</u>	<u>400/5.54</u>
Purge Volume 7		<u>8:53</u>		<u>7.00</u>	<u>.60</u>	<u>12.0 / -194</u>	<u>14.5</u>	<u>380/5.53</u>
Purge Volume 8		<u>8:55</u>		<u>8.00</u>	<u>.57</u>	<u>11.4 / -189</u>	<u>14.6</u>	<u>370/5.52</u>
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-2 Date/Time 7-22-03/8:56 Sampled By JKA Method low flow Preservative _____ Filtered: yes / no

Time 9:08 Temperature 15.2 (°C / °F) Specific Conductance 57.50 (µmhos/cm) pH 5.58 (std units)

FIELD PARAMETERS (After Sample Collection)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods:

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102157

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton Purging/Sampling Point ID (Well No.) MW-43 Project No. 2017-18
 General Wellhead Condition good Top of Casing Elev. (msl / re) _____ ft. Weather cloudy

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 19.26 TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By JKA Well Headspace Reading (ppm or %) _____ Date/Time 7-22-03

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>7-22-03</u>	<u>10:30</u>	<u>10:31</u>	<u>1</u>	<u>43</u>	<u>12.0/-88</u>	<u>16.6</u>	<u>46/5.42/Clear</u>
Purge Volume 2		<u>10:33</u>		<u>2</u>	<u>43</u>	<u>11.9/-92</u>	<u>15.7</u>	<u>40/5.39</u>
Purge Volume 3		<u>10:35</u>		<u>3</u>	<u>42</u>	<u>11.8/-95</u>	<u>15.3</u>	<u>39/5.39</u>
Purge Volume 4		<u>10:37</u>		<u>4</u>	<u>42</u>	<u>11.6/-98</u>	<u>14.9</u>	<u>39/5.39</u>
Purge Volume 5		<u>10:39</u>		<u>5</u>	<u>42</u>	<u>11.4/-101</u>	<u>14.8</u>	<u>38/5.41</u>
Purge Volume 6		<u>10:</u>		<u>6</u>	<u>42</u>	<u>11.3/-104</u>	<u>14.8</u>	<u>37/5.44</u>
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-43 Date/Time 7-22-03/10:45 Sampled By JKA Method low flow Preservative _____ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time 10:51 Temperature 15.1 (°C / °F) Specific Conductance 44 (µmhos/cm) pH 5.56 (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

bloc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton Purging/Sampling Point ID (Well No.) MW-42 Project No. 2017-18
 General Wellhead Condition good Top of Casing Elev. (msl / re) _____ ft. Weather Sunny

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 15.51 TD (ft btoc) _____ Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By JKA Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>7/22/03</u>	<u>11:50</u>	<u>12:03</u>	<u>1</u>	<u>.32</u>	<u>16.4/-52</u>	<u>16.9</u>	<u>990/8.57/dirty</u>
Purge Volume 2			<u>12:04</u>	<u>2</u>	<u>.32</u>	<u>16.7/-48</u>	<u>16.5</u>	<u>990/7.95</u>
Purge Volume 3			<u>12:06</u>	<u>3</u>	<u>.31</u>	<u>16.7/-46</u>	<u>15.9</u>	<u>990/7.95</u>
Purge Volume 4			<u>12:08</u>	<u>4</u>	<u>.30</u>	<u>16.9/-44</u>	<u>15.3</u>	<u>990/7.82</u>
Purge Volume 5			<u>12:10</u>	<u>5</u>	<u>.29</u>	<u>16.8/-43</u>	<u>15.3</u>	<u>990/7.80</u>
Purge Volume 6			<u>12:12</u>	<u>6</u>	<u>.29</u>	<u>16.7/-42</u>	<u>15.2</u>	<u>990/7.81</u>
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-42 Date/Time 7-22-03/12:15 Sampled By JKA Method low flow Preservative _____ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time 12:20 Temperature 15.2 (°C) (°F) _____ Specific Conductance 26 (µmhos/cm) pH 7.82 (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102161

GENERAL INFORMATION

11/97
revised 7/01

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

AR102163

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton - GERAIL Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017
 General Wellhead Condition protector - good Top of Casing Elev. (msl / re) 58.47 ft. Weather overcast, 85°F
concrete pool - broken
 FLUID LEVEL/WELL DEPTH MEASUREMENTS
 Static Water Level (ft btoc) 19.29 TD (ft btoc) 29.75 (pneum) Previous TD (ft btoc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness N/A ft. Sediment Description N/A Sediment Removal Method N/A Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By CAMontero Well Headspace Reading (ppm or %) N/A Date/Time 08/26/03/0915

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level 19.29 = Water Column _____ ft x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 19.29 = Water Column 10.46 ft. x 0.00118 = 0.019 gallons x 3.785 = 0.071 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity /pH/Color/Odor
Purge Volume 1	8/26	0924	0928	1.1 Ltr	1.25 S/m	119.9 / -167	13.7	460 / 7.63 / redish-yellow
Purge Volume 2	8/26	0931		3	1.1 S/m	119.9 / -178	13.6	290 / 7.69 / milky white
Purge Volume 3	8/26	0935		5	1.0 ms/cm S/m	119.9 / -176	13.8	220 / 7.34 / slt cloudy
Purge Volume 4		0937		6	9	114.9 / -181	13.6	170 / 7.35 / do.
Purge Volume 5		0941		7	0.87 S/m	114.9 / -183	13.5	150 / 7.36 / do.
Purge Volume 6		0943		9	0.84	114.9 / -184	13.5	120 / 7.35 / do.
Purge Volume 7		0945		10	0.82	114.9 / -184	14.0	110 / 7.30 / do.
Purge Volume 8		0948		10.5	0.80	114.9 / -183	14.0	94 / 7.27 / do.
Purge Volume 9		0949		11	0.79	114.9 / -183	14.0	75 / 7.25 / do.
Total Volume		0950		11.5	0.77	119.9 / -183	14.1	74 / 7.24 /

SAMPLING DATA

Sample ID No. MW-2-1 Date/Time 8/26/03 0959 Sampled By CAMontero Method micropurge Preservative Various Filtered: yes / ☒ (HCl, HNO₃, H₂SO₄, etc)

FIELD PARAMETERS (After Sample Collection)

Time 1705 Temperature 14.6 (C° / °F) Specific Conductance 0.61 S/m (µmhos/cm) pH 6.98 (std units)

9:24
 * 0934 stop to change cond units to mS/cm
 * 0937 begin purging again change back to S/m

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site Elkton - GE Raker Purging/Sampling Point ID (Well No.) MW-43 Project No. 2017
 General Wellhead Condition V. Good Top of Casing Elev. (msl / re) _____ ft. Weather overcast, humid, 85°F

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) 33.09 (previous) Previous TD (ft btoc) — Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness NA ft. Sediment Description NA Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) NA Screen Length 15 (ft.) x 0.10 1.5 maximum drawdown during micropurging
 Measured By CA Montero Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 19.78 = Water Column 13.31 ft x 0.00118 = 0.024 gallons x 3.785 0.09 liters to remove prior to first parameter measurement

	Date	Start Time / Stop Time	Volume (Gallons/liters)	Specific Conductance $\mu S/cm$	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity / pH / Color / (Odor)
Purge Volume 1	<u>8/26/03</u>	<u>10:55</u> ^{ON} _{10:55} ^{STOP} _{10:55} ^{EFFLUENT}	<u>2</u>	<u>0.85</u>	<u>119.9 / -112</u>	<u>13.7</u>	<u>1990 / 6.83 / v. cloudy</u>
Purge Volume 2	<u>am</u>	<u>11:00</u>	<u>5</u>	<u>0.76</u>	<u>119.9 / -112</u>	<u>13.7</u>	<u>1990 / 6.38 / do</u>
Purge Volume 3		<u>11:07</u>	<u>8</u>	<u>0.67</u>	<u>119.9 / -118</u>	<u>13.8</u>	<u>1990 / 6.34 / v. cloudy</u>
Purge Volume 4		<u>11:14</u>	<u>11</u>	<u>0.66</u>	<u>119.9 / -128</u>	<u>14.1</u>	<u>280 / 6.98 / sli. cloudy</u>
Purge Volume 5		<u>11:23</u>	<u>13</u>	<u>0.64</u>	<u>119.9 / -136</u>	<u>14.2</u>	<u>120 / 6.87 / do</u>
Purge Volume 6		<u>11:21</u>	<u>14</u>	<u>0.63</u>	<u>119.9 / -139</u>	<u>14.4</u>	<u>85 / 6.34 / do</u>
Purge Volume 7		<u>11:27</u>	<u>16</u>	<u>0.61</u>	<u>119.9 / -139</u>	<u>14.4</u>	<u>55 / 6.34 / do</u>
Purge Volume 8		<u>11:34</u>	<u>20</u>	<u>0.60</u>	<u>119.9 / -127</u>	<u>14.1</u>	<u>51 / 6.31 / sli. cloudy</u>
Purge Volume 9		<u>11:36</u>	<u>21</u>	<u>0.61</u>	<u>119.9 / -129</u>	<u>14.2</u>	<u>54 / 6.32 / sli. cloudy</u>
Total Volume							

SAMPLING DATA

Sample ID No. MW-43-1 Date/Time 8/24/03 11:40 Sampled By CA Montero Method _____ Preservative HCL, HNO₃, Filtered: yes / ☒ H₂SO₄, Ice

FIELD PARAMETERS (After Sample Collection)

Time 11:53 Temperature 14.1 °C / °F _____ Specific Conductance 0.59 $\mu S/cm$ (μmhos/cm) pH 6.35 (std units)

* 1103 clean flow-through cell, very cloudy w/ abundant sediment

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

AR102167

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE(EIKTON)RAILCARPurging/Sampling Point ID (Well No.) MW-42Project No. 2017General Wellhead Condition V-good

Top of Casing Elev. (msl / re) _____ ft.

Weather _____

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft bloc) 17.29 17.29TD (ft bloc) 38.10 (previous)Previous TD (ft bloc) —

Static Water Level Elev. (msl / re) _____ ft.

Sediment Thickness NM ft.Sediment Description NM

Sediment Removal Method _____

Obstructed: Yes / No

Top of Screen (ft bloc) _____

Screen Length 20 (ft.) x 0.10 2

maximum drawdown during micropurging

Measured By _____

Well Headspace Reading (ppm or %) _____

Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 17.29 = Water Column 20.81 ft. x 0.00118 = 0.025 gallons x 3.785 0.09 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>8/26/03</u>	<u>1343</u>	<u>1345</u>	<u>1</u>	<u>2.9 mS/cm</u>	<u>19.9 / -77</u>	<u>15.5</u>	<u>950 / 8.13 / sli cloudy</u>
Purge Volume 2		<u>1347</u>		<u>2</u>	<u>2.9</u>	<u>19.9 / -78</u>	<u>15.4</u>	<u>1990 / 8.43 / do.</u>
Purge Volume 3		<u>1349</u>		<u>4</u>	<u>2.7</u>	<u>19.9 / -78</u>	<u>15.0</u>	<u>1990 / 8.79 / v. cloudy</u>
Purge Volume 4		<u>1353</u>		<u>5.5</u>	<u>2.6</u>	<u>19.9 / -76</u>	<u>14.9</u>	<u>1990 / 8.88 / do</u>
Purge Volume 5		<u>1357</u>		<u>8</u>	<u>2.4</u>	<u>19.9 / -70</u>	<u>14.8</u>	<u>1990 / 8.66 / do.</u>
Purge Volume 6		<u>1400.50</u>		<u>10</u>	<u>2.3</u>	<u>19.9 / -68</u>	<u>15.0</u>	<u>1990 / 8.51 / do.</u>
Purge Volume 7		<u>1404.5</u>		<u>12</u>	<u>2.2</u>	<u>19.9 / -64</u>	<u>15.0</u>	<u>1990 / 8.31 / do</u>
Purge Volume 8		<u>1420</u>		<u>16</u>	<u>2.0</u>	<u>19.9 / -44</u>	<u>15.0</u>	<u>1990 / 7.76 / sli cloudy</u>
Purge Volume 9		<u>1429.50</u>		<u>20</u>	<u>1.9</u>	<u>19.9 / -41</u>	<u>15.2</u>	<u>840 / 7.72 / sli cloudy</u>
Total Volume		<u>1434</u>		<u>22</u>	<u>1.8</u>	<u>19.9 / -38</u>	<u>15.1</u>	<u>830 / 7.70 / do.</u>
		<u>1437</u>		<u>23</u>	<u>1.8</u>	<u>19.9 / -38</u>	<u>15.2</u>	<u>820 / 7.70 / do</u>

SAMPLING DATA

Sample ID No. MW-42 Date/Time 8/26/03 1445 Sampled By CA Montero Method Micropurge Preservative HCL H₂SO₄ Filtered: yes / ☒ noHN03, Ice

FIELD PARAMETERS (After Sample Collection)

Time 1451Temperature 15.3 (°C / °F)Specific Conductance 1.7 mS/cm (µmhos/cm)pH 7.64 (std units)* 1341 Pump on
* 1343 water in container

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102169

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE RAILCAR E11204 Purging/Sampling Point ID (Well No.) MW-44 Project No. 2017
 General Wellhead Condition V. good Top of Casing Elev. (msl / re) _____ ft. Weather sunny / partly cloudy, breezy
humid 85°F

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft bloc) 16.44 TD (ft bloc) 40.12 Previous TD (ft bloc) _____ Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness Not Applicable ft. Sediment Description N/A Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft bloc) _____ Screen Length 20 (ft.) x 0.10 2 maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 16.44 = Water Column 23.68 ft. x 0.00118 = 0.043 gallons x 3.785 0.16 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance $\mu S/cm$	Dissolved Oxygen/Redox	Temperature (C°/F°)	Turbidity / pH / Color / Odor
Purge Volume 1		1527		1	1.0	19.9 / 62	15.9	250 / 6.45 / slightly cloudy
Purge Volume 2		1531.50		3.5	0.70	19.9 / 64	15.1	250 / 5.22 / cloudy
Purge Volume 3		1533		4	0.64	19.9 / 187	15.0	230 / 5.04 / minor cloudy
Purge Volume 4		1534.50		5	0.58	19.9 / 206	14.9	210 / 4.92 / minor cloudy
Purge Volume 5		1536.50		6	0.54	19.9 / 218	14.9	170 / 4.87 / clear
Purge Volume 6		1538		7	0.52	19.9 / 225	14.8	170 / 4.88 / do.
Purge Volume 7		1540		8	0.50	19.9 / 232	14.6	150 / 4.92 / do.
Purge Volume 8		1541		8.5	0.50	19.9 / 235	14.6	160 / 4.87 / do.
Purge Volume 9		1542		9	0.49	19.9 / 237	14.6	150 / 4.86 / do.
Total Volume								

SAMPLING DATA

Sample ID No. MW-44-1 Date/Time 8/26/03 1545 Sampled By CFM Outen Method Micropurge Preservative HNO₃ Filtered: yes / no
H₂SO₄, ICE

FIELD PARAMETERS (After Sample Collection)

Time 1554 Temperature 14.5 (°C / °F) Specific Conductance 0.47 (μ mhos/cm) pH 4.75 (std units)

* 1520 pump on
 * 1523 water in container

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GERAILCAR Elkton MD Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017
 General Wellhead Condition _____ Top of Casing Elev. (msl / re) _____ ft. Weather rain down to drizzle
humid. no wind

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) 29.75 previous Previous TD (ft btoc) N/A Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By CA Montero Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD NA - Static Water Level 19.43 = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 19.43 = Water Column 10.32 ft. x 0.00118 = 0.012 gallons x 3.785 0.046 liters to remove prior to first parameter measurement

Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance <u>ms/cm</u>	Reversed (Redox/DO) Dissolved Oxygen/ Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	09/23/03	1041	1043	1007	-98 / 11.57	14.50	219 / 7.77 / slightly / lach
Purge Volume 2		1045	2	9.4	-75 / 10.81	14.38	219 / 7.50 / do. / do.
Purge Volume 3		1048	3	9.1	-64 / 10.66	14.30	244 / 7.36 / do. / do.
Purge Volume 4		1051	4	6.74	-48 / 10.51	14.22	295 / 7.23 / do. / do.
Purge Volume 5		1053.5	5	5.54	-46 / 10.44	14.31	335 / 7.19 / do.
Purge Volume 6		1056.5	6	5.22	-51 / 10.18	14.42	343 / 7.21 / do.
Purge Volume 7		1059	7	5.22	-55 / 10.04	14.50	351 / 7.24 / do.
Purge Volume 8		1101.5	8	5.27	-58 / 9.91	14.46	346 / 7.25 /
Purge Volume 9		1104.5	9	5.24	-61 / 9.83	14.52	349 / 7.26 /
Total Volume		*SAMPLE @ 1110					

49 ramp 130/0 = 2.97

SAMPLING DATA

10:38 pump on
 10:39 water in canister
 Sample ID No. MW-24 Date/Time 9/23/03 1110 Sampled By CA Method Micro Preservative HNO3, H2SO4, HCL, KI Filtered: yes (no)

FIELD PARAMETERS (After Sample Collection)

Time 1120 Temperature 14.39 (°C / °F) Specific Conductance 5.17 ms/cm (µmhos/cm) pH 7.29 (std units)

-69.021 / 00 10.09

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GEPAILCAR ELKTON Purging/Sampling Point ID (Well No.) MW-43 Project No. 2017-18
 General Wellhead Condition good Top of Casing Elev. (msl / re) _____ ft. Weather overcast, still air, humid

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft bloc) 19.43 TD (ft bloc) 33.09 (previous) Previous TD (ft bloc) N/A Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft bloc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 19.43 = Water Column 13.16 ft. x 0.00118 = 0.024 gallons x 3.785 0.09 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance ^{ms/cm}	Dissolved Oxygen/Redox ^(Reversed = Redox/DO)	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>9/23/07</u>	<u>1150</u>	<u>1153</u>	<u>1</u>	<u>0.514</u>	<u>-105 / 9.21</u>	<u>14.43</u>	<u>99.1 / 7.54 / clear / no odor</u>
Purge Volume 2			<u>1155.5</u>	<u>2</u>	<u>0.501</u>	<u>-101 / 7.95</u>	<u>14.13</u>	<u>91.6 / 7.50 / do. / do.</u>
Purge Volume 3			<u>1153</u>	<u>3</u>	<u>0.494</u>	<u>-96 / 7.48</u>	<u>14.29</u>	<u>86.9 / 7.54 / do. / do.</u>
Purge Volume 4			<u>1201</u>	<u>4</u>	<u>0.490</u>	<u>-92 / 7.08</u>	<u>14.36</u>	<u>80.1 / 7.34 / do. / do.</u>
Purge Volume 5			<u>1203.5</u>	<u>5</u>	<u>0.486</u>	<u>-90 / 6.89</u>	<u>14.35</u>	<u>81.4 / 7.31 / do. / do.</u>
Purge Volume 6			<u>1206</u>	<u>6</u>	<u>0.485</u>	<u>-89 / 6.71</u>	<u>14.41</u>	<u>82.8 / 7.29 / do. / do.</u>
Purge Volume 7			<u>1208.5</u>	<u>7</u>	<u>0.483</u>	<u>-88 / 6.58</u>	<u>14.45</u>	<u>80.0 / 7.23 /</u>
Purge Volume 8			<u>1211</u>	<u>8</u>	<u>0.485</u>	<u>-87 / 6.49</u>	<u>14.42</u>	<u>80.1 / 7.27 /</u>
Purge Volume 9								
Total Volume			<u>* 1215 SAMPLED</u>					

For M Purge: 1148
 H₂O in container: 1150

SAMPLING DATA

Sample ID No. MW-43 Date/Time 9-23-03 / 1215 Sampled By CA Montano Method MICRO Preservative HNO₃, H₂SO₄ Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time 1228 Temperature 14.59 (°C / °F) Specific Conductance 0.490 (µmhos/cm) pH 7.17 (std units)

~~0.490~~

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft bloc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GERAILCAR - Elkton Purging/Sampling Point ID (Well No.) MW-42 Project No. 201718
 General Wellhead Condition Very good Top of Casing Elev. (msl / re) _____ ft. Weather partly cloudy, humid
sun coming out
 FLUID LEVEL/WELL DEPTH MEASUREMENTS
 Static Water Level (ft bloc) 17.69 TD (ft bloc) N/A Previous TD (ft bloc) 38.10 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft bloc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By Chmante Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 17.69 = Water Column 20.41 ft. x 0.00118 = 0.037 gallons x 3.785 0.14 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance <u>ns/cm</u>	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>9/23/03</u>	<u>2:22.5</u>	<u>2:25.5 PM</u>	<u>1</u>	<u>3.22</u>	<u>↑ 19.99 / -34</u>	<u>15.61</u>	<u>274 / 8.36 / clear / no odor</u>
Purge Volume 2		<u>2:27.5</u>		<u>2</u>	<u>3.19</u>	<u>↑ 19.99 / -35</u>	<u>15.09</u>	<u>334 / 8.42 / do. / do.</u>
Purge Volume 3		<u>2:29</u>		<u>3</u>	<u>3.12</u>	<u>↑ 19.99 / -34</u>	<u>14.93</u>	<u>338 / 8.50 / do. / do.</u>
Purge Volume 4		<u>2:31</u>		<u>4</u>	<u>3.06</u>	<u>↑ 19.99 / -32</u>	<u>14.91</u>	<u>330 / 8.57 / do. / do.</u>
Purge Volume 5		<u>2:36</u>		<u>6.5</u>	<u>2.84</u>	<u>↑ 19.99 / -26</u>	<u>14.75</u>	<u>463 / 8.74 / do. / do.</u>
Purge Volume 6		<u>2:38.5</u>		<u>8</u>	<u>2.76</u>	<u>↑ 19.99 / -25</u>	<u>14.71</u>	<u>505 / 8.81 / do. / do.</u>
Purge Volume 7		<u>2:42</u>		<u>9</u>	<u>2.65</u>	<u>↑ 17.45 / -21</u>	<u>15.06</u>	<u>630 / 8.93 / do. / do.</u>
Purge Volume 8		<u>2:46</u>		<u>11</u>	<u>2.49</u>	<u>↑ 19.99 / -16</u>	<u>14.78</u>	<u>655 / 8.96 / do. / do.</u>
Purge Volume 9		<u>2:51.5</u>		<u>13</u>	<u>2.34</u>	<u>↑ 19.99 / -11</u>	<u>14.59</u>	<u>660 / 8.98 / do. / do.</u>
Total Volume		<u>2:57.5</u>		<u>15</u>	<u>2.13</u>	<u>↑ 19.99 / -4</u>	<u>14.52</u>	<u>665 / 8.95 / do. / do.</u>
Pump on	<u>2:21</u>	<u>3:01.5</u>		<u>17</u>	<u>2.16</u>	<u>↑ 19.99 / -3</u>	<u>14.47</u>	<u>667 / 8.95 / do. / do.</u>

H₂O in container 2:22.5

SAMPLING DATA

Sample ID No. MW-42-1 Date/Time 9/23/03 3:05 PM Sampled By Chmante Method Micro Preservative HNO₃ HCl
MW-42-1 504, ICE Filtered: yes / no

FIELD PARAMETERS (After Sample Collection)

Time 3:05 PM Temperature 14.53 (°C/°F) Specific Conductance 2.10 ns/cm (µmhos/cm) pH 8.97 (std units)

pump in @ 1:15 pm

* 2:34 change meter battery

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102177

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GERALDAK- Elkton Purging/Sampling Point ID (Well No.) MW-44 Project No. 2017-18
 General Wellhead Condition very good Top of Casing Elev. (msl / re) _____ ft. Weather sunny, humid

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 16.73 TD (ft btoc) / Previous TD (ft btoc) 40.12 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By _____ Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD / - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 16.73 = Water Column 23.39 ft. x 0.00118 = 0.042 gallons x 3.785 0.16 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance <u>ms/cm</u>	Dissolved Oxygen/Redox	Temperature (°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>9/23/03</u>	<u>3:31</u>	<u>3:33 pm</u>	<u>1</u>	<u>0.93</u>	<u>14.99 / 151</u>	<u>14.33</u>	<u>196 / 6.70 / clear / no odor</u>
Purge Volume 2			<u>3:35.5</u>	<u>2</u>	<u>0.746</u>	<u>14.99 / 172</u>	<u>14.07</u>	<u>285 / 6.66 / do. / do.</u>
Purge Volume 3			<u>3:38</u>	<u>4</u>	<u>0.550</u>	<u>18.36 / 280</u>	<u>13.95</u>	<u>417 / 5.22 / do. / do.</u>
Purge Volume 4			<u>3:42</u>	<u>6</u>	<u>0.459</u>	<u>15.89 / 310</u>	<u>13.80</u>	<u>402 / 4.85 / do. / do.</u>
Purge Volume 5			<u>3:46</u>	<u>9</u>	<u>0.489</u>	<u>13.74 / 323</u>	<u>13.83</u>	<u>412 / 4.80 / do. / do.</u>
Purge Volume 6			<u>3:48</u>	<u>10</u>	<u>0.478</u>	<u>13.54 / 326</u>	<u>13.87</u>	<u>413 / 4.79 / do. / do.</u>
Purge Volume 7			<u>3:50</u>	<u>11</u>	<u>0.479</u>	<u>13.04 / 328</u>	<u>13.84</u>	<u>408 / 4.81 / do. / do.</u>
Purge Volume 8			<u>* sample</u>					
Purge Volume 9								
Total Volume								

Pump on 3:30 pm

H₂O in container

Sample ID No. MW-44 Date/Time 9/23/03 3:55 pm Sampled By Chilton Method Micro Preservative HNO₃, H₂SO₄, HCl, TGA Filtered: yes ☒ no

FIELD PARAMETERS (After Sample Collection)

Time 4:05 PM Temperature 14.02 (°C / °F) Specific Conductance 0.501 mS/cm (µmhos/cm) pH 4.90 (std units)

pump in @ 1:20 pm

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE RAILCAR - Elkton Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017
 General Wellhead Condition broken cracked surface concrete well protector good Top of Casing Elev. (msl / re) _____ ft. Weather overcast, windy, humid
hi 60's - 70's
 Static Water Level (ft btoc) _____ TD (ft btoc) N/A Previous TD (ft btoc) N/A (29.75) Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness N/A ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By CA Montero Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 19.29 = Water Column 10.46 ft. x 0.00118 = 0.012 gallons x 3.785 0.047 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance <u>ms/cm</u>	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>10/21/03</u>	<u>1023</u>	<u>1026</u>	<u>2.5</u>	<u>7.03</u>	<u>9.52 / -29</u>	<u>14.51</u>	<u>189 / 7.37 / sh cloudy /</u>
Purge Volume 2			<u>1028</u>	<u>4</u>	<u>6.83</u>	<u>9.19 / -33</u>	<u>14.48</u>	<u>183 / 7.44 / clear / lacto</u>
Purge Volume 3			<u>1031</u>	<u>5.5</u>	<u>6.46</u>	<u>8.70 / -35</u>	<u>14.48</u>	<u>167 / 7.48 / do. / v. light</u>
Purge Volume 4			<u>1033.5</u>	<u>7.5</u>	<u>6.36</u>	<u>8.38 / -36</u>	<u>14.41</u>	<u>173 / 7.47 / do. / v. light</u>
Purge Volume 5			<u>1036</u>	<u>9</u>	<u>6.32</u>	<u>8.21 / -37</u>	<u>14.44</u>	<u>166 / 7.48 / do. / v. light</u>
Purge Volume 6			<u>1037</u>	<u>10</u>	<u>6.36</u>	<u>8.12 / -36</u>	<u>14.44</u>	<u>168 / 7.47 / do. / v. light</u>
Purge Volume 7			<u>SAMPLE</u>					<u>168 / 7.47 / do. / v. light</u>
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-2-1 Date/Time 10/21/03 1040 Sampled By CA Montero Method Micro purge Preservative HCL, HNO3
H2SO4 Filtered: yes / (no) ice

FIELD PARAMETERS (After Sample Collection)

Time 1052 Temperature 14.47 (°C / °F) Specific Conductance 6.31 (µmhos/cm) pH 7.42 (std units)
ms/cm

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:
 btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:
 Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GERALCAR - ELKton Purging/Sampling Point ID (Well No.) MW-43 Project No. 2017-18
 General Wellhead Condition pad + protector Top of Casing Elev. (msl / re) _____ ft. Weather overcast, windy, humid
excellent h. 60's - 10 70's
 FLUID LEVEL/WELL DEPTH MEASUREMENTS
 Static Water Level (ft bto) _____ TD (ft bto) N/A Previous TD (ft bto) 33.09 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness N/A ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft bto) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By C. Montero Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 19.79 = Water Column 13.3 ft. x 0.00118 = 0.016 gallons x 3.785 0.059 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance ^{ms/cm}	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>10/21/03</u>	<u>1120</u>	<u>1122.5</u>	<u>2</u>	<u>3.55</u>	<u>8.07/-56</u>	<u>14.13</u>	<u>161 / 7.51 / clear / slight odor</u>
Purge Volume 2		<u>1126</u>		<u>4.5</u>	<u>2.48</u>	<u>7.93/-55</u>	<u>14.03</u>	<u>124 / 7.54 / clear / do.</u>
Purge Volume 3		<u>1129</u>		<u>6.5</u>	<u>2.14</u>	<u>7.71/-52</u>	<u>14.05</u>	<u>101 / 7.49 / do. / do.</u>
Purge Volume 4		<u>1131</u>		<u>8.25</u>	<u>2.02</u>	<u>7.62/-50</u>	<u>14.04</u>	<u>95.3 / 7.46 / do. / do.</u>
Purge Volume 5		<u>1133</u>		<u>9.75</u>	<u>1.89</u>	<u>7.51/-47</u>	<u>14.07</u>	<u>87.6 / 7.42 / do. / do.</u>
Purge Volume 6		<u>1135</u>		<u>11</u>	<u>1.49</u>	<u>7.49/-45</u>	<u>14.08</u>	<u>87.7 / 7.40 / do. / do.</u>
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-43-1 Date/Time 10/21/03 / 1140 Sampled By C. Montero Method Micro Preservative HCL H₂SO₄ HNO₃ Filtered: yes ☒ no ice

FIELD PARAMETERS (After Sample Collection)

Time 1150 Temperature 14.18 °F Specific Conductance 1.89 ^{ms/cm} (μmhos/cm) pH 7.39 (std units)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:
 btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:
 Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GERAILCAR - Elkbn Purging/Sampling Point ID (Well No.) MW-42 Project No. 2017-18
 General Wellhead Condition protector + concrete pad Top of Casing Elev. (msl / re) _____ ft. Weather overcast / partly sunny
excellent windy 10 to 15 to humidity

Static Water Level (ft btoc) _____ TD (ft btoc) N/A Previous TD (ft btoc) 38.10 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By CM Montero Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 16.96 = Water Column 21.14 ft. x 0.00118 = 0.025 gallons x 3.785 0.094 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance ^{ms/cm}	Dissolved Oxygen/Redox _{µV}	Temperature (°C/°F)	Turbidity / pH/Color/ Odor
Purge Volume 1	10/21/03	1357.5	1401	2	2.38	15.97 / -17	14.63	9999 / 8.27 / 1.2 / slight color
Purge Volume 2		1404		3.75	2.24	14.40 / -20	14.48	9999 / 8.44 / cloudy, yellow / S
Purge Volume 3		1409		6.25	2.11	13.61 / -18	14.39	9999 / 8.60 / do. / do
Purge Volume 4		1414		8.75	2.00	13.01 / -15	14.44	9999 / 8.69 / do. / do
Purge Volume 5		1420		11	1.87	12.80 / -10	14.42	9999 / 8.73 / do. / do.
Purge Volume 6		1425	1429	13	1.87	13.24 / 0	14.68	602 / 8.65 / slight milky / do / do
Purge Volume 7		1434		15	1.74	12.92 / 0	14.56	582 / 8.70 / do. / do
Purge Volume 8		1438		17	1.68	12.71 / 1	14.49	580 / 8.74 / do. / do.
Purge Volume 9		1440		18	1.65	12.66 / 2	14.37	573 / 8.74 / do. / do.
Total Volume		1442		18.75	1.62	12.45 / 3	14.40	575 / 8.75 / do. / do.
		1444		20	1.63	12.51 / 3	14.47	565 / 8.75 / do. / do.

stop 1445

SAMPLING DATA

Sample ID No. MW-42-1 Date/Time 10/21/03 1450 Sampled By CM Montero Method MICRO Preservative H₂SO₄ Filtered: yes / ☒ no
IC 6

FIELD PARAMETERS (After Sample Collection)

Time 1502 Temperature 14.75 (°C / °F) Specific Conductance 1.49 ^{ms/cm} (µmhos/cm) pH 8.80 (std units)

pump on 1356 pump in 1235 10/21/03

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

bloc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailor & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE RAICAR-Elkton Purging/Sampling Point ID (Well No.) MW-44 Project No. 2017-18
 General Wellhead Condition concrete pad + protector Top of Casing Elev. (msl / re) _____ ft. Weather overcast / partly sunny
excellent windy 10-15's humidity low

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) _____ TD (ft btoc) 11.4 Previous TD (ft btoc) 40.12 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By CAumont Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 16.13 = Water Column 23.99 ft. x 0.00118 = 0.028 gallons x 3.785 0.107 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/Liters)	Specific Conductance $\mu S/cm$	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>10/21/03</u>	<u>1518.5</u>	<u>1521</u>	<u>1.5</u>	<u>0.612</u>	<u>12.91 / 140</u>	<u>13.76</u>	<u>629 / 5.80 / 11.1 cloudy / no</u>
Purge Volume 2			<u>1523</u>	<u>3</u>	<u>0.510</u>	<u>11.87 / 227</u>	<u>13.87</u>	<u>689 / 5.23 / 11.1 cloudy / do.</u>
Purge Volume 3			<u>1525</u>	<u>4</u>	<u>0.477</u>	<u>10.62 / 249</u>	<u>13.84</u>	<u>660 / 4.86 / 11.1 cloudy / do.</u>
Purge Volume 4			<u>1528</u>	<u>5.75</u>	<u>0.446</u>	<u>10.14 / 269</u>	<u>13.77</u>	<u>659 / 4.57 / 11.1 do. / do.</u>
Purge Volume 5			<u>1530</u>	<u>6.75</u>	<u>0.438</u>	<u>9.92 / 277</u>	<u>13.76</u>	<u>660 / 4.47 / 11.1 clear / do.</u>
Purge Volume 6			<u>1532</u>	<u>8</u>	<u>0.438</u>	<u>9.85 / 280</u>	<u>13.80</u>	<u>668 / 4.47 / 11.1 do. / do.</u>
Purge Volume 7			<u>1534</u>	<u>9</u>	<u>0.436</u>	<u>9.86 / 284</u>	<u>13.76</u>	<u>663 / 4.42 / 11.1 do. / do.</u>
Purge Volume 8			<u>1536</u>	<u>10</u>	<u>0.438</u>	<u>9.83 / 287</u>	<u>13.76</u>	<u>660 / 4.41 / 11.1 do. / do.</u>
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-44-1 Date/Time 10/21/03 1545 Sampled By CAumont Method Micro Preservative HCL HNO₃ Filtered: yes / no (no)
ICE

FIELD PARAMETERS (After Sample Collection)

Time 1553 Temperature 13.81 (°C / °F) _____ Specific Conductance 0.433 $\mu S/cm$ (umhos/cm) _____ pH 4.45 (std units)

pump on 1517

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

AR102187

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE RAILCAR Purging/Sampling Point ID (Well No.) MW-2 Project No. 2017-18
 General Wellhead Condition no concrete on checker 2002 stack Top of Casing Elev. (msl / re) _____ ft. Weather clear, mild & windy

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 19.13 TD (ft btoc) NA Previous TD (ft btoc) 29.75 Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By Chun-ting Huo interpreter Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 29.75 - Static Water Level 19.13 = Water Column 10.62 ft. x 0.00118 = 0.01253 gallons x 3.785 0.0474 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance <u>ms/cm</u> _{±3}	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity /pH/Color/ Odor _{for color}
Purge Volume 1	<u>12/20/03</u>	<u>1528</u>	<u>1535</u>	<u>1</u>	<u>8.03</u>	<u>19.99 / -30</u>	<u>13.82</u>	<u>23.4 / 6.13 / clear / light odor</u>
Purge Volume 2			<u>1540</u>	<u>6.5</u>	<u>8.20</u>	<u>19.99 / -33</u>	<u>13.70</u>	<u>23.7 / 6.16 / do / do.</u>
Purge Volume 3			<u>1545</u>	<u>2.0</u>	<u>7.85</u>	<u>19.99 / -22</u>	<u>13.76</u>	<u>24.1 / 6.16 / do / do.</u>
Purge Volume 4			<u>1550</u>	<u>2.5</u>	<u>6.97</u>	<u>19.99 / -10</u>	<u>13.71</u>	<u>27.5 / 6.17 / do / do</u>
Purge Volume 5			<u>1555</u>	<u>3.0</u>	<u>6.91</u>	<u>19.99 / -7</u>	<u>13.76</u>	<u>27.4 / 6.17 / do / do</u>
Purge Volume 6			<u>SAMPLE</u>					
Purge Volume 7								
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-2-1 Date/Time 11/20/03 1556 Sampled By Chun-ting Method MICRO Preservative HCL, HNO3 Filtered: yes / (no)

FIELD PARAMETERS (After Sample Collection)

Time 1645 Temperature 13.01 (°C) (°F) _____ Specific Conductance 6.0 (µmhos/cm) pH 6.24 (std units)

pump in 1310
pump on 1526
11/20/03

ms/cm

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤ 10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE Eklon Purging/Sampling Point ID (Well No.) MW-43 Project No. 2017-18
 General Wellhead Condition concrete pad/well protected Top of Casing Elev. (msl / re) _____ ft. Weather clear breeze
excellent 50's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 19.73 TD (ft btoc) 33.09 Previous TD (ft btoc) N/A Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By C. Montero - Interphase plate Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 33.09 - Static Water Level 19.73 = Water Column 13.36 ft. x 0.00118 = 0.016 gallons x 3.785 0.06 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance <u>ms/cm</u>	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity / pH/Color/ Odor
Purge Volume 1	<u>11/21/03</u>	<u>0831</u>	<u>0833</u>	<u>1</u>	<u>0.489</u>	<u>19.99 / -45</u>	<u>13.00</u>	<u>173 / 5.19 / clear / slight odor</u>
Purge Volume 2			<u>0835.5</u>	<u>2</u>	<u>0.470</u>	<u>19.99 / -45</u>	<u>13.36</u>	<u>194 / 5.31 / clear / do</u>
Purge Volume 3			<u>0839</u>	<u>3</u>	<u>0.458</u>	<u>19.99 / -36</u>	<u>13.54</u>	<u>87.3 / 5.32 / do / do</u>
Purge Volume 4			<u>0841</u>	<u>4</u>	<u>0.453</u>	<u>19.99 / -32</u>	<u>13.60</u>	<u>80.4 / 5.30 / do / do</u>
Purge Volume 5			<u>0843</u>	<u>4.75</u>	<u>0.451</u>	<u>19.99 / -30</u>	<u>13.63</u>	<u>80.1 / 5.30 / do / do</u>
Purge Volume 6			<u>0845</u>	<u>5.75</u>	<u>0.449</u>	<u>19.99 / -29</u>	<u>13.66</u>	<u>81.9 / 5.28 / do / do</u>
Purge Volume 7			<u>0847</u>		<u>0.449</u>	<u>19.99 / -30</u>	<u>13.67</u>	<u>85.1 / 5.35 / do / do</u>
Purge Volume 8			<u>SAMPLE</u>					
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-43/1 Date/Time 11/21/03 0850 Sampled By C. Montero Method MICRO Preservative HCL HNO3 Filtered: yes / ☒ no

FIELD PARAMETERS (After Sample Collection)

Time 0900 Temperature 13.75 (°C) (°F) _____ Specific Conductance 0.441 (µmhos/cm) ms/cm pH 5.44 (std units)

pump in 1320 11/20/03
 pump on 0830 11/21/03

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GE MAILCAR Purging/Sampling Point ID (Well No.) MW-42 Project No. 2017-18
 General Wellhead Condition excellent Top of Casing Elev. (msl / re) _____ ft. Weather clear, breezy
50's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 16.12 TD (ft btoc) 38.10 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By ChMonten Hung Nguyen Well Headspace Reading (ppm or %) _____ Date/Time _____
prof

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 38.10 - Static Water Level 16.12 = Water Column _____ ft. x 0.00118 = _____ gallons x 3.785 _____ liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (C/F)	Turbidity / pH / Color / Odor
Purge Volume 1	<u>11/21/03</u>	<u>1039</u>	<u>1041</u>	<u>1</u>	<u>2.33</u>	<u>19.99 / -11</u>	<u>14.35</u>	<u>565 / 9.71 / cloudy / none</u>
Purge Volume 2			<u>1042.5</u>	<u>2</u>	<u>2.21</u>	<u>19.99 / -16</u>	<u>14.30</u>	<u>555 / 9.89 / slightly cloudy / none</u>
Purge Volume 3			<u>1044</u>	<u>3</u>	<u>2.15</u>	<u>19.99 / -17</u>	<u>14.31</u>	<u>576 / 9.97 / do / do</u>
Purge Volume 4			<u>1046</u>	<u>4</u>	<u>1.96</u>	<u>19.99 / -16</u>	<u>14.26</u>	<u>580 / 10.02 / do / do</u>
Purge Volume 5			<u>1047.5</u>	<u>5</u>	<u>1.90</u>	<u>19.99 / -13</u>	<u>14.25</u>	<u>585 / 10.05 / do / do</u>
Purge Volume 6			<u>1049.5</u>	<u>6</u>	<u>1.88</u>	<u>19.99 / -11</u>	<u>14.27</u>	<u>578 / 10.07 / do / do</u>
Purge Volume 7			<u>1051.5</u>	<u>7</u>	<u>1.83</u>	<u>19.99 / -8</u>	<u>14.31</u>	<u>574 / 10.09 / do / do</u>
Purge Volume 8								
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-42 Date/Time 11/21/03 1055 Sampled By ChMonten Method Micro Preservative HCL, HNO3 Filtered: yes / (no)
H2SO4

FIELD PARAMETERS (After Sample Collection)

Time 1107 Temperature 14.30 (°C / °F) Specific Conductance 1.67 (µmhos/cm) pH 10.06 (std units)
pump in 0935 11/21/03
pump on 1038 (ctw)

PURGING/SAMPLING INFORMATION FORM
(continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing

re = Elevation relative to site-specific datum

msl = Elevation relative to mean sea level

TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-

Teflon/PVC/HDPE Bailer & ID (in.)

Submersible/Diaphragm/Peristaltic Pump

PURGING/SAMPLING INFORMATION FORM

GENERAL INFORMATION

Site GEE/Kton Purging/Sampling Point ID (Well No.) MW-44 Project No. 2017-18
 General Wellhead Condition excellent Top of Casing Elev. (msl / re) _____ ft. Weather clear breezy 50's

FLUID LEVEL/WELL DEPTH MEASUREMENTS

Static Water Level (ft btoc) 15.28 TD (ft btoc) 40.12 Previous TD (ft btoc) NA Static Water Level Elev. (msl / re) _____ ft.
 Sediment Thickness _____ ft. Sediment Description _____ Sediment Removal Method _____ Obstructed: Yes / No
 Top of Screen (ft btoc) _____ Screen Length _____ (ft.) x 0.10 _____ maximum drawdown during micropurging
 Measured By Chumanteo Hand-interphase Well Headspace Reading (ppm or %) _____ Date/Time _____

PURGE DATA

Macro Volume Calculations

Well TD _____ - Static Water Level _____ = Water Column _____ ft. x 0.17 (2 in.) or 0.66 (4 in.) _____ x 3 _____ gallons or _____ x 5 _____ gallons

Micro Volume Calculation

Well TD 40.12 - Static Water Level 15.28 = Water Column 24.84 ft. x 0.00118 = 0.029 gallons x 3.785 0.11 liters to remove prior to first parameter measurement

	Date	Start Time	Stop Time	Volume (Gallons/liters)	Specific Conductance	Dissolved Oxygen/Redox	Temperature (°C/°F)	Turbidity /pH/Color/ Odor
Purge Volume 1	<u>11/21/03</u>	<u>1119</u>	<u>1121.5</u>	<u>1.5</u>	<u>0.629</u>	<u>↑ 1999 / 220</u>	<u>14.06</u>	<u>30.9 / 5.90 / 5 li. / cloudy / none</u>
Purge Volume 2			<u>1126.5</u>	<u>2</u>	<u>0.584</u>	<u>↑ 1999 / 233</u>	<u>13.98</u>	<u>30.7 / 5.73 / do / do</u>
Purge Volume 3			<u>1129</u>	<u>3</u>	<u>0.513</u>	<u>↑ 1999 / 246</u>	<u>13.92</u>	<u>26.9 / 5.41 / do / do</u>
Purge Volume 4			<u>1126</u>	<u>4</u>	<u>0.472</u>	<u>↑ 1999 / 261</u>	<u>13.95</u>	<u>30.1 / 5.22 / clear / do</u>
Purge Volume 5			<u>1128</u>	<u>5</u>	<u>0.456</u>	<u>↑ 1999 / 274</u>	<u>13.93</u>	<u>22.6 / 5.09 / clear / do</u>
Purge Volume 6			<u>1129</u>	<u>5.5</u>	<u>0.445</u>	<u>↑ 1999 / 282</u>	<u>13.92</u>	<u>21.5 / 5.07 / clear / do</u>
Purge Volume 7			<u>1131</u>	<u>7.5</u>	<u>0.448</u>	<u>↑ 1999 / 288</u>	<u>13.94</u>	<u>20.0 / 5.01 / clear / do</u>
Purge Volume 8			<u>1133</u>	<u>8.5</u>	<u>0.442</u>	<u>↑ 1999 / 292</u>	<u>13.95</u>	<u>22.3 / 5.00 / clear / do</u>
Purge Volume 9								
Total Volume								

SAMPLING DATA

Sample ID No. MW-44 Date/Time 11/21/03 1135 Sampled By Chumanteo Method Micro Preservative HCL HNO3 Filtered: yes ☒ no

FIELD PARAMETERS (After Sample Collection)

Time 1150 Temperature 14.02 (°C/°F) Specific Conductance 0.429 (µmhos/cm) pH 4.99 (std units)

pump in 0945 11/21/03
 pump on 1118 11/21/03

PURGING/SAMPLING INFORMATION FORM (continued)

NAPL MEASUREMENTS

Interface Measurements From	ft btoc	Elevation (msl / re) ft.	Comments
a) Air-light liquid	_____	_____	_____
b) Light liquid water	_____	_____	_____
c) Dense liquid	_____	_____	_____
d) TD	_____	_____	_____
e) Thickness of light liquid (b - a)	_____ ft.		
f) Thickness of dense liquid (d - c)	_____ ft.		

COMMENTS

Field Parameters	Stabilization Criteria
Dissolved Oxygen	±10% (if measuring)
Conductivity	3% of Full Scale Range
pH	0.10 Standard Units
Turbidity	10 N.T.U.
Temperature	0.2 °C
Eh / Redox	Not Applicable
Drawdown	≤10% of Screen Length

Abbreviations:

btoc = Below Top of Casing
 re = Elevation relative to site-specific datum
 msl = Elevation relative to mean sea level
 TD = Total Depth in. = inch ft. = feet / foot

Notes:

Purge/Sample Methods-
 Teflon/PVC/HDPE Bailer & ID (in.)
 Submersible/Diaphragm/Peristaltic Pump

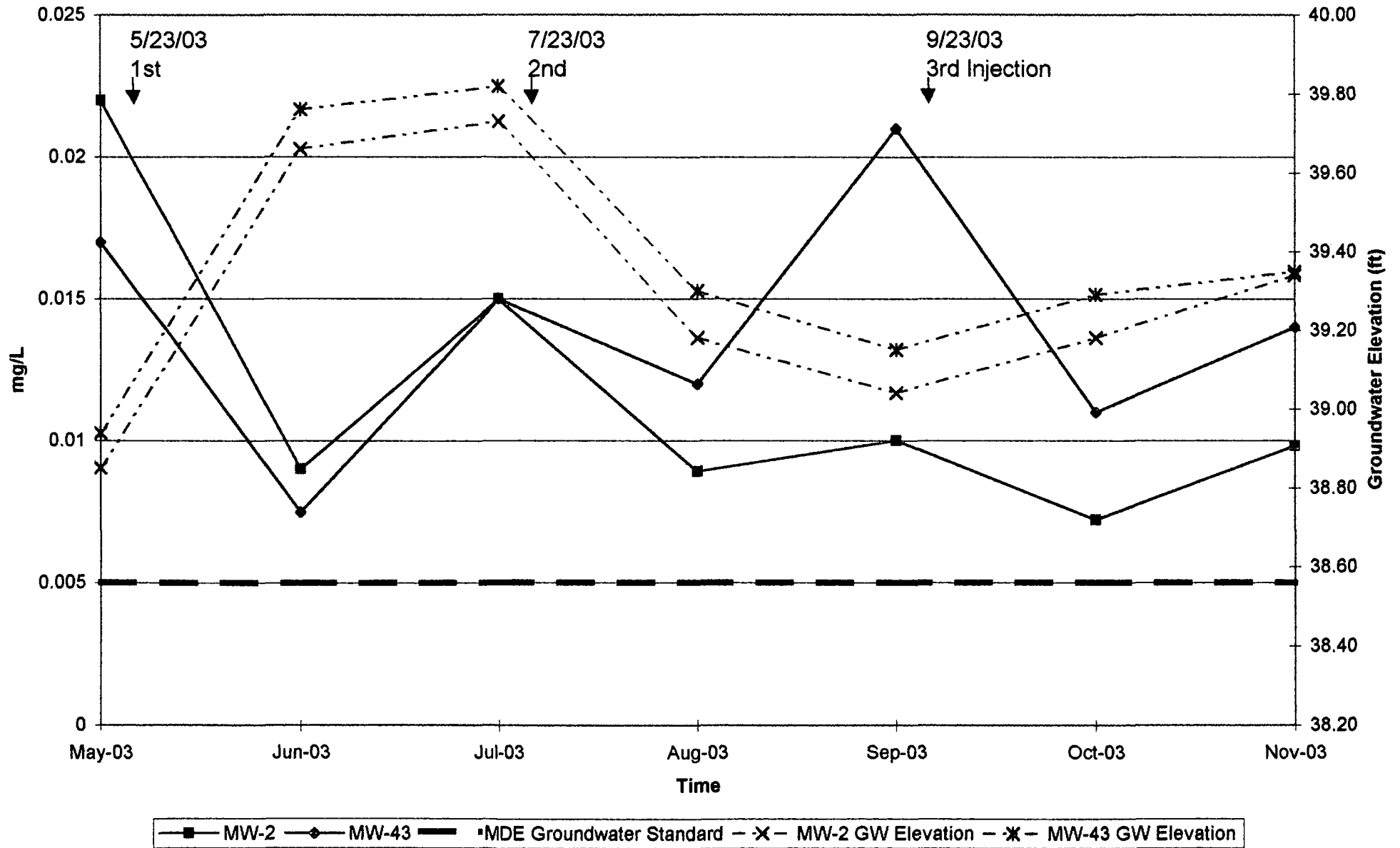
APPENDIX 4

Charts of Volatile Organic Compounds and Degradation Indicator Parameters

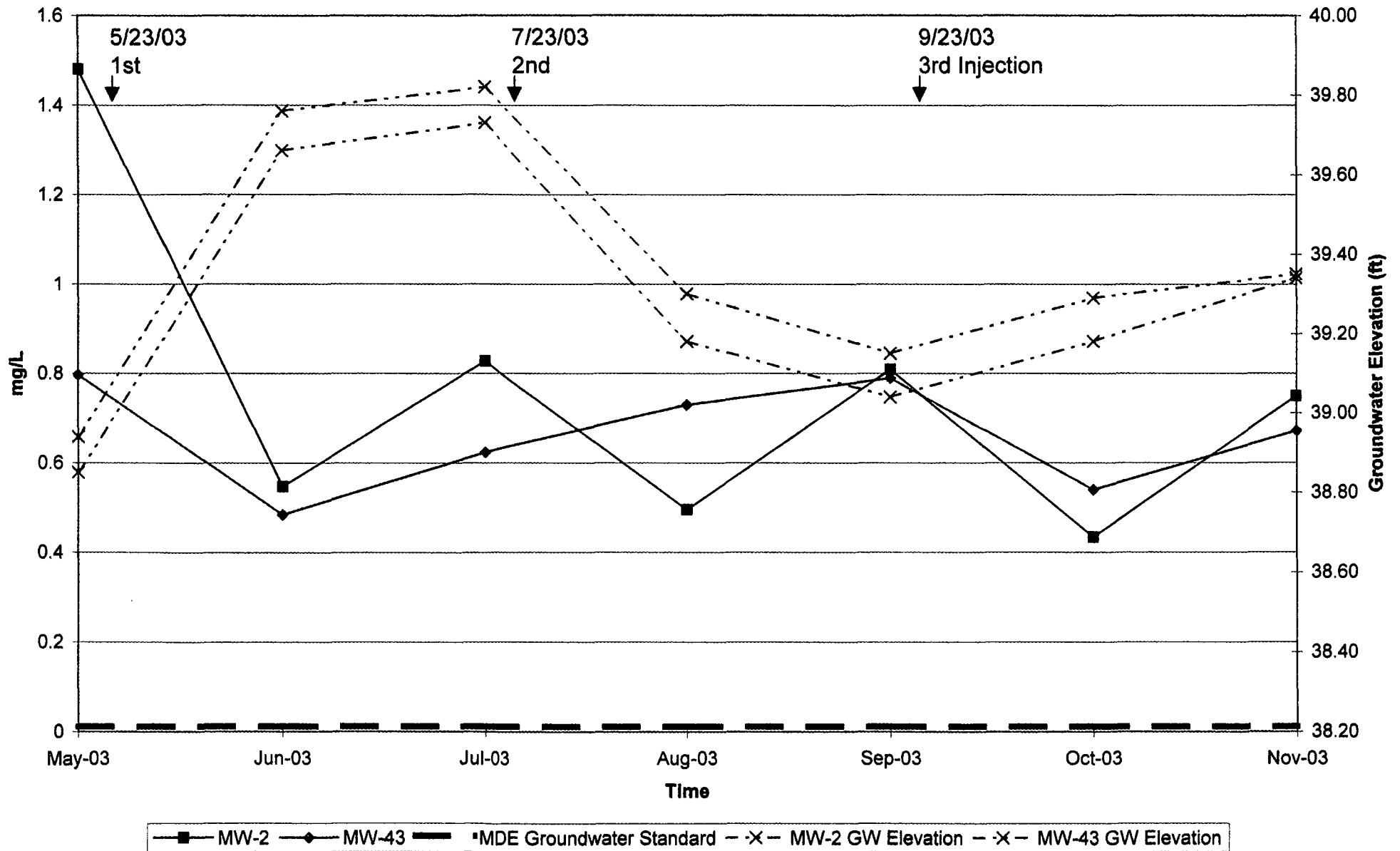
RSA Project No. 2017
GE Railcar, Elkton, MD
In-situ Remediation Pilot Study

MW-2 & MW-43 PSA Charts Volatile Organic Compounds

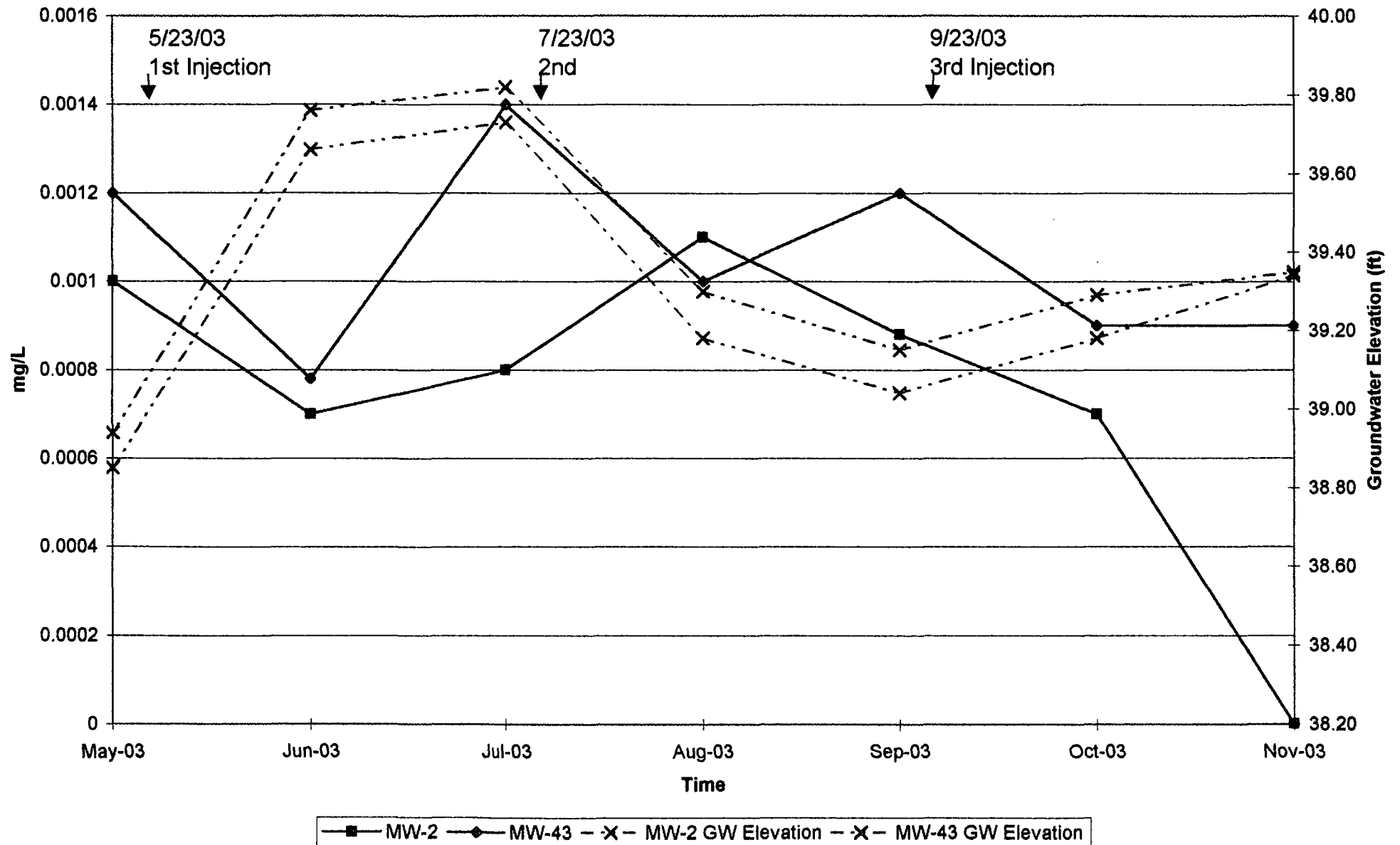
**Benzene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



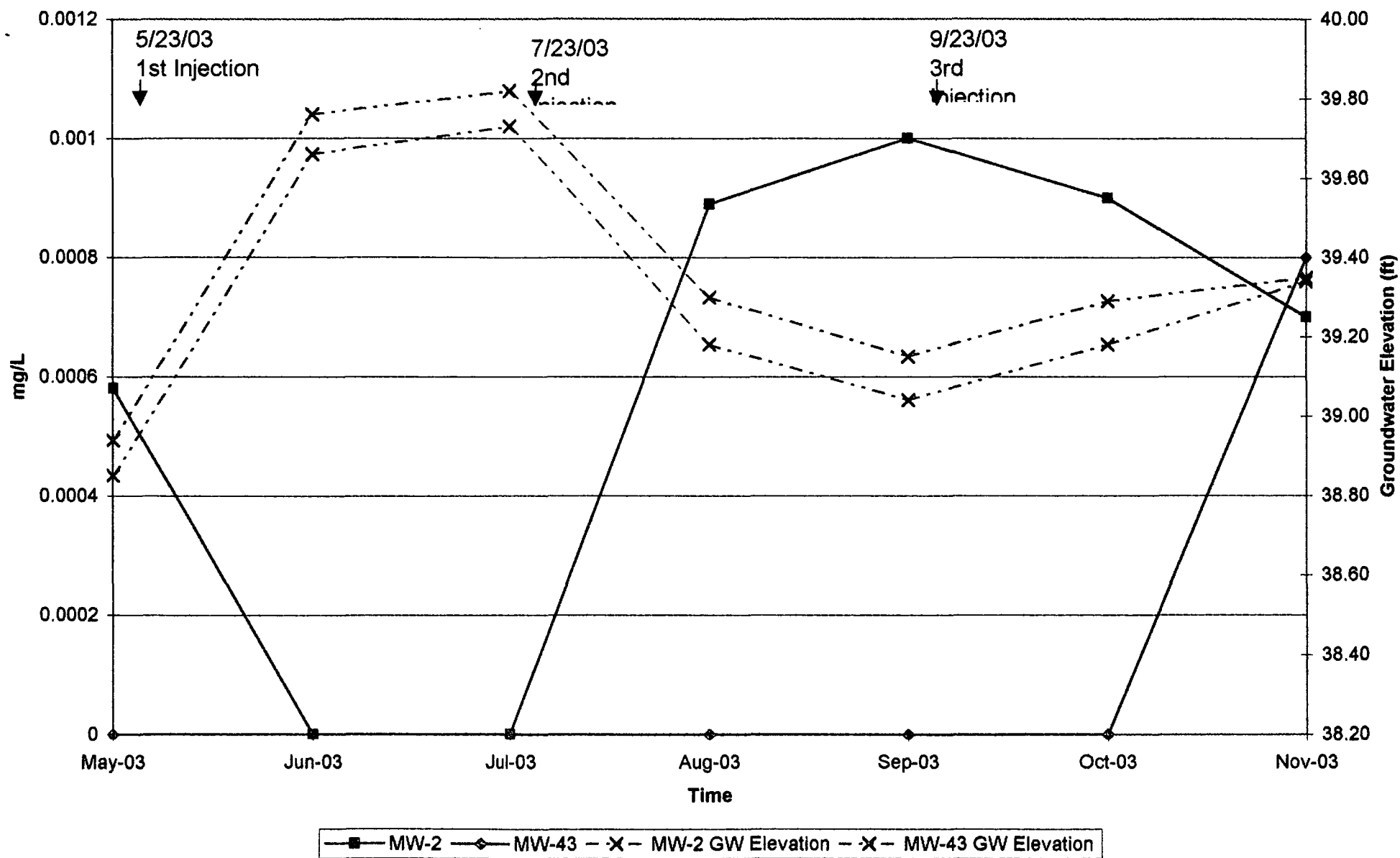
**Chlorobenzene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



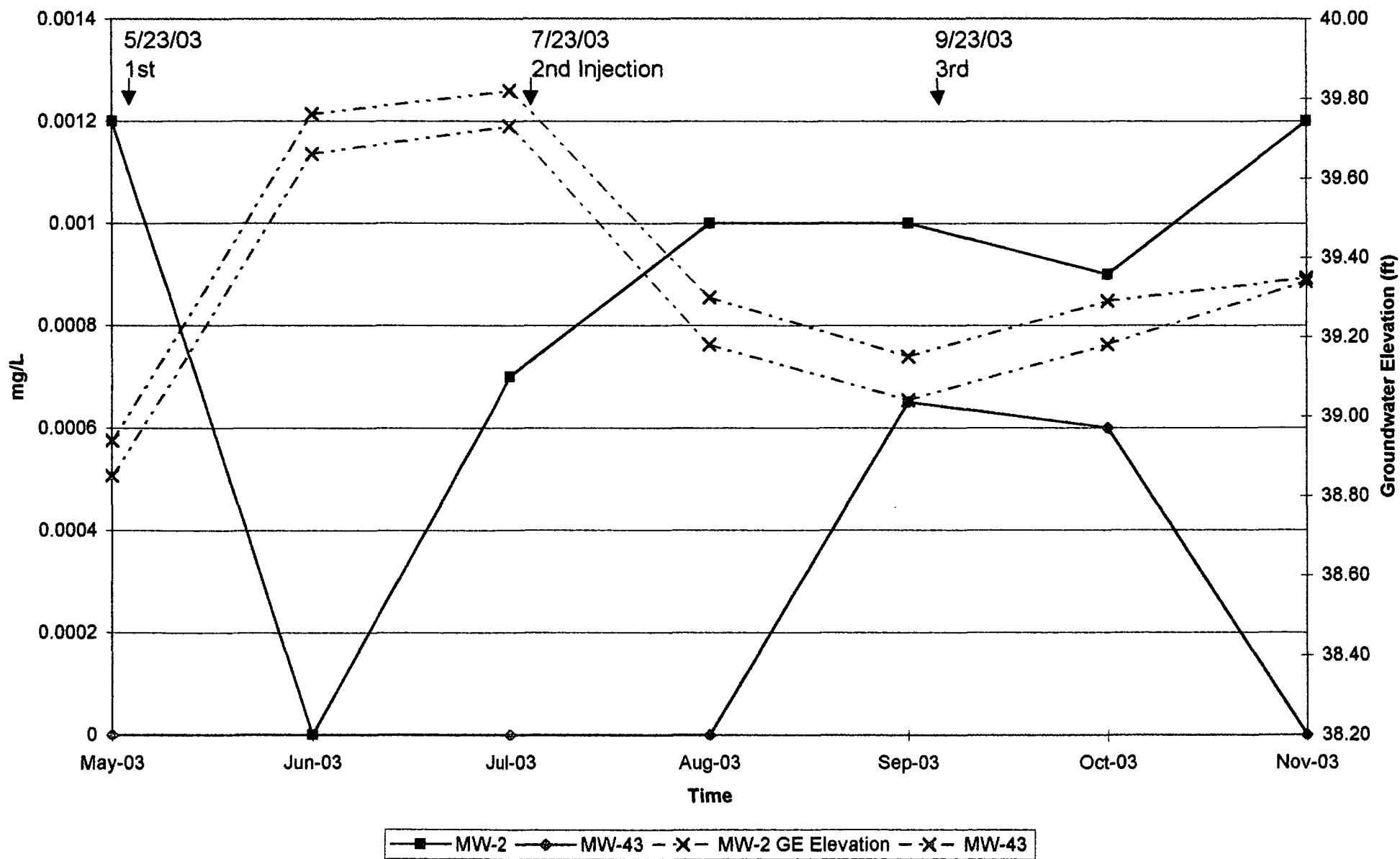
1,1-Dichloroethane Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area



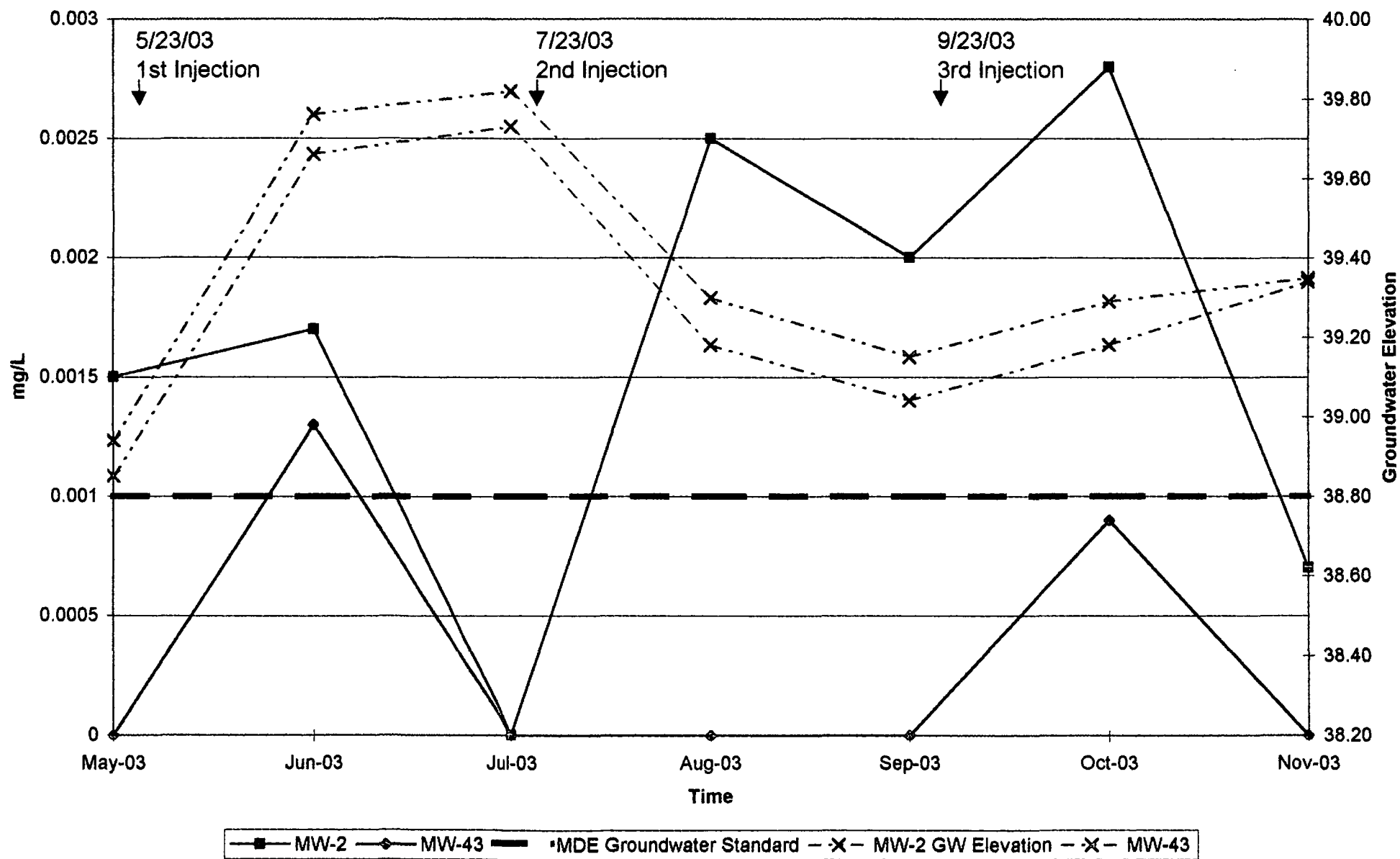
cis-1,2-Dichloroethene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area



**trans-1,2-Dichloroethene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



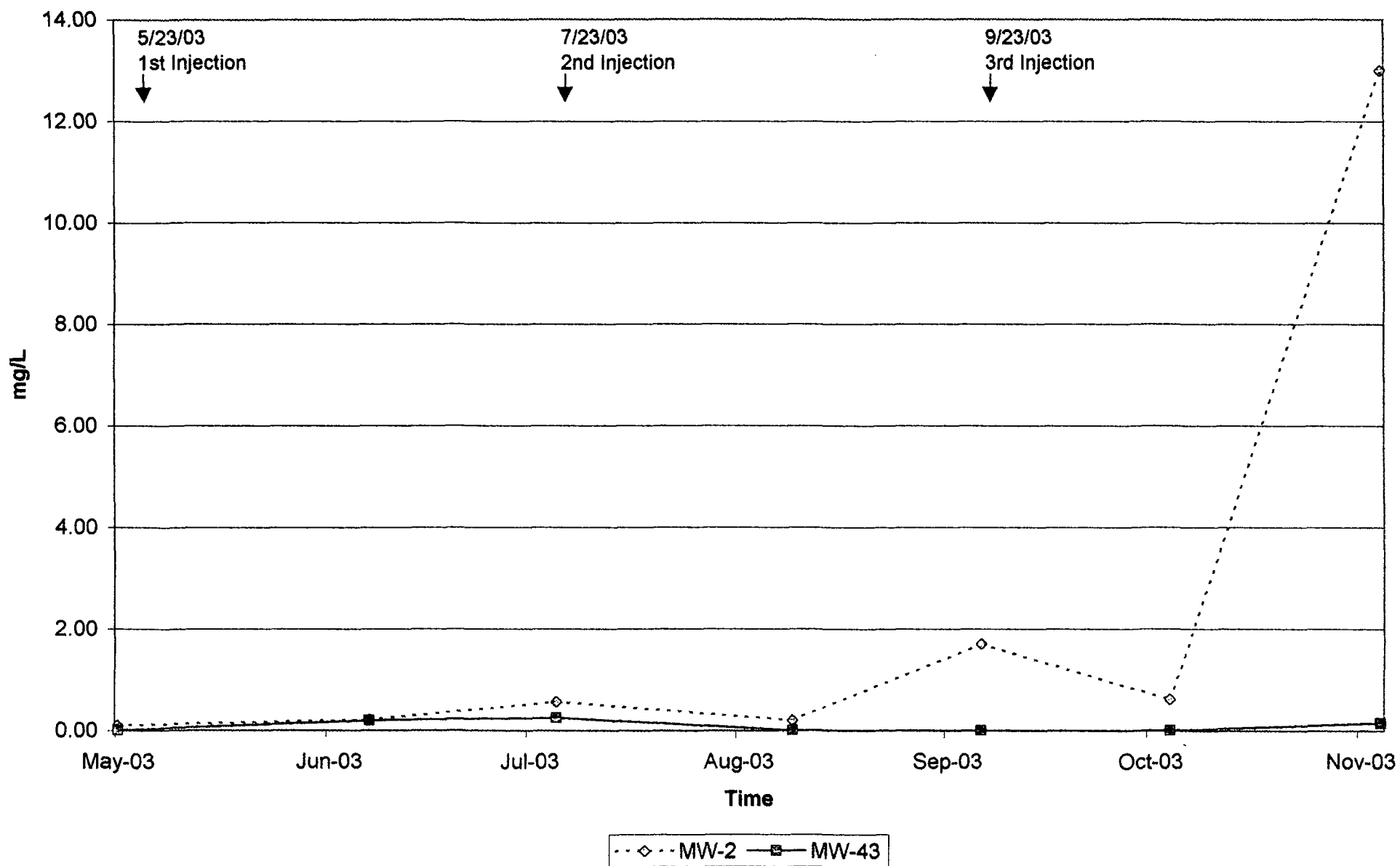
1,1,2,2-Tetrachloroethane Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area



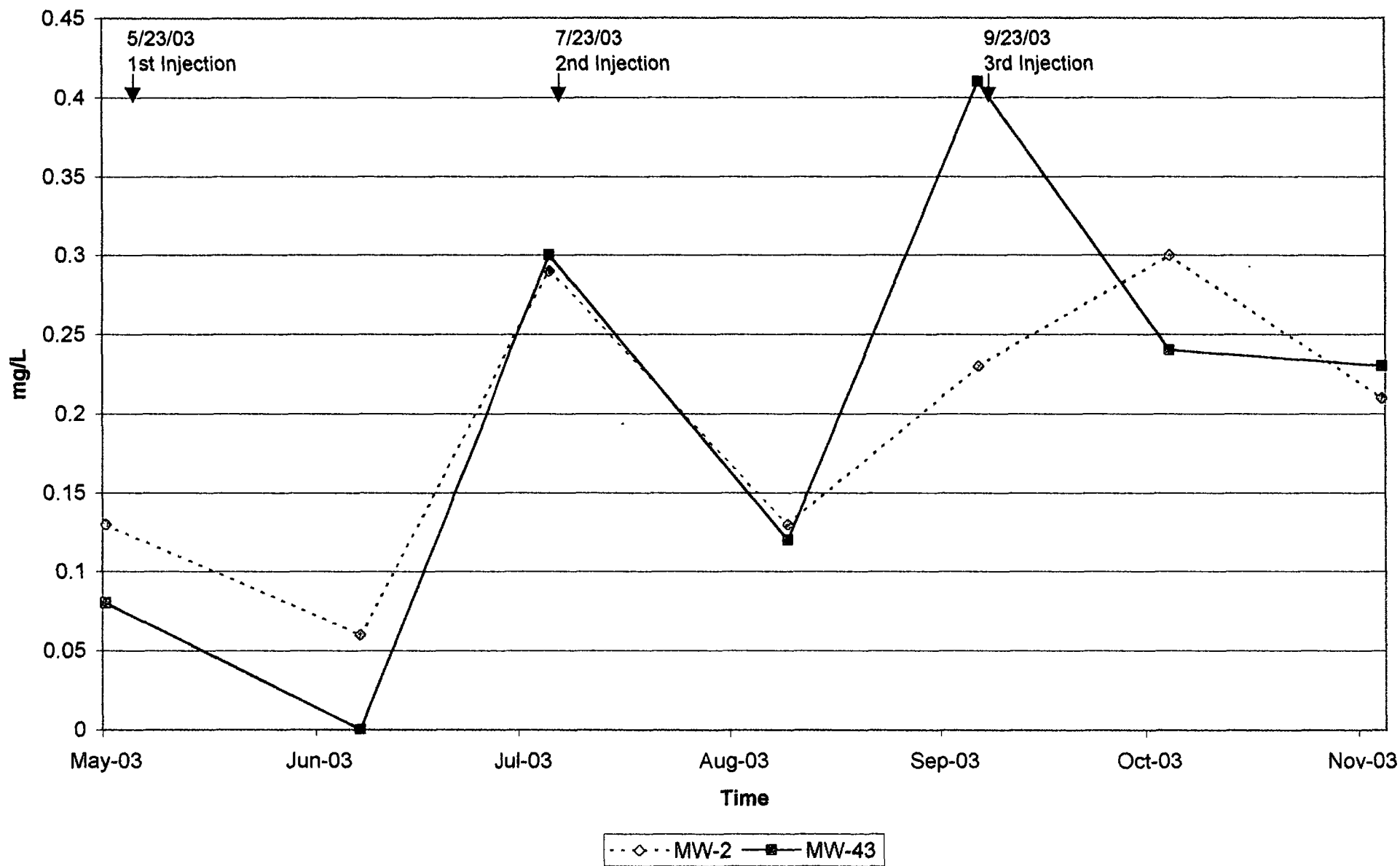
RSA Project No. 2017
GE Railcar, Elkton, MD
In-situ Remediation Pilot Study

MW-2 & MW-43 PSA Charts Degradation Indicator Parameters

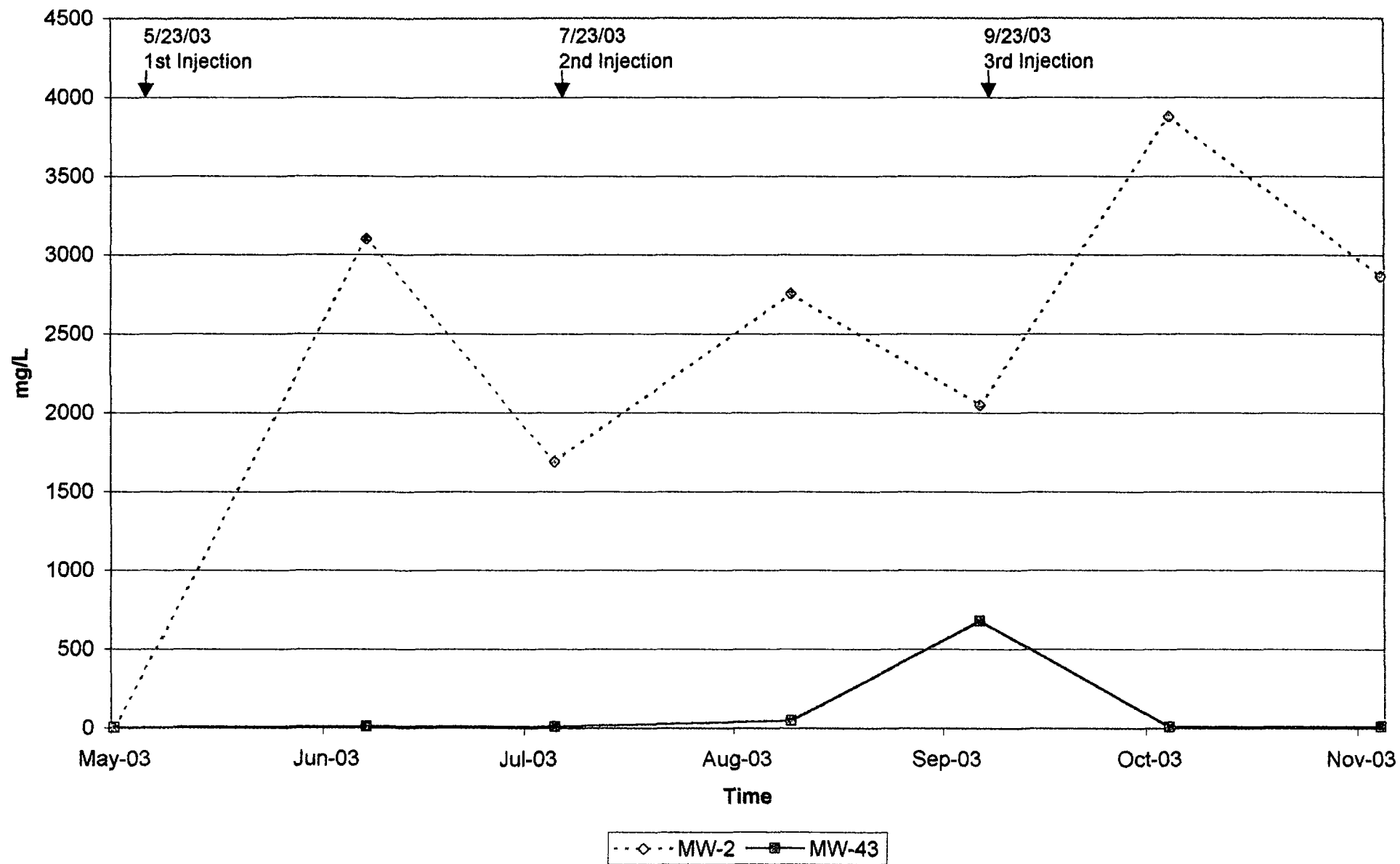
TPH, Diesel Range Organics Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area



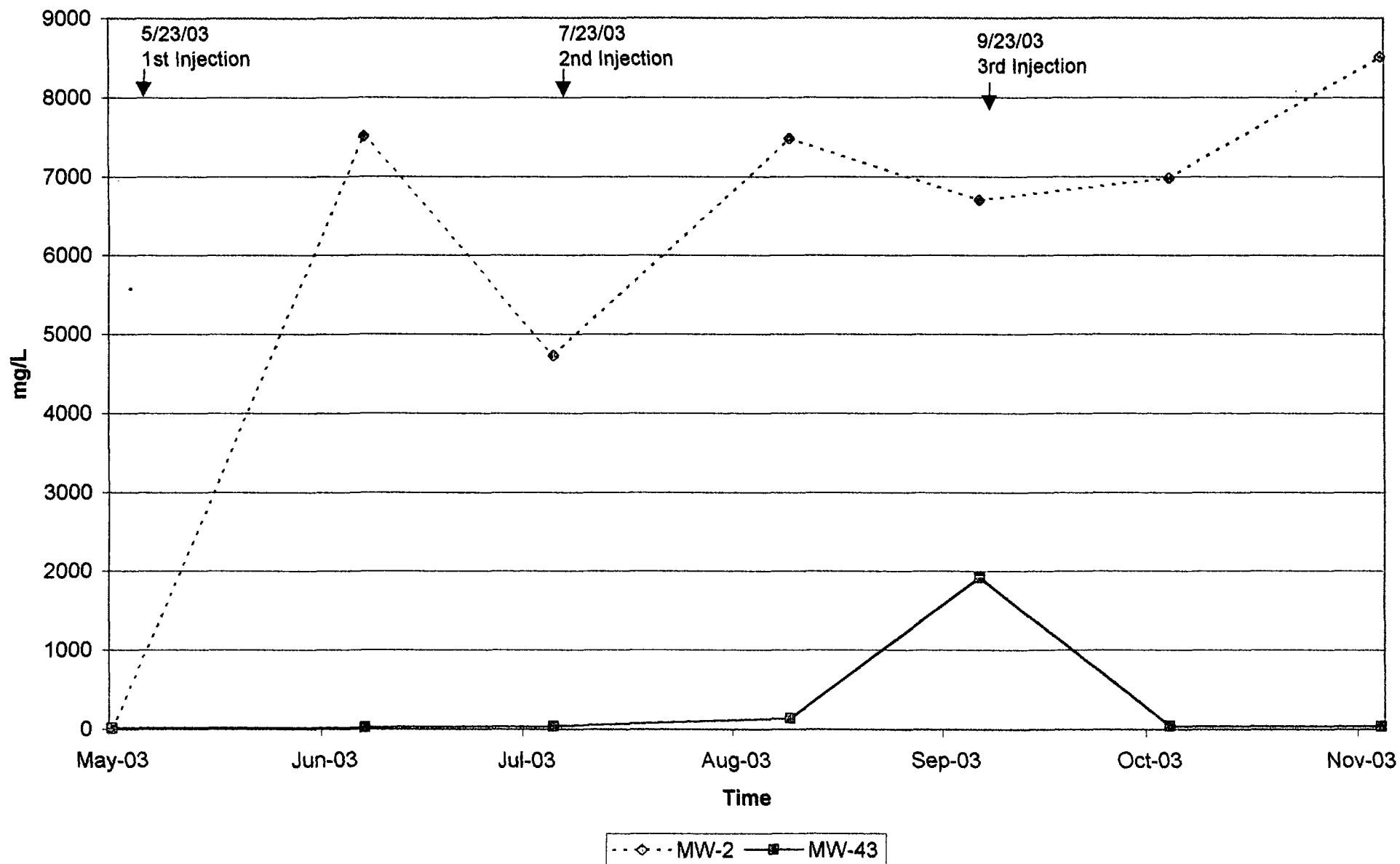
TPH, Gasoline Range Organics Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area



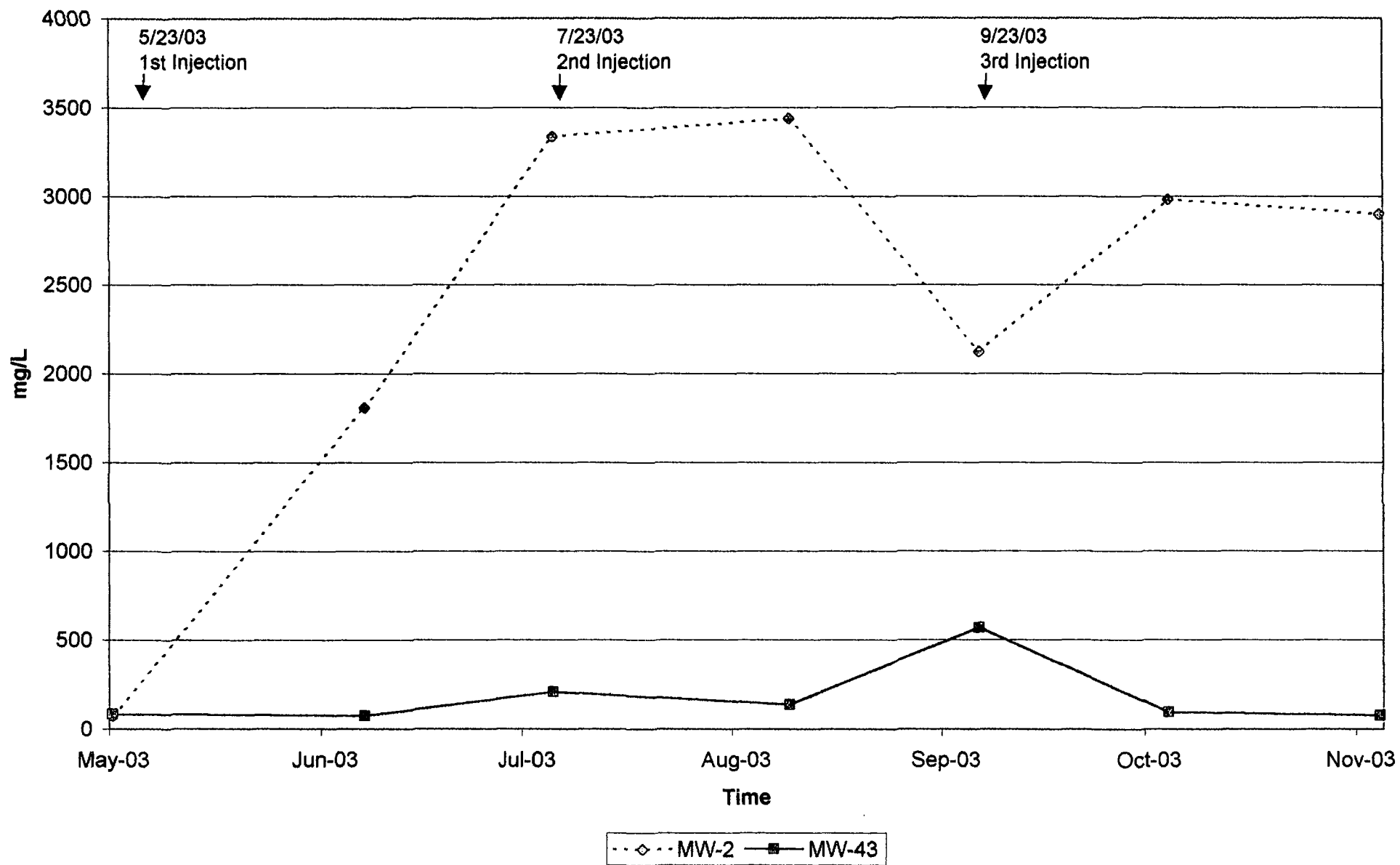
**Total Organic Carbon Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



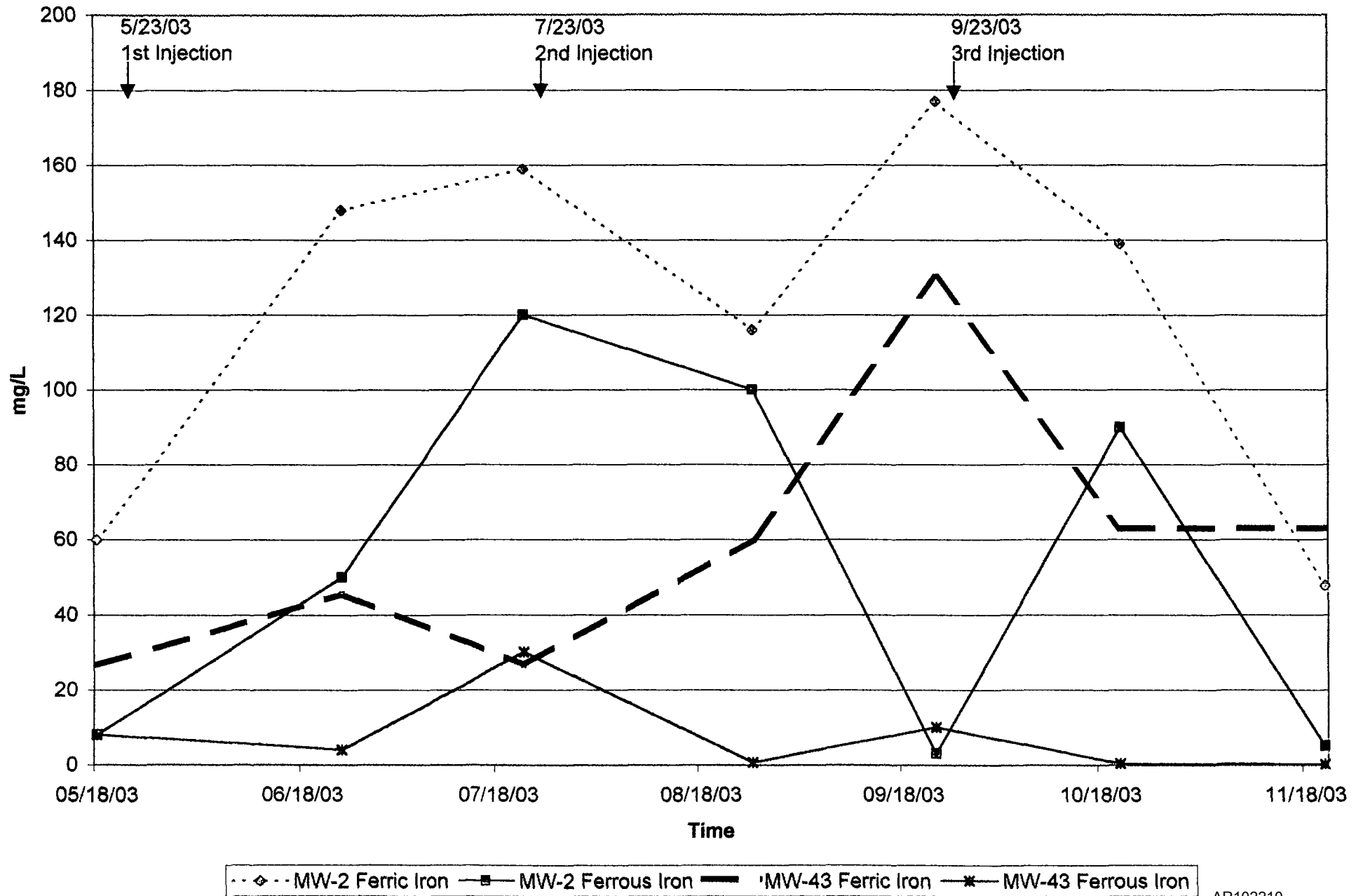
Chemical Oxygen Demand Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area



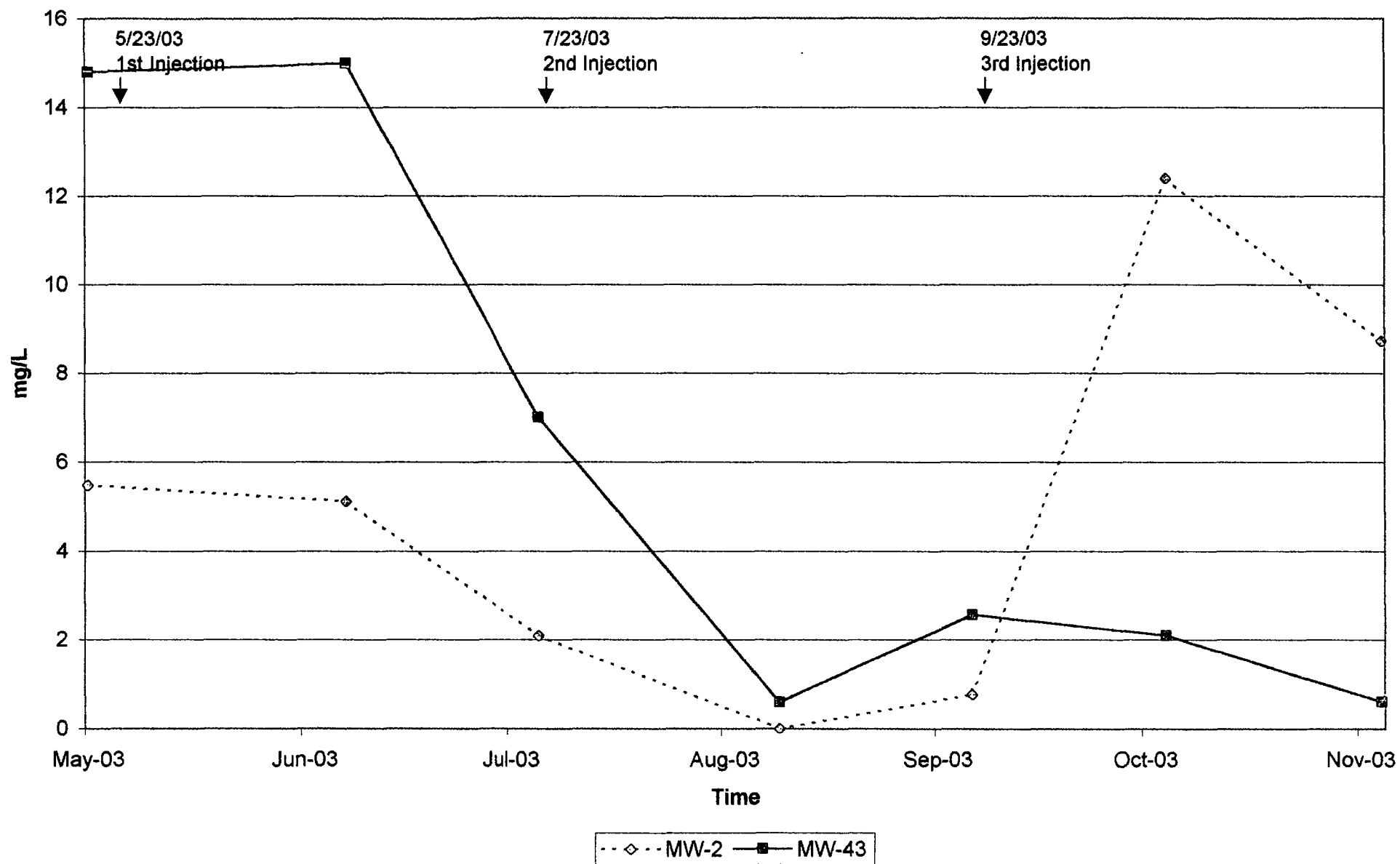
**Total Alkalinity Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



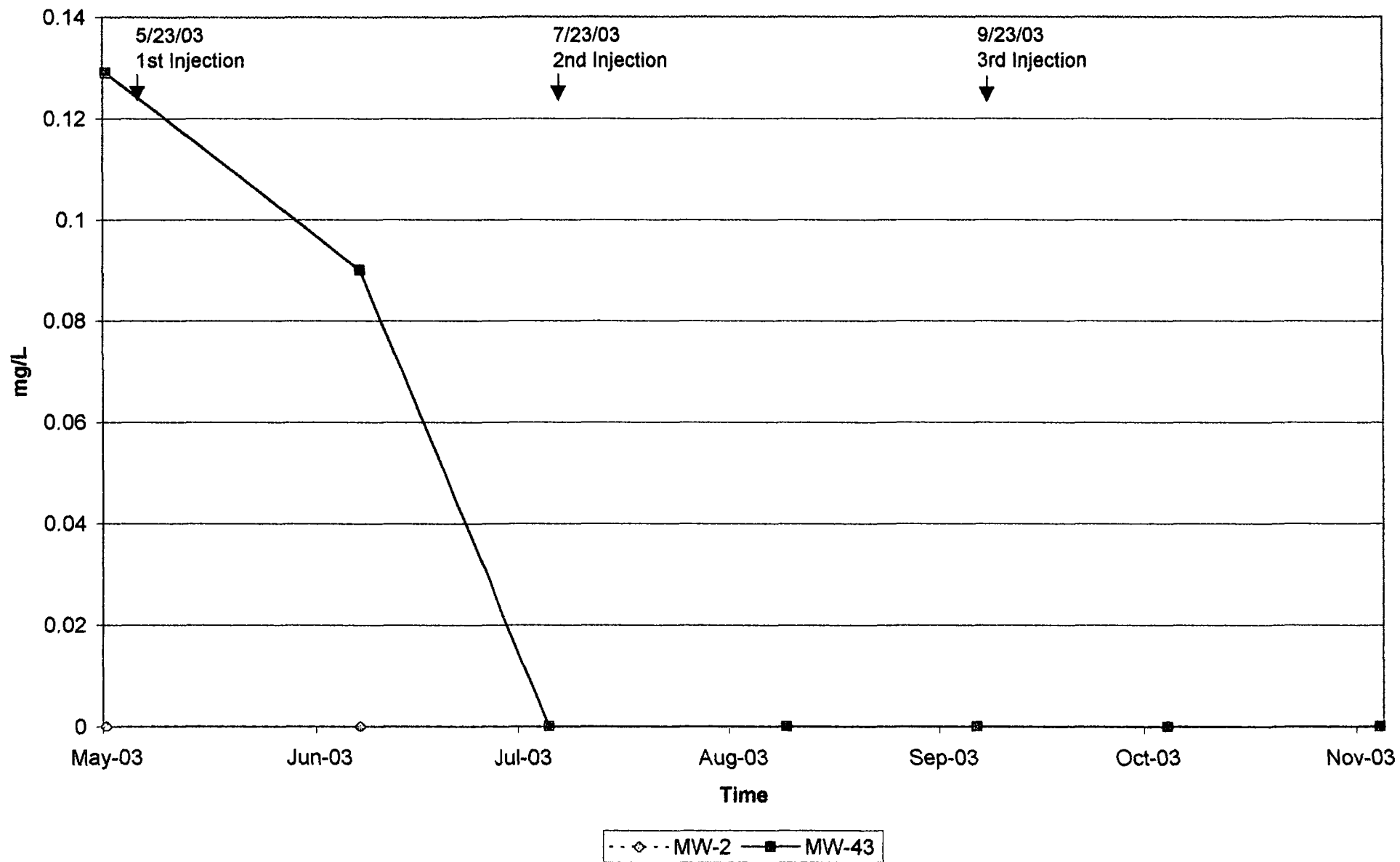
**Ferric & Ferrous Iron Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



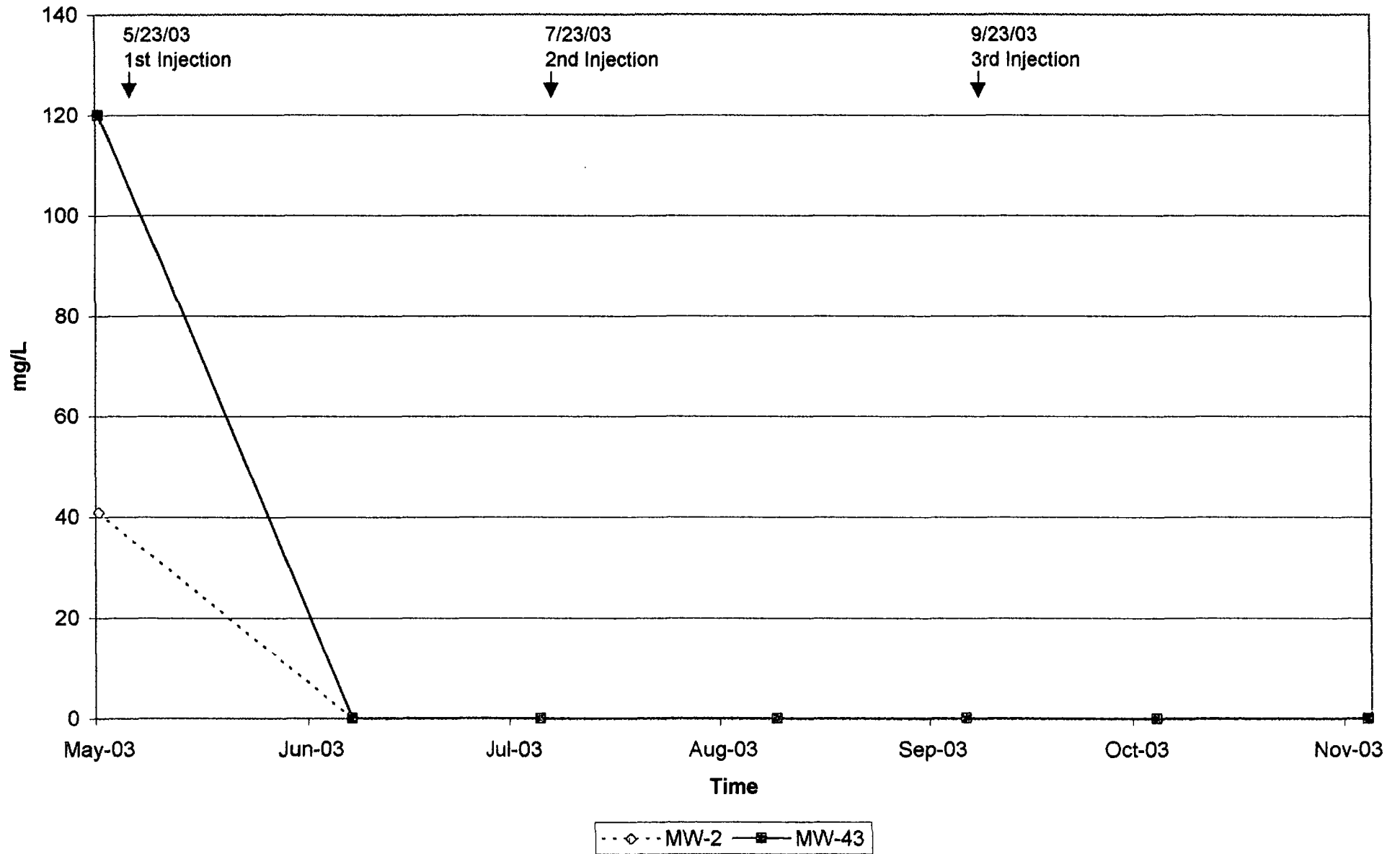
**Sulfate Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



**Nitrate Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



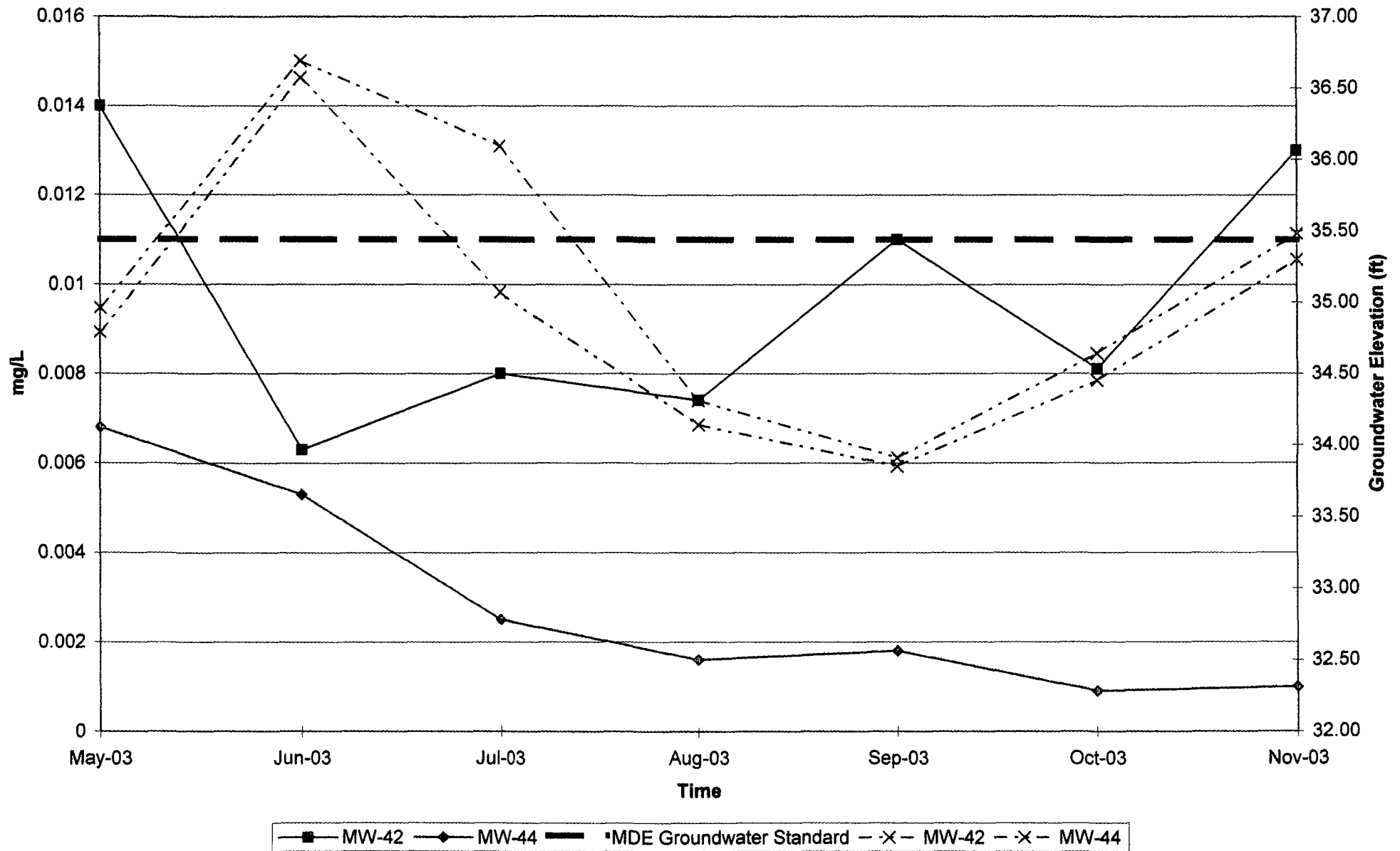
**Methane Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-2 & MW-43 Pilot Study Area**



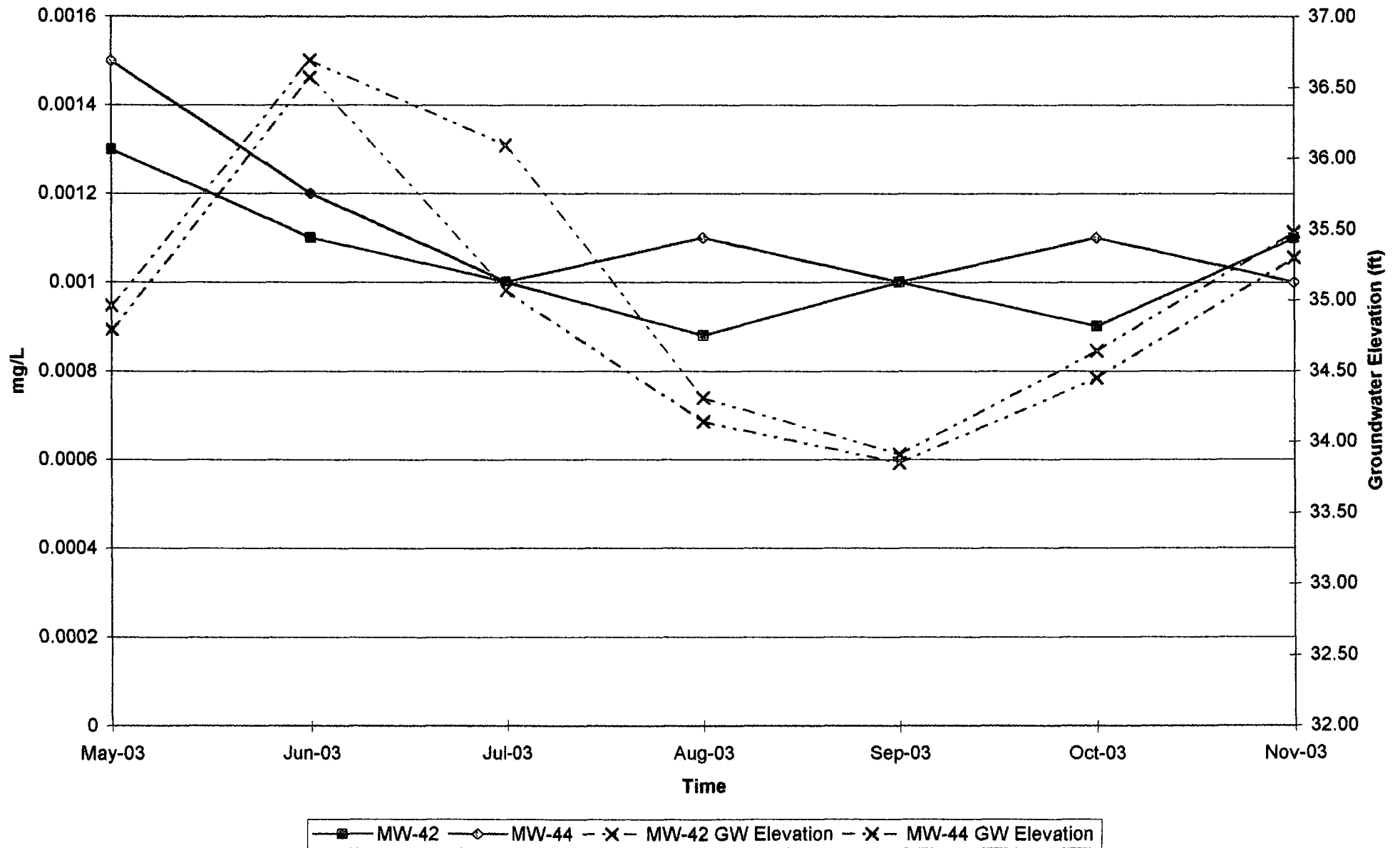
RSA Project No. 2017
GE Railcar, Elkton, MD
In-situ Remediation Pilot Study

MW-42 & MW-44 PSA Charts Volatile Organic Compounds

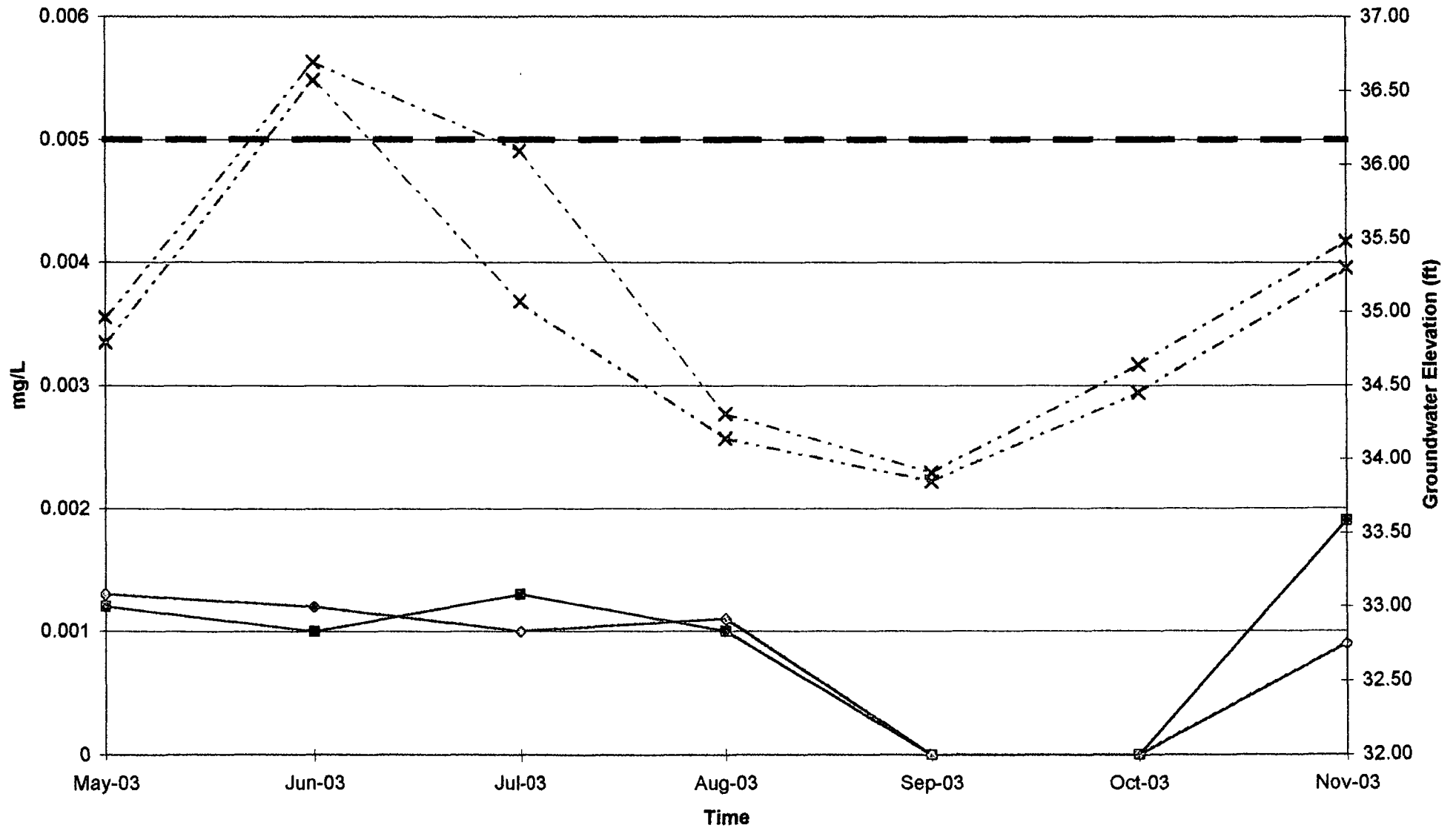
Chlorobenzene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



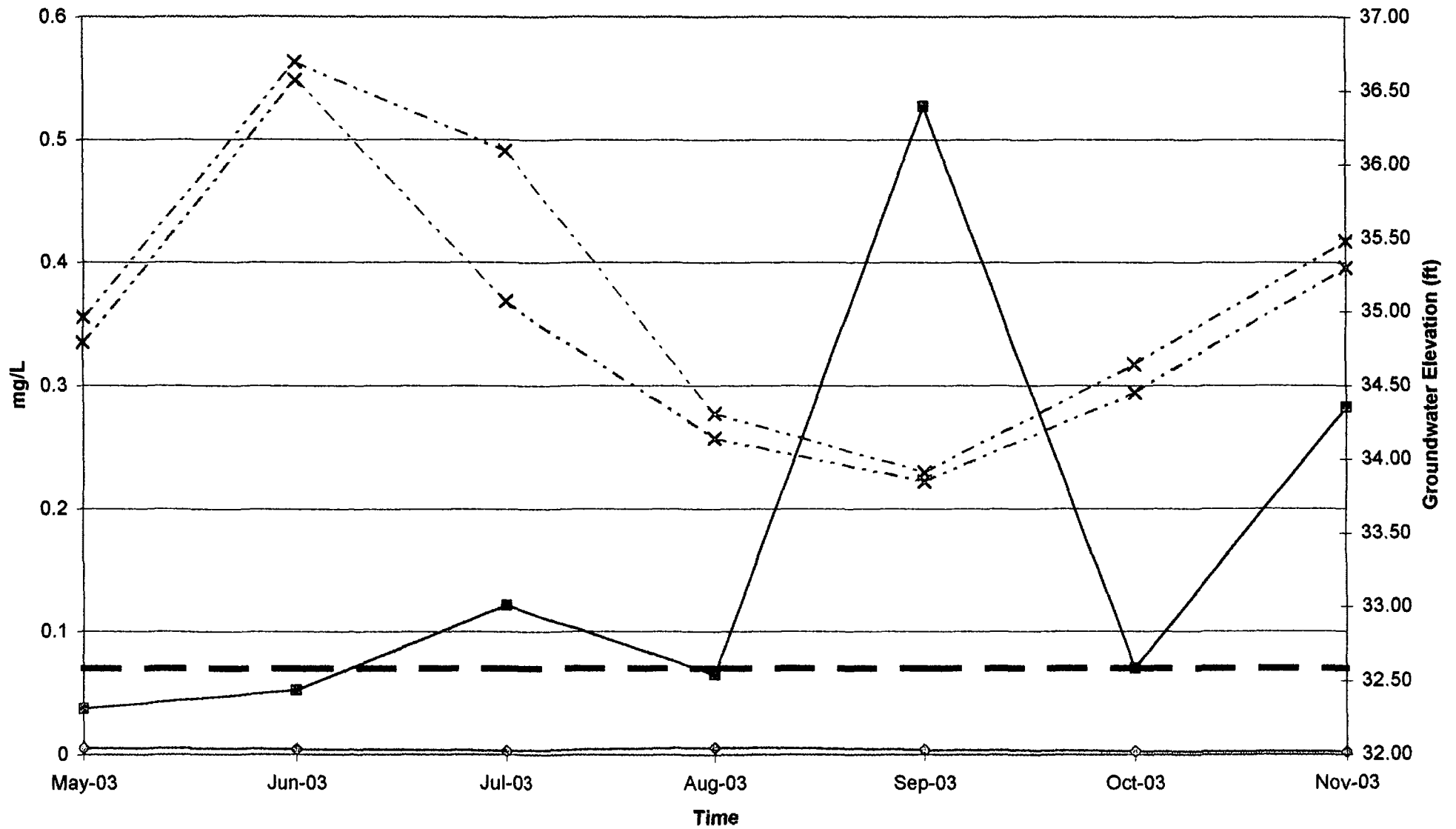
Chloroform Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



**1,2-Dichloroethane Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**

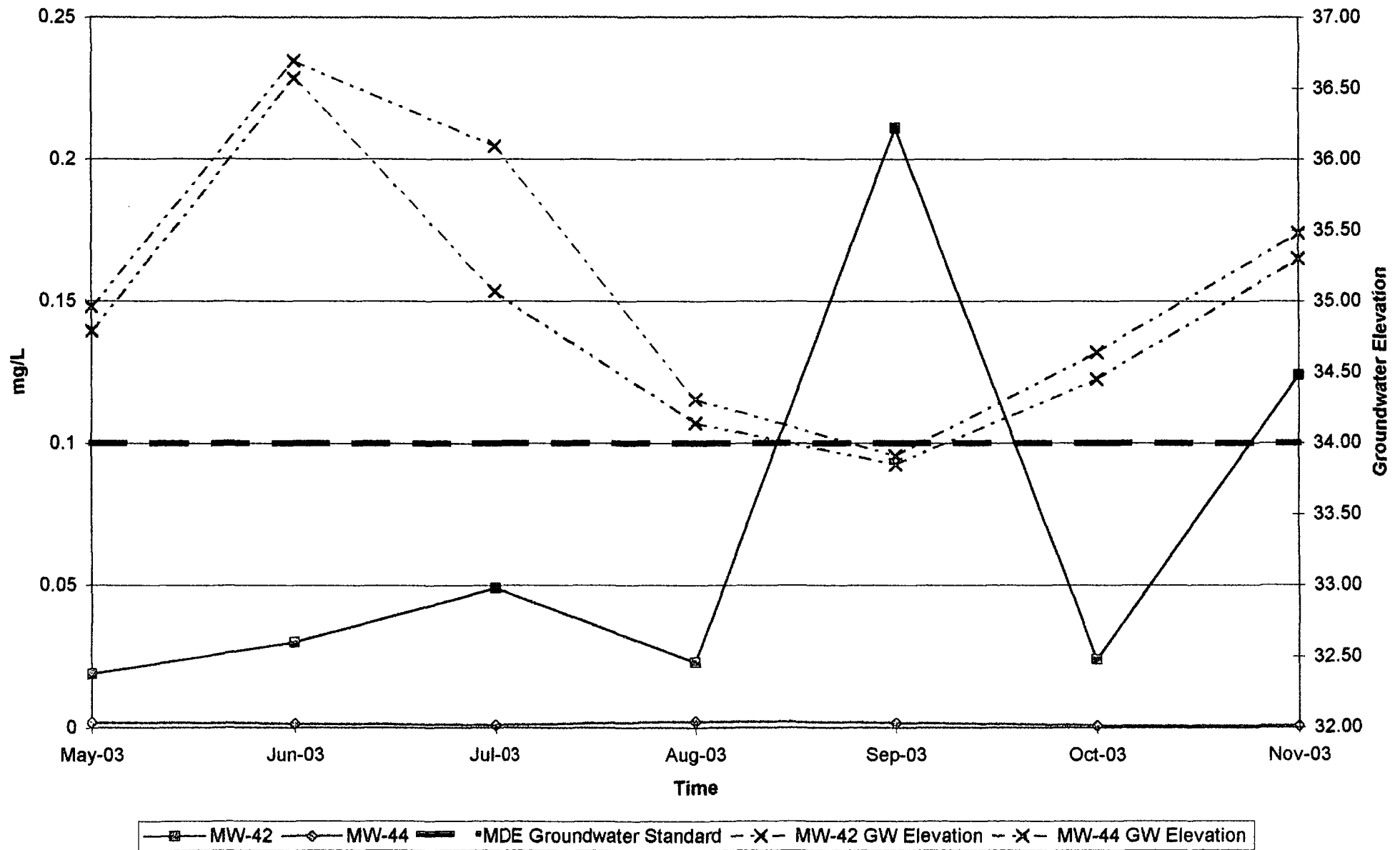


cis-1,2-Dichloroethene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area

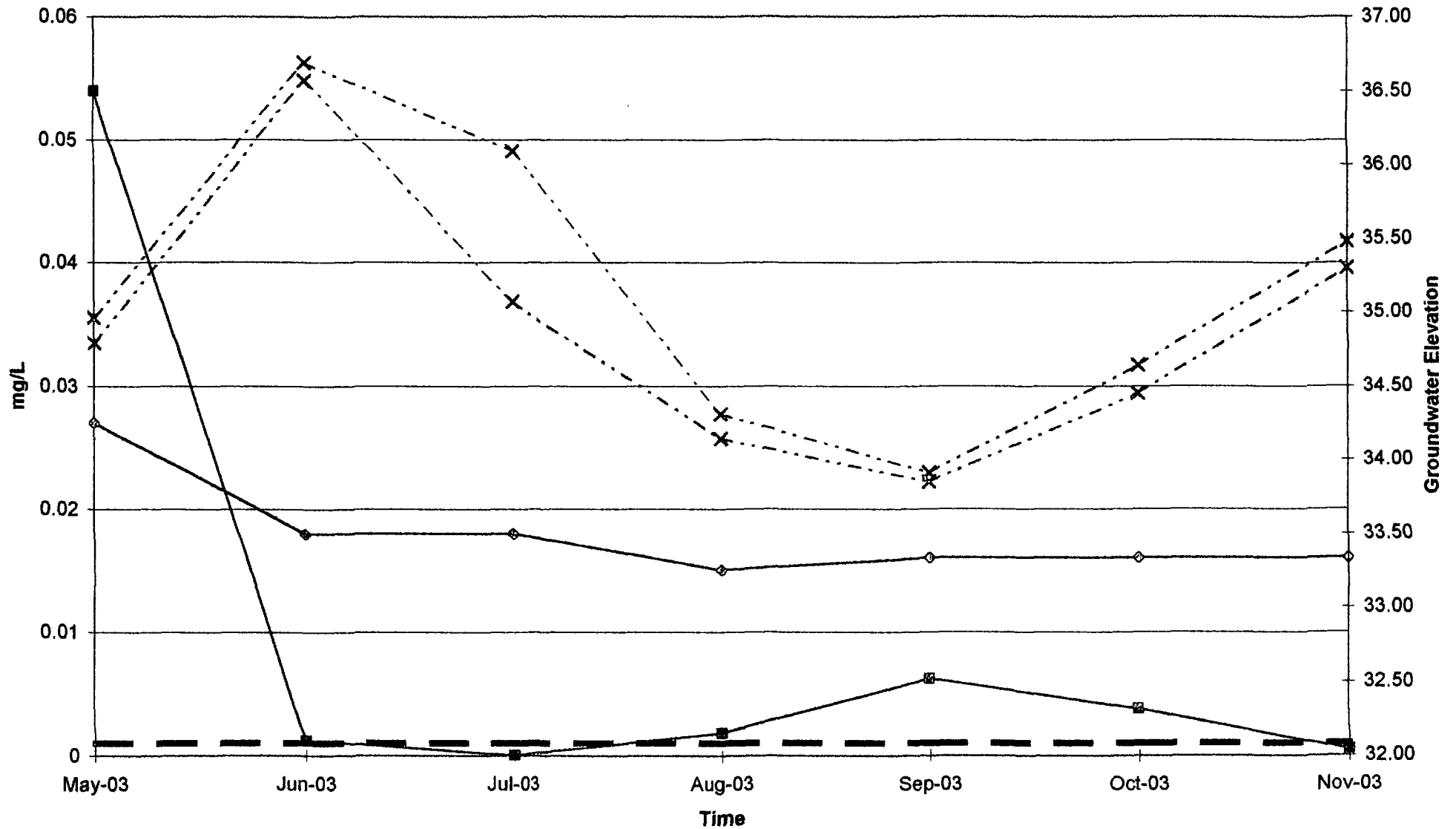


—■— MW-42 —◇— MW-44 — MDE Groundwater Standard - -X- - MW-42 GW Elevation - -X- - MW-44 GW Elevation

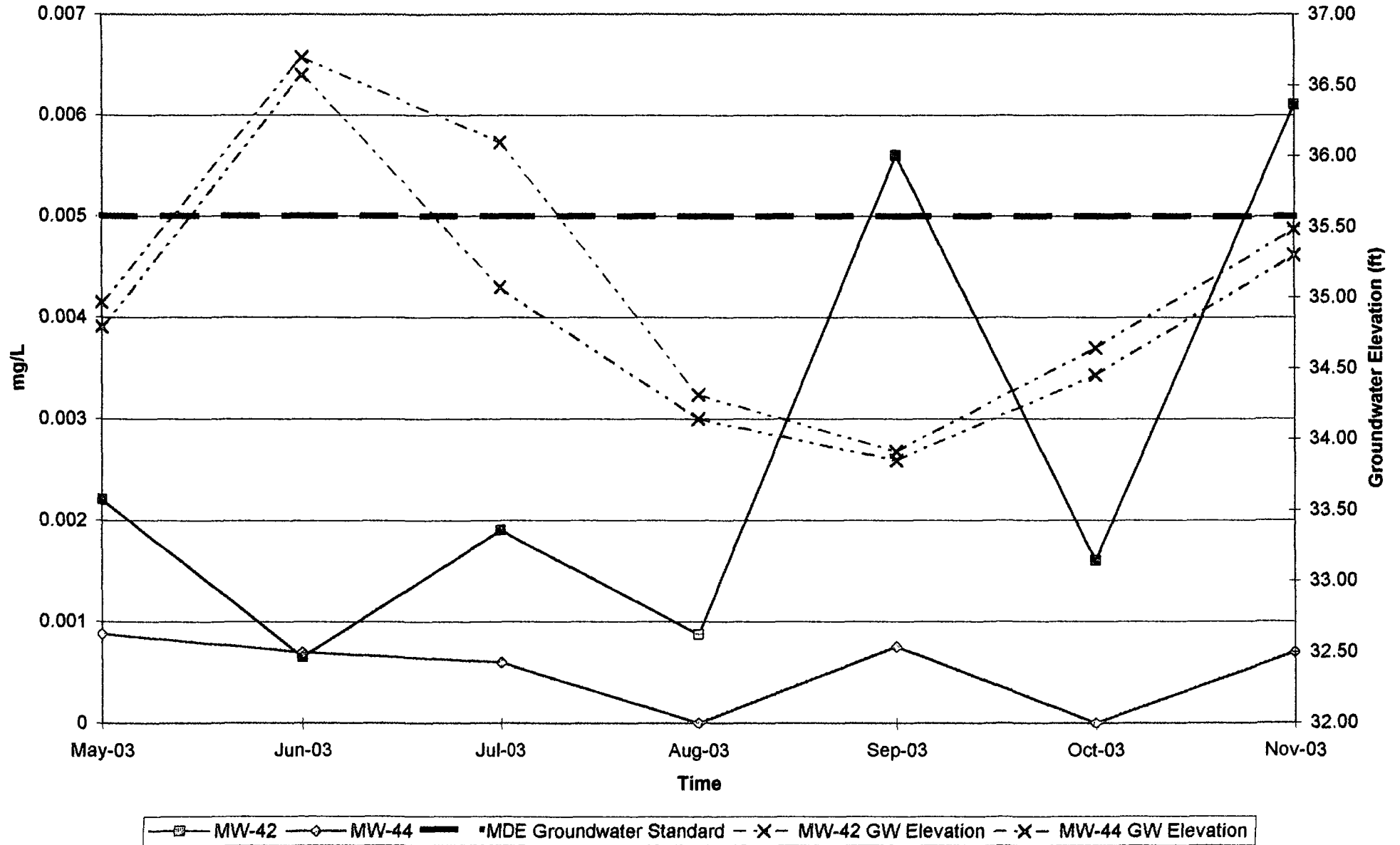
**trans-1,2-Dichloroethene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



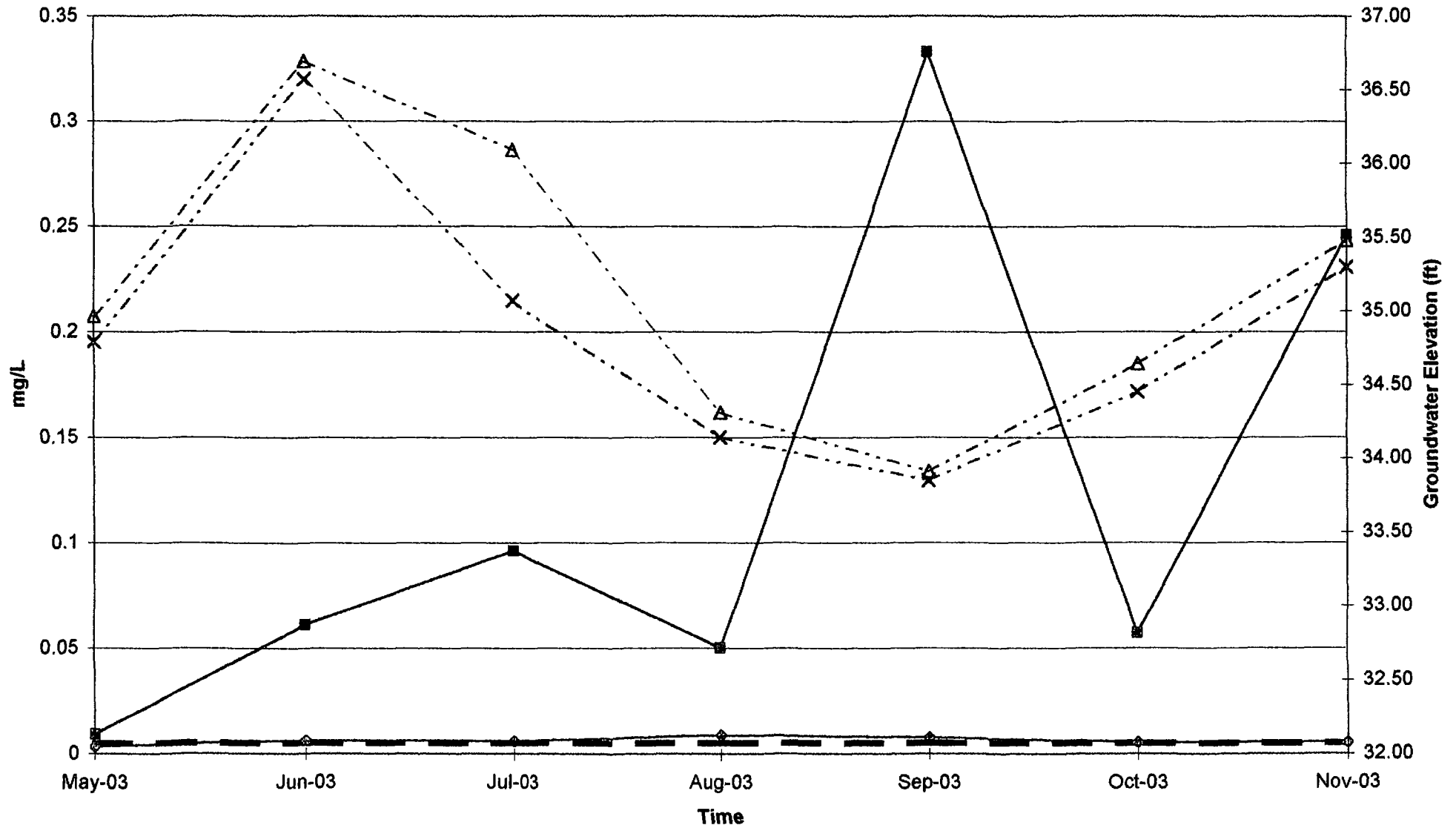
**1,1,2,2-Tetrachloroethane Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



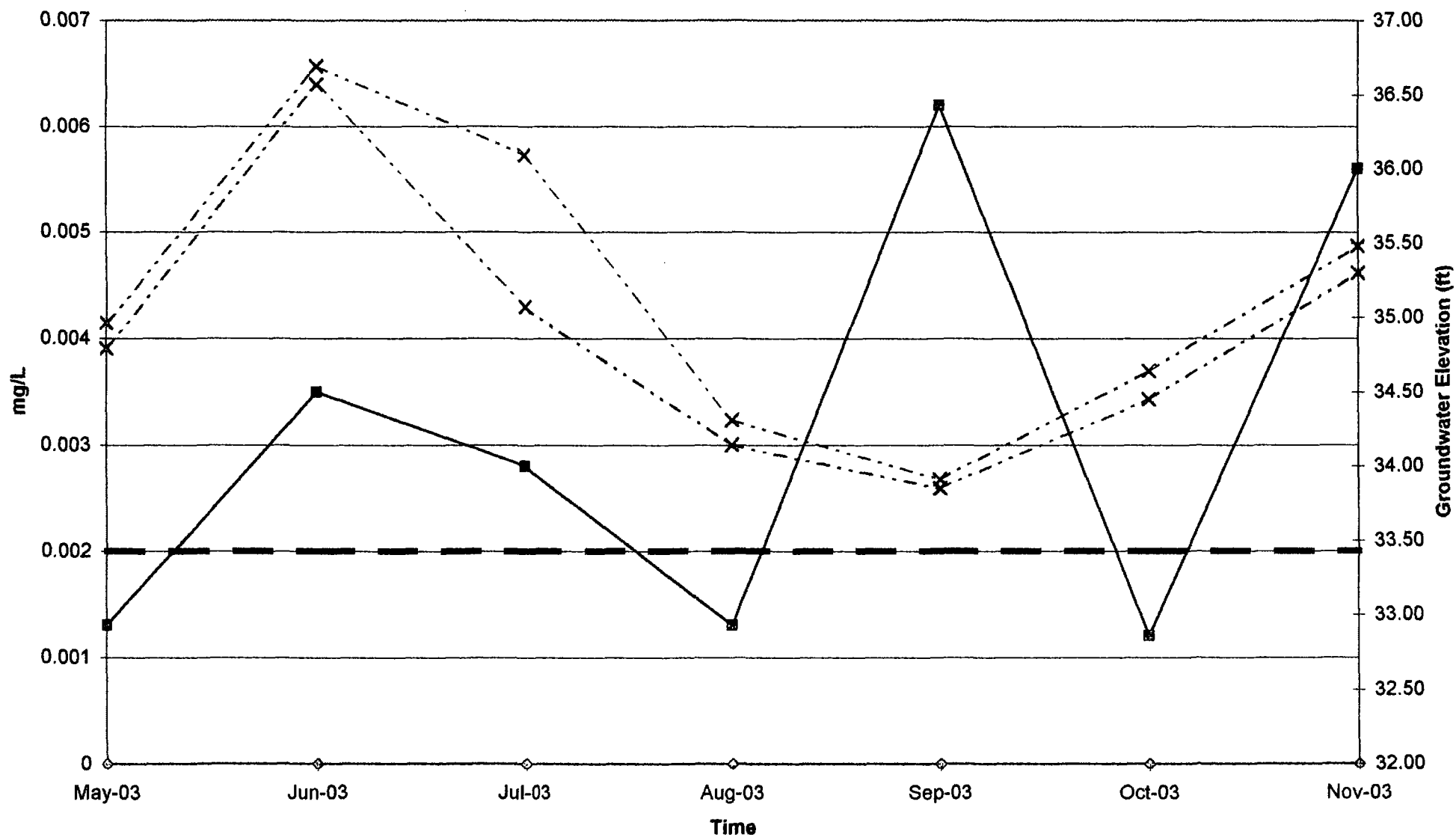
1,1,2-Trichloroethane Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



Trichloroethene Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



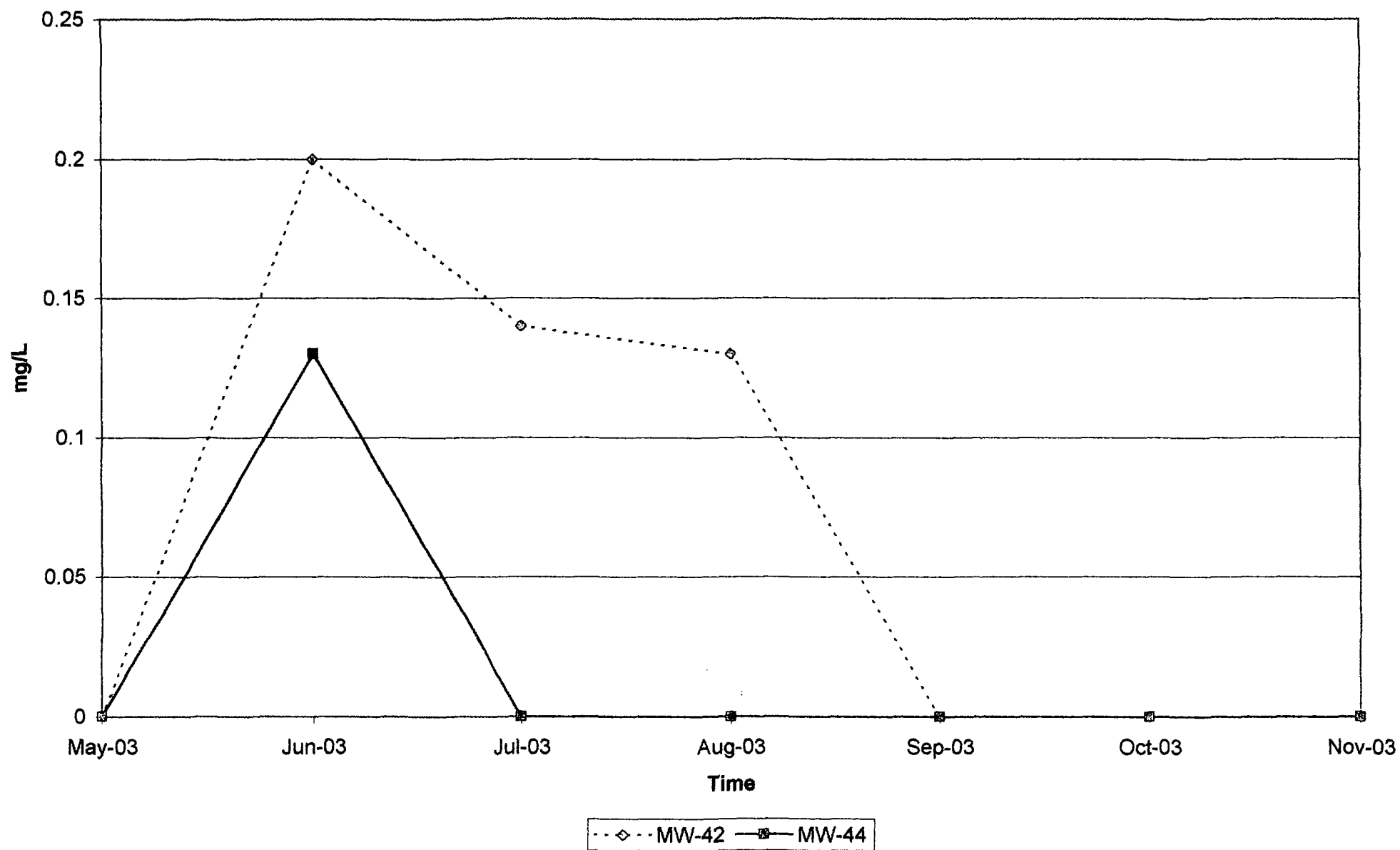
Vinyl Chloride Concentration & Groundwater Elevation
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



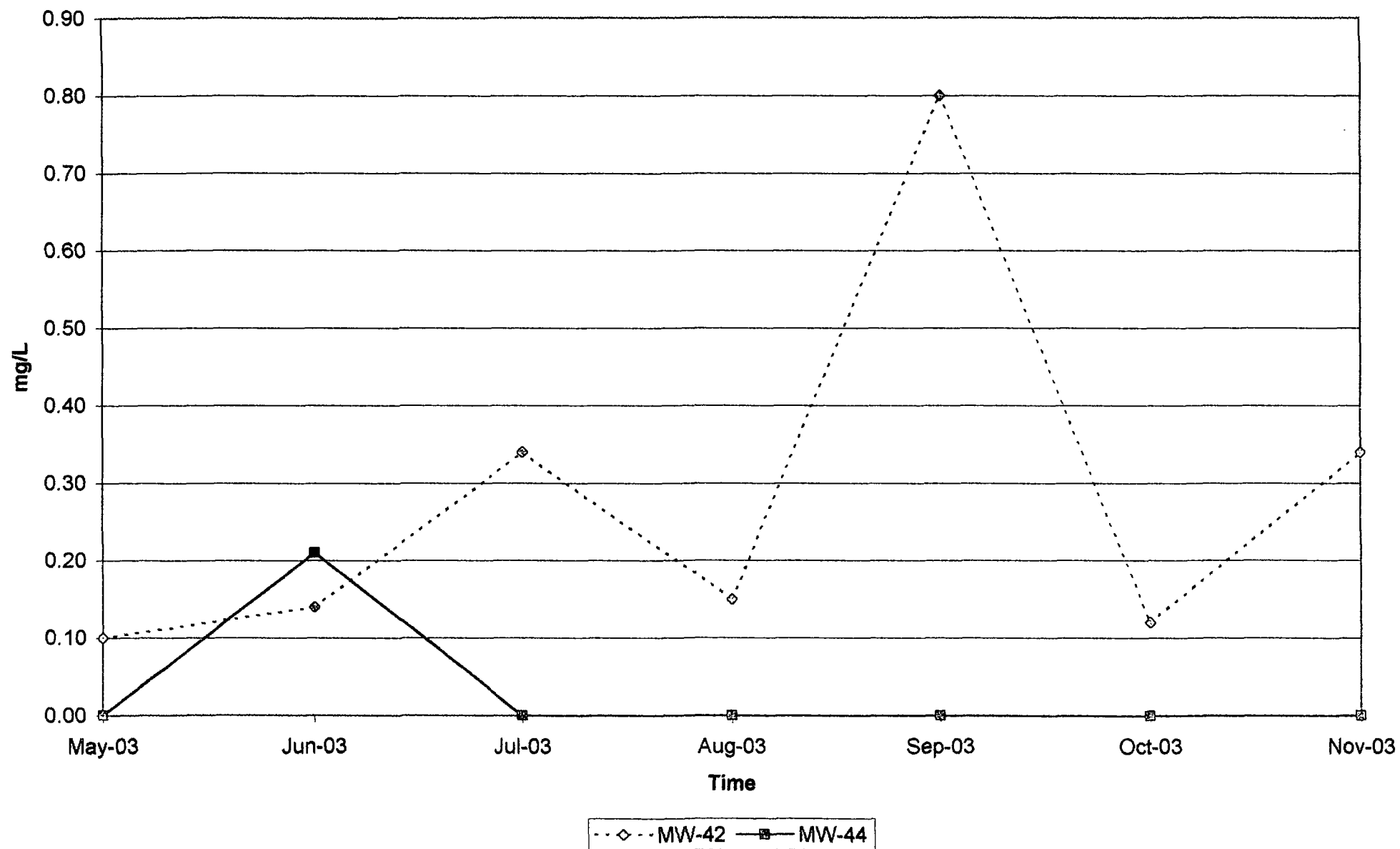
—■— MW-42 —◇— MW-44 — MDE Groundwater Standard —x— MW-42 GW Elevation —x— MW-44 GW Elevation

MW-42 & MW-44 PSA Charts Dechlorination Indicator Parameters

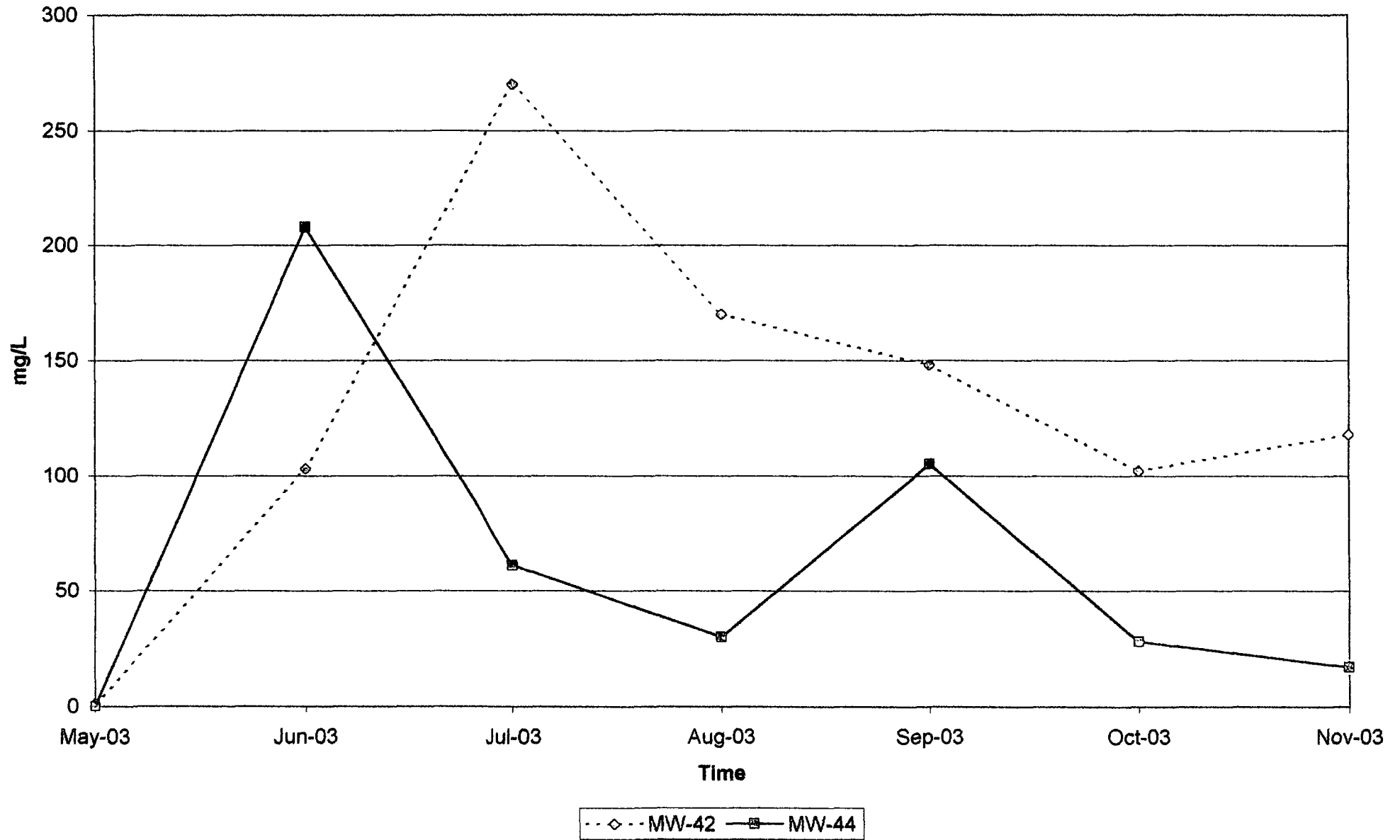
TPH, Diesel Range Organics Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



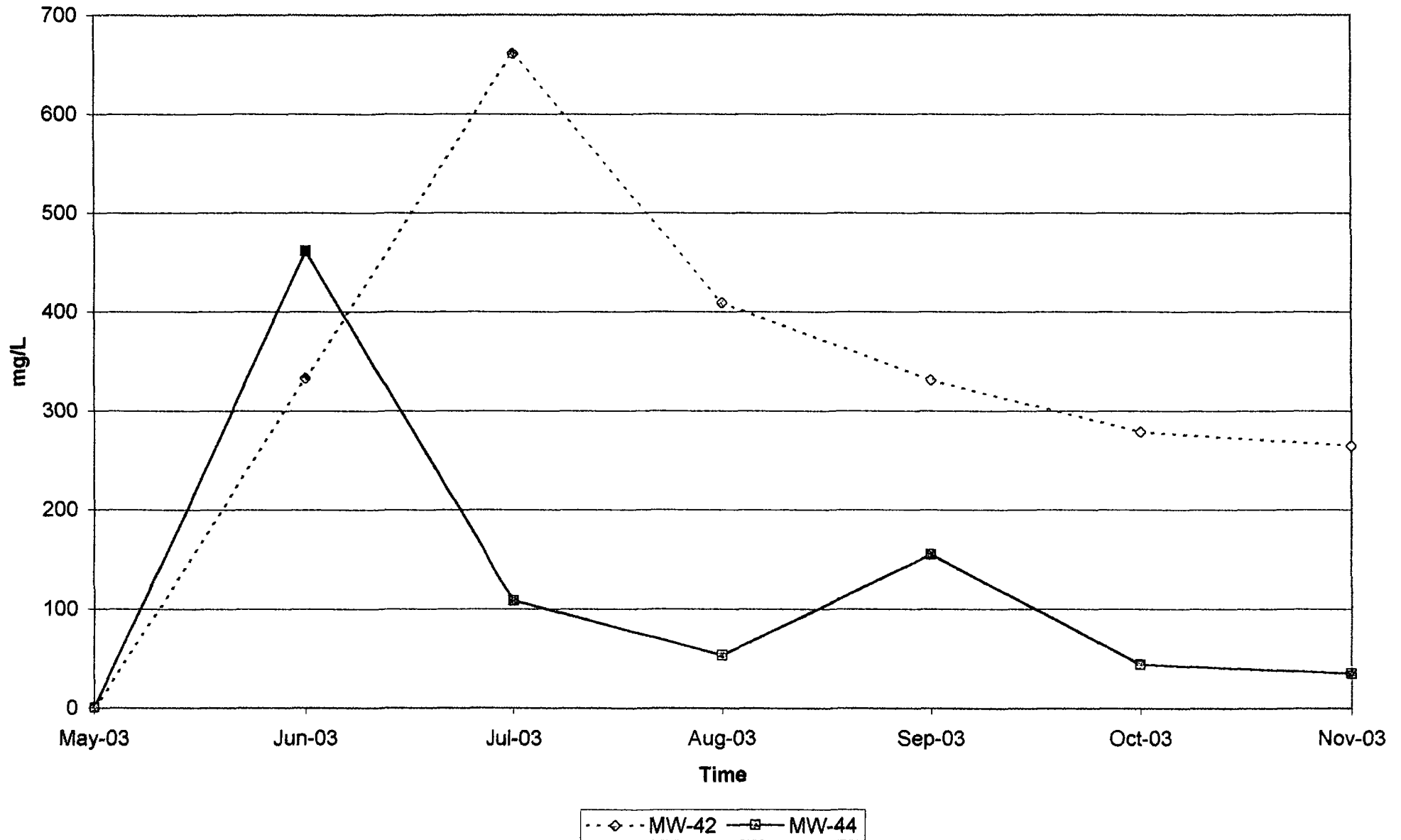
TPH, Gasoline Range Organics Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area



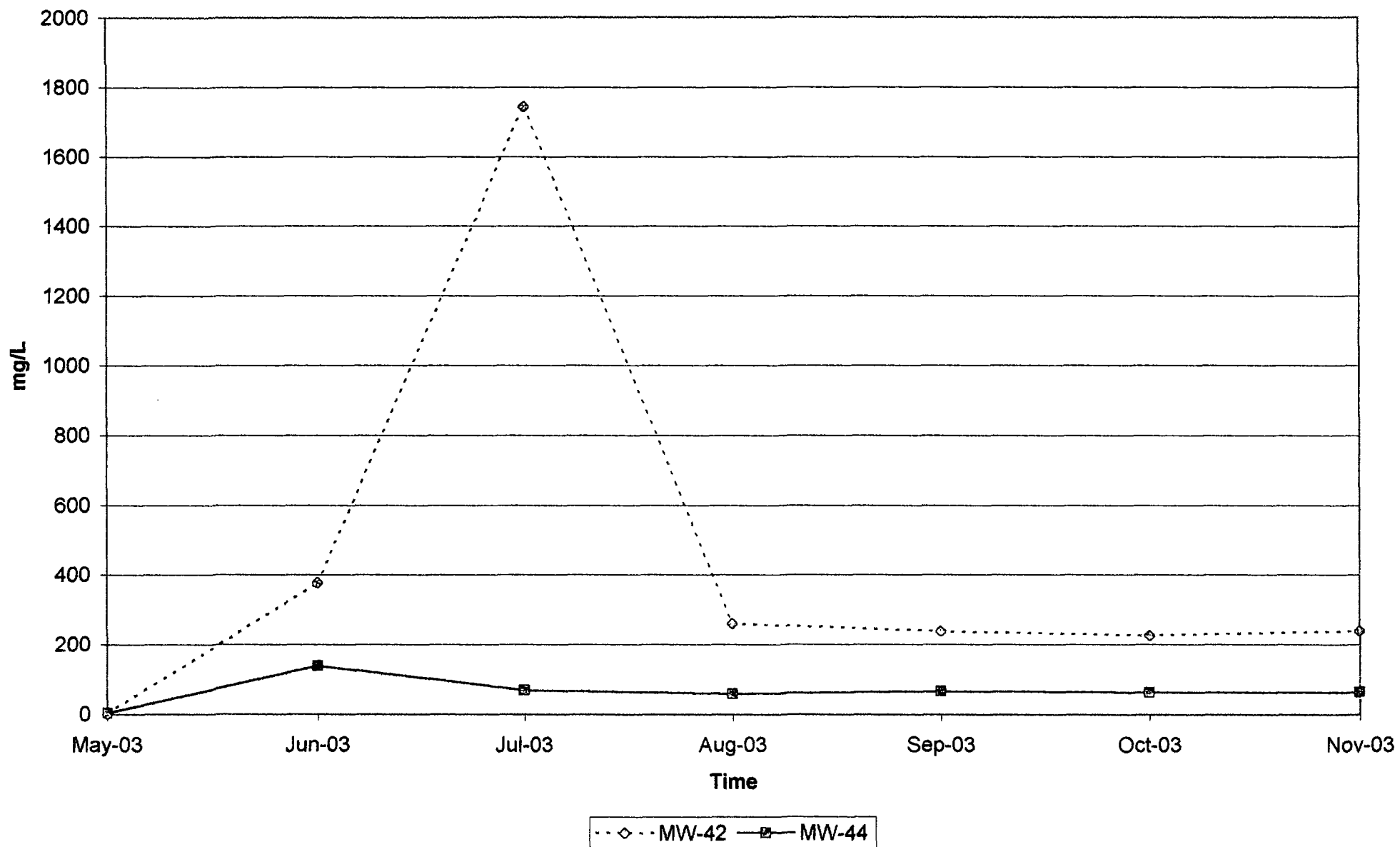
**Total Organic Carbon Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



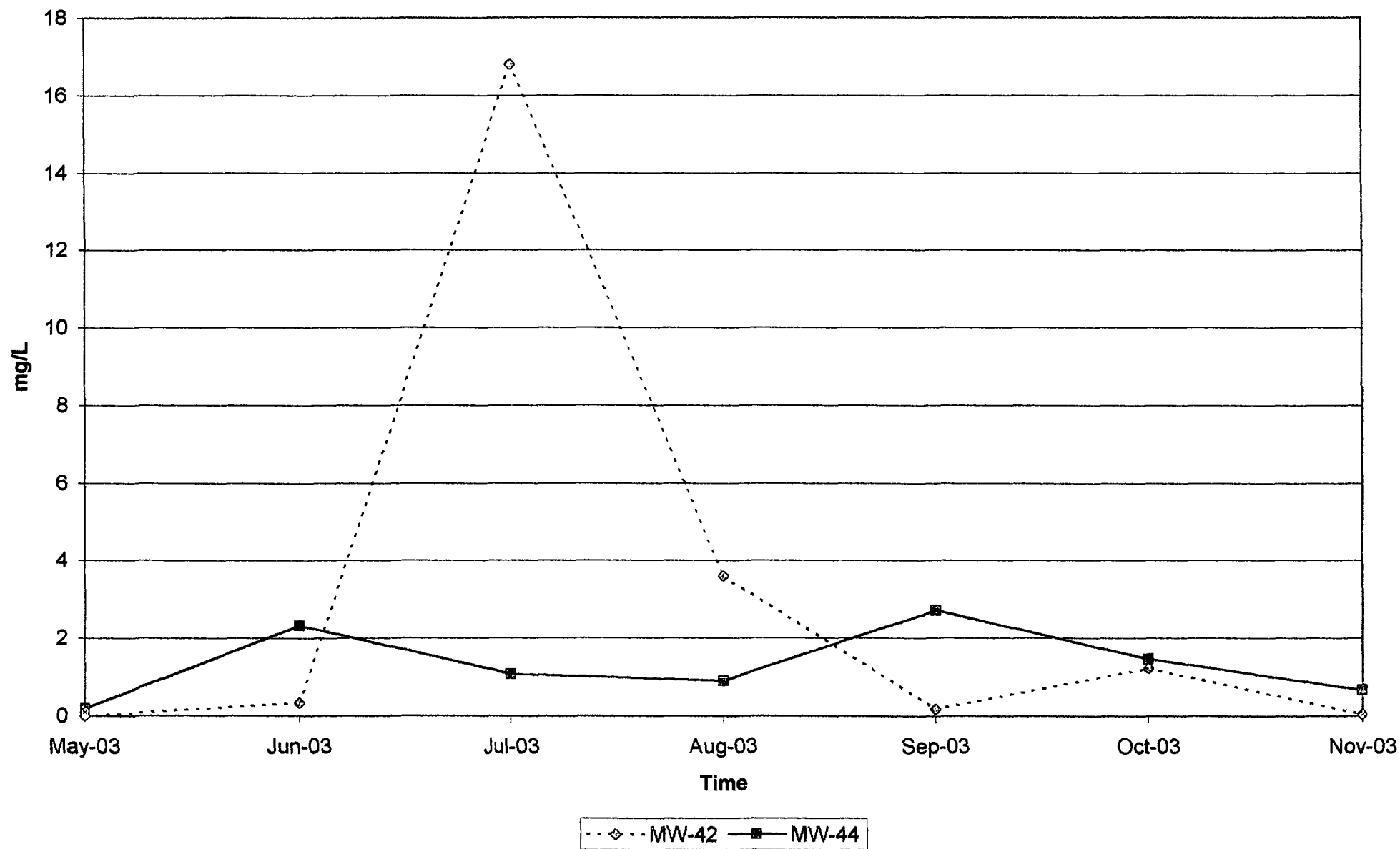
**Chemical Oxygen Demand Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



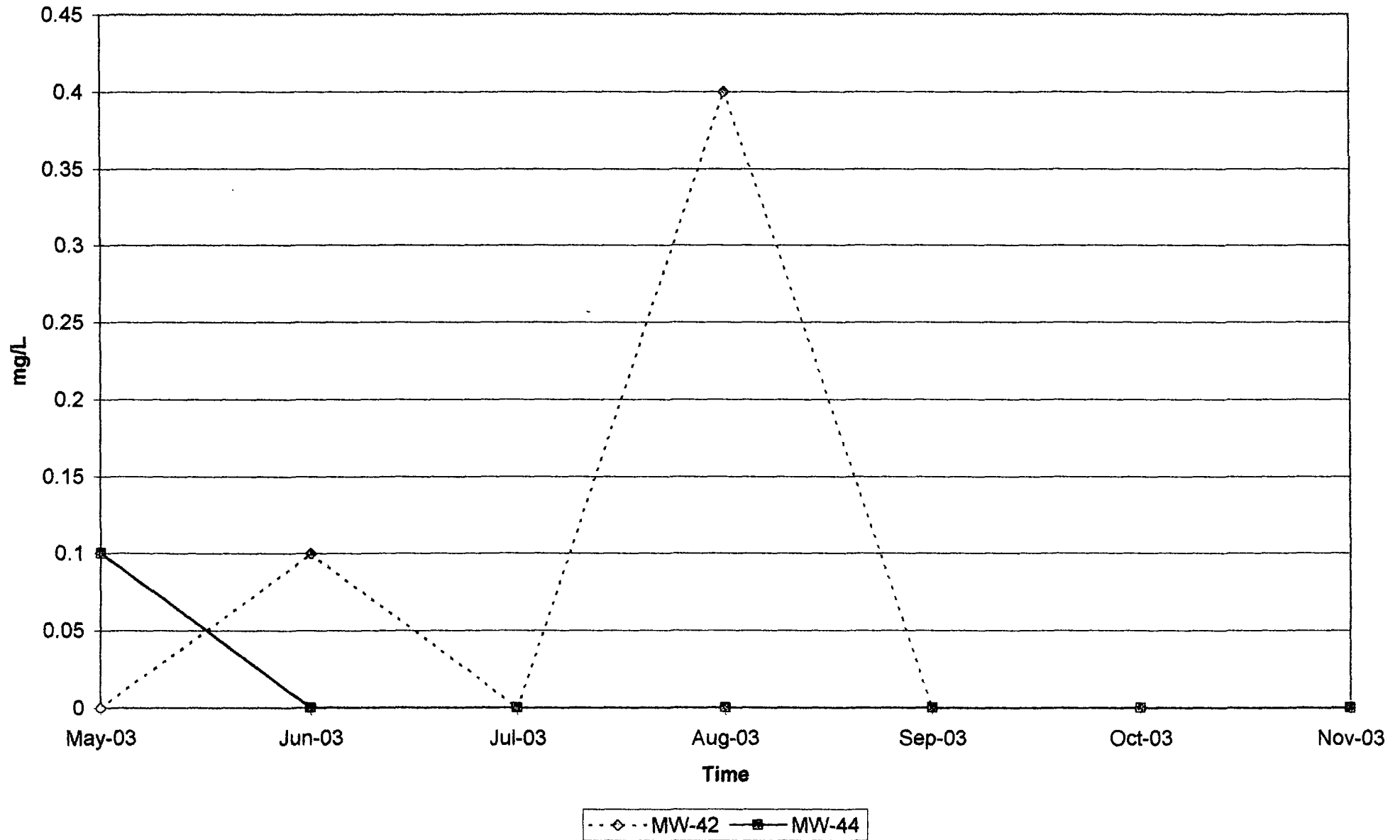
**Total Alkalinity Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



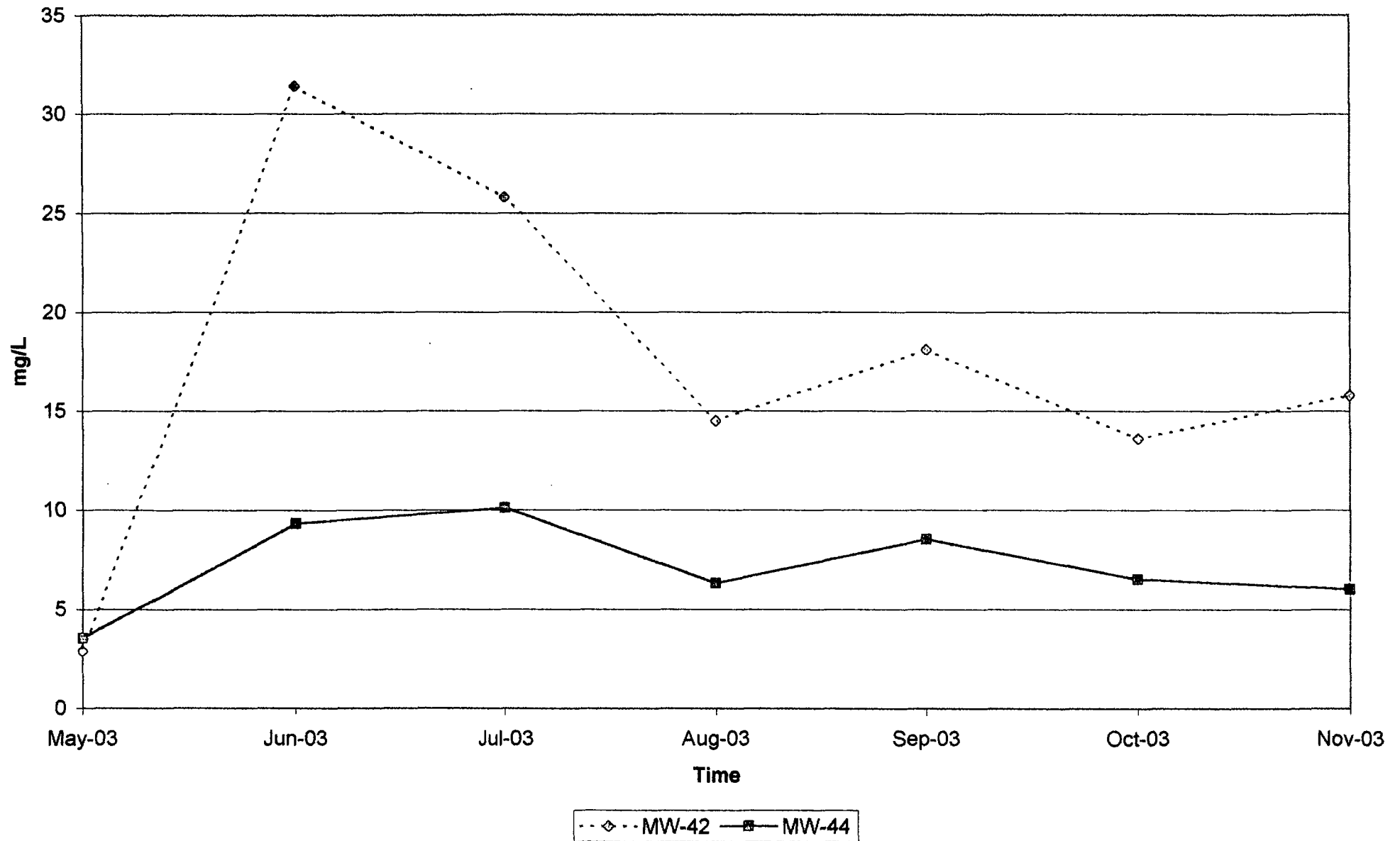
**Ferric Iron Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



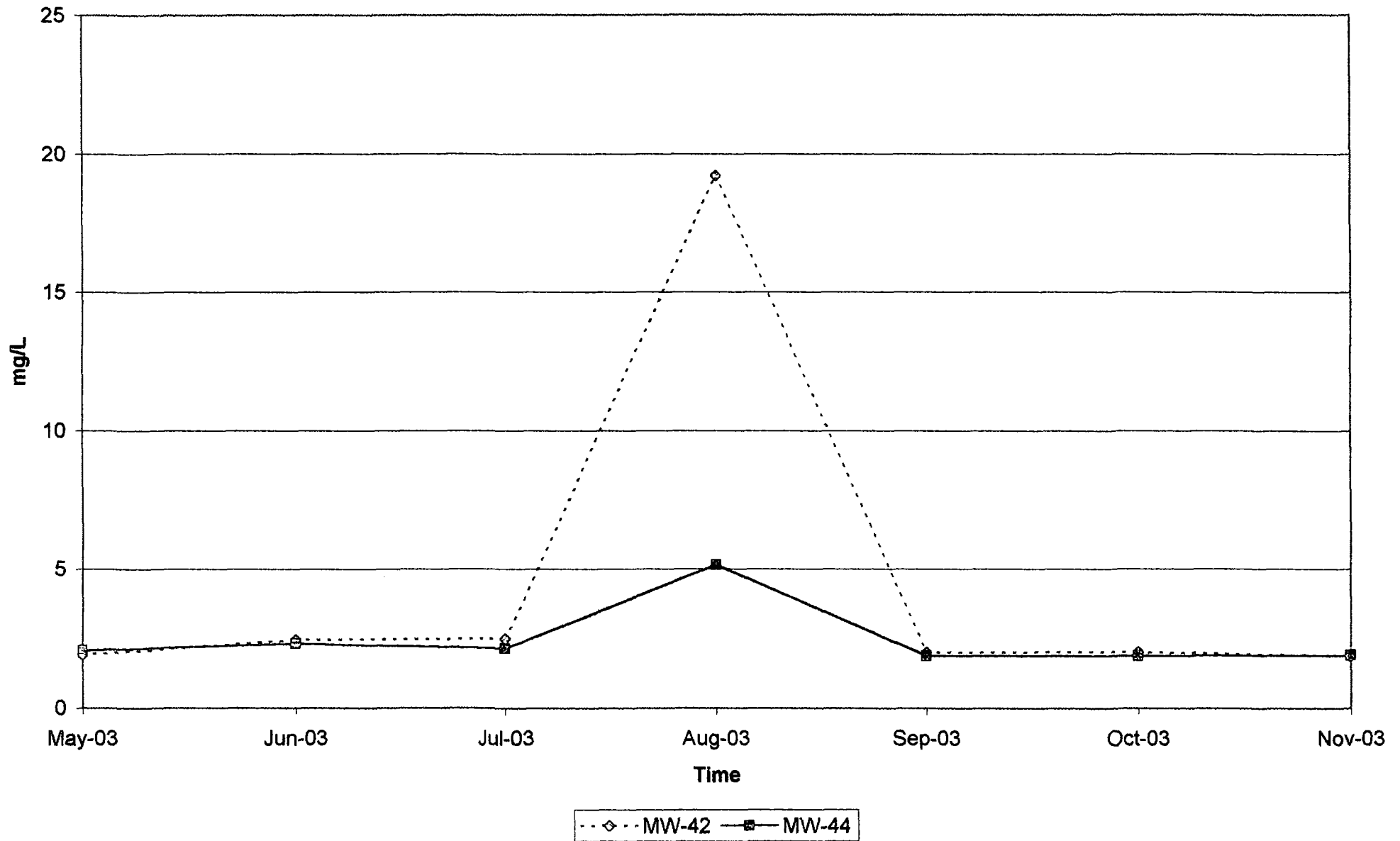
**Ferrous Iron Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



**Sulfate Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



**Nitrate Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**



**Methane Concentration in Groundwater
GE Railcar, Elkton, Maryland
MW-42 & MW-44 Pilot Study Area**

