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Targeted Brownfields Assessment Report

Amerbelle Textiles
104 East Main Street
Vernon, Connecticut

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TARGETED BROWNFIELDS ASSESSMENT REPORT
AMERBELLE TEXTILES
VERNON, CONNECTICUT
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TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION AND BACKGROUND INFORMATION 3
- 2.1 Site Location and Description 3
- 2.2 Site History and Use 5
- 2.3 Groundwater and Surface Water Resources 10
- 2.4 Site Features and Utilities 10
- 2.5 Environmental Studies and Information 11

3.0 PRELIMINARY CONCEPTUAL SITE MODEL 13
- 3.1 Areas of Concern 13
- 3.2 Contaminants of Potential Concern 14
- 3.3 Potential Migration Pathways and Receptors 16

4.0 TBA INVESTIGATION 18
- 4.1 Soil Borings 18
- 4.2 Monitoring Well Installation and Groundwater Sampling 19
- 4.3 Geologic and Hydrogeologic Conditions 20

5.0 ANALYTICAL DATA EVALUATION 23
- 5.1 Soil Samples 23
- 5.2 Groundwater Samples 26
- 5.3 Data Usability Assessment 28

6.0 REVISED CONCEPTUAL SITE MODEL 31
- 6.1 Building 11 Loading Dock Area and Interior of Building 11 31
- 6.2 Trenches and Southeast Corner of Building 14 32
- 6.3 Northwest Corner of Building 14 33
- 6.4 Building 7 Loading Dock, Building 9, and Tank Area East of Building 13 34
- 6.5 Contaminants of Concern 34
- 6.6 Potential Migration Pathways and Receptors 35
- 6.7 Identified Data Gaps 37

7.0 CONCLUSIONS AND RECOMMENDATIONS 38

8.0 LIMITATIONS 40

9.0 REFERENCES 41

FIGURES

Figure 1. Site Locus Map
Figure 2. Site Plan (GeoDesign, 2004b)
Figure 3. Sampling Locations
Figure 4. Groundwater Contours for Bedrock
Figure 5. Conceptual Site Model

TABLES

Table 1. Summary of Phase I & II Assessments, Data Gaps, and Planned TBA Investigation Locations
Table 2. Soil and Groundwater Sampling Locations and Analyses – TBA Investigation
Table 3. Summary of Analytical Data for Soil Samples: Volatile Organic Compounds
Table 4. Summary of Analytical Data for Soil Samples: SVOCs and Metals
Table 5. Summary of Analytical Data for Soil Samples: ETPH
Table 6. Summary of Analytical Data for Groundwater Samples
Table 7. Summary of GeoDesign and TBA Investigations and Remaining Areas of Concern

APPENDICES

APPENDIX A	SELECTED TABLES AND FIGURES FROM PHASE I AND PHASE II REPORTS (GEODESIGN, 2004)
APPENDIX B	BORING LOGS
APPENDIX C	MONITORING WELL INSTALLATION LOGS
APPENDIX D	GROUNDWATER FIELD SAMPLING WORKSHEETS
APPENDIX E	LABORATORY DATA SHEETS & DATA VALIDATION MEMORANDA
APPENDIX F	EPA SITE PROGRAM REPORT (JULY 2005) – ROOSEVELT MILLS SITE
APPENDIX G	ROOSEVELT MILLS BEDROCK WELL DATA, 2005 (COURTESY OF SAIC)
APPENDIX H	STATEMENT OF LIMITATIONS

1.0 INTRODUCTION

This Targeted Brownfields Assessment (TBA) report for the Amerbelle Textiles property has been prepared in accordance with Metcalf & Eddy's (M&E's) EPA-approved Final Field Task Work Plan (M&E, October 2005) for conducting the TBA under EPA's Response Action Contract (RAC). This report presents the results of the TBA, performed on behalf of the TBA applicant, the town of Vernon, Connecticut, and the current Site owner, the Hockanum Industrial Development and Venture Corporation (HIDVC).

The Amerbelle Textiles property (the Site) is located at 104 East Main Street in Vernon, Tolland County, Connecticut. The Site was formerly owned and operated by the Amerbelle Corporation. Amerbelle Corporation was in arrears in its sewer payments to the town, and was prepared to close its Vernon operations and declare bankruptcy in November 2003. To help preserve the business and its 107 jobs for the town, the town enlisted the HIDVC to work with Amerbelle Corporation to transfer the property. The HIDVC is a non-profit corporation established by the Town of Vernon to take ownership of industrial properties within the town that have closed or are in danger of closing, and assist the town in maintaining productive uses of such sites. The Site is currently owned by the HIDVC (HIDVC, 2004).

Previous investigations at the Site have included Phase I and Phase II Environmental Site Assessments (ESA) prepared by GeoDesign, Inc. for Murtha Cullina, LLP (GeoDesign, 2004a and 2004b). These two assessments were provided to the Town of Vernon by Murtha Cullina to support the town's TBA application, and were subsequently provided electronically (PDF format) to M&E by the Town of Vernon point of contact (POC), Mr. Laurence Shaffer.

The town and the HIDVC identified an individual with knowledge of the business (Mr. Douglas Rimsky), who was also one of Amerbelle Corporation's main customers, to take over operation of the business. Amerbelle Textiles LLC (owner Mr. Douglas Rimsky) is currently leasing the Site from HIDVC and has expressed an interest in purchasing the property, including all land, buildings, and equipment, but has concerns regarding the Site's environmental condition and potential liability. The Phase I and Phase II ESAs produced by GeoDesign helped address these concerns, but some data gaps remained that led the town to apply for an EPA Targeted Brownfields Assessment grant. The town and HIDVC are hopeful that the TBA will address

remaining environmental concerns and allow for the transfer of the property from HIDVC to Amerbelle Textiles LLC. For the time being, HIDVC intends to continue leasing the property to Amerbelle Textiles LLC, and textile dyeing and finishing operations are continuing (HIDVC, 2004).

2.0 SITE DESCRIPTION AND BACKGROUND INFORMATION

Information presented in this section summarizes Site conditions and Site history and use, including a discussion of previous environmental investigations and activities.

The Site was owned and operated by the Amerbelle Corporation (a different entity than Amerbelle Textiles LLC). Amerbelle Corporation was in arrears in its sewer payments to the town, and was prepared to close its Vernon operations and declare bankruptcy in November 2003. To help preserve the business and its 107 jobs for the town, the town enlisted the HIDVC to work with Amerbelle Corporation to transfer the property. The HIDVC is a non-profit corporation established by the Town of Vernon to take ownership of industrial properties within the town that have closed or are in danger of closing, and assist the town in maintaining productive uses of such sites. The Site is currently owned by the HIDVC (HIDVC, 2004).

2.1 Site Location and Description

Amerbelle Textiles is located at 104 East Main Street in Vernon, Tolland County, Connecticut (Figure 1). The Site consists of a northern parcel and a southern parcel. Both parcels are occupied by various buildings and are separated by Brooklyn Street (Figure 2). Current operations include dyeing and treatment of fabrics that are subsequently converted into products such as wedding gowns, automobile convertible tops, and other specialty fabrics (HIDVC, 2004). Based on historic and on-going manufacturing operations, the Site is considered an "Establishment" under the Connecticut Property Transfer Act (22a-134) (GeoDesign, 2004a).

The 1.5-acre northern parcel is occupied by an approximately 42,700 square-foot mill complex. The mill complex to the north of Brooklyn Street is comprised of Buildings Nos. 1 through 9, 11, and 13 (see Figure 2). Buildings Nos. 3 and 11 are approximately five stories tall and Building No. 4 is four stories tall. The remaining buildings are one to two stories. These buildings are primarily constructed of mortar, stone, and brick. Several locations have crawl spaces and/or half-story areas (GeoDesign, 2004a).

The northern parcel mill complex currently houses solvent and latex-based textile coating operations, the company's industrial boiler systems, and storage areas. In addition to the manufacturing and boiler operations, these latter buildings also house a QC laboratory, various administrative offices, and the operations of Challenge Sailcloth, a tenant at the site (GeoDesign, 2004a).

The property is supplied with heat from two large industrial boilers located in the northern central portion of the property. The boilers are each authorized to burn either natural gas or used fuel oil. Natural gas is piped to the facility. The used fuel oil is stored in two 18,000-gallon aboveground storage tanks (ASTs) that are located inside a concrete containment structure that is fully-covered by a prefabricated metal building enclosure. Four oil-filled transformers are located outdoors inside a fenced enclosure, just to the east of the fuel oil tanks. One large transformer is marked as non-PCB containing. Three smaller transformers are indicated to contain PCBs (GeoDesign, 2004a).

The 2.7-acre southern parcel is occupied by an approximately 54,500 square-foot two-story brick building (Building No. 14) which currently houses textile dyeing and finishing operations. Building No. 14 was constructed in 1956 and adjoins an approximately 3,000 square foot 4-story building (Building No. 12) that was constructed between 1885 and 1892. Building No. 12 currently houses the maintenance shop and is used for storage. The parcel is adjoined by residential properties to the south; Grove Street and Paper Mill Pond to the east; Brooklyn Street to the north; and Cedar Street to the west (GeoDesign, 2004a).

A small dam of the Hockanum River forms Paper Mill Pond across Grove Street to the east of the Site. From Grove Street, the Hockanum River continues through the Site, in a raceway constructed beneath Buildings Nos. 14, 7, and 5. The river flows from the southeast corner to the north-central portion of the Site, discharging to American Mill Pond, then continuing to the southwest, ultimately joining the Connecticut River. The raceway was constructed when the Hockanum River was first used to supply power to the textile mills (GeoDesign, 2004a).

The Site topography slopes downwards from the south to the north with an overall topographic relief of approximately 60 feet. Based on regional topography, geology, and drainage considerations, the migration of groundwater beneath the Site is expected to be controlled by

the shallow elevation of the bedrock surface, the presence of the historic canal, and other historic drainage features. The bedrock surface is anticipated to be irregular but to generally slope downward towards the northwest (GeoDesign, 2004a).

The Surficial Materials Map of Connecticut (USGS, 1992) indicates that the Site is underlain by sand and gravel overlying sand. The map states, "Sand & gravel is generally less than 20-feet thick, horizontally bedded, and overlies thicker inclined layers of sand (deltaic deposits)." Just west of the Site, the map indicates "thin till." The thin till was described as generally less than 10-15 feet thick and includes areas of bedrock outcrop where the till is absent (GeoDesign, 2004a).

According to the Bedrock Geology of the Rockville Quadrangle (State Geological and Natural History Survey of Connecticut, 1955), the Glastonbury Gneiss underlies the Site. The Glastonbury Gneiss is described as a gray, medium to coarse-grained, well-foliated gneiss. The bedrock is exposed in the northwestern portion of the Site where the raceway discharges to the American Mill Pond (GeoDesign, 2004a).

The Water Quality Classifications Map of Connecticut, Thames River, Pawcatuck River, and Southeast Coastal Basin (CTDEP, 1986), indicates the groundwater underlying the Site is classified as GB. This classification indicates an area in which groundwater is known or presumed to be affected in quality by historic intense, urban, commercial, and industrial development. Areas having GB groundwater are presumed to be provided with municipal water supply services (GeoDesign, 2004a).

From *The Atlas of the Public Water Supply Sources & Drainage Basins of Connecticut* (1982), the Rockville Quadrangle indicates that the Site is located within the Connecticut Major Basin, the Hockanum Regional Basin, and the Hockanum River Sub-basin. No water supply sources were indicated within a one-half mile radius of the Site (GeoDesign, 2004a).

2.2 Site History and Use

The Site is occupied by numerous buildings. The mill buildings were constructed between 1865 and 1869 by Albert Dart, a local blacksmith who developed several mills in the area. Textile

dyeing and finishing operations have been the main activity at the Site since that time (GeoDesign, 2004a).

At least two separate companies occupied the original mill buildings which make up the present Site. The White Manufacturing Company and then J.J. Regan manufactured cotton yarn and gingham cloth in what are now Buildings No. 1, 3, 4, and 5 until approximately 1909. The Rose Silk Company (for a very short time) and then Belding Brothers Silk Thread Mill occupied Buildings No. 8, 9, and 11. Belding Brothers Silk Mill operated at the Site from approximately 1868 through 1927 and took over the J. J. Regan portions of the Site (northwestern corner) in 1909. The property was reportedly vacant between 1927 and 1936. In 1936, the Site was occupied by American Dyeing Corporation, which subsequently changed its name to Amerbelle Corporation (GeoDesign, 2004a). Amerbelle Corporation operated until April 19, 2005, when the property was transferred to the HIVDC and the dyeing business was turned over to Amerbelle Textiles LLC (see Section 2.0). The business continues to operate as a tenant of HIDVC under the name Amerbelle Textiles LLC.

Belding Brothers' dyeing operations are believed to have been in Building No. 8 and ceased in 1927. From 1936 when American Dyeing Corporation took over the site, until the construction of Building No. 14 in 1956, dyeing operations were performed in Building No. 11. Dyeing operations have been performed in Building No. 14 since it was constructed (GeoDesign, 2004a).

Amerbelle Textiles LLC currently operates at the Site as a "commission dye house." The company performs dyeing, coating, and finishing of synthetic and blend fabrics for textile converters. Bales of nylon or polyester fabrics, typically linen-white in appearance, are received into the facility. Within Amerbelle's facility, the fabric is typically scoured, bleached, and dyed. Following the dyeing process, the fabric is typically processed through machines called calendars to tighten the weave. The fabric is then further processed by application of latex or solvent-based coating and/or a water-based finish solution. Following lay-up and inspection, the fabric is packaged and shipped either to the customer or to the next step in the textile converting process (GeoDesign, 2004a).

Amerbelle's dyeing and finishing operations are conducted inside Building No. 14. Dye

chemicals and dye stuffs are measured out and prepared for use in an area of the "Dye House" located in the northwest corner of Building No. 14 (Figure 2, Dye Mixing Room area). The dye chemicals and dye stuffs are then delivered out to the Dye House floor for use in three different types of dyeing processes: beam dyeing, jig dyeing, and jet dyeing. Finishes are applied to fabrics in the "Finish Department" located at the eastern end of Building No. 14. Finishes are applied by whole fabric immersion in a water-based finish solution. Finishes impart physical attributes to the fabric such as water-repellency or flame retardance. Finishes can also be applied to impart anti-microbial or anti-static properties to a fabric. Finish chemicals are measured out and prepared for use in an area in the southeast portion of Building No. 14. Finish chemicals are then applied to fabric at the feed ends of five finish "tenter frame" machines. The fabric is then dried in gas-fired drying ovens (GeoDesign, 2004a).

Amerbelle's dyeing and finishing operations consume large quantities of water for process use and for non-contact cooling. Amerbelle's water needs are largely met by withdrawing water on-site from the Hockanum River. Hockanum River water is pumped from the raceway and then processed through bag filters for use as non-contact cooling water, and through a combination of sand filters and bag filters for use as process water. Filtered water for process use is stored in several aboveground tanks and then pumped to the various dyeing and finishing machines. The water is batch mixed with dye chemicals, dye stuffs, and finish chemicals at the individual dyeing machines and finishing frames and applied to the fabric (GeoDesign, 2004a).

After processing, batches of dye, finish, and rinse wastewaters are discharged to a network of concrete floor trenches and sumps in Building No. 14. All of the wastewater is eventually conveyed to a stainless steel in-ground collection sump, located in the western portion of the building. From the sump, the wastewater is pumped to two 7,500-gallon aboveground stainless steel neutralization tanks for pH adjustment. Approximately 150,000 gallons to 200,000 gallons of dyeing and finishing wastewater is discharged to the sanitary sewer per day, in accordance with a state-issued sewer discharge permit (GeoDesign, 2004a).

Filtered river water is used for non-contact cooling in "cooling cans" located at the ends of the finish tenter frames and at the ends of the coating lines. Non-contact cooling water is also used in five water-cooled air compressors. The non-contact cooling water is discharged back into the Hockanum River at the northwestern portion of the Site, in accordance with a National Pollution

Discharge Elimination System (NPDES) permit issued by the state. Current flows of non-contact cooling water average about 200,000 gallons per day (gpd) (GeoDesign, 2004a).

Much smaller amounts of river water and "city" water are used for contact cooling, for laboratory use, for equipment maintenance, and for sanitary purposes. A total of approximately 2,000 gpd of process and sanitary wastewater are discharged to the sanitary sewer following use as boiler blowdown, floor washing, compressor condensate, quality control laboratory operations, and sanitary use (GeoDesign, 2004a).

Amerbelle's "Coating Department" is located indoors on the north side of Brooklyn Street (see Figure 2, Latex Coating and Solvent Coaters). Amerbelle operates one coating line for applying water-based "latex" coatings and two coating lines for applying solvent-based coatings. Solvent emissions from the two solvent coating lines are directed to a gas-fired thermal oxidizer or "incinerator" to accomplish destruction of volatile organic compounds (VOCs) prior to discharge to the environment, in accordance with a state-issued air emission permit (GeoDesign, 2004a).

Coatings are applied to one side of the fabric using knife-coating operations. The coated fabrics then enter drying ovens that are heated by natural gas (for the latex coater) or by air-to-air heat exchangers (for the two solvent coating lines). The air-to-air heat exchangers draw heat from the exhaust gases leaving Amerbelle's gas-fired thermal oxidizer. Amerbelle's coatings are either solvent-based or water-based, and include acrylics, acrylic and urethane blends, urethanes, and silicones. Amerbelle's solvent-based coatings typically contain toluene (40-45%), isopropyl alcohol (10-15%) and methyl ethyl ketone (2 to 3%) as the principal solvents. Coatings are typically applied to impart physical attributes such as custom pigmenting, breathable waterproofing, flame retardant properties, or anti-microbial or non-ravel properties (GeoDesign, 2004a).

Small amounts of wastewater generated by the clean-out of equipment used to mix and apply the latex coatings are discharged to the sanitary sewer in accordance with a state-issued discharge permit. Small amounts of waste generated by the clean-out of equipment used to mix and apply the solvent coatings are collected and disposed off-site as a hazardous waste (GeoDesign, 2004a).

After dyeing, coating and finishing, fabrics are subjected to inspection on the second floor of Building No. 14. Stains and marks on the fabric are removed by an airbrush applicator using trichloroethylene (TCE). Approximately three to nine gallons of TCE are used per month in this process. No waste TCE is generated (GeoDesign, 2004a).
A maintenance shop located within Building No. 12 performs typical maintenance functions including welding, minor machining (turning, milling, grinding), and electrical repair. A small mineral spirits parts cleaner is located here for maintenance department use. A second small parts cleaner is located in the boiler department in Building No. 5. The parts cleaner uses a citrus-based fluid (GeoDesign, 2004a).

A quality control laboratory is located on the second floor of Building 8. This lab conducts a variety of dyeing and finishing tests on fabric samples. The QC lab also performs dry clean testing on fabric samples and employs the chlorinated solvent perchloroethylene (PCE, also known as tetrachloroethylene). One to three gallons of PCE are used per month in this process. Waste PCE is accumulated and shipped off-site as a hazardous waste (GeoDesign, 2004a).

Challenge Sailcloth is a tenant at the Site and occupies portions of Buildings Nos. 8, 9, and 11. Challenge Sailcloth is also a customer of Amerbelle, and markets and distributes sail cloth which has been coated by Amerbelle. According to interviews performed by GeoDesign, Challenge Sailcloth does not use or store oils or hazardous materials as part of their operation. No such materials were observed during the Site visits by GeoDesign (GeoDesign, 2004a) or by M&E and EPA on September 8, 2004.

Land in the general vicinity of the Site currently consists mostly of residential properties. An automobile repair facility is located to the southeast, across Grove Street and east Main. Several light industrial/commercial buildings are located along the eastern side of Paper Mill Pond southeast of the Site (GeoDesign, 2004a).

The mill building located at the northeast corner of the Site is known as Daniel's Warehouse and is believed to have an industrial history similar to Amerbelle's. The building is believed to be currently used primarily for storage. Anocoil Corporation is located approximately 500-feet to the north and downgradient of the Site. Anocoil manufactures lithographic plates for the commercial printing industry (GeoDesign, 2004a).

2.3 Groundwater and Surface Water Resources

A small dam on the Amerbelle property impounds the Hockanum River and forms Paper Mill Pond across Grove Street to the east of the Site. From Grove Street, the Hockanum River flows through the Site, in a raceway constructed beneath Buildings Nos. 14, 7, and 5. The river flows from the southeast corner to the north-central portion of the Site. The raceway was constructed when the Hockanum River was first used to supply power to the textile mills (GeoDesign, 2004a).

The Water Quality Classifications Map of Connecticut, Thames River, Pawcatuck River, and Southeast Coastal Basin (CTDEP, 1986) indicates the groundwater underlying the Site is classified as GB. This classification indicates an area in which groundwater is known or presumed to be affected in quality by historic intense, urban, commercial, and industrial development. Areas having GB groundwater are presumed to be provided with municipal water supply services (GeoDesign, 2004a).

From *The Atlas of the Public Water Supply Sources & Drainage Basins of Connecticut* (1982), the Rockville Quadrangle indicates that the Site is located within the Connecticut Major Basin, the Hockanum Regional Basin, and the Hockanum River Sub-basin. No water supply sources were indicated within a one-half mile radius of the Site (GeoDesign, 2004a).

2.4 Site Features and Utilities

The Site is occupied by various buildings as described in Sections 2.1 and 2.2. The property is supplied with heat from two large industrial boilers located in the northern central portion of the property. The boilers are each authorized to burn either natural gas or specification used fuel oil. Natural gas is piped to the facility. Specification used fuel oil is stored in two 18,000-gallon ASTs that are located inside a concrete containment structure that is fully-covered by a prefabricated metal building enclosure. Four oil-filled transformers are located outdoors inside a fenced enclosure, just to the east of the fuel oil tanks. One large transformer is marked as non-PCB containing. Three smaller transformers are indicated to contain PCBs (GeoDesign, 2004a).

2.5 Environmental Studies and Information

The following sources of information were provided by the town of Vernon and the USEPA. Historical investigations include Phase I and Phase II investigations by GeoDesign.

According to the GeoDesign Phase I, no environmental investigations occurred at the property prior to the 2004 Phase I investigation. GeoDesign conducted extensive file review as part of the Phase I. This included reviews of the following: Sanborn Fire Insurance Maps, historical facility map, aerial photographs, facility file information obtained from Amerbelle, and file reviews at the town offices (Tax Assessor's Office, Clerk's Office, Health Department, Building and Zoning Department, Sewer Department, and Fire Department) and Connecticut Department of Environmental Protection (CTDEP). GeoDesign also reviewed an Environmental Data Resources, Inc. (EDR) report for the property.

Phase I field activities conducted by GeoDesign included a review of available file information and determination of potential areas of environmental concern at the property. The file review identified former USTs in two areas: one area at the current location of the fuel oil ASTs, and another area south of Building 14 (former xylene USTs; see Figure 2).

The two steel 20,000 gallon USTs formerly located in the fuel oil AST area were used to store fuel oil of various types and were removed in 1989. No documentation was found that summarized the condition of the tanks upon removal or the condition of the subgrade, but Amerbelle located analytical reports that appear to be from tank closure soil samples, showing a maximum TPH concentration of 150 mg/kg. Amerbelle also located a letter to CTDEP documenting approval from the town of Manchester landfill to dispose of excavated soil there. From these records it is inferred that contaminated soil was excavated and removed from the Site prior to installation of the ASTs in the same area.

The former xylene USTs were of steel construction and were removed in 1993. No records were located by GeoDesign indicating post-excavation soil sampling or oversight of the tank removal by the town fire marshal or other regulatory agency. Amerbelle personnel indicated to GeoDesign that there are no known USTs on site at the present time.

According to interviews conducted by GeoDesign (2004a), the Town of Vernon was replacing a sewer line within Brooklyn Street in 1994 and encountered warm, dye-colored water in the sewer line excavation. The town notified Amerbelle of the potential release and installed clay dams within the sewer line excavation to minimize the migration of the water along the coarse backfill for the new line. Amerbelle took action to re-line the trenching and containment troughs underlying dyeing machines in Building 14, but was never able to determine if these troughs were the actual source of the release of the dye-colored water (GeoDesign, 2004a).

The Recognized Environmental Conditions identified in the GeoDesign Phase I, including the former UST locations, are presented in Appendix A (see figure extracted from the GeoDesign report).

GeoDesign conducted Phase II activities to address selected potential areas of concern identified during Phase I activities. During Phase II, GeoDesign performed eleven soil borings and completed five of the borings as monitoring wells. The locations are shown on Figure 2. Soil samples were collected, and four of the five wells were sampled (one, AM-5, was not sampled because it was found to be dry when the sampling team attempted to sample it). The remaining wells were sampled over a period of several days due to lack of groundwater recharge. The data summary tables from the Phase II are reproduced in Appendix A. The boring logs from the GeoDesign Phase II are also included in Appendix A.

3.0 PRELIMINARY CONCEPTUAL SITE MODEL

The objective of the conceptual site model (CSM) is to provide a representation of the nature and extent of contamination in soil and groundwater at the site that can be utilized to develop subsequent environmental investigation and remedial plans. A preliminary evaluation of the areas of concern (AOCs), contaminants of concern (COCs), potential receptors, migration pathways, and data gaps is presented below, based on the work performed by GeoDesign (2004a, 2004b). The TBA investigation locations and analyses that were planned to help address identified data gaps are also discussed below.

3.1 Areas of Concern

Table 1 presents a summary of the Recognized Environmental Conditions (areas of concern) identified by GeoDesign in the Phase I ESA (see figure in Appendix A), the associated GeoDesign Phase II Environmental Assessment investigation location (borings and/or wells), and the contaminants of note that were detected (as summarized from results presented in the tables in Appendix A). Remaining data gaps and TBA investigation locations (both planned locations and completed locations) are also included in Table 1 and shown on Figure 3. The Phase II Environmental Assessment report (GeoDesign, 2004b) noted that it was difficult to access many locations to install borings and wells because of underground utilities and building/equipment locations. It was also noted that for several potential well locations, a well could not be installed because the water table was below the bedrock surface. During the September 8, 2004 site visit by M&E and EPA, these conditions were discussed, and it was agreed that TBA efforts would focus on installation of additional wells (in bedrock as needed), and gaining access to areas not previously sampled because of subsurface utilities. Six locations were proposed to install additional wells site-wide, investigate locations where soil contamination was encountered during the Phase II, and install wells where subsurface utilities had previously precluded installation. Vacuum excavation was used to avoid utility damage at the Brooklyn Street location (location ME-2 on Figure 3), and a drill rig with rock coring capability was used so that wells could be installed in the rock as needed.

During a pre-bid site visit on October 18, 2005 with M&E, potential drilling subcontractors and Amerbelle representatives in attendance, it was determined that proposed location ME-4 on Figure 3 would not be performed because of the extreme difficulty of moving a drill rig into

Building No. 3. Alternative locations in the vicinity were examined but none was deemed satisfactory, and it was decided to focus efforts on other locations. Location ME-3 on Figure 3 was attempted twice but could not be completed as a monitoring well, as discussed in more detail in Section 4, because the bore hole collapsed before a well casing could be installed.

3.2 Contaminants of Potential Concern

The contaminants of potential concern that GeoDesign analyzed during the Phase II investigation included VOCs, semivolatile organic compounds (SVOCs), petroleum hydrocarbons, metals, and two chemicals related to the dyeing business (formaldehyde and aniline). The Phase II analyses included reporting of Tentatively Identified Compounds (TICs) with the intent of possibly identifying other dye-related chemicals not typically reported for VOC and SVOC analyses, should they have been present in soil or groundwater. The data summary tables prepared by GeoDesign are reproduced in Appendix A.

VOCs. Very low levels of petroleum-related VOCs were detected in soil and groundwater during the Phase II investigation. Although detected levels were very low, the use of solvents at the site suggests that VOCs remain contaminants of concern, so additional sampling and analysis was included in the TBA investigation.

SVOCs. No SVOCs were detected in the samples collected during the Phase II investigation. However, these compounds remain contaminants of concern because of their presence in dyeing chemicals. Polynuclear Aromatic Hydrocarbons (PAHs) are a subset of the SVOCs that may also be present due to their association with petroleum and ash, both of which may be present in site soil. Additional soil and groundwater sampling and analyses for SVOCs were performed during the TBA investigation.

Petroleum Hydrocarbons. Extractable Total Petroleum Hydrocarbon (ETPH) analyses were performed during the Phase II investigation, and concentrations in soil samples that exceeded Connecticut RSR residential direct exposure criteria (RES DEC) were reported at two locations (see table in Appendix A): AM-1 (1 to 3 foot sample, 930 mg/kg) and AM-6 (5 to 6 foot sample, 770 mg/kg). Neither of these concentrations exceeds the Industrial Commercial DEC (I/C DEC) of 2500 mg/kg. Detectable concentrations of ETPH below applicable criteria were present at

several other soil sample locations and also in groundwater samples. Oils are used extensively at the site. ETPH analyses were included for both soil and groundwater as part of the TBA investigation.

Metals. Certain metals were detected by GeoDesign in site soil and/or groundwater at levels exceeding Connecticut RSR criteria for direct exposure (soil) or surface water protection (groundwater). Arsenic was detected at a concentration of 122 mg/kg in the 3 to 5 foot sample from location AM-1. Lead was detected in the 5 to 7 foot sample from location AM-4 at a concentration of 438 mg/kg, which exceeds the 400 mg/kg value that CTDEP currently requires for soil at residential properties to be protective of human health, in accordance with CT Department of Public Health standards. Arsenic and copper were detected in the groundwater sample from AM-7 at concentrations exceeding the Surface Water Protection Criteria (SWPC), and zinc was detected in the groundwater sample from the town-installed well W-1 at a concentration above its SWPC.

The metals detected in soil samples may be related to the presence of ash on site, as noted in the Phase II assessment report. The leachability of the metals via Synthetic Precipitation Leaching Procedure was not evaluated during the Phase II investigation. The TBA investigation included total metals mass analyses for soil samples, and selection of a subset of the soil samples for the SPLP metals extraction/analysis based on the results of the metals mass analyses. Groundwater samples were also analyzed for total metals. The analyte list was the Connecticut RSR list of metals, consistent with the Phase II investigation.

Aniline. Aniline, a dye-related compound, was analyzed but was not detected in soil or groundwater during the GeoDesign Phase II investigation. Along with the SVOCs routinely reported that are regulated under the Connecticut RSR, the laboratory that performed the SVOC analyses for the TBA investigation was directed to report aniline as a Tentatively Identified Compound (TIC) if it was identified in any TBA samples.

Formaldehyde. Formaldehyde was analyzed in soil and groundwater samples during the Phase II investigation using EPA SW-846 Method 8315. Formaldehyde was not detected in the groundwater samples. It was detected in two soil samples at concentrations of 17 mg/kg and 9.3 mg/kg. There are no Connecticut RSR criteria for formaldehyde, but EPA Region 9 has

established a residential soil Preliminary Remediation Goal (PRG) for formaldehyde of 9,200 mg/kg and an industrial soil PRG of 100,000 mg/kg (EPA Region 9, 2004). Because the concentrations of formaldehyde detected are orders of magnitude below these PRGs, the TBA investigation analytical plan did not include sampling and analysis for formaldehyde.

Benzidine. Benzidine is an SVOC that is similar to aniline and is related to dye manufacturing and use. In the past, industry used benzidine to produce dyes, but benzidine has not been made for sale in the United States since the mid-1970s and major U.S. dye companies no longer make benzidine-based dyes (ATSDR, 2001). The GeoDesign Phase II investigation included benzidine as part of their Method 8270 SVOC analyte list, and benzidine was not detected. However, the reporting limit for benzidine by Method 8270 is greater than risk-based screening values for this compound, such as the Region 9 Preliminary Remediation Goals for soil and water. Benzidine is not regulated under the Connecticut RSR. Analysis for benzidine is not commonly performed, and it is very difficult to attain reporting limits as low as the Region 9 PRG. Similar to the GeoDesign investigation, the TBA investigation laboratory screened for benzidine in the SVOC samples and ran a standard for benzidine, so that if it were detected, the concentration could be quantified.

PCBs. During the GeoDesign Phase II investigation, the PCB transformer area was inspected and a soil sample was collected for PCB analysis using EPA SW-846 Method 8082. No PCBs were detected at a reporting limit of 400 ug/kg for each of the Aroclors. The TBA investigation analytical plan did not include additional sampling and analysis for PCBs.

The soil and groundwater analyses performed at each sampling location during the TBA are summarized in Table 2.

3.3 Potential Migration Pathways and Receptors

Because the site is almost completely paved or covered with buildings, potential migration pathways are limited to leaching of contaminants from soil into groundwater and resulting transport to the groundwater discharge point (presumed to be the Hockanum River), and/or volatilization of VOCs from groundwater or soil and subsequent migration to the indoor air of the on-site buildings. Because the site is to remain in industrial use, it is not anticipated that future

development of the site would result in removal of pavement and possibly alter the migration pathways to include direct exposure to soil and groundwater, surface water runoff, or windblown deposition of contaminated soil particles.

In some portions of the site, groundwater is entirely within the bedrock. The bedrock is highly weathered and fractured, and transport of groundwater contamination or Dense Non-Aqueous Phase Liquid (DNAPL) contaminants via bedrock fractures is a possibility. Transport of contamination via bedrock fractures, if occurring, would not necessarily correspond to the prevailing groundwater flow direction.

Currently, potential receptors appear to be limited to persons who could potentially be exposed to indoor air containing VOC contamination, and persons or flora and fauna that may be exposed to groundwater migrating from the site. The area is served by public water; therefore there is little chance of local residents consuming affected groundwater. Potential future receptors include construction workers who perform intrusive activities that could expose workers to potentially contaminated soil, soil gas, and/or groundwater.

4.0 TBA INVESTIGATION

The TBA investigation was conducted in November-December 2005 and January 2006 and consisted of soil borings with surface and subsurface soil sampling, installation of monitoring wells in overburden and bedrock, and groundwater sampling.

4.1 Soil Borings

Soil borings were drilled on November 28th through December 3rd, 2005. Soil borings located outdoors were advanced using a truck-mounted hollow-stem auger drill rig, which was re-tooled for rock coring using either an H-size or N-size core barrel for locations where the boring was advanced into bedrock. A roller-bit was used to create a socket to seat casing prior to beginning rock coring activities. The one indoor boring (Location 3) was advanced using a propane-powered skid-mounted rig because the location could not be accessed with the truck-mounted rig. At this location, it was necessary to use drive and wash drilling techniques in the overburden because the skid-mounted rig could not drive augers. Overburden soil samples were collected continuously from each boring using split-spoon samplers, with the exception of ME-2. Location ME-2 in Brooklyn Street was first cleared using vacuum excavation to a depth of five feet below ground surface (bgs) before roller bit drilling and rock coring were used to advance the well into bedrock. No soil samples were collected from ME-2.

The soil samples from each boring were logged and characterized, and observations were made to attempt to identify possible impacts by oil or hazardous materials (OHM). These observations included recording the visual appearance of the samples (looking for evidence of petroleum, ash, and other possible evidence of contamination), and field screening for total volatile organic compounds using a PID. The PID was used to screen the soil samples when they were first opened, and then again as a headspace after the soil was allowed to sit in a sealed bag for several minutes. Soil boring locations are shown on Figure 3, and soil boring logs are included in Appendix B.

Five soil borings were drilled throughout the site, identified as ME-1, ME-2, ME-3, ME-5, and ME-6 on Figure 3. Location ME-4 was not attempted because of difficulties in accessing the location that were identified during the pre-bid drillers meeting. Locations ME-1, ME-2, ME-5,

and ME-6 were completed as monitoring wells. Location ME-3 could not be completed as a well because the hole collapsed before the well casing could be placed. Two attempts were made to install a well at ME-3 without success. As noted in the boring log for ME-3, a large fracture zone was encountered in the boring that was filled with gravel, and this fracture is believed to have caused the collapse of the borehole.

Soil samples for laboratory analysis were typically collected from surface soil (defined as the interval from the ground surface to no more than 4 feet bgs), and from subsurface soil (greater than 4 feet bgs) near the water table for locations where the water table was within the overburden. The sampled intervals and analyses performed for each location are presented in Table 2.

4.2 Monitoring Well Installation and Groundwater Sampling

Four monitoring wells were installed at the site during the TBA field investigation. The wells are identified as ME-1, ME-2, ME-5, and ME-6 on Figure 3 and were constructed in the soil boring locations bearing the same identifications. Wells ME-1, ME-2, and ME-6 were completed in the bedrock, and well ME-5 was completed in the overburden.

All wells were constructed using two-inch schedule-40 flush joint PVC. The monitoring wells were screened across the water table with a 10-foot section of 10-slot PVC well screen and brought flush to grade with a solid PVC riser that was capped and housed in a six-inch aluminum gate box. The well construction consisted of sand pack in the annular space around the PVC from the bottom to approximately 2 feet above the top of the well screen, 1 foot of hydrated bentonite chips, sand above the bentonite, and a concrete pad with flush mount gate box. Well installation logs are included in Appendix C.

Well development was completed following installation of groundwater monitoring wells. The wells were developed by pumping to remove fine-grained particles until the water produced was relatively clear.

Existing overburden monitoring well AM-7 and the newly installed wells ME-1, ME-2, ME-5, and ME-6 were sampled on January 31 and February 1, 2006. Wells ME-1, ME-2, and ME-6 were

installed in the bedrock and were sampled using EPA low-flow methods (July, 1996). During groundwater sampling, the purge water was monitored for temperature, pH, specific conductivity, oxidation reduction potential, dissolved oxygen and turbidity (collectively referred to as field parameters). Groundwater sampling was initiated upon stabilization of these field parameters. Field sampling worksheets are included in Appendix D.

Because of the low volume of water within each well coupled with low recharge, the overburden monitoring wells (ME-5 and AM-7) could not be sampled with strict adherence to the EPA low-flow procedure. Instead, these wells were sampled with a peristaltic pump without use of a flow cell to monitor for field parameter stabilization. Also, because of elevated turbidity, the samples from these wells designated for metals analysis were field-filtered by pumping the water through an in-line filter prior to filling the sample bottles and preserving the samples with nitric acid. Also because of limited volume, it was not possible to collect sufficient sample to allow analysis of all parameters originally specified (VOC, SVOC, metals, and ETPH). ME-5 was sampled for VOCs, ETPH, and metals, but SVOC analysis was omitted. AM-7 was sampled for SVOCs and metals, but the VOC and ETPH analyses were omitted.

4.3 Geologic and Hydrogeologic Conditions

Amerbelle Textiles sits astride a bedrock knoll located on the edge of a large valley that contains American Mill Pond east of the site, and further to the northeast Shenipsit Lake. Topographically, the land surface slopes downward to the west, north, and northeast on and adjacent to the site. To the south the topography is relatively level and to the southwest and east the topography rises in elevation. In general, the underlying overburden at the site consists of a thin mantle of red/brown sandy soils with some semblance of a till, especially at depth. The soils at depth were also generally finer-textured silts, just above bedrock. A natural soil sequence, however, was not observed because of the urban location and the years of construction and maintenance of the facility and town improvements of roadways and utilities. Most soils at the site could be described as fill, most likely native soils that were disturbed by urban practices. Depths to bedrock ranged from 3 to 13.5 feet below ground surface and, in general, bedrock appeared to be deeper to the northeast.

Bedrock at the site consists primarily of gneiss derived from rocks with compositions ranging from felsic to mafic, with an overlying yellow-gold micaceous, phyllitic/schistose rock. The bedrock in general was highly weathered near the surface and well fractured. At ME-3, the thickness of the phyllite/schist was thicker than at the other boreholes and contained a bed of graphitic schist. At well ME-6, there was a zone of quartzite along with the gneiss. Gneiss was also found in both wells ME-1 and ME-2.

Bedrock fractures were apparent in the rock cores that were retrieved. While multiple fractures were found in ME-1 and ME-2, they were relatively small compared to fractures found at well locations ME-3 and ME-6. The fractures encountered at ME-3 and ME-6 were very large (~2 feet) bedrock fractures containing heavily weathered bedrock and gravel. In both well ME-3 and ME-6, these large fractures were encountered above groundwater and were followed by many large fractures below the water table. In both cases, the fractures appeared to be highly conductive based on the amount of drilling water that was lost to the borehole while drilling. In ME-3 the borehole repeatedly collapsed before smaller casing or a well could be inserted.

Overburden groundwater at the site was discontinuous and (when observed) it occurred in the finer material at the base of the overburden (on top of bedrock). In general, it appears that there is an increase in overburden groundwater to the northeast, however, due to the urban nature of the site and site conditions, it is difficult to determine the exact nature of the overburden groundwater. ME-1 contained no overburden groundwater, while ME-2 appeared to have 2 to 3 inches of water atop bedrock. ME-3 was indeterminate due to the different drilling technique (drive and wash). Wells ME-5 and ME-6 both contained approximately 2 feet of overburden groundwater. At well ME-5 (the only overburden well installed), the increase in saturated thickness may be the result of trapped groundwater due to the location of ME-5. Well ME-5 is surrounded by building foundations to the north and east, and the raceway to the west. Additionally, well ME-5 is in a loading dock depression. Well ME-6, a bedrock well, is in a similar situation as ME-5, located in a loading dock and surrounded by building foundations. The difference between overburden groundwater depth (10.8 feet) and bedrock groundwater depth (19.5 feet) at well ME-6 suggests a poor connectivity between overburden groundwater and bedrock groundwater. In wells ME-1 and ME-2, the groundwater elevation in the bedrock was between 2.2 and 6.6 feet below the top of bedrock, also suggesting that the overburden and bedrock groundwater zones at the site are not well connected. There are two lines of

evidence, however, that suggest that there is at least a partial connection between bedrock and overburden. The first is that in all borings where rock cores were collected, weathered bedrock and fractures (often large) were encountered in the upper (top) portion of the bedrock. The second line of evidence was visual/olfactory observance of petroleum/solvent contamination in both the overburden and bedrock groundwater at monitoring well location ME-6; though bedrock groundwater seemed to be more highly contaminated (stronger odors) than the overburden.

The hydrology of the site is impacted by the anthropogenic features of the site. Nearly 100 percent of the site is covered by impervious features (asphalt parking lots, buildings, etc), drainage systems, and roads. The impervious cover severely limits direct groundwater recharge to the site; therefore most recharge to the overburden (and bedrock) comes from up gradient adjacent properties (west and likely south).

Based on the evidence from the drilling program, a conceptual model of the site hydrogeology was developed. The thin overburden aquifer resides in the fine textured soils just above bedrock. The groundwater in the overburden either seeps laterally along the bedrock surface or flows downward into the bedrock where gradients are downward and vertical permeability permits it. Contaminant migration may also follow in a similar fashion. Due to the elevation and the complex fractured rock hydrogeology, the groundwater table in the bedrock is typically below the bedrock surface at the site. The interpretation of bedrock hydrogeology is further complicated by the sheer vertical drop (in particular to the north) and the large number of buildings that cover the site and adjacent properties. Groundwater in the bedrock is likely derived from a combination of infiltration from overburden and recharge from off site. A groundwater elevation map based on elevations obtained from the TBA-installed wells and AM-7 is presented in Figure 4. While the contours are inferred in many instances due to limited bedrock well coverage (note ME-5 and AM-7 are overburden wells), the overall direction of groundwater flow appears to be to the northwest towards American Mill Pond.

5.0 ANALYTICAL DATA EVALUATION

The laboratory analytical data from the TBA investigation are presented and discussed in this section. Soil analytical results are presented in Table 3 (VOCs), Table 4 (SVOCs and metals), and Table 5 (ETPH). Groundwater analytical results for all parameters are summarized in Table 6. The tables present only those organic analytes that were detected in one or more samples, while results for all of the CT RSR metals are presented. Laboratory data sheets and data validation memoranda are provided in Appendix E.

Data are compared to criteria contained in state regulations. The Regulations of Connecticut State Agencies ("RCSA") Sections 22a-133k-1 through 22a-133k-3, inclusive, comprise the Remediation Standard Regulations ("RSRs"). The RSRs apply to investigation and remediation of properties that are being transferred and meet the definition of "establishment" in the Connecticut Property Transfer Law. The RSRs also apply to sites undergoing voluntary remediation under RCSA Section 22a-133x or Section 22a-133y, and to remedial actions required by an order of the Commissioner pursuant to Chapter 445 or 446k of the Connecticut General Statutes. The CTDEP also suggests using the RSRs for guidance on sites that do not fit these categories, but are undergoing investigation and/or remediation.

The CTDEP RSR criteria included in Tables 3, 4, and 5 for comparison to the soil results are the industrial/commercial and residential direct exposure criteria and the GB pollutant mobility criteria (I/C and RES DEC and GB PMC, respectively). The site is classified as industrial/commercial and is expected to remain that way, but the residential direct exposure criteria are also included on the tables for information purposes. The CTDEP RSR criteria applied to the groundwater results are the proposed revised industrial/commercial and residential volatilization criteria (I/C VC and RES VC, respectively) (CTDEP, March 2003), and the surface water protection criteria (SWPC).

5.1 Soil Samples

Surface and subsurface soil samples were collected from locations ME-1, ME-3, ME-5, and ME-6 on Figure 3 and submitted for laboratory analysis. Analytical results from samples are summarized by contaminant below.

VOCs. Very low concentrations of VOCs (predominantly ethylbenzene and xylenes) were detected in the 2 to 2.5 foot bgs sample from location 3, the boring advanced inside Building 14 that collapsed before it could be completed as a monitoring well (Table 3). The detected concentrations are orders of magnitude below CT RSR criteria. Methylene chloride was detected in the subsurface soil sample from ME-5 (10 to 12 feet bgs), but this compound was also detected in the associated trip blank and is considered unlikely to be an actual site contaminant.

SVOCs. Most of the compounds detected in site soil samples are in the subset of SVOCs known as polycyclic aromatic hydrocarbons (PAHs) and related compounds (dibenzofuran and carbazole, see Table 4). PAHs are typically formed during the incomplete burning of organic material including wood, coal, oil, gasoline and garbage and are also found in coal tar, creosote, and asphalt (MassDEP, May 2002). PAHs are frequently found in soil because of the widespread historic practice of emptying fireplaces, stoves, and boilers in both rural and urban areas (MassDEP, May 2002). The concentrations found in site soil samples are fairly uniform and are below the applicable CT RSR criteria (both direct exposure and pollutant mobility). It is considered likely that the concentrations of PAHs are indicative of background concentrations for soil in the vicinity of the site, rather than a release of OHM. For the surface soil sample from ME-5, the boring log also noted the presence of coal ash in the sample which may be a source of the PAHs detected in that sample.

Concentrations of two other commonly encountered SVOCs, the phthalate esters di-n-butyl phthalate and bis(2-ethylhexyl)phthalate, were also detected in site soil samples. The phthalate esters are most often used as plasticizers and are not specifically related to the dyeing process. The concentrations detected were well below CT RSR criteria and are not indicative of a specific release of these compounds to site soil.

Metals. Arsenic was detected in one soil sample (ME-5, 0 to 4 feet bgs) at a concentration of 54.4 mg/kg, which is five times the RES and I/C DEC (Table 4). The arsenic concentrations detected in other TBA-collected soil samples were below direct exposure criteria and appear to be consistent with natural soil background concentrations. No other detected metals concentrations approached or exceeded direct exposure criteria for the soil samples collected during the TBA. The lead concentration in one soil sample collected by GeoDesign (AM-4, 5 to

7 feet below ground surface) exceeded the current CTDEP criterion for lead in residential soil of 400 mg/kg, but for the TBA-collected samples no lead concentrations approached this value, nor did any of the other GeoDesign-collected samples. It is possible that the lead is localized in the subsurface soil near AM-4.

An examination of the boring log for ME-5 (Appendix B) shows that the 0 to 4 foot soil sample was likely impacted by coal ash and coal chips. A similar observation was made by GeoDesign (2004b) at the nearby boring location AM-1, where arsenic was also detected at an elevated concentration (122 mg/kg) and ash and slag were noted in the boring log (see Appendix A). It is considered likely that the source of the arsenic in this part of the site is coal ash mixed with soil and used as fill. This area of the site is paved, and therefore there is no current exposure to the soil.

SPLP extraction/metals analysis was requested for seven of the eight soil samples collected (Table 4). No metals were detected in SPLP extracts at concentrations approaching their respective pollutant mobility criteria (the GB PMC). Results for mercury were rejected during data validation because of an exceedance of the holding time for mercury of 28 days. However, based on the mass analysis results for mercury, it would not be possible for the soil samples to have leached mercury at a concentration exceeding the mercury GB PMC, even if all the contained mercury were to leach out. Therefore, the rejection of the mercury results does not constitute a data gap in terms of evaluating pollutant mobility for mercury.

ETPH. Table 5 presents the ETPH concentrations detected in site soil samples collected during the TBA. Low concentrations ranging from 21 mg/kg to 75 mg/kg were detected. These concentrations are well below the RES and I/C DEC and do not indicate the presence of a significant release of petroleum hydrocarbons to the site. Soil samples collected by GeoDesign (2004b) and analyzed for ETPH showed higher concentrations, with two results exceeding the RES DEC of 500 mg/kg (AM-1, 1 to 3 feet bgs at 920 mg/kg, and AM-6, 5 to 6 feet bgs at 770 mg/kg). No reported results exceeded the I/C DEC of 2500 mg/kg. AM-1 is located near ME-5 in a loading dock area where oil releases from vehicles are likely to have occurred. AM-6 is located within Building 3 which currently serves as a general storage area.

5.2 Groundwater Samples

Groundwater samples were collected from the TBA-installed wells (ME-1, ME-2, ME-5, and ME-6) and from the GeoDesign well AM-7. AM-7 was selected for sampling because arsenic and copper were detected in the sample from this well during the GeoDesign investigation at concentrations exceeding their respective SWPC. GeoDesign also sampled town well W-1, and zinc was detected in that sample in excess of the SWPC. However, town well W-1 was not selected for re-sampling during the TBA because of the unavailability of construction details for that well, and because ME-2 was installed in the same area. The results of the TBA groundwater sampling event are presented in Table 6. The results of the 2004 GeoDesign groundwater sampling event are reproduced in Appendix A.

VOCs. Except for low concentrations of acetone in the sample from ME-2, detections of VOCs were limited to the sample from ME-6 located in the northernmost portion of the site near Building 8 and the neighboring property known as Daniel's Warehouse. ME-6 is a bedrock well, and the bedrock at that location was observed to be highly fractured. The VOCs detected were the chlorinated solvents TCE and PCE and their biodegradation products cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, and vinyl chloride. PCE, TCE, and cis-1,2-DCE were present at concentrations in the hundreds of parts per billion range. The concentration of TCE exceeded the Industrial/Commercial Volatilization Criterion (I/C VC). Traces of two trichlorobenzene isomers were also detected. Chlorinated solvents were not detected in any other wells sampled during the TBA.

The source of the chlorinated solvents in site groundwater is not known. TCE and PCE are both used at Amerbelle in very limited quantities (GeoDesign, 2004a). According to the GeoDesign Phase I report (GeoDesign, 2004a), after dyeing, coating and finishing, fabrics are subjected to inspection on the second floor of Building No. 14, and stains and marks on the fabric are removed by an airbrush applicator using TCE. Approximately three to nine gallons of TCE are used per month in this process and no waste TCE is generated (GeoDesign, 2004a). PCE is used in a quality control laboratory located on the second floor of Building 8 to perform dry clean testing on fabric samples. One to three gallons of PCE are used per month, and waste PCE is accumulated and shipped off-site as a hazardous waste (GeoDesign, 2004a). Because both TCE and PCE are apparently used at the site (and were likely also used in the past), it is

possible that one or more releases occurred and are the source of the TCE and PCE detected in the bedrock groundwater from ME-6. The storage area for 55-gallon drums is located in Building 11 which is near ME-6. Floor drains in Building 11 are now sealed, but the potential for a release existed in the past.

Another possible contributing source is the Roosevelt Mills site at 215 East Main Street, approximately one-half mile to the east of the Amerbelle site. The Roosevelt Mills site is a former woolen mill that included dry cleaning operations. The EPA Superfund Innovative Technology Evaluation Program (SITE) has been studying the site and evaluating a chemical oxidation technology to remediate chlorinated solvents that have been released there. A *Site Characterization and Treatability Study Report* released in July 2005 (EPA, 2005, reproduced in Appendix F) identified a pure-phase PCE source area (DNAPL) existing as distinct globules underneath the Roosevelt Mills building, and a chlorinated solvent plume emanating from this source area that contains PCE and the breakdown products TCE, DCE, and vinyl chloride. The report indicates that the plume is moving to the southwest. The laboratory-scale tests of chemical oxidation included in the report indicated that the technology was effective in reducing the concentrations of chlorinated solvents in the site soil and groundwater. Work is ongoing to perform an in-situ pilot test of the chemical oxidation technology at the site. Dr. Scott Beckman of Science Applications International Corporation (SAIC) is overseeing the work at the site on EPA's behalf, and he provided some groundwater quality data from bedrock wells located at the site (see Appendix G). PCE and TCE contamination is evident in the bedrock wells at the site, but concentrations are considerably lower than those observed in the sample from ME-6 on the Amerbelle site. However, given the presence of DNAPL at the Roosevelt Mills site (EPA, 2005) and the complexities of contaminant transport in fractured bedrock, the possibility that the Roosevelt Mills source area is contributing to the chlorinated solvent contamination observed in the groundwater at ME-6 cannot be ruled out.

SVOCs. The groundwater sample from bedrock well ME-2, located in Brooklyn Street, showed low-level detections of bis(2-ethylhexyl)phthalate and aniline. Aniline was quantified by the laboratory as a Tentatively Identified Compound (TIC) because it is not a routinely analyzed SVOC and is not regulated under the CT RSR. Aniline is of interest, as discussed in Section 2, because of its use as a component of dyes. The vicinity of ME-2 is the area where dye-colored

water was observed during sewer installation in Brooklyn Street, and the aniline detection may be a remnant of that past release.

ETPH. Low concentrations of ETPH (extractable total petroleum hydrocarbons) were detected in all groundwater samples collected. ETPH was also detected in the wells sampled by GeoDesign in 2004. Specific analytes that are typically found in petroleum hydrocarbon products, and for which there are CT RSR criteria (for example, the VOCs benzene, toluene, ethylbenzene, and xylenes; and the PAHs), were not detected in the corresponding samples. Releases of petroleum hydrocarbons and/or organic dyes may have occurred over the years that are reflected in the ETPH detections.

Metals. Chromium, copper, and lead were detected in the sample from ME-2 and its field duplicate at concentrations exceeding the SWPC. The field team also observed a bluish-green color to the sample from ME-2 when it was preserved with nitric acid. Groundwater in this vicinity may be showing residual impacts from the release of dye-colored water encountered in Brooklyn Street when new sewers were being installed.

For existing well AM-7, exceedances of SWPC were observed for copper and zinc. The GeoDesign results for AM-7 (2004b – see Appendix A) showed SWPC exceedances for arsenic in addition to copper, but the zinc concentration was much lower than was observed during the 2006 TBA sampling event. For both sampling events, the metals sample was filtered before preservation and analysis, and therefore elevated metals concentrations cannot be attributed to high sample turbidity. The source of the metals in the groundwater from AM-7 is not known.

5.3 Data Usability Assessment

Samples were analyzed by a directly-subcontracted laboratory. Quality control (QC) samples were also collected and submitted for laboratory analysis to monitor and evaluate laboratory and sampling performance. The field QC samples collected included trip blanks, field duplicates, and matrix spike/matrix spike duplicate samples.

M&E conducted a limited QC review/validation of analytical laboratory data in accordance with the EPA-approved FTWP (M&E, 2005). The review/validation provides an overview of the

laboratory and field QC data by identifying potential QC issues and assessing common QC criteria that might affect reporting and usability of the environmental data, as well as verifying that the laboratory has met minimum data acceptance criteria established by M&E. Although the limited review/validation was based on EPA Region I data validation guidelines (U.S. EPA, 1996), it was more limited in scope. The review/validation performed by M&E consisted of completing Tier II-like forms only for applicable criteria parameters, assessing data usability, and summarizing the results in abbreviated Tier II-like memoranda. The validation memoranda are included in Appendix E.

Data Qualifiers - General

Data found to be suspect during the validation/review process were qualified. Laboratory data forms were revised by hand to indicate any validation qualifications that supersede laboratory qualifiers and are included in the data validation memoranda. The final validation qualifiers are consistent with EPA validation guidelines. Positive results that were shown to exhibit poor precision or accuracy were qualified as approximated and flagged with a "J." Results with a J flag are still usable for project objectives, but such results are of reduced precision or accuracy as compared to positive results that are not so flagged. Nondetect results were flagged with a "UJ" if the associated QC data did not meet applicable criteria. Positive results were not qualified if they were found to meet all validation criteria. Nondetect results that were found to meet the validation criteria were shown as the quantitation limit or detection limit followed by a "U" qualifier. Sample data that failed to meet associated QC criteria were rejected and flagged with an "R" using EPA data validation guidelines. Because rejected data are unusable for project objectives, the numerical result or quantitation limit for a rejected result is not presented in the data summary tables and should not be relied upon for making site decisions.

Data Qualifications of Note

VOCs in Soil. For sample ME-5 (10 to 12 feet bgs), the reported result for methylene chloride was qualified with the "TB" flag, indicating that methylene chloride was also detected in the trip blank associated with this sample. This flag indicates that the result for methylene chloride in the sample may not be actual sample contamination, but may have arisen from cross-contamination that also affected the trip blank. Menthylene chloride was not detected in any

other soil sample at a concentration greater than the blank action limit applicable to the samples.

SVOCs in Soil. Soil sample ME-1 (0.5 to 3 feet bgs) was analyzed as a matrix spike/matrix spike duplicate (MS/MSD). The reported results for 2,4-dinitrophenol and pentachlorophenol in the sample were rejected because of very low recoveries of these compounds in the MS/MSD. These compounds were not detected in any other soil samples from the site and were not suspected to be present based on the site history.

SPLP Metals. SPLP metals results for mercury were rejected in all samples because of an exceedance of the holding time for mercury of 28 days. However, based on the mass analysis results for mercury, it would not be possible for the soil samples to have leached mercury at a concentration exceeding the mercury GB PMC, even if all the contained mercury were to leach out. Therefore, the rejection of the mercury results does not constitute a data gap in terms of evaluating pollutant mobility for mercury.

6.0 REVISED CONCEPTUAL SITE MODEL

Based on the findings of the TBA, the preliminary CSM was revised to re-evaluate the areas of concern, contaminants of concern, migration pathways and potential receptors of contamination, and to identify remaining data gaps. Table 7 is an update of Table 1 that includes each Recognized Environmental Condition (REC) identified by GeoDesign in their Phase I Environmental Site Assessment (2004a), summaries of the GeoDesign Phase II (2004b) and TBA investigation results, and an evaluation of potential sources of detected contaminants and remaining data gaps. The RECs that are listed first in Table 7 are those that are areas of concern for which additional investigation or remedial action is recommended. These areas are discussed further below. Following a discussion of each area of concern, the contaminants of concern and potential migration pathways and receptors are updated and a flowchart of the conceptual site model is presented. Finally, data gaps related to these AOCs are summarized.

6.1 Building 11 Loading Dock Area and Interior of Building 11

The Building 11 loading dock area and interior of Building 11 were listed as RECs by GeoDesign because of the potential for chemical spills during loading, unloading or storage of chemicals. GeoDesign installed an overburden well in the loading dock area (AM-5), but it could not be sampled because it was found to be dry when GeoDesign returned to the site to perform groundwater sampling. As noted in Section 4, the water table at the site fluctuates and is sometimes within the overburden, but more often is believed to be below the overburden/bedrock interface. GeoDesign also installed a well within Building 11 (AM-7). AM-7 groundwater was sampled and analyzed by GeoDesign for VOCs, SVOCs, ETPH, and metals. Only ETPH and metals were detected; arsenic and copper were detected at concentrations above their respective SWPC.

During the TBA, well ME-6 was installed near AM-5 and advanced into the bedrock. The groundwater sample from ME-6 was contaminated with PCE, TCE, and the degradation products of these two compounds (1,2-DCE and vinyl chloride). The source of the contamination is not known, but as discussed in Section 5, both PCE and TCE are used and stored at the site, and there is also a confirmed PCE DNAPL site (the Roosevelt Mills site) approximately 0.5 miles to the east of Amerbelle Textiles. Releases of PCE and/or TCE may have occurred within Building 11 or adjacent buildings before the building floor drains were

sealed, although no chlorinated solvents were detected in the sample from AM-7. Because the contamination is located within highly fractured bedrock, it is very difficult to identify a specific source and the migration of the contamination may not necessarily correspond to the groundwater flow direction. No other on-site wells that were sampled by GeoDesign or by M&E showed detectable levels of chlorinated solvents; however, ME-6 is the well closest to the Hockanum River, and it could be positioned between a potential on-site release and the river. It is also possible that a release could migrate through bedrock fractures from off site to the vicinity of ME-6, and not necessarily be evidenced in any of the other on-site wells. Additional investigation, consisting of borehole geophysics to determine fracture patterns and orientation, along with installation of additional wells, could be used to attempt to identify possible sources and to define the extent of the contamination. Wells positioned along Route 74 between Roosevelt Mills and Amerbelle Textiles could be installed to attempt to determine if the DNAPL at Roosevelt Mills is contributing to the contamination at ME-6. Further research into past PCE and TCE storage and disposal practices might help determine possible locations to look for an on-site source.

Well AM-7 was sampled with analysis for dissolved metals during the TBA to attempt to confirm the arsenic and copper exceedances of SWPC detected by GeoDesign. Copper and zinc (but not arsenic) were detected above their respective SWPC. The source of metals contamination at AM-7 is not known. This well is screened in the overburden, and samples were high in turbidity and required field filtering, despite attempts to redevelop the well and reduce turbidity. A possible release of metal-containing substances to the subsurface in this area cannot be ruled out. However, other nearby wells (ME-5, ME-6) do not show elevated metals concentrations and, if a release occurred, the extent of its impact to groundwater appears to be limited. Soil samples from AM-7 collected by GeoDesign (see Appendix A) did not show elevated metals concentrations, suggesting that leaching of metals from soil is not the source of the metals detected in groundwater at this location.

6.2 Trenches and Southeast Corner of Building 14

The trenches in Building 14 and the southeast corner of the building are listed as RECs by GeoDesign because of observed dye-colored water in an excavation in the vicinity, and because the concrete trenches that convey dye wastewater were eroded in some areas. No wells were installed in Building 14 by GeoDesign because of auger refusal before groundwater

was encountered. An attempt was made during the TBA investigation to install a bedrock well in the southeast corner of Building 14 (location 3 on Figure 3) to check for possible releases of dye-colored water to groundwater. It was not possible to install the well with the available equipment because the borehole collapsed due to fractured bedrock as soon as the casing was withdrawn. As a result, there is no data concerning groundwater in this area, and it is not known if releases in this area of the building may have occurred that have impacted groundwater. This area of the site is also of interest because of possible releases from a gas station that used to be located across from Building 14 along Grove Street, and because it is upgradient of most other possible on-site release areas. Future investigations should consider additional attempts to install a bedrock well in this vicinity using techniques to address the problem of borehole collapse. Examination of fractures in the borehole using borehole geophysics (in conjunction with similar work in the ME-6 area) may also be advisable to attempt to identify the source(s) of the chlorinated solvent contamination in groundwater at ME-6.

6.3 Northwest Corner of Building 14

The northwest corner of Building 14 was identified as a REC in the GeoDesign Phase I ESA because of observed dye-colored water in an excavation in Brooklyn Street that was dug to install a new sewer line in 1994. Bedrock well ME-2 was installed in Brooklyn Street in the vicinity of the observed dye-colored water, but avoiding the sewer line. Aniline and ETPH were detected in the groundwater sample from ME-2, and chromium, lead, and copper were detected at concentrations exceeding SWPC. These detections may be related to the past release of dye-colored water, the source of which was never conclusively identified by Amerbelle, although actions were taken to upgrade the wastewater conveyance system within Building 14, and the problem did not seem to recur. The extent appears to be limited because similar detections were not observed in groundwater samples from ME-1 (bedrock) or ME-5 (overburden), although these wells may not be positioned to capture a plume migrating from the immediate vicinity of ME-2. Soil samples were not collected from ME-2 because of the need to use vacuum excavation at this location to avoid subsurface utilities. Additional wells may be warranted to attempt to define the extent and collect data to allow derivation of alternate SWPC, although access restrictions limit where wells can be placed, and the complexity of the hydrogeology may make it difficult to accurately estimate the amount of site groundwater that is entering the Hockanum River.

6.4 Building 7 Loading Dock, Building 9, and Tank Area East of Building 13

Above-ground storage tanks are located in an area east of Building 13, and ETPH and arsenic were detected in GeoDesign's soil samples from AM-1. Petroleum releases and impacts to soil from ash used as fill were both suspected. Soil sample results from TBA boring ME-5 confirmed the presence of ash used as fill and elevated arsenic concentrations in this area. SPLP metals results from the same sample showed no exceedances of GB PMC for arsenic or any other CT RSR-regulated metal. There were no exceedances of SWPC for groundwater samples from AM-1 (sampled by GeoDesign in 2004) or ME-5 (TBA-collected sample), further confirming that metals pollutant mobility is not of concern in this area. ETPH was detected in the ME-5 groundwater sample but not the AM-1 groundwater sample collected by GeoDesign. There is no evidence of a significant release of petroleum in this area, but the evidence of ash used as fill first noted by GeoDesign was confirmed by the TBA investigation. Additional investigation does not appear to be necessary in this area, but steps to permanently maintain the pavement to limit direct exposure to the elevated arsenic concentrations in the soil are recommended.

6.5 Contaminants of Concern

The original contaminants of concern for the site consisted of VOCs including the BTEX compounds and chlorinated solvents, SVOCs including the PAHs and dye-related compounds (e.g., aniline), ETPH, and the CTDEP 15 metals (with foucs on arsenic, copper, and zinc). All these compounds were analyzed in soil and groundwater samples during the TBA investigation. Chlorinated solvents (PCE, TCE, and their degradation products) were detected in groundwater at ME-6 at elevated concentrations, and these compounds are now considered to be the primary contaminants of concern at the site. Some metals also continue to be contaminants of concern in soil and/or groundwater. Arsenic was detected in surface soil at one location (ME-5) in excess of the I/C DEC, and although this area is currently paved so there is no direct exposure, future redevelopment or construction could potentially result in human exposures. Lead was detected by GeoDesign in the subsurface soil sample from AM-4 (5 to 7 feet) at a concentration of 438 mg/kg, which exceeds CTDEP current standards for residential soil, but lead was not elevated in any of the other TBA or GeoDesign soil samples. Other metals in addition to arsenic (chromium, copper, lead, and zinc) were detected in groundwater samples above SWPC. Pollutant mobility does not appear to be a concern, however, because none of the seven soil samples analyzed for SPLP metals showed exceedances of GB PMC.

Extractable Total Petroleum Hydrocarbon concentrations in soil and groundwater samples did not exceed available CT RSR criteria, but the presence of ETPH in these media is considered evidence of some type of release and it is recommended that any future analyses at the site continue to include ETPH.

SVOCs, including PAHs and aniline and phthalate esters, were detected in some samples but not at concentrations that would indicate a human health concern or evidence of a specific release. PAH detections are most likely from ash used as fill co-mingled with natural soil. Traces of aniline in groundwater samples may be residual contamination from past releases of dye-containing water. No SVOC concentrations approached or exceeded applicable criteria, including the GB PMC criteria for PAHs.

6.6 Potential Migration Pathways and Receptors

Figure 5 includes a flowchart conceptual site model that indicates potential sources, release mechanisms, exposure pathways, and potential human receptors based on current and possible future uses of the property. Ecological receptors are not shown on Figure 6. Because the site is almost entirely paved, current ecological receptors are limited to flora and fauna that could be exposed to groundwater contaminants at the groundwater discharge point, believed to be the Hockanum River.

Potential Sources. The chlorinated solvent contamination is presented as having a minimum of two possible sources, possible on-site source(s) and the upgradient DNAPL site. The hydrogeology of the site is extremely complicated because of the fractured bedrock aquifer that underlies the site. Of particular concern is the area of ME-6, where high levels of PCE and TCE were observed in the groundwater. The location of the well, in a loading dock depression, is an area where past spills may have occurred; however, the level of contamination in the fractured bedrock could also be impacted by an off-site source. Further evaluation of the site is needed to test the conceptual site model, particularly information on fracture/lineament features of the Glastonbury Gneiss bedrock in Vernon. Borehole geophysics could provide information about the strike and dip of bedrock fractures in the wells located on site, as well as direction of groundwater movement, resistivity, and aperture size. Based on the geophysics, additional

wells could then be located off-site to evaluate off site contributions. A tracer test could also be performed to analyze connectivity in the bedrock.

Releases of dye-containing water are speculated to be potential sources for the low level ETPH and metals contamination detected in some groundwater wells. The area of soil with elevated arsenic concentrations is speculated to be from the presence of ash used as fill co-mingled with the soil. This speculation is backed by visual observations of ash in the borings where soil samples were collected that showed elevated arsenic concentrations.

Migration Pathways. Because the site is almost completely paved or covered with buildings, potential migration pathways are limited to leaching of contaminants from soil or DNAPL into groundwater and resulting transport to the groundwater discharge point; and volatilization of volatile contaminants (the chlorinated solvents) from soil or groundwater into soil gas, with possible subsequent migration of soil gas into the indoor air of site buildings. The buildings near ME-6 are primarily used for storage and are seldom occupied, but exposures could occur in the future if these buildings are staffed and if there is a complete pathway for migration of VOCs from groundwater to indoor air. Future development of the site (such as removal of pavement) could expand the migration pathways to include direct exposure to soils, surface water runoff, and windblown migration of contaminated soil particles.

Receptors. Current human receptors include on-site workers and possible trespassers. While future residential use is not anticipated, a future resident is also shown as a potential receptor should land uses change. Future human receptors may also include construction workers involved in invasive activities such as excavation that could lead to exposure to soil currently covered by pavement. Current human receptors appear to be limited to humans that may be exposed to groundwater migrating from the site, or exposed to indoor air that may be impacted by volatilization of chlorinated solvents from groundwater. Reportedly the area is served by public water; therefore there is little chance of local residents consuming affected groundwater. Well ME-6 is located outdoors, and it is not known if the chlorinated solvent contamination extends beneath on-site buildings or if it is limited to the vicinity of ME-6 and downgradient.

6.7 Identified Data Gaps

The following data gaps remain and, depending on future site use, may require additional investigation:

Soil Gas/Indoor Air Exposure Pathway. It is not known if chlorinated solvents are volatilizing from groundwater and impacting the indoor air of on-site buildings. While the chlorinated solvents were only detected in one outdoor well (ME-6) that is the most downgradient on the site, it is possible that there is some migration of VOCs to the air of the storage buildings near ME-6. Installation and sampling of soil gas points could be performed to attempt to evaluate whether the indoor air pathway is complete. The points would be installed in the overburden and do not require the large equipment needed for installing bedrock wells (although coring through the concrete floors would be needed), and therefore it may be feasible to perform them within Buildings 8 and 11.

Sources of Chlorinated Solvent Contamination. The sources are not known and may include on-site spills and off-site sources. As noted in Section 6.6, additional wells and borehole geophysics could help elucidate possible sources.

Surface Water Exposure Pathway. Concentrations of several metals in groundwater samples exceeded their respective SWPC, but the concentrations are relatively low. Additional wells could be considered to attempt to define the extent and collect data to allow derivation of alternate SWPC, although access restrictions limit where wells can be placed, and the complexity of the hydrogeology may make it difficult to accurately estimate the amount of site groundwater that is entering the Hockanum River.

Sources of Metals and EPTH in Groundwater. Dye-containing water releases are speculated to be a source. While there have been two documented releases of dye-colored water, it is not known if these releases are a source of these contaminants in groundwater.

7.0 CONCLUSIONS AND RECOMMENDATIONS

This section presents conclusions and recommendations based on the results of the TBA conducted at the Amerbelle Textiles site. It should be noted that the TBA was designed to collect data to evaluate potential contamination and partially fill data gaps identified by the GeoDesign investigation (2004), and was not intended to provide a comprehensive characterization of the site. Due to access limitations posed by site buildings and operations, and difficulties in drilling within the fractured bedrock, full characterization of every REC identified by GeoDesign was not feasible.

Groundwater contamination with chlorinated solvents was detected at bedrock well ME-6, the most downgradient well location. The source of the contamination is not known but may be from on-site spills and/or an off-site source located approximately 0.5 miles to the east where the existence of PCE as a Dense Non-Aqueous Phase Liquid has been documented. One compound (TCE) was detected at a concentration exceeding its I/C VC. The following recommendations are made to further assess this contamination:

- Install and sample soil gas probes outdoors and in nearby buildings to check for the potential for migration of VOCs to indoor air

- Continue monitoring of ME-6 groundwater for VOCs to check for possible seasonal variation and concentration trends. Since remediation of the potential off-site source is underway, it is possible that a downward trend will be observed.

- Re-examine Amerbelle's records for information on use and storage of TCE and PCE, to help evaluate whether an on-site source is likely and if so, to identify areas for further investigation to possibly include additional wells and borehole geophysics.

Chromium, copper, and lead were detected in the groundwater sample from ME-2 and its field duplicate at concentrations exceeding the Surface Water Protection Criteria (SWPC). For existing well AM-7, exceedances of SWPC were observed for copper and zinc. The GeoDesign results for AM-7 (2004b – see Appendix A) showed SWPC exceedances for arsenic in addition to copper, but the zinc concentration was much lower than was observed during the 2006 TBA

sampling event. For both sampling events, the metals sample was filtered before preservation and analysis, and therefore elevated metals concentrations cannot be attributed to high sample turbidity. The source(s) of the metals in the groundwater from ME-2 and AM-7 is not known. Additional investigation could be considered to attempt to collect data to allow derivation of alternate SWPC. However, access restrictions limit where wells can be placed, and the complexity of the hydrogeology may make it difficult to accurately estimate the amount of site groundwater that is entering the Hockanum River. Additional monitoring to attempt to discern trends in metals concentrations is suggested before attempting to install additional wells.

Based on the soil analytical data collected, there are RSR direct exposure exceedances for soil (the fill-impacted area near ME-5, where arsenic exceeded DEC) but there are no known pollutant mobility issues, since SPLP testing showed no exceedances of GB PMC. This is significant because the direct exposure issues can be addressed by keeping the affected soil inaccessible in accordance with the RSRs (by maintaining the current pavement cover and implementing an Environmental Land Use Restriction), and no additional action would be required to be in compliance with the RSRs.

8.0 LIMITATIONS

No warranty, whether expressed or implied, is given with respect to this report or any opinions herein. It is expressly understood that this report and opinions expressed herein are based upon site conditions reported to M&E, observed by M&E, and as they existed only at the time this Targeted Brownfields Assessment was conducted. Without limiting the foregoing, this report, any opinions or conclusions stated herein, and its attachments are subject to the complete General Statement of Limitations and Conditions provided in Appendix H, which are incorporated by reference into, and are an integral part of, this report submittal. This report has been prepared on behalf of, and for the exclusive use of, the U.S. Environmental Protection Agency. Any use of or reliance on M&E's report by a third party, even with M&E's consent, shall be at such party's own risk.

9.0 REFERENCES

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FIGURES

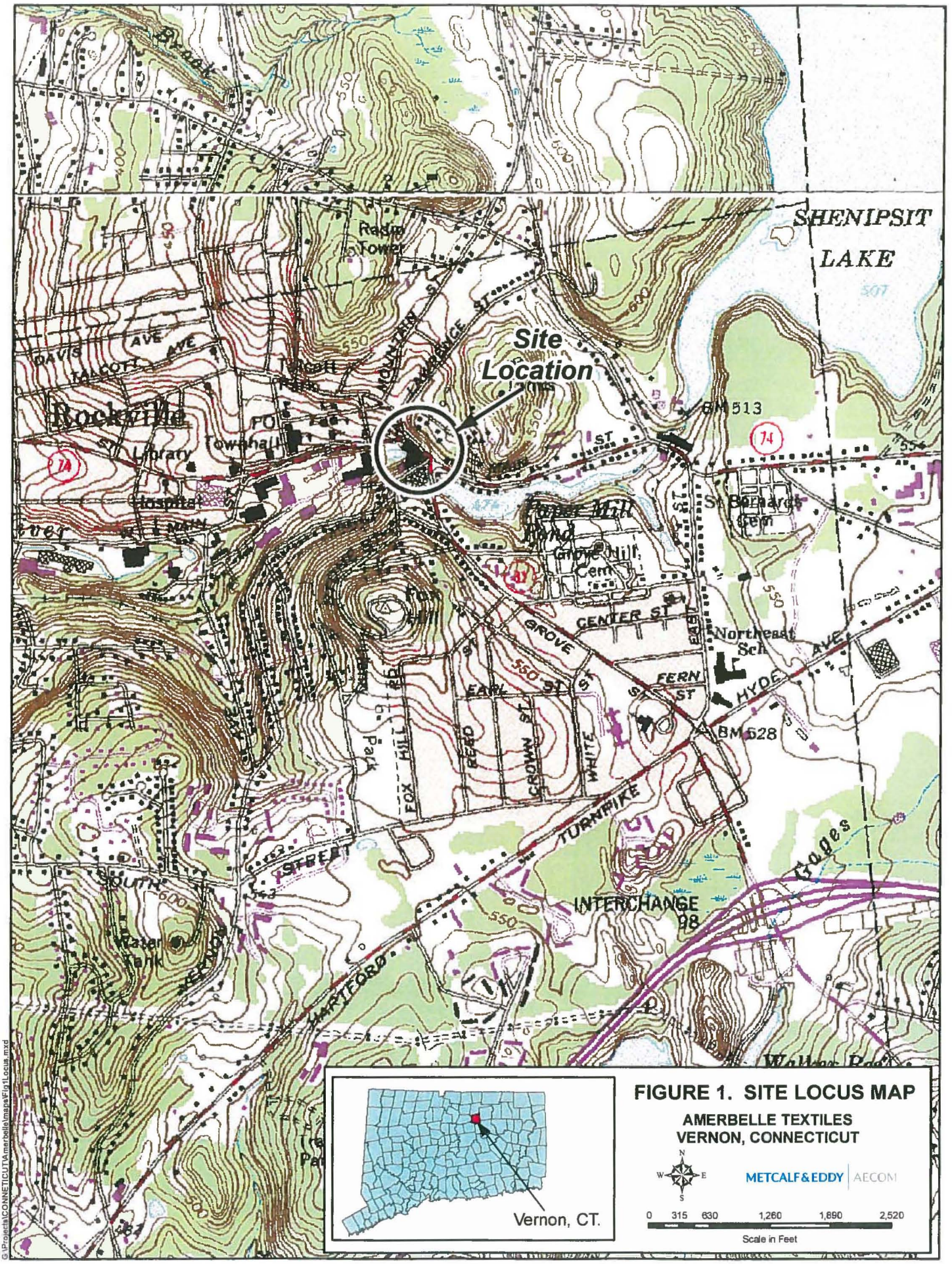

FIGURE 1. SITE LOCUS MAP

AMERBELLE TEXTILES
VERNON, CONNECTICUT

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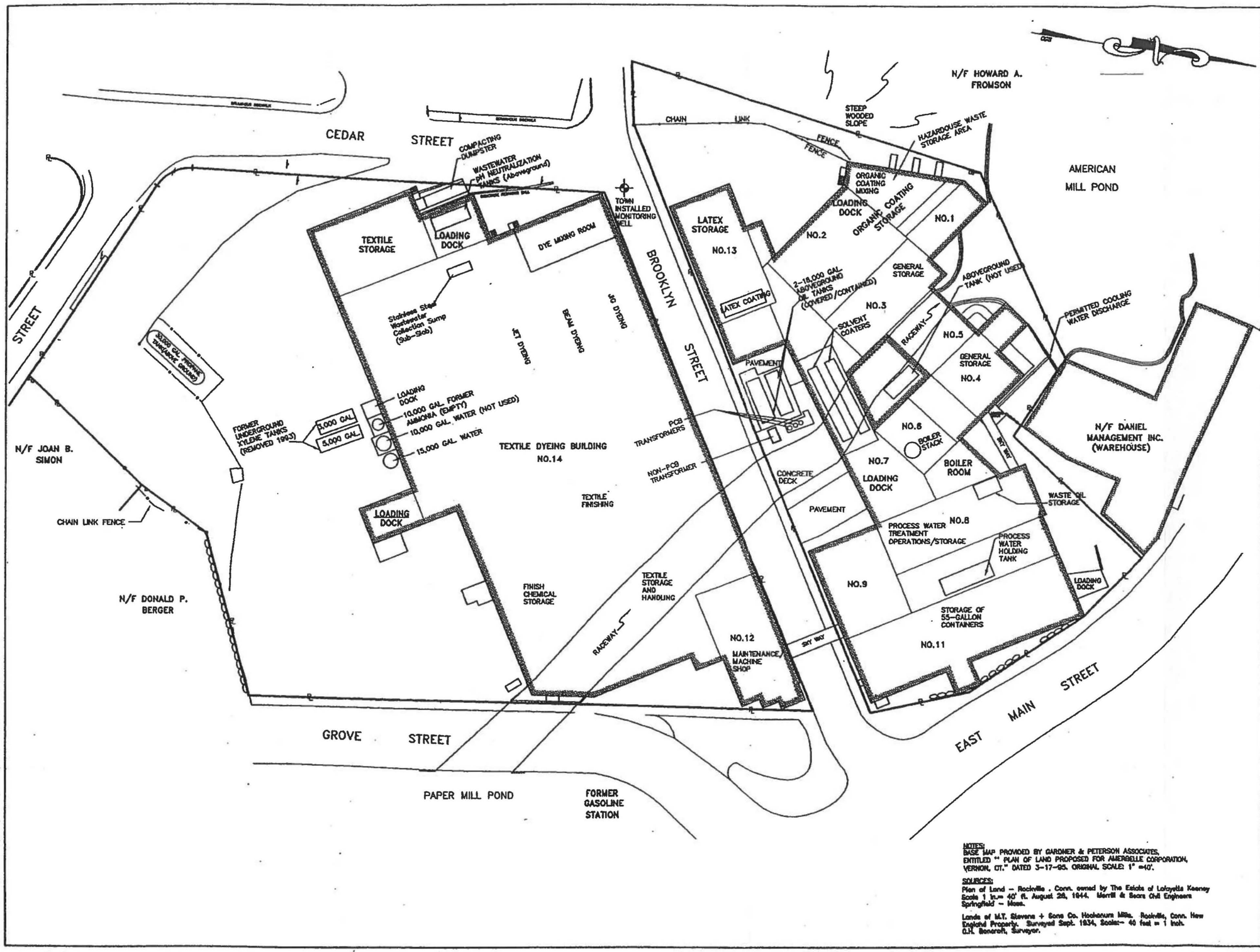

NOTES:
BASE MAP PROVIDED BY GARDMER & PETERSON ASSOCIATES, ENTITLED " PLAN OF LAND PROPOSED FOR AMERBELLE CORPORATION, VERNON, CT." DATED 3-17-85. ORIGINAL SCALE: 1" =40'.

SOURCES:
Plan of Land – Rockville . Conn. owned by The Estate of Lafayette Keeney Scale 1 in.= 40' ft. August 28, 1944. Merrill & Sears Civil Engineers Springfield – Mass.

Lands of M.T. Stevens + Sons Co. Hockanum Mills. Rockville, Conn. New England Property. Surveyed Sept. 1934, Scale:– 40 feet = 1 inch. G.H. Bancroft, Surveyor.

REV. No.	DESCRIPTION	BY	DATE

GEODESIGN INCORPORATED
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SCALE IN FEET
1" = 60'
0' 30' 60' 120'

SITE PLAN
AMERBELLE CORPORATION
104 EAST MAIN STREET
VERNON, CONNECTICUT

DRAWN BY: SMC
REVIEWED BY: TFC

PROJECT No.
553-003

FIGURE No.
2

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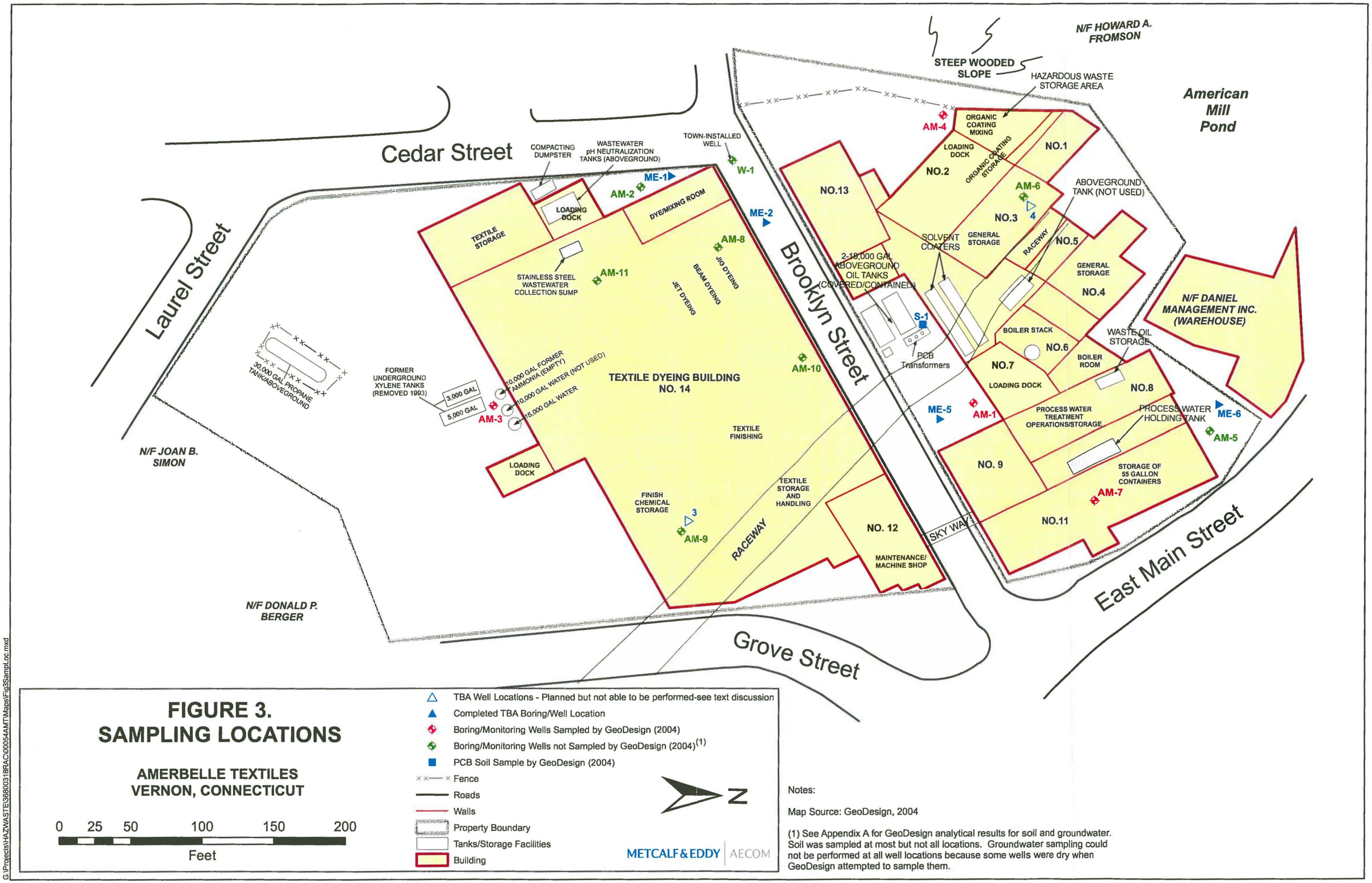

Notes:

Map Source: GeoDesign, 2004

(1) See Appendix A for GeoDesign analytical results for soil and groundwater. Soil was sampled at most but not all locations. Groundwater sampling could not be performed at all well locations because some wells were dry when GeoDesign attempted to sample them.

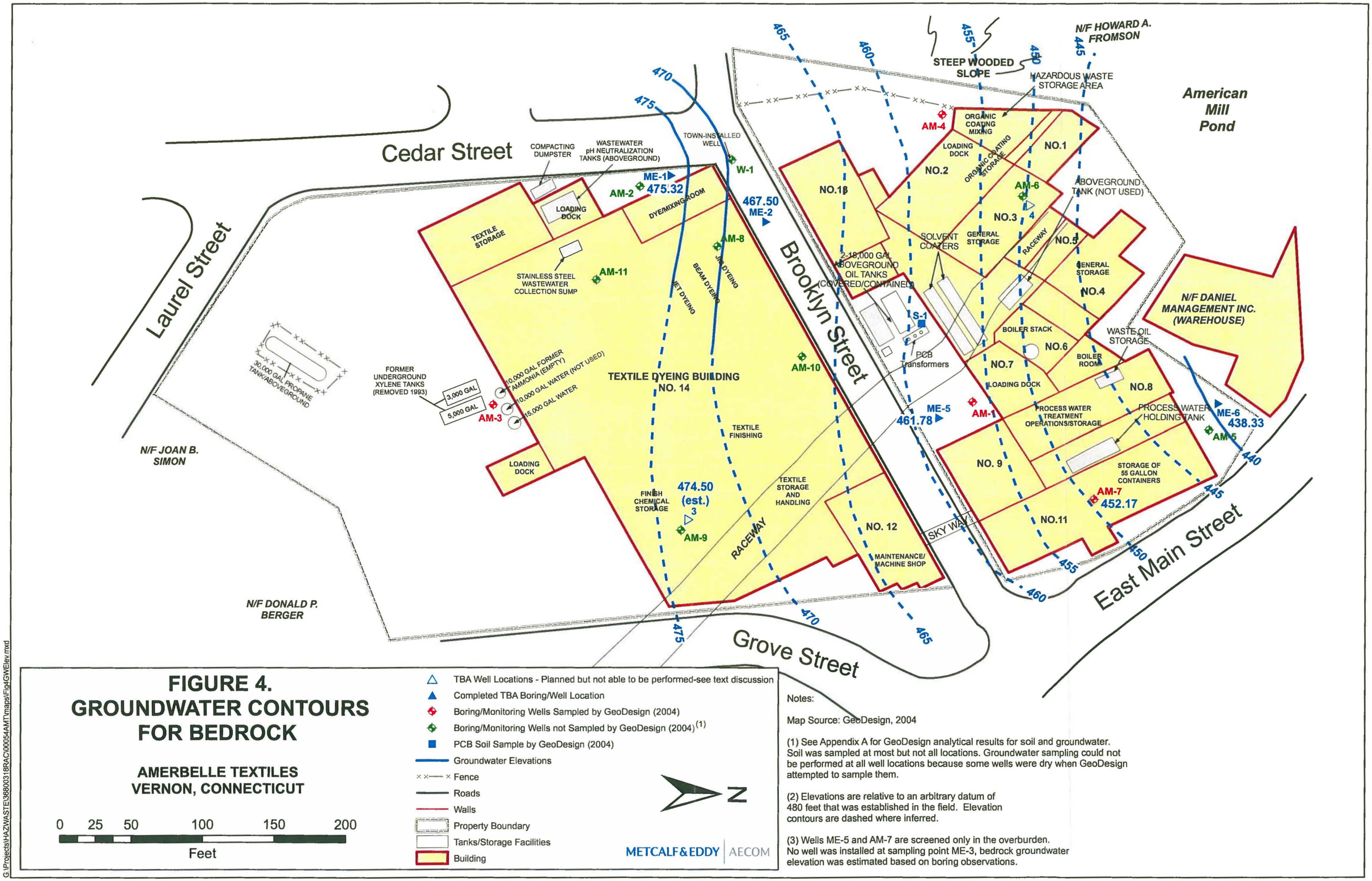

FIGURE 4. GROUNDWATER CONTOURS FOR BEDROCK

AMERBELLE TEXTILES
VERNON, CONNECTICUT

0 25 50 100 150 200
Feet

- TBA Well Locations - Planned but not able to be performed-see text discussion
- Completed TBA Boring/Well Location
- Boring/Monitoring Wells Sampled by GeoDesign (2004)
- Boring/Monitoring Wells not Sampled by GeoDesign (2004)(1)
- PCB Soil Sample by GeoDesign (2004)
- Groundwater Elevations
- Fence
- Roads
- Walls
- Property Boundary
- Tanks/Storage Facilities
- Building

N

METCALF & EDDY | AECOM

Notes:

Map Source: GeoDesign, 2004

(1) See Appendix A for GeoDesign analytical results for soil and groundwater. Soil was sampled at most but not all locations. Groundwater sampling could not be performed at all well locations because some wells were dry when GeoDesign attempted to sample them.

(2) Elevations are relative to an arbitrary datum of 480 feet that was established in the field. Elevation contours are dashed where inferred.

(3) Wells ME-5 and AM-7 are screened only in the overburden. No well was installed at sampling point ME-3, bedrock groundwater elevation was estimated based on boring observations.

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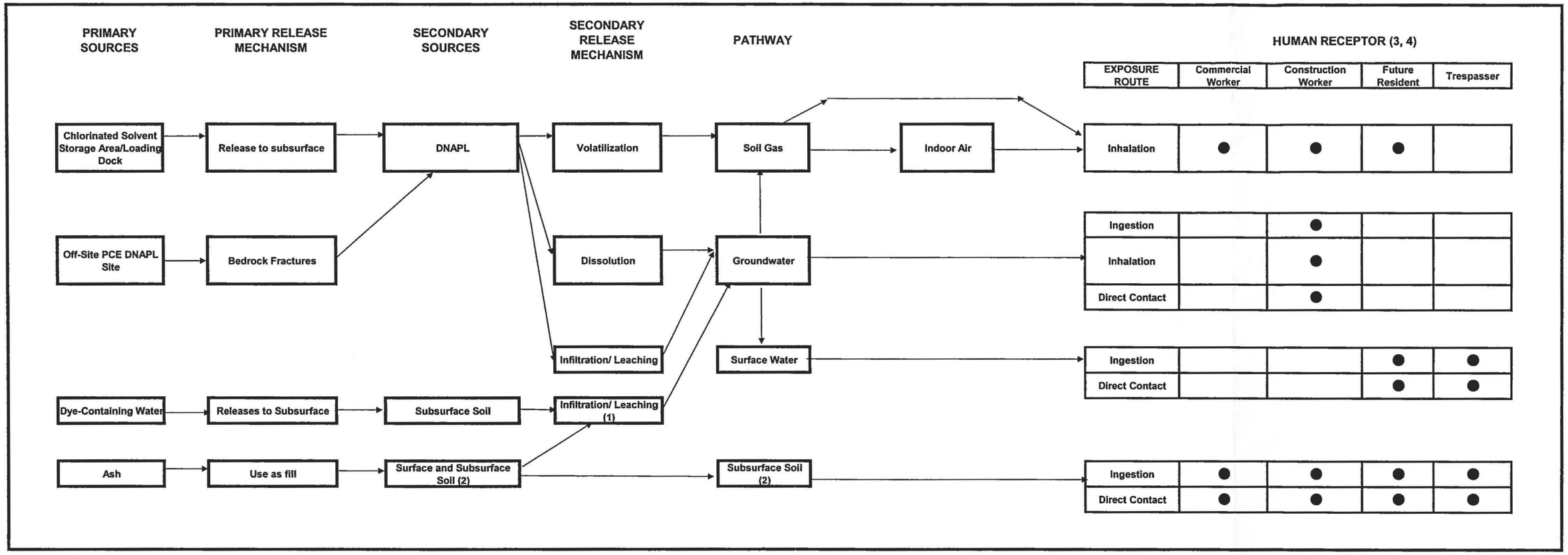
Figure 5. Conceptual Site Model



Contaminants of Concern:

Chlorinated Solvents/DNAPL - PCE, TCE, and their degradation products
Dye-Containing Water - Metals, Aniline, ETPH
Ash - Metals (particularly Arsenic), PAHs, ETPH

Notes:

1. SPLP metals analyses indicate that site soil no longer leaches metals at levels of potential concern, but this mechanism of release is not ruled out from having occurred in the past.
2. It is assumed that ash was placed as fill (surface and subsurface soil) prior to site being paved. Area of ashy fill is no longer exposed at the surface. For future uses, possible re-exposure of the soil would need to be evaluated as a potential risk.
3. Dots show pathways that would likely be considered if a human health risk assessment were to be performed, but the list is not intended to be exhaustive. Not all pathways are known to be complete . Although there are no plans for residential future uses, and the site is expected to remain as a dyeing operation, the future resident is included here for completeness.
4. Ecological receptors and exposure pathways are not presented.

Table 1. Summary of Phase I & II Assessments, Data Gaps, and Proposed TBA Investigation Locations

Summary of GeoDesign Phase I and Phase II Assessments (GeoDesign, 2004)						TBA Investigation and Rationale		
Recognized Environmental Condition/Location	Rationale for Listing	Associated Phase II Investigation Location	Depths of auger refual (feet bgs)	Phase II Analytical Results Summary		Remaining Data Gaps	Proposed TBA Investigation Locations	Boring/Well Location ID (see M&E (Figure 3)
				Soil	Groundwater			
ormer USTs located south f Building 14 (3,000 gal and 5,000 gal xylene)	Underground xylene tanks were removed without reported closure confirmation soil sampling.	AM-3	15.0	ETPH at 240 mg/kg (3-5 ft)	No Detections of Note	Groundwater flow direction not known due to complex subsurface (bedrock, raceway) and no wells in bedrock. Possible release may have gone undetected.	Install additional wells site-wide (including bedrock, see below) to obtain additional information on site groundwater flow.	see below
Loading dock on south de of Building 14	Potential for chemical spills during loading/unloading	None	N/A	N/A	N/A	Evidence of surface releases (if any) is likely obliterated due to paving and vehicle activity in this area. Possible migration of a release through pavement cracks cannot be ruled out based on visual observations of no obvious surface impacts.	No activity because evidence of past releases (if any) is not likely to be detected by surface soil sampling, and other REC were prioritized for installation of borings/wells.	N/A
oading dock on west nd of Building 14	Potential for chemical spills during loading/unloading. This dock is located nearest the dye and finishing chemical room and wastewater treatment area.	AM-2	5.5	No sample	No well	Groundwater could not be sampled (auger refusal before groundwater was encountered, so no well was installed).	Install well in area (with rock coring as needed to reach water table). Collect soil samples during boring installation. Sample well.	1
orthwest corner of Building 14	Location where dye-colored water was observed in the ground during sewer line installations in 1997. This is also the area where seeps of discolored liquid were observed coming from an exhaust vent and cracks in the foundation.	AM-2	5.5	No sample	No well	Groundwater could not be sampled (auger refusal before groundwater was encountered). Complex utilities in Brooklyn Street prevented installation of well in street. Town well installation details not available but it is likely set in sewer pipeline bedding and not natural material. Dye-colored water is suspected to have been released within Building 14 and migrated through the subsurface to the sewer line.	Install well in street (with rock-coring if needed). Use vacuum extraction to remove soil until below utilities, then advance hole using drill rig. Sample well. No soil samples proposed because of need for vacuum extraction to avoid utility damage. Purpose of well is to evaluate whether impacts in this area still exist from past dye colored water release(s).	2
		AM-8	4.0	Formaldehyde at 17 mg/kg (3-4 ft); traces EX	No well			
		W-1 (town well)	N/A	N/A	Zn > SWPC (filtered sample)			
/astewater conveyance enches in Building 14	Concrete erosion and chemical attack was visible on the surface of the visible areas of concrete. The sub-slab trench network is extensive.	AM-8	4.0	Formaldehyde at 17 mg/kg; traces EX	No well	Groundwater could not be sampled (auger refusal before groundwater was encountered).	Attempt installation of bedrock well in Building 14 to evaluate potential for releases to subsurface. Collect soil samples during boring installation. Sample well.	3
		AM-9	12.0	None	No well			
		AM-10	7.2	No sample	No well			
		AM-11	6.5	Formaldehyde at 9.3 mg/kg (5-6 ft)	No well			

Table 1. Summary of Phase I & II Assessments, Data Gaps, and Proposed TBA Investigation Locations

Summary of GeoDesign Phase I and Phase II Assessments (GeoDesign, 2004)						TBA Investigation and Rationale		
Recognized Environmental Condition/Location	Rationale for Listing	Associated Phase II Investigation Location	Depths of auger refual (feet bgs)	Phase II Analytical Results Summary		Remaining Data Gaps	Proposed TBA Investigation Locations	Boring/Well Location ID (see M&E (Figure 3)
				Soil	Groundwater			
Southeast corner of Building 14	Location where a bridge contractor identified dye-colored liquid in 1995 and adjacent to location of process water overflows.	AM-9	12.0	None	No well	Groundwater could not be sampled (auger refusal before groundwater was encountered).	Attempt installation of bedrock well in Building 14 to evaluate potential for releases to subsurface. Collect soil samples during boring installation. Sample well.	3
Building 12	Maintenance/Machine Shop Welding, minor machining, and electrical repair. Contains a small mineral spirits parts cleaner.	None	N/A	N/A	N/A	Surface releases may have taken place but significant releases to subsurface are not suspected, and if present might be observable via other wells to be installed downgradient.	No Activity; other REC were prioritized because likelihood of release was considered to be greater elsewhere, and downgradient wells might detect releases to groundwater, if they occurred in Building 12.	N/A
Slope west of Bldgs. 1 and 2	Location of reported dye-colored water seepage (1994) and observed solid waste debris.	AM-4	19.5	ETPH at 360 mg/kg (3-5 ft); Pb at 438 mg/kg (5-7 ft)	No Detections of Note	Slope area not accessible. AM-4 would potentially show groundwater contamination migrating from Building 2 area, if present.	No Activity because area is not accessible for drill rigs and access is difficult for any type of sampling due to very steep slope.	N/A
Building 13	Latex coating operations	None	N/A	N/A	N/A	Releases possible but not suspected; area not accessible.	No Activity because area is not accessible for drill rigs.	N/A
Building 2 loading dock	Potential for chemical spills during loading/unloading	AM-4	19.5	ETPH at 360 mg/kg (3-5 ft); Pb at 438 mg/kg (5-7 ft)	No Detections of Note	Extent of soil contamination is unknown. AM-4 result does not exceed CT RSR but does exceed DEP guideline for Pb in residential soil.	No Activity; see below for Bldgs. 1 & 2	N/A
Buildings 1 and 2	Storage of flammable solvents and mixing of coatings	AM-4	19.5	ETPH at 360 mg/kg (3-5 ft); Pb at 438 mg/kg (5-7 ft)	No Detections of Note	Well downgradient of buildings is not available. Extent of soil contamination is unknown.	Attempt installation of bedrock well in vicinity of boring AM-6. Collect soil samples and groundwater samples.	4
		AM-6	8.5	ETPH at 770 mg/kg (5-6 ft bgs)	No well			
Building 3	Downgradient of solvent coating/ former storage area	AM-6	8.5	ETPH at 770 mg/kg (5-6 ft bgs)	No well	Downgradient well not available. Extent of soil contamination is unknown.	Attempt installation of bedrock well in vicinity of boring AM-6. Collect soil samples and groundwater samples.	4
Building 7	Solvent Coaters	None	N/A	N/A	N/A	Located partially above raceway. Releases (if any) likely entered raceway and river. Area is not accessible for borings/wells.	No Activity; area not accessible for a drill rig.	N/A

Table 1. Summary of Phase I & II Assessments, Data Gaps, and Proposed TBA Investigation Locations

Summary of GeoDesign Phase I and Phase II Assessments (GeoDesign, 2004)						TBA Investigation and Rationale		
Recognized Environmental Condition/Location	Rationale for Listing	Associated Phase II Investigation Location	Depths of auger refual (feet bgs)	Phase II Analytical Results Summary		Remaining Data Gaps	Proposed TBA Investigation Locations	Boring/Well Location ID (see M&E (Figure 3)
				Soil	Groundwater			
Area east of Building 13	Two 18,000 gallon fuel oil ASTs where oil releases have occurred	AM-1	12.3	ETPH at 920 mg/kg (1-3 ft); As at 122 mg/kg (3-5 ft)	No Detections of Note	Tanks currently contained. AM-1 potentially downgradient but raceway complicates groundwater flow. Extent of soil contamination is unknown.	Attempt soil boring/well installation in vicinity of AM-1. Collect soil and groundwater samples.	5
uth of Building 7	Four transformers (3 PCB-containing)	PCB Surface Soil Sample (S-1)	N/A	No PCBs detected	N/A	Previous investigation did not detect evidence of release.	No Activity	N/A
ilding 7 Loading Dock	Potential for chemical spills during loading/unloading	AM-1	12.3	ETPH at 920 mg/kg (1-3 ft); As at 122 mg/kg (3-5 ft)	No Detections of Note	Extent of soil contamination is unknown.	Attempt soil boring/well installation in vicinity of AM-1. Collect soil and groundwater samples.	5
uilding 9	Former dye storage	AM-1	12.3	ETPH at 920 mg/kg (1-3 ft); As at 122 mg/kg (3-5 ft)	No Detections of Note	Extent of soil contamination in unknown.	Attempt soil boring/well installation in vicinity of AM-1. Collect soil and groundwater samples.	5
Building 8	Former Belding Bros. Dye House; Waste oil storage area	None	N/A	N/A	N/A	No direct evidence of releases. Phase I report notes that waste oil storage area was neat and well maintained.	No Activity. Access to area with a drill rig is difficult and other REC were prioritized for borings/wells.	N/A
uilding 11	Reported location of former Amerbelle dye operations and present chemical storage	AM-7	11.0	ETPH at 83 mg/kg (3-5 ft)	As and Cu > SWPC (filtered sample)	Source of As and Cu is unknown. Address with additional groundwater sampling and possible derivation of alternate SWPC.	Re-sample AM-7 for metals and compare to other groundwater sample results site wide. Consider deriving alternate SWPC.	all new wells
Building 11 loading dock	Potential for chemical spills during loading/unloading	AM-5	12.8	None	Well dry	Groundwater not sampled; well dry	Attempt soil boring/well installation in vicinity of AM-5. Collect soil and groundwater samples.	6
cross Grove Street om Building 14	Former gasoline station located across Grove Street southeast of site	None	N/A	N/A	N/A	Not known if releases occurred at former gas station and migrated onto site.	No Activity (TBA is restricted to site property). On-site wells will be sampled for petroleum-related compounds (BTEX, ETPH).	all new wells

Notes:

N/A - not applicable
CT RSR - Connecticut Remediation Standard Regulations
SWPC - Surface Water Protection Criteria (Connecticut Remediation Standard Regulations)
EX - Ethylbenzene and Xylenes
As - Arsenic
Cu - Copper
Pb - Lead
Zn - Zinc
ETPH - Extractable Total Petroleum Hydrocarbons (CTDEP method)
No Detection of Note - No organic compounds were detected and no metals were detected in excess of CT RSR criteria.

References:

GeoDesign, Inc. 2004. Phase I Environmental Site Assessment.
GeoDesign, Inc. 2004. Phase II Environmental Site Assessment.

Table 2
Soil and Groundwater Sampling Locations and Analyses - TBA Investigation

	Sampled Intervals for Soil; Well Screen Interval for Groundwater	Approximate Depth to Bedrock (feet bgs)	Samples Collected for Analysis					Rationale for Sampling and Analysis
			VOCs	SVOCs	Mass Metals	SPLP Metals	ETPH	
Soil								
ME-1	1 to 1.5 feet bgs (VOC); 0.5 to 3 feet bgs (other analyses)	3.0	1	1	1	1	1	Vicinity of Building 14 loading dock and dye/mixing room where spills may have occurred. No soil or groundwater samples obtained in this area during previous investigation. Well could not be installed previously because of auger refusal before water table was encountered.
ME-2	No soil samples - purpose was for well installation only	5.3	No soil samples					No soil samples collected. Vacuum excavation used to remove soil to avoid potential for hitting underground utilities.
ME-3	0.5 to 2 feet and 2 to 2.5 feet bgs (VOC); 0.5 to 4 feet and 4 to 6 feet bgs (other analyses)	6	2	2	2	2	2	Evaluate potential for releases in Building 14. Previously collected soil samples in Building 14 showed traces of formaldehyde, ethylbenzene, and xylenes.
ME-4	Location was determined to be inaccessible during pre-bid drillers meeting and was not performed							
ME-5	2 to 4 feet and 10 to 12 feet bgs (VOC); 0 to 4 feet and 10 to 12 feet bgs (SVOC, mass metals); 0 to 4 feet and 8 to 10 feet bgs (ETPH); 0 to 4 feet bgs (SPLP metals)	12.8	2	2	2	1	2	Area is east of Aboveground Storage Tank Area (now contained) where releases had occurred in the past, and is adjacent to Building 7 loading dock and Building 9 former dye storage area. Soil samples from previous investigation (location AM-1) showed elevated ETPH and arsenic concentrations.
ME-6	1 to 1.5 feet bgs plus field duplicate (VOC); 0.5 to 4 feet bgs plus field duplicate (other analyses)	13.5	2	2	2	2	2	Near Building 11 loading dock with potential for releases during loading/unloading. Well was attempted during Phase II investigation (AM-5) but could not be sampled because it was dry. No soil samples were collected from AM-5 during Phase II investigation.
Groundwater								
ME-1	4.9 to 14.9 feet bgs (in bedrock)	3.0	1	1	1	NA	1	Vicinity of Building 14 loading dock and dye/mixing room where spills may have occurred. No soil or groundwater samples obtained in this area during previous investigation. Well could not be installed previously because of auger refusal before water table was encountered.

Table 2
Soil and Groundwater Sampling Locations and Analyses - TBA Investigation

	Sampled Intervals for Soil; Well Screen Interval for Groundwater	Approximate Depth to Bedrock (feet bgs)	Samples Collected for Analysis					Rationale for Sampling and Analysis
			VOCs	SVOCs	Mass Metals	SPLP Metals	ETPH	
ME-2	8.0 to 18.0 feet bgs (in bedrock) - sample plus field duplicate	5.3	2	2	2	NA	2	Groundwater in this area could not be sampled during the Phase II investigation because of auger refusal. Dye-colored water was observed in the ground during sewer line installations in 1997. Seeps of discolored liquid were observed coming from cracks in the foundation of Building 14 in this vicinity. Town well W-1 was sampled and had Zinc concentrations above CT SWPC; however, there are no construction details for W-1.
ME-3	No well installed despite two attempts, because hole collapsed before well could be installed							
ME-4	Location was determined to be inaccessible during pre-bid drillers meeting and was not performed							
ME-5	4.8 to 12.8 feet bgs (in overburden). SVOC not collected because of insufficient water volume and poor well recharge. Metals sample field filtered.	12.8	1	0	1	NA	1	Location is east of Aboveground Storage Tank Area (now contained) where releases had occurred in the past, and is adjacent to Building 7 loading dock and Building 9 former dye storage area.
ME-6	15.5 to 25.5 feet bgs (in bedrock)	13.5	1	1	1	NA	1	Near Building 11 loading dock with potential for releases during loading/unloading. Well was attempted during Phase II investigation (AM-5) but could not be sampled because it was dry.
AM-7	4.5 to 9.5 feet bgs (in overburden). VOC and ETPH not collected because of low recharge. Metals sample field filtered.	11.0	0	1	1	NA	0	Re-sampled during TBA because results from sampling this well during the Phase II investigation showed concentrations of arsenic and copper that exceeded CT SWPC.

NOTES:
bgs = below ground surface
CT SWPC = Surface Water Protection Criteria
NA = Not Applicable

Table 3. Summary of Analytical Data for Soil Samples: Volatile Organic Compounds*
TBA Investigation -- Amerbelle Textiles Site -- November/December 2005

LOCATION NAME	ME-1SB1-1.5	ME-3SB0.5-2	ME-3SB2-2.5	ME-5SB2-4	ME-5SB10-12	ME-6SB1-1.5	ME-7SB1-1.5	ME-6SB10-12	CT RSR Direct Exposure Criteria** (RES)	CT RSR Direct Exposure Criteria** (I/C)	CT RSR Pollutant Mobility Criteria** (GB)
SAMPLE DEPTH (ft bgs)	1.0-1.5	0.5-2.0	2.0-2.5	2-4	10-12	1.0-1.5	1.0-1.5	10-12			
M&E SAMPLE ID	ME-1SB1-1.5	ME-3SB0.5-2	ME-3SB2-2.5	ME-5SB2-4	ME-5SB10-12	ME-6SB1-1.5	ME-7SB1-1.5	ME-6SB10-12			
DATE SAMPLED	11/29/2005	12/3/2005	12/3/2005	11/28/2005	11/28/2005	11/30/2005	11/30/2005	11/30/2005			
COMMENTS							FD (ME-6SB1-1.5)				
PARAMETER/ANALYTE											
VOLATILE ORGANIC COMPOUNDS - SW-846 Method 8260B/5035 (ug/kg)											
1,1-Dichloroethene	5 U	6 U	**2 J**	4 U	6 UJ	5 UJ	5 UJ	5 UJ	1,000	9,500	1,400
Acetone	5 UJ	6 UJ	**7 J**	4 UJ	6 UJ	5 UJ	5 UJ	5 UJ	500,000	1,000,000	140,000
Carbon disulfide	5 U	6 U	**3 J**	4 U	6 U	5 U	5 U	5 U	500,000	1,000,000	140,000
Methylene chloride	28 UJ	20 UJ	21 UJ	17 UJ	**31 TB**	23 U	23 U	26 U	82,000	760,000	1,000
Tetrachloroethene	5 U	6 U	4 U	4 U	6 U	**1 J**	**1 J**	5 U	12,000	110,000	1,000
Ethylbenzene	5 U	6 U	**10**	4 U	6 U	5 U	5 U	5 U	500,000	1,000,000	10,100
m,p-Xylene	5 U	6 U	**36**	4 U	6 U	5 U	5 U	5 U		See total xylenes	
o-Xylene	5 U	6 U	**13**	4 U	6 U	5 U	5 U	5 U		See total xylenes	
Xylenes (total)	5 U	6 U	**49**	4 U	6 U	5 U	5 U	5 U	500,000	1,000,000	19,500
1,2,4-Trimethylbenzene	5 UJ	6 U	**2 J**	4 U	6 U	5 U	5 U	5 U	500,000	1,000,000	70,000
LAB SAMPLE ID											
Volatile Organic Compounds	D1429-06B	D1429-21A	D1429-18A	D1429-01B	D1429-03C	D1429-09C	D1429-10C	D1429-13C			

NOTES:

Bolded values - detected concentrations
* - Validated data presented. Analyte presented if it was detected in at least one sample from this grouping, or if results for the analyte were rejected during data validation.
** - Values shown for standards are in the same units as the analytical data.
FD = Field Duplicate
ft bgs = feet below ground surface

CT RSR criteria
RES = Residential
I/C = Industrial/Commercial
GB = Groundwater classification
January 1996. Remediation Standard Regulations. Section 22a-133k-2(b) Direct Exposure Criteria, and 22a-133k-2(c) Pollutant Mobility Criteria, and
April 30, 1999: Approved Criteria for Additional Polluting Substances, pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies.
"--" indicates that no standard is available, or this type of standard is not applicable to the analyte in question

Data Qualifiers
J - Quantitation is approximate due to limitations identified in the quality control review.
TB - Analyte was also detected in the trip blank.
U - Value reported is the sample-specific detection limit.
UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review.

Table 4. Summary of Analytical Data for Soil Samples: SVOCs and Metals*
TBA Investigation -- Amerbelle Textiles Site -- November/December 2005

LOCATION NAME	ME-1SB0.5-3	ME-3SB0.5-4	ME-3SB4-6	ME-5SB0-4	ME-5SB10-12	ME-6SB0.5-4	ME-7SB0.5-4	ME-6SB10-13.5	CT RSR Direct Exposure Criteria** (RES)	CT RSR Direct Exposure Criteria** (I/C)	CT RSR Pollutant Mobility Criteria** (GB)
SAMPLE DEPTH (ft bgs)	0.5-3.0	0.5-4.0	4.0-6.0	0.0-4.0	10-12	0.5-4.-0	0.5-4.0	10-13.5			
M&E SAMPLE ID	ME-1SB0.5-3	ME-3SB0.5-4	ME-3SB4-6	ME-5SB0-4	ME-5SB10-12	ME-6SB0.5-4	ME-7SB0.5-4	ME-6SB10-13.5			
DATE SAMPLED	11/29/05	12/3/05	12/3/05	11/28/05	11/28/05	11/30/05	11/30/05	11/30/05			
COMMENTS	VOC 1.0-1.5						FD (ME-6SB0.5-4)				
SEMIVOLATILE ORGANIC COMPOUNDS -SW-846 Method 8270C (ug/kg)											
Naphthalene	700 U	350 U	340 U	370 U	410 U	48 J	57 J	380 U	1,000,000	2,500,000	56,000
2-Methylnaphthalene	700 U	350 U	340 U	370 U	410 U	39 J	43 J	380 U	474,000	2,500,000	9,800
Acenaphthylene	110 J	59 J	340 U	370 U	410 U	350 U	350 U	380 U	1,000,000	2,500,000	84,000
Acenaphthene	700 U	350 U	340 U	370 U	410 U	140 J	140 J	380 U	1,000,000	2,500,000	84,000
2,4-Dinitrophenol	R	720 U	690 U	760 UJ	840 UJ	720 U	720 U	760 U	140,000	2,500,000	2,800
Dibenzofuran	700 UJ	350 U	340 U	370 U	410 U	69 J	74 J	380 U	270,000	2,500,000	5,600
Fluorene	700 UJ	350 U	340 U	370 U	410 U	110 J	110 J	380 U	1,000,000	2,500,000	56,000
Pentachlorophenol	R	720 U	690 U	760 U	840 U	720 U	720 U	760 U	5,100	48,000	1,000
Phenanthrene	130 J	210 J	340 U	230 J	140 J	1,200	1,200	380 U	1,000,000	2,500,000	40,000
Anthracene	700 UJ	54 J	340 U	59 J	410 U	250 J	250 J	380 U	1,000,000	2,500,000	400,000
Carbazole	700 UJ	350 U	340 U	370 U	410 U	150 J	140 J	380 U	31,000	290,000	1,000
Di-n-butylphthalate	700 UJ	68 J	340 U	370 U	410 U	350 U	350 U	380 U	1,000,000	2,500,000	140,000
Fluoranthene	260 J	520	340 U	320 J	150 J	1,600	1,600	380 U	1,000,000	2,500,000	56,000
Pyrene	420 J	580	340 U	440 J	200 J	1,500	1,600	380 U	1,000,000	2,500,000	40,000
Benzo(a)anthracene	270 J	360 J	340 UJ	260 J	120 J	890 J	880 J	380 UJ	1,000	7,800	1,000
Chrysene	250 J	300 J	340 UJ	200 J	87 J	820 J	840 J	380 UJ	84,000	780,000	1,000
Bis(2-ethylhexyl)phthalate	180 J	620	1,000	84 J	450 J	320 J	280 J	300 J	44,000	410,000	11,000
Benzo(b)fluoranthene	200 J	340 J	340 UJ	190 J	69 J	670 J	720 J	380 UJ	1,000	7,800	1,000
Benzo(k)fluoranthene	82 J	120 J	340 U	73 J	410 UJ	330 J	290 J	380 U	8,400	78,000	1,000
Benzo(a)pyrene	190 J	260 J	340 U	150 J	57 J	600	610	380 U	1,000	1,000	1,000
Indeno(1,2,3-cd)pyrene	140 J	170 J	340 U	85 J	410 UJ	340 J	330 J	380 U	1,000	7,800	1,000
Dibenz(a,h)anthracene	700 UJ	42 J	340 U	370 UJ	410 UJ	92 J	96 J	380 U	1,000	1,000	1,000
Benzo(g,h,i)perylene	190 J	200 J	340 U	110 J	43 J	390	400	380 U	1,000,000	2,500,000	42,000
CT RSR METALS, MASS (mg/kg)											
Antimony	0.054 UJ	0.053 UJ	0.051 UJ	0.053 UJ	0.066 UJ	0.055 UJ	0.054 UJ	0.062 UJ	27	8,200	--
Arsenic	1.8	2.6	1.4	54.4	2.0	0.83 UJ	0.82 UJ	0.94 UJ	10	10	--
Barium	87.4 J	72.4 J	58.0 J	186 J	35.8 J	44.4 J	50.1 J	54.2 J	4,700	140,000	--
Beryllium	0.32	0.28	0.29	0.0057 U	0.27 J	0.13 J	0.12 J	0.10 J	2	2	--
Cadmium	0.16 J	0.0052 U	0.0050 U	0.43	0.088 UJ	0.49	0.50	0.43	34	1,000	--
Chromium***	16.3 J	18.0 J	15.7 J	9.4 J	18.1 J	12.1 J	14.2 J	77.8 J	100***	100***	--
Copper	15.6	23.9	24.4	23.0	12.6	21.4	20.8	65.1	2,500	76,000	--
Lead	11.0 J	37.9 J	5.0 J	50.7 J	5.9 J	8.3 J	9.6 J	53.5 J	400****	1,000	--
Mercury	0.037 J	0.068 J	0.0066 U	0.094 J	0.010 J	0.035 J	0.074 J	0.12 J	20	610	--
Nickel	9.9 J	10.5 J	11.0 J	5.0 J	7.8 J	9.4 J	9.8 J	8.6 J	1,400	7,500	--
Selenium	1.5	1.4	1.0 UJ	7.0	2.0	1.0 U	0.98 U	1.1 U	340	10,000	--
Silver	0.017 U	0.17 UJ	0.12 UJ	0.018 U	0.022 U	0.52 UJ	0.54 UJ	0.80 UJ	340	10,000	--
Thallium	1.5	1.5	1.9	0.79 J	0.48 UJ	0.37 U	0.36 U	0.41 U	5.4	160	--
Vanadium	32.3 J	27.3 J	22.8 J	34.9 J	24.5 J	32.1 J	32.6 J	21.5 J	470	14,000	--
Zinc	66.8 J	44.4 J	32.4 J	27.0 J	24.7 J	34.2 J	36.0 J	58.1 J	20,000	610,000	--

Table 4. Summary of Analytical Data for Soil Samples: SVOCs and Metals*
TBA Investigation -- Amerbelle Textiles Site -- November/December 2005

LOCATION NAME	ME-1SB0.5-3	ME-3SB0.5-4	ME-3SB4-6	ME-5SB0-4	ME-5SB10-12	ME-6SB0.5-4	ME-7SB0.5-4	ME-6SB10-13.5	CT RSR Direct Exposure Criteria** (RES)	CT RSR Direct Exposure Criteria** (I/C)	CT RSR Pollutant Mobility Criteria** (GB)
SAMPLE DEPTH (ft bgs)	0.5-3.0	0.5-4.0	4.0-6.0	0.0-4.0	10-12	0.5-4.-0	0.5-4.0	10-13.5			
M&E SAMPLE ID	ME-1SB0.5-3	ME-3SB0.5-4	ME-3SB4-6	ME-5SB0-4	ME-5SB10-12	ME-6SB0.5-4	ME-7SB0.5-4	ME-6SB10-13.5			
DATE SAMPLED	11/29/05	12/3/05	12/3/05	11/28/05	11/28/05	11/30/05	11/30/05	11/30/05			
COMMENTS	VOC 1.0-1.5						FD (ME-6SB0.5-4)				
CT RSR METALS, SPLP (ug/L)											
Antimony	1.2 U	1.2 U	1.2 U	1.2 U	NA	1.2 U	1.2 U	2.0 UJ	--	--	60
Arsenic	1.6 U	1.6 UJ	1.6 U	**68.6**	NA	6.0 UJ	5.3 UJ	3.5 UJ	--	--	500
Barium	**33.0 J**	**49.5 J**	**27.1 J**	**122 J**	NA	**116 J**	**94.7 J**	**138 J**	--	--	10,000
Beryllium	0.15 U	**0.19 J**	0.15 U	0.15 U	NA	**0.48 J**	**0.38 J**	**0.38 J**	--	--	40
Cadmium	0.10 U	0.10 U	0.10 U	0.19 UJ	NA	0.19 UJ	0.10 U	0.10 UJ	--	--	50
Chromium	**5.5 J**	**12.0 J**	**5.3 J**	**8.1 J**	NA	**19.1 J**	**15.2 J**	**136**	--	--	500
Copper	20.6 UJ	24.4 UJ	16.7 UJ	23.4 UJ	NA	35.4 U	30.9 U	**85.5**	--	--	13,000
Lead	7.0 UJ	**30.3**	3.0 UJ	**60.9**	NA	**21.1**	**18.1**	**78.7**	--	--	150
Mercury	R	R	R	R	NA	R	R	R	--	--	20
Nickel	4.0 UJ	5.0 UJ	3.4 UJ	2.0 UJ	NA	**11.5 J**	**8.7 J**	**8.6 J**	--	--	1,000
Selenium	0.98 UJ	0.98 UJ	**3.1 J**	**8.7 J**	NA	**3.0 J**	0.98 UJ	0.98 UJ	--	--	500
Silver	0.91 U	0.91 U	0.91 U	0.91 U	NA	0.91 U	0.91 U	1.4 UJ	--	--	360
Thallium	1.2 U	1.2 U	1.2 U	2.1 UJ	NA	1.2 UJ	1.2 U	1.2 U	--	--	50
Vanadium	**10.2 J**	**11.2 J**	**5.9 J**	**21.7 J**	NA	**142**	**109**	**72.3**	--	--	500
Zinc	52.6 U	51.7 U	36.1 UJ	57.0 U	NA	74.8 U	65.0 U	110 U	--	--	50,000
LAB SAMPLE ID											
Semivolatile Organic Compounds	D1429-07A	D1429-19A	D1429-20A	D1429-02A	D1429-03A	D1429-11A	D1429-12A	D1429-14A			
RSR Metals (MASS)	D1429-07	D1429-19	D1429-20	D1429-02	D1429-03	D1429-11	D1429-12	D1429-14			
RSR Metals (SPLP)	E0091-02	E0091-06	E0091-07	E0091-01	NA	E0091-03	E0091-04	E0091-05			

NOTES:

Bolded values - detected concentrations

Bolded and boxed values - Concentration exceeds one or more CT RSR criteria.

* - Validated data presented. Analyte presented if it was detected in at least one sample from this grouping, or if results for the analyte were rejected during data validation.

** - Values shown for standards are in the same units as the analytical data.

*** - Direct Exposure Criteria are not established for total chromium. Criteria are established for hexavalent and trivalent chromium. Criteria presented are for hexavalent chromium, which are lower than those for trivalent chromium. Analytical result is for total chromium and hence is not directly comparable to the hexavalent chromium criteria.

**** Lead: 400 mg/kg is the standard typically required by CTDEP to be protective of human health (Connecticut Department of Public Health, Lead Environmental Management Unit, December 1, 2003). The 1996 RSR criterion is 500 mg/kg but in practice CTDEP is using the CTDPH standard.

FD = Field Duplicate

ft bgs = feet below ground surface

NA = Not Analyzed

CT RSR criteria

RES = Residential

I/C = Industrial/Commercial

GB = Groundwater classification

January 1996. Remediation Standard Regulations. Section 22a-133k-2(b) Direct Exposure Criteria, and 22a-133k-2(c) Pollutant Mobility Criteria, and

April 30, 1999: Approved Criteria for Additional Polluting Substances, pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies.

"--" indicates that no standard is available, or this type of standard is not applicable to the analyte in question

Data Qualifiers

J - Quantitation is approximate due to limitations identified in the quality control review.

R - Value is rejected due to limitations identified in the quality control review.

U - Value reported is the sample-specific detection limit.

UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review.

Table 6. Summary of Analytical Data -- Groundwater*
TBA Investigation -- Amerbelle Textiles Site

LOCATION NAME	ME-1	ME-2	ME-2CS	ME-5	ME-6	AM-7	CT Remediation Standard Regulations		
WELL SCREEN INTERVAL (ft bgs)	4.9-14.9	8.0-18.0	8.0-18.0	4.8-12.8	15.5-25.5	4.5 - 9.5			
SCREEN LOCATION	bedrock	bedrock	bedrock	overburden	bedrock	overburden			
M&E SAMPLE ID	ME-1	ME-2	ME-2CS	ME-5	ME-6	AM-7	Surface Water Protection Criteria**	Proposed Volatilization Criteria** (RES)	Proposed Volatilization Criteria** (I/C)
DATE SAMPLED	2/2/2006	2/2/2006	2/2/2006	2/2/2006	2/2/2006	2/2/2006			
COMMENTS			FD (ME-2)	metals samples field filtered for ME-5 and AM-7					
LAB SAMPLE ID									
Volatile Organic Compounds	E0118-06A	E0118-01A	E0118-02A						
Semivolatile Organic Compounds	E0018-06C	E0018-01C	E0118-02C		E0118-05C	E0118-07B			
Extr. Total Pet. Hydrocarbons	E0118-06	E0118-01	E0118-02	E0118-04	E0118-05				
CT RSR Metals	E0118-06	E0118-01	E0118-02	E0118-04	E0118-05	E0118-07			

NOTES:

(TIC) - Aniline was reported as A Tentatively Identified Compound (TIC) from the SVOC analysis in some samples. Because aniline is a dye-related compound, the concentrations reported for it are presented in this table.

* - Validated data presented. Analyte presented if it was detected in at least one sample from this grouping.

** - Values shown for standards are in the same units as the analytical data.

*** - Direct Exposure Criteria are not established for total chromium. Criteria are established for hexavalent and trivalent chromium. Criteria presented are for hexavalent chromium, which are lower than those for trivalent chromium. Analytical result is for total chromium and hence is not directly comparable to the hexavalent chromium criteria.

Bolded values - detected concentrations

Bolded and boxed values - Concentration exceeds one or more CT RSR criteria.

CT DEP Criteria ("--" indicates no standard available)

RES - Residential

I/C - Industrial/Commercial

January 1996. Remediation Standard Regulations. Section 22a-133k-3(b): Surface-Water Protection Criteria; and

April 30, 1999: Approved Criteria for Additional Polluting Substances, pursuant to Sections 22a-133k(1) through (3) of the Regulations of Connecticut State Agencies.

Proposed Volatilization Criteria: CTDEP, Permitting, Enforcement, and Remediation Division, March 2003. Proposed Revisions: Connecticut's Remediation Standard Regulations - Volatilization Criteria.

ft bgs - feet below ground surface

B - Organics: Analyte detected in a laboratory blank. Inorganics: The analyte was detected at a concentration greater than the Instrument Detection Limit (IDL) and less than the Contract Required Detection Limit (CRDL).

D - Reported results are from the analysis of a diluted sample.

FD - Field Duplicate

J - Quantitation is approximate due to limitations identified in the quality control review.

R - Value is rejected.

U - Value reported is the sample-specific detection limit.

UJ - Sample-specific detection limit is approximate due to limitations identified in the quality control review.

Table 7. Summary of GeoDesign and TBA Investigations and Remaining Areas of Conern

GeoDesign Phase I and Phase II Assessments (2004)						TBA Investigation Locations and Rationale			
Recognized Environmental Condition/Location	Rationale for Listing	Associated Phase II Investigation Location	Depths of auger refual (feet bgs)	Phase II Analytical Results Summary		Data Gaps Remaining after Phase II	Completed TBA Investigation Locations	Boring/Well Location ID (see M&E (Figure 3)	TBA Investigation Observations and Remaining Data Gaps
				Soil	Groundwater				
Remaining Areas of Conern									
Building 11	Reported location of former Amerbelle dye operations and present chemical storage	AM-7	11.0	ETPH at 83 mg/kg (3-5 ft)	As and Cu > SWPC (filtered sample)	Source of As and Cu is unknown. Address with additional groundwater sampling and possible derivation of alternate SWPC.	Re-sampled AM-7 for metals for comparison to other groundwater sample results site-wide. Sample was field-filtered, as was the GeoDesign sample, because of high sample turbidity.	AM-7	The groundwater sample from AM-7 showed concentrations of Cu and Zn (but not As) above SWPC. The metals contamination is confirmed but source remains unknown. Derivation of alternate SWPC is complex because of the complex hydrogeology and the groundwater discharge to the Hockanum River could not be estimated with the available data. There is still question about this well and whether it is representative of aquifer conditions. Yield is very low and turbidity is very high and does not dissipate with continued pumping. Other nearby wells (ME-5, ME-6) did not show elevated concentrations of metals in groundwater samples.
Building 11 loading dock	Potential for chemical spills during loading/unloading	AM-5	12.8	None	Well dry	Groundwater not sampled; well dry	Attempt soil boring/well installation in vicinity of AM-5. Collect soil and groundwater samples.	ME-6 bedrock	Groundwater from ME-6 is highly contaminated with PCE, TCE and their degradation products. Source may be storage area in Building 11 and/or an off-site source such as the Roosevelt Mills site, a confirmed PCE DNAPL site approximately 0.5 miles to the east. The bedrock at ME-6 is highly fractured and one very large fracture is present above the well screen.
Wastewater conveyance trenches in Building 14; southeast corner of Building 14.	Concrete erosion and chemical attack was visible on the surface of the visible areas of concrete. The sub-slab trench network is extensive. Dye-colored liquid identified in the southeast corner in 1995.	AM-8 AM-9 AM-10 AM-11	4.0 12.0 7.2 6.5	Formaldehyde at 17 mg/kg; traces EX None No sample Formaldehyde at 9.3 mg/kg (5-6 ft)	No well No well No well No well	Groundwater could not be sampled (auger refusal before groundwater was encountered).	Attempted installation of bedrock well in Building 14 to evaluate potential for releases to subsurface. Soil samples were collected. Well could not be installed, however, because of borehole collapse due to highly fractured bedrock.	ME-3 (attempted)	Because it was not physically possible to install a well in this area, there remains a question as to the potential for groundwater contamination. Additional attempts using a different drilling method could be considered. The Buildng 14 area remains a data gap. Also, if contamination is migrating from off-site, a well in this vicinity or entirely upgradient of site could be informative.
Area east of Building 13 Building 7 Loading Dock Building 9	Two 18,000 gallon fuel oil ASTs where oil releases have occurred Potential for chemical spills during loading/unloading Former dye storage	AM-1	12.3	ETPH at 920 mg/kg (1-3 ft); As at 122 mg/kg (3-5 ft)	No Detections of Note	Tanks currently contained. AM-1 potentially downgradient but raceway complicates groundwater flow. Extent of soil contamination is unknown.	Installed soil boring/well in vicinity of AM-1. Collected soil and groundwater samples.	ME-5 overburden	The 0 to 4 foot soil sample showed concentrations of arsenic above direct exposure criteria, consistent with GeoDesign's results for AM-1 soil and indicative of coal ash used as fill. No exceedances of pollutant mobility criteria. No detections in the ME-5 groundwater sample except for ETPH. There is no evidence of significant releases to this area. Exposure to the ash used as fill is currently prevented by pavement.
Northwest corner of Building 14	Location where dye-colored water was observed in the ground during sewer line installations in 1997. This is also the area where seeps of discolored liquid were observed coming from an exhaust vent and cracks in the foundation.	AM-2 AM-8 W-1 (town well)	5.5 4.0 N/A	No sample Formaldehyde at 17 mg/kg (3-4 ft); traces EX N/A	No well No well Zn > SWPC (filtered sample)	Groundwater could not be sampled (auger refusal before groundwater was encountered). Complex utilities in Brooklyn Street prevented installation of well in street. Town well installation details not available but it is likely set in sewer pipeline bedding and not natural material. Dye-colored water is suspected to have been released within Building 14 and migrated through the subsurface to the sewer line.	Installed well in street (with rock coring). Used vacuum extraction to remove soil until below utilities, then advanced hole using drill rig. Groundwater was sampled. Purpose of well was to evaluate whether impacts in this area still exist from past dye-colored water release(s).	ME-2 Bedrock	Aniline and ETPH were detected. Chromium, copper, and lead concentrations exceeded SWPC. Detections and exceedances may possibly be related to past releases of dye-colored water. Similar contamination was not found in other groundwater samples, so impact may be limited to the immediate vicinity.

Table 7. Summary of GeoDesign and TBA Investigations and Remaining Areas of Conern

GeoDesign Phase I and Phase II Assessments (2004)						TBA Investigation Locations and Rationale			
Recognized Environmental Condition/Location	Rationale for Listing	Associated Phase II Investigation Location	Depths of auger refual (feet bgs)	Phase II Analytical Results Summary		Data Gaps Remaining after Phase II	Completed TBA Investigation Locations	Boring/Well Location ID (see M&E (Figure 3)	TBA Investigation Observations and Remaining Data Gaps
				Soil	Groundwater				
Areas of Lesser Concern									
Former USTs located south of Building 14 (3,000 gal and 5,000 gal xylene)	Underground xylene tanks were removed without reported closure confirmation soil sampling.	AM-3	15.0	ETPH at 240 mg/kg (3-5 ft)	No Detections of Note	Groundwater flow direction not known due to complex subsurface (bedrock, raceway) and no wells in bedrock. Possible release may have gone undetected.	Additional wells were installed site-wide (including bedrock, see below) to obtain additional information on site groundwater flow.	ME-1 ME-2 ME-5 ME-6	ETPH was detected in all groundwater samples, but xylenes were not detected. A release that impacted groundwater would be expected to contain xylenes, although it is possible that any released xylene has undergone degradation to other products, and/or affected soil but not groundwater. Because there is no soil confirmation sampling to confirm that there was no release, it is not possible to conclusively rule out a xylene release based on the absence of xylene in groundwater.
Loading dock on west end of Building 14	Potential for chemical spills during loading/unloading. This dock is located nearest the dye and finishing chemical room and wastewater treatment area.	AM-2	5.5	No sample	No well	Groundwater could not be sampled (auger refusal before groundwater was encountered, so no well was installed).	Installed well in area (with rock coring as needed to reach water table). Collected soil samples during boring installation. Groundwater was sampled.	ME-1 Bedrock	No groundwater contamination was detected except for ETPH at 0.39 ppm. Low concentrations of ETPH and PAHs (below RES DEC and GB PMC) were detected in the soil. Source is not known, but may be related to ash used as fill and/or miscellaneous small petroleum or dye releases.
Buildings 1 and 2	Storage of flammable solvents and mixing of coatings	AM-4	19.5	ETPH at 360 mg/kg (3-5 ft); Pb at 438 mg/kg (5-7 ft)	No Detections of Note	Well downgradient of buildings is not available. Extent of soil contamination is unknown.	Attempt installation of bedrock well in vicinity of boring AM-6. Collect soil samples and groundwater samples.	Proposed Location 4 not attempted	After inspection by potential drilling contractors, it was concluded that this area would not be accessible for installation of of a bedrock well. Other locations were considered but no acceptable location could be identified. It may not be possible to examine this area further without substantial expense and disruption. There is no evidence of a release that has impacted groundwater and soil detections in AM-4 and AM-6 are below I/C DEC.
Building 3	Downgradient of solvent coating/ former storage area	AM-6	8.5	ETPH at 770 mg/kg (5-6 ft bgs)	No well				
Across Grove Street from Building 14	Former gasoline station located across Grove Street southeast of site	None	N/A	N/A	N/A	Not known if releases occurred at former gas station and migrated onto site.	No Activity (TBA is restricted to site property). On-site wells will be sampled for petroleum-related compounds (BTEX, ETPH).	All ME series wells	No BTEX compounds or PAHs were detected in the ME series groundwater samples. ETPH was detected with highest concentrations at ME-2. Most likely source is thought to be dye-colored water releases rather than releases from former gas station. BTEX would be expected to be present from a gasoline release. A well within Building 14 (attempted but not completed; see ME-3 discussion) would be useful in further evaluating possibility of off-site contaminants migrating onto site.
Areas Not Selected for Investigation During the TBA									
Loading dock on south side of Building 14	Potential for chemical spills during loading/unloading	None	N/A	N/A	N/A	Evidence of surface releases (if any) is likely obliterated due to paving and vehicle activity in this area. Possible migration of a release through pavement cracks cannot be ruled out based on visual observations of no obvious surface impacts.	No activity because evidence of past releases (if any) was considered unlikely to be detected by surface soil sampling, and other REC were prioritized for installation of borings/wells.	N/A	
Building 7	Solvent Coaters	None	N/A	N/A	N/A	Located partially above raceway. Releases (if any) likely entered raceway and river. Area is not accessible for installing borings/wells.	No Activity; area not accessible for a drill rig.	N/A	
Building 12	Maintenance/Machine Shop	None	N/A	N/A	N/A	Surface releases may have taken place but significant releases to subsurface not suspected, and if present might be observable via other wells to be installed downgradient.	No Activity; other REC were prioritized because likelihood of release was considered to be greater elsewhere, and downgradient wells might detect releases to groundwater, if they occurred in Building 12.	N/A	

Table 7. Summary of GeoDesign and TBA Investigations and Remaining Areas of Conern

GeoDesign Phase I and Phase II Assessments (2004)						TBA Investigation Locations and Rationale			
Recognized Environmental Condition/Location	Rationale for Listing	Associated Phase II Investigation Location	Depths of auger refual (feet bgs)	Phase II Analytical Results Summary		Data Gaps Remaining after Phase II	Completed TBA Investigation Locations	Boring/Well Location ID (see M&E (Figure 3)	TBA Investigation Observations and Remaining Data Gaps
				Soil	Groundwater				
Slope west of Bldgs. 1 and 2	Location of reported dye-colored water seepage (1994) and observed solid waste debris.	AM-4	19.5	ETPH at 360 mg/kg (3-5 ft); Pb at 438 mg/kg (5-7 ft)	No Detections of Note	Slope area not accessible. AM-4 would potentially show groundwater contamination migrating from Building 2 area, if present.	No Activity because area is not accessible for drill rigs and access is difficult for any type of sampling due to very steep slope.	N/A	
Building 13	Latex coating operations	None	N/A	N/A	N/A	Releases possible but not suspected; area not accessible.	No Activity because area is not accessible for drill rigs.	N/A	
Building 2 loading dock	Potential for chemical spills during loading/unloading	AM-4	19.5	ETPH at 360 mg/kg (3-5 ft); Pb at 438 mg/kg (5-7 ft)	No Detections of Note	Extent of soil contamination is unknown. AM-4 result does not exceed CT RSR but does exceed DEP guideline for Pb in residential soil.	No Activity; see above for Bldgs. 1 & 2	N/A	
South of Building 7	Four transformers (3 PCB-containing)	PCB Surface Soil Sample (S-1)	N/A	No PCBs detected	N/A	No evidence of contamination encountered during Phase II investigation.	No Activity; previous investigation did not detect evidence of a release.	N/A	
Building 8	Former Belding Bros. Dye House; waste oil storage area	None	N/A	N/A	N/A	No direct evidence of releases. Phase I Report notes that waste oil storage area was neat and well maintained.	No Activity. Access to area with a drill rig is difficult and other REC were prioritized for borings/wells.	N/A	

Notes:

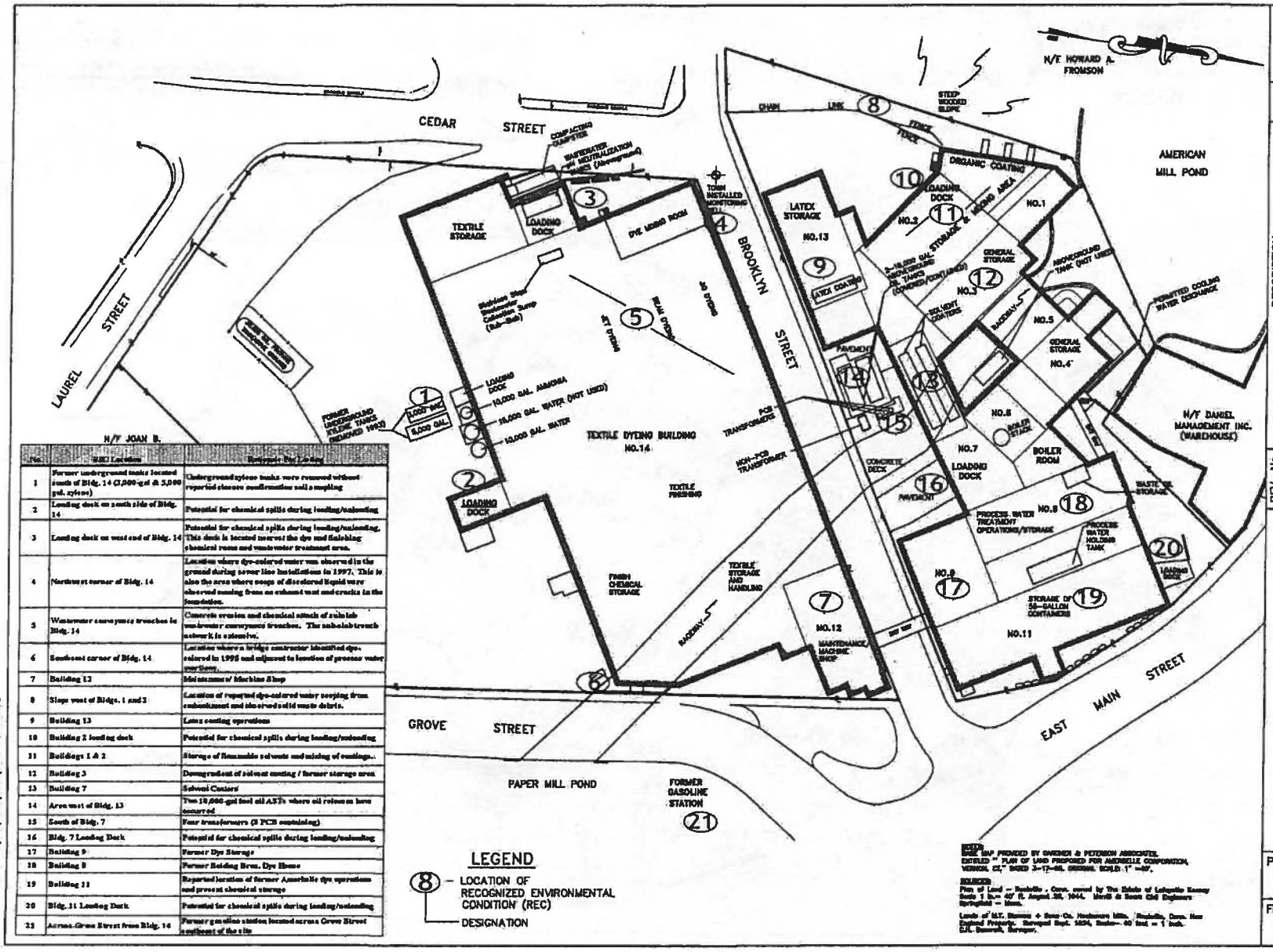
N/A - not applicable
CT RSR - Connecticut Remediation Standard Regulations
SWPC - Surface Water Protection Criteria (Connecticut Remediation Standard Regulations)
EX - Ethylbenzene and Xylenes
As - Arsenic
Cu - Copper
Pb - Lead
Zn - Zinc
ETPH - Extractable Total Petroleum Hydrocarbons (CTDEP method)
No Detection of Note - No organic compounds were detected and no metals were detected in excess of CT RSR criteria

References:

GeoDesign, Inc. 2004. Phase I Environmental Site Assessment.
GeoDesign, Inc. 2004. Phase II Environmental Site Assessment.

APPENDIX A

SELECTED TABLES AND FIGURES FROM PHASE I AND PHASE II REPORTS (GEODESIGN, 2004)



No.	SRC Location	Rationale For Listing
1	Former underground tanks located south of Bldg. 14 (3,000-gal & 5,000 gal. xylene)	Underground xylene tanks were removed without reported closure confirmation soil sampling
2	Loading dock on south side of Bldg. 14	Potential for chemical spills during loading/unloading
3	Loading dock on west end of Bldg. 14	Potential for chemical spills during loading/unloading. This dock is located nearest the dye and finishing chemical room and wastewater treatment area.
4	Northwest corner of Bldg. 14	Location where dye-colored water was observed in the ground during sewer line installations in 1997. This is also the area where seeps of discolored liquid were observed running from an exhaust vent and cracks in the foundation.
5	Wastewater conveyance trenches in Bldg. 14	Concrete erosion and chemical attack of subslab wastewater conveyance trenches. The subslab trench network is extensive.
6	Southeast corner of Bldg. 14	Location where a bridge contractor identified dye-colored in 1998 and adjacent to location of process water overflow.
7	Building 12	Maintenance/ Machine Shop
8	Slope west of Bldgs. 1 and 2	Location of reported dye-colored water seeping from embankment and observed solid waste debris.
9	Building 13	Latex coating operations
10	Building 2 loading dock	Potential for chemical spills during loading/unloading
11	Buildings 1 & 2	Storage of flammable solvents and mixing of coatings.
12	Building 3	Downgradient of solvent coating / former storage area
13	Building 7	Solvent Coaters
14	Area west of Bldg. 13	Two 10,000-gal fuel oil ASTs where oil releases have occurred
15	South of Bldg. 7	Four transformers (3 PCB containing)
16	Bldg. 7 Loading Dock	Potential for chemical spills during loading/unloading
17	Building 9	Former Dye Storage
18	Building 8	Former Boiling Bros. Dye House
19	Building 11	Reported location of former Amerbelle dye operations and present chemical storage
20	Bldg. 11 Loading Dock	Potential for chemical spills during loading/unloading
21	Across Grove Street from Bldg. 14	Former gasoline station located across Grove Street southeast of the site

LEGEND

(8) – LOCATION OF RECOGNIZED ENVIRONMENTAL CONDITION (REC)
DESIGNATION

NOTE:
THE MAP PROVIDED BY GARDNER & PETERSON ASSOCIATES, ENTITLED " PLAN OF LAND PREPARED FOR AMERBELLE CORPORATION, VERNON, CT," DATED 3-17-98, DRAWN, SCALE 1" =60'.

SOURCES:
Plan of Land – Rockville – Conn. owned by The Estate of Lafayette Kenney Scale 1 in.= 40' S. August 28, 1944. Merrill & Sears Civil Engineers Springfield – Mass.
Lands of M.T. Stevens + Sons Co. Hockanum Mills, Rockville, Conn. New England Property. Surveyed Sept. 1934, Scale– 40 feet = 1 inch. C.E. Bennett, Surveyor.

DATE	BY	DESCRIPTION	REV. No.

GEODESIGN INCORPORATED
GEOTECHNICAL ENGINEERS • ENVIRONMENTAL CONSULTANTS
1145 SOUTH ROAD • MIDDLEBURY, CONNECTICUT 06762
TELEPHONE (203)758-8328 FACSIMILE (203) 758-8342

SCALE IN FEET
1" = 60'
0' 30' 60' 120'

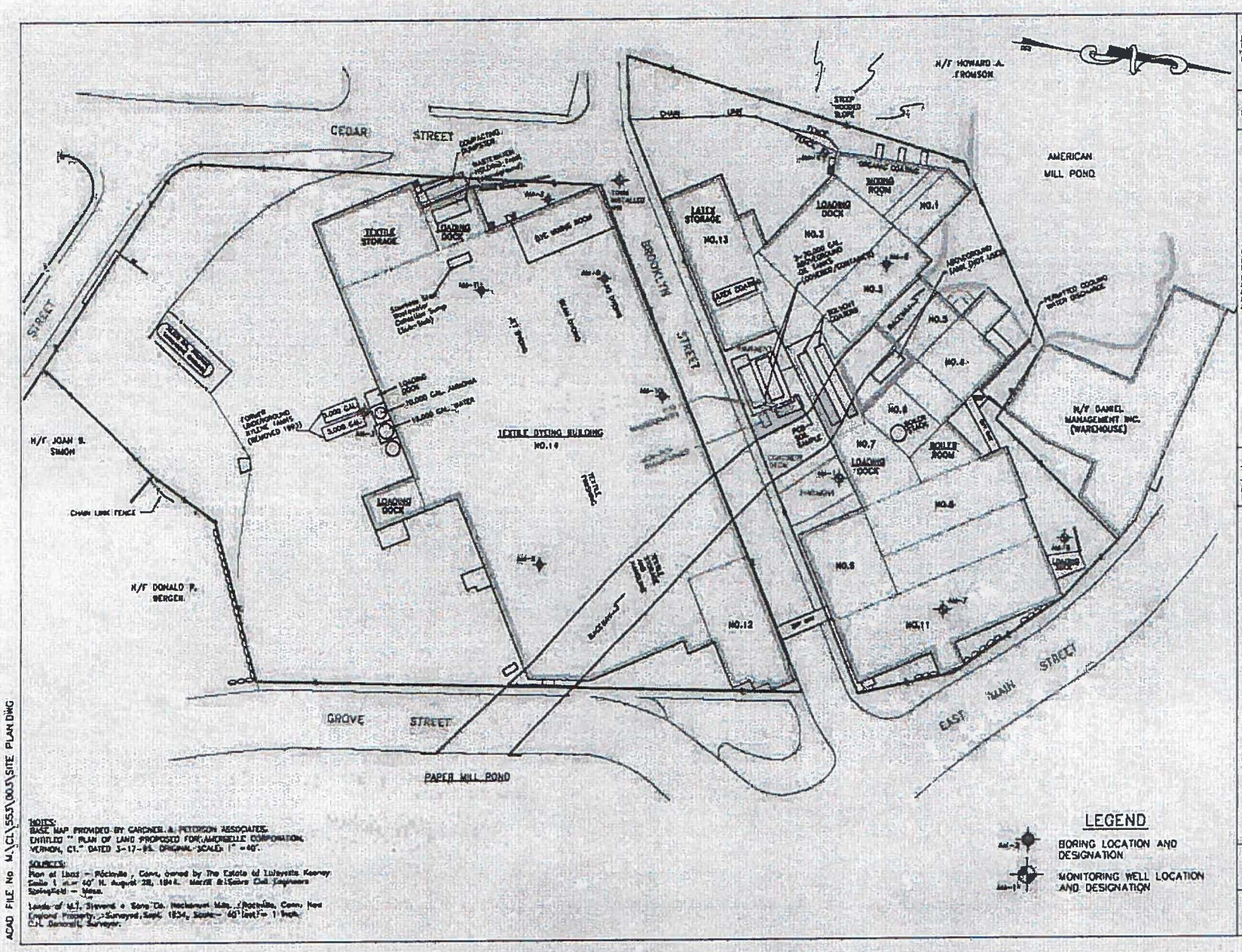
RECOGNIZED ENVIRONMENTAL CONDITIONS
AMERBELLE CORPORATION
104 EAST MAIN STREET
VERNON, CONNECTICUT

DRAWN BY: SMC
REVIEWED BY: TFC

PROJECT No.
553-003

FIGURE No.
3

ACAD FILE No. M:\CL\553\003\SITE PLAN.DWG


CEDAR STREET
STREET
TEXTILE STORAGE
LOADING DOCK
DYE MIXING ROOM
TOWER INSTALLED
BROOKLYN STREET
LATEX STORAGE
NO.13
LATEX COLLOID
LOADING DOCK
NO.3
NO.1
MIXING ROOM
STEEL DOORS
CHAIN LINK
STEEL DOORS
STEEL DOORS
DRAINING COLLOID
N/F HOWARD A. TRONSON
AMERICAN MILL POND
NO.2
NO.5
NO.4
NO.6
NO.7
NO.8
NO.9
NO.11
NO.12
BOILER ROOM
LOADING DOCK
TEXTILE DYEING BUILDING
NO.14
TEXTILE PRODUCT
LOADING DOCK
2,000 GAL.
3,000 GAL.
LOADING DOCK
10,000 GAL. AMMONIA
10,000 GAL. WATER
TOWER UNDERGROUND PIPELINE (REMOVED 1991)
N/F JOAN S. SIMON
CHAIN LINK FENCE
N/F DONALD P. BERGER
N/F DANIEL MANAGEMENT INC. (WAREHOUSE)
GROVE STREET
PAPER MILL POND
EAST MAIN STREET
LEGEND
BORING LOCATION AND DESIGNATION
MONITORING WELL LOCATION AND DESIGNATION
SCALE IN FEET
1"= 60'
0' 30' 60' 120'
DATE
BY
DESCRIPTION
REV. No.
GEOPHASION INCORPORATED
SITE PLAN
AMERBELLE CORPORATION
104 EAST MAIN STREET
VERNON, CONNECTICUT
DRAWN BY: SMC
REVIEWED BY: TFC
PROJECT No.
553-003
FIGURE No.
2
NOTES:
BASE MAP PROVIDED BY GARDNER & PETERSON ASSOCIATES.
ENTITLED " PLAN OF LAND PROPOSED FOR AMERBELLE CORPORATION, VERNON, CT." DATED 3-17-94. ORIGINAL SCALE: 1" =40'.
SOURCES:
Map of Land – Rockville, Conn. owned by The Estate of Lillyette Kearney Scale 1 in.= 40' N. August 28, 1944. Merrill & Evans Civil Engineers Springfield – Mass.
Lands of M.T. Stevens & Sons Co. Rockville Mass. / Rockville, Conn. New England Property. / Surveyed, Sept. 1934, Scale– 40' feet/= 1 Inch. C.H. Demerell, Surveyor.
ACAD FILE No. M:\CL\553\003\SITE PLAN.DWG

BORING LOCATION RATIONALE
Phase II Environmental Site Assessment
Amerbelle Corporation
104 East Main Street
Vernon, CT

Boring Designation	Location	Rationale
AM-1	Loading dock on the south side of Building 7.	Area of chemical loading/unloading
AM-2	Near northwest corner of Building 14 and Dye Mixing Room	Near Building No. 14 Dye Mixing Room, loading dock and near location where dye water had been encountered by town
AM-3	South side of Building No. 14, near loading dock	Former location of 3,000-gallon & 5,000-gallon underground xylene storage tanks (removed in 1993 without closure sampling).
AM-4	Southwest corner of Building No. 1	Adjacent to Building 2 loading/unloading dock and the Organic Coating/Mixing room in Building 1
AM-5	Building Exterior, Building No. 11 Loading Dock	Area of chemical loading/unloading
AM-6	Building Interior, Building No. 3	Interior storage location within an old portion of the mill
AM-7	Building Interior, Building No. 11	In an area identified as the dyehouse prior to construction of Building 14
AM-8	Building Interior, Building No, 14, Jig Dyeing area	Area of Jig Dyeing machines and wastewater conveyance trenches
AM-9	Building Interior, Building No. 14, textile finishing area	Textile finishing area – location of finish frames and finishing chemical storage
AM-10	Building Interior, Building No. 14, textile finishing area	Inferred to be downgradient of several dyeing and finishing operations, assuming groundwater flow towards the canal
AM-11	Building Interior, Building No. 14, wastewater collection sump area	Located adjacent to wastewater conveyance trenches and the main collection sump

TABLE 1
SOIL ANALYTICAL RESULTS SUMMARY
AMERBELLE CORPORATION
104 EAST MAIN STREET
VERNON, CONNECTICUT

Analyte	Sample Designation and Result (mg/kg)														Remediation Criteria (mg/kg)		
	AM-1/ 1-3'	AM-1/ 3-5'	AM-3/ 3-5'	AM-3/ 5-7'	AM-4/ 3-5'	AM-4/ 5-7'	AM-5/ 3-5'	AM-5/ 9-11'	AM-6/ 5-6'	AM-7/ 3-5'	AM-8/ 3-4'	AM-9/ 5-7'	AM-11/ 1-3'	AM-11/ 5-6'	R-DEC	I/C-DEC	GB-PMC [2]
Volatile Organic Compounds and TICs																	
2,2,3,3-tetramethyl-Butane	NT	NT	ND	NT	ND	NT	NT	ND	0.26 (J)	NT	ND	ND	ND	ND	NE	NE	NE
2,2,5,5-tetrmethyl-Hexane	NT	NT	ND	NT	0.37 (J)	NT	NT	0.15 (J)	ND	NT	ND	ND	ND	ND	NE	NE	NE
2,2-dimethyl-Hexane	NT	NT	0.19 (J)	NT	ND	NT	NT	ND	ND	NT	ND	ND	ND	ND	NE	NE	NE
Cyclohexane	NT	NT	ND	NT	0.29 (J)	NT	NT	ND	ND	NT	ND	ND	ND	ND	NE	NE	NE
Ethylbenzene	NT	NT	< 0.18	NT	< 0.18	NT	NT	< 0.14	< 0.21	NT	0.35	< 0.2	< 0.13	< 0.17	500	1,000	10
Methyl isobutyl ketone (MIBK)	NT	NT	< 1	NT	< 1	NT	NT	< 1	< 1	NT	< 0.36	< 0.4	< 0.26	< 0.34	500	1,000	14
Toluene	NT	NT	< 0.18	NT	0.42	NT	NT	< 0.14	< 0.21	NT	< 0.18	< 0.2	< 0.13	< 0.17	500	1,000	67
Total Xylenes	NT	NT	< 0.18	NT	< 0.18	NT	NT	< 0.14	< 0.21	NT	2.2	< 0.2	< 0.13	< 0.17	500	1,000	20
Semi-Volatile Organic Compounds and TICs																	
TICs	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	ND	NT	NT	ND			
Extractable Total Petroleum Hydrocarbons																	
ETPH	920	NT	240	NT	360	NT	< 10	NT	770	83	NT	< 10	NT	NT	500	2,500	2,500
Miscellaneous Organic Compounds																	
Aniline	NT	NT	NT	NT	NT	NT	NT	NT	NT	< 0.33	< 0.33	NT	NT	< 0.33	NE	NE	NE
Formaldehyde	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	17	NT	NT	9.3	NE	NE	NE
Total Metal Elements																	
Arsenic	3.97	**122**	NT	2.35	NT	5.63	NT	NT	NT	2.04	1.93	2.36	NT	1.93	10	10	NA
Barium	92	48.2	NT	43.9	NT	76.6	NT	NT	NT	114	113	60.5	NT	61.2	4,700	140,000	NA
Chromium	12.6	8.51	NT	11.8	NT	22.9	NT	NT	NT	16.4	28.4	15	NT	19.3	100 [3]	100 [3]	NA
Copper	20.1	19.7	NT	11.3	NT	27.1	NT	NT	NT	33.7	19.8	16.1	NT	15.1	2,500	76,000	NA
Lead	15.3	32.8	NT	20.8	NT	438	NT	NT	NT	40.3	13	28.5	NT	5.11	500	1,000	NA
Mercury	< 0.1	< 0.1	NT	< 0.1	NT	0.3	NT	NT	NT	0.11	< 0.1	< 0.1	NT	< 0.1	20	610	NA
Nickel	11.5	2.29	NT	7.41	NT	12.8	NT	NT	NT	8.66	12	8.42	NT	9.64	1,400	7,500	NA
Silver	0.762	< 0.5	NT	< 0.5	NT	< 0.5	NT	NT	NT	< 0.5	< 0.5	< 0.5	NT	< 0.5	340	10,000	NA
Zinc	26.8	15.4	NT	49.6	NT	73.4	NT	NT	NT	49	43.7	32.8	NT	22.4	20,000	610,000	NA

LEGEND:
NT = Not Tested
NE = None Established
ND = Not Detected
NA = Not Applicable
TICs = Tentatively Identified Compounds
J = J value indicates an estimated concentration that is below the quantification limit, but is present.
R-VC = Residential Volatilization Criteria
I/C-VC = Industrial/Commercial Volatilization Criteria
GB-PMC = Pollutant Mobility Criteria - GB Area

NOTES:
1. In general, only detected compounds are reported. Refer to the analytical data sheets for all analytes and detection limits.
2. The Pollutant Mobility Criteria for metal elements in soil can not be directly applied to mass analysis (total) results.
3. This standard assumes the more stringent DEC for hexavalent chromium.
4. Bolded data indicates exceedance of an applicable remediation standard.

TABLE 2
GROUNDWATER ANALYTICAL RESULTS SUMMARY
AMERBELLE CORPORATION
104 EAST MAIN STREET
VERNON, CONNECTICUT

Analyte	Sample Designation and Result (ug/l)					Remediation Criteria (ug/l)		
	AM-1	AM-3	AM-4	AM-7	W-1	R-VC	I/C-VC	SWPC
	Volatile Organic Compounds and TICs							
Chloroethane	<5	<5	<5	<5	120	12,000(2)	29,000(2)	NE
Dimethyl Formamide (DMF)	<1000	<1000	<1000	<1000	<1000	NE	NE	NE
Methyl isobutyl ketone (MIBK)	<10	<10	<10	<10	<10	13,000(2)	50,000	NE
	Semi-Volatile Organic Compounds and TICs							
1,4-Dichlorobenzene	NT	NT	NT	NT	14	1,400(2)	3,400(2)	26,000
1-[4-(2-benzoxazoly)'1H-Pyrrole-2,5-dione	NT	NT	NT	NT	54	NE	NE	NE
1-methoxy-4-octyl-Benzene	NT	NT	NT	NT	52	NE	NE	NE
2-Nonylphenol	NT	NT	NT	NT	120	NE	NE	NE
4-(2,2,4-trimethylpentyl)-Phenol	NT	NT	NT	NT	80	NE	NE	NE
4-chloro-2-(trifluoromethyl) Benzenamine	NT	NT	NT	NT	26	NE	NE	NE
4-Nonylphenol	NT	NT	NT	NT	130	NE	NE	NE
Aniline	<10	<10	<10	<10	<10	NE	NE	NE
Bis(2-ethylhexyl)phthalate	NT	NT	NT	NT	11	NE	NE	59
dodecyl-Phenol	NT	NT	NT	NT	190	NE	NE	NE
dodecyl-Phenol	NT	NT	NT	NT	210	NE	NE	NE
Fluoranthene	NT	NT	NT	NT	13	NE	NE	3,700
Formaldehyde	<100	<100	<100	<100	<100	NE	NE	NE
nonyl-Phenol	NT	NT	NT	NT	91	NE	NE	NE
Pyrene	NT	NT	NT	NT	12	NE	NE	110,000
	Extractable Petroleum Hydrocarbons							
ETPH	<100	<100	260	590	1100	NE	NE	NE
	Dissolved Metals							
Arsenic	<4	<4	<4	11	4	NE	NE	4
Barium	38	41	48	12	10	NE	NE	NE
Chromium	<1	<1	<1	2	1	NE	NE	110
Copper	2	2	3	82	28	NE	NE	48
Lead	<1	<1	<1	8	1	NE	NE	13
Nickel	<2	3	3	<2	41	NE	NE	880
Zinc	4	9	5	9	171	NE	NE	123

LEGEND:
NT = Not Tested
NE = None Established
TICs = Tentatively Identified Compounds
R-VC = Residential Volatilization Criteria
I/C-VC = Industrial/Commercial Volatilization Criteria
SWPC = Surface Water Protection Criteria

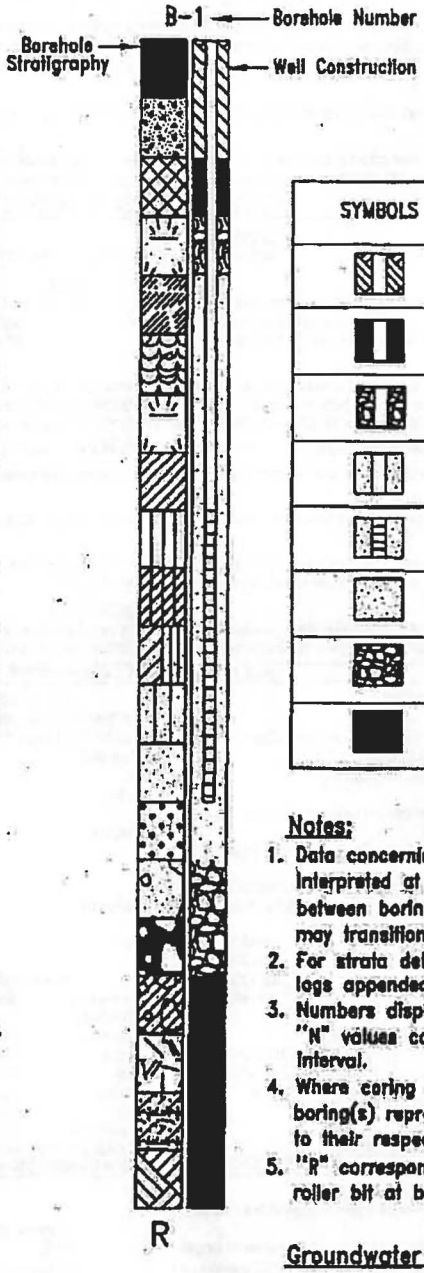
NOTES:
1. In general, only detected compounds are reported. Refer to the analytical data sheets for all analytes and detection limits.
2. Denotes the Proposed VC Standard (March 2003).
3. Bolded data indicates exceedance of remedial standard.

APPENDIX 2
BORING LOGS

STRATIGRAPHY SYMBOLS

SYMBOLS	TYPICAL DESCRIPTIONS OF PREDOMINENT MATERIAL TYPE
	ASPHALT
	CONCRETE
	FILL
	TOPSOIL
	SUBSOIL
	ORGANIC SILT OR CLAY WITH SHELLS
	PEAT
	CLAY
	SILT
	CLAY/SILT MIXTURE
	CLAY/SILT/SAND MIXTURE
	SILT/SAND MIXTURE
	POORLY-GRADED SAND
	WELL-GRADED SAND
	SAND/GRAVEL MIXTURE
	BOULDERS AND/OR COBBLES
	GLACIAL TILL
	DECOMPOSED BEDROCK
	SANDSTONE
	BEDROCK

EXPLANATION OF BORING



WELL SYMBOLS

SYMBOLS	TYPICAL DESCRIPTIONS
	CEMENT SEAL: 1 PIPE
	BENTONITE SEAL: 1 PIPE
	SLOUGH BACKFILL: 1 PIPE
	FILTER PACK: 1 PIPE
	SLOTTED PIPE WITH FILTER PACK: 1 PIPE
	FILTER PACK AT BOTTOM OF HOLE
	SLOUGH AT BOTTOM OF HOLE
	BENTONITE AT BOTTOM OF HOLE

Notes:

1. Data concerning the various strata have been interpreted at boring locations only. The stratigraphy between borings may vary from that shown, and may transition more gradually within borings.
2. For strata details, see Report and boring logs appended to this report.
3. Numbers displayed beside boring(s) represent SPT "N" values corresponding to their respective sampling interval.
4. Where coring was performed, numbers displayed beside boring(s) represent Recovery and RQD values corresponding to their respective sampling interval.
5. "R" corresponds to refusal of sampler, casing and/or roller bit at bottom of boring.

Groundwater Observations (where applicable)

▽ Water Level Reading at time of drilling.

▼ Water Level Reading after completing drilling.

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TELEPHONE: (203)758-8836 FACSIMILE: (203)758-8842

SUBSURFACE PROFILE LEGEND

ACAD FILE No. M:\CL\FORMS\LEGEND.DWG

EXPLANATION OF THE FORM - BORING LOG

The following provides an explanation of the various fields on the Boring Log form.

BORING LOG HEADING

Project and Boring Details
Within the upper portion of the Boring Log, details with regards to the Project Name and Location, Boring Number, and GeoDesign's file number are provided. In addition, within the upper section of the Boring Log, the Drilling Company's name, and their representative, together with the name of GeoDesign's representative, are presented. Details with regards to the dates when the boring was drilled, its coordinates or other location references and the corresponding surface elevation may also be provided. Where applicable, the Datum used is provided in the text of the Report.

Casing and Sampler
This section provides a summary of the typical size of samplers and casings used, together with the type of drilling rig. See below for a description of samplers.

Groundwater Observations
Water levels typically indicated on the Boring Log are levels measured in the boring at the times indicated. In permeable materials, the indicated levels may reflect the location of groundwater. In low permeability soils and/or due to effects of the casing, the accurate determination of groundwater levels may not be possible with only short term observations.

CENTRAL PORTION OF BORING LOG

DEPTH
This column gives the depth scale of the boring, in feet or meters.

CASING BLOWS
Indicates the number of blows per foot (0.3 m) required to advance the casing, using a 136 kg (300-pound) hammer.

SAMPLE INFORMATION

The initial columns provide the sample number, sample type, penetration, recovery and sample depth. The Sample Type Coding is as follows:

A - Auger Sample
C - Core - Diamond Bit - NX double tube, unless otherwise noted
PS- Undisturbed Piston - 3" (76 mm)
SS - Split-Barrel (Split-Spoon)
SSL - Large Split-Barrel - 3" (76 mm)
ST - Shelby Tube - 3" (76 mm)
V - Vane Test

Blows / 6 inch (0.15 meter) Interval
Representative soil samples were obtained in the boring by split-barrel sampling procedures in general accordance with ASTM D 1586. The split-barrel sampling procedure utilizes a standard 51 mm (2") outside diameter split-barrel sampler that is driven into the bottom of the boring with a 63.5 kg (140-pound) hammer falling a distance of 0.76 m (30"). The number of blows required to advance the sampler in 0.15 m (6") increments is recorded as part of the Standard Penetration Test (SPT). These values are indicated at their depth of occurrence.

The number of blows required to advance the split-barrel sampler the middle two - 0.15 m (6") increments of a 0.61 m (24") penetration is recorded as the Standard Penetration Resistance Value ("N").

Where the sampler advanced by Weight of Rods or Weight of Hammer, the designation WOR and WOH, respectively, was used. In the case of PS or ST samples, the designation PUSH was used.

Coring Time
This column provides the rate in minutes at which the core barrel was advanced into the bedrock (or boulder) in one foot (0.3 m) intervals.

PID Reading - Where Applicable
This column provides results for samples which were screened in the field with a photoionization detector for the presence of volatile organic compounds (including certain petroleum constituents) calibrated relative to benzene in air standard.

Moisture Content (%) - Where Applicable
This column provides moisture content determination results for the samples tested.

SAMPLE DESCRIPTION

This column provides a description of the soil and bedrock units, based on visual observation of the samples, sometimes in conjunction with field and laboratory tests. Each sample was generally described according to the following classification and terminology. In general, description of the soil units followed the Burmister classification system.

SOIL PROPERTIES & DESCRIPTIONS

TEXTURE*

Component	Size (mm)
CLAY	<0.002 mm
SILT	< #200 Sieve (0.075 mm)
SAND	#200 to #4 Sieve (0.075 mm to 4.75 mm)
Fine	#200 to #40 Sieve (0.075 mm to 0.425 mm)
Medium	#40 to #10 Sieve (0.425 mm to 2.00 mm)
Coarse	#10 to #4 Sieve (2.00 mm to 4.75 mm)
GRAVEL	#4 Sieve to 3 in (4.75 mm to 76 mm)
Fine	#4 Sieve to 3/4 in. (4.75 mm to 19 mm)
Coarse	3/4 in to 3 in (19 mm to 76 mm)
COBBLES	3 in to 12 in (76 mm to 305 mm)
BOULDERS	> 12 in (305 mm)

*textural classification as determined by sieve and hydrometer analyses

COMPOSITION

Principal Component in Upper Case i.e. >50%
CLAY, SILT, SAND, GRAVEL, COBBLES, BOULDERS

Minor Component Upper and Lower Case i.e.<50%
Clay, Silt, Sand, Gravel, Cobbles, Boulders

DESCRIPTIVE ADJECTIVE	PERCENTAGE REQUIREMENT
trace	<10 %
little	10 - 20 %
some	20 - 35 %
and	35 - 50 %

MOISTURE CONDITION

Dry	Absence of moisture, dusty
Moisture	Damp but no visible water
Wet	Visible free water

COHESIVE SOILS

ESTIMATED CONSISTENCY CLASSIFICATION ***	"N" Value
Very Soft	<2
Soft	2 - 4
Medium	4 - 8
Stiff	8 - 15
Very Stiff	15 - 30
Hard	> 30

COHESIONLESS SOILS

ESTIMATED COMPACTNESS DESCRIPTION ***	"N" Value
Very Loose	<4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

*** empirical relationship

PLASTICITY - Burmister

Degree of Plasticity	Soil Type	Smallest Diameter of Thread**
Non-Plastic	SILT	None
Slight	Clayey SILT	1/4" (6 mm)
Low	SILT & CLAY	1/8" (3 mm)
Medium	CLAY & SILT	1/16" (1.6 mm)
High	Silty CLAY	1/32" (0.8 mm)
Very High	CLAY	1/64" (0.4 mm)

** moisture at or near optimum

STRUCTURE

Stratified,	>6 mm (1/4")
Laminated,	< 6 mm (1/4")
Parting,	0 to 1.6 mm (1/16")
Seam,	1.6 to 13 mm (1/2")
Layer,	13 to 305 mm (12")
Stratum,	> 305 mm (12")

BEDROCK PROPERTIES & DESCRIPTIONS

RECOVERY AND ROCK QUALITY DESIGNATION (RQD)
Recovery is defined as the length of core obtained expressed as a percentage of the total length cored.

RQD is defined as the total length of sound core pieces, 4 inches (100 mm) or greater in length, excluding drilling breaks, expressed as a percentage of the total length cored. RQD provides an indication of the integrity of the rock mass and relative extent of seams and bedding planes.

Classification	RQD %
Very Poor Quality	0 - 25
Poor Quality	25 - 50
Fair Quality	50 - 75
Good Quality	75 - 90
Excellent Quality	90 - 100

HARDNESS

TYPICAL ROCK TYPES		Moh's Hardness Scale
Hard	Cannot be scratched with knife	> 5.5
Moderately Hard	Can scratch with knife but not fingernail	5.5 - 2.5
Soft	Can be scratched with fingernail	< 2.5
SANDSTONE		
Well Cemented	Capable of scratching a knife blade	5.5 - 2.5
Cemented	Can be scratched with knife	< 2.5
Poorly Cemented	Can be broken apart easily with fingers	

WEATHERING

Fresh	No visible signs of weathering
Slightly Weathered	Slight discoloration of parent material in joints and seams
Moderately Weathered	Less than 35% of rock material is decomposed. Fresh or discolored rock is present.
Highly Weathered	More than 35% of rock material is decomposed. Fresh or discolored rock is present.
Extremely Weathered	All rock material is decomposed to soil. Rock mass structure may still be intact.

SPACING OF DISCONTINUITIES

Bedding	Jointing	Spacing (inches)	Spacing (mm)
Very Thick Bedded	Very Wide	>80	>2000
Thick Bedded	Wide	24 - 80	600 - 2000
Medium Bedded	Moderate	8 - 24	200 - 600
Thin Bedded	Close	2.4 - 8	60 - 200
Very Thin Bedded	Very Close	0.8 - 2.4	20 - 60
Laminated	Shattered	0.24 - 0.8	6 - 20
Thinly Laminated	Fissured	<0.24	<6

When classification of rock materials has been estimated from disturbed samples, core samples and petrographic analysis may reveal other rock types.

SYMBOL
This column provides a graphical representation of the soil and bedrock units, and inferred geological contacts. See Subsurface Profile Legend.

STRATA DESCRIPTION (ELEVATION/DEPTH)
This column gives the elevation and depth of inferred geological contacts together with a general description of the respective soil and bedrock units. Stratification lines represent approximate boundaries between material types, transitions may be gradual.

BORING LOG FOOTER

The lower portion of the log provides additional drilling notes within the Remarks section together with additional General Notes.

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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-1
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 22, 2004	Date Finished:	January 22, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset:	ft

	Casing:	Sampler:
Type:	H.S.A.	SS
I.D.:	4.25 in.	1.38 in.
Hammer Wt.:	NA	140 lbs
Hammer Fall:	NA	30 in.
Rig Type:	Truck	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
1/22/04	11.8		In auger
1/29/04	10.3		

Depth (ft)	Casing Blows/ft	Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)	Strata Description: Depth & Elevation (feet)	Sample Description: Classification System:
													1.0 Asphalt & Basecoarse Fill	
		1	SS	24.0	16.0	1.0	15	18	45	63		ND		Very dense, brown/black fine to coarse SAND and GRAVEL, trace Silt (ash fragments and slag)
		2	SS	24.0	13.0	3.0	29	30	16	18		ND		Dense, brown/yellow/gray (banded) fine to coarse SAND, little fine Gravel, trace Silt
5													5.0 Sand & Gravel	
		3	SS	24.0	14.0	5.0	10	6	7	8		ND		Medium dense, red/brown fine to medium SAND, little fine to coarse Gravel, little Silt
		4	SS	24.0	4.0	7.0	7	7	7	5		ND		Medium dense, red/brown fine to medium SAND, little fine to coarse Gravel, little Silt
													9.0 Sand & Silt	
10		5	SS	15.0	10.0	9.0	3	1	100/3"			ND	10.3 ▼ Bedrock	Very dense, brown fine to medium SAND, some Silt, trace fine to coarse Gravel (wet) (N. rock in tip)
													12.3 ▼ Bottom of Exploration at 12.3 ft	
15														
20														
25														
30														

Symbol

Well Log

Remarks: Spoon refusal at 10.3 feet; HSA refusal at 10.9 feet; solid stem auger refusal at 12.3 feet below ground.
Installed 2" PVC well screen 7 to 12 feet below ground; Sand 5 to 12 feet below grade, bentonite chips 3 to 5 feet below ground, auger cuttings backfill, finished with curb box and cement collar.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected, N. R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-1

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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-2
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 22, 2004	Date Finished:	January 22, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset:	ft

	Casing:	Sampler:
Type:	H.S.A.	SS
I.D.:	4.25 in.	1.38 in.
Hammer Wt.:	NA	140 lbs
Hammer Fall:	NA	30 in.
Rig Type:	Truck	
Hammer Type:		

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Sample Information

Depth (ft)	Casing Blows/ft	Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)
		1	SS	24.0	18.0	1.0	30	22	18	11		ND
		2	SS	24.0	14.0	3.0	10	8	14	16		ND
5		3	SS	3.0	1.0	5.0	100/3"					ND
10												
15												
20												
25												
30												

Strata Description (Depth & Elevation (feet))	Symbol	Sample Description (Classification System)
Asphalt & Basecoarse Sand		Dense, red/brown fine to coarse SAND, some fine to coarse Gravel, trace Silt
		Medium dense, red/brown fine to medium SAND, little Silt
5.0 Bedrock		Very dense, gray fine to medium SAND and GRAVEL, trace Silt (weathered rock)
Bottom of Exploration at 5.3 ft		

Remarks: Spoon refusal at 5.3 feet, solid stem auger refusal at 5.5 feet below ground. Backfilled with cuttings and cemented over hole with asphalt.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual

Boring No.: AM-2

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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-3
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors
Foreman:	Mike St. John
GeoDesign Rep.:	Alan Colwell
Date Started:	January 22, 2004
Date Finished:	January 22, 2004
N. Coordinate:	
E. Coordinate:	
Ground Surface Elevation (feet):	
Station:	
Offset:	ft

	Casing:	Sampler:
Type:	H.S.A.	SS
I.D.:	4.25 in.	1.38 in.
Hammer Wt.:	NA	140 lbs
Hammer Fall:	NA	30 in.
Rig Type:	Truck	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
1/29/04	12.7		

Depth (ft)	Casing Blows/ft	Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)
		1	SS	3.0	3.0	1.0	100/3"					ND
		2	SS	24.0	4.0	3.0	5	4	3	3		0.2
5												
		3	SS	24.0	14.0	5.0	3	3	3	4		ND
		4	SS	24.0	1.0	7.0	7	7	6	5		ND
10		5	SS	24.0	1.0	9.0	4	3	3	5		ND
		6	SS	24.0	3.0	11.0	6	9	14	15		ND
		7	SS	19.0	16.0	13.0	9	10	13	50/1"		0.1
15												
20												
25												
30												

Depth & Elevation (feet)	Strata Description	Symbol	Sample Description (Classification System)
1.0	Asphalt & Basecoarse		
	(FILL) Sand & Gravel		Very dense, red/brown fine to coarse SAND and GRAVEL, little Silt
			Loose, red/brown fine to coarse SAND and GRAVEL, little Silt
			Loose, red/brown fine to coarse SAND, little fine to coarse Gravel, little Silt
			Medium dense, no recovery (Brick piece in tip of spoon)
			Loose, no recovery (Rock in tip of spoon)
			Medium dense, brown fine to coarse SAND, little fine to coarse Gravel, little Silt (wet)
13.0	Sand		Medium dense, brown fine to medium SAND, little Silt, trace fine Gravel (wet) (w. Bedrock in tip of spoon)
15.0	Bottom of Exploration at 15.0 ft		

Well Log

Remarks: Spoon refusal at 1 foot; solid stem augered through to 3 feet below ground (possible cobble).
Spoon refusal at 14.7 feet, Hollow Stem Auger refusal at 15 feet below ground.
Installed 2" PVC well screen from 14.5 to 9.5 feet below ground. Sand pack from 14.5 to 8 feet below ground, bentonite chips from 8 to 6 feet below ground, auger cuttings to 1 foot, curb box, cement collar 1 to 0 feet.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-3

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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-4
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 22, 2004	Date Finished:	January 22, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset: ft	

	Casing:	Sampler:
Type:	H.S.A.	SS
I.D.:	4.25 in.	1.38 in.
Hammer Wt.:	NA	140 lbs
Hammer Fall:	NA	30 in.
Rig Type:	Truck	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
▼ 1/29/04	18.1		
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)
		1	SS	24.0	3.0	1.0	50/3"					ND
		2	SS	24.0	5.0	3.0	2	2	1	2		0.3
5		3	SS	24.0	6.0	5.0	3	2	2	9		0.1
		4	SS	24.0	8.0	7.0	6	7	9	10		0.1
10		5	SS	24.0	13.0	9.0	11	13	19	19		ND
		6	SS	24.0	14.0	11.0	20	24	25	12		ND
		7	SS	24.0	15.0	13.0	12	14	15	15		ND
15		8	SS	24.0	3.0	15.0	24	18	16	15		ND
		9	SS	24.0	17.0	17.0	12	10	24	35		ND
20		10	SS	1.0	1.0	19.0	100/1"					ND
25												
30												

Depth & Elevation(feet)	Strata Description	Symbol	Classification System: Sample Description
1.0	Asphalt & Basecoarse		
	FILL Sand & Gravel		Very dense, brown fine to coarse SAND and GRAVEL, little Silt
			Loose, dark brown/black fine to coarse SAND, little fine Gravel, little Silt
			Loose, brown/black fine to coarse SAND and GRAVEL, little Silt (ash fragments/slag)
			Medium dense, red/brown fine to coarse SAND, some fine Gravel, little Silt
			Dense, red/brown fine to coarse SAND, trace fine to coarse Gravel, trace Silt
11.0	Silty Sand & Gravel		Dense, red/brown fine to coarse SAND and GRAVEL, little Silt
			Dense, red/brown fine to coarse SAND and GRAVEL, little Silt
			Dense, red/brown fine to coarse SAND and GRAVEL, little Silt
	▼		Dense, brown fine to medium SAND, little fine Gravel, little Silt (wet)
19.5	Bottom of Exploration at 19.5 ft		Very dense, light brown fine to medium SAND, little Silt (weathered bedrock)

Well Log

Remarks: Spoon refusal at 19.1 feet; HSA refusal at 19.5 feet below ground.
Installed 2" PVC well screen from 19 to 9 feet below ground, sand pack 19 to 7.5 feet below ground, bentonite chips 7.5 to 5.5 feet below ground, auger cuttings to ground surface and flush mount curb box with cement collar.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 5805 Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-4

GEODESIGN INCORPORATED
Geotechnical Engineers and Environmental Consultants
984 Southford Road
Middlebury, Connecticut 06762
Telephone: 203-758-8836 Fax: 203-758-8842

BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-5
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 22, 2004	Date Finished:	January 22, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset:	ft

	Casing:	Sampler:
Type:	H.S.A.	SS
I.D.:	4.25 in.	1.38 in.
Hammer Wt.:	NA	140 lbs
Hammer Fall:	NA	30 in.
Rig Type:	Truck	
Hammer Type:		

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
1/29/04	Dry		

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)	Strata Description (Depth & Elevation (feet))	Symbol	Sample Description (Classification System)	Well Log
													1.0 Asphalt & Basecoarse			
		1	SS	24.0	14.0	1.0	85	33	10	7		0.1	Silty Sand		Dense, brown fine to coarse SAND and GRAVEL, little Silt	
		2	SS	24.0	12.0	3.0	3	3	3	3		0.2			Loose, brown fine to medium SAND, some fine Gravel, little Silt	
5		3	SS	24.0	10.0	5.0	3	2	2	3		0.1			Loose, brown fine to medium SAND, some fine Gravel, little Silt	
		4	SS	24.0	2.0	7.0	3	4	5	5		0.1			Loose, brown fine to medium SAND, some fine Gravel, little Silt (gravel in tip of spoon)	
10		5	SS	24.0	12.0	9.0	3	2	4	5		0.3	10.0 Bedrock		Loose, brown fine to medium SAND, trace fine Gravel, trace Silt	
		6	SS	24.0	7.0	11.0	8	6	7	100/3"		0.1	12.5 Bottom of Exploration at 12.8 ft		Medium dense, gray fine to coarse GRAVEL, some fine to medium Sand, little Silt (wet)	
15																
20																
25																
30																

Remarks: Split spoon and HSA refusal at 12.8 feet.
2" PVC well installed 12.5 to 7.5 feet, sand pack 12.5 to 5.5, bentonite chips 5.5 to 3.5, auger cuttings to ground surface, curb box and cement collar.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual

Boring No.: AM-5

GEODESIGN INCORPORATED
Geotechnical Engineers and Environmental Consultants
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Telephone: 203-758-8836 Fax: 203-758-8842

BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-6
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors
Foreman:	Mike St. John
GeoDesign Rep.:	Alan Colwell
Date Started:	January 23, 2004
Date Finished:	January 23, 2004
N. Coordinate:	
E. Coordinate:	
Ground Surface Elevation (feet):	
Station:	
Offset:	ft

	Casing:	Sampler:
Type:	S.S.A	
I.D.:	4.0 in.	in.
Hammer Wt.:	NA	
Hammer Fall:	NA	
Rig Type:	Skid	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)	Strata Description Depth & Elevation (feet)	Symbol	Sample Description Classification System:
		1				0.0						NO	1.0		Brown fine to medium SAND, some Silt, little fine to coarse Gravel (between & under slabs)
													1.8 Slab		
													2.8 Slab		
													Sand & Gravel		
5													5.0		
		2				5.0						0.6	6.0 Slab		
		3				6.0						0.4	Sand & Gravel (Cobbles)		
		4				7.0						0.3	8.5		
													Possible Bedrock Bottom of Exploration at 8.5 ft		
10															
15															
20															
25															
30															

Remarks:
SSA grinding (possible Slab) from 1 to 1.8 feet, 2.1 to 2.8 feet, and 5 to 6 feet. Difficult drilling 6 to 8 feet, grinding at 8.5 feet (possible bedrock).
Attempted to see down hole with light, hole collapsed to 6 feet below ground.
Samples obtained off SSA flights.
Abandoned hole with bentonite chips and cement surface seal.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N. R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-6

GEODESIGN INCORPORATED
Geotechnical Engineers and Environmental Consultants
984 Southford Road
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Telephone: 203-758-8836 Fax: 203-758-8842

BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-7
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 23, 2004	Date Finished:	January 23, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset:	ft

	Casing:	Sampler:
Type:	S.S.A	
I.D.:	4.0 in.	in.
Hammer Wt.:	NA	
Hammer Fall:	NA	
Rig Type:	Skid	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
1/29/04	8.0		

Depth (ft)	Casing Blows/ft	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)	Strata Description (Depth & Elevation (feet))	Symbol	Sample Description (Classification System)	Well Log
													Concrete Slab			
													Sand & Gravel (Cobbles)		Brown fine to medium SAND, little fine to coarse Gravel, little Silt	
						3.0						0.1				
5																
						7.0						0.1				
10																
						10.0						0.1	11.0			
													Bottom of Exploration at 11.0 ft			
15																
20																
25																
30																

Remarks

Concrete slab approximately 0.5 feet thick.
Samples obtained off of SSA flights.
Difficult drilling throughout boring due to possible cobbles.
Hole collapsed to 9.5 feet before well installation.
Installed 2" PVC well at 9.5 to 4.5 feet, sand pack 9.5 to 3.0 feet. Bentonite chips 3 to 1 feet, concrete seal.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected, N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-7

GEODESIGN INCORPORATED
Geotechnical Engineers and Environmental Consultants
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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-8
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 31, 2004	Date Finished:	January 31, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset: ft	

	Casing:	Sampler:
Type:	S.S.A	
I.D.:	4.0 in.	in.
Hammer Wt.:	NA	
Hammer Fall:	NA	
Rig Type:	Skid	
Hammer Type:		

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Sample Information

Depth (ft)	Casing Blows/ft	Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0 - 6	6 - 12	12 - 18	18 - 24	Coring Time (min./ft)	PID Reading (ppm)
		1				3.0						3.9

Strata Description (Depth & Elevation (feet))	Symbol	Sample Description (Classification System:)
SLAB		
SAND, GRAVEL (COBBLES)		
4.0		Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
Bottom of Exploration at 4.0 ft		

Remarks:
Concrete slab approximately 0.5 feet thick.
Difficult drilling 1 foot to 4 feet below grade (cobbles).
SSA Refusal at 4 feet below grade (possible bedrock).
Samples obtained from SSA flights.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%, Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-8

GEODESIGN INCORPORATED
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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-9
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 31, 2004	Date Finished:	January 31, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset:	ft

	Casing:	Sampler:
Type:	S.S.A	
I.D.:	4.0 in.	in.
Hammer Wt.:	NA	
Hammer Fall:	NA	
Rig Type:	Skid	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Number	Sample Type	Penetration (inches)	Recovery (inches)	Sample Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)	Strata Description (Depth & Elevation (feet))	Symbol	Sample Description (Classification System:)
													SLAB		
													SAND, GRAVEL (COBBLES)		
						3.0						0.2			Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
5															
						5.0						1.4			Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
						7.0						0.7			Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
10															
						10.0						0.1			Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
													12.0 Bottom of Exploration at 12.0 ft		
15															
20															
25															
30															

Remarks:
Concrete slab approximately 0.42 feet thick.
SSA Refusal at 12 feet (possible bedrock).
Samples obtained from SSA flights.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual

BORING LOG PID 12/9/03 LOGS.GPJ GEODESIGN.PID.GDT 2/23/04

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Geotechnical Engineers and Environmental Consultants
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BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-10
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 31, 2004	Date Finished:	January 31, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset:	ft

	Casing:	Sampler:
Type:	S S.A	
I.D.:	4.0 in.	in.
Hammer Wt.:	NA	
Hammer Fall:	NA	
Rig Type:	Skid	
Hammer Type:		

Groundwater Observations

Date	Depth (ft)	Elev. (ft)	Notes

Depth (ft)	Casing Blows/ft.	Sample Number	Type	Penetration (inches)	Recovery (inches)	Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min/ft)	PID Reading (ppm)
						1.0						0.4
						3.0						0.2
5						5.0						0.3
10												
15												
20												
25												
30												

Strata Description (Depth & Elevation(feet))	Symbol	Sample Description (Classification System:)
SLAB		
SAND & GRAVEL (COBBLES)		Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
		Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
		Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
7.2 Bottom of Exploration at 7.2 ft		

Remarks:
Concrete slab approximately 0.5 feet thick.
SSA Refusal at 7.2 feet below grade (possible bedrock).
Samples obtained from flights of SSA.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N. R. = Not Recorded, N.A. = Not Applicable; O.R. = Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-10

GEODESIGN INCORPORATED
Geotechnical Engineers and Environmental Consultants
984 Southford Road
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Telephone: 203-758-8836 Fax: 203-758-8842

BORING LOG

Project Name: Amerbelle Corporation, Vernon, CT

Boring No.: AM-11
Page No.: 1 of 1
File No.: 553-003.0
Checked By: TFC

Boring Company:	New England Boring Contractors		
Foreman:	Mike St. John		
GeoDesign Rep.:	Alan Colwell		
Date Started:	January 31, 2004	Date Finished:	January 31, 2004
N. Coordinate:		E. Coordinate:	
Ground Surface Elevation (feet):			
Station:		Offset: ft	

	Casing:	Sampler:
Type:	S.S.A	
I.D.:	4.0 in.	in.
Hammer Wt.:	NA	
Hammer Fall:	NA	
Rig Type:	Skid	
Hammer Type:		

Groundwater Observations			
Date	Depth (ft)	Elev. (ft)	Notes
▼			
▼			
▼			
▼			

Depth (ft)	Casing Blows/ft	Sample Number	Sample Type	Penetration (inches)	Recovery (inches)	Sample Depth (ft)	Blows / 6 inch Interval 0-6	6-12	12-18	18-24	Coring Time (min./ft)	PID Reading (ppm)	Strata Description Depth & Elevation (feet)	Symbol	Sample Description Classification System:
													SLAB		
						1.0						3.8	SAND/GRAVEL (COBBLES)		Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
						3.0						1.4			Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
5															
						5.0						4.4			Red-brown fine to medium SAND, little Silt, little fine to coarse Gravel
						6.0						0.5	6.5		Gray-brown fine to medium SAND, little Silt, little fine to coarse Gravel
													Bottom of Exploration at 6.5 ft		
10															
15															
20															
25															
30															

Remarks:
Concrete slab approximately 0.5 feet thick.
SSA Refusal at 6.5 feet (possible bedrock).
Samples obtained from SSA flights.

Notes:
1) Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector. The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N. R. = Not Recorded; N A. = Not Applicable; O.R.= Out of Range
2) Water level readings have been made at times and under conditions stated, fluctuations of groundwater may occur due to other factors than those present at the time measurements were made. A.C. = After coring; N.R. = Not Recorded.
3) Sample Type Coding: A = Auger; C = Core; G=Grab; PS = Piston Sampler; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR = Weight of Rod
4) Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
5) Stratification lines represent approximate boundary between material types, transitions may be gradual.

Boring No.: AM-11

APPENDIX B

BORING LOGS

BOREHOLE LOG

METCALF & EDDY, INC.	SITE LOCATION	BORING/WELL ID
701 Edgewater Drive Wakefield, MA 01880 (617) 246-5200	AMERBELLE TEXTILES Brooklyn/East Main Streets Vernon/Rockville, Connecticut	ME-1

DRILL CONTRACTOR:	Geologic EarthEx	DRILLING METHOD:	Auger/Drive and Wash
DRILLER:	John Ferreira	DRILL RIG:	B-53 Mobile Rig
GEOLOGIST/ENG.	William Abrahams-Dematte	DRILLING FLUID:	Water (for bedrock drilling only)
START DATE:	November 29, 2005	SAMPLING METHOD:	2" Split-Spoon
FINISH DATE:	November 29, 2005		
WELL INFORMATION:	Approximately 400 gallons of water lost during bedrock portion of drilling.		
SCREEN INTERVAL	4.9-14.9 ft. bgs	PIPE MATERIAL:	Sch 40 flush threaded PVC
BORING DEPTH	16.0 feet bgs	PIPE SIZE:	2"

PAGE 1 of 1

Depth	Spoon No.	Range (ft)	Blow Counts (per 6 in.)	Rec. Length (ft)	PID* (ppm)	Water Table	Depth (ft)	Sample Description	Stratigraphic Description
0 ft	1	0-0.5	asphalt	1.5	ns	No Over-burden WT	0-0.5	Asphalt - roller-bit	Fill
	3"/300#	0.5-1.0	20				0.5-0.8	Red-brown, fine-medium sand and gravel, some silt, trace clay, dry.	
		1.0-1.5	28						
2 ft		1.5-2.0	23				0.8-2.0	Brown-red, fine sand, some-little medium sand little fine gravel, trace silt, friable, dry.	
	2	2.0-2.5	26	1.0	ns	Bed-rock WT 5.2	2.0-2.2	Red and white, medium sand, loose, dry	
	2"/140#	2.5-3.0	120 for 5"				2.2-2.4	Brownish-red, fine sand and fine gravel, little medium sand, loose, dry.	
	Auger	3.0-3.7	refusal						
4 ft	Roller bit	3.7-9.0					2.4-3.0	Pinkish-red changing to orange-red with depth Fine sand and pebble. Head of spoon was gold flaked phyllitic rock.	
	4" bit								
6 ft							3.0-3.7	Augered to refusal, weathered phyllitic bedrock	Bedrock 3.0 ft.
							3.7-9.0	Rollerbit drilling continued to approximately 9 feet before competent enough rock was encountered to set casing.	
8 ft								Rock coring was completed in a 3 foot run followed by a 4 foot run. Short runs were necessary due to the slope on which the drill rig sat. A large fracture at 13.3 feet was encountered, but no other notable fractures to depth	
9 ft									
	Rock Core	9-10	0.51 min	5.4 ft	-				
10 ft	3.9"OD	10-11	9.2 min						
	HQ barrel	11-12	10 min						
		12-13	9 min est.						
		13-14	8.75 min						
15 ft		14-15	9.55 min						
		15-16	11 min						

*PID calibrated with isobutylene. To read as benzene, multiply by 0.6.
min = minutes ns = not sampled

BOREHOLE LOG

METCALF & EDDY, INC.	SITE LOCATION	BORING/WELL ID
701 Edgewater Drive Wakefield, MA 01880 (617) 246-5200	AMERBELLE TEXTILES Brooklyn/East Main Streets Vernon/Rockville, Connecticut	ME-2

DRILL CONTRACTOR:	Geologic EarthEx	DRILLING METHOD:	Vacuum Extract/Roller Bit
DRILLER:	John Ferreira	DRILL RIG:	B-53 Mobile Rig
GEOLOGIST/ENG.	William Abrahams-Dematte	DRILLING FLUID:	Water (for bedrock drilling only)
START DATE:	November 28, 2005	SAMPLING METHOD:	2" Split-Spoon
FINISH DATE:	November 28, 2005		

PAGE 1 of 1

WELL INFORMATION:	Approximately 30 gallons water lost in bedrock drilling.		
SCREEN INTERVAL	8.0 -18.0 ft. bgs	PIPE MATERIAL:	Sch 40 flush threaded PVC
BORING DEPTH	18.0 feet bgs	PIPE SIZE:	2"

Depth	Spoon No.	Range (ft)	Blow Counts (per 6 in.)	Rec. Length (ft)	PID* (ppm)	Water Table	Depth (ft)	Sample Description	Stratigraphic Description
0 ft							0.0-5.3	Vacuum extracted soils to a depth of 5.0 feet. Spoon at 5.0 feet went only 0.3 feet before reaching refusal. Soils observed were fill (asphalt and 1-1/2 inch gravel in top foot) to depth. The soils appeared to have the texture of till.	Fill (till)
2 ft							5.3-18	Roller Bit drilling - due to lack of support in borehole as a result of vacuum extraction, rock coring was not possible because casing could not be set and stability maintained. Rock coring. Stopped 2 feet shy of target depth due to lateness of day and rock competence. Well built.	Bedrock 5.3 ft
4 ft									
6 ft						Over-burden WT ~4.2 ft			
8 ft							5.3-6.5	Tried to seat casing, could not due to lack of support for casing.	
10 ft						Bed-rock WT 11.9	6.5-10.5	Drill rate: 5 minutes (1.25 min/ft)	
							10.5-11.5	Drill rate: 4.5 minutes	
							11.5-12.5	Drill rate: 6 minutes	
12 ft							12.5-13.5	Drill rate: 4.5 minutes	
							13.5-14.5	Drill rate: 8.5 minutes	
							14.5-18.0	Drill rate: > 35 minutes (10+ min/ft).	
14 ft									
16 ft									
18 ft									
20 ft									

*PID calibrated with isobutylene. To read as benzene, multiply by 0.6.

BOREHOLE LOG

METCALF & EDDY, INC.	SITE LOCATION	BORING/WELL ID
701 Edgewater Drive Wakefield, MA 01880 (617) 246-5200	AMERBELLE TEXTILES Brooklyn/East Main Streets Vernon/Rockville, Connecticut	ME-3

DRILL CONTRACTOR:	Geologic EarthEx	DRILLING METHOD:	Drive and Wash/Rollerbit/Core
DRILLER:	John Ferreira	DRILL RIG:	Propane fired skid rig.
GEOLOGIST/ENG.	William Abrahams-Dematte	DRILLING FLUID:	Water
START DATE:	December 2, 2005	SAMPLING METHOD:	2" Split-Spoon
FINISH DATE:	December 3, 2005		

PAGE 1 of 1

WELL INFORMATION:	Approximately 1000 gallons of water lost during bedrock portion of drilling.		
SCREEN INTERVAL	no well installed	PIPE MATERIAL:	no well installed
BORING DEPTH	21.0 feet bgs	PIPE SIZE:	no well installed

Depth	Spoon No.	Range (ft)	Blow Counts (per 6 in.)	Rec. Length (ft)	PID* (ppm)	Water Table	Depth (ft)	Sample Description	Stratigraphic Description
0 ft	1	0-2	concrete	1.7	1		0-0.5	Concrete - hole saw	Fill (Till)
			24				0.5-1.7	Red-brown silty fine sand and gravel, compact dry.	
			37						
2 ft			61				1.7-2.0	Void	
	2	2-4	48	1.4	2		2.0-3.4	Red-brown, sand, gravel, silt, little-trace clay trace cobbles, dense, dry.	
			60						
			39				3.4-4.0	Void	
4 ft			41			Over-burden WT ~5.4 ft	4.0-5.0	Brown-red, medium sand, some-little fine and coarse sand, trace silt and pebble, loose, dry.	
	3	4-6	57	1.0	4		5.0-6.0	Void	
			33						
			19						
6 ft			120 for 4.5"						Bedrock 5.3 ft
	Rock Core	6-8	< 1 min	1.9		Bed-rock WT > 8 ft.		First rock core run. Recovery is only 50% likely because the upper portion of the run is weathered rock surface. Core recovered is competent, with a couple fractures. Rock appears to be a granofel.	
	3"OD	8-10	6.25 min						
	Rock Core	10-11	not timed	3.3				Second rock core run. Recovery is appears to be more gneissic than previous recovery. A large seam divides top and bottom of core. The seam is comprised of gravel and some cobble of igneous nature though one cobble was a red sandstone(?!). At the bottom of the core a gold mica phyllite was encountered. The phyllite exibits fracture with iron staining and is very soft.	
	3"OD	11-12	5 min						
		12-13	5 min						
		13-14	3.2 min						
15 ft		14-15	not timed						
		15-16	6.5 min	3.5				Third rock core run. This run was ended after 3.5 feet of coring due to the reduced coring rate (i.e. more highly competent bedrock). Gravel found at top of 100% core recovery. Top 2 feet were same as previous core run, exhibiting fractures about every 0.5 feet. The bottom 1-1/2 ft of core was a graphitic phyllite/schist with high angled planes.	
		16-17	6.5 min						
		17-18	8.5 min						
		18-19	7.75 for 6"						
20 ft		19-20	not cored						
								An attempt to set a well at 18.5 feet was made, however, the hole collapsed to 10 feet after removing rock coring equipment from the hole. A second attempt to reopen the hole was made the following day, but again the hole collapsed to a little over 8 feet below flow surface as a result of the fractured zone containing gravel. A temporary well was installed and voided of drilling water and allowed to sit for 20 minutes. After 20 minutes, there was no recharge to the well at all (which was expected given depth to water in bedrock).	
								After removing the temporary well, two 50 pound bags of bentonite were emptied into the hole and the floor resealed. No well was installed.	

*PID calibrated with isobutylene. To read as benzene, multiply by 0.6.

BOREHOLE LOG

METCALF & EDDY, INC.	SITE LOCATION	BORING/WELL ID
701 Edgewater Drive Wakefield, MA 01880 (617) 246-5200	AMERBELLE TEXTILES Brooklyn/East Main Streets Vernon/Rockville, Connecticut	ME-5

DRILL CONTRACTOR:	Geologic EarthEx	DRILLING METHOD:	Hollow Stem Auger - 3.25"ID
DRILLER:	John Ferreira	DRILL RIG:	B-53 Mobile Rig
GEOLOGIST/ENG.	William Abrahams-Dematte	DRILLING FLUID:	none
START DATE:	November 28, 2005	SAMPLING METHOD:	2" Split-Spoon
FINISH DATE:	November 28, 2005		

PAGE 1 of 1

WELL INFORMATION:			
SCREEN INTERVAL	4.8-12.8 ft. bgs	PIPE MATERIAL:	Sch 40 flush threaded PVC
BORING DEPTH	12.8 feet bgs	PIPE SIZE:	2"

Depth	Spoon No.	Range (ft)	Blow Counts (per 6 in.)	Rec. Length (ft)	PID* (ppm)	Water Table	Depth (ft)	Sample Description	Stratigraphic Description
0 ft	1	0-2	asphalt	1.3	0		0-0.5	Asphalt - roller-bit	Fill
			10				0.5-1.4	Black/gray, coal ash and chips, dry	
			22				1.4-1.8	Red, fine sand, some fine gravel, dry.	
2 ft			57				1.8-2.0	Void	
	2	2-4	28	1.5	0		2.0-2.1	Black fine-medium sand, possibly highly weathered micaceous rock	
			39				2.1-2.5	Red, fine-medium sand, trace gravel, loose,dry	
			44				2.5-2.7	grey/black, coal chips and ash, slightly moist, compact	
4 ft			50				2.7-3.1	Pinkish-red, fine sand, some-little silt, slightly compact, becomes or-red with depth, dry.	
	3	4-6	33	1.4	0		3.1-3.3	Bright yellow with black flecks, fine sand-silt texture, highly weathered rock {based on similar observations in other borings.}	
			56				3.3-3.5	Black, vitrous, coal.	
			22				3.5-4.0	Void	
6 ft			16						
	4	6-8	18	1.0	0		4.0-4.2	fall in	
			20				4.2-4.4	brown-red, fine sand, trace fine gravel, dry	
			12				4.4-4.6	Bright yellow/silver gray weathered rock.	
8 ft			12				4.6-5.4	bright orange-red, fine sand, some-little silt, lens of fine sandy silt, slightly compact, dry	Till
	5	8-10	12	1.5	0	Over-burden WT 10.4	5.4-6.0	Void	
			10				6.0-7.0	orange-red with variations in texture throghout Fine-medium sand and pebble to fine sand trace fine gravel, slightly compact, dry.	
			13				7.0-8.0	Void	
10 ft			13						
	6	10-12	5	1.0	0		8.0-9.5	Same As 6.0-7.0	
			6				9.5-10.0	Void	
			6				10.0-11.0	Same As 6.0-7.0, Wet at 10.4	
12 ft			7				11.0-12.0	Void	
	7	12-14	120 for 6"	0.4	0		12.0-12.4	Same As 6.0-7.0 Saturated Refusal at 12.4 feet, final open hole measurement 12.8 ft bgs.	Bedrock 12.8 ft.
14 ft									
16 ft									
18 ft									
20 ft									

*PID calibrated with isobutylene. To read as benzene, multiply by 0.6.

BOREHOLE LOG

METCALF & EDDY, INC.	SITE LOCATION	BORING/WELL ID
701 Edgewater Drive Wakefield, MA 01880 (617) 246-5200	AMERBELLE TEXTILES Brooklyn/East Main Streets Vernon/Rockville, Connecticut	ME-6

DRILL CONTRACTOR:	Geologic EarthEx	DRILLING METHOD:	Auger/Drive and Wash
DRILLER:	John Ferreira	DRILL RIG:	B-53 Mobile Rig
GEOLOGIST/ENG.	William Abrahams-Dematte	DRILLING FLUID:	Water (for bedrock drilling only)
START DATE:	November 30, 2005	SAMPLING METHOD:	2" Split-Spoon
FINISH DATE:	November 30, 2005		

PAGE 1 of 1

WELL INFORMATION:	Approximately 1000 gallons of water lost during bedrock portion of drilling.		
SCREEN INTERVAL	15.5-25.5 ft. bgs	PIPE MATERIAL:	Sch 40 flush threaded PVC
BORING DEPTH	25.5 feet bgs	PIPE SIZE:	2"

Depth	Spoon No.	Range (ft)	Blow Counts (per 6 in.)	Rec. Length (ft)	PID* (ppm)	Water Table	Depth (ft)	Sample Description	Stratigraphic Description
0 ft	1	0-2	asphalt	1.0	1		0-0.5	Asphalt - roller-bit	Fill (till like)
	3"/300#		13				0.5-1.5	Red, fine-coarse sand, some fine gravel, loose dry, trace black chips - coal??	
			15						
2 ft			22				1.5-2.0	Void.	
	2	2-4	8	1.7	1		2.0-2.6	Red-brown fine sand, little-trace pebble and fine gravel, slightly compact, dry.	
			9						
			5				2.6-3.7	Red-brown, fine sand, some medium sand, little-trace coarse sand and pebble, trace silt, trace fine and coarse gravel, loose, dry.	
4 ft			5						
	3	4-6	9	0.7	2		3.7-4.0	Void.	
	2"/140#		5				4.0-4.7	Red-brown, fine sand, trace coarse sand and pebble, loose, dry.	
			5						
6 ft			5				4.7-6.0	Void.	
	4	6-8	4	1.0	2		6.0-6.4	Red-brown, fine sand trace coarse sand and fine gravel, loose, dry.	
			5						
			5				6.4-6.7	Red-brown, fine sand, little silt, trace coarse sand and fine gravel, slightly compact, dry.	
8 ft			10						
	5	8-10	3	0.6	3		6.7-7.0	Same As 6.0-6.4, with gold mica weathered rock in the spoon head.	
			5						
			4						
10 ft			5			Over-burden WT 10.8	7.0-8.0	Void.	
	6	10-12	2	1.0	0		8.0-8.6	Same As 6.0-6.4	
			4				8.6-10.0	Void.	
			7				10.0-10.4	Red-brown fine sand, trace medium sand and silt, slightly compact, dry.	
12 ft			8						
	7	12-13.5	8	0.7	0		10.4-11.0	Red-brown, fine-medium sand, trace pebble and gravel, wet at 10.8 ft.	
			13						
			120 for 5"				11.0-12.0	Void.	
14 ft	Rollerbit	13.5-16	-				12.0-12.4	Red-brown, fine sand and silt, trace gravel, trace coal chips, saturated.	
	4" bit		-				12.7-12.7	Pepper granite, weathered.	
			-				12.7-13.5	Void.	BEDROCK 13.5 ft
			-						
16 ft			-					Roller bit to seat casing for coring. Large fracture 14.1 ft	
	Coring	16-17	4.25 min	1.8 ft	-			Rock coring proceded for 2 feet before all water was lost From 18-20 feet hundreds of gallons of water was lost with no return from hole. At approximately 4 feet core barrel ran into more competent rock but got jammed at 20.5 ft. Hole was open to 19.2 ft. Many fractures. Due to massive (2 ft) fracture, collapse in well was an issue. 3" casing was telescoped and via 3" roller bit the hole was eventually open to 25.5 ft.	
	3" OD	17-18	3.25 min						
	barrel	18-19	4.7 min						
20 ft		19-20	2.3 min						
20.5		20-20.5	1.9 min			Bedrock WT 19.5			
	Rollerbit	20.5-25.5							
	3" bit								
25.5 ft									

*PID calibrated with isobutylene. To read as benzene, multiply by 0.6.

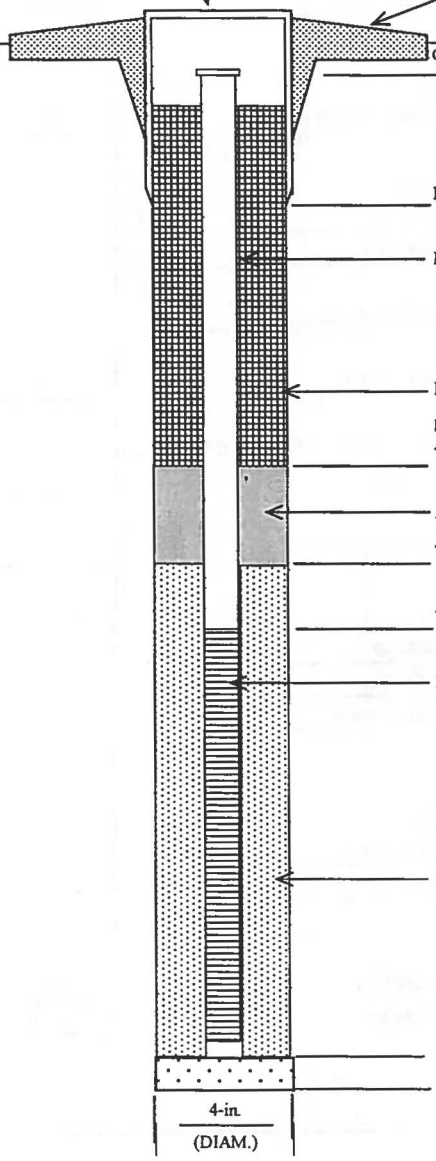
APPENDIX C

MONITORING WELL INSTALLATION LOGS

MONITORING WELL INSTALLATION LOG

PROJECT: **Amerbelle Textiles**	JOB NO. **36800318.00052**	WELL NO. **ME-1**
DRILLING CONTRACTOR: Earth Exploration	COORDINATES:	
BEGUN: 11/29/2005	GEO/ENG: William Abrahams-Dematte	WATER LEVEL (Depth/Elev.)
FINISHED: 11/29/2005	DRILLER: John Ferreira	5.17 ft bgs

	DEPTH BGS HEIGHT AGS (FT)	ELEV. (FT) NGVD DATUM
FLUSHMOUNT SURFACE CASING: DIA.: 6" TYPE: Aluminum Pentangle Nut — CONCRETE		
GENERALIZED GEOLOGIC LOG — GROUND SURFACE	0.22	
TOP OF PVC RISER		
Refer to Boring Log — BOTTOM OF PROTECTIVE PIPE	1.0	
PVC RISER CASING: SCH.: 40 DIAM.: 2-in.		
BACKFILL TYPE: Bentonite to 6" below protective pipe bottom, then sand.		
TOP OF ANNULAR SEAL	2.7	
ANNULAR SEAL: TYPE: Bentonite Chips	3.0	<Bedrock
TOP OF FILTER PACK	4.7	
TOP OF WELL SCREEN	4.9	
PVC SCREEN: SCH.: 40 DIAM.: 2-in. SLOT SIZE: 0.010-in.		
FILTER PACK TYPE: Morie equiv. SIZE: 00		
BOTTOM OF SCREEN	14.9	
BOTTOM OF HOLE*	16.0	



METHOD DRILLED: Augur/rollerbit/rock core

METHOD DEVELOPED: Surge and purge - 20 gallons

TIME DEVELOPED: 1 hour

M&E

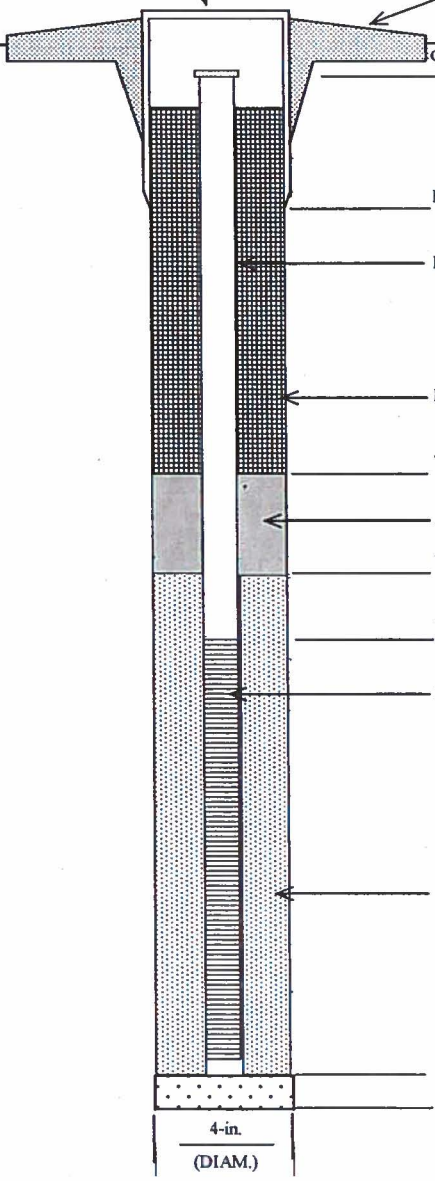
MONITORING WELL INSTALLATION LOG

PROJECT: Amerbelle Textiles	JOB NO. 36800318.00052	WELL NO. ME-2
DRILLING CONTRACTOR: Earth Exploration	COORDINATES:	
BEGUN: 11/28/2005	GEO/ENG: William Abrahams-Dematte	WATER LEVEL (Depth/Elev.)
FINISHED: 11/28/2005	DRILLER: John Ferreira	11.87 ft bgs

	DEPTH BGS HEIGHT AGS (FT)	ELEV. (FT) NGVD DATUM
FLUSHMOUNT SURFACE CASING: DIA.: 6" TYPE: Aluminum Pentangle Nut; CONCRETE		
GROUND SURFACE	0.24	
TOP OF PVC RISER		
BOTTOM OF PROTECTIVE PIPE	1.0	
PVC RISER CASING: SCH.: 40 DIAM.: 2-in.		
BACKFILL TYPE: drill cuttings.		
TOP OF ANNULAR SEAL	3.5	
ANNULAR SEAL: TYPE: Bentonite Chips	5.3	<Bedrock
TOP OF FILTER PACK	6.0	
TOP OF WELL SCREEN	8.0	
PVC SCREEN: SCH.: 40 DIAM.: 2-in. SLOT SIZE: 0.010-in.		
FILTER PACK TYPE: Morie SIZE: 00		
BOTTOM OF SCREEN	18.0	
BOTTOM OF HOLE*	18.0	

GENERALIZED GEOLOGIC LOG

Refer to Boring Log



METHOD DRILLED: Vacuum Extract/rollerbit

METHOD DEVELOPED: Surge and purge - 25 gallons

TIME DEVELOPED: 3 hour

M&E

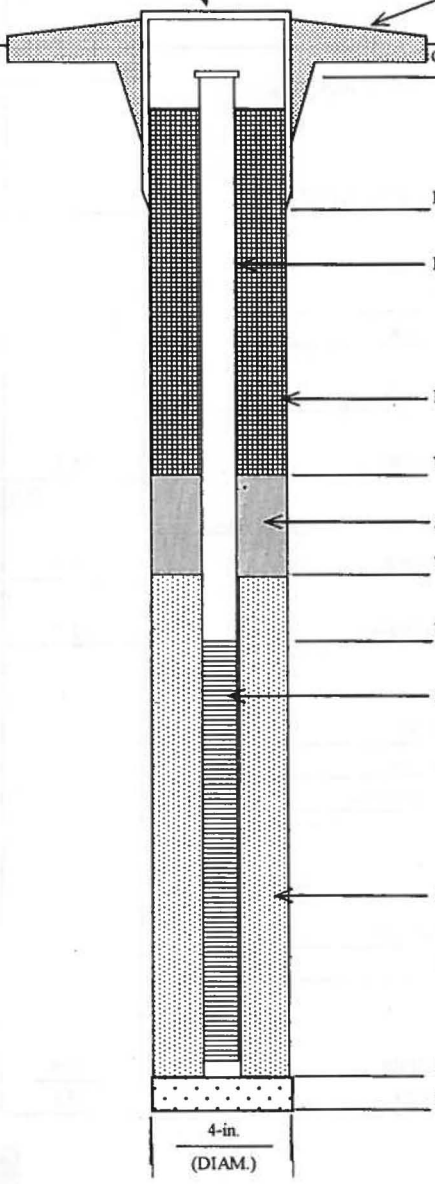
MONITORING WELL INSTALLATION LOG

PROJECT: **Amerbelle Textiles**	JOB NO. **36800318.00052**	WELL NO. **ME-5**
DRILLING CONTRACTOR: Earth Exploration	COORDINATES:	
BEGUN: 11/28/2005	GEO/ENG: William Abrahams-Dematte	WATER LEVEL (Depth/Elev.)
FINISHED: 11/28/2005	DRILLER: John Ferreira	11.66 ft bgs

	DEPTH BGS HEIGHT AGS (FT)	ELEV. (FT) NGVD DATUM
FLUSHMOUNT SURFACE CASING: DIA.: 6" TYPE: Aluminum Pentangle Nut		
CONCRETE		
GROUND SURFACE	0.31	
TOP OF PVC RISER		
BOTTOM OF PROTECTIVE PIPE	1.0	
PVC RISER CASING: SCH.: 40 DIAM.: 2-in.		
BACKFILL TYPE: drill cuttings.		
TOP OF ANNULAR SEAL	1.8	
ANNULAR SEAL: TYPE: Bentonite Chips		
TOP OF FILTER PACK	3.8	
TOP OF WELL SCREEN	4.8	
PVC SCREEN: SCH.: 40 DIAM.: 2-in. SLOT SIZE: 0.010-in.		
FILTER PACK TYPE: Morie SIZE: 00		
BOTTOM OF SCREEN	12.8	
BOTTOM OF HOLE*	12.8	

GENERALIZED GEOLOGIC LOG

Refer to Boring Log



METHOD DRILLED:
Hollow Stem Auger

METHOD DEVELOPED:
Watera - 5 gallons

TIME DEVELOPED:
3 hour

M&E

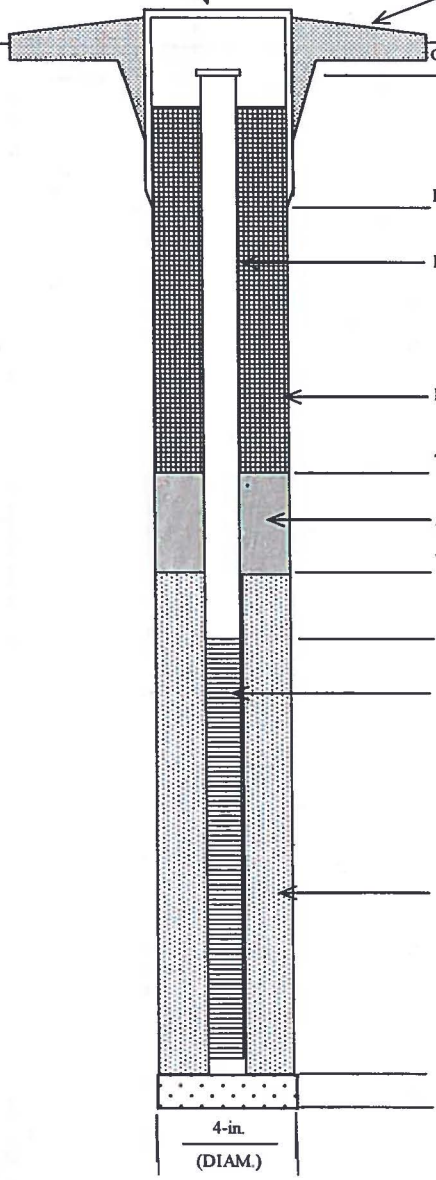
MONITORING WELL INSTALLATION LOG

PROJECT: Amerbelle Textiles	JOB NO. 36800318.00052	WELL NO. ME-6
DRILLING CONTRACTOR: Earth Exploration	COORDINATES:	
BEGUN: 11/30/2005	GEO/ENG: William Abrahams-Dematte	WATER LEVEL (Depth/Elev.)
FINISHED: 11/30/2005	DRILLER: John Ferreira	19.47 ft bgs

FLUSHMOUNT SURFACE CASING:
DIA.: 6"
TYPE: Aluminum Pentangle Nut

GENERALIZED GEOLOGIC LOG

Refer to Boring Log



	DEPTH BGS HEIGHT AGS (FT)	ELEV. (FT) NGVD DATUM
CONCRETE		
GROUND SURFACE	0.26	
TOP OF PVC RISER		
BOTTOM OF PROTECTIVE PIPE	1.0	
PVC RISER CASING: SCH.: 40 DIAM.: 2-in.		
BACKFILL TYPE: drill cuttings, bentonite		
TOP OF ANNULAR SEAL	11.5	
ANNULAR SEAL: TYPE: Bentonite Chips	13.5	<Bedrock
TOP OF FILTER PACK	14.3	
TOP OF WELL SCREEN	15.5	
PVC SCREEN: SCH.: 40 DIAM.: 2-in. SLOT SIZE: 0.010-in.		
FILTER PACK TYPE: Morie SIZE: 00		
BOTTOM OF SCREEN	25.5	
BOTTOM OF HOLE*	25.5	

4-in. (DIAM.)

METHOD DRILLED:
Vacuum Extract/rollerbit
METHOD DEVELOPED:
Surge and purge - 25 gallons
TIME DEVELOPED:
3 hour

M&E

APPENDIX D

GROUNDWATER FIELD SAMPLING WORSHEETS

Metcalf & Eddy

LOW FLOW MONITORING WELL SAMPLING WORKSHEET

Job Name: Amerbelle Job No.: _____ Samplers: R. Barton

Well ID: MW-1 Date Sampled: 2/1/06 Arrival Time: 10:50 Depart. Time: 13:00

Well secure upon arrival? Yes / No PID Readings (ppm) 0.0 Breathing Zone 0.0 Well Headspace

Depth of water from T.O.C./T.O.PVC 4.65 ft

Well Diameter: 2" inches _____ ft (dia)

YSI ID No. Pine

Depth of well from T.O.C./T.O.PVC _____ ft

Turbidimeter ID No. 25 10 1501

Depth of water from T.O.C./T.O.PVC _____ ft

Colorimeter ID: NA

Feet of standing water _____ ft

Purging Method peristaltic

Volume of standing water _____ gal

Purge Time: Start 11:00 End 11:45

14.58 bottom of well

Sample Collection: Time Start: 11:45 End: 12:45

	Time	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Sp. Cond (µmhos/cm^c)	DO (mg/l)	Turbidity (NTU)	Flow Rate (mL/min)
Initial Reading	11:09	4.65	6.21	38.6	14.40	2277	1.58	9.15	400
Final Reading (End of purge)	11:45	4.82	5.84	144.5	13.35	2218	0.84	5.28	400

Colorimeter Readings: NA

Sulfide: _____ Dilution: _____ (mL purge/mL DI) Iron (Fe^{+2}): _____ Dilution: _____ (mL purge / mL DI)

Sample Characteristics: *(circle all applicable)*

Describe odor:	none	sulfide	fishy	musty	petroleum		
Describe color:	colorless	black	brown	orange	red	yellow	
Describe appearance:	turbid	silty	sand	clay	floaters	sheen	
	clear	multiphase	foaming	slimy	algae	efferevescing	

Comments:

Test Papers: Lead Acetate: neg Potassium Iodide: neg

Metcalf & Eddy

LOW FLOW MONITORING WELL SAMPLING WORKSHEET (CONTINUED)

Job Name: Amerbelle Job No.: _____ Samplers: R. Barbour

Well ID: MW-1 Date Sampled: 2/1/06 Page: 1

Time (military)	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Specific Conductivity (µmhos/cm°)	DO (mg/l)	Turbidity (NTU)	Flow Rate (mL/min)
11:28	4.65	5.85	121.1	13.39	2240	1.22	5.28	400
11:32	4.65	5.85	128.3	13.81	2231	0.89	5.28	400
11:36	4.65	5.84	138.4	13.32	2222	0.86	5.08	400
11:40	4.82	5.84	143.4	13.39	2219	0.85	5.30	400
11:45	4.82	5.84	144.5	13.35	2218	0.84	5.28	400
Stabilization		± 0.1	± 10mV	± 3%	± 3%	± 10%	±10%;< 5NTU	

Metcalf & Eddy

LOW FLOW MONITORING WELL SAMPLING WORKSHEET

Job Name: Amerbelle Job No.: _____ Samplers: R. Barbosa/D. Laferte

Well ID: ME-2 Date Sampled: 2/1/06 Arrival Time: 09:20 Depart. Time: 1200

Well secure upon arrival? (Yes) No PID Readings (ppm) 0.1 Breathing Zone 4.6 Well Headspace

Depth of water from T.O.C./T.O.PVC 5.29 ft Well Diameter: 2 inches _____ ft (dia)

YSI ID No. Pine Depth of well from T.O.C./T.O.PVC _____ ft

Turbidimeter ID No. 2510-1501 Depth of water from T.O.C./T.O.PVC _____ ft

Colorimeter ID: NA Feet of standing water _____ ft

Purging Method peristaltic Volume of standing water _____ gal

Purge Time: Start 0950 End _____ 17.[illegible] bottom of well

Sample Collection: Time Start: 1030 End: 1200

	Time	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Sp. Cond (µmhos/cm^c)	DO (mg/l)	Turbidity (NTU)	Flow Rate (mL/min)
Initial Reading	0955	8.40	6.53	-43.6	9.58	3424	2.16	4.03	*120 estimated
Final Reading (End of purge)	0[illegible]8	8.86	6.35	-85.0	9.76	3393	0.99	2.96	120

Colorimeter Readings: NA

Sulfide: NA Dilution: NA (mL purge/mL DI) Iron (Fe^{+2}): NA Dilution: NA (mL purge / mL DI)

Sample Characteristics: *(circle all applicable)*

Describe odor:	none	sulfide	fishy	musty	petroleum		
Describe color:	colorless	black	brown	orange	red	yellow	
Describe appearance:	turbid	silty	sand	clay	floaters	sheen	
	clear	multiphase	foaming	slimy	algae	efferevescing	

Comments: Foam on top
Metals primed Green/blue

Test Papers: Lead Acetate: Neg Potassium Iodide: Neg

Metcalf & Eddy

LOW FLOW MONITORING WELL SAMPLING WORKSHEET (CONTINUED)

Job Name: Amerbelle Textiles Job No.: _____ Samplers: Lafarte Bartosz

Well ID: ME-2 Date Sampled: 1/31/06 Page: 2

Time (military)	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Specific Conductivity (µmhos/cm°)	DO (mg/l)	Turbidity (NTU)	Flow Rate (mL/min)
1000	8.80	6.39	-59.6	9.30	3438	1.74	2.91	*120
1005	8.86	6.36	-70.8	9.91	3427	1.16	3.86	120
1010	8.86	6.35	-75.8	9.75	3412	1.04	3.52	120
1015	8.86	6.36	-75.7	8.99	3413	1.22	3.47	120
1020	8.86	6.35	-78.0	9.71	3407	1.02	3.16	120
1025	8.86	6.35	-84.4	9.83	3393	1.01	2.89	120
1030	8.86	6.35	-85.0	9.76	3393	0.99	2.96	120
			1030 SAMPLE					
			1130 FD					
Stabilization		± 0.1	± 10mV	± 3%	± 3%	± 10%	±10%;< 5NTU	

Flow rate estimated.

field Dup = ME-2CP

LOW FLOW MONITORING WELL SAMPLING WORKSHEET

Job Name: Amerbelle Textiles ~~Ottati & Goss/Kingston Steel Drum~~ Samplers: Lafeste

Well ID: ME-5 Date Sampled: 1/31/06 Arrival Time: 1230 Depart. Time: 1430

Well secure upon arrival? (Yes) No PID Readings (ppm) 0 (Breathing Zone) 0 (Well Headspace)

Depth of water from T.O.C./(T.O.PVC) 11.65 ft Well Diameter: 2 inches _____ ft (dia)

YSI ID No. 02 C098S AD Depth of well from T.O.C./(T.O.PVC) 12.80 ft

Turbidimeter ID No. 2510-1501 Depth of water from T.O.C./T.O.PVC _____ ft

Colorimeter ID: N/A Feet of standing water _____ ft

Purging Method Peristaltic Volume of standing water _____ gal

Purge Time: Start 1330 End 1430

Sample Collection: Time Start: 1330 End: 1430

	Time	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Sp. Cond (µmhos/cm^c)	DO (mg/l)	Turbidity (NTU)	Flow Rate (ml/min)
Initial Reading	NA	→	→	→	→	→	→	→	→
Final Reading (End of purge)	NA	→	→	→	→	→	→	→	→

Colorimeter Readings:

Sulfide: NA Dilution: NA (ml purge/ml DI) Iron (Fe^{+2}): _____ Dilution: _____ (mL purge / mL DI)

Sample Characteristics: *(circle all applicable)*

Describe odor:	none	sulfide	fishy	musty	petroleum		_____
Describe color:	colorless	black	brown	orange	red	yellow	_____
Describe appearance:	turbid	silty	sand	clay	floaters	sheen	_____
	clear	multiphase	foaming	slimy	algae	efferevescing	_____

Comments: No YSI reading. Sample avail. H_2O Per B. Weir.

VOC, Metals, EPH only

Metals field filtered

Test Papers: Lead Acetate: N/A Potassium Iodine: N/A

LOW FLOW MONITORING WELL SAMPLING WORKSHEET

Job Name: ~~Ottati & Goss/Kingston Steel Drum~~ Amerbelle Textiles Samplers: Lafarte

Well ID: MS-6 Date Sampled: 1/31/06 Arrival Time: 1430 Depart. Time: _____

Well secure upon arrival? Yes / No PID Readings (ppm) 0 Breathing Zone 0 Well Headspace

Depth of water from T.O.C./T.O.PVC 18.96 ft Well Diameter: 2 inches _____ ft (dia)

YSI ID No. 02C0985 AD Depth of well from T.O.C./T.O.PVC 28.13 ft

Turbidimeter ID No. 2810-1501 Depth of water from T.O.C./T.O.PVC _____ ft

Colorimeter ID: NA Feet of standing water _____ ft

Purging Method Peristaltic Volume of standing water _____ gal

Purge Time: Start 1430 End _____

Sample Collection: Time Start: _____ End: _____

	Time	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Sp. Cond (µmhos/cm°)	DO (mg/l)	Turbidity (NTU)	Flow Rate (ml/min) * estimated
Initial Reading	1505	19.05	6.77	117.6	10.00	667	2.67	38.8	160
Final Reading (End of purge)									

Colorimeter Readings:

Sulfide: NA Dilution: NA (ml purge/ml DI) Iron (Fe^{+2}): _____ Dilution: _____ (mL purge / mL DI)

Sample Characteristics: *(circle all applicable)*

Describe odor:	none	sulfide	fishy	musty	petroleum		_____
Describe color:	colorless	black	brown	orange	red	yellow	_____
Describe appearance:	turbid	silty	sand	clay	floaters	sheen	_____
	clear	multiphase	foaming	slimy	algae	efferevescing	_____

Comments: _____

Test Papers: Lead Acetate: _____ Potassium Iodine: _____

MONITORING WELL SAMPLING WORKSHEET (ADDITIONAL PAGES)

Job Name: Amerbelle Textiles ~~YAWORSKI LAGOON~~ Job No.: [redacted] Samplers: Lafette

Well ID: ME-6 Date Sampled: 1/31/06

* estimated

Time (military)	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Specific Conductivity (µmhos/cm°)	DO (mg/l)	Turbidity (NTU)	Flow Rate (ml/min)
1510	~~10~~ ~~19.05~~	6.33	79.0	10.70	660	1.77	33.2	160
1515	19.05	6.28	37.8	11.26	663	1.32	16.9	160
1520	19.05	6.28	23.6	11.35	666	1.22	26.3	166
1525	19.05	6.28	19.0	11.34	666	1.11	14.2	160
1530	19.05	6.26	17.2	11.35	661	0.97	7.71	166
1535	19.05	6.26	14.2	11.35	662	0.88	7.23	160
1540	19.05	6.27	10.6	11.44	662	0.85	7.41	160
Stabilization		+/- .1	+/- 10mV	+/- 3%	+/- 3%	+/- 10%	+/-10%;<5NTU	

Metcalf & Eddy

LOW FLOW MONITORING WELL SAMPLING WORKSHEET

Job Name: Amerbelle Job No.: _____ Samplers: R. Barton

Well ID: AM-7 Date Sampled: 2/1/06 Arrival Time: 13:30 Depart. Time: 14:30

Well secure upon arrival? (Yes) / No PID Readings (ppm) — (Breathing Zone) — (Well Headspace)

Depth of water from T.O.C./T.O.PVC 8.51 ft Well Diameter: 2 inches _____ ft (dia)

YSI ID No. — Depth of well from T.O.C./T.O.PVC _____ ft

Turbidimeter ID No. — Depth of water from T.O.C./T.O.PVC _____ ft

Colorimeter ID: — Feet of standing water _____ ft

Purging Method — Volume of standing water _____ gal

Purge Time: Start — End — total well depth 9.28 ft.

Sample Collection: Time Start: 13:45 End: 14:20

	Time	Water Level (feet)	pH	ORP (mV)	Temp (°C)	Sp. Cond (µmhos/cm°)	DO (mg/l)	Turbidity (NTU)	Flow Rate (mL/min)
NA Initial Reading									
Final Reading (End of purge)									

- Collected a total + dissolved metals due to high turbidity

Colorimeter Readings: NA

Sulfide: _____ Dilution: _____ (mL purge/mL DI) Iron (Fe^{+2}): _____ Dilution: _____ (mL purge / mL DI) - Started sampling metals at 13:42; well ran dry after 3/4 SVOC bottle: Started re sampling at 13:57; continued at same rate until all bottles were full

Sample Characteristics: *(circle all applicable)*

Describe odor:	(none)	sulfide	fishy	musty	petroleum		
Describe color:	colorless	black	brown	orange	red	yellow	
Describe appearance:	turbid	(silty)	sand	clay	floaters	sheen	
	clear	multiphase	foaming	slimy	algae	efferevescing	

Comments: only .77 ft of water in well. Decision was made to sample well w/out getting YSI or turbidity readings due to small amount of water in well and very low recharge rate.
Well went dry after filling 1st SVOC bottle 3/4 full (13:44)

Test Papers: Lead Acetate: — Potassium Iodide: —

well recharge rate ≈ 13 ft/4 minutes
9.15 not feasible to take YSI parameter readings due to time constraints caused by very slow recharge in well (hydraulic conductivity very low)

APPENDIX E

LABORATORY DATA SHEETS AND DATA VALIDATION MEMORANDA

METCALF & EDDY | AECOM

Metcalf & Eddy
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MEMORANDUM

PROJECT NO: 036800318.00053
TO: TBA: Amerbelle Textiles, Vernon, CT
FROM: E. DeCola
REVIEWED BY: R. Purdy
CC: ~~B. Weir~~
N. Thurber
D. Laferte (memo only)

DATE: January 27, 2006
OFFICE: Wakefield
COMPANY: Metcalf & Eddy, Inc.

SUBJECT: Limited QC Review/Modified Tier II-Like Review
VOC, SVOC, ETPH, and Metals Analytical Results
Mitkem Corporation, Warwick, Rhode Island
SDG TB-04, Lab Project No. D14279 B.W.

On November 28, 29, and 30 and December 3, 2005, seventeen soil samples, including two field duplicate samples, and four trip blanks were collected by Metcalf & Eddy, Inc. (M&E) from the Targeted Brownfields Assessment (TBA) Amerbelle Textiles Site, located in Vernon, Connecticut. The sampling was performed as part of the TBA Response Action Contract Work Assignment #155-SIBZ-0100. The samples were submitted to Mitkem Corporation (Warwick, Rhode Island) for the analysis of volatile organic compounds according to *SW-846 Method 8260B, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*, for semivolatile organic compounds (SVOC) according to *SW-846 Method 8270C, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)*, for mercury according to *SW-846 Method 7471A, Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)*, for metals according to *SW-846 Method 6010B, Inductively Coupled Plasma-Atomic Emission Spectrometry,* and for extractable total petroleum hydrocarbons (ETPHs) according to the Connecticut method entitled *Analysis of Extractable Total Petroleum Hydrocarbons (ETPH) Using Methylene Chloride Gas Chromatograph/Flame Ionization Detection*. The samples were received by the laboratory on December 5, 2005. The data package was received in the M&E office on December 30, 2005.

M&E reviewed the data in accordance with the EPA-approved Final Field Task Work Plan for the site, and the guidance received from EPA Work Assignment Manager, Mr. James Byrne, in a September 17, 1999 letter to former M&E Work Assignment Manager, Barb Wyskowski. The data review included:

- * Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- * Preservation and Technical Holding Times
- * GC/MS and GC/ECD Instrument Performance Check
- Initial and Continuing Calibrations
- Surrogate Compounds
- Internal Standards
- Blank Analysis
- Inductively Coupled Plasma (ICP) Interference Check Samples

	•	ICP Serial Dilution Analysis
	•	Matrix Spike/Matrix Spike Duplicate
	•	Field Duplicate/Lab Duplicate Samples
NA	•	Sensitivity Check
	•	Performance Evaluation Samples/Accuracy Check
	•	Analyte Quantitation and Reported Quantitation Limits
*	•	Semivolatile and Pesticide/PCB Cleanup
*	=	All criteria met for this sample
NA	=	Not applicable and/or no information was provided by the laboratory

Note: Worksheets are not included for parameters that have met criteria or for criteria that are not applicable to the method and/or to the modified Tier II-like review.

Included in Attachment I is a copy of the chain-of-custody (COC) record. Included in Attachment II are the result summary sheets, annotated with qualifiers, if necessary, as detailed in this memorandum. Included in Attachment III are the data validation worksheets.

Data Completeness

The laboratory was contacted on January 6, 2006 and asked to submit the following information:

1. Form 2B (low level Calibration Check Standard) for metals
2. The ICP serial dilution summary forms for metals
3. Confirm if a holding blank analyzed for the VOA samples
4. The raw VOA data for ME-1SB1-1.5 or a list of compounds associated with the volatiles internal standard 1,4-dichlorobenzene.
5. The extraction dates for the ETPH analysis.

The laboratory submitted the requested information on January 12, 2006.

The laboratory was again contacted on January 18, 2006 to clarify the different reporting limits for the beryllium ICB and CCB nondetect results. The laboratory submitted the requested information on January 23, 2006.

The sample names for ME6SB10-12, ME6SB10-13.5, and ME6SB8-10 were changed to ME-6SB10-12, ME-6SB10-13.5, and ME-6SB8-10 to keep the sample names consistent.

Initial and Continuing Calibrations

VOC

Compounds that did not meet the relative standard deviation (RSD) criteria of ≤30% for Calibration Check Compounds (CCCs) and ≤15% for other compounds in the initial calibration (IC); and percent difference (%D) criteria of ≤20% for CCCs and ≤30% for other compounds in the continuing calibration (CC) are summarized in the following table:

Compound	Instrument: V1		
	IC 11/22/05	CC 12/6/05	IC 12/7/05
	%RSD	%D	%RSD
acetone	34.1	39.2	31.6
2-butanone	24.9	-	21.2
napththalene	20.2	45.2	16.6
1,2-dibromo-3-chloropropene	17.9	-	16.8
methylene chloride	-	-	17.1
chloroform	-	-	18.6
1,2-dichloroethane	-	-	17.9
1,3-dichloropropane	-	-	15.7
1,2-dibromoethane	-	-	15.6
1,1,2,2-tetrachloroethane	-	-	16.4
4-chlorotoluene	-	-	16.0
Samples Affected	TB-01, TB-02, ME-5SB10-12, ME-6SB10-12, ME-6SB1-1.5, ME-7SB1-1.5	TB-01, TB-02, ME-5SB10-12, ME-6SB10-12, ME-6SB1-1.5, ME-7SB1-1.5	ME-5SB2-4, ME-1SB1-1.5, ME-3SB2-2.5, ME-3SB0.5-2, TB-03, TB-04

-- QC acceptance criteria were not exceeded for this compound.

Actions: %RSD >30% for CCCs and >15% for other compounds: Estimate (J and UJ, respectively) positive and nondetect results.
% D >20% for CCCs and >30% for others: Estimate (J and UJ, respectively) positive and nondetect results.

SVOC

Compounds that did not meet the RSD criteria of ≤30% for CCCs and ≤15% for other compounds in the IC; and %D criteria of ≤20% for CCCs and ≤30% for other compounds in the CC are summarized in the following table. Minimum relative response factor (RRF) requirements of 0.010 were met for all compounds.

Compound	Instrument: S3			
	IC 11/21/05	CC 12/5/05	IC 12/15/05	CC 12/15/05
	%RSD	%D	%RSD	%D
4-methylphenol	19.3	-	-	-
di-n-octylphthalate	18.4	-	-	-

Compound	Instrument: S3			
	IC 11/21/05	CC 12/5/05	IC 12/15/05	CC 12/15/05
	%RSD	%D	%RSD	%D
2,4-dinitrophenol	33.8	-	-	-
4,6-dinitro-2-methylphenol	15.5	-	-	-
3,3'-dichlorobenzidine	16.9	15.8	-	21.1
benzo(b)fluoranthene	-	-	20.2	-
benzo(k)fluoranthene	20.6	-	-	-
dibenzo(a,h)anthracene	20.1	-	-	-
4-nitroaniline	-	-34.0	-	-
4-chloroaniline	-	-22.7	-	-
bis(2-etherhexyl)phthalate	-	-20.0	-	-
benzo(a)antracene	-	-	-	15.7
chrysene	-	-	-	15.6
Samples Affected	ME-1SB0.5-3, ME-5SB0-4, ME-5SB10-12		ME-3SB4-6, ME-3SB0.5-4, ME-6SB10-13.5, ME-6SB0.5-4, ME-7SB0.5-4	

Actions:

%RSD >30% for CCCs and >15% for other compounds: Estimate (J and UJ, respectively) positive and nondetect results.

% D >20% for CCCs and >30% for others: Estimate (J and UJ, respectively) positive and nondetect results.

Metals

No low level check standard was preformed for the metals analysis. However, the low calibration point was below the MDL for all analytes.

ETPH

All criteria met.

Surrogates

SVOC

The following table lists the samples with surrogate percent recoveries outside QC acceptance criteria and the actions taken:

Sample ID	Surrogate Recovery (%R)	Actions
	TPH-d_{14}	
ME-5SB0-4	114	No action since only one surrogate was out of criteria.
QC Limits	61-113	

TPH- terphenyl

VOC and ETPH

All surrogates for VOC and SVOC analyses met recovery criteria.

Metals

Not required.

Internal Standards

VOC

The following table summarizes the qualifications due to the internal standard (IS) results that did not meet response criteria (50%-200% of the daily calibration standard):

Internal Standard	Instrument: V1		
	Area	Acceptable Range	Action
1,4-dichlorobenzene	156,772	199,917-799,668	Qualify as estimated (J/UJ) all compounds associated with IS 1,4-dichlorobenzene in sample ME-1SB1-1.5.

Compounds associated with IS 1,4-dichlorobenzene are 1,1,2,2-tetrachloroethane, bromobenzene, 1,2,3-trichloropropane, n-propylbenzene, 2-chlorotoluene, 1,3,5-trimethylbenzene, 4-chlorotoluene, tert-butylbenzene, 1,2,4-trimethylbenzene, sec-butylbenzene, 4-isopropylbenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, n-butylbenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, hexachlorobutadiene, 1,2,3-trichlorobenzene, naphthalene, 1,3,5-trichlorobenzene

SVOC

The following table summarizes the qualifications due to the IS results that did not meet response criteria (50%-200% of the daily calibration standard):

Internal Standard	Instrument: S3		
	Area	Acceptable Range	Action
chrysene-d_{12}	345,828	458,206-1,832,822	Qualify as estimated (J/UJ) all compounds associated with IS chrysene-d_{12} in sample ME-5SB0-4.
chrysene-d_{12}	313,355	458,206-1,832,822	Qualify as estimated (J/UJ) all compounds associated with IS chrysene-d_{12} in sample ME-5SB10-12.
chrysene-d_{12}	421,025	458,206-1,832,822	Qualify as estimated (J/UJ) all compounds associated with IS chrysene-d_{12} in sample ME-1SB0.5-3.

Compounds associated with IS chrysene-d_{12} are benz(a)anthracene, bis(2-ethylhexyl)phthalate, butylbenzylphthalate, chrysene, 3,3'-dichlorobenzidine, pyrene, di-n-octylphthalate, indeno(1,2,3-cd)pyrene

Blanks

VOC

The following table summarizes the level of blank contamination detected in the laboratory and trip blanks associated with the soil samples. If a contaminant was detected in more than one blank, the highest concentration was used to qualify associated sample results.

Analyte	Blank Type	Max. Conc. (µg/Kg)	Blank Action Limit (µg/Kg)	Samples Affected/Actions
chloroform	M	1	5	No action required; all results are nondetect.
methylene chloride	TB	32	320	Qualify (TB) positive results in sample ME-5SB10-12.
naphthalene	TB	1	5	All results were nondetect after method blank actions; no action required.
methylene chloride	M	3	30	Qualify all samples as nondetect at the sample result except for samples TB-03 and ME-5SB10-12.
naphthalene	M	3	15	Qualify as nondetect (U) at the QL in sample TB-01. Qualify as nondetect (U) at the SR in sample ME-3SB2-2.5.

BAL – Blank Action Limit
M – Method Blank
QL – quantitation limit
SR – sample result
TB – Trip Blank

SVOC

No blank actions were required for SVOC analyses.

ETPH

The laboratory qualifier "B" was removed from samples ME-1SB0.5-3 and ME-5SB0-4, since the method blank for ETPH was nondetect.

Metals

The following table summarizes the level of blank contamination detected in the laboratory blanks associated with the soil samples. If a contaminant was detected in more than one blank, the highest concentration was used to qualify associated sample results. Blank action levels were adjusted for sample size and solids content.

Analyte	Maximum Concentration (mg/Kg)	Nominal BAL (mg/Kg)	Samples Affected/Actions
antimony	0.465	2.325	All sample results were nondetect; no actions required..
arsenic	-0.17	-0.8500	Qualify the results as nondetect at the absolute value of the negative BAL in samples ME-6SB0.5-4, ME-6SB10-13.5, and ME-7SB0.5-4.
barium	0.00955	0.0478	All sample results were >BAL; no actions required.
beryllium	0.00035	0.0018	All sample results were >BAL; no actions required.
cadmium	0.03	0.1500	Qualify the result as nondetect (U) at the sample reported result in sample ME-5SB10-12.
chromium	0.00145	0.0073	All sample results were >BAL; no actions required.
copper	0.33	1.6500	All sample results were >BAL; no actions required.
lead	0.1	0.5000	All sample results were >BAL; no actions required.
nickel	0.055	0.2750	All sample results were >BAL; no actions required.
selenium	-0.205	-1.0250	Qualify the result as nondetect at the sample result for sample ME3SB4-6. Qualify the results as nondetect at the absolute value of the negative BAL in samples ME-6SB0.5-4, ME-6SB10-13.5, and ME-7SB0.5-4.
silver	0.84	4.2	Qualify the results as nondetect (U) at the sample reported result in samples ME-3SB0.5-4, ME-3SB4-6, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4.
thallium	0.155	0.7750	Qualify the results as nondetect at the absolute value of the negative BAL in samples ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4. Qualify the result as nondetect at the sample result for sample ME-5SB10-12.
	-0.075	-0.3750	
vanadium	0.025	0.1250	All sample results were >BAL; no actions required.
zinc	1.06	5.3	All sample results were >BAL; no actions required.

BAL – Blank Action Limit

Matrix Spike/Matrix Spike Duplicate

VOC

Sample ME-1SB1-1.5 was analyzed as Matrix Spike/Matrix Spike Duplicate (MS/MSD) for VOC analysis. Compounds that did not meet recovery and/or RPD criteria are summarized in the following table:

Analyte	ME-1SB1-1.5 MS	ME-1SB1-1.5 MSD	% Recovery Criteria	RPD	Action
dibromochloromethane	116	117	76-115	-	Sample result is nondetect; no action taken.
1,1,2,2-tetrachloroethane	145	187	70-117	-	Sample result is nondetect; no action taken.
bromobenzene	132	157	79-119	-	Sample result is nondetect; no action taken.
1,2-dibromo-3-chloropropene	132	145	52-128	-	Sample result is nondetect; no action taken.
1,2,4-trichlorobenzene	41	30	49-126	-	Estimate (UJ) the nondetect result in sample ME-1SB1-1.5.
hexachlorobutadiene	34	34	58-115	-	Estimate (UJ) the nondetect result in sample ME-1SB1-1.5.
1,2,3-trichlorobenzene	26	28	44-131	-	Estimate (UJ) the nondetect result in sample ME-1SB1-1.5.
1,3-dichloropropane	-	128	76-119	-	Sample result is nondetect; no action taken.
1,2-dibromoethane	-	123	72-117	-	Sample result is nondetect; no action taken.
1,2,3-trichloropropane	-	208	0-154	-	Sample result is nondetect; no action taken.
2-chlorotoluene	-	145	70-132	-	Sample result is nondetect; no action taken.
4-chlorotoluene	-	130	77-122	-	Sample result is nondetect; no action taken.

SVOC

Sample ME-1SB0.5-3 was analyzed as MS/MSD for SVOC analysis. Compounds that did not meet recovery and/or RPD criteria are summarized in the following table:

Analyte	ME-1W-0-3 MS	ME-1W-0-3 MSD	% Recovery Criteria	RPD	RPD Criteria	Action
4-methylphenol	43	47	48-109	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
dimethylphthalate	61	-	62-117	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
2,4-dinitrophenol	7	6	15-136	-	-	Reject (R) the nondetect result in sample ME-1SB0.5-3.

Analyte	ME-1W-0-3 MS	ME-1W-0-3 MSD	% Recovery Criteria	RPD	RPD Criteria	Action
dibenzofuran	56	-	61-112	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
2,4-dinitrotoluene	56	-	59-123	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
4-chlorophenyl-phenyether	56	-	59-116	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
fluorene	56	61	63-115	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
4-6-dinitro-2-methylphenol	14	13	33-130	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
4-bromophenyl-phenylether	61	-	66-110	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
hexachlorobenzene	61	61	67-112	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
pentachlorophenol	7	12	19-130	53	40	Reject (R) the nondetect result in sample ME-1SB0.5-3.
phenanthrene	54	59	70-115	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
anthracene	61	61	63-117	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
carbazole	61	61	62-112	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
di-n-butylphthalate	61	61	70-120	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
fluoranthene	47	58	64-121	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
pyrene	60	-	60-120	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
bis(2-ethylhexyl)phthalate	62	-	64-115	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
di-n-octylphthalate	41	44	69-137	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.
benzo(b)fluoranthene	37	42	61-129	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
benzo(k)fluoranthene	42	45	62-130	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.

Analyte	ME-1W-0-3 MS	ME-1W-0-3 MSD	% Recovery Criteria	RPD	RPD Criteria	Action
benzo(a)pyrene	43	45	66-119	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
indeno(1,2,3-cd)pyrene	46	47	56-128	-	-	Estimate (J) the positive result in sample ME-1SB0.5-3.
dibenzo(a,h)anthracene	48	52	58-128	-	-	Estimate (UJ) the nondetect result in sample ME-1SB0.5-3.

Metals

Field sample ME-1SB0.5-3 was analyzed as a matrix spike. The following table summarizes the analytes that did not meet criteria for recovery:

Analyte	ME-1SB0.5-3 MS %R	Action
antimony	34.7	Estimate (UJ) the nondetect antimony results in all samples.

ETPH
All criteria met for MS/MSD. The average of the alkane recoveries was used to evaluate the ETPH MS/MSD criteria.

Field Duplicates/ Laboratory Duplicate Results

VOC, SVOC, and ETPH
All criteria met.

Metals
Samples ME-6SB-0.5-4 and ME-6SB0.5-4 were analyzed as field duplicates. All criteria were met for RPD for these samples.

Sample ME-1SB0.5-3 was analyzed as a laboratory duplicate twice. The following table summarizes the analytes that did not meet criteria (< 35%) for RPD:

Compound	ME-1SB0.5-3 Concentration	ME-1SB0.5-3 D Concentration	% RPD	Action
mercury	0.0369	0.0975	90.2	Estimate (J) the positive mercury result in sample ME-1SB0.5-3.
	0.0680	0.1102	47.4	

ICP Serial Dilution Analysis Results

ICP Serial Dilution Analysis was performed on sample ME-1SB0.5-3. Analytes that did not meet difference criteria (%D<15) are summarized in the following table:

Analyte	MDL (ug/L)	50xMDL (ug/L)	Sample Result	Serial Dilution	%D	Samples Affected/Actions
barium	2.1	105	1808.08	3814.60	110.0	Qualify as estimated (J) positive results in all samples.
chromium	0.38	19	336.16	471.58	40.3	Qualify as estimated (J) positive results in all samples.
lead	0.46	23	227.04	281.50	24.0	Qualify as estimated (J) positive results in all samples.
nickel	0.59	29.5	205.05	286.31	39.6	Qualify as estimated (J) positive results in all samples.
vanadium	0.47	23.5	62.19	860.21	28.7	Qualify as estimated (J) positive results in all samples.
zinc	2.3	115	1381.82	1761.40	27.5	Qualify as estimated (J) positive results in all samples.

Performance Evaluation Samples/Accuracy Check

Performance Evaluation Sample (PES)

No Performance Evaluation Samples were required for VOC, SVOC, ETPH or metals analyses.

Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)

VOC

Compounds that did not meet the recovery criteria for the VOC LCS are summarized in the following table:

Analyte	LCS	% Recovery Criteria	Action
1,1-dichloroethane	120	74-118	No action. Nondetect in all associated samples.
2,2-dichloropropane	126	64-125	No action. Nondetect in all associated samples.

SVOC

Compounds that did not meet the recovery criteria for the SVOC LCS are summarized in the following table:

Analyte	LCS	% Recovery Criteria	Action
di-n-octylphthalate	65	69-137	Estimate (J/UJ) the positive and nondetect results in samples ME-5SB0-4, ME-5SB10-12, and ME1SB0.5-3.
Benzo(b)fluoranthene	59	61-129	Estimate (J/UJ) the positive and nondetect results in samples ME-5SB0-4, ME-5SB10-12, and ME1SB0.5-3.
Benzo(a)pyrene	65	66-119	Estimate (J/UJ) the positive and nondetect results in samples ME-5SB0-4, ME-5SB10-12, and ME1SB0.5-3.

Metals
All criteria met.

Compound Quantitation and Reported Quantitation Limits

Metals

The following table summarizes the positive and blank-qualified metal results that were less than the reporting limit but greater than the MDL. These listed results are qualified as estimated (J) due to uncertainty in the quantitation at concentrations less than the reporting limit. Note that the overall qualification for the blank-qualified metal results is estimated, nondetect (UJ).

Sample	Affected Analytes
ME-1SB0.5-3	cadmium
ME-3SB0.5-4	silver
ME-3SB4-6	selenium, silver
ME-5SB0-4	thallium
ME-5SB10-12	mercury, thallium, cadmium, beryllium
ME-6SB0.5-4	arsenic, silver, beryllium
ME-6SB10-13.5	arsenic, silver, beryllium
ME-7SB0.5-4	arsenic, silver, beryllium

Attachment I

Chain-of-Custody

MITKEM CORPORATION
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

COMPANY: Metcalf + Eddy	PHONE: 203-269-7310	COMPANY	PHONE
NAME: Ryan Bartosz	FAX: 203-269-8788	NAME	FAX
ADDRESS: 860 North Main Street Extension		ADDRESS	
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP	

LAB PROJECT #: D1429

TURNAROUND TIME: 21 day

CLIENT PROJECT NAME: Amerbelle Textiles Inc.

CLIENT PROJECT #: 36900318.00052

CLIENT P.O.#:

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RCRA metals	% Moisture	COMMENTS
~~ME-SB2-4~~ RA	/													
~~ME-SB~~ RA	/													
ME-SB2-4	11/28/05 / 10:00		X		X		-1	4	X				X	
ME-SB0-4	↓ / ↓	X			X		-2	3		X	X	X		
ME-SB 10-12	↓ / 10:45	X	X		X		-3	6	X	X		X	X	VOC's % Moisture are grab samples
ME-SB8-10	↓ / 10:45	X			X		-4	1			X			ETPH only
TB-01	↓ / 11:00		X		X		-5	3	X					
	/													
	/													Temp Blank
	/													Included
	/													
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bartosz	11/28/05 / 17:00	James J Hartley	11/29/05 08:30
		/		/
		/		/

ADDITIONAL REMARKS: Send data to Barbara Weir M+E Wakefield refer to M+E Work Order for analyses. including SPLP analysis

COOLER TEMP: 4°

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

COMPANY: Metcalf + Eddy	PHONE: 203 269-7310	COMPANY	PHONE	LAB PROJECT #: D1429
NAME: Ryan Bartosz	FAX: 203 269-8788	NAME	FAX	
ADDRESS: 860 North Main Street Extension		ADDRESS		TURNAROUND TIME: 21 day
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
Amerbelle Textiles Inc.	36800318.00052	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RSR Metals	% Moisture	COMMENTS
ME-15B1-1.5	11/29/05 / 10:00		X		X		-6	10	X				X	MS/MSD
ME-15B0.5-3	/ ↓	X			X		-7	7		X	X	X		MS/MSD
TB-02	/ 11:00		X		X		-8	3	X					
	/													
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	/													temp blank included
	/													
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bartosz	11/29/05 1300	[illegible]	11-30-05 0900
		/		/
		/		/

ADDITIONAL REMARKS: send data to Barbara Weir M+E Wakefield
refer to M+E workorder for analyses including SPLP.

COOLER TEMP: 6°C

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MITKEM CORPORATION
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

COMPANY: Metcalf + Eddy	PHONE: 203 269-7310	COMPANY	PHONE
NAME: Ryan Bartosz	FAX: 203 269-8788	NAME	FAX
ADDRESS: 860 North Main Street Extension		ADDRESS	
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP	

LAB PROJECT #: D1429

TURNAROUND TIME: 21 day

CLIENT PROJECT NAME: Ameribelle Textiles, Inc.

CLIENT PROJECT #: 36800 318.00052

CLIENT P.O.#:

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RSR Metals	% Moisture	COMMENTS
ME-65B 1-1.5	11/30/05 8:40		X		X		-9	4	X				X	
ME-75B 1-1.5	/ 8:50		X				-10	4	X				X	
ME-65B 0.5-4	/ 8:40	X					-11	3		X	X	X		
ME-75B 0.5-4	/ 8:50	X					-12	3		X	X	X		
ME65B 10-12	/ 9:30		X				-13	4	X				X	
ME65B 10-13.5	/ 9:30	X					-14	2		X		X		
ME65B 8-10	/ 9:30	X					-15	1			X			
TB-03	/ 10:30		X				-16	3	X					
	/													
	/													
	/													temp blank included
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bartosz	11/30/05 / 13:00	Jaroy Healey	12/1/05 / 08:30
		/		/
		/		/

ADDITIONAL REMARKS: send back to Barbara Weir MTE, Wakefield. Refer to MTE WorkOrder for analyses including SPLP

COOLER TEMP: 2°

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0291

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

COMPANY: Metcalf + Eddy	PHONE: 203-269-7310	COMPANY	PHONE
NAME: Ryan Barton	FAX: 203-269-8788	NAME	FAX
ADDRESS: 860 North Main St. Ext.		ADDRESS	
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP	

LAB PROJECT #: D1429

TURNAROUND TIME: 21 day

CLIENT PROJECT NAME: Ameritelle Textile Site

CLIENT PROJECT #: 36800318.00052

CLIENT P.O.#:

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RSR metals	% Moisture	COMMENTS
TB-04	4/3/05 / 9:00		X		X		-17	3	X					
ME-35B 2-25	/ 11:30		X		X		-18	4	X				X	
ME-35B 0.5-4	/ 11:15	X			X		-19	3		X	X	X		
ME-35B 4-6	/ 13:00	X			X		-20	3		X	X	X		sample contains rope fibers from cutting
ME-35B 0.5-2	/ 11:00		X		X		-21	4	X				X	
	/													
	/													
	/													
	/													
	/													temp blank
	/													included
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Barty	12/3/05 / 13:00	[signature]	12-5-05 1200
		/		/
		/		/

ADDITIONAL REMARKS: send data to Barbara Weir, MTE, Wakefield. Refer to MTE Work Order for analyses including SPLP

COOLER TEMP: 4°

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

Attachment II

Sample Result Summary Sheets

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-06B

Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1H2009

Level: (low/med) LOW Date Received: 11/30/05

% Moisture: not dec. 6 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	28	~~B~~UJ
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	UJ
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	UJ
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

EAD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-06B

Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1H2009

Level: (low/med) LOW Date Received: 11/30/05

% Moisture: not dec. 6 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	UJ
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	UJ
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	UJ
108-86-1	Bromobenzene	5	UJ
96-18-4	1,2,3-Trichloropropane	5	UJ
103-65-1	n-Propylbenzene	5	UJ
95-49-8	2-Chlorotoluene	5	UJ
108-67-8	1,3,5-Trimethylbenzene	5	UJ
106-43-4	4-Chlorotoluene	5	UJ
98-06-6	tert-Butylbenzene	5	UJ
95-63-6	1,2,4-Trimethylbenzene	5	UJ
135-98-8	sec-Butylbenzene	5	UJ
99-87-6	4-Isopropyltoluene	5	UJ
541-73-1	1,3-Dichlorobenzene	5	UJ
106-46-7	1,4-Dichlorobenzene	5	UJ
104-51-8	n-Butylbenzene	5	UJ
95-50-1	1,2-Dichlorobenzene	5	UJ
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	UJ
87-68-3	Hexachlorobutadiene	5	UJ
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	UJ

FORM I VOA OLM03.0

EJD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-1SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-06B

Sample wt/vol: 5.1 (g/mL) G Lab File ID: V1H2009

Level: (low/med) LOW Date Received: 11/30/05

% Moisture: not dec. 6 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
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25.				
26.				
27.				
28.				
29.				
30.				

EAD
1/23/06

FORM I VOA-TIC OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB0.5-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-21A

Sample wt/vol: 4.7 (g/mL) G Lab File ID: V1H2013

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. 7 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	U
67-64-1	Acetone	6	UJ
74-88-4	Iodomethane	6	U
75-15-0	Carbon Disulfide	6	U
75-09-2	Methylene Chloride	20	~~B~~ UJ
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
108-05-4	Vinyl acetate	6	U
78-93-3	2-Butanone	6	UJ
156-59-2	cis-1,2-Dichloroethene	6	U
590-20-7	2,2-Dichloropropane	6	U
74-97-5	Bromochloromethane	6	U
67-66-3	Chloroform	6	UJ
71-55-6	1,1,1-Trichloroethane	6	U
563-58-6	1,1-Dichloropropene	6	U
56-23-5	Carbon Tetrachloride	6	U
107-06-2	1,2-Dichloroethane	6	UJ
71-43-2	Benzene	6	U
79-01-6	Trichloroethene	6	U
78-87-5	1,2-Dichloropropane	6	U
74-95-3	Dibromomethane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	6	U
108-88-3	Toluene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U

DAD 1/03/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB0.5-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-21A

Sample wt/vol: 4.7 (g/mL) G Lab File ID: V1H2013

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. 7 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	6	UJ
127-18-4	Tetrachloroethene	6	U
591-78-6	2-Hexanone	6	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	UJ
108-90-7	Chlorobenzene	6	U
630-20-6	1,1,1,2-Tetrachloroethane	6	U
100-41-4	Ethylbenzene	6	U
----------	m,p-Xylene	6	U
95-47-6	o-Xylene	6	U
1330-20-7	Xylene (Total)	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropylbenzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	UJ
108-86-1	Bromobenzene	6	U
96-18-4	1,2,3-Trichloropropane	6	U
103-65-1	n-Propylbenzene	6	U
95-49-8	2-Chlorotoluene	6	U
108-67-8	1,3,5-Trimethylbenzene	6	U
106-43-4	4-Chlorotoluene	6	UJ
98-06-6	tert-Butylbenzene	6	U
95-63-6	1,2,4-Trimethylbenzene	6	U
135-98-8	sec-Butylbenzene	6	U
99-87-6	4-Isopropyltoluene	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
104-51-8	n-Butylbenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-chloropropane	6	UJ
120-82-1	1,2,4-Trichlorobenzene	6	U
87-68-3	Hexachlorobutadiene	6	U
91-20-3	Naphthalene	6	U ~~1 JB~~ J
87-61-6	1,2,3-Trichlorobenzene	6	U

FORM I VOA OLM03.0

SD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-3SB0.5-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-21A

Sample wt/vol: 4.7 (g/mL) G Lab File ID: V1H2013

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. 7 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I VOA-TIC

SYD 1/23/06

OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB2-2.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-18A

Sample wt/vol: 6.7 (g/mL) G Lab File ID: V1H2012

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. 9 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	4	U
74-87-3	Chloromethane	4	U
75-01-4	Vinyl Chloride	4	U
74-83-9	Bromomethane	4	U
75-00-3	Chloroethane	4	U
75-69-4	Trichlorofluoromethane	4	U
75-35-4	1,1-Dichloroethene	2	J
67-64-1	Acetone	7	J
74-88-4	Iodomethane	4	U
75-15-0	Carbon Disulfide	3	J
75-09-2	Methylene Chloride	21	~~B~~ UJ
156-60-5	trans-1,2-Dichloroethene	4	U
1634-04-4	Methyl tert-butyl ether	4	U
75-34-3	1,1-Dichloroethane	4	U
108-05-4	Vinyl acetate	4	U
78-93-3	2-Butanone	4	UJ
156-59-2	cis-1,2-Dichloroethene	4	U
590-20-7	2,2-Dichloropropane	4	U
74-97-5	Bromochloromethane	4	U
67-66-3	Chloroform	4	UJ
71-55-6	1,1,1-Trichloroethane	4	U
563-58-6	1,1-Dichloropropene	4	U
56-23-5	Carbon Tetrachloride	4	U
107-06-2	1,2-Dichloroethane	4	UJ
71-43-2	Benzene	4	U
79-01-6	Trichloroethene	4	U
78-87-5	1,2-Dichloropropane	4	U
74-95-3	Dibromomethane	4	U
75-27-4	Bromodichloromethane	4	U
10061-01-5	cis-1,3-Dichloropropene	4	U
108-10-1	4-Methyl-2-pentanone	4	U
108-88-3	Toluene	4	U
10061-02-6	trans-1,3-Dichloropropene	4	U
79-00-5	1,1,2-Trichloroethane	4	U

1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB2-2.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-18A

Sample wt/vol: 6.7 (g/mL) G Lab File ID: V1H2012

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. 9 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	4	UJ
127-18-4	Tetrachloroethene	4	U
591-78-6	2-Hexanone	4	U
124-48-1	Dibromochloromethane	4	U
106-93-4	1,2-Dibromoethane	4	UJ
108-90-7	Chlorobenzene	4	U
630-20-6	1,1,1,2-Tetrachloroethane	4	U
100-41-4	Ethylbenzene	10	
	m,p-Xylene	36	
95-47-6	o-Xylene	13	
1330-20-7	Xylene (Total)	49	
100-42-5	Styrene	4	U
75-25-2	Bromoform	4	U
98-82-8	Isopropylbenzene	4	U
79-34-5	1,1,2,2-Tetrachloroethane	4	UJ
108-86-1	Bromobenzene	4	U
96-18-4	1,2,3-Trichloropropane	4	U
103-65-1	n-Propylbenzene	4	U
95-49-8	2-Chlorotoluene	4	U
108-67-8	1,3,5-Trimethylbenzene	4	U
106-43-4	4-Chlorotoluene	4	UJ
98-06-6	tert-Butylbenzene	4	U
95-63-6	1,2,4-Trimethylbenzene	2	J
135-98-8	sec-Butylbenzene	4	U
99-87-6	4-Isopropyltoluene	4	U
541-73-1	1,3-Dichlorobenzene	4	U
106-46-7	1,4-Dichlorobenzene	4	U
104-51-8	n-Butylbenzene	4	U
95-50-1	1,2-Dichlorobenzene	4	U
96-12-8	1,2-Dibromo-3-chloropropane	4	UJ
120-82-1	1,2,4-Trichlorobenzene	4	U
87-68-3	Hexachlorobutadiene	4	U
91-20-3	Naphthalene	13	~~B~~ UJ
87-61-6	1,2,3-Trichlorobenzene	4	U

FORM I VOA

EAD 1/23/06

OLM03.0

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-3SB2-2.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-18A

Sample wt/vol: 6.7 (g/mL) G Lab File ID: V1H2012

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. 9 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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SID 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB2-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-01B

Sample wt/vol: 6.3 (g/mL) G Lab File ID: V1H2008

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. 9 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	4	U
74-87-3	Chloromethane	4	U
75-01-4	Vinyl Chloride	4	U
74-83-9	Bromomethane	4	U
75-00-3	Chloroethane	4	U
75-69-4	Trichlorofluoromethane	4	U
75-35-4	1,1-Dichloroethene	4	U
67-64-1	Acetone	4	UJ
74-88-4	Iodomethane	4	U
75-15-0	Carbon Disulfide	4	U
75-09-2	Methylene Chloride	17	~~B~~ UJ
156-60-5	trans-1,2-Dichloroethene	4	U
1634-04-4	Methyl tert-butyl ether	4	U
75-34-3	1,1-Dichloroethane	4	U
108-05-4	Vinyl acetate	4	U
78-93-3	2-Butanone	4	UJ
156-59-2	cis-1,2-Dichloroethene	4	U
590-20-7	2,2-Dichloropropane	4	U
74-97-5	Bromochloromethane	4	U
67-66-3	Chloroform	4	UJ
71-55-6	1,1,1-Trichloroethane	4	U
563-58-6	1,1-Dichloropropene	4	U
56-23-5	Carbon Tetrachloride	4	U
107-06-2	1,2-Dichloroethane	4	UJ
71-43-2	Benzene	4	U
79-01-6	Trichloroethene	4	U
78-87-5	1,2-Dichloropropane	4	U
74-95-3	Dibromomethane	4	U
75-27-4	Bromodichloromethane	4	U
10061-01-5	cis-1,3-Dichloropropene	4	U
108-10-1	4-Methyl-2-pentanone	4	U
108-88-3	Toluene	4	U
10061-02-6	trans-1,3-Dichloropropene	4	U
79-00-5	1,1,2-Trichloroethane	4	U

EJD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB2-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-01B

Sample wt/vol: 6.3 (g/mL) G Lab File ID: V1H2008

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. 9 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	4	UJ
127-18-4	Tetrachloroethene	4	U
591-78-6	2-Hexanone	4	U
124-48-1	Dibromochloromethane	4	U
106-93-4	1,2-Dibromoethane	4	UJ
108-90-7	Chlorobenzene	4	U
630-20-6	1,1,1,2-Tetrachloroethane	4	U
100-41-4	Ethylbenzene	4	U
	m,p-Xylene	4	U
95-47-6	o-Xylene	4	U
1330-20-7	Xylene (Total)	4	U
100-42-5	Styrene	4	U
75-25-2	Bromoform	4	U
98-82-8	Isopropylbenzene	4	U
79-34-5	1,1,2,2-Tetrachloroethane	4	UJ
108-86-1	Bromobenzene	4	U
96-18-4	1,2,3-Trichloropropane	4	U
103-65-1	n-Propylbenzene	4	U
95-49-8	2-Chlorotoluene	4	U
108-67-8	1,3,5-Trimethylbenzene	4	U
106-43-4	4-Chlorotoluene	4	UJ
98-06-6	tert-Butylbenzene	4	U
95-63-6	1,2,4-Trimethylbenzene	4	U
135-98-8	sec-Butylbenzene	4	U
99-87-6	4-Isopropyltoluene	4	U
541-73-1	1,3-Dichlorobenzene	4	U
106-46-7	1,4-Dichlorobenzene	4	U
104-51-8	n-Butylbenzene	4	U
95-50-1	1,2-Dichlorobenzene	4	U
96-12-8	1,2-Dibromo-3-chloropropane	4	UJ
120-82-1	1,2,4-Trichlorobenzene	4	U
87-68-3	Hexachlorobutadiene	4	U
91-20-3	Naphthalene	4	UJ
87-61-6	1,2,3-Trichlorobenzene	4	U

EAD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-5SB2-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-01B

Sample wt/vol: 6.3 (g/mL) G Lab File ID: V1H2008

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. 9 Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EAD 1/23/06

FORM I VOA-TIC OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-03C

Sample wt/vol: 5.6 (g/mL) G Lab File ID: V1H1977

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. 20 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl Chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	6	U
75-35-4	1,1-Dichloroethene	6	UJ
67-64-1	Acetone	6	UJ
74-88-4	Iodomethane	6	U
75-15-0	Carbon Disulfide	6	U
75-09-2	Methylene Chloride	31	~~B~~ TB
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
108-05-4	Vinyl acetate	6	U
78-93-3	2-Butanone	6	UJ
156-59-2	cis-1,2-Dichloroethene	6	U
590-20-7	2,2-Dichloropropane	6	UJ
74-97-5	Bromochloromethane	6	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
563-58-6	1,1-Dichloropropene	6	U
56-23-5	Carbon Tetrachloride	6	U
107-06-2	1,2-Dichloroethane	6	U
71-43-2	Benzene	6	U
79-01-6	Trichloroethene	6	U
78-87-5	1,2-Dichloropropane	6	U
74-95-3	Dibromomethane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	6	U
108-88-3	Toluene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U

EJD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-03C

Sample wt/vol: 5.6 (g/mL) G Lab File ID: V1H1977

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. 20 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	6	U
127-18-4	Tetrachloroethene	6	U
591-78-6	2-Hexanone	6	U
124-48-1	Dibromochloromethane	6	U
106-93-4	1,2-Dibromoethane	6	U
108-90-7	Chlorobenzene	6	U
630-20-6	1,1,1,2-Tetrachloroethane	6	U
100-41-4	Ethylbenzene	6	U
	m,p-Xylene	6	U
95-47-6	o-Xylene	6	U
1330-20-7	Xylene (Total)	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropylbenzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
108-86-1	Bromobenzene	6	U
96-18-4	1,2,3-Trichloropropane	6	U
103-65-1	n-Propylbenzene	6	U
95-49-8	2-Chlorotoluene	6	U
108-67-8	1,3,5-Trimethylbenzene	6	U
106-43-4	4-Chlorotoluene	6	U
98-06-6	tert-Butylbenzene	6	U
95-63-6	1,2,4-Trimethylbenzene	6	U
135-98-8	sec-Butylbenzene	6	U
99-87-6	4-Isopropyltoluene	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
104-51-8	n-Butylbenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-chloropropane	6	UJ
120-82-1	1,2,4-Trichlorobenzene	6	U
87-68-3	Hexachlorobutadiene	6	U
91-20-3	Naphthalene	6	UJ
87-61-6	1,2,3-Trichlorobenzene	6	U

EJD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-5SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-03C

Sample wt/vol: 5.6 (g/mL) G Lab File ID: V1H1977

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. 20 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	12.25	6	J
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EBD
1/23/06

FORM I VOA-TIC OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-09C

Sample wt/vol: 5.6 (g/mL) G Lab File ID: V1H1978

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 5 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	UJ
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	23	~~B~~ U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	UJ
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

FORM I VOA

EJD
HJG 1/23/06

OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-09C

Sample wt/vol: 5.6 (g/mL) G Lab File ID: V1H1978

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 5 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	1	J
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	U

EJD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-6SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-09C

Sample wt/vol: 5.6 (g/mL) G Lab File ID: V1H1978

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 5 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EJD
1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-7SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-10C

Sample wt/vol: 5.4 (g/mL) G Lab File ID: V1H1979

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 7 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	UJ
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	23	~~B~~ U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	UJ
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

EJD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-7SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-10C

Sample wt/vol: 5.4 (g/mL) G Lab File ID: V1H1979

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 7 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	1	J
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	U

EJD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-7SB1-1.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-10C

Sample wt/vol: 5.4 (g/mL) G Lab File ID: V1H1979

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 7 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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E&D 1/23/06

FORM I VOA-TIC OLM03.0

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~ME6SB10-12~~ ME-6SB10-12 EKD 1/23/06

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-13C

Sample wt/vol: 5.8 (g/mL) G Lab File ID: V1H1980

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 8 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	UJ
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	26	~~B~~ U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	UJ
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

EKD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

~~ME6SB10-12~~
ME-6SB10-12

EJD 1/23/

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-13C

Sample wt/vol: 5.8 (g/mL) G Lab File ID: V1H1980

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 8 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	U

EJD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EAD 11/23/06

~~ME6SB10-12~~
ME-6SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-13C

Sample wt/vol: 5.8 (g/mL) G Lab File ID: V1H1980

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. 8 Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EAD 11/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-01

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H1964

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. _____ Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (mL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U J
67-64-1	Acetone	5	U J
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	27	~~B~~ U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	U J
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U J
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

1/23/06
EPD

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-01

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H1964

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. _____ Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5U ~~1 JJ~~	
87-61-6	1,2,3-Trichlorobenzene	5	U

FORM I VOA OLM03.0

EAD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-01

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-05A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H1964

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. _____ Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EJD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-02

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H1965

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. _____ Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	UJ
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	28	~~B~~ U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	UJ
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

EAD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-02

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H1965

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. _____ Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	U

EJD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-02

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-08A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H1965

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: not dec. _____ Date Analyzed: 12/06/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-03

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-16A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H2006

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. _____ Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (mL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	32	~~B~~ J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	UJ
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	UJ
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

EJD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-03

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-16A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H2006

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. _____ Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	UJ
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	UJ
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	UJ
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	UJ
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	U

EXD 1/23/06

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-03

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-16A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H2006

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: not dec. _____ Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EAD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-04

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-17A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H2007

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. _____ Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	U J
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	28	~~B~~ U J
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	U J
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U J
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U J
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

EAD 1/23/06

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-04

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-17A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H2007

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. _____ Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
142-28-9	1,3-Dichloropropane	5	U J
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U J
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U J
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U J
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U J
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	U J
87-61-6	1,2,3-Trichlorobenzene	5	U

EAD 1/23/06

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-04

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-17A

Sample wt/vol: 5.0 (g/mL) G Lab File ID: V1H2007

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: not dec. _____ Date Analyzed: 12/08/05

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(mL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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EAD 1/23/06

FORM I VOA-TIC OLM03.0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1SB0.5-3

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-07A

Sample wt/vol: 30.3 (g/mL) G Lab File ID: S3D3662

Level: (low/med) LOW Date Received: 11/30/05

% Moisture: 6 decanted: (Y/N) N Date Extracted: 11/29/05

Concentrated Extract Volume: 2000 (uL) Date Analyzed: 12/05/05

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	700	U
111-44-4	bis(2-Chloroethyl)Ether	700	U
95-57-8	2-Chlorophenol	700	U
541-73-1	1,3-Dichlorobenzene	700	U
106-46-7	1,4-Dichlorobenzene	700	U
95-50-1	1,2-Dichlorobenzene	700	U
95-48-7	2-Methylphenol	700	U
108-60-1	2,2'-oxybis(1-Chloropropane)	700	U
106-44-5	4-Methylphenol	700	UJ
621-64-7	N-Nitroso-di-n-propylamine	700	U
67-72-1	Hexachloroethane	700	U
98-95-3	Nitrobenzene	700	U
78-59-1	Isophorone	700	U
88-75-5	2-Nitrophenol	700	U
105-67-9	2,4-Dimethylphenol	700	U
120-83-2	2,4-Dichlorophenol	700	U
120-82-1	1,2,4-Trichlorobenzene	700	U
91-20-3	Naphthalene	700	U
106-47-8	4-Chloroaniline	700	UJ
111-91-1	bis(2-Chloroethoxy)methane	700	U
87-68-3	Hexachlorobutadiene	700	U
59-50-7	4-Chloro-3-Methylphenol	700	U
91-57-6	2-Methylnaphthalene	700	U
77-47-4	Hexachlorocyclopentadiene	700	U
88-06-2	2,4,6-Trichlorophenol	700	U
95-95-4	2,4,5-Trichlorophenol	1400	U
91-58-7	2-Chloronaphthalene	700	U
88-74-4	2-Nitroaniline	1400	U
131-11-3	Dimethylphthalate	700	UJ
208-96-8	Acenaphthylene	110	J
606-20-2	2,6-Dinitrotoluene	700	U
99-09-2	3-Nitroaniline	1400	U
83-32-9	Acenaphthene	700	U

1/23/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1SB0.5-3

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-07A

Sample wt/vol: 30.3 (g/mL) G Lab File ID: S3D3662

Level: (low/med) LOW Date Received: 11/30/05

% Moisture: 6 decanted: (Y/N) N Date Extracted: 11/29/05

Concentrated Extract Volume: 2000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	R ~~1400~~	~~U~~
100-02-7	4-Nitrophenol	1400	U
132-64-9	Dibenzofuran	700	UJ
121-14-2	2,4-Dinitrotoluene	700	UJ
84-66-2	Diethylphthalate	700	U
7005-72-3	4-Chlorophenyl-phenylether	700	UJ
86-73-7	Fluorene	700	UJ
100-01-6	4-Nitroaniline	1400	U
534-52-1	4,6-Dinitro-2-methylphenol	1400	UJ
86-30-6	N-Nitrosodiphenylamine (1)	700	U
101-55-3	4-Bromophenyl-phenylether	700	UJ
118-74-1	Hexachlorobenzene	700	UJ
87-86-5	Pentachlorophenol	R ~~1400~~	~~U~~
85-01-8	Phenanthrene	130	J
120-12-7	Anthracene	700	UJ
86-74-8	Carbazole	700	UJ
84-74-2	Di-n-butylphthalate	700	UJ
206-44-0	Fluoranthene	260	J
129-00-0	Pyrene	420	J
85-68-7	Butylbenzylphthalate	700	UJ
91-94-1	3,3'-Dichlorobenzidine	700	UJ
56-55-3	Benzo(a)anthracene	270	J
218-01-9	Chrysene	250	J
117-81-7	bis(2-Ethylhexyl)phthalate	180	J
117-84-0	Di-n-octylphthalate	700	UJ
205-99-2	Benzo(b)fluoranthene	200	J
207-08-9	Benzo(k)fluoranthene	82	J
50-32-8	Benzo(a)pyrene	190	J
193-39-5	Indeno(1,2,3-cd)pyrene	140	J
53-70-3	Dibenzo(a,h)anthracene	700	UJ
191-24-2	Benzo(g,h,i)perylene	190	J

(1) - Cannot be separated from Diphenylamine

EJD 1/23/06

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-1SB0.5-3

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-07A

Sample wt/vol: 30.3 (g/mL) G Lab File ID: S3D3662

Level: (low/med) LOW Date Received: 11/30/05

% Moisture: 6 decanted: (Y/N) N Date Extracted:11/29/05

Concentrated Extract Volume: 2000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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FORM I SV-TIC OLM03.0

1/23/06

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-19A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3867

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	720	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	720	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	59	J
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	720	U
83-32-9	Acenaphthene	350	U

EJD 1/03/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-19A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3867

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	720	U
100-02-7	4-Nitrophenol	720	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	720	U
534-52-1	4,6-Dinitro-2-methylphenol	720	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	720	U
85-01-8	Phenanthrene	210	J
120-12-7	Anthracene	54	J
86-74-8	Carbazole	350	U
84-74-2	Di-n-butylphthalate	68	J
206-44-0	Fluoranthene	520	
129-00-0	Pyrene	580	
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	UJ
56-55-3	Benzo(a)anthracene	360	J
218-01-9	Chrysene	300	J
117-81-7	bis(2-Ethylhexyl)phthalate	620	
117-84-0	Di-n-octylphthalate	350	U
205-99-2	Benzo(b)fluoranthene	340	J
207-08-9	Benzo(k)fluoranthene	120	J
50-32-8	Benzo(a)pyrene	260	J
193-39-5	Indeno(1,2,3-cd)pyrene	170	J
53-70-3	Dibenzo(a,h)anthracene	42	J
191-24-2	Benzo(g,h,i)perylene	200	J

(1) - Cannot be separated from Diphenylamine

EXP 1/23/06

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-3SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-19A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3867

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	15.43	190	J
2. 192-97-2	BENZO[E]PYRENE	15.74	190	NJ
3.	UNKNOWN	17.99	190	J
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EJD 1/03/06

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB4-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-20A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3855

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: 3 decanted: (Y/N) N Date Extracted:12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	340	U
111-44-4	bis(2-Chloroethyl)Ether	340	U
95-57-8	2-Chlorophenol	340	U
541-73-1	1,3-Dichlorobenzene	340	U
106-46-7	1,4-Dichlorobenzene	340	U
95-50-1	1,2-Dichlorobenzene	340	U
95-48-7	2-Methylphenol	340	U
108-60-1	2,2'-oxybis(1-Chloropropane)	340	U
106-44-5	4-Methylphenol	340	U
621-64-7	N-Nitroso-di-n-propylamine	340	U
67-72-1	Hexachloroethane	340	U
98-95-3	Nitrobenzene	340	U
78-59-1	Isophorone	340	U
88-75-5	2-Nitrophenol	340	U
105-67-9	2,4-Dimethylphenol	340	U
120-83-2	2,4-Dichlorophenol	340	U
120-82-1	1,2,4-Trichlorobenzene	340	U
91-20-3	Naphthalene	340	U
106-47-8	4-Chloroaniline	340	U
111-91-1	bis(2-Chloroethoxy)methane	340	U
87-68-3	Hexachlorobutadiene	340	U
59-50-7	4-Chloro-3-Methylphenol	340	U
91-57-6	2-Methylnaphthalene	340	U
77-47-4	Hexachlorocyclopentadiene	340	U
88-06-2	2,4,6-Trichlorophenol	340	U
95-95-4	2,4,5-Trichlorophenol	690	U
91-58-7	2-Chloronaphthalene	340	U
88-74-4	2-Nitroaniline	690	U
131-11-3	Dimethylphthalate	340	U
208-96-8	Acenaphthylene	340	U
606-20-2	2,6-Dinitrotoluene	340	U
99-09-2	3-Nitroaniline	690	U
83-32-9	Acenaphthene	340	U

EP 1/03/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-3SB4-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-20A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3855

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: 3 decanted: (Y/N) N Date Extracted:12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	690	U
100-02-7	4-Nitrophenol	690	U
132-64-9	Dibenzofuran	340	U
121-14-2	2,4-Dinitrotoluene	340	U
84-66-2	Diethylphthalate	340	U
7005-72-3	4-Chlorophenyl-phenylether	340	U
86-73-7	Fluorene	340	U
100-01-6	4-Nitroaniline	690	U
534-52-1	4,6-Dinitro-2-methylphenol	690	U
86-30-6	N-Nitrosodiphenylamine (1)	340	U
101-55-3	4-Bromophenyl-phenylether	340	U
118-74-1	Hexachlorobenzene	340	U
87-86-5	Pentachlorophenol	690	U
85-01-8	Phenanthrene	340	U
120-12-7	Anthracene	340	U
86-74-8	Carbazole	340	U
84-74-2	Di-n-butylphthalate	340	U
206-44-0	Fluoranthene	340	U
129-00-0	Pyrene	340	U
85-68-7	Butylbenzylphthalate	340	U
91-94-1	3,3'-Dichlorobenzidine	340	UJ
56-55-3	Benzo(a)anthracene	340	UJ
218-01-9	Chrysene	340	UJ
117-81-7	bis(2-Ethylhexyl)phthalate	1000	
117-84-0	Di-n-octylphthalate	340	U
205-99-2	Benzo(b)fluoranthene	340	UJ
207-08-9	Benzo(k)fluoranthene	340	U
50-32-8	Benzo(a)pyrene	340	U
193-39-5	Indeno(1,2,3-cd)pyrene	340	U
53-70-3	Dibenzo(a,h)anthracene	340	U
191-24-2	Benzo(g,h,i)perylene	340	U

(1) - Cannot be separated from Diphenylamine

EJP 1/23/06

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-3SB4-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-20A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3855

Level: (low/med) LOW Date Received: 12/05/05

% Moisture: 3 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	13.52	150	J
2.	UNKNOWN	15.42	210	J
3.	UNKNOWN	15.49	190	J
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FORM I SV-TIC

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1/23/06

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB0-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-02A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S3D3658

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: 12 decanted: (Y/N) N Date Extracted: 11/29/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	370	U
111-44-4	bis(2-Chloroethyl)Ether	370	U
95-57-8	2-Chlorophenol	370	U
541-73-1	1,3-Dichlorobenzene	370	U
106-46-7	1,4-Dichlorobenzene	370	U
95-50-1	1,2-Dichlorobenzene	370	U
95-48-7	2-Methylphenol	370	U
108-60-1	2,2'-oxybis(1-Chloropropane)	370	U
106-44-5	4-Methylphenol	370	UJ
621-64-7	N-Nitroso-di-n-propylamine	370	U
67-72-1	Hexachloroethane	370	U
98-95-3	Nitrobenzene	370	U
78-59-1	Isophorone	370	U
88-75-5	2-Nitrophenol	370	U
105-67-9	2,4-Dimethylphenol	370	U
120-83-2	2,4-Dichlorophenol	370	U
120-82-1	1,2,4-Trichlorobenzene	370	U
91-20-3	Naphthalene	370	U
106-47-8	4-Chloroaniline	370	UJ
111-91-1	bis(2-Chloroethoxy)methane	370	U
87-68-3	Hexachlorobutadiene	370	U
59-50-7	4-Chloro-3-Methylphenol	370	U
91-57-6	2-Methylnaphthalene	370	U
77-47-4	Hexachlorocyclopentadiene	370	U
88-06-2	2,4,6-Trichlorophenol	370	U
95-95-4	2,4,5-Trichlorophenol	760	U
91-58-7	2-Chloronaphthalene	370	U
88-74-4	2-Nitroaniline	760	U
131-11-3	Dimethylphthalate	370	U
208-96-8	Acenaphthylene	370	U
606-20-2	2,6-Dinitrotoluene	370	U
99-09-2	3-Nitroaniline	760	U
83-32-9	Acenaphthene	370	U

1/23/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB0-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-02A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S3D3658

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: 12 decanted: (Y/N) N Date Extracted:11/29/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	760	UJ
100-02-7	4-Nitrophenol	760	U
132-64-9	Dibenzofuran	370	U
121-14-2	2,4-Dinitrotoluene	370	U
84-66-2	Diethylphthalate	370	U
7005-72-3	4-Chlorophenyl-phenylether	370	U
86-73-7	Fluorene	370	U
100-01-6	4-Nitroaniline	760	UJ
534-52-1	4,6-Dinitro-2-methylphenol	760	UJ
86-30-6	N-Nitrosodiphenylamine (1)	370	U
101-55-3	4-Bromophenyl-phenylether	370	U
118-74-1	Hexachlorobenzene	370	U
87-86-5	Pentachlorophenol	760	U
85-01-8	Phenanthrene	230	J
120-12-7	Anthracene	59	J
86-74-8	Carbazole	370	U
84-74-2	Di-n-butylphthalate	370	U
206-44-0	Fluoranthene	320	J
129-00-0	Pyrene	440	J
85-68-7	Butylbenzylphthalate	370	UJ
91-94-1	3,3'-Dichlorobenzidine	370	UJ
56-55-3	Benzo(a)anthracene	260	J
218-01-9	Chrysene	200	J
117-81-7	bis(2-Ethylhexyl)phthalate	84	J
117-84-0	Di-n-octylphthalate	370	UJ
205-99-2	Benzo(b)fluoranthene	190	J
207-08-9	Benzo(k)fluoranthene	73	J
50-32-8	Benzo(a)pyrene	150	J
193-39-5	Indeno(1,2,3-cd)pyrene	85	J
53-70-3	Dibenzo(a,h)anthracene	370	UJ
191-24-2	Benzo(g,h,i)perylene	110	J

(1) - Cannot be separated from Diphenylamine

EBD 1/03/06

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-5SB0-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-02A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S3D3658

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: 12 decanted: (Y/N) N Date Extracted: 11/29/05

Concentrated Extract Volume: 2000 (uL) Date Analyzed: 12/05/05

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	16.20	920	J
2.	UNKNOWN	19.52	1300	J
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FORM I SV-TIC

OLM03.0

1/23/06

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-03A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S3D3660

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/29/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	410	U
111-44-4	bis(2-Chloroethyl)Ether	410	U
95-57-8	2-Chlorophenol	410	U
541-73-1	1,3-Dichlorobenzene	410	U
106-46-7	1,4-Dichlorobenzene	410	U
95-50-1	1,2-Dichlorobenzene	410	U
95-48-7	2-Methylphenol	410	U
108-60-1	2,2'-oxybis(1-Chloropropane)	410	U
106-44-5	4-Methylphenol	410	UJ
621-64-7	N-Nitroso-di-n-propylamine	410	U
67-72-1	Hexachloroethane	410	U
98-95-3	Nitrobenzene	410	U
78-59-1	Isophorone	410	U
88-75-5	2-Nitrophenol	410	U
105-67-9	2,4-Dimethylphenol	410	U
120-83-2	2,4-Dichlorophenol	410	U
120-82-1	1,2,4-Trichlorobenzene	410	U
91-20-3	Naphthalene	410	U
106-47-8	4-Chloroaniline	410	UJ
111-91-1	bis(2-Chloroethoxy)methane	410	U
87-68-3	Hexachlorobutadiene	410	U
59-50-7	4-Chloro-3-Methylphenol	410	U
91-57-6	2-Methylnaphthalene	410	U
77-47-4	Hexachlorocyclopentadiene	410	U
88-06-2	2,4,6-Trichlorophenol	410	U
95-95-4	2,4,5-Trichlorophenol	840	U
91-58-7	2-Chloronaphthalene	410	U
88-74-4	2-Nitroaniline	840	U
131-11-3	Dimethylphthalate	410	U
208-96-8	Acenaphthylene	410	U
606-20-2	2,6-Dinitrotoluene	410	U
99-09-2	3-Nitroaniline	840	U
83-32-9	Acenaphthene	410	U

EB 1/23/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-03A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S3D3660

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: 20 decanted: (Y/N) N Date Extracted:11/29/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	840	UJ
100-02-7	4-Nitrophenol	840	U
132-64-9	Dibenzofuran	410	U
121-14-2	2,4-Dinitrotoluene	410	U
84-66-2	Diethylphthalate	410	U
7005-72-3	4-Chlorophenyl-phenylether	410	U
86-73-7	Fluorene	410	U
100-01-6	4-Nitroaniline	840	UJ
534-52-1	4,6-Dinitro-2-methylphenol	840	UJ
86-30-6	N-Nitrosodiphenylamine (1)	410	U
101-55-3	4-Bromophenyl-phenylether	410	U
118-74-1	Hexachlorobenzene	410	U
87-86-5	Pentachlorophenol	840	U
85-01-8	Phenanthrene	140	J
120-12-7	Anthracene	410	U
86-74-8	Carbazole	410	U
84-74-2	Di-n-butylphthalate	410	U
206-44-0	Fluoranthene	150	J
129-00-0	Pyrene	200	J
85-68-7	Butylbenzylphthalate	410	UJ
91-94-1	3,3'-Dichlorobenzidine	410	UJ
56-55-3	Benzo(a)anthracene	120	J
218-01-9	Chrysene	87	J
117-81-7	bis(2-Ethylhexyl)phthalate	450	J
117-84-0	Di-n-octylphthalate	410	UJ
205-99-2	Benzo(b)fluoranthene	69	J
207-08-9	Benzo(k)fluoranthene	410	UJ
50-32-8	Benzo(a)pyrene	57	J
193-39-5	Indeno(1,2,3-cd)pyrene	410	UJ
53-70-3	Dibenzo(a,h)anthracene	410	UJ
191-24-2	Benzo(g,h,i)perylene	43	J

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 OLM03.0

1/23/06

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-5SB10-12

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-03A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S3D3660

Level: (low/med) LOW Date Received: 11/29/05

% Moisture: 20 decanted: (Y/N) N Date Extracted: 11/29/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/05/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	13.53	200	J
2. 15155-62-1	1-DOCOSANOL, FORMATE	15.89	550	NJ
3. 74685-33-9	3-EICOSENE, (E)-	16.63	280	NJ
4. 54482-31-4	D-HOMOANDROSTANE, (5.ALPHA.,	19.35	930	NJ
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FORM I SV-TIC

EJP 1/23/06

OLM03.0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-11A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3868

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	48	J
106-47-8	4-Chloroaniline	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	39	J
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	720	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	720	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	720	U
83-32-9	Acenaphthene	140	J

EJP 1/23/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-11A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3868

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	720	U
100-02-7	4-Nitrophenol	720	U
132-64-9	Dibenzofuran	69	J
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	110	J
100-01-6	4-Nitroaniline	720	U
534-52-1	4,6-Dinitro-2-methylphenol	720	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	720	U
85-01-8	Phenanthrene	1200	
120-12-7	Anthracene	250	J
86-74-8	Carbazole	150	J
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	1600	
129-00-0	Pyrene	1500	
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	UJ
56-55-3	Benzo(a)anthracene	890	J
218-01-9	Chrysene	820	J
117-81-7	bis(2-Ethylhexyl)phthalate	320	J
117-84-0	Di-n-octylphthalate	350	U
205-99-2	Benzo(b)fluoranthene	670	J
207-08-9	Benzo(k)fluoranthene	330	J
50-32-8	Benzo(a)pyrene	600	
193-39-5	Indeno(1,2,3-cd)pyrene	340	J
53-70-3	Dibenzo(a,h)anthracene	92	J
191-24-2	Benzo(g,h,i)perylene	390	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2

EBD 1/23/06

OLM03.0

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-6SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-11A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S3D3868

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I SV-TIC OLM03.0

EDD 1/23/06

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~ME6SB10-13.5~~
ME-6SB10-13.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-14A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S3D3858

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 12 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	380	U
111-44-4	bis(2-Chloroethyl)Ether	380	U
95-57-8	2-Chlorophenol	380	U
541-73-1	1,3-Dichlorobenzene	380	U
106-46-7	1,4-Dichlorobenzene	380	U
95-50-1	1,2-Dichlorobenzene	380	U
95-48-7	2-Methylphenol	380	U
108-60-1	2,2'-oxybis(1-Chloropropane)	380	U
106-44-5	4-Methylphenol	380	U
621-64-7	N-Nitroso-di-n-propylamine	380	U
67-72-1	Hexachloroethane	380	U
98-95-3	Nitrobenzene	380	U
78-59-1	Isophorone	380	U
88-75-5	2-Nitrophenol	380	U
105-67-9	2,4-Dimethylphenol	380	U
120-83-2	2,4-Dichlorophenol	380	U
120-82-1	1,2,4-Trichlorobenzene	380	U
91-20-3	Naphthalene	380	U
106-47-8	4-Chloroaniline	380	U
111-91-1	bis(2-Chloroethoxy)methane	380	U
87-68-3	Hexachlorobutadiene	380	U
59-50-7	4-Chloro-3-Methylphenol	380	U
91-57-6	2-Methylnaphthalene	380	U
77-47-4	Hexachlorocyclopentadiene	380	U
88-06-2	2,4,6-Trichlorophenol	380	U
95-95-4	2,4,5-Trichlorophenol	760	U
91-58-7	2-Chloronaphthalene	380	U
88-74-4	2-Nitroaniline	760	U
131-11-3	Dimethylphthalate	380	U
208-96-8	Acenaphthylene	380	U
606-20-2	2,6-Dinitrotoluene	380	U
99-09-2	3-Nitroaniline	760	U
83-32-9	Acenaphthene	380	U

1/23/06

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~ME6SB10-13.5~~ ME-6SB10-13.6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-14A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S3D3858

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 12 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	760	U
100-02-7	4-Nitrophenol	760	U
132-64-9	Dibenzofuran	380	U
121-14-2	2,4-Dinitrotoluene	380	U
84-66-2	Diethylphthalate	380	U
7005-72-3	4-Chlorophenyl-phenylether	380	U
86-73-7	Fluorene	380	U
100-01-6	4-Nitroaniline	760	U
534-52-1	4,6-Dinitro-2-methylphenol	760	U
86-30-6	N-Nitrosodiphenylamine (1)	380	U
101-55-3	4-Bromophenyl-phenylether	380	U
118-74-1	Hexachlorobenzene	380	U
87-86-5	Pentachlorophenol	760	U
85-01-8	Phenanthrene	380	U
120-12-7	Anthracene	380	U
86-74-8	Carbazole	380	U
84-74-2	Di-n-butylphthalate	380	U
206-44-0	Fluoranthene	380	U
129-00-0	Pyrene	380	U
85-68-7	Butylbenzylphthalate	380	U
91-94-1	3,3'-Dichlorobenzidine	380	UJ
56-55-3	Benzo(a)anthracene	380	UJ
218-01-9	Chrysene	380	UJ
117-81-7	bis(2-Ethylhexyl)phthalate	300	J
117-84-0	Di-n-octylphthalate	380	U
205-99-2	Benzo(b)fluoranthene	380	UJ
207-08-9	Benzo(k)fluoranthene	380	U
50-32-8	Benzo(a)pyrene	380	U
193-39-5	Indeno(1,2,3-cd)pyrene	380	U
53-70-3	Dibenzo(a,h)anthracene	380	U
191-24-2	Benzo(g,h,i)perylene	380	U

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 OLM03.0

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

~~ME6SB10-13.5~~
ME-6SB10-13.5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-14A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S3D3858

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 12 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/15/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 10544-50-0	CYCLIC OCTAATOMIC SULFUR	12.41	220	NJ
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FORM I SV-TIC OLM03.0

1/23/06

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-7SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-12A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S3D3869

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)Ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	2,2'-oxybis(1-Chloropropane)	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	57	J
106-47-8	4-Chloroaniline	350	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-Methylphenol	350	U
91-57-6	2-Methylnaphthalene	43	J
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	720	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	720	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U
99-09-2	3-Nitroaniline	720	U
83-32-9	Acenaphthene	140	J

1/23/06

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-7SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-12A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S3D3869

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 7 decanted: (Y/N) N Date Extracted: 12/13/05

Concentrated Extract Volume: 1000 (uL) Date Analyzed: 12/16/05

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
51-28-5	2,4-Dinitrophenol	720	U
100-02-7	4-Nitrophenol	720	U
132-64-9	Dibenzofuran	74	J
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	110	J
100-01-6	4-Nitroaniline	720	U
534-52-1	4,6-Dinitro-2-methylphenol	720	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	720	U
85-01-8	Phenanthrene	1200	
120-12-7	Anthracene	250	J
86-74-8	Carbazole	140	J
84-74-2	Di-n-butylphthalate	350	U
206-44-0	Fluoranthene	1600	
129-00-0	Pyrene	1600	
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	350	U J
56-55-3	Benzo(a)anthracene	880	J
218-01-9	Chrysene	840	J
117-81-7	bis(2-Ethylhexyl)phthalate	280	J
117-84-0	Di-n-octylphthalate	350	U
205-99-2	Benzo(b)fluoranthene	720	J
207-08-9	Benzo(k)fluoranthene	290	J
50-32-8	Benzo(a)pyrene	610	
193-39-5	Indeno(1,2,3-cd)pyrene	330	J
53-70-3	Dibenzo(a,h)anthracene	96	J
191-24-2	Benzo(g,h,i)perylene	400	

(1) - Cannot be separated from Diphenylamine

FORM I SV-2 OLM03.0

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-7SB0.5-4

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: MD1429

Matrix: (soil/water) SOIL Lab Sample ID: D1429-12A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S3D3869

Level: (low/med) LOW Date Received: 12/01/05

% Moisture: 7 decanted: (Y/N) N Date Extracted:12/13/05

Concentrated Extract Volume: 1000(uL) Date Analyzed: 12/16/05

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ____

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
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30.				

FORM I SV-TIC OLM03.0

1/23/06

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-1SB0.5-3
Lab ID: D1429-07

Project: M&E Connecticut Brownfields
Collection Date: 11/29/05 10:00

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				CTETPH_S			
Extractable Total Petroleum Hydrocarbon	75	~~B~~	13	mg/Kg	1	12/06/2005 20:42	2119
Surr: para-Terphenyl	56.4		37-131	%REC	1	12/06/2005 20:42	2119

1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-3SB0.5-4
Lab ID: D1429-19

Project: M&E Connecticut Brownfields
Collection Date: 12/03/05 11:15

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	43		13	mg/Kg	1	12/16/2005 18:44	21393
Surr: para-Terphenyl	80.8		37-131	%REC	1	12/16/2005 18:44	21393

SAD
1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-3SB4-6
Lab ID: D1429-20

Project: M&E Connecticut Brownfields
Collection Date: 12/03/05 13:00

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch I
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	20		12	mg/Kg	1	12/16/2005 18:15	213
Surr: para-Terphenyl	80.7		37-131	%REC	1	12/16/2005 18:15	213

EJD ~~1/26~~ 1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-5SB0-4
Lab ID: D1429-02

Project: M&E Connecticut Brownfields
Collection Date: 11/28/05 10:00

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	25	B	14	mg/Kg	1	12/06/2005 19:14	21193
Surr: para-Terphenyl	61.2		37-131	%REC	1	12/06/2005 19:14	21193

EJD
1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-5SB8-10
Lab ID: D1429-04

Project: M&E Connecticut Brownfields
Collection Date: 11/28/05 10:45

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch I
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	33	B	14	mg/Kg	1	12/06/2005 19:43	2119
Surr: para-Terphenyl	65.3		37-131	%REC	1	12/06/2005 19:43	2119

E&D 1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-6SB0.5-4
Lab ID: D1429-11

Project: M&E Connecticut Brownfields
Collection Date: 11/30/05 08:40

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	54		13	mg/Kg	1	12/16/2005 19:13	21393
Surr: para-Terphenyl	89.3		37-131	%REC	1	12/16/2005 19:13	2139

EJD 1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ~~ME6SB8-10~~ ME-6SB8-10
Lab ID: D1429-15
EAD 1/23/06

Project: M&E Connecticut Brownfields
Collection Date: 11/30/05 09:30

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch I
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	21		12	mg/Kg	1	12/16/2005 20:12	2139
Surr: para-Terphenyl	83.8		37-131	%REC	1	12/16/2005 20:12	2139

EAD 1/23/06

Qualifiers:

- ND - Not Detected at the Reporting Limit
- J - Analyte detected below quanititation limits
- B - Analyte detected in the associated Method Blank
- DF - Dilution Factor
- S - Spike Recovery outside accepted recovery limits
- R - RPD outside accepted recovery limits
- E - Value above quantitation range
- RL - Reporting Limit

Mitkem Corporation

Date: *28-Dec-05*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-7SB0.5-4
Lab ID: D1429-12

Project: M&E Connecticut Brownfields
Collection Date: 11/30/05 08:50

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				**CTETPH_S**			
Extractable Total Petroleum Hydrocarbon	56		26	mg/Kg	1	12/16/2005 19:42	21393
Surr: para-Terphenyl	38.4		37-131	%REC	1	12/16/2005 19:42	21393

EJD 1/23/06

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-1SB0.5-3

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-07

Level (low/med): MED Date Received: 11/30/05

% Solids: 94.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.054	U	~~N~~J	P
7440-38-2	Arsenic	1.8			P
7440-39-3	Barium	87.4	J	~~E~~	P
7440-41-7	Beryllium	0.32			P
7440-43-9	Cadmium	0.16	~~B~~	J	P
7440-47-3	Chromium	16.3	J	~~E~~	P
7440-50-8	Copper	15.6			P
7439-92-1	Lead	11.0	J	~~E~~	P
7440-02-0	Nickel	9.9	J	~~E~~	P
7782-49-2	Selenium	1.5			P
7440-22-4	Silver	0.017	U		P
7440-28-0	Thallium	1.5			P
7440-62-2	Vanadium	32.3	J	~~E~~	P
7440-66-6	Zinc	66.8	J	~~E~~	P
7439-97-6	Mercury	0.037		~~N~~J	CV

ESD 1/27/05

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-3SB0.5-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-19

Level (low/med): MED Date Received: 12/05/05

% Solids: 93.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.053	U	~~N~~J	P
7440-38-2	Arsenic	2.6			P
7440-39-3	Barium	72.4	J		P
7440-41-7	Beryllium	0.28			P
7440-43-9	Cadmium	0.0052	U		P
7440-47-3	Chromium	18.0	J		P
7440-50-8	Copper	23.9			P
7439-92-1	Lead	37.9	J		P
7440-02-0	Nickel	10.5	J		P
7782-49-2	Selenium	1.4			P
7440-22-4	Silver	0.17	~~B~~	UJ	P
7440-28-0	Thallium	1.5			P
7440-62-2	Vanadium	27.3	J		P
7440-66-6	Zinc	44.4	J		P
7439-97-6	Mercury	0.068		~~*~~J	CV

EBD 1/27/05

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-3SB4-6

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-20

Level (low/med): MED Date Received: 12/05/05

% Solids: 97.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.051	U	~~N~~ J	P
7440-38-2	Arsenic	1.4			P
7440-39-3	Barium	58.0	J		P
7440-41-7	Beryllium	0.29			P
7440-43-9	Cadmium	0.0050	U		P
7440-47-3	Chromium	15.7	J		P
7440-50-8	Copper	24.4			P
7439-92-1	Lead	5.0	J		P
7440-02-0	Nickel	11.0	J		P
7782-49-2	Selenium	1.0	~~B~~	UJ	P
7440-22-4	Silver	0.12	~~B~~	UJ	P
7440-28-0	Thallium	1.9			P
7440-62-2	Vanadium	22.8	J		P
7440-66-6	Zinc	32.4	J		P
7439-97-6	Mercury	0.0066	U		CV

EBD 1/27/05

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-5SB0-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-02

Level (low/med): MED Date Received: 11/29/05

% Solids: 88.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.053	U	~~N~~ J	P
7440-38-2	Arsenic	54.4			P
7440-39-3	Barium	186	J	~~E~~	P
7440-41-7	Beryllium	0.0057	U		P
7440-43-9	Cadmium	0.43			P
7440-47-3	Chromium	9.4	J	~~E~~	P
7440-50-8	Copper	23.0			P
7439-92-1	Lead	50.7	J	~~E~~	P
7440-02-0	Nickel	5.0	J	~~E~~	P
7782-49-2	Selenium	7.0			P
7440-22-4	Silver	0.018	U		P
7440-28-0	Thallium	0.79	~~B~~	J	P
7440-62-2	Vanadium	34.9	J	~~E~~	P
7440-66-6	Zinc	27.0	J	~~E~~	P
7439-97-6	Mercury	0.094		~~*~~ J	CV

EB 1/27/05

Comments:

FORM I - IN SW846

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-5SB10-12

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-03

Level (low/med): MED Date Received: 11/29/05

% Solids: 80.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.066	U	~~N~~J	P
7440-38-2	Arsenic	2.0			P
7440-39-3	Barium	35.8	J	~~E~~	P
7440-41-7	Beryllium	0.27	B	J	P
7440-43-9	Cadmium	0.088	~~B~~	~~U~~ J	P
7440-47-3	Chromium	18.1	J	~~E~~	P
7440-50-8	Copper	12.6			P
7439-92-1	Lead	5.9	J	~~E~~	P
7440-02-0	Nickel	7.8	J	~~E~~	P
7782-49-2	Selenium	2.0			P
7440-22-4	Silver	0.022	U		P
7440-28-0	Thallium	0.48	~~B~~	UJ	P
7440-62-2	Vanadium	24.5	J	~~E~~	P
7440-66-6	Zinc	24.7	J	~~E~~	P
7439-97-6	Mercury	0.010	~~B~~	~~K~~ J	CV

EBD 1/27/05

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

~~ME6SB10-13.5~~ ME-6SB10-13.5

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-14

Level (low/med): MED Date Received: 12/01/05

% Solids: 88.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.062	U	NJ	P
7440-38-2	Arsenic	~~0.52~~	~~B~~	0.94UJ	P
7440-39-3	Barium	54.2	J		P
7440-41-7	Beryllium	0.10	~~B~~	J	P
7440-43-9	Cadmium	0.43			P
7440-47-3	Chromium	77.8	J		P
7440-50-8	Copper	65.1			P
7439-92-1	Lead	53.5	J		P
7440-02-0	Nickel	8.6	J		P
7782-49-2	Selenium	~~0.074~~	~~U~~	1.1U	P
7440-22-4	Silver	0.80	~~B~~	UJ	P
7440-28-0	Thallium	~~0.007~~	U	0.41U	P
7440-62-2	Vanadium	21.5	J		P
7440-66-6	Zinc	58.1	J		P
7439-97-6	Mercury	0.12		*J	CV

1/27/05

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-6SB0.5-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-11

Level (low/med): MED Date Received: 12/01/05

% Solids: 93.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.055	U	NJ	P
7440-38-2	Arsenic	~~0.45~~	~~B~~	.83UJ	P
7440-39-3	Barium	44.4	J		P
7440-41-7	Beryllium	0.13	~~B~~ J		P
7440-43-9	Cadmium	0.49			P
7440-47-3	Chromium	12.1	J		P
7440-50-8	Copper	21.4			P
7439-92-1	Lead	8.3	J		P
7440-02-0	Nickel	9.4	J		P
7782-49-2	Selenium	~~0.065~~	~~U~~	1.0U	P
7440-22-4	Silver	0.52	~~B~~ UJ		P
7440-28-0	Thallium	~~0.077~~	~~U~~	0.37U	P
7440-62-2	Vanadium	32.1	J		P
7440-66-6	Zinc	34.2	J		P
7439-97-6	Mercury	0.035		*J	CV

EJD 1/27/05

Comments:

FORM I - IN SW846

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-7SB0.5-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: MD1429

Matrix (soil/water): SOIL Lab Sample ID: D1429-12

Level (low/med): MED Date Received: 12/01/05

% Solids: 93.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	0.054	U	~~N~~ J	P
7440-38-2	Arsenic	~~0.57~~ ~~B~~		0.82UJ	P
7440-39-3	Barium	50.1	J		P
7440-41-7	Beryllium	0.12	~~B~~	J	P
7440-43-9	Cadmium	0.50			P
7440-47-3	Chromium	14.2	J		P
7440-50-8	Copper	20.8			P
7439-92-1	Lead	9.6	J		P
7440-02-0	Nickel	9.8	J		P
7782-49-2	Selenium	~~0.064~~ ~~U~~		0.98U	P
7440-22-4	Silver	0.54	~~B~~	UJ	P
7440-28-0	Thallium	~~0.076~~ ~~U~~		0.36U	P
7440-62-2	Vanadium	32.6	J		P
7440-66-6	Zinc	36.0	J		P
7439-97-6	Mercury	0.074		~~N~~ J	CV

EJD 1/27/05

Comments:

FORM I - IN SW846

Attachment III

Data Validation Worksheets

REGION I
Data Review Worksheets

Site Name Amerbelle textiles
Reference Number

REGION I REVIEW OF INORGANIC CONTRACT LABORATORY DATA PACKAGE

The hardcopied (laboratory name) Mitkem data package received at Region I has been reviewed and the quality assurance and performance data summarized. The data review included:

~~Case No.~~ Lab No. D1429 SAS No. Sampling Date(s) 11/28-30/05 12/3/05
SDG. No. Matrix Soil Shipping Date(s)
No. of Samples 8 Date Rec'd by Lab

Traffic Report Nos: ME-5SB0-4; 10-12; ME-1SB0.5-3; ME6SB0.5-4; ME7SB0.5-4; ME6SB10-13.5; ME-3SB0.5-4, 4
Trip Blank No.: —
Equipment Blank No.: —
Field Dup Nos: ME-6SB0.5-4 & ME-7SB0.5-4
PE Sample Nos: —

SOW No. SW-846 requires that specific analytical work be done and that associated reports be provided by the laboratory to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- Data Completeness
- Holding Times
- Calibrations
- Blanks
- ICP Interference Check Results
- Matrix Spike Recoveries
- Laboratory Duplicates
- Field Duplicates
- Lab Control Sample Results
- Furnace AA Results
- ICP Serial Dilution Results
- Detection Limit Results
- Sample Quantitation

Overall Comments:

Definitions and Qualifiers:

A - Acceptable Data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Analyte not detected

Reviewer: E. Deeba Date: 1/5/06

REGION I
Data Review Worksheets

Data Validation Worksheet Cover Page - Page 2

Check if all criteria are met and no hardcopy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the Data Validation Memorandum.

Inorganics Worksheets

✓	I.		DATA COMPLETENESS
✓	II.		HOLDING TIMES
✓	III	A.	INSTRUMENT CALIBRATION (Section 1)
✓	III	B.	INSTRUMENT CALIBRATION (Section 2)
___	III	C.	INSTRUMENT CALIBRATION (Section 3)
___	IV	A.	BLANK ANALYSIS RESULTS (Section 1-3)
___	IV	B.	BLANK ANALYSIS RESULTS (Section 4)
___	V	A.	ICP INTERFERENCE CHECK SAMPLE (Sections 1 & 2)
NA	V	B.	ICP INTERFERENCE CHECK SAMPLE (Section 3)
___	VI.		MATRIX SPIKE
___	VII.		LABORATORY DUPLICATES
___	VIII.		FIELD DUPLICATES
✓	IX.		LABORATORY CONTROL SAMPLE
NA	X	A.	FURNACE ATOMIC ABSORPTION ANALYSIS
___	XI.		INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS
___	XII.		DETECTION LIMIT ANALYSIS
NA	XIII.		SAMPLE QUANTITATION
NA	XIV.		ACCURACY CHECK (Performance Evaluation Sample)

I certify that all criteria were met for the worksheets checked above.

Signature: [signature] Name: [signature]

Date: 1/6/05

REGION I
Data Review Worksheets

I. DATA COMPLETENESS

MISSING INFORMATION	DATE LAB CONTACTED	DATE REC'D
Serial Dilution form	1/6/05	
2B CRQL form	↓	
The requested data was rec'd on 1/12/06.		
The lab was contacted again on 1/18/06 to clarify the differences in the beryllium ICB + CCB nondetect values.		
The lab responded on Jan. 23, 2006.		

EBD 1/6/05

REGION I
Data Review Worksheets

See attached sheet

IV A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 &2 below. A separate worksheet should be used for soil and water samples.

1. Laboratory Blanks MATRIX: _____

DATE	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS

2. Equipment/Trip Blanks

DATE	EQUIP BL#	ANALYTE	CONC./UNITS

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix for every 20 samples and for each digestion batch? Yes or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

EJD 1/6/05

REGION I
Data Review Worksheets

See attached Sheet

IV B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that element's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

1. When the concentration is greater than the MDL, but less than the CRQL and Action Level, report the CRQL with a U.
2. When the concentration is greater than the CRQL, but less than the Action Level, report the sample concentration detected with a U.
3. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

MATRIX:_____ MATRIX:_____

ELEMENT	MAX CONC./ UNITS	AL/ UNITS	ELEMENT	MAX CONC./ UNITS	AL/ UNITS

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

$$\text{Conc. in ug/L} \times \frac{\text{Volume digested to (200ml)}}{\text{Weight digested (1gram)}} \times \frac{1\text{L}}{1000\text{ml}} \times \frac{1000\text{gm}}{1\text{kg}} \times \frac{1\text{mg}}{1000\text{ug}} = \text{mg/kg}$$

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be applied to sample results.

EJD 1/6/05

BLANK ACTION LEVELS - SOLIDS

		Traffic Report Sample No.					
		M&E Sample No.	ME-6SB10-13.5		ME-7SB0.5-4		
		Lab Sample ID					
		% Solids	88		93		
		Sample Weight	1.03 g		1.12 g		
		Prep Volume	0.050		0.050		
Analyte	Type	Blank					
Antimony	ICB/CCB	9.3	1	2.5651	1	2.2321	NO BLANK ACTION, ALL RESULTS ND
Arsenic	ICB/CCB	-3.4	1	-0.9378	1	-0.8161	USE ABSOLUTE BAL VALUE WITH U AS NEW DL
Arsenic	ICB/CCB	2.1	1	0.5792	1	0.5040	FOR: ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Barium	MB	0.191	1	1.0536	1	0.9169	NO BLANK ACTIONS, ALL RESULTS >BAL
Beryllium	MB	0.007	1	0.0386	1	0.0336	NO BLANK ACTIONS, ALL RESULTS >BAL or ND
Cadmium	ICB/CCB	0.6	1	0.1655	1	0.1440	U AT SR FORME-5SB10-12
Chromium	MB	0.029	1	0.1600	1	0.1392	NO BLANK ACTIONS, ALL RESULTS >BAL
Copper	MB	0.563	1	3.1057	1	2.7026	NO BLANK ACTIONS, ALL RESULTS >BAL
Lead	MB	0.359	1	1.9804	1	1.7233	NO BLANK ACTIONS, ALL RESULTS >BAL
Nickel	MB	0.17	1	0.9157	1	0.7969	NO BLANK ACTIONS, ALL RESULTS >BAL
Selenium	ICB/CCB	-4.10	1	-1.1308	1	-0.9841	U AT SR FOR ME-3SB4-6; U AT AB.VALUE OF NEG
Selenium	MB	0.242	1	1.3350	1	1.1617	BAL: ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Silver	ICB/CCB	16.80	1	4.6337	1	4.0323	U AT SR FOR ME-3SB0.5-4, ME-3SB4-6, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Thallium	ICB/CCB	-1.50	1	-0.4137	1	-0.3600	U AT SR FOR ME-5SB10-12; AT AB.VALUE OF NEG
Thallium	ICB/CCB	3.10	1	0.8550	1	0.7440	BAL: ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Vanadium	ICB/CCB	0.50	1	0.1379	1	0.1200	NO BLANK ACTIONS, ALL RESULTS >BAL
Zinc	MB	1.439	1	7.9380	1	6.9076	NO BLANK ACTIONS, ALL RESULTS >BAL

REGION I
Data Review Worksheets

VI. MATRIX SPIKE

TR # ME-1SB0.5-3 MATRIX: Soil

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
SSR - spiked sample result
SR - sample result

Analyte	SSR	SR	S	%R	Action
Antimony	7.1799	0.0540U	20.69	34.7	J/UJ in all sample

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.

2. If any analyte does not meet the %R criteria, follow the actions stated below:

	PERCENT RECOVERY		
	<30%	30%-74%	>125%
Positive Samples Results	J	J	J
Non-detected Results	R	UJ	A

2. Frequency Criteria

A. Was a matrix spike prepared at the required frequency? Yes or No

B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? 35.3 Yes or No

A separate worksheet should be used for each matrix spike pair.

EAD 1/6/05

REGION I
Data Review Worksheets

VII. LABORATORY DUPLICATES

List the concentrations of any analytes not meeting the criteria for duplicate precision. For soil duplicates, calculate the CRQL in mg/kg using the sample weight, volume and percents solids data for the sample. Indicate what criterion was used to evaluate precision by circling either the RPD or CRQL for each element.

MATRIX: Soil

Element	CRQL water ug/L	CRQL soil mg/kg	Sample # ME-180053	Duplicate# same	RPD	Action
Aluminum	200					
Antimony	60					
Arsenic	10					
Barium	200					
Beryllium	5					
Cadmium	5					
Calcium	5000					
Chromium	10					
Cobalt	50					
Copper	25					
Iron	100					
Lead	5					
Magnesium	5000					
Manganese	15					
Mercury	0.2	0.03	0.0369	0.0975	90.2	J positive
Nickel	40					
Potassium	5000					
Selenium	5					
Silver	10					
Sodium	5000					
Thallium	10					
Vanadium	50					
Zinc	20					
Cyanide	10					

Laboratory Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >20% for waters and >35% for soils.

2. If sample results are less than 5x the CRQL, estimate (J) positive results for elements whose absolute difference is >CRQL, (2xCRQL for soil). If both samples are non-detected the RPD is not calculated (NC).

EBD 1/6/03

REGION I
Data Review Worksheets

VII. LABORATORY DUPLICATES

List the concentrations of any analytes not meeting the criteria for duplicate precision. For soil duplicates, calculate the CRQL in mg/kg using the sample weight, volume and percents solids data for the sample. Indicate what criterion was used to evaluate precision by circling either the RPD or CRQL for each element.

MATRIX: Soil

Element	CRQL water ug/L	CRQL soil mg/kg	Sample # ME-3SB0.5-4	Duplicate# D Soil	RPD	Action
Aluminum	200					
Antimony	60					
Arsenic	10					
Barium	200					
Beryllium	5					
Cadmium	5					
Calcium	5000					
Chromium	10					
Cobalt	50					
Copper	25					
Iron	100					
Lead	5					
Magnesium	5000					
Manganese	15					
Mercury	0.2	0.03	0.0680	0.1102	17.4	
Nickel	40					
Potassium	5000					
Selenium	5					
Silver	10					
Sodium	5000					
Thallium	10					
Vanadium	50					
Zinc	20					
Cyanide	10					

Laboratory Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >20% for waters and >35% for soils.

2. If sample results are less than 5x the CRQL, estimate (J) positive results for elements whose absolute difference is >CRQL, (2xCRQL for soil). If both samples are non-detected the RPD is not calculated (NC).

1/6/5

REGION I
Data Review Worksheets

~~analyzed for but not required~~ EAD

XI. INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS

✓ Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within 10% of the original undiluted analysis, for concentrations greater than 50x MDL.

____ Serial dilutions were not performed for the following:

_____

____ Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x MDL before dilution.

Report all results below that do not meet the required laboratory criteria for ICP serial dilution analysis.

MATRIX: SO

ELEMENT	MDL	50xMDL	SAMPLE RESULT	SERIAL DILUTION	%D	ACTION
Aluminum						
Antimony						
Arsenic						
Barium	2.1	105	1808.08	3814.60	110.0	J(+)
Beryllium						
Cadmium						
Calcium						
Chromium	0.356	19	336.16	471.58	40.3	J(+)
Cobalt						
Copper						
Iron						
Lead	0.46	~~23~~ 23	227.04	281.50	24.0	J(+)
Magnesium			~~205.05~~	~~286.31~~	~~39.6~~	
Manganese						
Nickel	0.59	29.5	203.05	286.31	39.6	J(+)
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium	0.47	23.5	668.19	860.21	28.7	J(+)
Zinc	2.3	115	1381.82	1761.40	27.5	↓

Actions apply to all samples of the same matrix.

ACTIONS:

1. Estimate (J) positive results if %D >15.

EAD 1/6/06

REGION I
Data Review Worksheets

XII. DETECTION LIMIT ANALYSIS

1. Method Detection Limits

✓ Method Detection Limit results were present and found to be less than the Contract Required Quantitation Limits.

_____ MDLs were not included in the data package on Form 9.

_____ MDLs were present, but the criteria was not met for the following elements: _____

2. Reporting Requirements

✓ Were sample results on Form I reported down to the MDL not the CRQL for all analytes? Yes or No

_____ Were sample results that were analyzed for ICP for Se, Tl, As, or Pb at least 5x IDL. Yes or No

_____ Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I. Yes or No

If No, the reported results may be inaccurate. Make the necessary changes on the data summary tables and request that the laboratory resubmit the corrected data.

3. Estimated Results

List the samples and elements that had concentrations that were qualified as estimated (J and UJ) for being greater than the MDL but less than the CRQL. Include blank-qualified results.

Element	Sample(s)			
Hg	ME-55B10-12			
As	ME-65B0.5-4	ME-75B0.5-4	ME-65B10-13.5	~~ME-55B10-12~~ EBD
Be	ME-68B0.5-4			ME-55B10-12
Silver				~~ME-35B0.5-4~~ ME-3
Thallium	ME-55B0-4 ; ~~ME-75B10-12~~ EBD		ME-55B10-12	~~ME-35B0.5-4~~ EBD
Cd	ME-55B10-12	ME-15B0.5-3		
Se	ME-35B-4-6			

1/6/05 EBD

EPA-NE
Data Validation Worksheet Cover Page – Page 1

Site Name Annabelle Tetti
Reference No.

REGION I ORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name Mitkem
Lab No. ~~Case/Project No.~~ D 1429
SDG No. —
No. of Samples/Matrix 17/80

SOW Method No. 8270, 8260 C ETPH
Sampling Date(s) 11/28-30/05, 12/1/05
Shipping Date(s) ↓
Date Rec'd by Lab ↓

Traffic Report Sample Nos. ME-5SB2-4, 0-4, 10-12, 8-10; ME-1SB1-1.5, 0.5-3; ME-7SB1-1.5, 0.5-4; ME-6SB1-1.5, 0.5-4, 10-12, 10-13.5, 8-10; ME-3SB2-2.5, 0.5-4, 4-6, 0.5-2
Trip Blank No. TB-01, TB-02, TB-03, TB-04
Equipment Blank No. —
Bottle Blank No. —
Field Duplicate Nos. ME-6SB1-1.5 + ME-7SB1-1.5
PES No. —

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision 12/96 was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPjP or amendment to QAPjP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a ~~partial~~ Tier III was used, then identify samples, parameters, etc. that received partial Tier III validation.

The data were evaluated based upon the following parameters:

- Overall Evaluation of Data
- Data Completeness (CSF Audit – Tier I)
- Preservation and Technical Holding Times
- GC/MS & GC/ECD Instrument Performance Check
- Initial and Continuing Calibrations
- Blanks
- Surrogate Compounds
- Internal Standards
- Matrix Spike/Matrix Spike Duplicate
- Field Duplicates
- Sensitivity Check
- PE Samples/Accuracy Check
- Target Compound Identification
- Compound Quantitation and Reported Quantitation Limits
- TICs
- Semivolatile and Pesticide/PCB Cleanup
- System Performance

Region I Definitions and Qualifiers:

A - Acceptable Data
J - Numerical value associated with compound is an estimate quantity
R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
U - Compound not detected at that numerical sample quantitation limit.
UJ - The sample quantitation limit is an estimated quantity
TB, BB, EB – Compound detected in aqueous trip blank, aqueous bottle blank, or aqueous equipment blank associated with soil/sediment samples.

Validator's Name E. Decola Company Name **Metcalf & Eddy** Phone Number 781-516-5200

Date Validation Started 1/5/06 Data Validation Completed 1/13/06

Check if all criteria are met and no hard copy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the data Validation Memorandum.

VOA/SV Worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT	
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES	
VOA/SV-II	GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)	✓
VOA/SV-III	INITIAL CALIBRATION	
VOA/SV-IV	CONTINUING CALIBRATION	
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	
VOA-VI	VOA SURROGATE SPIKE RECOVERIES	✓
SV-VI	SV SURROGATE SPIKE RECOVERIES	
VOA/SV-VII	INTERNAL STANDARD PERFORMANCE	
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE	✓
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	NA
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	
VOA/SV-Pest/PCB-XII	TARGET COMPOUND IDENTIFICATION	NA
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	NA
VOA/SV-XIV	TENTITIVELY IDENTIFIED COMPOUNDS	NA
VOA/SV-XV	SEMIVOLATILE CLEANUP	NA
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	NA

Pest/PCB Worksheets:

VOA/SV-PEST/PCB	COMPLETE SDG FILE (CSF) AUDIT	NA
VOA/SV-PEST/PCB-I	PRESERVATION AND HOLDING TIMES	
Pest/PCB-IIA	GC/ECD INSTRUMENT PERFORMANCE CHECK-RESOLUTION	
Pest/PCB-IIB	GC/ECD INSTRUMENT PERFORMANCE CHECK-RETENTION TIMES	
Pest/PCB-IIC	GC/ECD INSTRUMENT PERFORMANCE CHECK-ACCURACY CHECK OF INITIAL CALIBRATION	
Pest/PCB-IID	GC/ECD INSTRUMENT PERFORMANCE CHECK-PESTICIDE DEGRADATION	
Pest/PCB-III	INITIAL CALIBRATION	
Pest/PCB-IV	CONTINUING CALIBRATION	
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	
Pest/PCB-VI	SURROGATE COMPOUNDS: SPIKE RECOVERIES AND RETENTION TIME SHIFT	
Pest/PCB-VII	PESTICIDE CLEANUP	
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE	
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	
Pest/PCB-XII	COMPOUND IDENTIFICATION	
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB

COMPLETE SDG FILE (CSF) AUDIT

Organic Fractions: VOA + ETPH

Missing Information	Date Lab Contacted	Date Received
VOA Was a HB analyzed of samples?	1/6/05	
RAW data for ME-15B1-1.5 or 1.34 of compounds quantified with IS 1,4-dichlorobenzene-d4.	1/6/05	
ETPH: extraction/prep date	1/6/05	
VOA + ETPH requested data was rec'd on 1/12/06.		
~~Lab was contacted again on 1/18/06~~		

Validator [signature]

Date 1/13/06

III. INITIAL CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	RRF	Samples Affected	Action
11/22/05	V1	VOA	SO	acetone	34.1	–	TB-01,02; ME-5SB10-12, ~~2-4~~;	J/UJ
				2-butanone	24.7	–	ME-6SB10-12, 1-1.5;	
				Naphthalene	20.2	–	ME-7SB1-1.5	
				1,2-dibromo-3-chloropropane	17.9	–		
12/7/05	V1	VOA	SO	acetone	31.6	–	TB-03; TB-04;	
				Methylene chloride	17.1	–	ME-5SB2-4; ~~ME-5SB10-12~~;	J/UJ
				2-butanone	21.2	–	ME1SB1-1.5, MS, MSD;	
				Chloroform	18.6	–	ME-3SB2-2.5, 0.5-2;	
				1,2-dichloroethane	17.9	–	~~ME1SB0.5~~	
				1,3-dichloropropane	15.7	–		
				~~1,2-dichloropropane~~	~~15.7~~			
				1,2-dibromoethane	15.6	–		
				1,1,2,2-tetrachloroethane	16.4	–		
				4-chlorotoluene	16.0	–		
				1,2-dibromo-3-chloropropane	16.8	–		
				Naphthalene	16.6			

Comments: – indicates criteria met.

all criteria met for ETPH

Validator: EAD

Date: 1/6/06

III. INITIAL CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	RRF	Samples Affected	Action
11/2/05	S3	SVOA	SO	2,4-dinitrophenol	33.8	–	ME1SB0.53,	J/UJ
				4-methylphenol	19.3	–	ME-5SB0-4,	
				4,6-dinitro-2-methylphenol	155	–	ME-5SB10-12	
				3'3'-dichlorobenzidine	16.9	–		
				Di-n-octylphthalate	18.4	–		
				Benzo(k)fluoranthene	20.6	–		
				dibenzo(a,h)anthracene	20.1	–		
12/15/05	S3	SVOA	SO	benzo(b)fluoranthene	20.2	–	ME-3SB2-2.5,	J/UJ
							ME-3SB0.5-2	
							ME-6SB10-12,	
							ME-6SB1-1.5	
							ME7SB1-1.5	

Comments: – indicates criteria was met.

Validator: [signature]

Date: 1/6/06

RA-NE - Data Validation Worksheet
DA/SV-IV

. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action
11/2/05	12/6/05	V1	VOA	SO	acetone	39.2	–	TB-01, TB-02, ME-55B10-12	J/UJ
					naphthalene	45.2	–	ME-65B10-12, ME-65B1-1.5	↓
								ME-75B1-1.5	

Comments:

lidator: ED

Date: 1/6/06

12/96

DA-NE - Data Validation Worksheet
DA SV-IV

4. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action
11/21/05	12/5/05	S3	SVOA	SO	4-nitroaniline	-34.0	–	(ME-5SB0.4, ME-1SB0.5-3,	J/UJ
↓	↓	↓	↓	↓	4-chloroaniline	-22.7	–	ME-1SB0.5-3, MS, MSD)	
↓	↓	↓	↓	↓	3,3'-dichlorobenzidine	-20.0	15.8	↓	
↓	↓	↓	↓	↓	bis(2-ethylhexyl)phthalate	-20.0	–	↓	
12/15/05	12/15/05	S3	SVOA	SO	3,3'-dichlorobenzidine	21.1	–	(ME-3SB4-6, ME-3SB0.5-4,	J/UJ
↓	↓	↓	↓	↓	benzo(a)anthracene	15.7	–	ME-6SB0.5-4, ME-6SB10-13.5,	↓
↓	↓	↓	↓	↓	chrysene	15.6	–	ME-7SB0.4-4)	↓

Comments:
all criteria met EPH

Validator: EBD

Date: 1/6/06

12/96

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-V-A

___ **All Criteria Met**

V. BLANK ANALYSIS

List the blank contamination below. Concentration Level: _____

Sampler: R. Bednarz Company: MHE Contacted: Yes (No) Date: _____

1. Laboratory: Method, Storage and Instrument Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/ Column	Compound	Conc. (units) ~~ug/L~~ ug/kg
—	—	SVOA/SO	SBLK3K	—	none	—
—	—	SVOA/SO	SBLK3V	—	none	—
—	12/6/05	VOA/SO	VBLK1K	V1/DB-624	Chloroform	1J
—	↓		VBLK1K		Methylene Chloride	3J
—	12/8/05		VBLK1M		Methylene Chloride	2J
—	↓	↓	VBLK1M	↓	Naphthalene	3J

2. Field: Equipment (Rinsate), Trip and Bottle Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/Column	Compound	Conc. (units) ug/kg
—	12/6/05	VOA/SO	TB-01	V1/DB-624	Methylene Chloride	27B
—	↓	↓	TB-01	↓	Naphthalene	1J
—	12/6/05		TB-02		Methylene Chloride	28B
—	12/8/05	↓	TB-03	↓	Methylene Chloride	32B
	12/8/05		TB-04		Methylene Chloride	28B

Holding Blanks were run on CLP Methods SVC + OLM and all were ND. [illegible] Contractual info

Validator EQ Date 1/5/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-V-B

___ **All Criteria Met**

3. Blank Actions – List the maximum concentrations of blank compounds.

Compound	Type of Blank	Date Blank Sampled/Originated	Max. Conc. (units) ug/kg	Action Level (units) ug/kg	Sample QL	Samples Affected	Action
Naphthalene	M	12/8/05	3	15	5	ME-3SB0.5-2, ME-3SB2-2.5, TB-01 U at QL, U at SR, U at QL	
Methylene Chloride	M	12/6/05	3	30	5	all samples in SDG except TB-03 + ME-5SB10-12	U at SR
Methylene Chloride	~~M~~ T (TB)	12/8/05	32 B	320	5	ME-5SB10-12	TB
Naphthalene	TB	12/6/05	1 J	~~10~~ 5	5	all ND after method BAL	
Chloroform	MB	12/6/05	1 J	5	5	more all ND	

Comments: SVOA + ETPH: all criteria met. ETPH results for ME-1SB0.5-3 + ME-5SB0-4 were qualified w/ a B due to decane detected in a MB; the B was removed since the MB was ETPH ND

Validator E. Decker

Date 1/6/06

EPA-NE – Data Validation Worksheet
SV-VI

___ **All Criteria Met**
___ **Not Applicable**

VI. SV SURROGATE SPIKE RECOVERIES – List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Base/Neutral Method QC Acceptance Criteria					
	NBZ-d_5	2-FBP	TPH-d_{14}	1,2-DCB-d_4*	Other:	
OLM03.2	Water 35-114 / Soil 23-120	Water 43-116 / Soil 30-115	Water 33-141 / Soil 18-137	Water 16-110 / Soil 20-130		
OLM02.1	40-110	30-110	20-140	NA		
Other:						
Sample Number/Matrix	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**Action**
SB1KSV			116			no action, QC
ME-55B0-4			114			no action only one QC

Method	Acid Method QC Acceptance Criteria					
	Phenol-d_5	2-FP	2,4,6-TBP	2-CP-d_4*	Other:	
OLM03.2	Water 10-110 / Soil 24-113	Water 21-110 / Soil 25-121	Water 10-123 / Soil 19-122	Water 33-110 / Soil 20-130		
OLM02.1	15-115	15-110	15-130	NA		
Other:						
Sample Number/Matrix	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**Action**

* Advisory Surrogates – OLM03.2

Validator [signature] all criteria met for ETPH Date 1/5/06

EPA-NE – Data Validation Worksheet
VOA/SV--VII

___ **All Criteria Met**

Na
~~Ba~~ EtPH

VII. INTERNAL STANDARD PERFORMANCE

List the internal standards that are outside the area count and retention time method QC acceptance criteria.
IS Area Count method QC acceptance criteria: 50 % -- 200 %
IS Retention Time method QC acceptance criteria: ± 0.50 min

Sample Number (TR#)	Date and Time Analyzed	Instrument	Parameter	IS Outside Area Count and/or RT Criteria	IS Area	RT Shift	Acceptable Range (IS Area or RT Shift)	Action
~~ME-5~~								
ME-1581-1.5	12/12/05	V1	VOA	156772	DCB	–	199917-799668	J/UJ
ME-5580-4	12/5/05	S3	SOA	345828	CRY	–	458206-183282	J/UJ
↓ 10-12	↓	↓	↓	313355	↓	–	↓	↓
ME-1580.5-3				421025		–		
↓ MSD				415292		–		

VOA compounds assoc. w/ DCB: 1,1,2,2-tetrachloroethane, Bromobenzene, 1,2,3-trichloropropane, n-propylbenzene, 2-chlorotoluene, 1,3,5-trimethylbenzene, 4-chlorotoluene, tert-butylbenzene, 1,2,4-trimethylbenzene, sec-butylbenzene, 4-isopropyltoluene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, n-butylbenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2,4-trichlorobenzene, Hexachlorobutadiene, 1,2,3-trichlorobenzene, naphthalene, 1,3,5-trichlorobenzene.
all > 200% of standard.

SOA: CRY compounds: benzo(a)anthracene, Bis(2-ethylhexyl)phthalate, Butylbenzylphthalate, chrysene, 3,3'-dichlorobenzidine, pyrene, Di-n-octylphthalate, indeno(1,2,3-cd)pyrene

VOA: DCB = 1,4-dichlorobenzene

Validator _____ Date 1/5/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-VIII

___ **All Criteria Met**

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE – List all MS/MSD analytes that are outside method QC acceptance criteria

Use a separate worksheet for each MS/MSD pair.

Sample # ME-1SB1-1.5 Matrix SO Concentration Level _____

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits % Rec	Method QC Limits RPD	Concentration Unspiked Sample	Concentration MS	Concentration MSD	%RSD	Action	
VOA	Dibromochloromethane	116	117	–	76-115		NA - all spikes				~~J/UJ~~	J
	1,1,2,2-tetrachloroethane	145	187	–	70-117						ND ~~J/J~~	
	Bromobenzene	132	157	–	79-119						ND	J
	1,2,dibromo-3-chloropropane	132	145	–	52-128						ND	J
	1,2,4-trichlorobenzene	41	30	–	49-126							J/U
	Hexachlorobutadiene	34	34	–	58-115							
	1,2,3-trichlorobenzene	36	28	–	44-131							
	1,3-dichloropropane	–	128	–	76-119						ND	J
	1,2-dibromoethane	–	123	–	72-117						ND	J
	1,2,3-trichloropropane	–	208	–	0-154						ND	J
	2-chlorotoluene	–	145	–	70-132						ND	J
	4-chlorotoluene	–	130	–	77-122						ND	J

all criteria met for EtPH.

Validator ED

Date 1/5/06

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-VIII

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE - List all MS/MSD analytes that are outside method QC acceptance criteria.

Use a separate worksheet for each MS/MSD pair.

Sample # ME-15B0.5-3 Matrix SO Concentration Level _____

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits % Rec	Method QC Limits RPD	Concentration Unspiked Sample	Concentration MS	Concentration MSD	% RSD	Action
SVOA	4-methylphenol	43	47	—	48-109	—	No - all spiked				J/UJ
	dimethylphthalate	61	-	—	62-117	—					↓
	2-4-dinitrophenol	7	6	—	15-136	—					R(ND)/J(+)
	dibenzofuran	56	—	—	61-112	—					J/UJ
	2,4-dinitrotoluene	56	—	—	59-123	—					
	4-chlorophenylphenylether	56	—	—	59-116	—					
	Fluorene	56	61	—	63-115	—					
	4-6-dinitro-2-methylphenol	14	13	—	53-130	—					
	4-Bromophenyl-Phenyl Ether	61	—	—	68-110	—					
	hexachlorobenzene	61	61	—	67-112	—					↓
	pentachlorophenol	7	12	53	19-130	40					R(ND)/J(+)

Validator: EAD Date: 1/6/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-VIII

___ **All Criteria Met**

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE – List all MS/MSD analytes that are outside method QC acceptance criteria

Use a separate worksheet for each MS/MSD pair.

Sample # ME15805-3 Matrix SO Concentration Level _____

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits % Rec	Method QC Limits RPD	Concentration Unspiked Sample	Concentration MS	Concentration MSD	%RSD	Action
SOA	Phenanthrene	54	59	–	70-115	–	NQ – coel sp. low				J/UJ
	Anthracene	61	61	–	63-117	–					
	Carbazole	61	61	–	62-122	–					
	Di-n-butylphthalate	61	61	–	70-120	–					
	Fluoranthene	47	58	–	64-121	–					
	Pyrene	60	–	–	66-120	–					
	Bis 2-ethylhexyl phthalate	62	–	–	64-115	–					
	Di-n-octylphthalate	41	44	–	69-137	–					
	Benzo(b)fluoranthene	37	42	–	61-129	–					
	Benzo(k)fluoranthene	42	45	–	62-130	–					
	Benzo(a)pyrene	43	45	–	66-119	–					

Validator ESD Date 1/6/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-VIII

___ **All Criteria Met**

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE – List all MS/MSD analytes that are outside method QC acceptance criteria

Use a separate worksheet for each MS/MSD pair.

Sample # ME-1SB0.5-3 Matrix SO Concentration Level _____

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits		Concentration			%RSD	Action
					% Rec	RPD	Unspiked Sample	MS	MSD		
SVOA	Indeno(1,2,3-cd)pyrene	46	47	–	56-128	–	NC – all spiked				J/UJ
↓	~~Benzo(g,h,i) perylene~~										
↓	dibenzo(a,h)anthracene	48	52	–	56-128	–					J/UJ

Validator [signature] Date 1/6/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-XI

___ **All Criteria Met**

XI. ACCURACY CHECK **(Performance Evaluation Results)** – List all analytes that are outside criteria

SDG No. _____ CASE: _____

Are more that one-half of the PES analytes within criteria for each parameter? Y N

PE Sample Number	Ampule Number	Parameter	Type of PES	Matrix	Analyte	Conc.	Region I EPA PES Scores *	Non-EPA PES Scores **	Samples Affected	Action
NO PE.										

* For Region I PESs indicate the Region I PES Score Report Result: Action High; Action Low; TCL MISS; TCL CONTAMINANT; TIC HIT: TIC MISS; TIC CONTAMINANT

** For Non-EPA PESs indicate the Non-EPA PES Score: PES COMPOUND MISS; PES COMPOUND CONTAMINANT; PES COMPOUND HIT (% Recovery Limits)

LCS: VOA VIKLCS – see attached sheet
SVOA – see attached sheet
EXPH – all criteria met

Validator ED

Date 1/6/05

Laboratory Control Sample

Parameter/ Matrix	LCS ID	Date	Compound	Method QC Limits	LCS %R	Samples Affected	Action
VOA/SO	V1KLCS	12/6/2005	1,1-dichloroethane	74-118	120	TB-01, TB-02, ME5SB10-12, ME6SB1-1.5, ME7SB1-1.5, ME6SB10-12	None, all ND
VOA/SO	V1KLCS	12/6/2005	2,2-dichloropropane	64-125	126		
SVOA/SO	S3KLCS	12/5/2005	Di-n-octylphthalate	69-137	65	ME-5SB0-4, ME-5SB10-12, ME1SB0.5-3	J/UJ
SVOA/SO	S3KLCS	12/5/2005	Benzo(b)fluoranthene	61-129	59		
SVOA/SO	S3KLCS	12/5/2005	Benzo(a)pyrene	66-119	65		

EAD 1/6/06

METCALF & EDDY | AECOM

Metcalf & Eddy
701 Edgewater Drive, Wakefield, Massachusetts 01880-5371
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MEMORANDUM

PROJECT NO:	036800318.00053	**DATE:**	March 27, 2006
TO:	TBA: Amerbelle Textiles, Vernon, Connecticut	**OFFICE:**	Wakefield
FROM:	E. DeCola	**COMPANY:**	Metcalf & Eddy, Inc.
REVIEWED BY:	R. Purdy		
CC:	B. Weir		
	N. Thurber (memo only)		
	D. Laferte (memo only)		

SUBJECT: Limited QC Review/Modified Tier II-Like Review
SPLP Metals Analytical Results
Mitkem Corporation, Warwick, Rhode Island
Laboratory Project Number E0091

On January 27, 2005 M&E requested that seven soils samples collected by Metcalf & Eddy, Inc. (M&E) from the Targeted Brownfields Assessment (TBA) Amerbelle Textiles Site, located in Vernon, Connecticut in November 2005, be analyzed for additional parameters. The sampling was performed as part of the TBA Response Action Contract Work Assignment #155-SIBZ-0100. The samples were submitted to Mitkem Corporation (Warwick, Rhode Island) for the analysis of Synthetic Precipitation Leaching Procedure (SPLP) Metals using SW-846 Method 1312. The data package was received in the M&E office on February 17, 2006.

M&E reviewed the data in accordance with the EPA-approved Final Field Task Work Plan for the site, and the guidance received from EPA Work Assignment Manager, Mr. James Byrne, in a September 17, 1999 letter to former M&E Work Assignment Manager, Barb Wyskowski. The data review included:

*	•	Overall Evaluation of Data and Potential Usability Issues
*	•	Data Completeness
	•	Preservation and Technical Holding Times
*	•	Initial and Continuing Calibrations
	•	Blank Analysis
*	•	Inductively Coupled Plasma (ICP) Interference Check Samples
*	•	ICP Serial Dilution Analysis
	•	Matrix Spike (MS) Recoveries
*	•	Field Duplicate/Lab Duplicate Samples
NA	•	Sensitivity Check
NA	•	Performance Evaluation Samples/Accuracy Check
	•	Analyte Quantitation and Reported Quantitation Limits
*	=	All criteria met for this sample
NA	=	Not applicable and/or no information was provided by the laboratory

Note: Worksheets are not included for parameters that have met criteria or for criteria that are not applicable to the method and/or to the modified Tier II-like review.

Included in Attachment I is a copy of the chain-of-custody (COC) record. Included in Attachment II are the result summary sheets, annotated with qualifiers, if necessary, as detailed in this memorandum. Included in Attachment III are the data validation worksheets.

Preservation and Technical Holding Times

The mercury results for all samples are rejected (R) due to exceeded holding times. The SPLP mercury samples were analyzed for mercury 40 days outside of holding time.

Blank Analysis

The following table summarizes the level of blank contamination detected in the laboratory blanks associated with the soil samples. If a contaminant was detected in more than one blank, the highest concentration was used to qualify associated sample results.

Analyte	Maximum Concentration (ug/L)	BAL (ug/L)	Samples Affected/Actions
Antimony	6.3	31.5	Report with U at SR: ME-6SB10-13.5,
Arsenic	2.3	11.5	Report with U at SR: ME-3SB0.5-4, ME-6SB0.5-4, ME-6SB10-13.5, and ME-7SB0.5-4
Cadmium	0.1	0.5	Report with U at SR: ME-5SB0-4, ME-6SB0.5-4, and ME-6SB10-13.5
Copper	8.4	42	Report with U at SR: ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4 and ME-7SB0.5-4
Lead	1.8	9.0	Report with U at SR: ME-1SB0.5-3 and ME-3SB4-6
Mercury	0.10	0.50	Report with U at SR: ME-6SB10-13.5
Nickel	1.1	5.5	Report with U at SR: ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, and ME-5SB0-4
Selenium	-1.4	7.0	Estimate the positive results (J): ME-3SB4-6 and ME6SB0.5-4. Estimate the nondetect results (UJ): ME-1SB0.5-3, ME-3SB0.5-4, ME-5SB0-4, ME-6SB10-13.5, and ME-7SB0.5-4
Silver	11.3	56.5	Report with U at SR: ME-6SB10-13.5
Thallium	3.1	15.5	Report with U at SR: ME-5SB0-4 and ME-6SB0.5-4
Vanadium	0.7	3.5	all above BAL, no action
Zinc	27.1	136	Report with U at SR: ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4, ME-6SB10-13.5, and ME-7SB0.5-4

BAL – Blank Action Limit

SR – Sample Result

Matrix Spike/Matrix Spike Duplicate

No matrix spike sample was requested by M&E for the SPLP metals analyses.

Performance Evaluation Samples/Accuracy Check

Performance Evaluation Sample (PES)

No Performance Evaluation Samples were required for metals analysis.

Compound Quantitation and Reported Quantitation Limits

The following table summarizes the positive and blank-qualified metal results that were less than the reporting limit but greater than the MDL. These listed results are qualified as estimated (J) due to uncertainty in the quantitation at concentrations less than the reporting limit. Note that the overall qualification for the blank-qualified metal results is estimated, nondetect (UJ).

Analyte	Affected Sample
Arsenic	ME-3SB0.5-4, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Antimony	ME-6SB10-13.5
Barium	ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Beryllium	ME-3SB0.5-4, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Cadmium	ME-5SB0-4, ME-6SB0.5-4, ME-6SB10-13.5
Chromium	ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4, ME-7SB0.5-4
Copper	ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4
Lead	ME-1SB0.5-3, ME-3SB4-6
Mercury	ME-6SB10-13.5
Nickel	ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Selenium	ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4
Silver	ME-6SB10-13.5
Thallium	ME-5SB0-4, ME-6SB0.5-4
Vanadium	ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4
Zinc	ME-3SB4-6

Attachment I

Chain-of-Custody

Edward A Lawler

From: "Laferte, Denise" <Denise.Laferte@m-e.aecom.com>
To: "Edward A Lawler" <elawler@mitkem.com>
Cc: "Weir, Barbara" <Barb.Weir@m-e.aecom.com>
Sent: Friday, January 27, 2006 14:25
Subject: RE: Upcoming Brownfields, M&E

Hi Ed,

1. We are doing 7of the 8 soil samples, SPLP for all metals. You are correct, these are Mitkem ID Nos. D1429-02, D1429-07, D1429-11, D1429-12, D1429-14, D1429-19, D1429-20.

2. The work order is in progress for Mill Street.

3. Please price out using GC/MS. I believe we want better compound identification, not lower limits.

Have a great weekend,

Denise Laferte
Environmental Scientist III
(781) 224-6184

METCALF & EDDY | AECOM
701 Edgewater Drive
Wakefield, MA 01880
T (781) 224-5200 F (781) 225-6293

E0091-01-11-28-05 10:00 - 0
02-11-29-05 10:00 - 0
03-11-30-05 0840 - 1
04-11-30-05 0856 - 1
05-11-30-05 0930 - 1
06-12-2-05 11:15 - 19
07-12-2-05 13:00 - 2

-----Original Message-----
From: Edward A Lawler [mailto:elawler@mitkem.com]
Sent: Friday, January 27, 2006 2:15 PM
To: Laferte, Denise
Subject: Re: Upcoming Brownfields, M&E

Hi Denise--

1. Amberbelle SPLP metals: do you want SPLP for the full CT-RST list of metals, or only for selected metals? I wanted to confirm that the samples requiring SPLP metals are Mitkem #s D1429-02, -07, -11, -12, -14, -19 and -20. Is there some easy way for you to confirm this?

2. Mill St: We do have capacity to perform the metals analyses.

3. Bellingham: We stopped performing EPH analyses for a period of time while we automated much of the data handling for this test. We have completed this, and are not performing EPH analyses again. We typically quantify the PAHs in the EPH aromatic fraction by FID, but can easily use GC/MS instead. Do you want lower reporting limits than FID can provide (GC/MS-SIM), or are you concerned with improved compound identification. I am not sure how this would impact our pricing--I'll have to talk to Ben Dodge (who was up at M&E today I believe).

-- Ed

----- Original Message -----
From: Laferte, Denise
To: Edward A Lawler
Cc: Weir, Barbara

Sent: Friday, January 27, 2006 10:13
Subject: Upcoming Brownfields, M&E

Hi Ed,

We seem to have a lot going on, so I wanted to summarize what is coming up.

- Amerbelle Site - groundwater sampling will occur next Tuesday/Wednesday (1/31, 2/1). Samples will be at M&E on Thursday 2/2 for pickup. There will be 6 or 7 groundwater samples for the following analyses: CT ETPH, VOCs, SVOCs, CT RSR Metals. We will require **benzidine** analysis/reporting, using your single point calibration method. **We have reviewed the soil results and would like to request SPLP metals analysis on the following samples: ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4, ME-6SB10-13.5, and ME-7SB0.5-4.**
- Mill Street - new work for an old site, we anticipate soil sampling during the week of 2/6 and groundwater sampling during the week of 2/13. The required analysis, reporting limits, and number of samples is attached. **Please confirm capacity for these samples and we can begin the work order process.**
- Bellingham - a new site. Sampling will likely occur in late Feb/Early March. Previous work at the site included EPH analysis using GCMS to quantitate PAHs. Are you currently doing EPH analysis and do you use GCMS to quantitate PAHs?

Denise Laferte
Environmental Scientist III
(781) 224-6184

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<<Mitkem Mill Street.xls>>

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: Metcalf + Eddy	PHONE: 203-269-7310	COMPANY	PHONE	LAB PROJECT #: D1429
NAME: Ryan Bartosz	FAX: 203-269-8788	NAME	FAX	
ADDRESS: 860 North Main Street Extension		ADDRESS		TURNAROUND TIME: 2/day
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP		

CLIENT PROJECT NAME: Amerbelle Textiles Inc.
CLIENT PROJECT #: 36800318.00052
CLIENT P.O.#:

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RCRA metals	% Moisture	COMMENTS
~~ME-55B2-4~~ RA	/													
~~ME-55B~~ RA	/													
ME-55B2-4	11/28/05 / 10:00		X		X		-1	4	X				X	
ME-55B0-4	↓ / ↓	X			X		-2	3		X	X	X		
ME-55B10-12	/ 10:45	X	X		X		-3	6	X	X		X	X	VOC/% Moisture are grab samples
ME-55B8-10	↓ / 10:45	X			X		-4	1			X			ETPH only
TB-01	↓ / 11:00		X		X		-5	3	X					
	/													
	/													Temp Blank
	/													Included
	/													
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bartosz	11/28/05 / 17:00	James J Healy	11/29/05 08:30
		/		/
		/		/

ADDITIONAL REMARKS: Send data to Barbara Weir M+E Wakefield
refer to M+E Work Order for analyses. including

COOLER TEMP: 4°

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

0289

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: Metcalf + Eddy	PHONE: 203 269-7310	COMPANY	PHONE	LAB PROJECT #: D1429
NAME: Ryan Bartosz	FAX: 203 269-8788	NAME	FAX	
ADDRESS: 860 North Main Street Extension		ADDRESS		TURNAROUND TIME: 21 day
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
Amerbelle Textiles Inc.	36800318.00052	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RSR Metals	% Moisture	COMMENTS
ME-1SB1-1.5	11/29/05 / 10:00		X		X		-6	10	X				X	MS/MSD
ME-1SB0.5-3	/ ↓	X			X		-7	7		X	X	X		MS/MSD
TB-02	/ 11:08		X		X		-8	3	X					
	/													
	/													
	/													
	/													
	/													
	/													
	/													temp blank included
	/													
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bartosz	11/29/05 1300	[signature]	11-30-05 0900
		/		/
		/		/

ADDITIONAL REMARKS: send data to Barbara Weir M+E Wakefield refer to M+E workorder for analyses including SPLP.

COOLER TEMP: 6°C

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

0290

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: Metcalf + Eddy	PHONE: 203 269-7318	COMPANY	PHONE	LAB PROJECT #: D1429
NAME: Ryan Bardosz	FAX: 203 269-8788	NAME	FAX	
ADDRESS: 860 North Main Street Extension		ADDRESS		TURNAROUND TIME: 21 day
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
Ameribelle Textiles, Inc.	36800 318.00052	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	RSR Metals	% Moisture	COMMENTS
ME-65B 1-1.5	11/30/05 8:40		X		X		-9	4	X				X	
ME-75B 1-1.5	/ 8:50		X				-10	4	X				X	
ME-65B 0.5-4	/ 8:40	X					-11	3		X	X	X		
ME-75B 0.5-4	/ 8:50	X					-12	3		X	X	X		
ME65B 10-12	/ 9:30		X				-13	4	X				X	
ME65B 10-13.5	/ 9:30	X					-14	2		X		X		
ME65B 8-10	/ 9:30	X					-15	1			X			
TB-03	/ 10:30		X				-16	3	X					
	/													
	/													
	/													temp blank included
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bardosz	11/30/05 / 13:00	Jamey Healey	12/1/05 / 08:30
		/		/
		/		/

ADDITIONAL REMARKS: send back to Barbara Weir MtE, Wakefield. Refer to MtE WorkOrder for analyses including SPLP

COOLER TEMP: 2°

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

0291

MITKEM CORPORATION
175 Metro Center Boulevard
Warwick, Rhode Island 02886-1755
(401) 732-3400 • Fax (401) 732-3499
email: mitkem@mitkem.com

CHAIN-OF-CUSTODY RECORD

REPORT TO		INVOICE TO		
COMPANY: Metcalf + Eddy	PHONE: 203-269-7310	COMPANY	PHONE	LAB PROJECT #: D1429
NAME: Ryan Bardon	FAX: 203-269-8788	NAME	FAX	
ADDRESS: 860 North Main St. Ext.		ADDRESS		TURNAROUND TIME: 21 day
CITY/ST/ZIP: Wallingford, CT 06492		CITY/ST/ZIP		

CLIENT PROJECT NAME:	CLIENT PROJECT #:	CLIENT P.O.#:
Amerbelle Textiles, Inc	36800318.00052	

REQUESTED ANALYSES

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE	GRAB	WATER	SOIL	OTHER	LAB ID	# OF CONTAINERS	VOC's	SVOC's	ETPH	PSR Metals	% Moisture	COMMENTS
TB-04	12/3/05 / 9:00		X		X		-17	3	X					
ME-35B 2-25	/ 11:30		X		X		-18	4	X			X		
ME-35B 0.5-4	/ 11:15	X			X		-19	3		X	X	X		
ME-35B 4-6	/ 13:00	X			X		-20	3		X	X	X		sample contains rope fibers from cutting
ME-35B 0.5-2	/ 11:00		X		X		-21	4	X			X		
	/													
	/													
	/													
	/													
	/													temp blank
	/													include d
	/													

TSF#	RELINQUISHED BY	DATE/TIME	ACCEPTED BY	DATE/TIME
	Ryan Bardy	12/3/05 / 13:00	[signature]	12-5-05 1200
		/		/
		/		/

ADDITIONAL REMARKS: send data to Barbara Weir, MtE, Wakefield. Refer to MtE Work Order for analyses including SPLP

COOLER TEMP: 4°

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

8992

Attachment II

Sample Result Summary Sheets

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-1SB0.5-3

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-02

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	1.6	U		P
7440-39-3	Barium	33.0	~~B~~	J	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.10	U		P
7440-47-3	Chromium	5.5	~~B~~	J	P
7440-50-8	Copper	20.6	~~B~~	UJ	P
7439-92-1	Lead	7.0	~~B~~	UJ	P
7440-02-0	Nickel	4.0	~~B~~	UJ	P
7782-49-2	Selenium	0.98	U	J	P
7440-22-4	Silver	0.91	U		P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	10.2	~~B~~	J	P
7440-66-6	Zinc	52.6	U		P
7439-97-6	Mercury	~~0.071~~	~~U~~	R	CV

EB 3/14/06

Comments:

FORM I - IN SW846

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-3SB0.5-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-06

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	1.6	~~B~~	UJ	P
7440-39-3	Barium	49.5	~~B~~	J	P
7440-41-7	Beryllium	0.19	~~B~~	J	P
7440-43-9	Cadmium	0.10	U		P
7440-47-3	Chromium	12.0	~~B~~	J	P
7440-50-8	Copper	24.4	~~B~~	UJ	P
7439-92-1	Lead	30.3			P
7440-02-0	Nickel	5.0	~~B~~	UJ	P
7782-49-2	Selenium	0.98	U	J	P
7440-22-4	Silver	0.91	U		P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	11.2	~~B~~	J	P
7440-66-6	Zinc	51.7	U		P
7439-97-6	Mercury	~~0.064~~	~~U~~	R	CV

EJD 3/16/06

Comments:

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-3SB4-6

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-07

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	1.6	U		P
7440-39-3	Barium	27.1	~~B~~	J	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.10	U		P
7440-47-3	Chromium	5.3	~~B~~	J	P
7440-50-8	Copper	16.7	~~B~~	UJ	P
7439-92-1	Lead	3.0	~~B~~	UJ	P
7440-02-0	Nickel	3.4	~~B~~	UJ	P
7782-49-2	Selenium	3.1	~~B~~	J	P
7440-22-4	Silver	0.91	U		P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	5.9	~~B~~	J	P
7440-66-6	Zinc	36.1	~~B~~	UJ	P
7439-97-6	Mercury	~~0.066~~	~~U~~	R	CV

EJD 3/14/06

Comments:

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-5SB0-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-01

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	68.6			P
7440-39-3	Barium	122	~~B~~	J	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.19	~~B~~	UJ	P
7440-47-3	Chromium	8.1	~~B~~	J	P
7440-50-8	Copper	23.4	~~B~~	UJ	P
7439-92-1	Lead	60.9			P
7440-02-0	Nickel	2.0	~~B~~	UJ	P
7782-49-2	Selenium	8.7	~~B~~	J	P
7440-22-4	Silver	0.91	U		P
7440-28-0	Thallium	2.1	~~B~~	UJ	P
7440-62-2	Vanadium	21.7	~~B~~	J	P
7440-66-6	Zinc	57.0	U		P
7439-97-6	Mercury	~~0.070~~	~~U~~	R	CV

3/14/06
EJD

Comments:

FORM I - IN SW846

0007

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-6SB0.5-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-03

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	6.0	~~B~~	UJ	P
7440-39-3	Barium	116	~~B~~	J	P
7440-41-7	Beryllium	0.48	~~B~~	J	P
7440-43-9	Cadmium	0.19	~~B~~	UJ	P
7440-47-3	Chromium	19.1	~~B~~	J	P
7440-50-8	Copper	35.4	U		P
7439-92-1	Lead	21.1			P
7440-02-0	Nickel	11.5	~~B~~	J	P
7782-49-2	Selenium	3.0	~~B~~	J	P
7440-22-4	Silver	0.91	U		P
7440-28-0	Thallium	1.2	~~B~~	UJ	P
7440-62-2	Vanadium	142			P
7440-66-6	Zinc	74.8	U		P
7439-97-6	Mercury	~~0.071~~	~~U~~	R	CV

3/14/06
EAD

Comments:

FORM I - IN SW846

0002

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-6SB10-13.5

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-05

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.0	~~B~~	UJ	P
7440-38-2	Arsenic	3.5	~~B~~	UJ	P
7440-39-3	Barium	138	~~B~~	J	P
7440-41-7	Beryllium	0.38	~~B~~	J	P
7440-43-9	Cadmium	0.10	~~B~~	UJ	P
7440-47-3	Chromium	136			P
7440-50-8	Copper	85.5			P
7439-92-1	Lead	78.7			P
7440-02-0	Nickel	8.6	~~B~~	J	P
7782-49-2	Selenium	0.98	U	J	P
7440-22-4	Silver	1.4	~~B~~	UJ	P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	72.3			P
7440-66-6	Zinc	110	U		P
7439-97-6	Mercury	~~0.083~~	~~B~~	R	CV

EJD 3/14/06

Comments:

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U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-7SB0.5-4

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Matrix (soil/water): SOIL Lab Sample ID: E0091-04

Level (low/med): MED Date Received: 01/27/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	5.3	~~B~~	UJ	P
7440-39-3	Barium	94.7	~~B~~	J	P
7440-41-7	Beryllium	0.38	~~B~~	J.	P
7440-43-9	Cadmium	0.10	U		P
7440-47-3	Chromium	15.2	~~B~~	J	P
7440-50-8	Copper	30.9	U		P
7439-92-1	Lead	18.1			P
7440-02-0	Nickel	8.7	~~B~~	J	P
7782-49-2	Selenium	0.98	~~B~~	UJ	P
7440-22-4	Silver	0.91	U		P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	109			P
7440-66-6	Zinc	65.0	U		P
7439-97-6	Mercury	~~0.071~~	~~U~~	R	CV

3/14/06

Comments:

FORM I - IN SW846

Attachment III

Data Validation Worksheets

REGION I
Data Review Worksheets

Site Name Amerbelle Textiles
Reference Number

REGION I REVIEW OF INORGANIC CONTRACT LABORATORY DATA PACKAGE

The hardcopied (laboratory name) _____ data package received at Region I has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No. —
~~SDG~~ No. E0091
No. of Samples 7

SAS No. —
Matrix Soil

Sampling Date(s) 11/27/05
Shipping Date(s) 11/27/05
Date Rec'd by Lab 11/27/05

1/27/06 - Requested SPLP metal anal.

Traffic Report Nos: ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, ME-5SB0-4, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Trip Blank No.: —
Equipment Blank No.: —
Field Dup Nos: ME-6SB0.5-4, ME-7SB0.5-4
PE Sample Nos: —

SOW No. ~~6/01~~ 6/01 7470 requires that specific analytical work be done and that associated reports be provided by the laboratory to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- Data Completeness
- Holding Times
- Calibrations
- Blanks
- ICP Interference Check Results
- Matrix Spike Recoveries
- Laboratory Duplicates
- Field Duplicates
- Lab Control Sample Results
- Furnace AA Results
- ICP Serial Dilution Results
- Detection Limit Results
- Sample Quantitation

Overall Comments: _____

Definitions and Qualifiers:

A - Acceptable Data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Analyte not detected

Reviewer: [signature] Date: 3/14/06

REGION I
Data Review Worksheets

Data Validation Worksheet Cover Page - Page 2

Check if all criteria are met and no hardcopy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the Data Validation Memorandum.

Inorganics Worksheets

___I. DATA COMPLETENESS
___II. HOLDING TIMES
✓ III A. INSTRUMENT CALIBRATION (Section 1)
✓ III B. INSTRUMENT CALIBRATION (Section 2)
✓ III C. INSTRUMENT CALIBRATION (Section 3)
___IV A. BLANK ANALYSIS RESULTS (Section 1-3)
___IV B. BLANK ANALYSIS RESULTS (Section 4)
✓ V A. ICP INTERFERENCE CHECK SAMPLE (Sections 1 & 2)
✓ V B. ICP INTERFERENCE CHECK SAMPLE (Section 3)
NA VI. MATRIX SPIKE
___VII. LABORATORY DUPLICATES
___VIII. FIELD DUPLICATES
✓ IX. LABORATORY CONTROL SAMPLE
NA X A. FURNACE ATOMIC ABSORPTION ANALYSIS
✓ XI. INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS
✓ XII. DETECTION LIMIT ANALYSIS
NA XIII. SAMPLE QUANTITATION
NA XIV. ACCURACY CHECK (Performance Evaluation Sample)

I certify that all criteria were met for the worksheets checked above.

Signature: Elizabeth DeCola Name: Elizabeth DeCola

Date: 3/14/06

REGION I
Data Review Worksheets

I. DATA COMPLETENESS

MISSING INFORMATION	DATE LAB CONTACTED	DATE REC'D

REGION I
Data Review Worksheets

II. HOLDING TIMES

Complete table for all samples and circle the Analysis date for samples not within criteria.

SAMPLE ID	DATE SAMPLED	HG DATE ANALYSIS SPL Pexter	CYANIDE DATE ANALYSIS	OTHERS DATE ANALYSIS	pH	ACTION
* all sample	11/27/05	2/2/06	—	Criteria met		Reject all ND Hg Results

METALS - 180 DAYS FROM SAMPLE COLLECTION
MERCURY - 28 DAYS FROM SAMPLE COLLECTION
CYANIDE - 14 DAYS FROM SAMPLE COLLECTION

* Mercury ~~few~~ samples were ~~extracted~~ 39 days out of hold time

ACTION:

1. If holding times are exceeded all positive results are estimated (J) and non-detects are estimated (UJ).
2. If holding times are greatly exceeded, the reviewer may determine that non-detects are usable (R).

all mercury results are rejected. ✓

REGION I
Data Review Worksheets

all criteria NA.

III A. INSTRUMENT CALIBRATION (Section 1)

1. Recovery Criteria

List the analytes which did not meet the percent recovery (%R) criteria for Initial or Continuing Calibration.

DATE	ICV/CCV#	ANALYTE	%R	ACTION	SAMPLES AFFECTED

ACTIONS:

If any analyte does not meet the %R criteria follow the actions stated below:

For positive results:

	Accept	Estimate (J)	Reject (R)
Metals	90-110%R	75-89%R, 111-125%R	<75%R, >125%R
Mercury	80-120%R	65-79%R, 121-135%R	<65%R, >135%R
Cyanide	85-115%R	70-84%R, 116-130%R	<70%R, >130%R

For Non-detected results

	Accept	Estimate (UJ)	Reject (R)
Metals	90-110%R	75-89%R, 111-125%R	<75%R, >125%R
Mercury	80-120%R	65-79%R, 121-135%R	<65%R, >135%R
Cyanide	85-115%R	70-84%R, 116-130%R	<70%R, >130%R

REGION I
Data Review Worksheets

III B. INSTRUMENT CALIBRATION (Section 2)

2. Analytical Sequence

A. Did the laboratory use the proper number of Standards for calibration as described in the SOW? Yes or No

B. Were calibrations performed at the beginning of Each analysis? Yes or No

C. Were calibration standards analyzed at the beginning of sample analysis and at a minimum frequency of ten percent or every two hours during analysis, whichever is more frequent? Yes or No

D. Were the correlation coefficients for the calibration curves for AA, Hg, and CN ≥ 0.995? Yes or No - no raw data submit

E. Was a standard at CRQL analyzed for all ICP analyses? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the samples affected.

_____

_____

_____

_____

REGION I
Data Review Worksheets

III C. INSTRUMENT CALIBRATION (Section 3) – NA

1. Quantitation Limit Criteria

List the analytes which did not meet the percent recovery (%R) criteria for the CRQL standard.

DATE	CRI#	ANALYTE	%R	ACTION	SAMPLES AFFECTED

ACTIONS:

Recovery Criteria

Metals/Mercury/Cyanide	70% - 130%
Antimony, Lead, Thallium (by ICP-AES)	50% - 150%
Cobalt, Manganese, Zinc (by ICP-MS)	50% - 150%

If any analyte does not meet the %R criteria follow the actions stated below:

Recovery	≤MDL	<2xCRQL	≥2xCRQL
<50%	R	R	J
<30% Sb, Pb, Tl (AES)	R	R	J
<30% Co, Mn, Zn (MS)	R	R	J
50% - 69%	UJ	J	A
<30% - 49% Sb, Pb, Tl (AES)	UJ	J	A
<30% - 49% Co, Mn, Zn (MS)	UJ	J	A
130% < R ≤180%			
150% < R ≤200% Sb, Pb, Tl (AES)	A	J	A
150% < R ≤200% Co, Mn, Zn (MS)	A	J	A
130% < R ≤165% Cyanide	A	J	A
>180%			
>200% Sb, Pb, Tl (AES)	R	R	R
>200% Co, Mn, Zn (MS)	R	R	R
>165% Cyanide	R	R	R

REGION I
Data Review Worksheets

IV A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 &2 below. A separate worksheet should be used for soil and water samples.

1. Laboratory Blanks MATRIX: Soil (SPCP)

DATE	ICB/CCB#	~~PREP BL~~	ANALYTE	CONC./UNITS ug/L
		CCB	Hg	~~0.070~~ 0.100B
		CCB	Silver	11.3
		ICB	Antimony	6.3
		CCB	Arsenic	2.3
		CCB	Cadmium	0.1

~~2. Equipment/Trip Blanks~~

~~DATE~~	~~EQUIP BL#~~	ANALYTE	CONC./UNITS
	ICB	Copper	8.4
	CCB	Lead	1.8
	CCB	Nickel	1.1
	CCB	Selenium	-1.4
	CCB	Thallium	3.1
	CCB/ICB	Vanadium	0.7
	ICB	Zinc	27.1

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix for every 20 samples and for each digestion batch? Yes or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

REGION I
Data Review Worksheets

IV B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that element's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

1. When the concentration is greater than the MDL, but less than the CRQL and Action Level, report the CRQL with a U.
2. When the concentration is greater than the CRQL, but less than the Action Level, report the sample concentration detected with a U.
3. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

MATRIX: So

ELEMENT	MAX CONC./ UNITS ug/L	AL/ UNITS ug/L	ELEMENT	MAX CONC./ UNITS ug/L	AL/ UNITS ug/L
Hg	0.100	0.5	Ni	1.1	5.5
Silver	11.3	56.5	Se	-1.4	7.0
SB	6.3	31.5	Th	3.1	15.5
As	2.3	11.5	Vanadium	0.7	3.5
Cd	0.1	.5	Zn	27.1	135.5
Copper	8.4	42			
Pb	1.8	9.0			

See attached sheet

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

$$\text{Conc. in ug/L} \times \frac{\text{Volume digested to (200ml)}}{\text{Weight digested (1gram)}} \times \frac{1\text{L}}{1000\text{ml}} \times \frac{1000\text{gm}}{1\text{kg}} \times \frac{1\text{mg}}{1000\text{ug}} = \text{mg/kg}$$

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be applied to sample results.

TBA: Amerbelle						
SPLP metals data						
ALL UNITS IN UG/L						
Analyte	Type	Blank	BAL	CRDL	MDL	ACTION
Antimony	ICB	6.3	31.5	20	1.2	Report with U at SR: ME-6SB10-13.5,
Arsenic	CCB	2.3	11.5	20	1.6	Report with U at SR: ME-3SB0.5-4, ME-6SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4
Cadmium	CCB	0.1	0.5	5.0	0.10	Report with U at SR: ME-6SB0.5-4,ME-6SB10-13.5, ME-5SB0-4
Copper	ICB	8.4	42	30	6.3	Report with U at SR: ME-3SB0.5-4, ME-3SB4-6,ME-5SB0-4, ME-1SB0.5-3, ME-6SB0.5-4 and ME-7SB0.5-4
Lead	CCB	1.8	9.0	10	0.46	Report with U at SR: ME-1SB0.5-3 and ME-3SB4-6
Mercury	CCB	0.100	0.500	0.2	0.05	Report with U at SR: ME-6SB10-13.5
Nickel	CCB	1.1	5.5	50	0.59	Report with U at SR: ME-1SB0.5-3, ME-3SB0.5-4, ME-3SB4-6, and ME-5SB0-4
Selenium	CCB	-1.4	7.0	30	0.98	Estimate the positive results (J): ME-3SB4-6 and ME6SB0.5-4. Estimate the nondetect results (UJ): ME-1SB0.5-3, ME-3SB0.5-4, ME-6SB10-13.5, ME-7SB0.5-4 ME-5-SB0-4
Silver	CCB	11.3	56.5	30	0.91	Report with U at SR: ME-6SB10-13.5
Thallium	CCB	3.1	15.5	20	1.20	Report with U at SR: ME-6SB0.5-4 and ME-5SB0-4
Vanadium	CCB/ICB	0.7	3.5	50	0.47	all above BAL, no action
Zinc	ICB	27.1	135.5	50	2.3	Report with U at SR ME-3SB0.5-4, ME-1SB0.5-3, ME-3SB~~0.5-4~~, ME-5SB0-4, ME-6SB0.5-4,ME-6SB10-13.5, ME-7SB0.5-4 4-6

U.S. EPA - CLP

3
BLANKS

Lab Name: Mitkem Corporation Contract: Agmt#20, WO# 2560,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Mercury	0.047	U	0.047	U	0.100	B	0.100	B	0.070	U	

FORM III - IN SW846

U.S. EPA - CLP

3
BLANKS

Lab Name: Mitkem Corporation Contract: Agmt#20, WO# 2560,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Silver	3.8	B	11.3	B	9.9	B	9.1	B	0.910	U	

U.S. EPA - CLP

3
BLANKS

Lab Name: Mitkem Corporation Contract: Agmt#20, WO# 2560,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0091

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C		M
Antimony	6.3	B	4.3	B	2.6	B	2.7	B	1.200	U		
Arsenic	1.6	U	1.6	U	2.3	B	1.6	U	1.600	U		
Barium	2.1	U	2.1	U	2.1	U	2.1	U	2.100	U		
Beryllium	0.2	U	0.2	U	0.2	U	0.2	U	0.150	U		
Cadmium	0.1	U	0.1	B	0.1	U	0.1	B	0.100	U		
Chromium	0.4	U	0.4	U	0.4	U	0.4	U	0.380	U		
Copper	8.4	B	7.2	B	6.3	U	6.3	U	6.300	U		
Lead	1.7	B	1.2	B	1.1	B	1.8	B	0.823	B		
Nickel	1.0	B	1.1	B	0.7	B	0.9	B	0.590	U		
Selenium	1.0	U	1.0	U	-1.4	B	1.0	U	0.980	U		
Thallium	3.0	B	3.1	B	2.7	B	2.2	B	-2.571	B		
Vanadium	0.7	B	0.5	B	0.5	B	0.7	B	0.470	U		
Zinc	27.1	B	21.8	B	8.4	B	10.8	B	3.102	B		

REGION I
Data Review Worksheets

all criteria met

V A. ICP INTERFERENCE CHECK SAMPLE (Sections 1 & 2)

1. Recovery Criteria

List any elements in the ICS AB solution which did not meet the criteria for %R.

DATE	ELEMENT	%R	ACTION	SAMPLES AFFECTED

ACTIONS:

If an element does not meet the %R criteria, follow the actions stated below:

	PERCENT RECOVERY		
	<50%	50-79%	>120%
Positive Sample Results	R	J	J
Non-detected Sample Results	R	UJ	A

2. Frequency Requirements

Were Interference QC samples run at the beginning and end of each sample analysis run or a minimum of twice per 8 hour working shift, whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below and list the samples affected.

_____

_____

_____

REGION I
Data Review Worksheets

NA - analytes not reported

V B. ICP INTERFERENCE CHECK SAMPLE (Section 3)

1. Report the concentration of any element detected in the ICS A solution >MDL that should not be present.

ELEMENT	CONC. DETECTED IN THE ICS	CONC. OF INTERFERENTS IN THE ICS			
		AL	CA	FE	MG
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Estimate the concentration produced by the interfering element in all affected samples. See guidelines for examples. List the samples affected by interferences below:

SAMPLE AFFECTED	ELEMENT AFFECTED	SAMPLE CONC. (ug/L)	SAMPLE INTERFERENT CONC.				ESTIMATED INTERF. (ug/L)
			AL	CA	FE	MG	
_____	_____	_____	___	___	___	___	_____
_____	_____	_____	___	___	___	___	_____
_____	_____	_____	___	___	___	___	_____
_____	_____	_____	___	___	___	___	_____

ACTIONS:

1. In general, the sample data can be accepted without qualification if the sample concentrations of Al, Ca, Fe, Mg are less than 50% of their respective levels in the ICS solution.

2. Estimate (J) positive results for affected elements for samples with levels of interferents 50% or more of that in the ICS solution.

3. Reject (R) positive results if the reported concentration is due entirely to the interfering element.

4. Estimate (UJ) non-detected results for which false negatives are suspect.

Give explanations for any actions taken below:

_____

_____

_____

REGION I
Data Review Worksheets

NA- none requested

VI. MATRIX SPIKE

TR # _____ MATRIX: _____

1. Recovery Criteria

List the percent recoveries for analytes which did not meet the required criteria.

S - amount of spike added
SSR - spiked sample result
SR - sample result

Analyte	SSR	SR	S	%R	Action

Matrix Spike Actions apply to all samples of the same matrix.

ACTIONS:

1. If the sample concentration exceeds the spike concentration by a factor of 4 or more, no action is taken.

2. If any analyte does not meet the %R criteria, follow the actions stated below:

	PERCENT RECOVERY		
	<30%	30%-74%	>125%
Positive Samples Results	J	J	J
Non-detected Results	R	UJ	A

2. Frequency Criteria

A. Was a matrix spike prepared at the required frequency? Yes or No

B. Was a post digestion spike analyzed for elements that did not meet required criteria for matrix spike recovery? Yes or No

A separate worksheet should be used for each matrix spike pair.

REGION I
Data Review Worksheets

VII. LABORATORY DUPLICATES

not required in Method 6010B

List the concentrations of any analytes not meeting the criteria for duplicate precision. For soil duplicates, calculate the CRQL in mg/kg using the sample weight, volume and percents solids data for the sample. Indicate what criterion was used to evaluate precision by circling either the RPD or CRQL for each element.

MATRIX: _____

Element	CRQL water ug/L	CRQL soil mg/kg	Sample #	Duplicate#	RPD	Action
Aluminum	200					
Antimony	60					
Arsenic	10					
Barium	200					
Beryllium	5					
Cadmium	5					
Calcium	5000					
Chromium	10					
Cobalt	50					
Copper	25					
Iron	100					
Lead	5					
Magnesium	5000					
Manganese	15					
Mercury	0.2					
Nickel	40					
Potassium	5000					
Selenium	5					
Silver	10					
Sodium	5000					
Thallium	10					
Vanadium	50					
Zinc	20					
Cyanide	10					

Laboratory Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >20% for waters and >35% for soils.

2. If sample results are less than 5x the CRQL, estimate (J) positive results for elements whose absolute difference is >CRQL, (2xCRQL for soil). If both samples are non-detected the RPD is not calculated (NC).

REGION I
Data Review Worksheets

VIII. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. For soil duplicates, calculate the CRQL in mg/kg using the sample weight, volume and percents solids data for the sample. Indicate what criteria was used to evaluate precision by circling either the RPD or CRQL for each element.

MATRIX: Soil SPLP

Element	SPLP CRQL ~~water~~ ug/L	soil mg/kg	Sample # ME-6SB 0.5-4	Duplicate# ME-7SB0.5-4	RPD	Action none; all sample results are <5x CRQL + difference < CRQL; no action needed
Aluminum	~~200~~					
Antimony	20 ~~60~~		ND	ND		
Arsenic	20 ~~10~~		6.0 B	5.3 B	12.4	
Barium	200		116 ~~80~~	94.7	~~80.2~~	
Beryllium	5		~~0.115~~ 0.48	0.38	23	
Cadmium	5		0.19	ND		
Calcium	5000					
Chromium	20 ~~10~~		19.1	15.2	22.7	
Cobalt	50					
Copper	30 ~~25~~		35.4	30.9	13.6	
Iron	100					
Lead	10 ~~5~~		21.1	18.1	15.3	
Magnesium	5000					
Manganese	15					
Mercury	0.2		ND	ND		
Nickel	50 ~~40~~		~~11.15~~ 11.5	8.7	27.7	
Potassium	5000					
Selenium	30 ~~5~~		3.0	ND		
Silver	10					
Sodium	5000					
Thallium	~~20~~ ~~10~~		1.2	ND		
Vanadium	50		142	109	26.3	
Zinc	50 ~~20~~		74.8	65.0	14.0	
Cyanide	10					

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >30% for waters and >50% for soils.

2. If sample results are less than 5x the CRQL, estimate (J) positive results and (UJ) nondetected results for elements whose absolute difference is >2xCRQL, (4xCRQL for soil). If both samples are non-detected the RPD is not calculated (NC).

REGION I
Data Review Worksheets

IX. LABORATORY CONTROL SAMPLE — all criteria met.

1. Aqueous LCS

List any LCS recoveries not within the 80-120% criteria and the samples affected.

DATE	ELEMENT	%R	ACTION	SAMPLES AFFECTED

2. Solid LCS — NA

List any analytes that were not within the control windows set by the EPA for the solids LCS sample. The 80-120% criteria is not used to evaluate solid LCS results.

ELEMENT	LCS CONC.	CONTROL WINDOWS	ACTION	SAMPLES AFFECTED

ACTIONS:

AQUEOUS LCS	Percent Recovery <50%	51-79%	>120%
Positive Results	R	J	A
Non-detected Results	R	J	A

SOLID LCS	<EPA Control Windows	>EPA Control Windows
Positive Results	J	J
Non-detected Results	UJ	A

3. Frequency Criteria

A. Was an LCS analyzed for every matrix, every digestion batch, and every 20 samples? Yes or No

REGION I
Data Review Worksheets

X A. FURNACE ATOMIC ABSORPTION ANALYSIS — NA

1. Duplicate Precision

_____ Duplicate injections one-point analytical spikes were performed for all samples: duplicate injections agreed within ± 20%.

_____ Duplicate injections and/or spikes were not performed for the following samples/elements: _____

_____ Duplicate injections did not agree within ± 20% for samples/elements: _____

2. Post Digestion Spike Recoveries

_____ Spike recoveries met the 85-115% recovery criteria for all samples.

_____ Spike recoveries did not meet the 85-115% criteria but did not require MSA for the following samples/elements:

_____

_____ MSA was used to quantitate analytical results when contractually required.

_____ Correlation coefficients ≥0.995, accept results

_____ Correlation coefficients <0.995 for sample numbers/elements: _____

_____ Method of Standard Addition (MSA) was not performed as required for samples/elements: _____

ACTIONS:

1. Estimate (J) positive results if duplicate injections are outside ±20% RSD or CV.

2. If the sample absorbance is <50% of post digestion spike absorbance the following actions should be applied:

	PERCENT RECOVERY		
	<10%	11%-84%	>115%
Positive Sample Results	J or R	J	J
Non-detected Results	R	UJ	A

3. Estimate (J) sample results if MSA was required and not performed.

4. Estimate (J) sample results if correlation coefficient was <0.995.

REGION I
Data Review Worksheets

all criteria met

XI. INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS

✓ Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within 10% of the original undiluted analysis, for concentrations greater than 50x MDL.

_____ Serial dilutions were not performed for the following:

_____

_____ Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x MDL before dilution.

Report all results below that do not meet the required laboratory criteria for ICP serial dilution analysis.

MATRIX: soil ; ug/L

ELEMENT	MDL	50xMDL	SAMPLE RESULT	SERIAL DILUTION	%D	ACTION
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper	6.3	315	16.67		100.0	None; all results are < 50xMDL
Iron						
Lead	0.46	23	3.05		810	
Magnesium						
Manganese						
Nickel	0.89	29.5	3.38		38.5	
Potassium						
Selenium	0.98	49.0	3.08		399.4	
Silver						
Sodium						
Thallium						
Vanadium	0.47	23.5	5.94		22.4	
Zinc	2.3	115	36.08		33.7	

Actions apply to all samples of the same matrix.

ACTIONS:

1. Estimate (J) positive results if %D >15. ✓

REGION I
Data Review Worksheets

XII. DETECTION LIMIT ANALYSIS

1. Method Detection Limits

X Method Detection Limit results were present and found to be less than the Contract Required Quantitation Limits.

_____ MDLs were not included in the data package on Form 9.

_____ MDLs were present, but the criteria was not met for the following elements:_____

2. Reporting Requirements

_____ Were sample results on Form I reported down to the MDL not the CRQL for all analytes? Yes or No

_____ Were sample results that were analyzed for ICP for Se, Tl, As, or Pb at least 5x IDL. Yes or No

_____ Were sample weights, volumes, and dilutions taken into account when reporting detection limits on Form I. Yes or No

If No, the reported results may be inaccurate. Make the necessary changes on the data summary tables and request that the laboratory resubmit the corrected data.

Silver -

3. Estimated Results

Zn - ME-35B4-6

List the samples and elements that had concentrations that were qualified as estimated (J and UJ) for being greater than the MDL but less than the CRQL. Include blank-qualified results.

Th - ~~all samples except~~ ME-65B10-13.5 + ~~ME-75B0.5-4~~ EXP 0.5-4 ME-55B0-4

Element	Sample(s)
Hg	ME-65B10-13.5
Antimony	ME-65B10-13.5
Arsenic	ME-35B0.5-4, ME65B 0.5-4, ME-65B10-13.5, ME-75B0.5-4,
Beryllium + Nickel	~~ME-15B0.5-3~~ EXP, all samples
Be	ME-35B0.5-4, ME-65B0.5-4, ME-65B10-13.5, ME-75B0.5-4
Cd	ME-55B0-4, ME-65B0.5-4, ME-65B10-13.5
Chromium	all samples except ME-65B10-13.5
Copper + Vanadium	all samples except ME65B0.5-4 + 10-B.5 + ME-75B0.5-4
Lead	ME-15B0.5-3 + ME-35B4-6
Se	ME-35B4-6, ME-65B0.5-4, ME-65B0.5-4

REGION I
Data Review Worksheets

NA

XIII. SAMPLE QUANTITATION

_____ Sample results fall within the linear range for ICP and within the calibrated range for all other parameters.

_____ Sample results were beyond the linear range/calibration range of the instrument for the following elements:

_____

In the space below, please show a minimum of one sample calculation per method:

ICP

FURNACE

MERCURY

CYANIDE

For soil samples, the following equation may be necessary to convert raw data values (usually reported in ug/L) to actual sample concentrations (mg/kg):

$$C \times \frac{V}{W \times S} \times \frac{1L}{1000mL} \times DF \times \frac{1mg}{1000ug} \times \frac{1000g}{1kg} = \frac{mg}{kg} \text{ (dry weight)}$$

Where,
C = concentration, ug/L
V = final sample volume, mL
W = wet sample weight, g
S = percent solids
DF = dilution factor

EPA-NE - Data Validation Worksheets
Data Review Worksheets

NA- No PE on Brownfields

XIV. ACCURACY CHECK (Performance Evaluation Results)

List all analytes that are outside criteria

SDG No. _____ CASE: _____

Are more that one-half of the PES analytes within criteria for each parameter? Y N

PE Sample Number	Ampule Number	Parameter	Type of PES	Matrix	Analyte	Conc.	Region I EPA PES Scores *	Non-EPA PES Scores **	Samples Affected	Action

* For Region I PESs indicate the Region I PES Score Report Result: Action High; Action Low; TCL MISS; TCL CONTAMINANT; TIC HIT: TIC MISS; TIC CONTAMINANT

** For Non-EPA PESs indicate the Non-EPA PES Score: PES COMPOUND MISS; PES COMPOUND CONTAMINANT; PES COMPOUND HIT (% Recovery Limits)

METCALF & EDDY | AECOM

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MEMORANDUM

PROJECT NO:	036800318.00053	**DATE:**	April 7, 2006
TO:	Amerbelle Textiles, Vernon, Connecticut	**OFFICE:**	Wakefield
FROM:	R. Purdy	**COMPANY:**	Metcalf & Eddy, Inc.
REVIEWED BY:	A. Schkuta		
CC:	B. Weir N. Thurber D. Laferte (memo only)		

SUBJECT: Limited QC Review/Modified Tier II-Like Review
VOC, SVOC, CT ETPH, and Metals Analytical Results
Mitkem Corporation, Warwick, Rhode Island
Lab Project No. E0118

On February 1, 2006, six groundwater samples (including one field duplicate pair) and one trip blank were collected by Metcalf & Eddy, Inc. (M&E) field personnel from the Targeted Brownfields Assessment (TBA) Amerbelle Textiles site, located in Vernon, Connecticut. The sampling was performed as part of the TBA Response Action Contract Work Assignment #155-SIBZ-0100. The samples were submitted to Mitkem Corporation (Warwick, Rhode Island) for the analysis of volatile organic compounds (VOC) using Massachusetts Department of Environmental Protection (MADEP) Method for the Determination of Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) (SW-846 Method 8260B), May 2004; for semivolatile organic compounds (SVOC) using MADEP Method for the Determination of Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) (SW-846 Method 8270B), August 2004; for extractable total petroleum hydrocarbons (ETPH) using "Analysis of Extractable Total Petroleum Hydrocarbons (ETPH) Using Methylene Chloride Gas Chromatograph/Flame Ionization Detection," March 1999 (Connecticut DEP); for metals using MADEP Method for the Determination of Trace Metals by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) (SW-846 Method 6010B), May 2004; and for mercury using MADEP Method for the Determination of Mercury in Liquid Waste (SW-846 Method 7470A), August 2004. The samples were received by the laboratory on February 2, 2006. The data package was received in the M&E office on February 24, 2006.

M&E reviewed the data in accordance with the EPA-approved Final Field Task Work Plan for the site, and the guidance received from EPA Work Assignment Manager, Mr. James Byrne, in a September 17, 1999 letter to former M&E Work Assignment Manager, Barb Wyskowski. The data review included:

- Data Completeness
- Preservation and Technical Holding Times
- GC/MS and GC/ECD Instrument Performance Check
- Initial and Continuing Calibrations
- Surrogate Compounds

	•	Internal Standards
	•	Blank Analysis Result
	•	Inductively Coupled Plasma (ICP) Interference Check Sample Results
	•	ICP Serial Dilution Analysis Results
	•	Matrix Spike/Matrix Spike Duplicate
	•	Field Duplicate/ Lab Duplicate Sample Results
NA	•	Sensitivity Check
	•	Performance Evaluation Samples/Accuracy Check
	•	Analyte Quantitation and Reported Quantitation Limits
NA	•	Semivolatile and Pesticide/PCB Cleanup

*	=	All criteria met for this sample
NA	=	Not applicable and/or no information was provided by the laboratory

Note: Worksheets are not included for parameters that have met criteria or for criteria that are not applicable to the method and/or to the modified Tier II-like review.

A copy of the chain-of-custody (COC) record is included in Attachment I. Included in Attachment II are the result summary sheets, annotated with qualifiers, if necessary, as detailed in this memorandum. Included in Attachment III are the data validation worksheets.

Preservation and Technical Holding Times

Because of issues related to the performance of the internal standard, the laboratory re-extracted the five samples submitted for ETPH analysis. This re-extraction was performed 16 days after collection, exceeding the 7-day extraction holding time. The results for ETPH were qualified as estimated (J).

Initial and Continuing Calibrations

VOC

All compounds met the minimum response factor (RF) criteria of 0.05 in the initial calibration (IC) and continuing calibration (CC) standards. The compounds that did not meet the relative standard deviation (RSD) criteria of ≤ 30% in the (IC) or the percent difference (%D) criteria of ≤ 25% in the CC are summarized in the table below. Positive and nondetect results for these compounds in the affected samples were qualified as estimated (J/UJ).

	Instrument: V1		Instrument: V6	
Compound	**IC 02/01/06**	**CC 02/15/06**	**IC 02/01/06**	**CC 02/03/06**
	%RSD	**%D**	**%RSD**	**%D**
acetone	60.7	-	-	29.3
naphthalene	31.8	25.2	30.3	-
Samples Affected	TB-01	TB-01	ME-1, ME-1RE, ME-2, ME-2CS, ME-5, ME-5RE, ME-6	ME-1, ME-1RE, ME-5, ME-6

SVOC

All compounds met the minimum response factor (RF) criteria of 0.05 in the initial calibration (IC) and continuing calibration (CC) standards. The compounds that did not meet the relative standard deviation (RSD) criteria of ≤ 30% in the (IC) or the percent difference (%D) criteria of ≤ 25% in the CC are summarized in the table below. Positive and nondetect results for these compounds in the affected samples were qualified as estimated (J/UJ).

	Instrument: S3	
Compound	**IC 02/06/06**	
	%RSD	**min. RF**
2,4-dinitrophenol	31.8	-
Samples Affected	AM-7, ME-1, ME-1RE, ME-2, ME-2CS, ME-6	

Metals

All criteria were met for the initial and continuing calibration standards. No low-level calibration check standard was preformed for the metals analysis. However, the low calibration point was at or below the reporting limit for all analytes.

Surrogate Compounds

SVOC

The following table summarizes the surrogate recoveries outside the recovery criteria, the affected samples, and the validation action taken.

Sample	Surrogate	Recovery	Recovery Criteria	Action
ME-6	2,4,6-tribromophenol	125%	37% - 122%	None; only one surrogate exceeds criteria

ETPH

The following table summarizes the surrogate recoveries outside the recovery criteria, the affected samples, and the validation action taken.

Sample	Surrogate	Recovery	Recovery Criteria	Action
ME-2	para-terphenyl	17.2%	24.4% - 123%	None; ETPH is reported from the analysis of the re-extracted sample.

Internal Standards

The following table summarizes the internal standard (IS) recoveries outside the recovery criteria of 50%-200%, the affected samples, and the validation action taken.

Sample	Internal Standard	IS Area	Acceptance Range	Action
ME-1	1,4-dichlorobenzene-d_4	463478	477481 – 1909924	Estimate the positive and nondetect results (J and UJ, respectively) associated with this IS.
ME-1RE	1,4-dichlorobenzene-d_4	443507	477481 – 1909924	None; report results from the first analysis.
ME-5	1,4-dichlorobenzene-d_4	457929	477481 – 1909924	Estimate the positive and nondetect results (J and UJ, respectively) associated with this IS.
ME-5RE	1,4-dichlorobenzene-d_4	401825	476632 – 1906526	None; report results from the first analysis.

Compounds associated with 1,4-dichlorobenzene-d_4: 1,1,2,2-tetrachloroethane, bromobenzene, 1,2,3-trichloropropane, n-propylbenzene, 2-chlorotoluene, 1,3,5-trimethylbenzene, 4-chlorotoluene, tert-butylbenzene, 1,2,4-trimethylbenzene, sec-butylbenzene, 4-isopropyltoluene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, n-butylbenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, 1,2-4-trichlorobenzene, hexachlorobutadiene, 1,2,3-trichlorobenzene, and naphthalene.

ETPH

The laboratory noted that the internal standard solution had degraded, necessitating the re-extraction and analysis of the samples. The results from the re-extracted samples are reported, qualified for holding time exceedances as noted above.

Blanks

VOC

Methylene chloride and naphthalene were detected in the trip blank TB-01 associated with these samples (5µg/L and 2µg/L, respectively). These compounds were not detected in the associated field samples. No validation actions were necessary as a result of this blank contamination.

ETPH

The method blank contained 141µg/L ETPH. The laboratory reported that this is likely the result of a rising baseline during chromatography rather than the result of hydrocarbon contamination. Additionally, the ETPH results for all samples exceeded the calculated blank action limit. No validation actions were necessary as a result of this reported blank contamination

Metals

The following table summarizes the level of blank contamination detected in the laboratory blanks associated with the groundwater samples. If a contaminant was detected in more than one blank, the highest concentration was used to qualify associated sample results.

Analyte	Blank Type	Maximum Concentration (µg/L)	Blank Action Limit (µg/L)	Samples Affected/Actions
antimony	inst	6.2	31.0	Qualify the result as nondetect (U) at the reported concentration for samples AM-7, ME-2, ME-2CS, ME-5, and ME-6
arsenic	inst	2.4	12.0	Qualify the result as nondetect (U) at the reported concentration for samples ME-2, ME-2CS
barium	inst	18.5	92.5	Qualify the result as nondetect (U) at the reported concentration for samples ME-2, ME-2CS, ME-5, and ME-6
beryllium	inst	0.5	2.5	Qualify the result as nondetect (U) at the reported concentration for samples ME-2, ME-2CS
cadmium	inst	0.8	4.0	Qualify the result as nondetect (U) at the reported concentration for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6
chromium	mb	0.99	5.0	Qualify the result as nondetect (U) at the reported concentration for samples AM-7, ME-1, ME-5, and ME-6
copper	mb	7.21	36.1	Qualify the result as nondetect (U) at the reported concentration for samples ME-1 and ME-6
lead	mb	2.60	13.0	Qualify the result as nondetect (U) at the reported concentration for samples AM-7, ME-1, ME-5, and ME-6
mercury	inst	-0.089	0.44	Qualify the result as estimated (UJ) at the reported detection limit for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6
nickel	inst	5.1	25.5	Qualify the result as nondetect (U) at the reported concentration for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6
selenium	inst	1.7	8.5	Qualify the result as nondetect (U) at the negative BAL for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6
	inst	-1.2	6.0	
silver	inst	-6.3	31.5	Qualify the result as estimated (UJ) at the reported detection limit for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6
thallium	inst	2.1	10.5	Qualify the result as nondetect (U) at the negative BAL for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6
	inst	-1.4	7.0	
vanadium	inst	4.5	22.5	Qualify the result as nondetect (U) at the reported concentration for samples AM-7, ME-1, ME-2, ME-2CS, ME-5, and ME-6

Analyte	Blank Type	Maximum Concentration (µg/L)	Blank Action Limit (µg/L)	Samples Affected/Actions
zinc	mb	27.7	138	Qualify the result as nondetect (U) at the reported concentration for samples ME-1, ME-2CS, ME-5, and ME-6

inst – instrument blank (ICB, CCB)
mb – method blank

For positive blank contamination, sample results were qualified as follows:

- If the sample was nondetect, qualification of the data was not required.
- If the sample result was ≤ BAL, the result was qualified as a nondetect (U) at the reported concentration
- If the sample result was > BAL, qualification of the data was not required

For negative instrument drift, sample results were qualified as follows:

- If the sample result was nondetect, the result was qualified as estimated (UJ)
- If the sample result was ≤ negative BAL, the result was qualified as estimated (J)
- If the sample result was > negative BAL, qualification of the data was not required

For positive blank contamination and negative instrument drift where the positive BAL is > the negative BAL, sample results were qualified as follows:

- If the sample result was nondetect, the result was qualified as nondetect (U) at the negative BAL
- If the sample result was ≤ negative BAL, the result was qualified as nondetect (U) at the negative BAL
- If the sample result was > negative BAL but ≤ BAL, the result was qualified as nondetect (U) at the reported concentration
- If the sample result was > BAL, qualification of the data was not required

For positive and negative blank contamination where the negative BAL is > the positive BAL, sample results were qualified as follows:

- If the sample result was nondetect, the result was qualified as nondetect (U) at the negative BAL
- If the sample result was ≤negative BAL, the result was qualified as nondetect (U) at the negative BAL
- If the sample result was > negative BAL, qualification of the data was not required

Inductively Coupled Plasma (ICP) Interference Check Sample Results

All recovery criteria (80%-120%) were met for all analytes in Interference Check Sample AB.

Due to the limited nature of this review (lack of raw data), an in-depth review of the ICSA solution exceedances was not possible. The validator reviewed the ICSA results to determine whether there were any gross exceedances (unspiked analytes at concentrations >reporting limit). Lead was detected in the ICSA solutions at an absolute value greater than the reporting limit of 10 µg/L (-13 µg/L and -14 µg/L) in the analytical sequence. However, no actions were taken since the significance of this interference could not be evaluated for the groundwater samples due to lack of raw data.

ICP Serial Dilution Analysis Results

The serial dilution %D for barium exceeded the precision acceptance criteria (15%). The positive results for barium in all samples were qualified as estimated (J). Note that the barium results in samples ME-2. ME-2CS, ME-5, ME-6 were previously qualified as nondetect (U) at the reported concentration. The overall qualification for these samples is estimated nondetect (UJ).

Matrix Spike/Matrix Spike Duplicate

SVOC

Sample ME-1 was analyzed as the matrix spike (MS) and matrix spike duplicate (MSD) with this data set. The compounds that did not meet recovery (%R) and %RPD acceptance criteria for and the data validation actions taken are summarized in the following table:

Compound	MS %R	MSD %R	%R QC Limits	% RPD	%RPD QC Limits	Actions
phenol	28	26	30 – 130	-	20	Estimate (UJ) the nondetect result in ME-1.
4,6-dinitro-2-methylphenol	-	-	30 – 130	21	20	Estimate (UJ) the nondetect result in ME-1.
benzo[b]fluoranthene	-	-	40 - 140	22	20	Estimate (UJ) the nondetect result in ME-1.
bis(2-ethylhexyl)phthalate	-	-	40 - 140	21	20	Estimate (UJ) the nondetect result in ME-1.

- - meets criteria

ETPH

Sample ME-1 was analyzed as the matrix spike (MS) and matrix spike duplicate (MSD) with this data set. The compounds that did not meet recovery (%R) and %RPD acceptance criteria for and the data validation actions taken are summarized in the following table:

Compound	MS %R	MSD %R	%R QC Limits	% RPD	%RPD QC Limits	Actions
ETPH	47	40	50 – 150	-	50	None; ETPH is reported from the analysis of the re-extracted sample.

- - meets criteria

Field Duplicate/ Lab Duplicate Sample Results

Samples ME-2 and ME-2CS were analyzed as field duplicates with this sample set. The RPD of the ETPH results (38%) exceeded the 30% RPD criteria. The positive ETPH results in all samples were qualified as estimated (J).

Performance Evaluation Samples/Accuracy Check

Performance Evaluation Sample

No Performance Evaluation Samples were required for VOC, SVOC, ETPH, or metals analyses.

Laboratory Control Sample/ Laboratory Control Sample Duplicate (LCS/LCSD)

VOC

The compounds in the LCS/LCSD pairs that did not meet %R and %RPD criteria as listed are summarized in the following table:

Analyte	LCS %R	LCSD %R	%R Limits	%RPD	%RPD Limits	Action
VIDLCS / VIDLCSD						
acetone	54	58	70 - 130	-	25	None; analyte not reported from this analytical sequence
carbon disulfide	-	66	70 - 130	37	25	
VIJLCS / VIJLCSD						
acetone	-	68	70 - 130	-	25	Estimate (UJ) the nondetect result in sample TB-01.
V6ELCS / V6ELCSD						
acetone	-	150	70 - 130	56	25	Estimate (J) the positive results in samples ME-2 and ME-2CS.

- - met QC requirements

SVOC

The compounds in the LCS/LCSD pairs that did not meet %R and %RPD criteria as listed are summarized in the following table:

Analyte	LCS %R	LCSD %R	%R Limits	%RPD	%RPD Limits	Action
S3DLCS / S3DLCSD						
phenol	28	-	30 - 130	-	25	Estimate (UJ) the nondetect result in samples AM-7, ME-1, ME-2, ME-2CS, and ME-6.

- - met QC requirements

Analyte Quantitation and Reported Quantitation Limits

VOC

The results for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene in sample ME-6 were reported from the analysis of a five-fold dilution.

Samples ME-1 and ME-5 were re-analyzed because of poor internal standard performance (low response for 1,4-dichlorobenze-d_4). The re-analyses showed no improvement in performance. The results from the initial analyses of samples ME-1 and ME-5 are reported, with qualifications as noted above.

ETPH

Because of issues related to the performance of the internal standard (a possibly degraded solution), the laboratory re-extracted the five samples submitted for ETPH analysis. The results from the re-extraction and re-analyses are reported for all samples, with qualifications as noted above.

Metals

The positive and blank-qualified results for the analytes and samples listed below were qualified as estimated (J and UJ, respectively) because they were greater than the reported method detection limit but less than the reporting limit.

antimony	AM-7, ME-2, ME-2CS, ME-5, ME-6
arsenic	ME-2, ME-2CS
barium	AM-7, ME-1, ME-2, ME-2CS, ME-5, ME-6
beryllium	ME-2, ME-2CS
cadmium	AM-7, ME-1, ME-2, ME-2CS, ME-5, ME-6
chromium	AM-7, ME-1, ME-5, ME-6
copper	AM-7, ME-1, ME-6
lead	AM-7, ME-1, ME-5, ME-6
nickel	AM-7, ME-1, ME-2, ME-2CS, ME-5, ME-6
selenium	ME-1, ME-2, ME-2CS, ME-5
vanadium	AM-7, ME-1, ME-2, ME-5, ME-6
zinc	AM-7, ME-1, ME-2CS, ME-6

Attachment I

Chain-of-Custody

Note: Seven Sam[illegible] bottles have incorrect date (1/31) Please note in case narrative and analyze. Actual sample date was 2/1/06 for all sample (DD)

M&E Metcalf & Eddy

CHAIN OF CUSTODY FORM

Job/Project Name: Amerbelle Textiles
Job/Project Location: Vernon, CT
Job/Project Number: 368 —
Samplers: (Signatures) Denise Lafuente
Recorder: (Signature) Denise Lafuente
Date: 2/1/06
Lab (Samples Sent To): Mitkem (courier)

SAMPLING Date	SAMPLING Time	SAMPLE NUMBER	SAMPLE LOCATION	MATRIX Water	MATRIX Soil				COMPOSITE/GRAB	PRESERVATIVE (Y/N)	VOC (HCl)	SVOC	Benzidine	CT ETPH (HCl)	CT RSR Metals (HNO3) Field filtered	CT RSR metals HNO3			Total #	COMMENTS
2/1/06 1/31/06	1030	ME.2	ME.2	X			-01		G	Y	3	2	*	2	2				9	
1/31/06	1130	ME.2CS	ME.2CS	X			-02		G	Y	3	2	*	2	2				9	
1/31/06	1130	TB.01	TB.01	X			-03		G	Y	3								3	
1/31/06	1330	ME-5	ME-5	X			-04		G	Y	2			2		1			5	
1/31/06	1545	ME.6	ME.6	X			-05		G	Y	2	2	*	2		1			7	
1/31/06	1050	ME-1	ME-1	X			-06		G	Y	6	6	*	6	3				21	ms/msD
1/31/06	1345	AM-7	AM-7	X			-07		G	Y		2	*			1			3	

2°C

3°C

Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Relinquished By: (Signature)	Date:	Time:	Received By: (Signature)
Denise Lafuente	~~2/1/06~~ 2/1/06	1300	[illegible]	(DD) ~~2/1/06~~ 2/2/06	2/1/06	1300	James Henley
Relinquished By: (Signature)	Date:	Time:	Relinquished By: (Signature)	Relinquished By: (Signature)	Date:	Time:	Received By: (Signature)
Relinquished By: (Signature)	Date:	Time:	Received for Lab By: (Signature)	Date:	Time:	Comments: TAT = 21 days Single pt calibration for Benzidine Screen.	

Method of Shipment: Courier (Mitkem)

Results to D. Lafuente

Distribution: **Original** to Lab. **Copy 1** to Field Files, **Copy 2** to Project Manager

02333

Attachment II

Sample Result Summary Sheets

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-06A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0705

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	U J
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-06A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0705

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
----------	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	UJ
108-86-1	Bromobenzene	5	UJ
96-18-4	1,2,3-Trichloropropane	5	UJ
103-65-1	n-Propylbenzene	5	UJ
95-49-8	2-Chlorotoluene	5	UJ
108-67-8	1,3,5-Trimethylbenzene	5	UJ
106-43-4	4-Chlorotoluene	5	UJ
98-06-6	tert-Butylbenzene	5	UJ
95-63-6	1,2,4-Trimethylbenzene	5	UJ
135-98-8	sec-Butylbenzene	5	UJ
99-87-6	4-Isopropyltoluene	5	UJ
541-73-1	1,3-Dichlorobenzene	5	UJ
106-46-7	1,4-Dichlorobenzene	5	UJ
104-51-8	n-Butylbenzene	5	UJ
95-50-1	1,2-Dichlorobenzene	5	UJ
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	UJ
87-68-3	Hexachlorobutadiene	5	UJ
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	UJ

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-1

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-06A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0705

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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3.				
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29.				
30.				

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-01A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0794

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/07/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	23	J
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-01A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0794

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/07/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	U J
87-61-6	1,2,3-Trichlorobenzene	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-01A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0794

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/07/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 12

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	4.46	4	J
2.	UNKNOWN	10.90	26	J
3.	UNKNOWN	11.14	6	J
4.	UNKNOWN	11.45	7	J
5.	UNKNOWN	11.86	18	J
6.	UNKNOWN	12.01	5	J
7.	UNKNOWN	12.14	32	J
8.	UNKNOWN	12.34	6	J
9.	UNKNOWN	12.42	27	J
10.	UNKNOWN	12.47	23	J
11.	UNKNOWN	12.69	13	J
12.	UNKNOWN	13.24	5	J
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2CS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-02A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0795

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/07/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	19	J
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2CS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-02A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0795

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/07/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	5	U
87-61-6	1,2,3-Trichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-2CS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-02A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0795

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/07/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	10.91	20	J
2.	UNKNOWN	11.87	14	J
3.	UNKNOWN	12.14	22	J
4.	UNKNOWN	12.43	22	J
5.	UNKNOWN	12.47	16	J
6.	UNKNOWN	12.69	10	J
7. 445-03-4	BENZENAMINE, 4-CHLORO-2-(TRI	14.76	8	NJ
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-04A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0715

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	U
78-93-3	2-Butanone	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-04A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0715

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
	m,p-Xylene	5	U
95-47-6	o-Xylene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	UJ
108-86-1	Bromobenzene	5	UJ
96-18-4	1,2,3-Trichloropropane	5	UJ
103-65-1	n-Propylbenzene	5	UJ
95-49-8	2-Chlorotoluene	5	UJ
108-67-8	1,3,5-Trimethylbenzene	5	UJ
106-43-4	4-Chlorotoluene	5	UJ
98-06-6	tert-Butylbenzene	5	UJ
95-63-6	1,2,4-Trimethylbenzene	5	UJ
135-98-8	sec-Butylbenzene	5	UJ
99-87-6	4-Isopropyltoluene	5	UJ
541-73-1	1,3-Dichlorobenzene	5	UJ
106-46-7	1,4-Dichlorobenzene	5	UJ
104-51-8	n-Butylbenzene	5	UJ
95-50-1	1,2-Dichlorobenzene	5	UJ
96-12-8	1,2-Dibromo-3-chloropropane	5	UJ
120-82-1	1,2,4-Trichlorobenzene	5	UJ
87-68-3	Hexachlorobutadiene	5	UJ
91-20-3	Naphthalene	5	UJ
87-61-6	1,2,3-Trichlorobenzene	5	UJ

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-5

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-04A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0715

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-05A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0716

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q	
75-71-8	Dichlorodifluoromethane		5	U	
74-87-3	Chloromethane		5	U	
75-01-4	Vinyl Chloride		35		
74-83-9	Bromomethane		5	U	
75-00-3	Chloroethane		5	U	
75-69-4	Trichlorofluoromethane		5	U	
75-35-4	1,1-Dichloroethene		2	J	
67-64-1	Acetone		5	U J	
74-88-4	Iodomethane		5	U	
75-15-0	Carbon Disulfide		5	U	
75-09-2	Methylene Chloride		5	U	
156-60-5	trans-1,2-Dichloroethene		9		
1634-04-4	Methyl tert-butyl ether		5	U	
75-34-3	1,1-Dichloroethane		5	U	
108-05-4	Vinyl acetate		5	U	
78-93-3	2-Butanone		5	U	
156-59-2	cis-1,2-Dichloroethene	620 D	~~600~~	~~E~~	(25)
590-20-7	2,2-Dichloropropane		5	U	
74-97-5	Bromochloromethane		5	U	
67-66-3	Chloroform		5	U	
71-55-6	1,1,1-Trichloroethane		5	U	
563-58-6	1,1-Dichloropropene		5	U	
56-23-5	Carbon Tetrachloride		5	U	
107-06-2	1,2-Dichloroethane		5	U	
71-43-2	Benzene		5	U	
79-01-6	Trichloroethene	450 D	~~650~~	~~E~~	(25)
78-87-5	1,2-Dichloropropane		5	U	
74-95-3	Dibromomethane		5	U	
75-27-4	Bromodichloromethane		5	U	
10061-01-5	cis-1,3-Dichloropropene		5	U	
108-10-1	4-Methyl-2-pentanone		5	U	
108-88-3	Toluene		5	U	
10061-02-6	trans-1,3-Dichloropropene		5	U	
79-00-5	1,1,2-Trichloroethane		5	U	

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-05A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0716

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L		Q
142-28-9	1,3-Dichloropropane		5	U
127-18-4	Tetrachloroethene	290 D	~~720~~ ~~E~~	(25)
591-78-6	2-Hexanone		5	U
124-48-1	Dibromochloromethane		5	U
106-93-4	1,2-Dibromoethane		5	U
108-90-7	Chlorobenzene		5	U
630-20-6	1,1,1,2-Tetrachloroethane		5	U
100-41-4	Ethylbenzene		5	U
	m,p-Xylene		5	U
95-47-6	o-Xylene		5	U
1330-20-7	Xylene (Total)		5	U
100-42-5	Styrene		5	U
75-25-2	Bromoform		5	U
98-82-8	Isopropylbenzene		5	U
79-34-5	1,1,2,2-Tetrachloroethane		5	U
108-86-1	Bromobenzene		5	U
96-18-4	1,2,3-Trichloropropane		5	U
103-65-1	n-Propylbenzene		5	U
95-49-8	2-Chlorotoluene		5	U
108-67-8	1,3,5-Trimethylbenzene		5	U
106-43-4	4-Chlorotoluene		5	U
98-06-6	tert-Butylbenzene		5	U
95-63-6	1,2,4-Trimethylbenzene		5	U
135-98-8	sec-Butylbenzene		5	U
99-87-6	4-Isopropyltoluene		5	U
541-73-1	1,3-Dichlorobenzene		5	U
106-46-7	1,4-Dichlorobenzene		5	U
104-51-8	n-Butylbenzene		5	U
95-50-1	1,2-Dichlorobenzene		5	U
96-12-8	1,2-Dibromo-3-chloropropane		5	U
120-82-1	1,2,4-Trichlorobenzene		9	
87-68-3	Hexachlorobutadiene		5	U
91-20-3	Naphthalene		5	U J
87-61-6	1,2,3-Trichlorobenzene		1	J

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-05A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V6E0716

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/03/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-01

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-03A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V1H3343

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/15/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl Chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
67-64-1	Acetone	5	UJ
74-88-4	Iodomethane	5	U
75-15-0	Carbon Disulfide	5	U
75-09-2	Methylene Chloride	5	
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
108-05-4	Vinyl acetate	5	UJ
78-93-3	2-Butanone	5	UJ
156-59-2	cis-1,2-Dichloroethene	5	U
590-20-7	2,2-Dichloropropane	5	U
74-97-5	Bromochloromethane	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
563-58-6	1,1-Dichloropropene	5	U
56-23-5	Carbon Tetrachloride	5	U
107-06-2	1,2-Dichloroethane	5	U
71-43-2	Benzene	5	U
79-01-6	Trichloroethene	5	U
78-87-5	1,2-Dichloropropane	5	U
74-95-3	Dibromomethane	5	U
75-27-4	Bromodichloromethane	5	U
110-75-8	2-Chloroethyl vinyl ether	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB-01

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-03A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V1H3343

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/15/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
79-00-5	1,1,2-Trichloroethane	5	U
142-28-9	1,3-Dichloropropane	5	U
127-18-4	Tetrachloroethene	5	U
591-78-6	2-Hexanone	5	U J
124-48-1	Dibromochloromethane	5	U
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
630-20-6	1,1,1,2-Tetrachloroethane	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (Total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-86-1	Bromobenzene	5	U
96-18-4	1,2,3-Trichloropropane	5	U
103-65-1	n-Propylbenzene	5	U
95-49-8	2-Chlorotoluene	5	U
108-67-8	1,3,5-Trimethylbenzene	5	U
106-43-4	4-Chlorotoluene	5	U
98-06-6	tert-Butylbenzene	5	U
95-63-6	1,2,4-Trimethylbenzene	5	U
135-98-8	sec-Butylbenzene	5	U
99-87-6	4-Isopropyltoluene	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
104-51-8	n-Butylbenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U
87-68-3	Hexachlorobutadiene	5	U
91-20-3	Naphthalene	2	JB J
87-61-6	1,2,3-Trichlorobenzene	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB-01

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-03A

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V1H3343

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: not dec. _____ Date Analyzed: 02/15/06

GC Column: DB-624 ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AM-7

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-07B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4508

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U J
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

AM-7

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-07B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4508

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted:02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	20	UJ
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	1	J
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
92-87-5	Benzidine	20	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

AM-7

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-07B

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4508

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 50-84-0	BENZOIC ACID, 2,4-DICHLORO-	11.10	14	NJ
2. 57-10-3	N-HEXADECANOIC ACID	13.93	5	NJ
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-06C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4505

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	UJ
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-1

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-06C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4505

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	20	UJ
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	UJ
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	UJ
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	UJ
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
92-87-5	Benzidine	20	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-1

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-06C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4505

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-01C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4509

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U J
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-01C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4509

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	20	UJ
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	2	J
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
92-87-5	Benzidine	20	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-2

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-01C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4509

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 62-53-3	ANILINE	4.82	19	NJ
2.	UNKNOWN	5.14	26	J
3.	UNKNOWN	5.46	18	J
4. 149-57-5	HEXANOIC ACID, 2-ETHYL-	6.41	22	NJ
5. 445-03-4	BENZENAMINE, 4-CHLORO-2-(TRI	7.02	98	NJ
6.	UNKNOWN	7.39	160	J
7. 143-22-6	ETHANOL, 2-[2-(2-BUTOXYETHOX	10.74	1100	NJ
8.	UNKNOWN	11.16	170	J
9.	UNKNOWN	12.03	45	J
10. 1515-72-6	N-N-BUTYLPHTHALIMIDE	12.36	110	NJ
11.	UNKNOWN	12.52	33	J
12.	UNKNOWN	12.57	28	J
13. 1786-94-3	3,6,9,12,15-PENTAOXANONADECA	12.75	570	NJ
14.	UNKNOWN	12.80	31	J
15.	UNKNOWN	12.84	30	J
16.	UNKNOWN	12.89	20	J
17.	UNKNOWN	13.65	17	J
18.	UNKNOWN	14.27	130	J
19.	UNKNOWN	15.23	17	J
20.	UNKNOWN	15.54	16	J
21.				
22.				
23.				
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28.				
29.				
30.				

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2CS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-02C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4510

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	UJ
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-2CS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-02C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4510

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	20	UJ
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	2	J
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
92-87-5	Benzidine	20	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-2CS

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-02C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4510

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 62-53-3	ANILINE	4.82	31	NJ
2.	UNKNOWN	5.14	23	J
3.	UNKNOWN	5.45	26	J
4.	UNKNOWN	5.69	23	J
5. 445-03-4	BENZENAMINE, 4-CHLORO-2-(TRI	7.03	100	NJ
6. 54446-78-5	ETHANOL, 1-(2-BUTOXYETHOXY)-	7.40	300	NJ
7.	UNKNOWN	10.76	1600	J
8.	UNKNOWN	11.18	340	J
9. 1515-72-6	N-N-BUTYLPHTHALIMIDE	12.37	270	NJ
10.	UNKNOWN	12.53	50	J
11.	UNKNOWN	12.59	43	J
12. 1786-94-3	3,6,9,12,15-PENTAOXANONADECA	12.78	1200	NJ
13.	UNKNOWN	12.82	48	J
14.	UNKNOWN	12.85	44	J
15.	UNKNOWN	12.90	26	J
16. 1786-94-3	3,6,9,12,15-PENTAOXANONADECA	14.29	320	NJ
17.	UNKNOWN	15.23	42	J
18.	UNKNOWN	15.55	30	J
19.	UNKNOWN	15.57	33	J
20. 57377-89-6	9,10-PHENANTHRENEDIONE, 1,2,	21.77	27	NJ
21.				
22.				
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-05C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4504

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	UJ
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	12	
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	20	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	20	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	20	U
83-32-9	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ME-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-05C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4504

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
51-28-5	2,4-Dinitrophenol	20	UJ
100-02-7	4-Nitrophenol	20	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	20	U
534-52-1	4,6-Dinitro-2-methylphenol	20	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	20	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10	U
117-84-0	Di-n-octylphthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)pyrene	10	U
53-70-3	Dibenzo(a,h)anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U
92-87-5	Benzidine	20	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ME-6

Lab Name: MITKEM CORPORATION Contract:

Lab Code: MITKEM Case No.: SAS No.: SDG No.: ME0118

Matrix: (soil/water) WATER Lab Sample ID: E0118-05C

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S3D4504

Level: (low/med) LOW Date Received: 02/02/06

% Moisture: _____ decanted: (Y/N)___ Date Extracted: 02/08/06

Concentrated Extract Volume: 1000(uL) Date Analyzed: 02/16/06

Injection Volume: 1.0(uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: ___

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) ug/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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Mitkem Corporation

Date: *23-Feb-06*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-2
Lab ID: E0118-01

Project: M&E Connecticut Brownfields
Collection Date: 02/01/06 10:30

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				**CTETPH_W**			
Extractable Total Petroleum Hydrocarbon	12	~~B~~ J	0.035	mg/L	1	02/20/2006 09:10	22285
Surr: para-Terphenyl	42.1		24.4-123	%REC	1	02/20/2006 09:10	22285

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *23-Feb-06*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-2CS
Lab ID: E0118-02

Project: M&E Connecticut Brownfields
Collection Date: 02/01/06 11:30

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch I
CT ETPH BY GC-FID				**CTETPH_W**			
Extractable Total Petroleum Hydrocarbon	8.2	~~B~~ J	0.035	mg/L	1	02/20/2006 09:36	222
Surr: para-Terphenyl	45.8		24.4-123	%REC	1	02/20/2006 09:36	222

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *23-Feb-06*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-5
Lab ID: E0118-04

Project: M&E Connecticut Brownfields
Collection Date: 02/01/06 13:30

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
CT ETPH BY GC-FID				**CTETPH_W**			
Extractable Total Petroleum Hydrocarbon	0.47	~~B~~ J	0.035	mg/L	1	02/20/2006 10:00	2228
Surr: para-Terphenyl	80.1		24.4-123	%REC	1	02/20/2006 10:00	22285

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *23-Feb-06*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-6
Lab ID: E0118-05

Project: M&E Connecticut Brownfields
Collection Date: 02/01/06 15:45

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch I
CT ETPH BY GC-FID				**CTETPH_W**			
Extractable Total Petroleum Hydrocarbon	1.4	~~B~~ J	0.035	mg/L	1	02/20/2006 10:26	222
Surr: para-Terphenyl	100		24.4-123	%REC	1	02/20/2006 10:26	222

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

Mitkem Corporation

Date: *23-Feb-06*

Client: Metcalf & Eddy, Inc.
Client Sample ID: ME-1 **Project:** M&E Connecticut Brownfields
Lab ID: E0118-06 **Collection Date:** 02/01/06 10:50

Analyses	Result	Qual	RL	Units	DF	Date Analyzed	Batch ID
T ETPH BY GC-FID				**CTETPH_W**			
Extractable Total Petroleum Hydrocarbon	0.39	~~B~~ J	0.035	mg/L	1	02/20/2006 10:50	22285
Surr: para-Terphenyl	100		24.4-123	%REC	1	02/20/2006 10:50	22285

Qualifiers:

ND - Not Detected at the Reporting Limit
J - Analyte detected below quanititation limits
B - Analyte detected in the associated Method Blank
DF - Dilution Factor
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
RL - Reporting Limit

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

AM-7

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Matrix (soil/water): WATER Lab Sample ID: E0118-07

Level (low/med): MED Date Received: 02/02/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	3.7	~~B~~	UJ	P
7440-38-2	Arsenic	1.6	U		P
7440-39-3	Barium	150	~~B~~	~~B~~ J	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	1.9	~~B~~	UJ	P
7440-47-3	Chromium	0.87	~~B~~	UJ	P
7440-50-8	Copper	247			P
7439-92-1	Lead	7.7	~~B~~	UJ	P
7440-02-0	Nickel	6.3	~~B~~	UJ	P
7782-49-2	Selenium	~~1.5~~	~~B~~	6.0 UJ	P
7440-22-4	Silver	0.91 UJ ~~0.91~~	~~U~~	~~31.5U~~	P
7440-28-0	Thallium	~~1.2~~	~~U~~	7.0 U	P
7440-62-2	Vanadium	3.3	~~B~~	UJ	P
7440-66-6	Zinc	1780			P
7439-97-6	Mercury	0.068	U	J	CV

Comments:

FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-1

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Matrix (soil/water): WATER Lab Sample ID: E0118-06

Level (low/med): MED Date Received: 02/02/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	1.6	U		P
7440-39-3	Barium	112	~~B~~	~~E~~ J	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.36	~~B~~	UJ	P
7440-47-3	Chromium	0.80	~~B~~	UJ	P
7440-50-8	Copper	16.1	~~B~~	UJ	P
7439-92-1	Lead	1.6	~~B~~	UJ	P
7440-02-0	Nickel	5.4	~~B~~	UJ	P
7782-49-2	Selenium	~~2.2~~	~~B~~	6.0 UJ	P
7440-22-4	Silver	0.91 UJ ~~0.91~~	~~B~~	~~35.5 U~~	P
7440-28-0	Thallium	~~1.2~~	~~B~~	7.0 U	P
7440-62-2	Vanadium	2.7	~~B~~	UJ	P
7440-66-6	Zinc	34.9	~~B~~	UJ	P
7439-97-6	Mercury	0.064	U	J	CV

Comments:

FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-2

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Matrix (soil/water): WATER Lab Sample ID: E0118-01

Level (low/med): MED Date Received: 02/02/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.3	~~B~~	UJ	P
7440-38-2	Arsenic	5.4	~~B~~	UJ	P
7440-39-3	Barium	60.7	~~B~~	UJ	P
7440-41-7	Beryllium	0.31	~~B~~	UJ	P
7440-43-9	Cadmium	0.72	~~B~~	UJ	P
7440-47-3	Chromium	125			P
7440-50-8	Copper	152			P
7439-92-1	Lead	14.0			P
7440-02-0	Nickel	18.4	~~B~~	UJ	P
7782-49-2	Selenium	~~5.1~~	~~B~~	6.0 UJ	P
7440-22-4	Silver	0.91 UJ ~~0.91~~	~~B~~	~~31.5U~~	P
7440-28-0	Thallium	~~1.2~~	~~B~~	7.0 U	P
7440-62-2	Vanadium	10.8	~~B~~	UJ	P
7440-66-6	Zinc	52.5			P
7439-97-6	Mercury	0.066	U	J	CV

Comments:

FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-2CS

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Matrix (soil/water): WATER Lab Sample ID: E0118-02

Level (low/med): MED Date Received: 02/02/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.5	~~B~~	UJ	P
7440-38-2	Arsenic	3.9	~~B~~	UJ	P
7440-39-3	Barium	55.4	~~B~~	~~B~~ UJ	P
7440-41-7	Beryllium	0.21	~~B~~	UJ	P
7440-43-9	Cadmium	0.69	~~B~~	UJ	P
7440-47-3	Chromium	144			P
7440-50-8	Copper	173			P
7439-92-1	Lead	14.3			P
7440-02-0	Nickel	16.5	~~B~~	UJ	P
7782-49-2	Selenium	~~2.4~~	~~B~~	6.0UJ	P
7440-22-4	Silver	0.91 UJ ~~0.91~~	~~U~~	~~3.5U~~	P
7440-28-0	Thallium	~~1.2~~	~~B~~	7.0U	P
7440-62-2	Vanadium	11.3	~~B~~	UJ	P
7440-66-6	Zinc	48.3	~~B~~	UJ	P
7439-97-6	Mercury	0.065	U	J	CV

Comments:

FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-5

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Matrix (soil/water): WATER Lab Sample ID: E0118-04

Level (low/med): MED Date Received: 02/02/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	1.4	~~B~~	UJ	P
7440-38-2	Arsenic	1.6	U		P
7440-39-3	Barium	81.8	~~B~~ ~~E~~	UJ	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.23	~~B~~	UJ	P
7440-47-3	Chromium	0.96	~~B~~	UJ	P
7440-50-8	Copper	6.3	U		P
7439-92-1	Lead	2.3	~~B~~	UJ	P
7440-02-0	Nickel	3.9	~~B~~	UJ	P
7782-49-2	Selenium	~~0.98~~	~~B~~	6.0 UJ	P
7440-22-4	Silver	0.91 UJ ~~0.91~~	~~B~~	~~31.5 U~~	P
7440-28-0	Thallium	~~1.2~~	~~B~~	7.0 U	P
7440-62-2	Vanadium	1.2	~~B~~	UJ	P
7440-66-6	Zinc	57.5		U	P
7439-97-6	Mercury	0.065	U	J	CV

Comments:

FORM I - IN SW846

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO

ME-6

Lab Name: Mitkem Corporation Contract: Agmt#20,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Matrix (soil/water): WATER Lab Sample ID: E0118-05

Level (low/med): MED Date Received: 02/02/06

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7440-36-0	Antimony	2.7	~~B~~	UJ	P
7440-38-2	Arsenic	1.6	U		P
7440-39-3	Barium	76.2	~~B~~	~~U~~ UJ	P
7440-41-7	Beryllium	0.15	U		P
7440-43-9	Cadmium	0.16	~~B~~	UJ	P
7440-47-3	Chromium	2.1	~~B~~	UJ	P
7440-50-8	Copper	9.4	~~B~~	UJ	P
7439-92-1	Lead	3.2	~~B~~	UJ	P
7440-02-0	Nickel	2.8	~~B~~	UJ	P
7782-49-2	Selenium	~~0.98~~	~~U~~	6.0 UJ	P
7440-22-4	Silver	0.91 UJ ~~0.91~~	~~U~~	~~3.5 U~~	P
7440-28-0	Thallium	~~1.2~~	~~U~~	7.0 U	P
7440-62-2	Vanadium	5.3	~~B~~	UJ	P
7440-66-6	Zinc	30.2	~~B~~	UJ	P
7439-97-6	Mercury	0.060	U	J	CV

Comments:

FORM I - IN SW846

Attachment III

Data Validation Worksheets

EPA-NE
Data Validation Worksheet Cover Page – Page 1

Site Name AMERBELLE
Reference No. 318.00053

REGION I ORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name MITKEM
Case/Project No. BROWNFIELDS
SDG No. E0118
No. of Samples/Matrix 6 GW 1 TB

SOW Method No. SW846 / MCP
Sampling Date(s) 2/1/06
Shipping Date(s) 2/2/06
Date Rec'd by Lab 2/2/06

Traffic Report Sample Nos. ME-1, ME-2, ME-5, ME-6, AM-1, ME-2CS

Trip Blank No. TB-01
Equipment Blank No. —
Bottle Blank No. —
Field Duplicate Nos. ME-2 & ME-2CS
PES No. —

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision 12/96 was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPjP or amendment to QAPjP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a ~~partial~~ Tier III was used, then identify samples, parameters, etc. that received partial Tier III validation.

The data were evaluated based upon the following parameters:

- Overall Evaluation of Data
- Data Completeness (CSF Audit – Tier I)
- Preservation and Technical Holding Times
- GC/MS & GC/ECD Instrument Performance Check
- Initial and Continuing Calibrations
- Blanks
- Surrogate Compounds
- Internal Standards
- Matrix Spike/Matrix Spike Duplicate
- Field Duplicates
- Sensitivity Check
- PE Samples/Accuracy Check
- Target Compound Identification
- Compound Quantitation and Reported Quantitation Limits
- TICs
- Semivolatile and Pesticide/PCB Cleanup
- System Performance

Region I Definitions and Qualifiers:

A - Acceptable Data
J - Numerical value associated with compound is an estimate quantity
R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
U - Compound not detected at that numerical sample quantitation limit.
UJ - The sample quantitation limit is an estimated quantity
TB, BB, EB – Compound detected in aqueous trip blank, aqueous bottle blank, or aqueous equipment blank associated with soil/sediment samples.

Validator's Name **Richard Purdy**____ Company Name **Metcalf & Eddy** Phone Number **(781) 246-5200**

Date Validation Started 3/29/06. Data Validation Completed 3/31/06

Check if all criteria are met and no hard copy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the data Validation Memorandum.

VOA/SV Worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT	✓
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES	
VOA/SV-II	GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)	✓
VOA/SV-III	INITIAL CALIBRATION	
VOA/SV-IV	CONTINUING CALIBRATION	
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	
VOA-VI	VOA SURROGATE SPIKE RECOVERIES	✓
SV-VI	SV SURROGATE SPIKE RECOVERIES	
VOA/SV-VII	INTERNAL STANDARD PERFORMANCE	
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE	
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	✓
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	
VOA/SV-Pest/PCB-XII	TARGET COMPOUND IDENTIFICATION	NA
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	
VOA/SV-XIV	TENTITIVELY IDENTIFIED COMPOUNDS	
VOA/SV-XV	SEMIVOLATILE CLEANUP	NA
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	

Pest/PCB Worksheets:

VOA/SV-PEST/PCB	COMPLETE SDG FILE (CSF) AUDIT	
VOA/SV-PEST/PCB-I	PRESERVATION AND HOLDING TIMES	
Pest/PCB-IIA	GC/ECD INSTRUMENT PERFORMANCE CHECK-RESOLUTION	
Pest/PCB-IIB	GC/ECD INSTRUMENT PERFORMANCE CHECK-RETENTION TIMES	
Pest/PCB-IIC	GC/ECD INSTRUMENT PERFORMANCE CHECK-ACCURACY CHECK OF INITIAL CALIBRATION	
Pest/PCB-IID	GC/ECD INSTRUMENT PERFORMANCE CHECK-PESTICIDE DEGRADATION	
Pest/PCB-III	INITIAL CALIBRATION	
Pest/PCB-IV	CONTINUING CALIBRATION	
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	
Pest/PCB-VI	SURROGATE COMPOUNDS: SPIKE RECOVERIES AND RETENTION TIME SHIFT	
Pest/PCB-VII	PESTICIDE CLEANUP	
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE	
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	
Pest/PCB-XII	COMPOUND IDENTIFICATION	
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-I

N All Criteria Met

Sampler: D. LaBrecque Company: M&E Contacted: (Yes) No Date: _____

I. PRESERVATION AND HOLDING TIMES: Circle sample numbers with exceeded holding times or omitted preservation
List all required preservation codes and circle omitted preservation codes
Circle all exceeded technical holding times
Identify extraction technique after "# of Days"/(*Extraction Code)

Sample No. (TR No.)	Matrix	Pres. Code	Date Sampled	VOA Date Analyzed	VOA # of Days from Samp. To Anal	VOA Action	BNA Date Extracted	BNA # of Days from Samp. To Extr./(*)	BNA Date Analyzed	BNA # of Days from Extr. To Anal	BNA Action	~~PEST/PCB~~ Date Extracted	~~PEST/PCB~~ # of Days from Samp. To Extr./(*)	~~PEST/PCB~~ Date Analyzed	~~PEST/PCB~~ # of Days from Extr. To Anal	~~PEST/PCB~~ Action
			2006	2006			2006							2006		
ME-1	AQ	1,2	2/1	2/3	2	A	2/8	7	2/16	8	A	VOA	RE	2/3	2	A
ME-2				2/7	6	A										
ME-2CS				2/7	6	A										
ME-5				2/3	2	A	—	—	—	—		VOA	RE	2/7	6	A
ME-6				2/3	2	A	2/8	7	2/16	8		VOA	DL	2/9	8	A
~~MM~~-7				—	—	—										
TB-01				2/15	14	A										

Preservation Code
1. Cool @ 4°C (±2)
2. Preserve with HCl to at least pH 2
3. Protect from light
4. Freeze
5. Room temperature (avoid excessive heat)

(*Extraction Code:)
L/L – Liquid/Liquid
SON – Sonication
SEP – Separatory Funnel SVOA.
SOX – Soxhlet
SPE – Solid Phase Extraction

Action Code:
J - Estimate (J) Detected Values
UJ - Estimate (UJ) Non-Detected Values
R - Reject (R) Non-Detected Values

Validator Richard Purdy Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-I

____ **All Criteria Met**

Sampler: Lafferty Company: M&E Contacted: Yes No Date: _____

I. PRESERVATION AND HOLDING TIMES: Circle sample numbers with exceeded holding times or omitted preservation
List all required preservation codes and circle omitted preservation codes
Circle all exceeded technical holding times
Identify extraction technique after "# of Days"/(*Extraction Code)

Sample No. (TR No.)	Matrix	Pres. Code	Date Sampled	VOA			~~BNA~~ CTETPH					RE ~~PEST/PCB~~				
				Date Analyzed	# of Days from Samp. To Anal	Action	2006 Date Extracted	# of Days from Samp. To Extr./(*)	2006 Date Analyzed	# of Days from Extr. To Anal	Action	2006 Date Extracted	# of Days from Samp. To Extr./(*)	2006 Date Analyzed	# of Days from Extr. To Anal	Action
ME-1	GW	1, 2	2/1/06				2/8	7	2/16	8	Δ	2/17	16	2/20	4	J/UJ
ME-2									2/16					2/20		
ME-2CS									2/16					2/20		
ME-5									2/16					2/20		
ME-6									2/16					2/20		

Preservation Code
1. Cool @ 4°C (±2)
2. Preserve with HCl to at least pH 2
3. Protect from light
4. Freeze
5. Room temperature (avoid excessive heat)

(*Extraction Code:)
L/L – Liquid/Liquid
~~SON~~ – Sonication
SEP – Separatory Funnel
SOX – Soxhlet
SPE – Solid Phase Extraction

Action Code:
J - Estimate (J) Detected Values
UJ - Estimate (UJ) Non-Detected Values
R - Reject (R) Non-Detected Values

Validator Richard Purdy Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV-III

____ **All Criteria Met**

III. INITIAL CALIBRATION – List all analytes that are outside calibration criteria

15% SW846

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	RRF	Samples Affected	Action
2/1/06	V1	VOA	AQ	~~VINYL ACETATE~~	~~25.6~~		~~ME-6DL, TB-01~~	~~J/UJ~~
				~~2-BUTANONE~~	~~25.3~~			~~(+)~~
				~~CHLOROFORM~~	~~21.3~~			~~NONE: CCC~~
				~~2-HEXANONE~~	~~29.5~~			~~J/UJ~~
				NAPHTHALENE	31.8			(1)
				ACETONE	60.7			J/UJ
2/1/06	V6	VOA	AQ	~~CCl_2F_2~~	~~21.1~~		~~ME-1, ME-5, ME-6~~	~~(1)~~
				~~VINYL CHLORIDE~~	~~18.5~~		~~ME-1RE, ME-2,~~	~~NONE: CCC~~
				~~BROMOMETHANE~~	~~24.7~~		~~ME-2CS, ME-5RE~~	~~J/UJ~~
				~~CHLOROETHANE~~	~~20.6~~			~~(+)~~
				~~$CBrF_3$~~	~~16.4~~			
				~~ACETONE~~	~~20.0~~			
				~~IODOMETHANE~~	~~17.7~~			
				~~$MeCl_2$~~	~~20.4~~			
				~~CHLOROFORM~~	~~20.0~~			~~NONE: CCC~~

Comments: (1) RSD OK W/O LOW STD. => UJ(ND); J (< LOW); A (> LOW)

=> use 30%

Validator RICHARD PURDY

Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV-III

____ **All Criteria Met**

III. INITIAL CALIBRATION – List all analytes that are outside calibration criteria

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	RRF	Samples Affected	Action
2/1/06	V6	VOA	AQ	~~2-HEXANONE~~	~~19.7~~		~~ME-1, ME-1RE, ME-2~~	~~J/UJ~~
				~~1122 Cl_2~~	~~21.9~~		ME-2CS, ME-5, ME-5RE	(1)
				~~14 Cl_2 Benzene~~	~~16.3~~		~~ME-6~~	(1)
				~~124 Cl_3 Benzene~~	~~26.5~~			~~J/UJ~~
				NAPHTHALENE	30.3			J/UJ
2/6/06	S3	SVOA	AQ	~~HEXACHLORO~~	~~27.0~~		~~ALL~~	~~J/UJ~~
				24 DND	31.8			
~~ETETPH~~	F1	ETPH	AQ	TPH	ACCEPTABLE			
2/13/06								

Comments: (1) see previous page

Validator Richard Puddy

Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV-IV

___ **All Criteria Met**

IV. CONTINUING CALIBRATION – List all analytes that are outside calibration criteria

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	% D	RRF	Samples Affected	Action
2/1/06	2/3/06	V6	VOA	AQ	ACETONE	29.3		(2)	J/UJ
	2/7/06				~~CHLOROMETHANE~~	~~24.5~~		~~ME-2, ME-2CS, ME-5RE~~	
					~~CHLOROETHANE~~	~~20.9~~			
	2/9/06	V1			~~TCE~~	~~20.8~~		ME-6DL	
	2/15/06				~~VINYL ACETATE~~	~~21.0~~		~~FB-01~~	
					~~2-HEXANONE~~	~~24.1~~			
					NAPHTHALENE	25.2			
		S3	SVOA		ALL ACCEPTABLE				
		F1	TPH		ALL ACCEPTABLE				

Comments: (2) ME-1, ME-5, ME-6, ME-1RE

Validator Richard Purdy

Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-V-A

___ All Criteria Met

V. BLANK ANALYSIS

List the blank contamination below.

Concentration Level: Low

Sampler: LAFORTE Company: M&E Contacted: Yes (No) Date: _____

1. Laboratory: Method, Storage and Instrument Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/ Column	Compound	Conc. (units) UG/L
	2/15/06	VOA / AQ	VBLK1J	V1 / DB624	NAPHTHALENE	2
			VHBLK1J		NAPHTHALENE	1
2/8/06	2/16/06	SVOA / AQ	NO CONTAMINANTS			
2/8/06	2/16/06	TPH / AQ	MB-22132	F1 /	TPH	88
2/17/06	2/20/06	⊥	MB-22285	F1 /	TPH	141

2. Field: Equipment (Rinsate), Trip and Bottle Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/Column	Compound	Conc. (units) UG/L
	2/15/06	VOA / AQ	TB-01	V1/DB624	$MeCl_2$	5
					NAPHTHALENE	2

Validator Richard Purdy Date 3/30/06.

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-V-B

___ **All Criteria Met**

3. **Blank Actions** – List the maximum concentrations of blank compounds.

Compound	Type of Blank	Date Blank Sampled/Originated	Max. Conc. (units)	Action Level (units)	Sample QL	Samples Affected	Action
$MeCl_2$	T	2/1/06	5 UG/L	50	5	~~TB-01~~	O
NAPHTHALENE	T	↓	2	10	5		↓
TPH	MB	2/17/06	141	705	35	ME-1 ME-2 ME-2CS ME-5 ME-6	↓

Comments: (1). SR < RL < BAL => SR = RL U; RL < SR < BAL => SR = SR U _____

Validator Richard Purdy

Date 3/30/06

___ All Criteria Met
___ Not Applicable

VI. SV SURROGATE SPIKE RECOVERIES – List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Base/Neutral Method QC Acceptance Criteria					
	NBZ-d_5	2-FBP	TPH-d_{14}	1,2-DCB-d_4*	Other: TPH	
OLM03.2	Water 35-114 / Soil 23-120	Water 43-116 / Soil 30-115	Water 33-141 / Soil 18-137	Water 16-110 / Soil 20-130	PARA - TERPHENYL	
OLM02.1	40-110	30-110	20-140	NA		
Other:	48-106	38-120	0-147		24.4-123	
Sample Number/Matrix	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**Action**
ME-2					17.2	J/UJ
						& REPORT
						RE-EXTRACT

Method	Acid Method QC Acceptance Criteria					
	Phenol-d_5	2-FP	2,4,6-TBP	2-CP-d_4*	Other:	
OLM03.2	Water 10-110 / Soil 24-113	Water 21-110 / Soil 25-121	Water 10-123 / Soil 19-122	Water 33-110 / Soil 20-130		
OLM02.1	15-115	15-110	15-130	NA		
Other:	0-120	1-103	37-122			
Sample Number/Matrix	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**Action**
ME-6			125			ACCEPT

* Advisory Surrogates – OLM03.2

Validator Richard Puren

Date _____

___ All Criteria Met

VII. INTERNAL STANDARD PERFORMANCE

List the internal standards that are outside the area count and retention time method QC acceptance criteria.
IS Area Count method QC acceptance criteria: 50 % -- 200 %
IS Retention Time method QC acceptance criteria: ± 0.50 min

Sample Number (TR#)	Date and Time Analyzed	Instrument	Parameter	IS Outside Area Count and/or RT Criteria	DCB IS Area	RT Shift	Acceptable Range (IS Area or RT Shift)	3 Action
ME-1	2/3/06 1315	V6	VOA	477481 – 1909924	463478	4		J/UJ
ME-1RE	1914				443507			
ME-5	1752				457929	4		
ME-5RE	2/7/06 1913			476632 – 1906526	401825			
		S3	SVOA	INTERNAL STANDARDS		ACCEPTABLE		
		F1	TPH	IS DATA NOT PROVIDED				

3 QUALIFY ANALYTES USING THAT IS

4 report this analysis

Validator Richard Purdy

Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-VIII

___ **All Criteria Met**

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE – List all MS/MSD analytes that are outside method QC acceptance criteria

Use a separate worksheet for each MS/MSD pair.

Sample # MG-1 Matrix GW Concentration Level L/M

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits		Concentration			%RSD	Action
					% Rec	RPD	Unspiked Sample	MS	MSD		
VOA	MS/MSD ACCEPTABLE				70-130	30					
SVOA	PHENOL	28	26	-	(5)		(6)				J/UJ
	4,6 DN 2MP	94	76	21							
	BENZO(B) FLUORAN			22							
	BIS(2EH) P			21							
TPH	TPH	47.3	40.3	-	50-150	50					J/UJ

(5) 40-140 – B/N
30-130 – ACIDS
20% RPD

(6) ALL COMPOUNDS SPIKED

Validator Richard Purdy Date 3/30/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-IX

___ **All Criteria Met**

IX. FIELD DUPLICATE PRECISION – List all field duplicate analytes that are outside criteria

Use a separate worksheet for each field duplicate pair.

Sample Number ME-2 Duplicate Sample Number ME-2CS Matrix GW

Parameter	Compound	Sample Conc.	Sample QL		Duplicate Conc.	Duplicate QL		30% RPD	QC Acceptance Criteria RPD or NA *	Action
			SQL	2xSQL		SQL	2xSQL			
VOA	ACETONE	23	5	10	19	5	10	19		OK
SVOA	BIS(2EH)P	2	10	20	2	10	20	0		OK
TPH	TPH	7300	35	70	5700	35	70	25		
	TPH (RE)	12000	35	70	8200	35	70	38%		J

* For instances where one duplicate result is ND (or reported less than the sample QL)

Does the MS/MSD data indicate acceptable laboratory precision? Y N

Comments: _____

Sampler Name: LAPERNE Contractor Name: M&E Date Contacted: _____

Reason for Contact and resolution obtained: _____

Validator RICHARD PURDY Date 8/30/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-XI

___ **All Criteria Met**

XIa. ACCURACY CHECK **(Performance Evaluation Results)** – List all analytes that are outside criteria

SDG No. ME0118 CASE: _____

70 – 130 % R
25 % RPD.

Are more that one-half of the PES analytes within criteria for each parameter? (Y) N

PE Sample Number	Ampule Number	Parameter	Type of PES	Matrix	Analyte	Conc.	Region I EPA PES Scores *	Non-EPA PES Scores **	Samples Affected	Action
VIDLCS		VOA	LCS	AQ	ACETONE		54%		ME-6DL	J/UJ
VIDLCSD					ACETONE		58%			
					CARBON DISULFIDE		66%	37% RPD		
VIJLCSD					ACETONE		68%		TB-01	
VIJLCS					~~12 BUTANONE~~		~~120%~~	~~EXCEEDS LAB LIMIT~~		
VGELCSD					ACETONE		150%	56% RPD	ME-2 ME-2CS	
S3DLCS		SVOA	LCS	AQ	PHENOL		28%		ME-1, ME-2 ME-2CS, ME-6 AM-1	
PE SAMPLES NOT SUBMITTED								≤ 30-130		

TPH – ACCEPTABLE.

* For Region I PESs indicate the Region I PES Score Report Result: Action High; Action Low; TCL MISS; TCL CONTAMINANT; TIC HIT: TIC MISS; TIC CONTAMINANT

** For Non-EPA PESs indicate the Non-EPA PES Score: PES COMPOUND MISS; PES COMPOUND CONTAMINANT; PES COMPOUND HIT (% Recovery Limits)

Validator Richard Purdy Date 8/30/06

EPA-NE – Data Validation Worksheet
VOA/SV – Pest/PCB-XIII

___ **All Criteria Met**

XIII. SAMPLE QUANTITATION

Recalculate, from the raw data, the concentrations for one positive detect and one reported sample quantitation limit for a non-detect in a diluted sample or soil sample per fraction. (Note: Although Section XIII, C.1.a, requires that one calculation for each fraction in each sample be performed, the validator is only required to reproduce as example, for each fraction, of one positive detect and one sample quantitation limit calculation on this worksheet.)

Do all soil/sediment samples have % solids greater than 30%? Y N
If no, list the sample numbers _____

Fraction		Calculation
VOA		ME-6
Sample No.:		report from 5x dil cis 12 DCE
Reported Compound:		TCE
Reported Value:		PCE
Non Detected Compound:		
Reported Quantitation Limit:		
BNA		
Sample No.:		
Reported Compound:		
Reported Value:		
Non Detected Compound:		
Reported Quantitation Limit:		
Pesticide/PCB		
Sample No.:		
Reported Compound:		
Reported Value:		
Non Detected Compound:		
Reported Quantitation Limit:		

Validator Richard Purdy

Date 3/30/06

___ All Criteria Met
___ Not Applicable

XIV. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

List the 5 TICs having the high concentration for each parameter.

Sample Number	Parameter	Compound	RRT	Est. Conc.	Action
ME-2	VOA	12 - UNKNOWN			
ME-2CS		6 - UNKNOWN			
		BENZENEAMINE 4 CHLORO-2	14.76	8	
AM-7	SVOA	BENZOIC ACID 2 4 DICHLORO	11.10	14	
		N-HEXANOIC ACIC	13.93	5	
ME-2		14- UNKNOWN			
		HEXANOIC ACID 2 ETHYL	6.41	22	
		BENZENEAMINE 4 CHLORO 2	7.02	98	
		ETHANOL 2(2-(2-BUTOXY	10.74	1100	
		N N BUTYLPHATHALIMIDE	12.36	110	
		3 6 9 12 15 PENTADOXANONA	12.75	570	(ME-2CS)
		ANILINE	4.81	19	(ME-2CS)
ME-2CS		13-UNKNOWN			
		9,10 PHENANTHRENEDION	21.77	27	
		AND AS ABOVE			

Validator Richard Purdy

Date _____

REGION I
Data Review Worksheets

Site Name Amerbelle
Reference Number 318-53

REGION I REVIEW OF INORGANIC CONTRACT LABORATORY DATA PACKAGE

The hardcopied (laboratory name) data package received at Region I has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No. ME0118 SAS No _____ Sampling Date(s) 2/1/06
SDG. No. — Matrix GW Shipping Date(s) 2/2/06
No. of Samples 6 GW Date Rec'd by Lab 2/2/06

Traffic Report Nos: AM-7, ME-1, ME-2, ME-2CS
ME-5, ME-6
Trip Blank No.: —
Equipment Blank No.: —
Field Dup Nos: ME-2 & ME-2CS
PE Sample Nos: —

SOW No. ☐ SW846 & MCP requires that specific analytical work be done and that associated reports be provided by the laboratory to the Regions, EMSL-LV, and SMO. The general criteria used to determine the performance were based on an examination of:

- Data Completeness
- Holding Times
- Calibrations
- Blanks
- ICP Interference Check Results
- Matrix Spike Recoveries
- Laboratory Duplicates
- Field Duplicates
- Lab Control Sample Results
- Lab Fortified Blanks (DAS only)
- ICP Serial Dilution Results
- Detection Limit Results
- Sample Quantitation

Overall Comments: _____

Definitions and Qualifiers:

A - Acceptable Data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Analyte not detected

Reviewer: Richard Purdy Date: 3/31/06

REGION I
Data Review Worksheets

Data Validation Worksheet Cover Page - Page 2

Check if all criteria are met and no hardcopy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the Data Validation Memorandum.

Inorganics Worksheets

✓	I.	DATA COMPLETENESS
✓	II	HOLDING TIMES
✓	III	A. INSTRUMENT CALIBRATION (Section 1)
✓	III	B. INSTRUMENT CALIBRATION (Section 2)
✓	III	C. INSTRUMENT CALIBRATION (Section 3)
	IV	A. BLANK ANALYSIS RESULTS (Section 1-3)
	IV	B. BLANK ANALYSIS RESULTS (Section 4)
✓	V	A. ICP INTERFERENCE CHECK SAMPLE (Sections 1 & 2)
	V	B. ICP INTERFERENCE CHECK SAMPLE (Section 3)
NA	V	C. ICP INTERFERENCE CHECK SAMPLE (Section 4)
✓	VI	MATRIX SPIKE
✓	VII	LABORATORY DUPLICATES
	VIII	FIELD DUPLICATES
✓	IX	LABORATORY CONTROL SAMPLE
✓	X	SENSITIVITY CHECK (MDL and LFB)
	XI	INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS
	XII	A. DETECTION LIMIT ANALYSIS
✓	XII	B. ACCURACY CHECK (Performance Evaluation Results)
✓	XIII	SAMPLE QUANTITATION

I certify that all criteria were met for the worksheets checked above.

Signature: _____ Name: Richard Pursey

Date: 3/31/06

REGION I
Data Review Worksheets

____ All Criteria Met

IV A. BLANK ANALYSIS RESULTS (Section 1-3)

List the blank contamination in Sections 1 & 2 below. A separate worksheet should be used for soil and water samples.

1. Laboratory Blanks MATRIX: _____

DATE	ICB/CCB#	PREP BL	ANALYTE	CONC./UNITS
SEE ATTACHED FORM 3s.				

2. Equipment/Trip Blanks

DATE	EQUIP BL#	ANALYTE	CONC./UNITS
NONE SUBMITTED			

3. Frequency Requirements

A. Was a preparation blank analyzed for each matrix for every 20 samples and for each digestion batch? Yes or No

B. Was a calibration blank run every 10 samples or every 2 hours whichever is more frequent? Yes or No

If No,

The data may be affected. Use professional judgement to determine the severity of the effect and qualify the data accordingly. Discuss any actions below, and list the samples affected.

_____

_____

U.S. EPA - CLP

3
BLANKS

Lab Name: Mitkem Corporation Contract: Agmt#20, WO# 2560,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C		M
Mercury	-0.064	B	-0.088	B	-0.089	B			-0.076	B		

FORM III - IN SW846

U.S. EPA - CLP

3
BLANKS

Lab Name: Mitkem Corporation Contract: Agmt#20, WO# 2560,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Antimony	6.2	B	4.4	B	3.6	B	5.0	B	3.537	B	
Arsenic	1.6	U	1.6	U	2.3	B	2.4	B	1.600	U	
Barium	18.5	B	13.7	B	9.1	B	9.0	B	11.745	B	
Beryllium	0.4	B	0.5	B	0.2	B	0.3	B	0.326	B	
Cadmium	0.5	B	0.8	B	0.3	B	0.5	B	0.570	B	
Chromium	1.7	B	1.4	B	0.8	B	0.9	B	0.994	B	
Copper	6.4	B	6.3	U	6.3	U	6.3	U	7.213	B	
Lead	2.4	B	1.6	B	1.6	B	1.6	B	2.603	B	
Nickel	5.1	B	4.4	B	2.6	B	3.1	B	3.639	B	
Selenium	1.0	U	-1.2	B	1.0	U	1.7	B	1.536	B	
Thallium	1.4	B	-1.4	B	2.1	B	1.8	B	1.200	U	
Vanadium	4.5	B	3.3	B	2.0	B	2.3	B	2.536	B	
Zinc	23.8	B	18.5	B	9.7	B	12.4	B	27.690	B	

U.S. EPA - CLP

3
BLANKS

Lab Name: Mitkem Corporation Contract: Agmt#20, WO# 2560,

Lab Code: MITKEM Case No. SAS No.: SDG No.: ME0118

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Silver	-1.1	B	-5.3	B	-6.3	B	-6.2	B	-5.003	B	

FORM III - IN SW846

____ All Criteria Met

IV B. BLANK ANALYSIS RESULTS (Section 4)

4. Blank Actions

The Action Levels for any analyte is equal to five times the highest concentration of that element's contamination in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the analyte in the sample exceeds the Action Level (AL). Specific actions are as follows:

1. When the concentration is greater than the MDL, but less than the Action Level, report the sample concentration detected with a U.

2. When the sample concentration is greater than the Action Level, report the sample concentration unqualified.

MATRIX: GW MATRIX: _____

ELEMENT	MAX CONC./ UNITS UG/L	AL/ UNITS		ELEMENT	MAX CONC./ UNITS	AL/ UNITS	
HG	-0.089	0.44	CCB	Cu	7.213	36.1	PB
AG	-6.3	31.5	CCB	Pb	2.603	13.0	PB
Sb	6.2	31.0	ICB	Ni	5.1	25.5	ICB
As	2.4	12.0	CCB	Se	1.7 / -1.2	8.5 / 6.0	CCB
Ba	18.5	92.5	ICB	Tl	2.1 / -1.4	10.5 / 7.0	CCB
Be	0.5	2.5	CCB	V	4.5	22.5	ICB
CD	0.8	4.0	CCB	Zn	27.69	138	PB
Cr	0.994	5.0	PB				

NOTE: Blanks analyzed during a soil case must be converted to mg/kg in order to compare them with the sample results.

$$\text{Conc. in } {}^{ug}/_{L} \times \frac{\text{final volume (200mL)}}{\text{weight digested (1gm)}} \times \frac{1L}{1000mL} \times \frac{1000gm}{1Kg} \times \frac{1mg}{1000ug} = {}^{mg}/_{Kg}$$

Multiplying this result by 5 to arrive at the action level gives a final result in mg/kg which can then be applied to sample results.

REGION I ____ **All Criteria Met**
Data Review Worksheets

V B. ICP INTERFERENCE CHECK SAMPLE (Section 3)

1. Report the concentration of any element detected in the ICS A solution > ~~2xMDL~~ RL that should not be present.

ELEMENT	CONC. DETECTED IN THE ICS	CONC. OF INTERFERENTS IN THE ICS			
		AL	CA	FE	MG
Pb	-13, -14				

Estimate the concentration produced by the interfering element in all affected samples. See guidelines for examples. List the samples affected by interferences below:

SAMPLE AFFECTED	ELEMENT AFFECTED	SAMPLE CONC. (ug/L)	SAMPLE INTERFERENT CONC.				ESTIMATED INTERF. (ug/L)
			AL	CA	FE	MG	

ACTIONS:

1. In general, the sample data can be accepted qithout qualification if the sample concentrations of Al,Ca, Fe, Mg are less than 50% of their respective levels in the ICS solution.

2. Estimate (J) positive results for affected elements for samples with levels of interferents 50% or more of that in the ICS solution.

3. Reject (R) positive results if the reported concentration is due entirely to the interfering element.

4. Estimate (UJ) non-detected results for which false negatives are suspect.

Give explanations for any actions taken below:

DATA FOR ~~INTERFERENT~~ INTERFERENTS NOT PROVIDED. COULD NOT ASSESS.

____ All Criteria Met

VIII. FIELD DUPLICATES

List the concentrations of all analytes in the field duplicate pair. For soil duplicates, calculate the CRDL in mg/kg using the sample weight, volume and percents solids data for the sample. Indicate what criteria was used to evaluate precision by circling either the RPD or CRDL for each element.

MATRIX: GW

Element	CRDL Water AES	CRDL Water MS	RL ~~Soil~~	Sample # ME-2	Duplicate# ME-2CS	RPD	Action
Aluminum	200	-					
Antimony	60	2					
Arsenic	10	1	20	5.4	3.9	32	ACCEPT
Barium	200	10					
Beryllium	5	1	5	0.31	0.21	38	ACCEPT
Cadmium	5	1					
Calcium	5000	-					
Chromium	10	2					
Cobalt	50	1					
Copper	25	2					
Iron	100	-					
Lead	10	1					
Magnesium	5000	-					
Manganese	15	1					
Mercury	0.2	-					
Nickel	40	1					
Potassium	5000	-					
Selenium	35	5	30	5.1	2.4	72	ACCEPT
Silver	10	1					
Sodium	5000	-					
Thallium	25	1					
Vanadium	50	1					
Zinc	60	2					
Cyanide	10	-					

Field Duplicate Actions should be applied to all other samples of the same matrix type.

ACTIONS:

1. Estimate (J) positive results for elements which have an RPD >30% for waters and >50% for soils.
2. If sample results are less than 5x the CRDL, estimate (J) positive results and (UJ) nondetected results for elements whose absolute difference is >2xCRDL, (4xCRDL for soil). If both samples are non-detected the RPD is not calculated (NC).

____ All Criteria Met

XI. INDUCTIVELY COUPLED PLASMA (ICP) SERIAL DILUTION ANALYSIS

_____ Serial dilutions were performed for each matrix and results of the diluted sample analysis agreed within ten percent of the original undiluted analysis.

_____ Serial dilutions were not performed for the following: _____

✓ Serial dilutions were performed, but analytical results did not agree within 10% for analyte concentrations greater than 50x the MDL before dilution.

Report all results below that do not meet the required laboratory criteria for ICP serial dilution analysis.

MATRIX: GW (ME-1)

ELEMENT	MDL	50xMDL	SAMPLE RESULT	SERIAL DILUTION	%D	ACTION
Aluminum						
Antimony						
Arsenicm						
Barium	2.1	105	111.91	149.55	33.6	J
Beryllium						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Thallium						
Vanadium						
Zinc						

Actions apply to all samples of the same matrix.
ACTIONS:
1. Estimate (J) positive results if %D >15.

REGION I
Data Review Worksheets

____ All Criteria Met

XII A. DETECTION LIMIT ANALYSIS

1. Method Detection Limits

✓ Method Detection Limit (MDL) results were present and found to be less than the Contract Required Quantitation Limits.

_____ MDLs were not included in the data package on Form XI.

_____ MDLs were present, but the criteria was not met for the following elements: _____

3. Reporting Requirements

_____ Were sample results on Form I reported down to the CRQL not the MDL for all analytes? Yes or No

ok.

_____ Were sample weights, volumes, and dilutions taken into account when reporting quantitation limits on Form I. Yes or No

If No,

The reported results may be inaccurate. Make the necessary changes on the data summary tables and request that the laboratory resubmit the corrected data.

RESULTS < RL

AM-7	Sb	Ba	Cd	Cr	Pb	Ni	Se	V	
ME-1	Ba	Cd	Cr	Cu	Pb	Ni	Se	V	Zn
ME-2	Sb	As	Ba	Be	Cd	Ni	Se	V	
ME-2CS	Sb	As	Ba	Be	Cd	Ni	Se	V	Zn
ME-5	Sb	Ba	Cd	Cr	Pb	Ni	Se	V	
ME-6	Sb	Ba	Cd	Cr	Cu	Pb	Ni	V	Zn

APPENDIX F

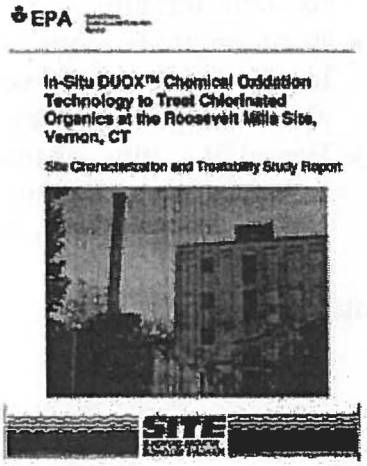
EPA SITE PROGRAM REPORT (JULY 2005) – ROOSEVELT MILLS SITE

http://www.epa.gov/ORD/NRMRL/pubs/540r05008/540r05008.htm
Last updated on Tuesday, June 20th, 2006.

Risk Management Research

EPA/540/R-05/008

In-Situ DUOX™ Chemical Oxidation Technology to Treat Chlorinated Organics at the Roosevelt Mills Site, Vernon, CT Site Characterization and Treatability Study Report[1]
(PDF, 1055 Kb, 45 pp)
July 2005



You will need Adobe Acrobat Reader to view Adobe PDF documents.
Click here to read About Portable Document Format Files[2].

Abstract:

A study was performed investigating the feasibility of applying the DUOX™ chemical oxidation technology to chlorinated solvent contaminated media at the Roosevelt Mills site in Vernon, Connecticut. The Roosevelt Mills site is a former woolen mill that included dry cleaning operations. The plant also housed metal plating operations. The primary contaminants of concern are chlorinated organic solvents: tetrachloroethene (PCE); trichloroethene, (TCE); cis-1,2-dichloroethene (DCE); and vinyl chloride (VC). The DUOX™ technology, developed by researchers at the Environmental Research Institute (ERI) at the University of Connecticut claims to provide a cost-effective, in-situ oxidation process to neutralize chlorinated organic chemicals. The DUOX™ technology utilizes a combination of two types of oxidants to destroy unsaturated chlorinated solvents. The oxidants belong to the persulfate and permanganate families of inorganic compounds. Sodium persulfate is used to satisfy the soil oxidant demand (SOD) and minimize the quantity of potassium permanganate needed to mineralize target compounds. This facilitates the transport of permanganate through the aquifer, allowing for more uniform distribution of permanganate and the use of a much smaller quantity. In turn, this alleviates problems caused by excess permanganate (precipitated manganese dioxide that can result in reduced aquifer permeability).

The study was performed under the auspices of the U.S. Environmental Protection Agency's Superfund Innovative Technology Evaluation (SITE) program. The SITE study consisted of: (1) a site characterization within and outside the Roosevelt Mills building to identify chlorinated source material and characterize the extent of the dissolved phase plume, and (2) a laboratory treatability study to evaluate the effectiveness of the DUOX™ technology on the impacted media at the site.

Results from the study are summarized below:

- A chlorinated solvent source area was located underneath the Roosevelt Mills building in a portion of the foundation fill material (upper 1-3 ft). It appears that pure-phase PCE exists as distinct globules within the coarse-grained fluidized zone.
- Groundwater results, both from inside and outside the building, indicate the presence of a dissolved chlorinated solvent plume emanating from the vicinity of the source area identified in the building.
- The near-surface fill material (source area matrix for the PCE) exhibits a very low soil oxidant demand.
- Permanganate alone and in combination with persulfate is effective in reducing the levels of chlorinated solvents in the site groundwater as well as in spiked soil samples simulating a free-phase globular distribution.
- Persulfate alone, as tested, was ineffective in reducing the levels of chlorinated solvents in any of the experiments. However, due to low SOD, there is no need to use persulfate for the chlorinated solvent source area.

Contact:

Paul Randall
randall.paul@epa.gov}

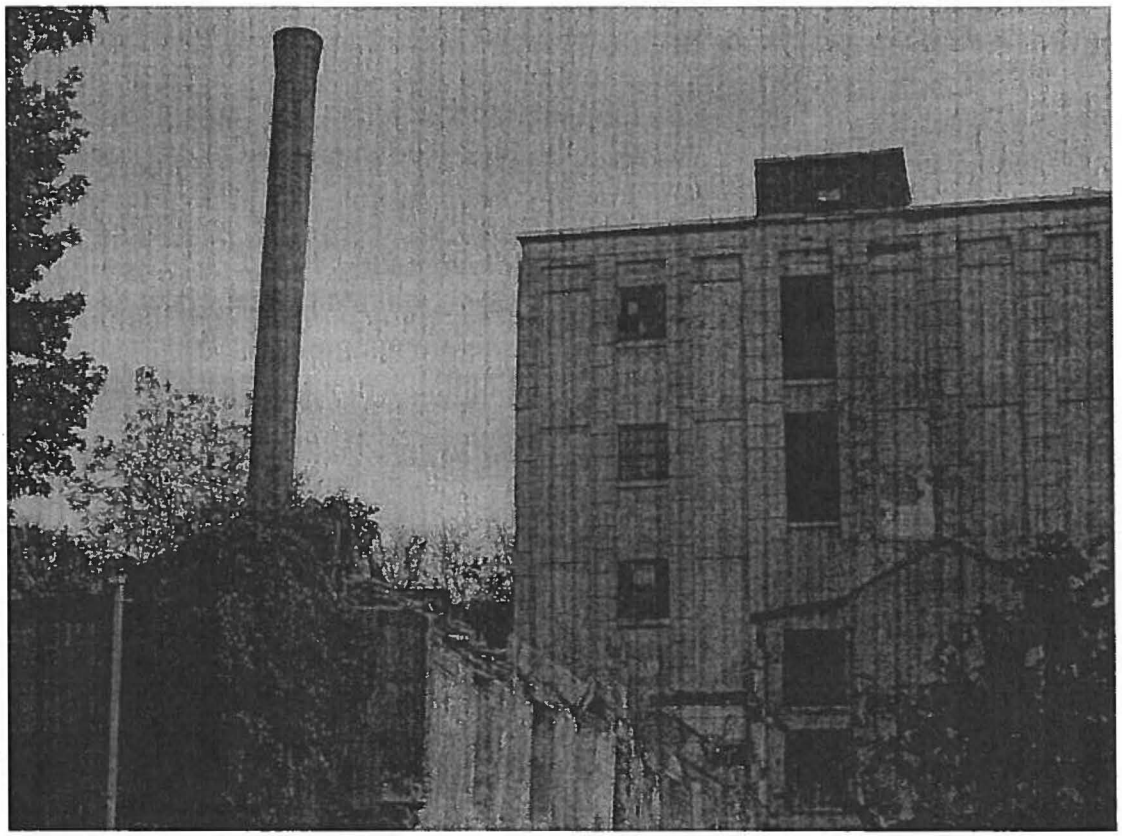
URLs Provided for your Reference

1. http://www.epa.gov/ORD/NRMRL/pubs/540r05008/540r05008.pdf
2. http://www.epa.gov/epahome/pdf.html
3. http://www.epa.gov/ORD/
4. http://www.epa.gov/ORD/NRMRL/

EPA United States Environmental Protection Agency

In-Situ DUOX™ Chemical Oxidation Technology to Treat Chlorinated Organics at the Roosevelt Mills Site, Vernon, CT

Site Characterization and Treatability Study Report



SITE
SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION

Notice

The information in this document has been funded by the U.S. Environmental Protection Agency (EPA) under Contract Number 68-C00-179 to Science Applications International Corporation (SAIC). It has been subjected to the Agency's peer and administrative reviews and has been approved for publication as an EPA document. Mention of trade names or commercial products does not constitute an endorsement or recommendation for use.

Foreword

The U.S. Environmental Protection Agency (EPA) is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory (NRMRL) is the Agency's center for investigation of technological and management approaches for preventing and reducing risks from pollution that threaten human health and the environment. The focus of the Laboratory's research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems. NRMRL collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL's research provides solutions to environmental problems by: developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions; and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This publication has been produced as part of the Laboratory's strategic long-term research plan. It is published and made available by EPA's Office of Research and Development to assist the user community and to link researchers with their clients.

Sally Gutierrez, Director
National Risk Management Research Laboratory

Abstract

A study was performed investigating the feasibility of applying the DUOX™ chemical oxidation technology to chlorinated solvent contaminated media at the Roosevelt Mills site in Vernon, Connecticut. The Roosevelt Mills site is a former woolen mill that included dry cleaning operations. The plant also housed metal plating operations. The primary contaminants of concern are chlorinated organic solvents: tetrachloroethene (PCE); trichloroethene, (TCE); cis-1,2-dichloroethene (DCE); and vinyl chloride (VC). The DUOX™ technology, developed by researchers at the Environmental Research Institute (ERI) at the University of Connecticut claims to provide a cost-effective, *in-situ* oxidation process to neutralize chlorinated organic chemicals. The DUOX™ technology utilizes a combination of two types of oxidants to destroy unsaturated chlorinated solvents. The oxidants belong to the persulfate and permanganate families of inorganic compounds. Sodium persulfate is used to satisfy the soil oxidant demand (SOD) and minimize the quantity of potassium permanganate needed to mineralize target compounds. This facilitates the transport of permanganate through the aquifer, allowing for more uniform distribution of permanganate and the use of a much smaller quantity. In turn, this alleviates problems caused by excess permanganate (precipitated manganese dioxide that can result in reduced aquifer permeability).

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Contents

Notice ii
Foreword iii
Abstract iv
Tables vi
Figures vii
Abbreviations and Acronyms viii
Acknowledgements ix

1.0 Introduction 1-1
1.1 Background 1-1
1.2 Roosevelt Mills Site 1-1
1.3 DUOX™ Technology Description 1-2

2.0 Site Characterization 2-1
2.1 Site Characterization Objectives 2-1
2.2 Site Characterization Execution 2-1
2.3 Site Characterization Results 2-3
2.3.1 Source Area Delineation 2-3
2.3.2 Soil and Groundwater Characterization Results 2-5
2.4 Results from ERI's Field Investigation 2-5

3.0 Treatability Study 3-1
3.1 Purpose of the Treatability Study 3-1
3.2 Treatability Study Objectives 3-1
3.3 Treatability Study Experimental Design 3-1
3.3.1 Task 1 - Preparation and Characterization of Soil and Groundwater 3-2
3.3.2 Task 2 – Determination of Soil Oxidant Demand 3-2
3.3.3 Task 3 - Degradation of VOCs in Groundwater and Soil by $KMnO_4$, $Na_2S_2O_8$ and the Dual Oxidants 3-3
3.4 Treatability Study Results and Conclusions 3-5
3.4.1 Task 1 Results and Conclusions 3-5
3.4.1.1 Particle Size Distribution 3-5
3.4.1.2 Characterization of Fill Material 3-5
3.4.1.3 Groundwater Characterization 3-5
3.4.2 Task 2 Results and Conclusions 3-5
3.4.3 Task 3 Results and Conclusions 3-9
3.4.3.1 Task 3-1 – Treatment of Contaminated Groundwater with Oxidants 3-9
3.4.3.2 Task 3- 2 – Treatment of a Contaminated Groundwater in a Soil Matrix with Oxidants 3-14
3.4.3.3 Task 3-3 – Treatment of Free Phase (Globular) PCE Contaminated Soil/Groundwater Matrix with Oxidants 3-14
3.5 Treatability Study General Conclusions and Discussion 3-19

Tables

2-1 Volatile Organic Compounds in Groundwater 2-6
2-2 Volatile Organic Compounds in Soil 2-7
2-3 Metals and Additional Analytes in Groundwater and Soil 2-8
2-4 ERI VOC Data (Detects) 2-11
3-1 Test Conditions of Batch Experiments for Soil Oxidant Demand (Task 2) 3-3
3-2 Test Conditions for Evaluating the Degradation of VOCs in Groundwater and Soil 3-4
3-3 Sieving Results for the Fill Material 3-6
3-4 Fill Characterization Results 3-7
3-5 Background Groundwater Characteristics 3-8
3-6 Contaminated Groundwater Characteristics 3-9
3-7 Soluble Metals Before and After Ten Days of Oxidant Treatment 3-12
3-8 Results from Contaminated Groundwater Treatment 3-13
3-9 Chlorinated VOC Results from Spiked Groundwater/Soil 3-15
3-10 Other Analytes Results from Spiked Groundwater/Soil 3-16
3-11 Results from Free-Phase (Globular) PCE Contaminated Soil/Groundwater 3-18

Figures

1-1 Roosevelt Mills site map 1-3
2-1 Conceptual model of suspected chlorinated solvent source areas 2-2
2-2 Proposed outside sampling locations 2-2
2-3 CPT push locations inside the building 2-4
2-4 Globules of PCE in the near-surface fill material (from Video-CPT) 2-5
2-5 Soil and groundwater results from inside the building 2-9
2-6 Predicted PCE groundwater plume 2-10
2-7 ERI's sampling locations 2-14
3-1 Oxidant consumption over time – Potassium Permanganate (alone) 3-10
3-2 Oxidant consumption over time – Sodium Persulfate (alone) 3-10
3-3 Oxidant consumption over time – Potassium Permanganate with 1 g/L Sodium Persulfate 3-11
3-4 Oxidant consumption over time – Potassium Permanganate with 72 hour 1 g/L Sodium Persulfate pretreatment 3-11

Abbreviations and Acronyms

ARA	Applied Research Associates
BTSA	Brownfields Targeted Site Assessment
CPT	Cone penetrometer
DCE	Dichloroethene
DNAPL	Dense non-aqueous phase liquid
EPA	U.S. Environmental Protection Agency
ERI	Environmental Research Institute
mg/Kg	Milligrams per kilogram
mg/L	Milligrams per liter
mL	Milliliter
MMFC	Mark Metal Finishing Corporation
NA	Not analyzed
ND	Non-detectable, or not detected at or above the method detection limit
ORD	Office of Research and Development (EPA)
ORP	Oxidation reduction potential
OSWER	Office of Solid Waste and Emergency Response (EPA)
PAHs	Polyaromatic hydrocarbons
PCE	Tetrachloroethene
PSD	Particle size distribution
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SAIC	Science Applications International Corporation
SOD	Soil oxidant demand
SITE	Superfund Innovative Technology Evaluation
SVOCs	Semivolatile organic compounds
S.U.	Standard units
TCE	Trichloroethene
TOC	Total organic carbon
ug/Kg	Micrograms per kilogram
ug/L	Micrograms per liter
um	Micron
USTs	Underground storage tanks
TPH	Total petroleum hydrocarbons
VOA	Volatile organic analysis
VOCs	Volatile organic compounds
VC	Vinyl chloride

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Section 1.0
Introduction

1.1 Background

A study was performed investigating the feasibility of applying the DUOX™ chemical oxidation technology to chlorinated solvent contaminated media at the Roosevelt Mills site in Vernon, Connecticut. The DUOX™ technology, developed by researchers at the Environmental Research Institute (ERI) at the University of Connecticut (referred to as the developer), claims to provide a cost-effective, *in-situ* oxidation process to neutralize chlorinated organic chemicals. The study was performed under the auspices of the U.S. Environmental Protection Agency's Superfund Innovative Technology Evaluation (SITE) program. The SITE Program is a formal program established by the EPA's Office of Solid Waste and Emergency Response (OSWER) and Office of Research and Development (ORD) in response to the Superfund Amendments and Reauthorization Act of 1986 (SARA). The SITE Program promotes the development, demonstration, and use of new or innovative technologies to clean up Superfund sites across the country.

The purpose of the study was to: (1) perform a site characterization of the Roosevelt Mills site to gain an understanding of the extent of groundwater chlorinated solvent contamination and the location of a potential chlorinated solvent source area. The site characterization would be used to assist in determining site-specific parameters associated with the application of the DUOX™ technology, and (2) perform treatability studies on contaminated soil and groundwater from the site that represent potential matrices and conditions that may be considered for subsequent pilot-scale testing at Roosevelt Mills.

This report will present background information on the Roosevelt Mills site and the DUOX™ technology, discuss the results from the site characterization and rationale for selecting media for study, and present the results and conclusions from the treatability study.

1.2 Roosevelt Mills Site

The Roosevelt Mills site is a former woolen mill that included dry cleaning operations. The plant also housed metal plating operations. The primary contaminants of concern are chlorinated organic solvents: tetrachloroethene (PCE); trichloroethene, (TCE); *cis*-1,2-dichloroethene (DCE); and vinyl chloride (VC).

Roosevelt Mills, now owned by the Roosevelt Acquisition Corporation, operated as a woolen mill from the mid-1800s to the late 1980s. The 7-acre site contains four main buildings (see **Figure 1-1**): a three-story Granite Mill Building, constructed in 1836; a one-story addition to the Granite Mill Building, constructed in 1937; a five-story Factory Building, constructed in 1907; and a Boiler House, also constructed in 1906. The Hockanum River has been channeled into two pathways (canal outlet and wasteway) that flow beneath the Granite Mill Building and the Factory Building. A pump-house is adjacent to the Factory Building at the east bank of the Hockanum River. Shenipsit Lake and a water treatment plant that is operated by the Connecticut Water Company border the northern portion of Roosevelt Mills. Groundwater beneath the site and within a 0.5-mile radius of the site is classified as GA (water suitable for drinking without treatment). Shenipsit Lake is utilized as a public water supply reservoir.

Operations conducted at Roosevelt Mills included wool carding, picking, dyeing, knitting, button manufacturing, and dry cleaning. Wool dyeing was conducted in the dye house north of the Granite Mill Building until 1937, then in the "1937 addition" until 1972, when the addition was leased to the Mark Metal Finishing Corporation (MMFC). Aluminum anodizing and electroplating were the two main activities of the MMFC conducted in the "1937 addition" from 1972 to 1996. Dyeing continued in the west basement area of the Factory Building after 1972. Past waste disposal practices by Roosevelt Mills are not known; however, it is probable that the mill discharged waste products to the Hockanum River. Potential sources of site contamination (**Figure 1-1**) include: floor pits; dyeing area; dry-cleaning area; floor

trench that discharged to the river; chemical storage area; electroplating area; former pond and waste house, contaminated soil with boiler slag and ash; fuel oil underground storage tanks (USTs); and a former drum storage area. Roosevelt Mills ceased operations in the mid-1980s, and the site is currently abandoned.

According to a December 1998 Roy F. Weston Inc. report entitled "Roosevelt Mills Site, Brownfields Targeted Site Assessment", EPA-Region I conducted in 1988 an emergency removal of containerized waste and raw materials left in the basement of the factory building when site operations ceased in the mid-1980s. It was noted that PCE was used as a dry-cleaning solvent in the basement dry-cleaning area of the factory building and that raw materials were stored in the basement dyeing and dry-cleaning area of the factory building. Drummed wastes removed during the removal action included several hundred 5 to 55-gallon drums of chemicals associated with dyeing and wool treatment. The drums contained petroleum naphtha, sodium chlorite, sodium acetate, sodium hypochlorite, sodium bisulfate, copper sulfate, sodium sulfate, tetrasodium pyrophosphate, acetic acid, formic acid, sodium hydroxide, hydrochloric acid, botylcarnityl (a pesticide), organic dyes, and pigments.

Other than the 1988 emergency removal, the only remediation measure implemented to date was the removal and replacement of the leaking USTs in the early 1980s. Approximately 1000 cubic yards of petroleum-contaminated soil was excavated, stockpiled on-site, and subsequently removed from the site. Another 10,000-gallon UST discovered leaking in 1985 was replaced with another 10,000 gallon UST.

Historical site characterization and assessment activities at the Roosevelt Mills site include limited soil sampling in the factory and boiler house (1988), installation of groundwater monitoring wells (1990), Phase I and II site assessments (1995), and a Brownfield Targeted Site Assessment (BTSA, 1997). Of theses activities, the BTSA conducted in 1997 provided the most complete picture of the site to date, and provides a starting point for developing a strategy for additional field sampling.

The Roosevelt Mills Brownfields Targeted Site Assessment (BTSA) was conducted by Roy F. Weston, Inc. in two Phases. Phase I sampling was performed in August, 1997; Phase II sampling was performed in April, 1998. During Phase I work, 21 soil samples, 6 sediment samples, and 8 groundwater samples were collected. During Phase II work, 22 soil samples and 7 groundwater samples were collected. Phase I and II samples were analyzed for potential contaminants of concern, including VOCs, SVOCs, TPH, RCRA Metals, PAHs, and Cyanide.

Results of groundwater samples collected during the BTSA reveal the presence of tetrachloroethene (PCE), trichloroethene (TCE), dichloroethene (DCE), and vinyl chloride (VC) at the site. These compounds are found within the near-surface aquifer primarily underlying the mill and main factory buildings. The presence of DCE and VC in the groundwater is evidence that PCE and TCE are being anaerobically biodegraded at the site. Further, the lateral distribution of these compounds follows the direction of groundwater flow and is consistent with migration away from a source region of active biodegradation .

1.3 DUOX™ Technology Description

The DUOX™ technology utilizes a combination of two types of oxidants to destroy unsaturated chlorinated solvents. The oxidants belong to the persulfate and permanganate families of inorganic compounds. The most economical oxidants from each class of oxidants are sodium persulfate ($Na_2S_2O_8$) and potassium permanganate ($KMnO_4$). This *in-situ* chemical oxidation process involves injecting a solution of one or more oxidants in series or simultaneously into the subsurface to mineralize the target contaminants.

In a typical process application, sodium persulfate is first injected into the subsurface and consumed by the combined effect of mineralizing target contaminants and satisfying soil oxidant demand (SOD) (due to reduced conditions and/or high background levels of natural organic matter). The primary purpose of sodium persulfate is to satisfy the SOD and minimize the quantity of potassium permanganate needed to mineralize target compounds. This facilitates the transport of permanganate through the aquifer, allowing for more uniform distribution of permanganate and the use of a much smaller quantity of permanganate. In turn, this alleviates problems caused by excess permanganate (precipitated manganese dioxide that can result in reduced aquifer permeability). This sequential dual treatment protocol can be repeated as many times as necessary to reduce contaminant concentrations to site target levels.

For the proper application and success of this technology, injection well location and oxidant injection rates must be based on a thorough evaluation of the site hydrogeologic conditions and the nature of the organic matter present at the site. An understanding of the extent of contamination at the site is, therefore, an

integral part of this technology. Thus, a careful evaluation of the site-specific parameters, and the extent of contamination, is needed for the proper application and success of this remedial technology.

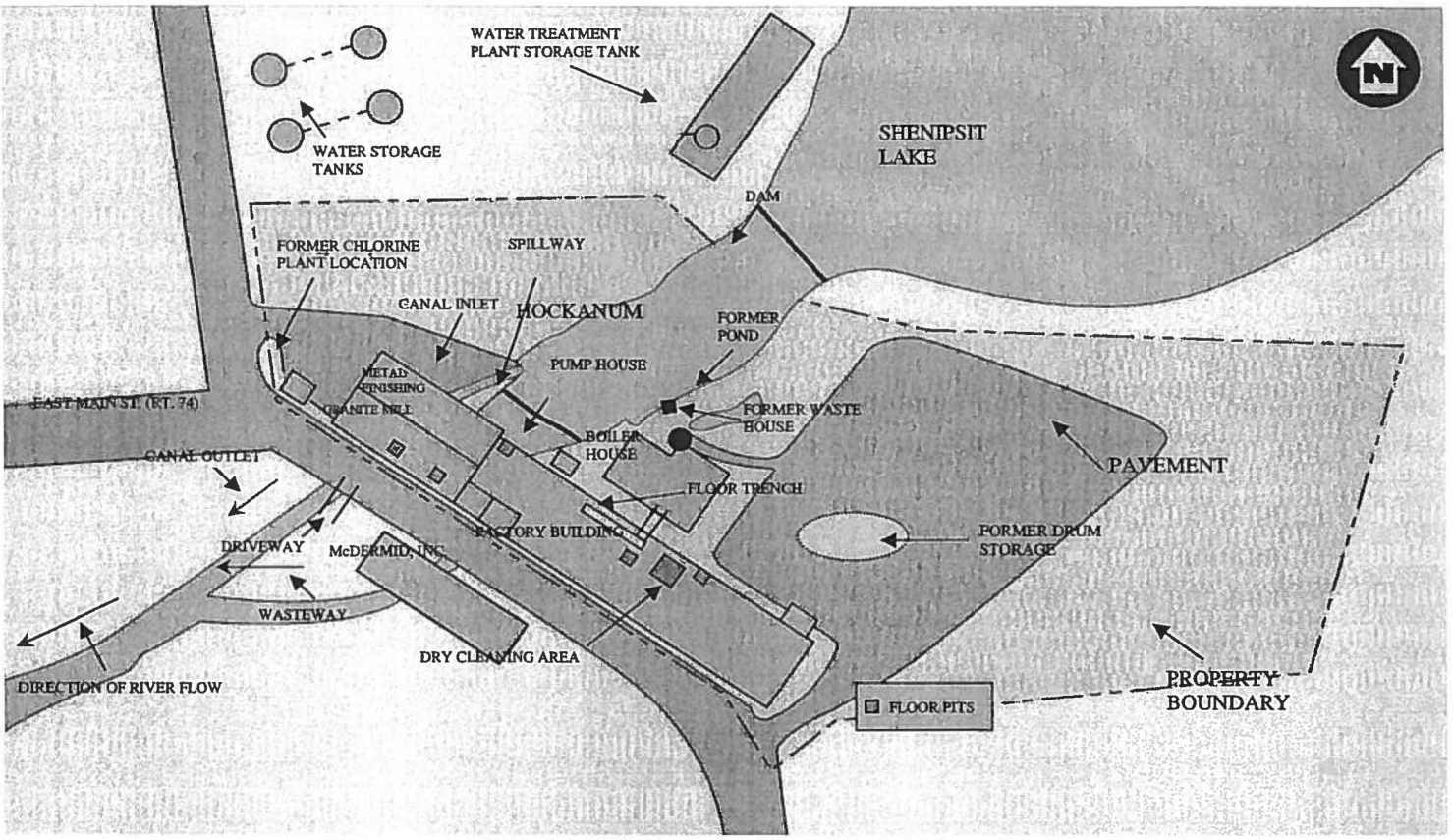


Figure 1-1. Roosevelt Mills site map.

Section 2.0
Site Characterization

2.1 Site Characterization Objectives

The site characterization objectives, as well as sampling and analysis methodologies, is described in the document: "*Quality Assurance Project Plan for the SITE Demonstration of In-Situ DUOX™ Chemical Oxidation Technology to Treat Chlorinated Organics at the Roosevelt Mills Site, Vernon, CT (October 2001)*" The two main goals of the site characterization were to: (1) Retrieve soil and groundwater samples to perform the treatability tests from both the contaminant source area (soil) and the dissolved groundwater plume that meet the following criteria: Soil PCE concentrations of 500-10,000 mg/Kg; Groundwater PCE concentrations of >50 mg/L, and (2) Characterize in sufficient detail to implement, if deemed feasible from the treatability study, a field demonstration of the DUOX™ technology. Characterization goals consist of locating and delineating PCE source areas believed to be beneath the building, defining the extent and concentration of the VOC contaminant plume, and determining the hydrogeologic properties that would be necessary to apply the DUOX™ technology at the Roosevelt Mills site.

Additional goals for the site characterization included: (1) determining the location and delineation of a potential TCE source area if one exists, (2) assessing background levels of metals in the groundwater and soil, and (3) determining the extent and distributions of non-critical VOCs (e.g., acetone) that may be present in the groundwater and/or soil.

2.2 Site Characterization Execution

Site characterization activities were initiated on January 14, 2002 and ended on January 28, 2002. The field activities focused on the collection of groundwater and soil samples both within the structure of the mill and outside the building. In addition to the collection of groundwater and soil samples, the field investigation focused on the collection of field parameters for groundwater (dissolved oxygen, ORP, pH), as well as the collection of subsurface geophysical and visual information via CPT sensors (piezocone and videocone).

Site characterization employed the use of a cone penetrometer (CPT) outfitted with several subsurface sensors and sample acquisition tools. CPT sensors and tools utilized were: (1) a standard piezocone for evaluating the site hydrogeological properties, (2) a Video-CPT for visually identifying the presence of pure-phase chlorinated solvents, (3) a Conesipper tool to collect groundwater samples, and (4) a VERTEK soil sampler to collect discrete soil samples as well as cores for use during the treatability study. Hydrogeological properties at all sample locations were assessed by the use of a standard piezocone. The piezocone determines soil stratigraphy, relative density, strength and hydrogeologic information. At selected depth intervals, pore water pressure was monitored over time to determine relative hydraulic conductivity and hydrostatic head. The video-CPT tool was used to discern the presence of pure-phase solvent by providing a visual assessment of free product which shows up as visually discernable globules.

Initial site characterization activities were focused on determining the location and extent of free product within the building. Based on a conceptual model of the contaminant distribution developed prior to the field investigation, candidate site locations within the building were probed using the Video-CPT tool for the source area. **Figure 2-1** depicts the probable source areas for the chlorinated solvents, and served as the starting locations for exploratory drilling. Locating the source area was the critical first step in defining the remainder of the investigation, and for collecting groundwater and soil samples for the treatability study. Once the source area was located, attention turned to the collection of groundwater samples both inside the building and outside the mill. **Figure 2-2** depicts the locations of the proposed sampling points outside of the mill building. These samples were used to assess the magnitude and extent of the dissolved plume emanating from the source area. It is important to note that samples from several of the outside locations were difficult to obtain due to

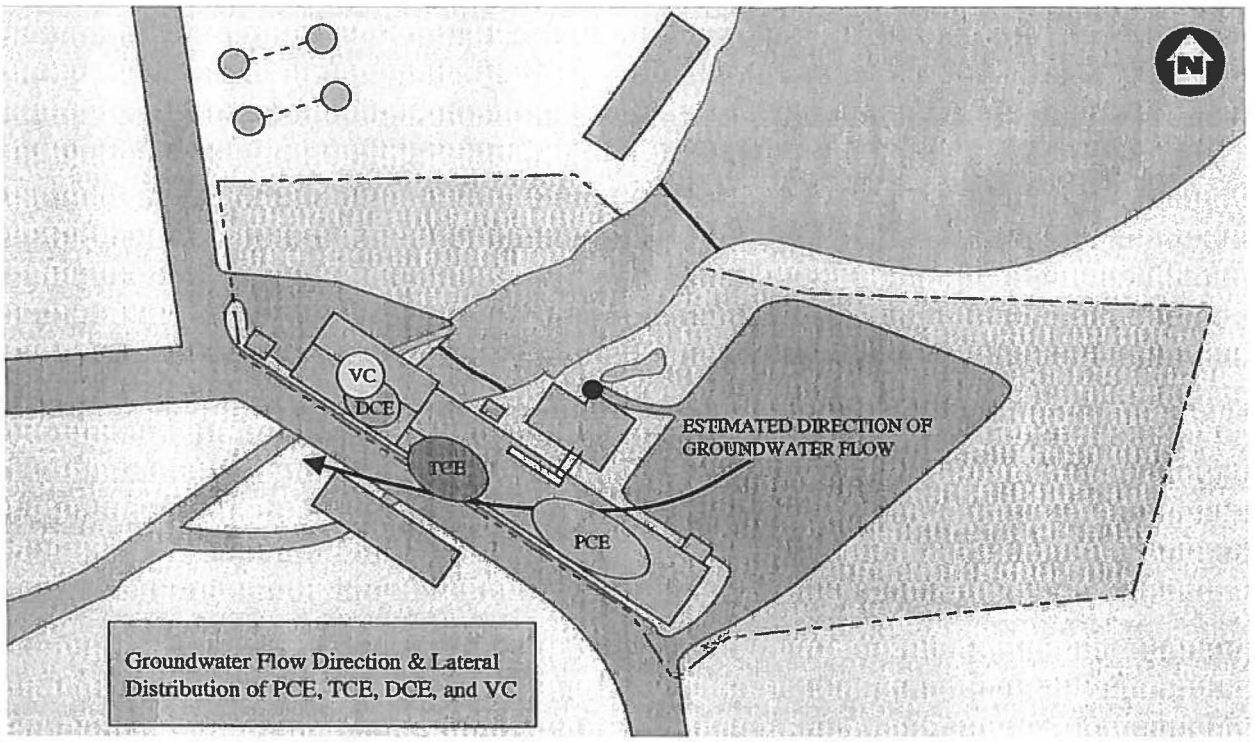


Figure 2-1. Conceptual model of suspected chlorinated solvent source areas.

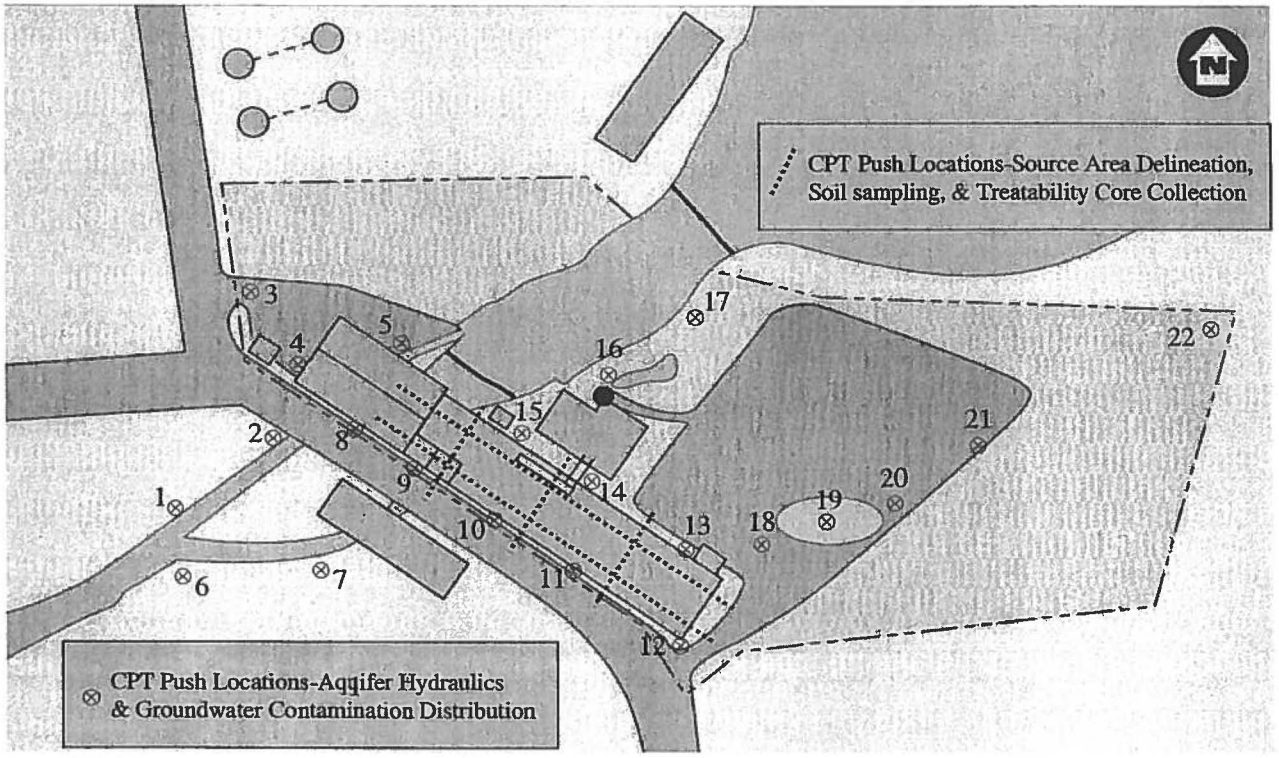


Figure 2-2. Proposed outside sampling locations.

accessibility issues. Subsequent to the January 2001 field effort, ERI performed a site characterization to obtain some of the samples that were not recovered in January. In addition to the collection of samples for analysis, soil cores and contaminated groundwater was recovered for the subsequent treatability study.

Site characterization activities were impacted by the physical conditions associated with sampling and working within the building and subsurface conditions related to the sub-basement. Noteworthy conditions consisted of: (1) a lack of reliable sub-floor plans which required very careful consideration of probe-hole placement and resulted in numerous zones of refusal (2) several areas within the work space that contained asbestos including construction debris and large mill equipment that required re-evaluation of the sampling layout and rig movement, and (3) cold conditions in the building causing ice hazards. In spite of these challenging sample conditions, the source area was delineated and samples were acquired and analyzed to meet the project objectives.

2.3 Site Characterization Results

As previously discussed, the site characterization focused on identification of the source area within the building, and the assessment of the magnitude and extent of soil and groundwater contamination. The following sections will present the results from these two efforts.

2.3.1 Source Area Delineation

Initial efforts focused on the detection and delineation of probable source areas within the building. To accomplish this task, the Video-CPT tool, along with the piezocone tool, were utilized. **Figure 2-3** depicts the push locations inside the building. These locations have the prefix "I" in the text to denote samples taken inside the building. The process consisted of advancing these CPT tools, and visually assessing in real-time, the presence of free phase material. Once detected, a core could be recovered and analyzed for Dense Non-Aqueous Phase Liquid (DNAPL) VOCs from the zones of interest. It was anticipated that the DNAPL source area would be encountered in the deeper strata underlying the building floor. This was based on the tendency for denser-than-water chlorinated solvents to accumulate within the basal sections of aquifers. Contrary to this supposition, no DNAPL was found at depth at the push locations investigated.

The chlorinated solvent source area was located within the basal portion of foundation fill material (upper 1-3 ft) near sample locations I8 and I10. It appears that pure-phase PCE exists as distinct globules within this fluidized zone rather than as a residual phase trapped by pore tension. This is supported by the video cone results and material cores. **Figure 2-4** is a screen capture of the Video-CPT and illustrates the globular nature of the PCE distributed within the coarse grained fill matrix. There is no evidence that the source area exists to the east at or past I7, and to the south past I11. The source area exists within a poorly sorted, fluidized zone which begins under the building foundation and extends to approximately 3 ft below the ground surface. Below the upper fill zone is a more consistent aquifer composed primarily of distinct sand layers interbedded with silty sand and gravel-sand layers (native material). The upper and underlying systems are hydraulically connected and so the groundwater within each is contaminated. However, PCE within the upper zone cannot overcome the pore pressures within the lower system and thus do not appear contaminated as free product. This is supported by video cone results, several core samples, and groundwater samples.

The globular nature of the PCE in the fill material results in a very heterogeneous distribution. Soil samples taken from this zone support the heterogeneous distribution of the source area. A soil sample from I10 in the 1-3' fill material exhibited a tetrachloroethene (PCE) concentration of 1,720 ug/Kg, while a soil sample from the same interval from adjacent I11 exhibited no detectable VOCs. Furthermore, analysis of this fill material is difficult due to the coarse nature and the globular distribution of the PCE within the pore space. In order to assess the level of contamination in this zone, a large volume of material should be extracted and analyzed.

Although there is no evidence of free product in the underlying native material, there are significant levels of dissolved chlorinated volatile organic compounds in the groundwater. These compounds represent both dissolved PCE as well as PCE degradation products derived from reductive dechlorination. It is postulated that PCE has diffused, in a dissolved state, from the overlying fill material into the native material and is being transported in the groundwater system. Reductive dechlorination is occurring in portions of the underlying groundwater system.

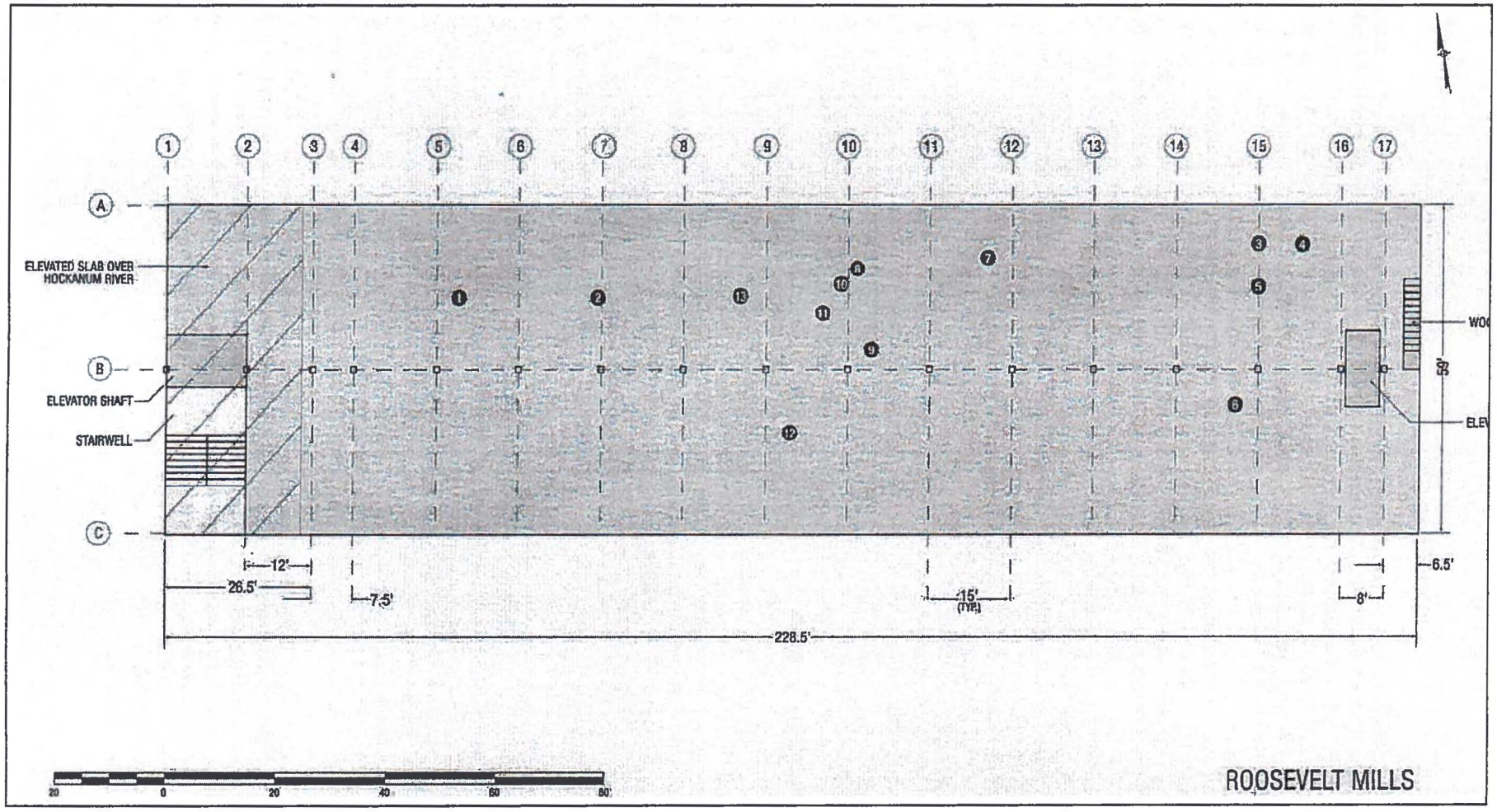


Figure 2-3. CPT push locations inside the building.

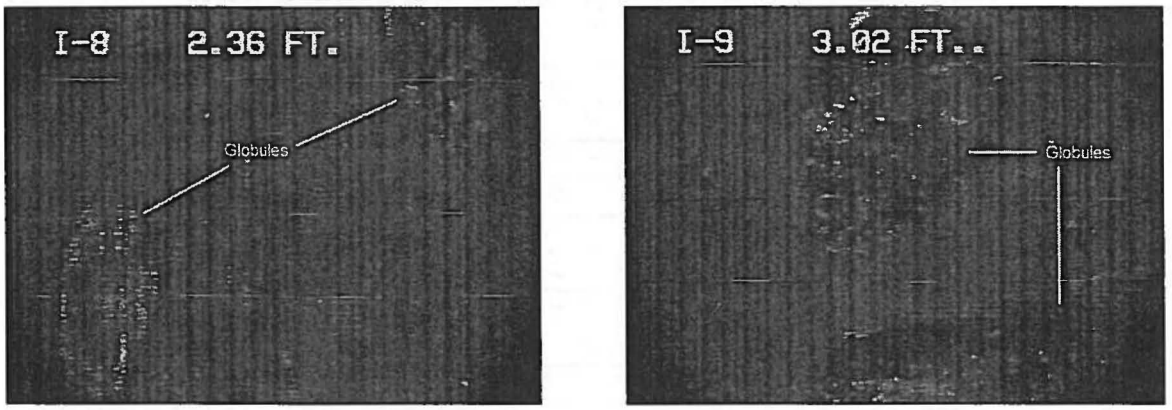


Figure 2-4. Globules of PCE in the near-surface fill material (from Video-CPT).

2.3.2 Soil and Groundwater Characterization Results

Tables 2-1 and **2-2** presents the results of the volatile organic compounds in groundwater and soil from both inside and outside of the building. **Table 2-3** presents the results of metals and other analytes from the soil and groundwater. **Figure 2-5** depicts the distribution of soil and groundwater contamination within the building.

The results from the VOC data, both from inside and outside the building, indicate the presence of a dissolved chlorinated solvent plume emanating from the vicinity of the source area identified in the building. There are several noteworthy characteristics of the solvent plume: (1) concentrations of PCE and chlorinated solvent daughter products are highest directly beneath the source area with concentrations of several hundred ppb, (2) there is evidence that reductive dechlorination is occurring due to the presence of PCE daughter products, and (3) the plume is migrating to the southwest and is consistent with the general groundwater flow. **Figure 2-6** depicts the predicted movement of PCE based on a groundwater model using data from this study as well as regional groundwater flow data.

Groundwater and soil samples acquired from outside of the building to the northeast do not contain significant levels of volatile organic compounds. This area was a potential area of concern due to the reported storage of drums containing hazardous materials. No significant chlorinated solvents were detected, and minor hits of petroleum-based hydrocarbons were encountered.

2.4 Results from ERI's Field Investigation

The Environmental Research Institute of the University of Connecticut, performed a field investigation subsequent to SAIC's field deployment in January. The purpose of ERI's investigation was to further delineate the concentration and extent of chlorinated solvent contamination inside and outside of the building. The results from ERI's characterization confirm and are consistent with the information gathered in January 2002.

ERI's data is presented in **Table 2-4**. **Figure 2-7** depicts sample locations. Note: ERI's data has not been evaluated by the EPA and is presented here for data comparisons.

Table 2-1. Volatile Organic Compounds in Groundwater.

SAMPLE ID	Matrix	Units	Acetone	Benzene	Bromomethane	Carbon disulfide	Chloromethane	1,1-Dichloroethane	cis-1,2-Dichloroethene	t-1,2-Dichloroethene	MeCl2	PCE	Ethylbenzene	Toluene	TCE	VC	Xylenes	Styrene
I1-(7-9)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.2 J	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U	3 U	1 U
I2-(1-4)-GW	GW	ug/L	101	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2 U	14	15	2.7	1	2 U	47	1 U
I5-(2.5-4)-GW	GW	ug/L	4 U	1 U	2 U	1 U	1 U	U	1 U	1 U	2 U	0.9 J	1 U	0.2 J	1 U	2 U	3 U	1 U
I7-(7-10)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.3 J	1 U	1 U	1 U	2 U	1 U	1 U	0.2 J	1 U	2 U	3 U	1 U
I8-(4-6.5)-GW	GW	ug/L	4 U	0.1 J	2 U	1.6	1 U	1.5	32	1.1	2 U	231	1 U	0.5 J	50	4.1	0.3 J	1 U
I9-(3-5.5)-GW	GW	ug/L	4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2 U	60	1 U	1 U	3.1	2 U	3 U	1 U
I10-(6-9)-GW	GW	ug/L	4 U	1 U	1 U	1 U	0.3 J	1 U	1 U	1 U	2 U	20	1 U	1 U	0.4 J	2 U	3 U	1 U
I11-(4-7)-GW	GW	ug/L	4 U	1 U	1 U	1 U	0.2 J	1 U	0.2 J	1 U	2 U	323	1 U	0.2 J	1.4	2 U	3 U	1 U
I11-(4-7)-Gwdup	GW	ug/L	4 U	1 U	2 U	1 U	0.2 J	1 U	1 U	1 U	2 U	127	1 U	1 U	1.6	2 U	3 U	1 U
I12-(7-9)-GW	GW	ug/L	55	1 U	2 U	1 U	1 U	1 U	2.9	1 U	2 U	172	2.2	0.4 J	4.3	2 U	8.7	1 U
I13-(3-6)-GW	GW	ug/L	149	1 U	2 U	1 U	1 U	1 U	36	1.1	2 U	69	1 U	1 U	115	0.7 U	3 U	1 U
O18-(10-13)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.5 J	1 U	1 U	1 U	2 U	1 U	1 U	0.3 J	1 U	2 U	3 U	1 U
O22-(6-9)	GW	ug/L	4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U	3 U	1 U
O24-(4-7)-GW	GW	ug/L	4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1.9	1 U	2 U	3 U	1 U
O26-(6-9)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.3 J	1 U	1 U	1 U	2 U	0.3 J	1 U	1 U	0.3 J	2 U	3 U	1 U
O27-(12.5-15.5)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.3 J	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U	3 U	1 U
O28-(12-15)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.2 J	1 U	1 U	1 U	2 U	0.2 J	1 U	1 U	1 U	2 U	3 U	1 U
O29-(10-13)-GW	GW	ug/L	4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	0.2 J	1 U	2 U	3 U	1 U
O29-(10-13)-GW-dup	GW	ug/L	4 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U	3 U	1 U
O30-(17-20)-GW	GW	ug/L	4 U	1 U	2 U	1 U	0.4 J	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U	2 U	3 U	1 U

U = Not Detected at the concentration indicated (e.g. 4U means not detected at a 4 ug/L detection limit)

J = Estimated Value

Table 2-2. Volatile Organic Compounds in Soil.

SAMPLE ID	Matrix	Units	Acetone	Benzene	Bromomethane	Carbon disulfide	Chloromethane	1,1-Dichhloroethane	cis-1,2-Dichloroethene	t-1,2-Dichlorethene	MeCl2	PCE	Ethylbenzene	Toluene	TCE	VC	Xylenes	Styrene
I1-(8-10)-S	Soil	ug/Kg	320 U	81 U	160 U	81 U	39 J	81 U	81 U	81 U	160 U	34 J	81 U	81 U	81 U	160 U	240 U	81 U
I7-(6-8)-S	Soil	ug/Kg	220 U	56 U	110 U	56 U	56 U	56 U	56 U	56 U	110 U	56 U	56 U	56 U	56 U	110 U	170 U	56 U
I8-(4.5-6.5)-S	Soil	ug/Kg	220 U	54 U	110 U	54 U	20 J	54 U	54 U	54 U	110 U	54 U	54 U	54 U	54 U	110 U	160 U	54 U
I10-(7-9)-S	Soil	ug/Kg	220 U	56 U	110 U	56 U	56 U	56 U	56 U	56 U	110 U	22 J	56 U	56 U	56 U	110 U	170 U	56 U
I10-(7-9)-Sdup	Soil	ug/Kg	17 U	56 U	28 J	56 U	56 U	56 U	56 U	56 U	8.7 J	56 U	56 U	56 U	56 U	110 U	170 U	56 U
I11-(5-7)-S	Soil	ug/Kg	240 U	58 U	120 U	58 U	58 U	58 U	58 U	58 U	120 U	58 U	58 U	58 U	58 U	120 U	170 U	58 U
I12-(7-9)-S	Soil	ug/Kg	220 U	56 U	110 U	56 U	58 U	58 U	58 U	58 U	110 U	58 U	58 U	58 U	58 U	110 U	170 U	58 U
I13-(2-4)-S	Soil	ug/Kg	240 U	62 U	120 U	62 U	30 J	62 U	62 U	62 U	120 U	300	62 U	62 U	37 J	120 U	190 U	62 U
I2-(1-3)-S	Soil	ug/Kg	220 U	55 U	110 U	55 U	55 U	55 U	55 U	55 U	110 U	270	63	12 J	16 J	110 U	160 U	55 U
O24-(6-7.7)-S	Soil	ug/Kg	34 U	56 U	110 U	56 U	56 U	56 U	56 U	56 U	17 J	56 U	8 J	27 J	49 J	110 U	27 J	3.7 J
O27-(5-7)-S	Soil	ug/Kg	14 U	59 U	120 U	59 U	59 U	59 U	59 U	59 U	7.1 J	59 U	59 U	59 U	44 J	120 U	180 U	3.9 J
O28-(13-15)-S	Soil	ug/Kg	14 U	57 U	110 U	57 U	57 U	57 U	57 U	57 U	7.1 J	57 U	57 U	57 U	38 J	110 U	170 U	57 U
O29-(9-10.5)-S	Soil	ug/Kg	19 U	57 U	110 U	57 U	57 U	57 U	57 U	57 U	9.6 J	57 U	57 U	57 U	36 J	110 U	170 U	57 U
O30-(15-17)-S	Soil	ug/Kg	17 U	55 U	110 U	55 U	55 U	55 U	55 U	55 U	8.5 J	55 U	55 U	55 U	36 J	110 U	160 U	3.3 J
O18-(12-14)-S	Soil	ug/Kg	260 U	66 U	37 J	66 U	66 U	66 U	66 U	66 U	130 U	66 U	66 U	66 U	66 U	130 U	200 U	66 U
O19-(10-12)-S	Soil	ug/Kg	260 U	64 U	130 U	64 U	64 U	64 U	64 U	64 U	130 U	64 U	64 U	64 U	64 U	130 U	190 U	64 U
O20-(5-7)-S	Soil	ug/Kg	240 U	62 U	120 U	62 U	62 U	62 U	62 U	62 U	120 U	62 U	62 U	62 U	62 U	120 U	190 U	62 U
O21-(6-8)-S	Soil	ug/Kg	280 U	69 U	140 U	69 U	69 U	69 U	69 U	69 U	140 U	69 U	69 U	69 U	69 U	140 U	210 U	69 U
O23-(2-4)-S	Soil	ug/Kg	240 U	60 U	120 U	60 U	60 U	60 U	60 U	60 U	120 U	60 U	60 U	60 U	60 U	120 U	240 U	60 U
O25-(8-10)-S	Soil	ug/Kg	260 U	64 U	130 U	64 U	64 U	64 U	64 U	64 U	130 U	64 U	64 U	64 U	64 U	130 U	190 U	64 U
O25-(8-10)-Sdup	Soil	ug/Kg	260 U	64 U	130 U	64 U	64 U	64 U	64 U	64 U	130 U	64 U	64 U	64 U	64 U	130 U	190 U	64 U
O26-(3-5)-S	Soil	ug/Kg	240 U	7 J	120 U	61 U	61 U	61 U	61 U	61 U	120 U	61 U	16 J	48 J	61 U	120 U	80 J	61 U

U = Not Detected at the concentration indicated (e.g. 220U means not detected at a 200 ug/Kg detection limit)

J = Estimated Value

Table 2-3. Metals and Additional Analytes in Groundwater and Soil.

SAMPLE ID	Matrix	Units	As	Cr	Fe	Pb	Mn	Se	K	Na	Sulfide	TOC	pH	Total Solids
I1-(7-9)-GW	GW	mg/L	0.014	0.12	90	0.049	1.4	0.01U	4.5	11				
I5-(2.5-4)-GW	GW	mg/L	0.14	0.45	740	0.53	28	0.01U	210	56				
I7-(7-10)-GW	GW	mg/L	0.034	0.23	590	0.26	19	0.01U	230	18				
I8-(4-6.5)-GW	GW	mg/L	0.14	0.93	660	1.3	43	0.01U	160	36				
I9-(3.0-5.5)-GW	GW	mg/L	0.098	0.47	670	0.43	29	0.01U	120	17				
I1-(8-10)-S	Soil	mg/Kg	3.1U	39		3.1		3.1U			30U	27200	6.76	61.7
I10-(7-9)-S	Soil	mg/Kg	2.1U	11	28000	1.1U		3.2			30U	320U		89.7
I11-(5-7)-S	Soil	mg/Kg	2.2U	8.7	28000	1.1U		3.2			30U	340U		86.2
I12-(7-9)-S	Soil	mg/Kg	2.1U	9.7	29000	1.1U		2.1U			30U	370U		89.3
I13-(2-4)-S	Soil	mg/Kg	2.4U	11	30000	2.4		4.7			30U	1480		80.2
I2-(1-3)-S	Soil	mg/Kg	2.1U	6.4	31000	4.2		3.2						91.1
I7-(6-8)-S	Soil	mg/Kg	2.2U	5.6		1.1U		2.2U			30U	290U	6.11	89.4
I8(4.5-6.5)-S	Soil	mg/Kg	2.1U	12		1.0U		4.1			30U	290U	8.47	91.8
O18-(12-14)-S	Soil	mg/Kg	2.4U	13	11000	3.6		2.4U			30U	280U		75.3
O19-(10-12)-S	Soil	mg/Kg	2.4U	22	20000	5.9		2.4U			30U	290U		78.4
O20-(5-7)-S	Soil	mg/Kg	1.9U	19	16000	4.7		1.9U			30U	400U		80.7
O21-(6-8)-S	Soil	mg/Kg	2.3U	15	13000	3.4		2.3U			30U	280U		72.9
O23-(2-4)-S	Soil	mg/Kg	2.3U	13	19000	1.1		2.3U			30U	430U		83
O24-(6-7.7)-S	Soil	mg/Kg	3.9	7.9	24000	3		3			60U	4500		90
O25-(8-10)-S	Soil	mg/Kg	2.4U	8.5	80	1.2		2.4U				3600		78.4
O25-(8-10)-S (dup)	Soil	mg/Kg	2.4U	12	14000	3.7		2.4U						
O26-(3-5)-S	Soil	mg/Kg	13	27	23000	26		3.7			30U	85000		82
O27-(5-7)-S	Soil	mg/Kg	2.4U	9.3	20000	2.4		2.4U			30U	4500		84.2
O28-(13-15)-S	Soil	mg/Kg	2.1U	17	25000	3.1		2.1			30U	260U		87
O29-(9-10.5)-S	Soil	mg/Kg	2.2U	11	11000	3.3		2.2U			30U	330U		87.2
O30-(15-17)-S	Soil	mg/Kg	2.2U	19	24000	2.2		3.3			30U	410U		91.6
I12-(7-9)-S	SPLP	mg/Kg	0.02U	0.01U	3.5	0.01U		0.02U						
O28-(13-15)-S	SPLP	mg/Kg	0.02U	0.01U	0.02U	0.01U		0.02U						

U = Not Detected at the concentration indicated (e.g. 3.1U means not detected at a 3.1 mg/Kg detection limit)

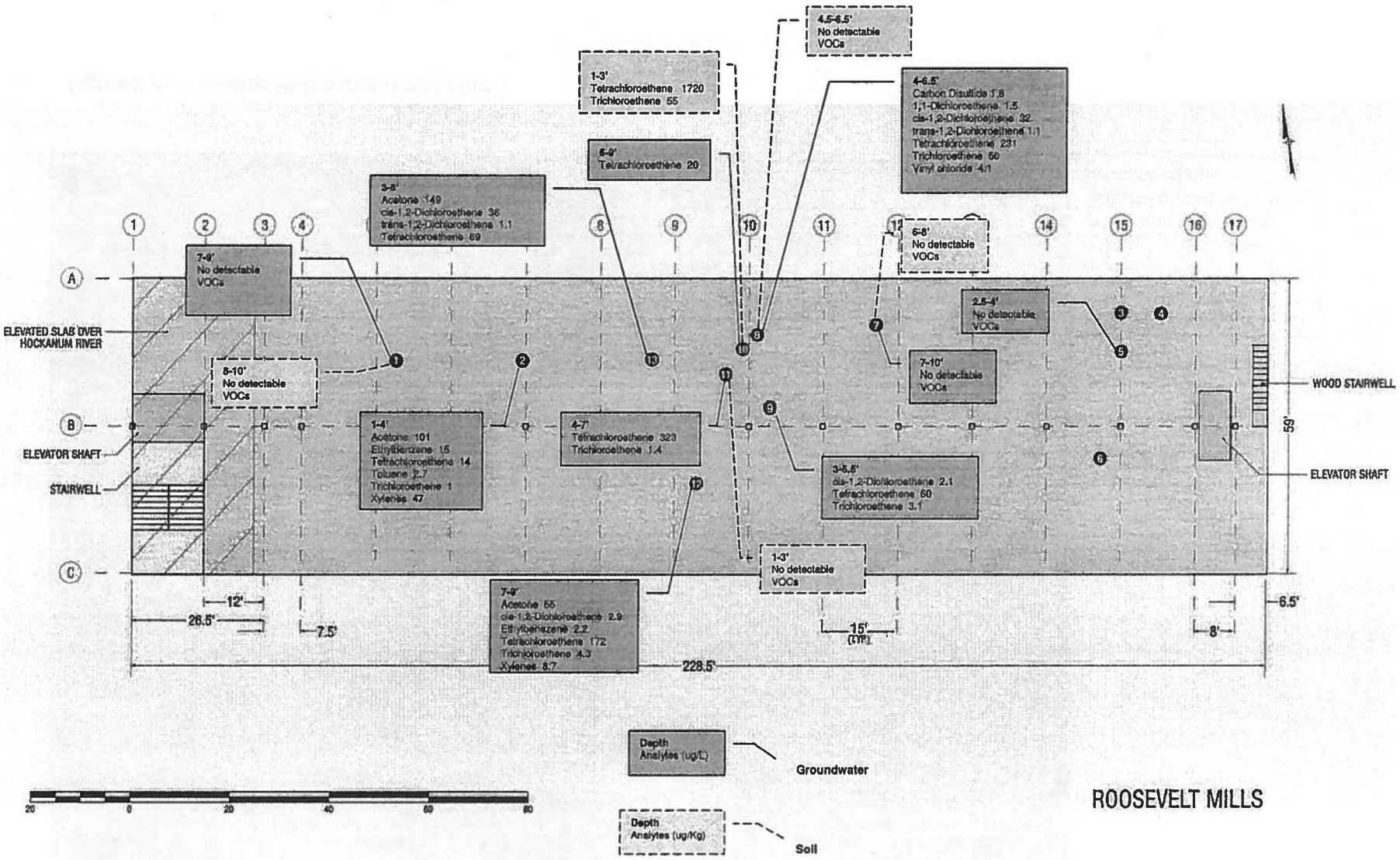
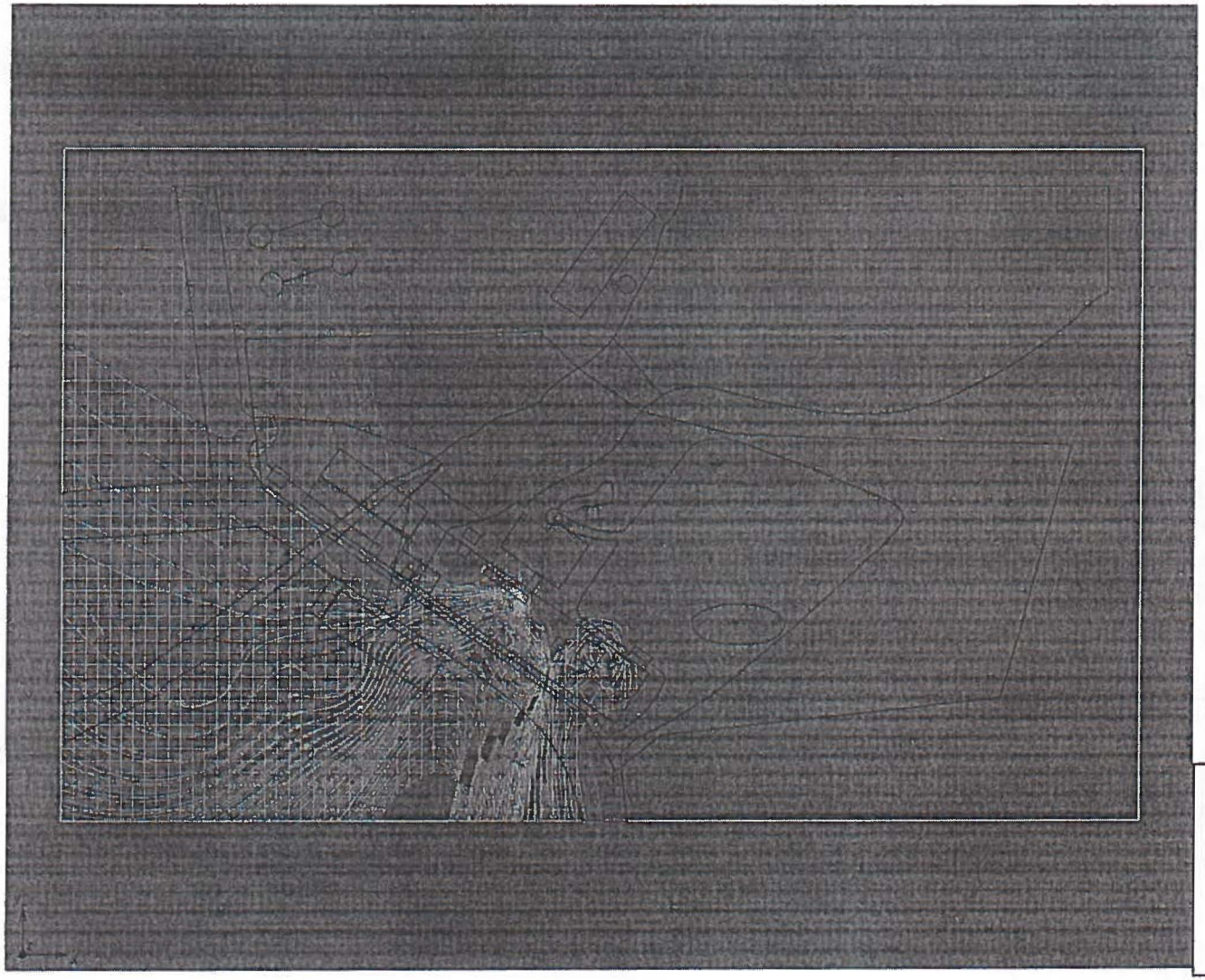


Figure 2-5. Soil and groundwater results from inside the building.



Note: Yellow and orange areas indicate probable higher concentrations, while green and blue areas indicate probable lower concentrations.

Figure 2-6. Predicted PCE groundwater plume.

Table 2-4. ERI VOC Data.

Sample#	RM4-9-7.5*	RM8-8	RM9-12	RM9-15	RM10-12	RM10-14	RM11-1-23-22	RM11-1-26-25	RMB28-14-13
Sampling date	2/19/02	2/11/02	2/12/02	2/12/02	2/13/02	2/13/02	2/14/02	2/14/02	5/8/02
Compound									
Trichloroethene	8.6	36.1	5	18.4					10.7
Tetrachloroethene	44.9	30.7	2.1	31.6	1.1***	1.2***			27.2
(Cis)-1,2-Dichloroethene		17.1	1.9	3					13.6
Chloroethene (Vinyl Chloride)		1.2							
4-iso-Propyltoluene		10.8							
Naphthalene		3.6							
(trans)-1,2-Dichloroethene			1.3						0.8
MTBE							2.5	4	
Sample#	RMB24-13-10**	RMB20-7-4	RMB20-10-7	RMB14-8-5					
Sampling date	5/30/02	5/31/02	5/31/2002	6/10/02					
Compound									
Trichloroethene	7.4			3.4					
Tetrachloroethene	24	6.5	9.8	9.5					
(Cis)-1,2-Dichloroethene	12.6			2.3					
Chloroethene (Vinyl Chloride)				1.4					
Sample#	RMB13-8-5	RMB13-15-12	RMB12-8-5	RMB12-15-12	RMB11-8-5-G	RMB11-13-10-G	RMB10-8-5	RMB9-6-4	
Sampling date	6/10/02	6/10/02	6/11/02	6/11/02	6/11/02	6/11/02	6/12/02	6/12/02	
Compound									
Trichloroethene							2.4	3.4	
Tetrachloroethene	679	4	164	3.3	776	235	14.4	6.9	
(Cis)-1,2-Dichloroethene								2.7	

Table 2.4 (cont'd)

Sample#	RMB6-7-4	RMB15-10-7	RMB15-6-3	RMB15-7-6	RMB17-6-4	RMB18-5-3	RMB18-14-10		
Sampling date	6/13/02	6/3/02	6/3/02	6/3/02	6/4/02	6/4/02	6/4/02		
Compound									
Trichloroethene	211		15.5	5.4	4.3	346			
Tetrachloroethene	321	2.4	19.4	7.5	7.4	287	4.6		
(Cis)-1,2-Dichloroethene	154		3.1	1.4		41.1			
(trans)-1,2-Dichloroethene						1.1			
1,1-Dichloroethene	1.3								
Sample#	RMB23-8-5	RMB23-11-8	RMB22-8-5	RMB22-11-8	RMB27-12-9	RMB21-11-8	RMB21-8-5	RMB26-12-9	RMB26-9-6
Sampling date	6/5/02	6/5/02	6/5/02	6/5/02	5/29/02	5/30/02	5/30/02	5/29/02	5/29/02
Compound									
Trichloroethene	3.7	3.6	5.9	3.7	2.2	1.3	2.7		1.4
Tetrachloroethene	32.5	39.8	70.8	51.4		13	33		9.4
(Cis)-1,2-Dichloroethene	1.1		1.2		4.8			4.2	

Sample#	020603-TB	020604-TB	LAB BLK	020614-FB	020614-TB	020613-FB	020605-TB	020611-TB	LAB BLK	020529-TB
Sampling date	6/3/02	6/4/02	6/6/02	6/14/02	6/14/02	6/13/02	6/5/02	6/11/02	6/18/02	5/29/02
Compound										
Chloroethene (Vinyl Chloride)							3			
Acetone	5	6		4	4	6		4		4
Dichloromethane		1	2		1			2	2	
Naphthalene	3	3								
Methyl Ethyl Ketone (MEK)								2		1

Table 2.4 (cont'd)

Sample#	020612-TB	020612-FB	020613-TB	020530-TB	020531-TB	020610-TB	020211-FB	020213-TB	020213-FB	020212-FB
Sampling date	6/12/02	6/12/02	6/13/02	5/30/02	5/31/02	6/10/02	2/11/02	2/13/02	2/13/02	2/12/02
Compound										
Tetrachloroethene							0.6		1.1	
Acetone	4	4	4		4	4		3	5	6
Dichloromethane				3	3	1				
Methyl Ethyl Ketone (MEK)						2				

* RM4-9-7.5 means RM at SAIC location 4 from 9 to 7.5 ft BGS
**RMB24-13-10 means RMB at ERI location 24 from 10 to 13 BGS
*** FB has 1.1 ppb of PCE

TB is trip blank
FB is field blank

List of Non-Detect Samples

Field samples

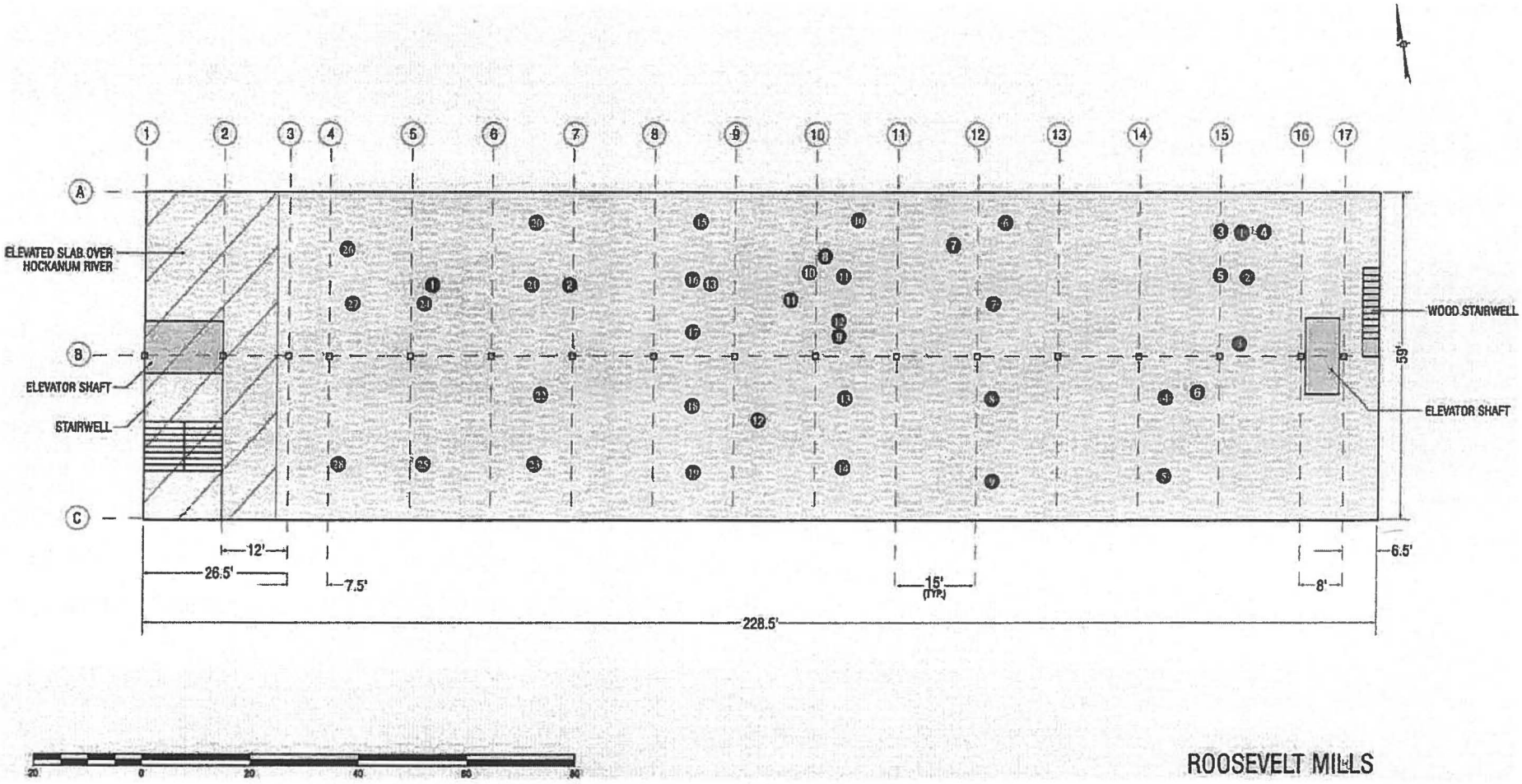
RMB24-9-6
RMB14-12-9
RMB10-9-7
RMB7-11-7
RMB5-7-3
RMB4-4-2
RMB3-5-4
RMB16-18-14
RMB13-25-21
RMB13-25-21-B
RMB16-8
RMB16-11
RM12-31-30-A (unfiltered)
RM12-31-30-A (filtered)
RMB17-7-6

Blanks

020531-FB
020530-FB
020529-FB
Lab Blank 6/3/02
020610-FB
020611-FB
020211-TB
Lab Blank 2/11/02
Lab Blank 2/15/02
020212-TB
020214-TB
020214-FB
Lab Blank 2/15/02
Lab Blank 2/22/02
020215-TB
020215-FB
020219-FB
020219-TB
020218-FB
020218-TB
020605-FB
020610-FB

Shallow refusal locations

RMB1	refusal at 1.5'
RMB2	refusal at 1'
RMB8	refusal at 2'
RMB19	refusal at 3'
RMB25	refusal at 3'



ERI locations are in blue

Figure 2-7. ERI's sampling locations

Section 3.0
Treatability Study

3.1 Purpose of the Treatability Study

The usability and benefits of the DUOX™ technology are dependent on the types and concentrations of the contaminants of concern, as well as characteristics of the associated matrix (soil and groundwater). Therefore, laboratory-based treatability studies are necessary prior to field implementation of the technology. Several treatability tests can be performed. Dosing experiments are needed to determine adequate oxidant types and concentrations in order to assure complete oxidation of the chlorinated organics (in soil and groundwater) without overdosing. Overdosing is undesirable from a cost perspective as well as potentially interfering with beneficial downgradient naturally-occurring reductive dechlorination processes. Dosing experiments addressing soil oxidant demand (SOD) are also beneficial for determining the expenditure of oxidants due to soil characteristics (oxidizable minerals and organic carbon compounds). SOD expenditure is a key feature of the DUOX™ technology, since low-cost oxidants are used to expend SOD. Finally, optimized oxidant candidates are tested on retrieved materials from the site to simulate treatment and determine reduction rates and efficiencies. For the Roosevelt Mills study, it was necessary to develop and test a spiked soil-fill matrix based on the results from the site characterization study. The findings from the site characterization study indicated that the source of the PCE was associated with a near-surface, coarse-grained fill material containing heterogeneously distributed globules of PCE. It was impossible to set-up identical replicates for the treatability study due to the inherent heterogeneity of the contaminated fill material. Therefore, uncontaminated fill material was retrieved from the site, screened, and spiked with appropriate levels of PCE to simulate globular-phase contamination.

The following sections discuss the treatability study objectives, experimental design, and results and conclusions.

3.2 Treatability Study Objectives

The objectives of the treatability study focused on evaluating the ability of the DUOX™ technology to treat both dissolved chlorinated organics in the groundwater as well as the globular free-phase PCE in the shallow fill material. Therefore, two primary objectives were established for the treatability study, and are summarized below:

1. Groundwater treatment - Concentrations of each of the target VOCs (PCE, TCE, DCE, VC), present in the groundwater, will reach 5 ug/l or less at the end of a 120 hr batch test using an optimized oxidant mixture (determined during optimization experiments) employing both oxidant solutions in series or combination.

2. Soil/Groundwater treatments - Achieve a 90 % reduction in the mass of PCE (based on the comparison of the post-treatment soil/water matrix) from the final experiments (performed in triplicate) employing both oxidant solutions in combination, with the calculated spiked concentrations based on the amount of PCE or chlorinated VOCs added to the soil/water system.

Secondary objectives for the treatability study included the evaluation of the behavior of heavy metals in the contaminated matrix when treated by the DUOX™ technology and the monitoring of pH, ORP, anions (chloride and sulfate), particle size distribution (PSD), oxidant concentrations and TOC.

3.3 Treatability Study Experimental Design

The project objectives were evaluated by a series of tasks and experiments. These tasks were sequentially performed in order to: (1) characterize groundwater and fill material from the site for use in the evaluation experiments (Task 1), (2) determine the soil oxidant demand (SOD) of candidate oxidants alone and in combination as a means of determining the optimal oxidant solution for the subsequent evaluation (Task 2), and (3) using the information from Tasks 1 and 2, perform the evaluation for the project objectives (Task 3). The three tasks are discussed in the following sections:

3.3.1 *Task 1 - Preparation and Characterization of Soil and Groundwater*

In order to generate a suitable and reproducible soil matrix for the evaluation experiment in Task 3, it was necessary to determine the grain size distribution of the fill material. Since the fill material is poorly-sorted and heterogeneous, containing excessively large cobbles, using this material without screening would require very large sample sizes to ensure a representative, reproducible sample for testing. Approximately 75 Kg of uncontaminated fill material was collected from the Roosevelt Mills site, characterized, and split into replicates for testing under Tasks 2 and 3.

Roosevelt Mills site groundwater was used in the treatability study. Both clean and contaminated groundwater were collected in a manner minimizing the soil particle content. Contaminated groundwater was collected just prior to the start of the groundwater treatability tests, and stored in 1-L VOCs-compatible Tedlar bags from the hot/treatment zones of the site while the clean groundwater was collected in 1-gallon amber glass bottles from areas absent of VOCs. Prior to use, triplicate groundwater samples (for both clean and contaminated groundwater) were characterized for parameters including VOCs, TOC, pH, metal content [including Na, K, Ca, Mg, Fe, Al, Mn, Cr, As, Se and Pb], alkalinity and anions (chloride and sulfate).

3.3.2 *Task 2 - Determination of Soil Oxidant Demand*

The results from this task provided data on the soil oxidant demand for individual oxidants and combinations. Potential cost reduction by applying the dual oxidants in combination or in sequence was evaluated based on the data obtained from this set of experiments. The source soil prepared in Task 1 was used to determine the soil oxidant demand under various testing conditions (e.g., different oxidant/soil ratios). Tests were performed in duplicate using a set of amber jar reactors on a rotator system used to enhance the contact between soil particles and the oxidant during the test.

Soil oxidant demand (SOD) was determined by oxidizing a certain amount (e.g., 50 g) of soil with the appropriate volume (e.g., 250 mL) of oxidant solutions in a desired oxidant/soil ratio (i.e., 0.5, 1, 3, 5, and 10 g/Kg). Two oxidants (i.e., $KMnO_4$ and $Na_2S_2O_8$) were applied separately, in sequence and in combination.

The oxidant concentrations in the reactors were periodically monitored during a test period of 10 days. The tests were run in duplicate to ascertain the reproducibility and reliability of the experimental data. The oxidant solutions used in the tests include 0.1, 0.2, 0.6, 1.0 and 2.0 g/L, corresponding to the oxidant/soil ratio of 0.5, 1, 3, 5 and 10 g/Kg, respectively (**Table 3-1**). In addition, duplicate control experiments (i.e., oxidant solutions in the absence of the soil as shown in Tests 1F, 2F, 3F and 4F in **Table 3-1**) were run to estimate the amount of oxidant consumption due to auto-decomposition during the test. Variation in the oxidant concentration with time was established by monitoring a data point every 2 days during the test. The SOD was determined using the following equation.

$$SOD = V(C_0 - C_s)/m_{soil}$$

where V = the total volume of oxidant solution in the reactor; C_0 = initial oxidant concentration; C_s = the oxidant concentration at the time of sample collection; m_{soil} = the mass of dry soil used in the reaction. Because both the studied oxidants are light sensitive, experiments were conducted in a manner minimizing light exposure (e.g., wrapping the reactors with aluminum foil or using amber reaction jars) to limit any photo-catalyzed decomposition.

An additional control experiment (i.e., Test 1G) was used to establish the baseline of metal ions (i.e., Cr, As, Pb and Fe), in order to understand the impact of chemical injection on the Roosevelt Mills site soil matrix (by comparing the levels of targeted metal ions between the soil-DI water mixture and the soil-oxidant mixture). The impacts of chemical oxidation with $KMnO_4$ and $Na_2S_2O_8$ on the leaching of selected metals (e.g., As, Cr, Pb and Fe,) from the soil were examined. This was accomplished by determining the increase in dissolved metal ions (collected by filtering samples with 0.45 µm filters) in the samples at the end of the selected oxidation tests. The amount of the increase in dissolved metal ions was determined by comparing the metal ion concentrations of control samples (i.e., Task 2-1G) with those of the oxidant-containing samples (i.e., Tasks 2-1D, 2-2D and 2-3D). The pH and oxidation-reduction potential of all samples were measured so that a correlation between metal leaching with pH, oxidation reduction potential (ORP) and oxidant concentration can be established.

Table 3-1. Test Conditions of Batch Experiments for Soil Oxidant Demand (Task 2)

Test	Total Oxidant Solution Vol., ml	Initial $KMnO_4$ Conc., g/L	$KMnO_4$/Soil ratio g/kg-dry soil	Water/Dry-soil Ratio
2-1A	250	0.1	0.5	5:1
2-1B	250	0.2	1	5:1
2-1C	250	0.6	3	5:1
2-1D	250	1.0	5	5:1
2-1E	250	2.0	10	5:1
2-1F	250	1.0	No soil	NA
2-1G	250	DI water (no oxidant)	No $KMnO_4$	5:1
Test	**Total Oxidant Solution Vol., ml**	**Initial $Na_2S_2O_8$ Conc. g/L**	**$Na_2S_2O_8$/Soil ratio g/kg-dry soil**	**Water/Dry-soil ratio**
2-2A	250	0.1	0.5	5:1
2-2B	250	0.2	1	5:1
2-2C	250	0.6	3	5:1
2-2D	250	1.0	5	5:1
2-2E	250	2.0	10	5:1
2-2F	250	1.0	No soil	NA
Test	**Total Oxidant Solution Vol., ml**	**Initial $KMnO_4$ Conc. g/L (with 1 g/L $Na_2S_2O_8$)**	**$KMnO_4$/Soil ratio g/kg-dry soil**	**Water/Dry-soil ratio**
2-3A	250	0.1	0.5	5:1
2-3B	250	0.2	1	5:1
2-3C	250	0.6	3	5:1
2-3D	250	1.0	5	5:1
2-3E	250	2.0	10	5:1
2-3F	250	1.0	No soil	NA
Test	**Total Oxidant Solution Vol., ml**	**Initial $KMnO_4$ Conc. g/L (with pretreatment by 1 g/L $Na_2S_2O_8$ for 72 h)**	**$KMnO_4$/Soil ratio g/kg-dry soil**	**Water/Dry-soil ratio**
2-4A	250	0.1	0.5	5:1
2-4B	250	0.2	1	5:1
2-4C	250	0.6	3	5:1
2-4D	250	1.0	5	5:1
2-4E	250	2.0	10	5:1
2-4F	250	1.0	No soil	NA

Notes: 1. All experiments were conducted in duplicate

3.3.3 Task 3 - Degradation of VOCs in Groundwater and Soil by $KMnO_4$, $Na_2S_2O_8$ and the Dual Oxidants

In Task 3, the ability of $KMnO_4$ and $Na_2S_2O_8$ to degrade the targeted VOCs in the Roosevelt Mills site groundwater and prepared soil matrix was investigated. Three sets of batch experiments (Tasks 3-1, 3-2 and 3-3) were used to evaluate the effectiveness of degrading VOCs (in aqueous phase and in pure phase) with chemical oxidation under various media: (1) contaminated groundwater (2) soil with "contaminated" groundwater mixture (i.e., soil + clean groundwater spiked with targeted VOCs at 10 mg/L), and (3) soil with "free product" mixture (i.e., soil spiked with pure PCE). The oxidant dose was determined from the Task 2 results.

Experiments were conducted under headspace free and relatively constant temperature conditions using appropriate reactors (e.g., 40-mL volatile organic analysis (VOA) vials and a vial rotator system for

mixing). A list showing experimental conditions and monitored parameters for Task 3 is presented in Table 3-2. The experiments were operated for a reaction period of 120 hours. The experimental procedures are described below.

In Task 3-1, the site VOC contaminated groundwater was used to determine the effectiveness of the DUOX™ technology in treated soluble chlorinated solvents in groundwater. The following experimental design was used:

- 6 vials used to determine initial (3 vials) and final (3 vials) VOCs levels as a control (Test 3-1D),
- vials (1 test in triplicate) used to determine VOC degradation by $KMnO_4$ oxidation (3-1A),
- vials (1 test in triplicate) used to determine VOC degradation by $Na_2S_2O_8$ oxidation (3-1B),
- vials (1 test in triplicate) for determining VOC degradation by $KMnO_4/Na_2S_2O_8$ oxidation (3-1C),
- vials used to determine the initial pH, ORP, chloride and oxidant levels (for 3-1D)
- another 6 vials (two for each oxidant) used to determine final pH, ORP, chloride production and oxidant concentrations at the end of the tests (3-1A, 3-1B, 3-1C).

These vials were injected with appropriate amounts of oxidant solutions to initiate the reactions. After the addition of the desired amount of oxidant, vials were placed in a rotator/shaker placed in an incubator set at 20 °C for 120 hours.

In Tasks 3-2 and 3-3 (see Table 3-2), procedures similar to the Task 3-1 experiments were followed with the following differences. For Task 3-2, a selected amount of soil and appropriate amounts of clean groundwater spiked with VOCs at the desired concentration (mixed to distribute the VOCs), was placed in each of the 23 vials or appropriate reactors, and an appropriate amount of the oxidant was added. For Task 3-3, a selected amount of soil was placed into each of the 23 vials or reactors, then pure-phase PCE was added to the soil. Distilled water was added to maintain a 5:1 water:soil ratio. Oxidants were added as above. This last task (3-3) was meant to simulate "pockets" of free product found in the soil void spaces, as observed during the site characterization efforts. The amount of pure product spiked during the third test of the treatability study is the estimated amount expected to produce free-product globules of a similar size and proportion (water-filled pore space versus PCE-filled pore space) as those observed during the site characterization. Spiking 10 ul of pure PCE into a treatability test sample of 8 grams for a concentration of approximately 2000 mg/Kg, met this requirement.

Table 3-2: Test Conditions for Evaluating the Degradation of VOCs in Groundwater and Soil

Task	Reaction media	Oxidant(s) 0.6 g/L concentration	No. of Reaction Vials	Aq/soil ratio
3-1A	Contaminated groundwater	$KMnO_4$	5	No soil
3-1B		$Na_2S_2O_8$	5	No soil
3-1C		$KMnO_4$/ $Na_2S_2O_8$	5	No soil
3-1D		None (Control experiment)	8	No soil
3-2A	Soil/groundwater spiked with 10 mg/L targeted VOCs (PCE, TCE and cis-DCE)	$KMnO_4$	5	5:1
3-2B		$Na_2S_2O_8$	5	5:1
3-2C		$KMnO_4$/ $Na_2S_2O_8$	5	5:1
3-2D		None (Control experiment)	8	5:1
3-3A	Soil spiked with pure PCE; distilled water	$KMnO_4$	5	5:1
3-3B		$Na_2S_2O_8$	5	5:1
3-3C		$KMnO_4$/ $Na_2S_2O_8$	5	5:1
3-3D		None (Control experiment)	8	5:1

NOTE: Reaction time (120 hrs) and temperature (20 degrees C) constant for all tests

3.4 Treatability Study Results and Conclusions

The following sections present the results from the three experimental tasks and discuss these results in relation to the usability of the DUOX™ technology at the Roosevelt Mills site.

3.4.1 Task 1 Results and Conclusions

3.4.1.1 Particle Size Distribution

The results from the particle size distribution (Task 1-A) are presented in **Table 3-3**. Approximately 100 grams of material was sampled from the near-surface shallow material and sieved through four sieves (10, 40, 100 and 200). The sieving operation was replicated four times, and reproducibility between replicates was good. Based on these results, it was decided that sieving through a No. 8 sieve (2.36 mm) would remove the oversize material and provide a suitable matrix for the testing in terms of reproducibility, and would be representative of the fill material.

3.4.1.2 Characterization of Fill Material

The clean fill material was characterized for metals, TOC, pH, total chloride, percent moisture and select chlorinated VOCs to: (1) determine the levels of metals and organic components that may expend oxidants, and (2) confirm that the material is clean relative to the chlorinated volatile organics. Results from the characterization are presented in **Table 3-4**. Three samples were analyzed for the analytes discussed above. Overall, reproducibility between the samples was good. The analysis for metals and TOC did not indicate the presence of compounds that would significantly expend the oxidant solutions. The analysis for VOCs did not indicate the presence of significant chlorinated materials that would influence the spiking experiment under Task 3.

3.4.1.3 Groundwater Characterization

Clean and contaminated groundwater from the Roosevelt Mills site was collected and analyzed for the purpose of determining inorganic and organic characteristics for Task 3 experiments. Results are presented in **Table 3-5** for the background area and in **Table 3-6** for the contaminated area. Three replicates were analyzed from both areas. The replicate data indicate good reproducibility. The results indicate that the groundwater sampled from the background area did not contain detectable levels of chlorinated solvents. The groundwater collected from the contaminated area at the site contained approximately 200 ug/L of PCE and was deemed appropriate for testing under Task 3.

3.4.2 Task 2 Results and Conclusions

Soil oxidant demand was evaluated on non-contaminated near-surface fill material to determine the levels and types of oxidants that would be most applicable for testing under Task 3. Under Task 2, two oxidants (potassium permanganate and sodium persulfate) were evaluated alone and in combination at five different concentration levels (0.1 g/L, 0.2 g/L, 0.6 g/L, 1.0 g/L, and 2.0 g/L) over a ten-day period. The oxidant concentrations were periodically measured over the ten-day period. The amount of oxidant consumed over the ten days is an indication of the soil oxidant demand (excluding auto-decomposition). **Figures 3-1** through **3-4** depict the results of the soil oxidant demand experiments for: (1) potassium permanganate (at the five concentrations), (2) sodium persulfate (at the five concentrations), (3) potassium permanganate (at the five concentrations) with 1 g/L of sodium persulfate, and (4) potassium permanganate (at the five concentrations) with a 72 hour pretreatment with 1 g/L sodium persulfate.

The experiments indicate that the near-surface fill material exhibits minimal soil oxidant demand, as demonstrated by the small decrease in oxidant concentration over the ten-day period for all oxidants and oxidant combinations. This is consistent with the findings from the characterization analyses under Task 1 which demonstrated that the fill material has low total organic carbon and low concentrations of metals that would expend the oxidants.

Based on the results from these experiments, it was decided that oxidant concentrations at 0.6 g/L would be used for the Task 3 studies. This determination was based on: (1) the levels of chlorinated solvents in the contaminated media, and (2) the fact that approximately 90% of the oxidants remained after the ten-day study at the 0.6 g/L concentration.

Table 3-3. Sieving Results for the Fill Material

Test # 1A-1					
Soil Weight	100.4	grams			
Time	40	minutes			
Sieve NO	Tare (g)	Sieved Weight (g)	Soil Retained (g)	% Retained	Particle Size Range (mm)
10	488.6	507.6	19.0	18.9	2 to 5
40	389.0	441.5	52.5	52.3	0.475 to 2
100	347.5	373.5	26.0	25.9	0.125 to 0.475
200	329.4	331.3	1.9	1.9	0.075 to 0.125
Bottom	503.8	504.5	0.7	0.7	< 0.075
		Total:	100.1		
Test # 1A-2					
Soil Weight	101.0	grams			
Time	40	minutes			
Sieve NO	Tare (g)	Sieved Weight (g)	Soil Retained (g)	% Retained	Particle Size Range (mm)
10	488.5	508.4	19.9	19.3	2 to 5
40	389.0	439.6	50.6	49.2	0.475 to 2
100	347.2	374.5	27.3	26.5	0.125 to 0.475
200	329.4	331.4	2.0	1.9	0.075 to 0.125
Bottom	503.7	504.5	0.8	0.8	< 0.075
		Total:	100.6		
Test # 1A-3					
Soil Weight	102.9	grams			
Time	40	minutes			
Sieve NO	Tare (g)	Sieved Weight (g)	Soil Retained (g)	% Retained	Particle Size Range (mm)
10	488.5	508.7	20.2	19.6	2 to 5
40	388.9	446.4	57.5	55.9	0.475 to 2
100	347.3	369.8	22.5	21.9	0.125 to 0.475
200	329.4	331.0	1.6	1.6	0.075 to 0.125
Bottom	503.7	504.4	0.7	0.7	< 0.075
		Total:	102.5		
Test # 1A-4					
Soil Weight	100.7	grams			
Time	40	minutes			
Sieve NO	Tare (g)	Sieved Weight (g)	Soil Retained (g)	% Retained	Particle Size Range (mm)
10	488.4	510.2	21.8	21.2	2 to 5
40	388.9	439.6	50.7	49.3	0.475 to 2
100	347.3	373.2	25.9	25.2	0.125 to 0.475
200	329.3	330.9	1.6	1.6	0.075 to 0.125
Bottom	503.7	504.3	0.6	0.6	< 0.075
		Total:	100.6		

Table 3-4. Fill Characterization Results

	Sample 1	Sample 2	Sample 3
Metals *(mg/kg dw)*			
Aluminum	40000	26000	28000
Arsenic	8.5	7.1	9.4
Chromium	100	74	80
Iron	97000	62000	68000
Lead	49	44	44
Manganese	2300	2300	1500
Selenium	<7.1	<7.1	<7.1
TOC *(mg/kg, dw)*	<510	<510	<510
Total Chloride *(mg/kg)*	70	70	70
pH	9.75	9.67	9.67
Moisture *(%)*	0.67	0.64	0.66

VOCs *(ug/kg dw)*					
	VC	t-DCE	c-DCE	TCE	PCE
Sample 1	<200	<200	<200	<200	<200
Sample 2	<200	<200	<200	<200	<200
Sample 3	<200	<200	<200	<200	<200

Table 3-5. Background Groundwater Characteristics

	Replicate 1	Replicate 2	Replicate 3
Metals *(mg/L)*			
Aluminum	<0.20	<0.20	<0.20
Arsenic	<0.010	<0.010	<0.010
Calcium	12	12	12
Chromium	<0.010	<0.010	<0.010
Iron	2.3	2.5	2.4
Lead	<0.0050	<0.0050	<0.0050
Manganese	0.28	0.29	0.29
Magnesium	3.4	3.6	3.6
Sodium	8.7	9.1	8.9
Potassium	5.9	6.1	6
Selenium	<0.010	<0.010	<0.010
TOC *(mg/L)*	1.6	1.6	1.5
Chloride *(mg/L)*	3.6	3.6	3.4
Sulphate *(mg/L)*	19.5	19.6	19.5
pH	8.45	8.22	8.1
ORP*(mv)*	862	817	800
Alkalinity *(mg/L)*	55	54	53

VOCs *(ug/L)*					
	VC	t-DCE	c-DCE	TCE	PCE
Replicate 1	<4	<4	<4	<4	<4
Replicate 2	<4	<4	<4	<4	<4
Replicate 3	<4	<4	<4	<4	<4

Table 3-6. Contaminated Groundwater Characteristics.			
	Replicate 1	Replicate 2	Replicate 3
Metals *(mg/L)*			
Aluminum	<0.20	<0.20	<0.20
Arsenic	<0.010	<0.010	<0.010
Calcium	15	14	14
Chromium	<0.010	<0.010	<0.010
Iron	<0.050	<0.050	<0.050
Lead	<0.0050	<0.0050	<0.0050
Manganese	0.021	0.021	0.021
Magnesium	2.6	2.5	2.6
Sodium	5.9	5.8	5.9
Potassium	3.9	3.9	3.9
Selenium	<0.010	<0.010	<0.010
TOC *(mg/L)*	<1.0	<1.0	<1.0
Chloride *(mg/L)*	4.2	4.2	4.2
Sulphate *(mg/L)*	18.7	18.7	18.6
pH	7.68	7.66	7.67
ORP*(mv)*	810	827	832
Alkalinity *(mg/L)*	40	41	41

VOCs *(ug/L)*					
	VC	t-DCE	c-DCE	TCE	PCE
Replicate 1	<8	<8	<8	<8	212
Replicate 2	<8	<8	<8	<8	201
Replicate 3	<4	<4	<4	<4	223

In order to determine the potential effect of the oxidants on metal solubilization, select experiments were sampled for metals on initial oxidant addition and at the end of the ten-day experiment. In addition, a DI water control (no oxidant) was sampled initially and at the end of ten days. The samples were filtered through a 0.45um filter and analyzed to determine dissolved metals. Results from the study are presented in **Table 3-7**. The study demonstrated that there were minor increases in some soluble metals in some of the experiments. Chromium increased (relative to the control) in the experiments that used potassium permanganate. Manganese also increased (relative to the control) in the experiments that used potassium permanganate.

3.4.3 Task 3 Results and Conclusions

Task 3 activities investigated the performance of the DUOX™ technology for the treatment of chlorinated solvents in groundwater and a soil/groundwater matrix. Under this task, three sets of experiments were performed. Task 3-1 investigated the ability of the oxidants (alone and in combination) to treat PCE contaminated groundwater from the Roosevelt Mills site. Task 3-2 investigated the ability of the oxidants (alone and in combination) to treat a spiked groundwater that was added to the near-surface fill material. Task 3-3 evaluated the ability of the oxidants (alone and in combination) to treat PCE as a free-phase globular component in the near-surface fill material. Results from these experiments are presented and discussed in the following sections.

3.4.3.1 Task 3-1 – Treatment of Contaminated Groundwater with Oxidants

Under this task, groundwater from the Roosevelt Mills site, contaminated with approximately 130 ug/L of PCE, was treated with potassium permanganate and sodium persulfate, alone and in combination, for 120 hours to determine the ability of the oxidants to degrade the PCE

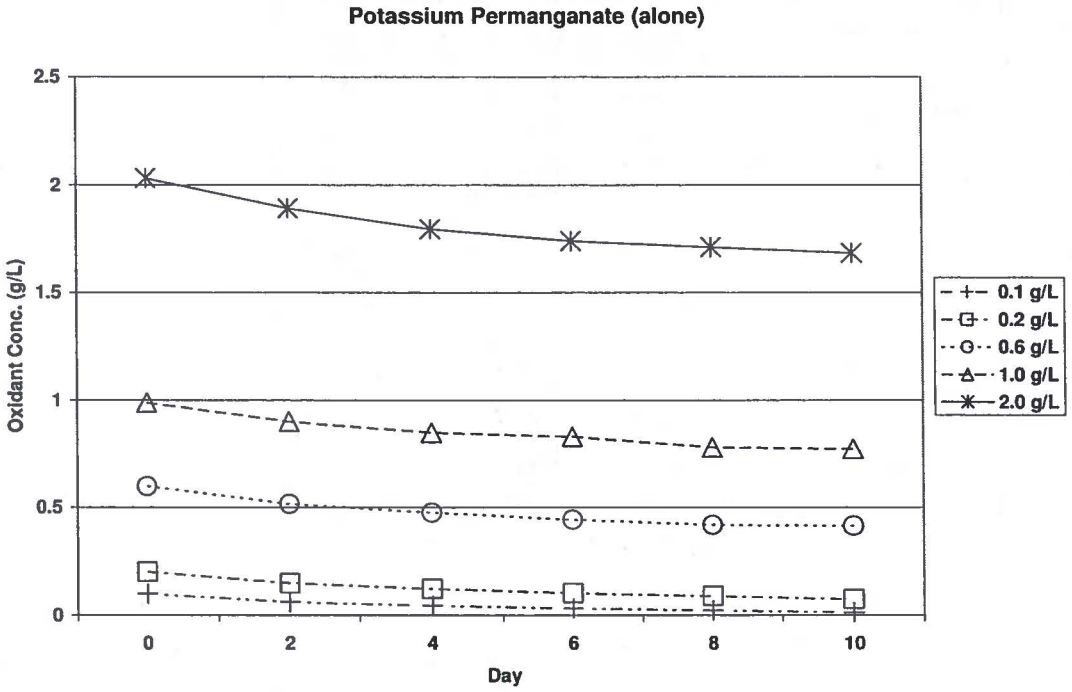


Figure 3-1. Oxidant consumption over time – Potassium Permanganate (alone).

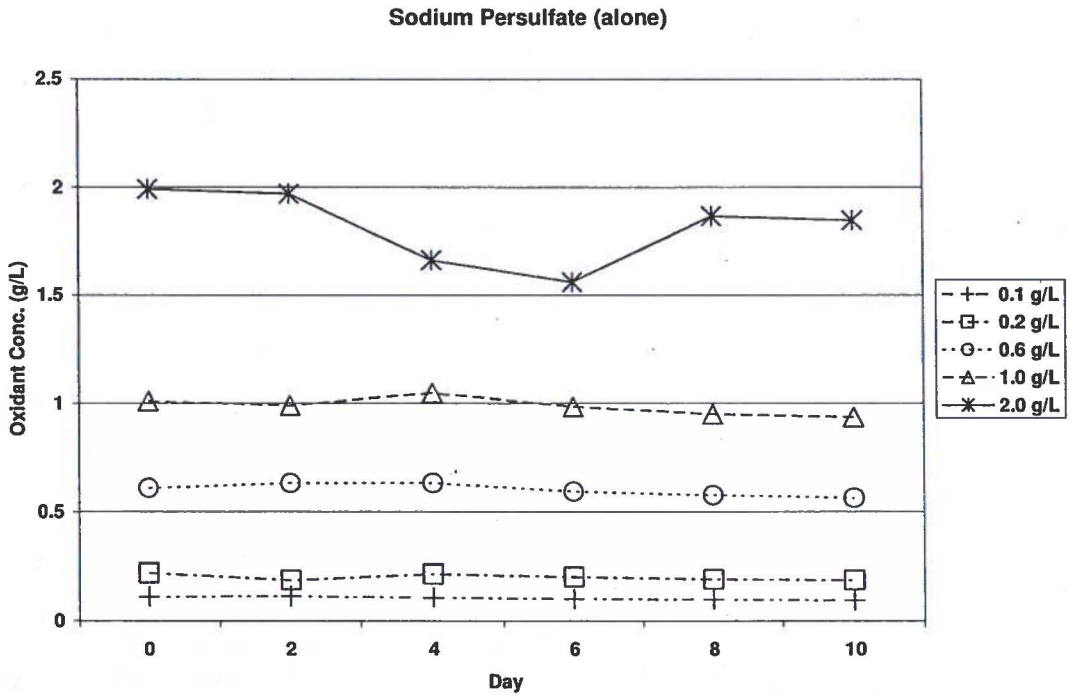


Figure 3-2. Oxidant consumption over time – Sodium Persulfate (alone).

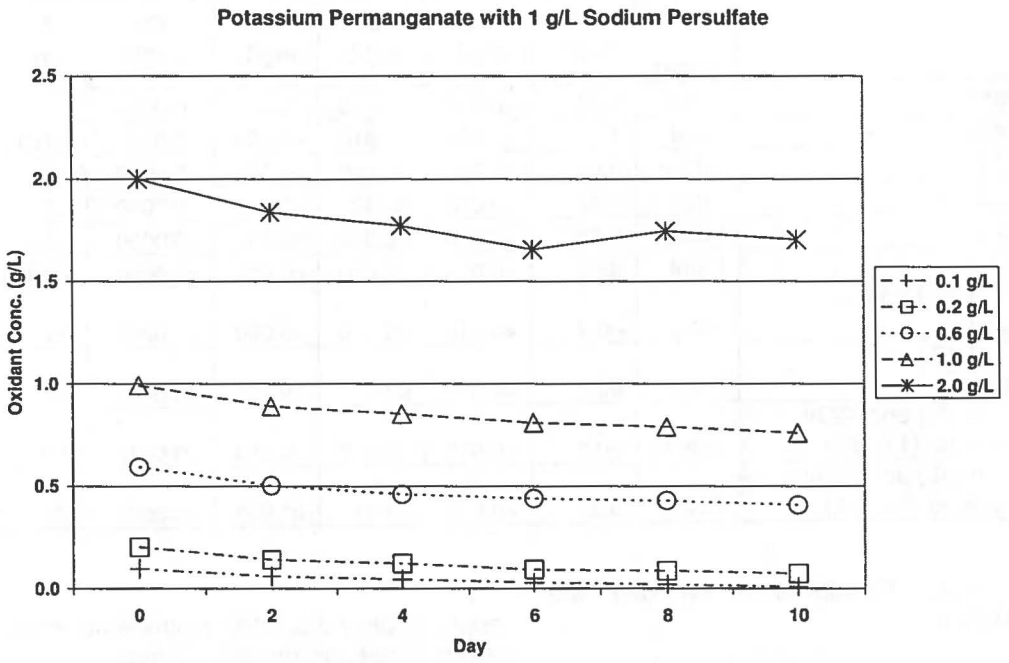


Figure 3-3. Oxidant consumption over time –Potassium Permanganate with 1 g/L Sodium Persulfate.

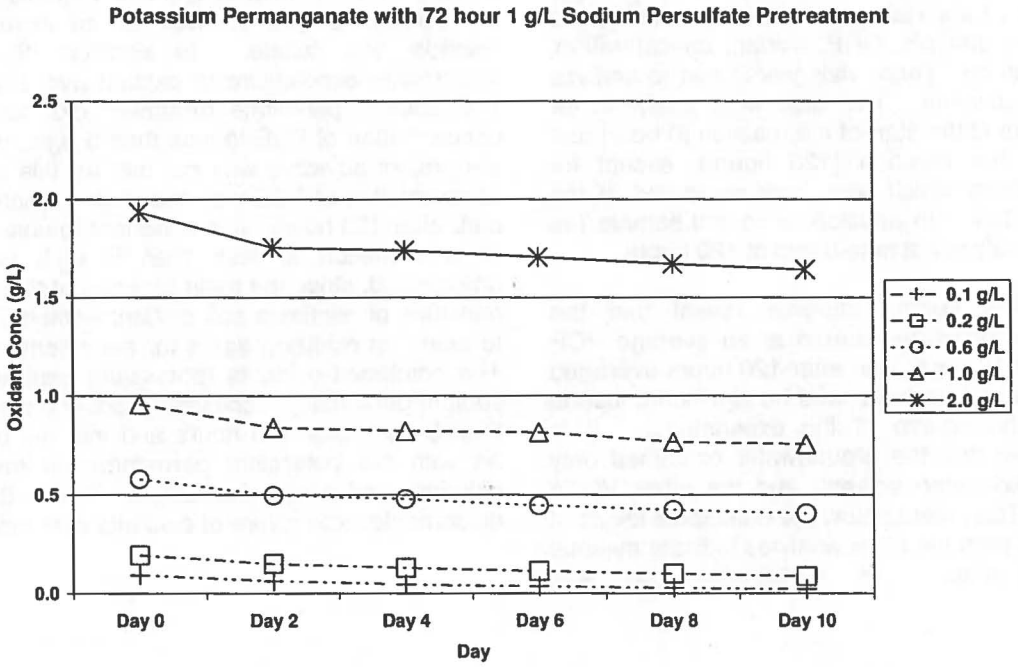


Figure 3-4. Oxidant consumption over time –Potassium Permanganate with 72 hour 1 g/L Sodium Persulfate pretreatment.

Table 3-7. Soluble Metals Before and After Ten Days of Oxidant Treatments

Sample	Stage	Al mg/L	As mg/L	Cr mg/L	Fe mg/L	Pb mg/L	Mn mg/L	Se mg/L
Control (no oxidant)	Initial	0.34	<0.010	<0.010	0.062	<0.0050	1.4	<0.010
Control (no oxidant)	Final	1	<0.010	<0.010	<0.050	<0.0050	<0.010	<0.010
Permanganate (1.0 g/L)	Initial	0.46	<0.010	<0.010	<0.050	<0.0050	38	0.018
Permanganate (1.0 g/L)	Final	0.37	<0.010	0.042	<0.050	<0.0050	3.9	<0.010
Persulfate (1.0 g/L)	Initial	0.43	<0.010	<0.010	0.066	<0.0050	0.59	<0.010
Persulfate (1.0 g/L)	Final	0.83	<0.010	<0.010	<0.050	<0.0050	<0.010	<0.010
Permanganate (1.0 g/L) and Persulfate (1.0 g/L)	Initial	<0.2	<0.010	<0.010	<0.050	<0.0050	49	0.018
Permanganate (1.0 g/L) and Persulfate (1.0 g/L)	Final	0.27	<0.010	0.04	<0.050	<0.0050	44	0.018
Permanganate (1.0 g/L) and 72 hr pretreat with persulfate (1.0 g/L)	Initial	<0.2	<0.010	<0.010	<0.050	<0.0050	2.7	<0.010
Permanganate (1.0 g/L) and 72 hr pretreat with persulfate (1.0 g/L)	Final	0.31	<0.010	0.021	<0.050	<0.0050	22	0.012

to less than 5 ug/L.. Results from this task are presented in **Table 3.8**.

Oxidants were added to the reaction vessels at a concentration of 0.6 g/L and reacted at 20°C for 120 hours. Five reaction vessels were used for each oxidant treatment and combination as well as a control (no oxidants). Two of the vials were used to measure the following parameters: pH, ORP, oxidant concentration, chloride, and sulfate. Three vials were used to analyze for chlorinated solvents. The vials were analyzed for these parameters at the start of the reaction (0 hour) and at the end of the reaction (120 hours), except for chlorinated solvents which were only measured at the end of the reaction. In addition, a control sample (no oxidants) was analyzed at time 0 and at 120 hours.

Results from the control samples reveal that the contaminated groundwater started at an average PCE concentration of 131 ppb, and after 120 hours averaged 126 ppb, indicating that there was no significant loss in volatiles over the course of the experiment. It is important to note that the groundwater contained only PCE as the chlorinated solvent, and the other VOCs (VC, DCE, and TCE) were below the detectable levels of 5 ug/L. Results from the other analytes indicate minimal changes over time. As a baseline, pH was approximately 8.6, ORP around 900, chloride 3.5 mg/L, and sulfate approximately 17 mg/L.

The potassium permanganate treatment successfully reduced the PCE to less than 5 ug/L after 120 hours, thereby meeting the project claim. In addition, there was an increase in pH, as well as an increase in both chloride and sulfate. In addition, there was no discernable expenditure of oxidant over the 120 hours. The sodium persulfate treatment did not reduce the concentration of PCE to less than 5 ug/L, and therefore the project objective was not met for this oxidant. The concentration of PCE was reduced to approximately 40 ug/L after 120 hours. It is important to note that the lack of a reduction to less than 5 ug/L is not totally unexpected, since the main purpose of this oxidant is to minimize or eliminate soil oxidant demand, as opposed to being an oxidizing agent for the chlorinated solvents. The combined oxidants (potassium permanganate and sodium persulfate) successfully reduced the PCE to less than 5 ug/L after 120 hours and met the project claim. As with the potassium permanganate treatment, pH, chloride, and sulfate increased. Again, there was no discernable expenditure of oxidants over the 120 hours.

Table 3-8. Results from Contaminated Groundwater Treatment

Initial Oxidant Conc (g/L)	Time	pH	ORP (mV)	Oxidant Conc (g/L)	Chloride (mg/L)	Sulfate (mg/L)	PCE (ug/L)	Average PCE (ug/L)	Met Claim
$KMnO_4$ (0.6)	120hr						<5	<5	YES
$KMnO_4$ (0.6)	120hr						<5		
$KMnO_4$ (0.6)	120hr						<5		
$KMnO_4$ (0.6)	120hr	9.5	946	0.557	4.5	21.8			
$KMnO_4$ (0.6)	120hr	9.2	955	0.584	5.8	20.1			
$KMnO_4$ (0.6)	0hr	8.9	923	0.560	4.7	21.6			
$KMnO_4$ (0.6)	0hr	8.8	938	0.563	4.3	21.0			
$Na_2S_2O_8$ (0.6)	120hr						48	40	NO
$Na_2S_2O_8$ (0.6)	120hr						38		
$Na_2S_2O_8$ (0.6)	120hr						34		
$Na_2S_2O_8$ (0.6)	120hr	8.8	879	0.648	3.9	24.9			
$Na_2S_2O_8$ (0.6)	120hr	8.6	870	0.595	3.9	25.6			
$Na_2S_2O_8$ (0.6)	0hr	8.4	825	0.638	3.7	21.2			
$Na_2S_2O_8$ (0.6)	0hr	8.4	829	0.634	3.7	21.3			
Both (0.6)	120hr						<5	<5	YES
Both (0.6)	120hr						<5		
Both (0.6)	120hr						<5		
Both (0.6)	120hr	9.3	968	0.559	4.7	22.1			
Both (0.6)	120hr	9.2	972	0.569	4.6	21.5			
Both (0.6)	0hr	8.7	942	0.573	4.0	24.4			
Both (0.6)	0hr	9.0	928	0.573	4.9	24.0			
None (Control)	120hr						137	126	
None (Control)	120hr						132		
None (Control)	120hr						108		
None (Control)	0hr						149	131	
None (Control)	0hr						133		
None (Control)	0hr						112		
None (Control)	120hr	8.3	775		3.5	17.3			
None (Control)	120hr	8.2	815		3.7	17.2			
None (Control)	0hr	8.7	908		3.6	17.6			
None (Control)	0hr	8.5	900		3.4	16.7			

In summary, potassium permanganate, alone and in combination with sodium persulfate, successfully reduced the PCE contaminated groundwater from a starting concentration of approximately 130 ug/L to less than 5 ug/L over the 120 hour test. Sodium persulfate alone did not reduce the PCE to less than 5 ug/L.

3.4.3.2 Task 3-2 – Treatment of Contaminated Groundwater in a Soil Matrix With Oxidants

Task 3-2 evaluated the oxidants, alone and in combination, to treat a spiked groundwater in a soil (near-surface fill) matrix. For these experiments, 10 mg/L each of PCE, TCE, and DCE were added to 40 ml of uncontaminated groundwater from the site. Eight grams of the screened near-surface fill material (soil) was added to the spiked groundwater. The groundwater/soil matrix was reacted with the oxidants, alone and in combination, for 120 hours. A control sample with no oxidants was also run. The initial and final samples (0 and 120 hours) were analyzed for pH, ORP, chloride, and sulfate. The final samples were analyzed for each of the chlorinated VOCs in both the aqueous and solid phases and converted to mass in order to calculate percent reduction. The control sample was analyzed for chlorinated VOCs both at 0 hours and at 120 hours.

Table 3-9 presents the results of the chlorinated VOC reductions (as percent) after 120 hours of treatment. **Table 3-10** presents the results of the other measurements and analytes.

The permanganate (alone) treatment achieved average mass reductions of 99.5% for PCE, 99.5% for TCE, and 99.4% for DCE. Based on these mass reductions, the permanganate treatment successfully met the project objective of a 90% mass reduction for all three analytes. There was also a reduction in the concentration of the oxidant during the course of the experiment (average of 0.57 g/L at time 0 hour to 0.45 g/L at 120 hours). There was also an increase in pH, chloride, and sulfate.

The persulfate (alone) treatment achieved average mass reductions of 15% for PCE, 6% for TCE, and 14.3% for DCE. Based on these mass reductions, the persulfate treatment did not meet the project objective of a 90% reduction in mass for any of the three analytes. Furthermore, there was no discernable reduction in the concentration of the oxidant over the course of the experiment. There was also an increase in chloride and sulfate from 0 hours to 120 hours.

The combined permanganate and persulfate treatment achieved average mass reductions of 99.5% for PCE, 99.5% for TCE, and 99.4% for DCE. Based on these mass reductions, the combined treatment successfully met the project objective of a 90% mass reduction for all three analytes. As with the permanganate (alone) treatment, the combined treatment exhibited a reduction in the concentration of oxidants over the course of the experiment, indicating that the oxidants (predominately permanganate) were expended during the oxidation of the chlorinated VOCs. There was also an increase in pH, chloride, and sulfate over the course of the experiment.

It is important to note that the reductions shown in **Table 3-9** for tests performed on the spiked groundwater/soil matrix were determined based on a comparison of the total final mass to the initial mass of the contaminant of interest. The initial mass was determined by averaging the results of the control test samples for the spiked compounds PCE, TCE and DCE (three T=0 hours analyses and three T120 analyses). The control measurements were reproducible with average RSD values for each analyte of approximately 10%. Final mass was determined using the aqueous and soil concentrations with the associated volumes and weights for samples analyzed after 120 hours of treatment. For samples with analyte concentrations that were reported as non-detected, the detection limit value (0.005 mg/L for the aqueous phase and 0.200 mg/Kg for the soil phase) was used as the sample concentration for calculating mass.

3.4.3.3 Task 3-3 – Treatment of Free-Phase (Globular) PCE Contaminated Soil/Groundwater Matrix with Oxidants

The site characterization study at Roosevelt Mills identified a chlorinated solvent source area in the near-surface, coarse-grained fill material. This fill material was impacted by PCE primarily distributed as a globular free-phase product within the large pore-spaces. Therefore, a remedial action should consider treatment of this material. Based on this need, the treatability study investigated the applicability of the DUOX™ process for the treatment of this free-phase, globular material within the saturated near-surface fill material. Due to the heterogeneous distribution of this material at the site, it was necessary to develop a soil/groundwater matrix, spiked with PCE to simulate free-phase distribution of the PCE.

The simulated soil/groundwater matrix was prepared by spiking 10 ul of PCE into 8 grams of the screened fill

Table 3-9. Chlorinated VOC Results from Spiked Groundwater/Soil.

Initial Oxidant Conc (g/L)	Time	Initial Mass: 0.485 mg				Initial Mass: 0.415 mg				Initial Mass: 0.375 mg			
		Final Mass, mg	PCE Mass Red.	Average PCE Red.	Met Claim	Final Mass, mg	TCE Mass Red.	Average TCE Red.	Met Claim	Final Mass, mg	DCE Mass Red.	Average DCE Red.	Met Claim
$KMnO_4$ (0.6)	120hr	0.002	99.5	99.5	YES	0.002	99.5	99.5	YES	0.002	99.4	99.4	YES
$KMnO_4$ (0.6)	120hr	0.002	99.5			0.002	99.5			0.002	99.4		
$KMnO_4$ (0.6)	120hr	0.002	99.6			0.002	99.6			0.002	99.5		
$Na_2S_2O_8$ (0.6)	120hr	0.440	9.4	15	NO	0.415	0	6	NO	0.337	10	14.3	NO
$Na_2S_2O_8$ (0.6)	120hr	0.400	17.6			0.377	9.1			0.314	16.3		
$Na_2S_2O_8$ (0.6)	120hr	0.401	17.3			0.378	8.8			0.313	16.5		
Both (0.6)	120hr	0.002	99.6	99.5	YES	0.002	99.5	99.5	YES	0.002	99.4	99.4	YES
Both (0.6)	120hr	0.002	99.5			0.002	99.5			0.002	99.4		
Both (0.6)	120hr	0.002	99.5			0.002	99.5			0.002	99.4		
None	120hr	0.525				0.449				0.399			
None	120hr	0.473				0.408				0.359			
None	120hr	0.384				0.338				0.312			
None	0hr	0.506				0.426				0.395			
None	0hr	0.553				0.464				0.415			
None	0hr	0.472				0.402				0.369			

Note: Initial mass determined as the average of the no treatment tests at T=0 and T=120 hours (6 samples)
Note: Detection limit values were used as the sample concentration to calculate final mass for samples with the analytes reported as ND

Table 3-10. Other Analytes Results from Spiked Groundwater/Soil.

Initial Oxidant Concentration (g/L)	Time	pH	ORP (mV)	Oxidant Conc (g/L)	Cl (mg/L)	SO4 (mg/L)
$KMnO_4$ (0.6)	120hr					
$KMnO_4$ (0.6)	120hr					
$KMnO_4$ (0.6)	120hr					
$KMnO_4$ (0.6)	120hr	8.7	819	0.445	47.3	57.1
$KMnO_4$ (0.6)	120hr	9.1	825	0.447	45.3	50.6
$KMnO_4$ (0.6)	0hr	7.9	866	0.615	40.1	32.3
$KMnO_4$ (0.6)	0hr	8	879	0.523	40.1	30.1
$Na_2S_2O_8$ (0.6)	120hr					
$Na_2S_2O_8$ (0.6)	120hr					
$Na_2S_2O_8$ (0.6)	120hr					
$Na_2S_2O_8$ (0.6)	120hr	9.1	808	0.638	20.5	70.0
$Na_2S_2O_8$ (0.6)	120hr	8.8	801	0.642	22.0	66.7
$Na_2S_2O_8$ (0.6)	0hr	8.9	746	0.622	12.9	31.0
$Na_2S_2O_8$ (0.6)	0hr	8.6	742	0.623	12.2	29.9
Both (0.6)	120hr					
Both (0.6)	120hr					
Both (0.6)	120hr					
Both (0.6)	120hr	8.8	845	0.404	42.1	55.6
Both (0.6)	120hr	9	839	0.407	42.5	60.7
Both (0.6)	0hr	8.4	880	0.557	38.8	32.9
Both (0.6)	0hr	8.4	868	0.513	35.9	30.2
None	120hr					
None	120hr					
None	120hr					
None	0hr					
None	0hr					
None	0hr					
None	120hr	9.3	814		18.9	53.2
None	120hr	9.1	807		18.8	49.6
None	0hr	9	779		11.3	23.7
None	0hr	8.9	751		11.0	23.6

material, resulting in a concentration of approximately 2,000 mg/kg. Distilled water was then added to achieve a 5:1 (w/w) ratio of aqueous to soil. As in Task 3-2, oxidants alone and in combination, as well as a no oxidant control, were evaluated to determine the mass reduction in the PCE over a 120 hour period. This test was considered the most challenging due to the concentration and distribution of the free-phase PCE within the soil matrix.

Table 3-11 presents the results of the PCE reductions (as percent) after 120 hours of treatment, as well as the initial and final analysis of oxidant concentration, pH, ORP, chloride, and sulfate.

The permanganate (alone) treatment was able to successfully degrade an average of 94.1% of the PCE and met the project objective of a 90% or greater mass reduction. It is important to note that the oxidant consumption was high (0.55 g/L to 0.15 g/L), presumably due to the relatively high concentration of PCE in the experiment. Furthermore, the chloride content increased from approximately 11 mg/L at the beginning of the experiment to 212 mg/L at the end, and may indicate the generation of chloride from the degradation of the chlorinated PCE. In contrast to tests run under Tasks 3-1 and 3-2, pH dropped from an average of 9.6 to 7.6.

As seen in the previous tasks, the persulfate (alone) treatment was not successful in meeting the project objective. The average reduction in mass for the persulfate was 0.8%, thereby not meeting the project objective of a 90% reduction in the mass of PCE. Furthermore, there was virtually no change in oxidant consumption over the course of the experiment.

The combined permanganate and persulfate treatment achieved an average mass PCE reduction of 91.4%, and met the project objective for a 90% mass reduction. As with the permanganate (alone) treatment, there was a large expenditure of the oxidants, as well as a large increase in the chloride concentration. The pH also was lowered over the course of the demonstration. Based on the previous experiments, it is probable that the permanganate is the operative oxidant responsible for the observed decomposition.

It is important to note that **Table 3-11** presents conservative estimates of the efficacy of the oxidant treatment on free-phase PCE in the near-surface fill material, based on several of the conditions placed on the determinations. As noted for Task 3-2, initial mass was determined by averaging the results of the control test samples for the spiked compound PCE, which had an RSD of <15% for all six values (three T0 and three T120 hour results). The QAPP specified that the initial mass used in the determination of percent reduction would be calculated based on the known spiked amount (16.2 mg). However, using the observed initial mass as measured from the controls (9.1 mg) provides a more conservative estimate of efficiency. Furthermore, calculations for the percent reduction in the treatment systems using potassium permanganate alone and both oxidants together were performed using an estimated concentration for the aqueous phase that overestimated the contribution of this phase to the total final mass. The analysis of the aqueous samples for each of these tests (three test vials for the permanganate and three vials for the tests with both oxidants) resulted in PCE concentrations that exceeded the upper range of the analytical calibration curve. Since the entire sample was consumed during the analysis, reanalyzing a diluted sample was not possible. Results for other samples that exceeded the calibration curve and were reanalyzed at a higher dilution (e.g., the control samples which were expected to be high and therefore analyzed initially at a dilution and reanalyzed at a higher dilution as necessary), indicated that concentration results were 50-70% higher when the sample was reanalyzed at an appropriate dilution. For the aqueous samples that exceeded the calibration range for PCE, an estimated concentration of five times the observed concentration was used in determining the final mass of PCE for these tests (e.g., sample 3-3A-2 had an observed PCE concentration of 1.973 mg/L and a value of 9.865 mg/L was used in the calculation of final mass).

Table 3-11. Results from Free-Phase (Globular) PCE Contaminated Soil/Groundwater

Initial Oxidant Conc (g/L)	Time	pH	ORP (mV)	Oxidant Conc (g/L)	Cl (mg/L)	SO4 (mg/L)	Final PCE Mass, mg	PCE Mass Red.	Average PCE Red.	Met Claim
$KMnO_4$ (0.6)	120hr						0.338*	94.3	94.1	YES
$KMnO_4$ (0.6)	120hr						0.355*	94		
$KMnO_4$ (0.6)	120hr						0.389*	93.9		
$KMnO_4$ (0.6)	120hr	7.4	878	0.123	278.3	49.3				
$KMnO_4$ (0.6)	120hr	7.8	933	0.178	146.1	35.8				
$KMnO_4$ (0.6)	0hr	9.7	832	0.537	10.0	8.2				
$KMnO_4$ (0.6)	0hr	9.5	922	0.567	11.6	7.0				
$Na_2S_2O_8$ (0.6)	120hr						10.8	-18.5	0.8	NO
$Na_2S_2O_8$ (0.6)	120hr						7.91	13		
$Na_2S_2O_8$ (0.6)	120hr						8.41	7.6		
$Na_2S_2O_8$ (0.6)	120hr	9.8	946	0.645	22.6	46.9				
$Na_2S_2O_8$ (0.6)	120hr	9.6	818	0.702	23.6	43.2				
$Na_2S_2O_8$ (0.6)	0hr	9.6	890	0.695	9.4	10.9				
$Na_2S_2O_8$ (0.6)	0hr	9.6	945	0.574	8.9	10.0				
Both (0.6)	120hr						0.358*	92.2	91.4	YES
Both (0.6)	120hr						0.401*	90.5		
Both (0.6)	120hr						0.175*	91.6		
Both (0.6)	120hr	7.3	852	0.142	243.4	46.8				
Both (0.6)	120hr	6.5	947	0.095	279.7	41.5				
Both (0.6)	0hr	9.7	776	0.614	9.3	9.6				
Both (0.6)	0hr	9.8	762	0.605	2.9	5.6				
None	120hr						10.4			
None	120hr						8			
None	120hr						10.4			
None	0hr						7.23			
None	0hr						8.04			
None	0hr						10.4			
None	120hr	9.86	823		15.8	35.9				
None	120hr	9.91	814		15.1	29.6				
None	0hr	10.1	766		8.6	6.4				
None	0hr	10.1	785		9.4	7.2				

Note: Initial mass determined as the average of the no treatment tests at T=0 and T=120 hours (6 samples)
Note: Detection limit values were used as the sample concentration to calculate final mass for samples With the analytes reported as ND
*Note: For tests with aqueous sample concentrations that exceeded calibration range, an estimate of 5 times the observed concentration was used (see text discussion) to calculate final mass.

3.5 Treatability Study General Conclusions and Discussion

The following general conclusions can be drawn from this treatability study:

1. The near-surface fill material (source area matrix for the PCE) exhibits a very low soil oxidant demand.
2. Permanganate alone and in combination with persulfate is effective in reducing the levels of chlorinated solvents in the site groundwater as well as in spiked soil samples simulating a free-phase globular distribution.
3. Persulfate alone was ineffective in reducing the levels of chlorinated solvents in any of the experiments.

There were minor increases in some soluble metals in some of the experiments.

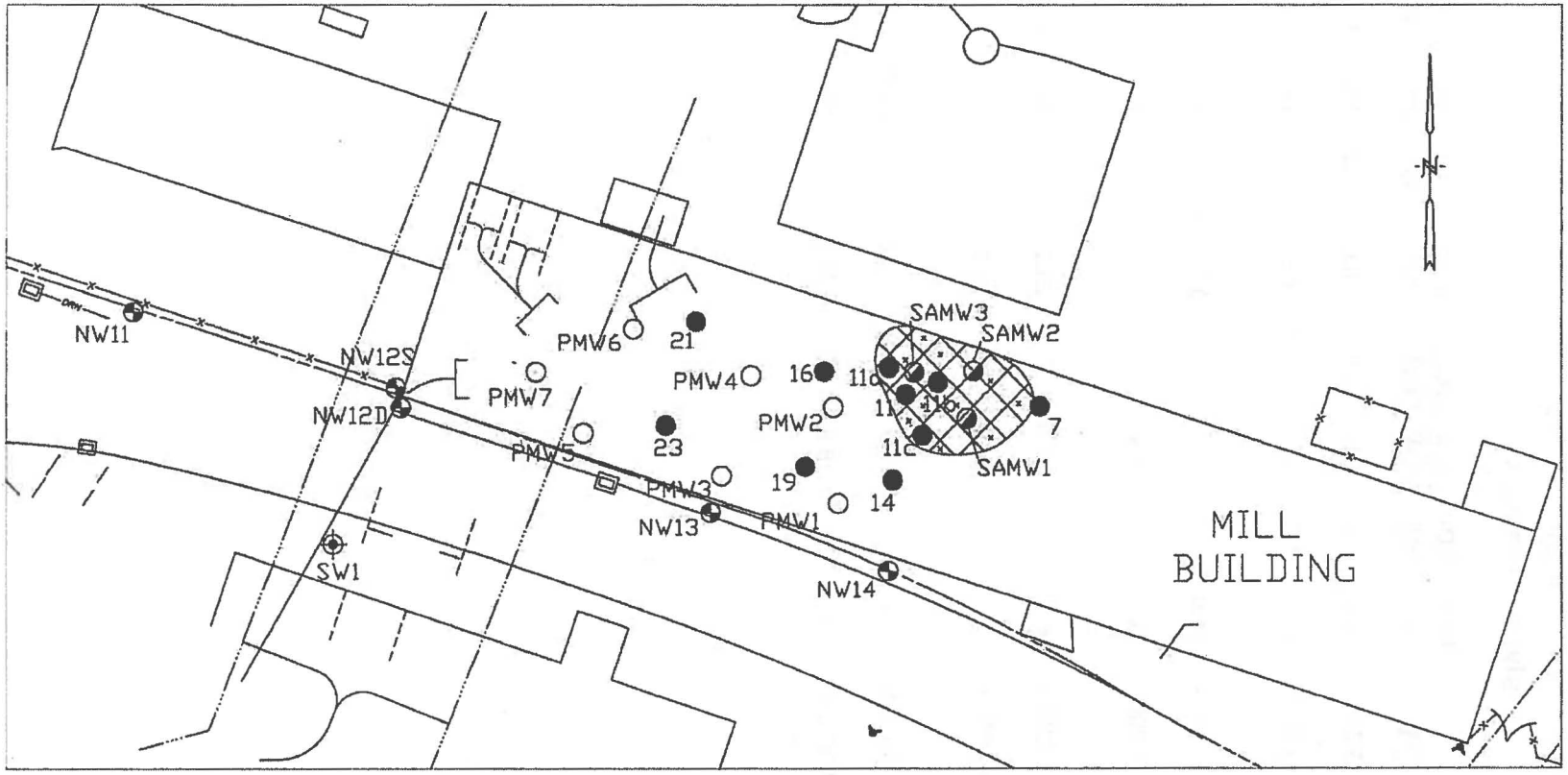
Based on these conclusions, the chlorinated solvent contamination in both the soil and groundwater can be effectively treated by using permanganate as an oxidant. However, due to the low soil oxidant demand of the soil (near-surface fill), the rationale for using a dual oxidant approach (DUOX™) is unnecessary. Persulfate would only be necessary if there was a need to expend the soil oxidant demand before using a more costly oxidant such as permanganate.

The study also demonstrated the appropriate dosing required to treat the more difficult free-phase distributed PCE in the fill matrix. A remedial solution for this site could include a source removal or treatment strategy. The use of the permanganate could potentially be used as a source treatment for the near-surface contaminated fill material, as well as the groundwater, assuming that an appropriate means of introducing the oxidant into the subsurface can be implemented.

This study at Roosevelt Mills was not able to fully demonstrate the potential of the DUOX™ technology for the treatment of chlorinated solvents in soil and groundwater. The major benefit of the DUOX™ process, as compared to single phase oxidation technologies, is in the treatment of impacted media with significant soil oxidant demand. Since the media evaluated during this study did not exhibit significant soil oxidant demand, the full utility of the process was not demonstrated. The technology may have merit at other sites where significant soil oxidant demand would benefit from a DUOX™ approach.

APPENDIX G

ROOSEVELT MILLS BEDROCK WELL DATA, 2005 (COURTESY OF SAIC)



LEGEND

- OUTSIDE MONITORING WELL
- PERFORMANCE MONITORING WELL
- SOURCE AREA MONITORING WELL
- INJECTION WELL
- SURFACE WATER SAMPLE LOCATION
- SOIL BORING
- SOURCE AREA

30' 0 30'
SCALE IN FEET

ROOSEVELT MILLS

ERI'S INJECTION WELL AND SAIC'S MONITORING WELL LOCATION MAP

drawn JL	checked SB	approved	figure no.
date 8/27/96	date 8/2/96	date	3-1
job no.		file no.	

Science Applications International Corporation
An Employee-Owned Company

Bedrock Monitoring Wells
Analytical Results

Well ID	Event	Date	PCE ug/L	RDL ug/L	TCE ug/L	RDL ug/L	1,2 DCE ug/L	RDL ug/L	VC ug/L	RDL ug/L
NW14	Baseline	9/15/2005	ND	1.0	ND	1.0	ND	1.0	ND	1.0
NW14	Injection	-								
NW14	Post-Inj 1	11/3/2005	ND	1.0	ND	1.0	ND	1.0	ND	1.0
NW14	Post-Inj 2	-								
NW13	Baseline	9/17/2005	51.8		4.5		0.77J		ND	1.0
NW13	Injection	-								
NW13	Post-Inj 1	11/3/2005	72.0		5.9		1.5		ND	1.0
NW13	Post-Inj 2	-								
NW12d	Baseline	9/17/2005	144.0		118.0		**21.2**		ND	1.0
NW12d	Injection	-								
NW12d	Post-Inj 1	11/3/2005	146.0		163.0		**36.2**		1.0	
NW12d	Post-Inj 2									
NW11	Baseline	9/17/2005	12.6		37.9		145.4		40.9	
NW11	Injection	-								
NW11	Post-Inj 1	11/3/2005	14.2		29.8		**123.6**		19.1	
NW11	Post-Inj 2	-								

APPENDIX H

STATEMENT OF LIMITATIONS

STATEMENT OF LIMITATIONS

SITE INVESTIGATIONS

The data presented and the opinions expressed in this report are qualified as follows:

1. The sole purpose of the investigation and of this report is to assess the physical characteristics of the Site with respect to the presence or absence in the environment of oil or hazardous materials and substances as defined in the applicable state and federal environmental laws and regulations and to gather information regarding current and past environmental conditions at the Site.

2. Metcalf & Eddy, Inc. (M&E) derived the data in this report primarily from visual inspections, examination of records in the public domain, interviews with individuals with information about the Site, and a limited number of subsurface explorations made on the dates indicated. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the Site, analysis of the data, and reevaluation of the findings, observations, and conclusions expressed in the report.

3. In preparing this report, M&E has relied upon and presumed accurate certain information (or the absence thereof) about the Site and adjacent properties provided by governmental officials and agencies, the Client, and others identified herein. Except as otherwise stated in the report, M&E has not attempted to verify the accuracy or completeness of any such information.

4. The data reported and the findings, observations, and conclusions expressed in the report are limited by the Scope of Services, including the extent of subsurface exploration and other tests. The Scope of Services was defined by the requests of the Client, the time and budgetary constraints imposed by the Client, and the availability of access to the Site.

5. Because of the limitations stated above, the findings, observations, and conclusions expressed by M&E in this report are not, and should not be considered, an opinion concerning the compliance of any past or present owner or operator of the Site with any federal, state, or local law or regulation. No warranty or guarantee, whether expressed or implied, is made with respect to the data reported or findings, observations, and conclusions expressed in this report. Further, such data, findings, observations, and conclusions are based solely upon site conditions in existence at the time of investigation.

6. This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the Agreement and the provisions thereof.