Department of Environmental Conservation

Division of Environmental Remediation

Long-Term Monitoring Assessment Report November 2010 – January 2012

Spaulding Composites Site
Tonawanda, Erie County, New York
Site Number 9-15-050

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New York State Department of Environmental Conservation
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1.0 INTRODUCTION

The NYSDEC has prepared this *Long-Term Monitoring Assessment Report* to summarize the post-remediation groundwater, surface water and soil sampling activities completed between November 2010 and January 2012 at the Spaulding Composites Site (the Site) in the City of Tonawanda, Erie County, New York (Figure 1-1). Six operable units at the Site were remediated during 2009 and 2010; Operable Units 1 through 4 under the State Superfund (SSF) Program and Operable Units 5 and 6 under the Environmental Restoration Program (ERP). The principal objective of the post-remediation groundwater monitoring activities was to obtain information sufficient to determine if long-term groundwater monitoring, as required by the 2003 Record of Decision/Statement of Basis (ROD/SOB), can be discontinued. This determination is critical to the preparation of the Site Management Plan (SMP) and has implications for future Site development. The principal objective of the surface water monitoring activities was to evaluate the impact of contaminated soil encountered during construction of a storm water retention pond on surface water in that pond.

The remaining sections of this report are organized as follows:

- **Section 2.0, Site History and Background:** This section describes the Site, discusses the history and previous investigations completed at the Site, and summarizes the March 2003 Record of Decision/Statement of Basis as it pertains to long-term groundwater monitoring;

- **Section 3.0, Soil Sampling Activities and Results:** This section describes the soil sampling activities completed during November 2010 and discusses the results of that sampling;

- **Section 4.0, Groundwater Monitoring Activities and Results:** This section describes both the pre- and post-remediation groundwater monitoring activities and discusses the results of that monitoring;

- **Section 5.0, Surface Water Monitoring Activities and Results:** This section describes post-remediation surface water monitoring activities and discusses the results of that monitoring;

- **Section 6.0, Discussion and Recommendations:** This section summarizes the findings of Sections 3.0 and 4.0, and makes recommendations concerning the long-term groundwater monitoring at the Site; and

- **Section 7.0, References:** This section contains a list of references utilized or cited in this report.

2.0 SITE HISTORY AND BACKGROUND

2.1 Site Description

The 46-acre Spaulding Composites Site is located at 310 Wheeler Street in the City of Tonawanda, Erie County, New York (Figure 1-1). The Site is bordered by Dodge and Enterprise Avenues and residential property to the north, Wheeler Street and a mix of commercial and residential properties to the east, Hackett Drive and commercial properties to the south, and Hinds Street and a mix of commercial and residential properties to the west (Figures 1-1 and 2-1). The topography of the Site and the surrounding area is relatively flat, with most surface water runoff toward on-site drainage ditches and storm sewers. The Niagara River is located approximately one mile to the north, while Two Mile Creek is located approximately one mile to the west (Figure 1-1).

The Spaulding Composites Site has been subdivided into seven Operable Units (OUs) as shown on Figure 2-1. Operable Units 1 through 4 are associated with the State Superfund portion of the Site, and consist of multiple Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs). Operable Units 5 through 7 are associated with the Environmental Restoration Program (ERP) portion of the Site. These operable units were designated to facilitate the ERP Site Investigation; Operable Units 5 and 7 were not part of Spaulding's manufacturing activities and so were thought to be relatively uncontaminated. Operable Unit 6 includes the manufacturing portion of the Site. Operable Units 1 through 4 are located within Operable Unit 6, but are not part of the Environmental Restoration Program.

2.2 Site History

Spaulding Composites began operations as a manufacturer of vulcanized fiber, an early "plastic" made by treating paper with a zinc chloride solution. The paper used to produce vulcanized fiber was also manufactured at the Site. During the late 1940s to early 1950s, the plant began production of composite laminates (Spauldite®) that were made by impregnating natural fibers with phenolic resins (and later, melamine and epoxy resins and synthetic fibers). Many of the phenolic resins used in the production of Spauldite® were also manufactured on-site. In the Fall of 1992 Spaulding ceased manufacturing operations at the Site and commenced decommissioning activities of the plant. Spaulding, however, maintained a limited manpower staff until January 23, 2004 to: (1)

operate an on-site water treatment system; and (2) maintain the facility (e.g., lawn mowing and security). From January 23 to October 11, 2004, the NYSDEC, through use of a Spill Contractor, operated and maintained the water treatment system.

2.3 SSF Remedial Investigation/RCRA Facility Investigation

To evaluate the nature and extent of contamination at Operable Units 1 through 4 of the Spaulding Composites Site, and to evaluate remedial alternatives to address this contamination, Spaulding completed both a Remedial Investigation/RCRA Facility Investigation (RI/RFI) and a Feasibility Study/Corrective Measures Study (FS/CMS) at the Site. This was a joint project between the State CERCLA and RCRA programs, with overall NYSDEC management, coordination and oversight provided by CERCLA staff. To satisfy both programs, Spaulding decided to conduct a single investigation of the Site. Reports entitled *RCRA Facility Investigation and Remedial Investigation Report* dated September 1998; *Supplemental Remedial Investigation/RCRA Facility Investigation Report* dated May 24, 1999; and *Limited Groundwater Sampling Program Report* dated August 30, 1999 were prepared by Spaulding's consultants and describe the field activities and findings of the RI/RFI in detail.

Based upon the RI/RFI results, in comparison to standards, criteria and guidance values (SCGs) and potential public health and environmental exposure routes, 17 SWMUs and AOCs were identified as requiring remediation. In addition to soil contamination, groundwater contamination was documented in monitoring well OW-8, which is located in AOC 45 (Rail Spur) of Operable Unit 4 (Figure 2-2). Groundwater exceedances documented in this well are shown on Figure 2-2.

2.4 ERP Site Investigation and Interim Remedial Measures

To evaluate the nature and extent of contamination at Operable Units 5 through 7 of the Spaulding Composites Site, Erie County and the City of Tonawanda (Applicant) completed a Site Investigation (SI) at the Site. Reports entitled *Site Investigation Report* dated May 2008 and *Supplemental Investigation Result Report* dated January 2009 were prepared by the Applicant's consultant and describe the field activities and findings of the SI in detail.

Based upon the SI results, in comparison to SCGs and potential public health and environmental exposure routes, numerous areas in Operable Units 5 and 6 were identified as requiring remediation. Remediation of contaminated soil at these operable units was completed as Interim Remedial Measures (IRMs) between August 28 and September 10, 2009, and between February 15 and November 1, 2010.

In addition to soil contamination at Operable Units 5 and 6, groundwater contamination was documented in monitoring well MW-43, which is located at the intersection of AOC 45 and SWMU 36 (Former Tank Farm Area; Figure 2-2). Groundwater exceedances documented in this well are shown on Figure 2-2. Groundwater exceedances documented in downgradient monitoring wells OW-A, OW-B and OW-9 are also shown on Figure 2-2.

2.5 SSF Record of Decision/Statement of Basis

In March 2003 the NYSDEC issued a Record of Decision/Statement of Basis for Operable Units 1 through 4 of the Spaulding Composites Site. The element of the ROD/SOB that pertains to long-term groundwater monitoring is summarized as follows:

- sampling and analysis of groundwater at AOC 45 (Rail Spur) following remediation to evaluate the effectiveness of soil removal activities on groundwater contamination at this area of the Site.

To comply with this requirement of the ROD, monitoring wells OW-8 and MW-43, which were destroyed during remediation activities, were replaced in November 2010. These wells, along with existing monitoring wells OW-A and OW-B, were sampled in November 2010, August 2011 and January 2012 as part of the post-remediation groundwater monitoring activities.

3.0 SOIL SAMPLING ACTIVITIES AND RESULTS

3.1 General

The October 2010 Well Installation Scope of Work contained a provision to submit samples for chemical analysis if they exhibited organic vapors. During well re-installation activities, elevated organic vapor reading were recorded, and a single sample was submitted to a lab for chemical analysis. This section describes the soil sampling activities associated with well re-installation and discusses the results of that sampling. An evaluation of these data is presented in Section 5.0.

Soil analytical results were evaluated against the unrestricted, restricted residential, and groundwater protection soil cleanup objectives of Tables 375-6.8(a) and 375-6.8(b) contained in the December 2006 NYSDEC publication entitled *"6NYCRR Part 375: Environmental Remediation Programs"*. The restricted residential soil cleanup objectives were utilized because the State Superfund and ERP remediations were completed to this level of cleanup. For contaminants not included in 6 NYCRR Part 375, the soil cleanup objectives identified in the October 2010 NYSDEC Commissioner's Policy CP-51 entitled "Soil Cleanup Guidance" were utilized.

3.2 Soil Sample Collection and Analysis

Monitoring wells OW-8R and MW-43R were completed by advancing 6¼-inch diameter augers with continuous split spoon sampling of the overburden beginning at 4 feet depth at OW-8R and 10 feet depth at MW-43R. These depths represented the general thickness of clean backfill placed in the excavations following the SSF and ERP remediations. Once initiated, continuous split spoon sampling was completed at each location until the desired well depth was reached.

3.3 Monitoring Well OW-8R

Soil samples collected from boring OW-8R exhibited elevated organic vapor readings that ranged from background levels to 450 ppm (see the boring log in Appendix A). Due to these elevated readings, a sample from 11 to 15 feet depth was submitted to TestAmerica Laboratories in Amherst, New York for chemical analysis of Target Compound List (TCL) volatile organic compounds and TCL semivolatile organic compounds. The analytical results for this sample are summarized in Table 3-1.

The results of the organic analyses revealed that both volatile and semivolatile organic compounds were detected in the soil sample from boring OW-8R (Table 3-1). Volatile organic compounds detected in the sample included acetone (0.011 J mg/kg) and methylene chloride (0.0044 J mg/kg). Of these compounds, none were detected at concentrations that exceeded the NYSDEC Part 375 unrestricted and groundwater protection soil cleanup objectives (Table 3-1).

Four semivolatile organic compounds were also detected in the soil sample (Table 3-1). Semivolatile organic compounds detected in the sample included 2,4-dimethylphenol (0.49 mg/kg), bis(2-ethylhexyl)phlphthalate (0.31 mg/kg), 2-methylphenol (0.28 mg/kg), 4-methylphenol (2.3 mg/kg) and phenol (1.7 mg/kg). Of these compounds, 4-methylphenol and phenol were detected at concentrations that exceeded both the NYSDEC Part 375 unrestricted and groundwater protection soil cleanup objectives (Table 3-1). Neither concentration, however, exceeded the NYSDEC Part 375 restricted residential soil cleanup objectives. There are no soil cleanup objectives for 2,4-dimethylphenol.

3.4 Monitoring Well MW-43R

At boring MW-43R, the only sample that exhibited organic vapor readings was collected from 20 to 22 feet depth (see the boring log in Appendix A). Since the readings were relatively low (35 to 45 ppm), it was decided not to submit a sample to a lab for chemical analysis.

4.0 GROUNDWATER MONITORING ACTIVITIES AND RESULTS

4.1 General

Including the January 2012 sampling event, the monitoring wells in the vicinity of AOC 45 have been sampled on numerous occasions since July 1996. This section describes the groundwater monitoring activities associated with these wells and discusses the results of that monitoring. An evaluation of these data is presented in Section 6.0.

Groundwater analytical results were evaluated against the August 1999 NYSDEC publication entitled *"Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations"* and the June 1998 NYSDEC publication entitled "*Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*".

4.2 Monitoring Well OW-8 & OW-8R

4.2.1 *1996 Sampling Events*

Monitoring well OW-8 was sampled in July and November 1996 as part of the RI/RFI completed by Spaulding. Prior to sampling, the well was purged dry using a stainless steel bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater samples were submitted to Columbia Analytical in Rochester, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, zinc, ethanol, methanol, and petroleum products. A duplicate sample from this well was collected in July 1996. The analytical results for these samples are summarized in Table 4-2, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed the presence of volatile and semivolatile organic compounds in groundwater from well OW-8 (Table 4-2). Volatile organic compounds detected in the samples included: acetone (170.0 μg/L and 140.0 μg/L in July 1996), benzene (2.8 J μg/L in July 1996 (both samples); 3.2 J μg/L in November 1996), 2-butanone (19.0 μg/L and 18.0 μg/L in July

1996; 26.0 μg/L in November 1996), chloroform (2.6 J μg/L in July 1996; the duplicate sample was ND), ethylbenzene (3.4 J μg/L in July 1996 (both samples); 3.8 J μg/L in November 1996), toluene (25.0 μg/L and 24.0 μg/L in July 1996; 32.0 μg/L in November 1996), and total xylenes (16.0 μg/L and 16.1 μg/L in July 1996; 17.9 μg/L in November 1996). The concentrations of acetone in July 1996 (original and duplicate samples) exceeded the NYSDEC groundwater guidance value for this contaminant (Table 4-2; Figure 2-2). The concentrations of benzene, toluene and total xylenes exceeded the NYSDEC groundwater standards in all three samples (Table 4-2; Figure 2-2).

Semivolatile organic compounds detected in groundwater from well OW-8 included: 2,4-dimethylphenol (73,000 μg/L and 70,000 μg/L in July 1996; 49,000 μg/L in November 1996), 2-methylphenol (47,000 μg/L and 45,000 μg/L in July 1996; 30,000 μg/L in November 1996), 3&4-methylphenol (220,000 μg/L and 210,000 μg/L in July 1996; 130,000 μg/L in November 1996) and phenol (190,000 μg/L and 180,000 μg/L in July 1996; 100,000 μg/L in November 1996). The concentrations of 2,4-dimethylphenol, 2-methylphenol, 3&4-methylphenol and phenol exceeded the NYSDEC groundwater standards in all three samples (Table 4-2; Figure 2-2).

Zinc and petroleum products were not detected in well OW-8 during either sampling event in 1996 (Table 4-2). Ethanol and methanol, however, were detected in this well (Table 4-2). Ethanol was detected in both samples collected in July 1996 at a concentration of 2,500 μg/L. Ethanol, however, was not detected in the November 1996 sample. Methanol was detected in all 3 samples (10,000 μg/L in July 1996 (both samples); 6,800 μg/L in November 1996). There are no groundwater standards or guidance values for these contaminants.

4.2.2 *2010 Sampling Event*

For the 2010 sampling event, monitoring well OW-8 was replaced on November 10, 2010. The new well, designated OW-8R, was constructed at the same location and to the approximate elevation (with respect to mean sea level) as the original well so that the same water bearing zone was monitored. This was required so that the post-remediation results could be compared directly to the pre-remediation results. The boring logs and well construction diagrams for monitoring wells OW-8 and OW-8R are contained in Appendix A.

Monitoring well OW-8R was sampled in November 2010 to document post-remediation contamination levels in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. Also during purging, a phenol or formaldehyde-like odor was noticed. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, Target Analyte List (TAL) metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-2, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed the presence of volatile organic compounds and semivolatile organic compounds in well OW-8R (Table 4-2). Acetone was the only volatile organic compound detected in this well, but at a concentration (4.9 J μg/L) well below the NYSDEC groundwater guidance value for this contaminant (Table 4-2).

Semivolatile organic compounds detected in the groundwater sample from well OW-8R included: bis(2-ethylhexyl)phthalate (3.3 J μg/L), 2,4-dimethylphenol (80.0 μg/L), 2-methylphenol (250.0 μg/L), 4-methylphenol (760.0 μg/L) and phenol (490.0 μg/L). The concentrations of 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol and phenol exceeded the NYSDEC groundwater standards (Table 4-2; Figure 4-1).

Four metals were detected in the groundwater sample from well OW-8R (Table 4-2). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-2; Figure 4-1). Neither metal, however, is an EPA priority pollutant metal. EPA priority pollutant metals are toxic metals for which technology-based effluent limitations and guidelines are required by Federal law.

Cyanide, ethanol, methanol and formaldehyde were not detected in the November 2010 groundwater sample collected from well OW-8R (Table 4-2).

4.2.3 *2011 Sampling Event*

Monitoring well OW-8R was sampled in August 2011 to document post-remediation contamination levels in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-2, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed the presence of volatile organic compounds and semivolatile organic compounds in well OW-8R (Table 4-2). Acetone was the only volatile organic compound detected in this well, but at a concentration (5.8 J μg/L) well below the NYSDEC groundwater guidance value for this contaminant (Table 4-2).

Semivolatile organic compounds detected in the groundwater sample from well OW-8R included: 2,4-dimethylphenol (1,300 μg/L), 2-methylphenol (1,600 μg/L), 4-methylphenol (6,200 μg/L) and phenol (2,600 μg/L). The concentrations of 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol and phenol increased significantly over the concentrations detected in November 2010, with the concentrations of 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol and phenol exceeding the NYSDEC groundwater standards (Table 4-2; Figure 4-2).

Nine metals were detected in the groundwater sample from well OW-8R (Table 4-2). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-2; Figure 4-2). Neither metal, however, is an EPA priority pollutant metal.

Formaldehyde was detected at a concentration of 16 J μg/L, which exceeded the NYSDEC groundwater standard for this contaminant (Table 4-2; Figure 4-2).

Cyanide, ethanol and methanol were not detected in the August 2011 groundwater sample collected from well OW-8R (Table 4-2).

4.2.4 *2012 Sampling Event*

Monitoring well OW-8R was sampled in January 2012 to document post-remediation contamination levels in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The purge log is contained in Appendix B. The groundwater sample was submitted to Upstate Laboratories, Inc. in East Syracuse, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-2, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that only semivolatile organic compounds were detected in well OW-8R (Table 4-2). Semivolatile organic compounds detected in this well included: 2,4-dimethylphenol (5,600 μg/L), 2-methylphenol (2,400 μg/L) and 3&4-methylphenol (7,300 μg/L). The concentrations of these contaminants increased significantly over the concentrations detected in August 2011, with the concentrations of 2,4-dimethylphenol, 2-methylphenol and 3&4-methylphenol exceeding the NYSDEC groundwater standards (Table 4-2; Figure 4-3).

Iron and manganese were the only metals detected in the groundwater sample from well OW-8R, with both metals detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-2; Figure 4-3). Neither metal, however, is an EPA priority pollutant metal.

Cyanide, ethanol, methanol and formaldehyde were not detected in the January 2012 groundwater sample collected from well OW-8R (Table 4-2).

4.3 Monitoring Well OW-9

4.3.1 *1996 Sampling Events*

Monitoring well OW-9 was sampled in July and November 1996 as part of the RI/RFI completed by Spaulding. Prior to sampling, the well was purged dry using a stainless steel bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater samples were submitted to Columbia Analytical in Rochester, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, zinc, ethanol, methanol, and petroleum products. The analytical results for these samples are summarized in Table 4-3, while information concerning sample collection and analysis is given in Table 4-1.

Acetone (25.0 μg/L in July 1996) and bis(2-ethylhexyl)phthalate (9.1 μg/L in July 1996) were the only contaminants detected in this well, with the concentration of bis(2-ethylhexyl)phthalate exceeding the NYSDEC groundwater standard (Table 4-3; Figure 2-2). No contaminants were detected in the November 1996 sample (Table 4-3).

4.3.2 *2010 Sampling Event*

As described in Section 4.3.1, groundwater in monitoring well OW-9 was not significantly impacted by the Spaulding facility. As a result, this well was proposed for inclusion in the long-term groundwater monitoring program to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R. Unfortunately, this well was decommissioned during the ERP IRM at Operable Unit 6 before it could be sampled.

4.4 Monitoring Well OW-A

4.4.1 *1998 Sampling Event*

Monitoring well OW-A was sampled in November 1998 as part of the Supplemental RI/RFI completed by Spaulding. Prior to sampling, the well was purged dry using a pre-cleaned PVC bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater sample was submitted to Paradigm Environmental Services, Inc. in Rochester, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, zinc and petroleum products. The analytical results for this sample are summarized in Table 4-4, while information concerning sample collection and analysis is given in Table 4-1.

Zinc was the only contaminant detected in this well, but at a concentration (32.0 μg/L) well below the NYSDEC groundwater guidance value for this contaminant (Table 4-4).

4.4.2 *1999 Sampling Event*

Monitoring well OW-A was sampled in August 1999 as part of the Limited Groundwater Sampling Program completed by Spaulding. This well was re-sampled to resolve the discrepancy between the Spaulding and NYSDEC analytical results from the 1998 sample. Spaulding's results were non-detect, while NYSDEC's results indicated the presence of several organic compounds. The NYSDEC results have not been summarized in Table 4-4 as the detected compounds were ultimately suspected of being a lab error.

Prior to sampling, monitoring well OW-A was purged dry using a pre-cleaned PVC bailer. During purging, specific conductance, temperature and pH of the groundwater were measured to ensure that the well had stabilized. The groundwater sample was submitted to Paradigm Environmental Services, Inc. in Rochester, New York for chemical analysis of TCL volatile organic compounds, STARS volatile organic compounds, and the acid extractable fraction of the semivolatile organic compounds list. The analytical results for this sample are summarized in Table 4-4, while information concerning sample collection and analysis is given in Table 4-1.

The results from well OW-A were non-detect for all analyzed compounds (Table 4-4).

4.4.3 *2008 Sampling Event*

Monitoring well OW-A was sampled in February 2008 as part of the ERP Site Investigation completed by Erie County and the City of Tonawanda. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater sample was submitted to ChemTech in Mountainside, New Jersey for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, TAL metals and cyanide. The analytical results for this sample are summarized in Table 4-4, while information concerning sample collection and analysis is given in Table 4-1.

Metals were the only contaminants detected in this well (Table 4-4). Of these metals, only antimony, iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-4; Figure 2-2), with antimony being an EPA priority pollutant metal. This contaminant was detected at a concentration of 128.0 μg/L (Table 4-4).

4.4.4 *2010 Sampling Event*

As described in Sections 4.4.1 through 4.4.3, groundwater from monitoring well OW-A was not impacted by volatile organic compounds and semivolatile organic compounds associated with the Spaulding Composites facility. As a result, this well was sampled in November 2010 to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. Also during purging, a sulphur-like odor was noticed. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-4, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that acetone (3.8 J μg/L) and phenol (1.5 J μg/L) were the only volatile and semivolatile organic compounds detected in groundwater from monitoring well OW-A. The concentration of acetone was well below the NYSDEC groundwater guidance value for this contaminant, while the concentration of phenol only slightly exceeded the NYSDEC groundwater standard (Table 4-4; Figure 4-1).

Four metals were detected in groundwater from well OW-A (Table 4-4). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-4; Figure 4-1). Neither metal, however, is an EPA priority pollutant metal.

Cyanide, ethanol, methanol and formaldehyde were not detected in the November 2010 groundwater sample collected from well OW-A (Table 4-4).

4.4.5 *2011 Sampling Event*

Monitoring well OW-A was sampled in August 2011 to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. Also during purging, a sulphur-like odor was noticed. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-4, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that phenol (0.56 J μg/L) was the only volatile or semivolatile organic compound detected in groundwater from monitoring well OW-A. The concentration of phenol, however, did not exceed the NYSDEC groundwater standard for this contaminant (Table 4-4).

Eleven metals were detected in groundwater from well OW-A (Table 4-4). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-4; Figure 4-2). Neither metal, however, is an EPA priority pollutant metal.

Formaldehyde was detected at a concentration of 6.7 J μg/L, which did not exceed the NYSDEC groundwater standard for this contaminant (Table 4-4).

Cyanide, ethanol and methanol were not detected in the August 2011 groundwater sample collected from well OW-A (Table 4-4).

4.4.6 *2012 Sampling Event*

Monitoring well OW-A was sampled in January 2012 to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The purge log is contained in Appendix B. The groundwater sample was submitted to Upstate Laboratories, Inc. in East Syracuse, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-4, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that bis(2-ethylhexyl)phthalate (1.3 J μg/L) was the only volatile or semivolatile organic compound detected in groundwater from monitoring well OW-A. The concentration of phenol, however, did not exceed the NYSDEC groundwater standard for this contaminant (Table 4-4).

Four metals were detected in groundwater from well OW-A (Table 4-4). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-4; Figure 4-3). Neither metal, however, is an EPA priority pollutant metal.

Cyanide, ethanol, methanol and formaldehyde were not detected in the January 2012 groundwater sample collected from well OW-A (Table 4-4).

4.5 Monitoring Well OW-B

4.5.1 *1998 Sampling Event*

Monitoring well OW-B was sampled in November 1998 as part of the Supplemental RI/RFI completed by Spaulding. Prior to sampling, the well was purged dry using a pre-cleaned PVC bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater sample was submitted to Paradigm Environmental Services, Inc. in Rochester, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, zinc and petroleum products. The analytical results for this sample are summarized in Table 4-5, while information concerning sample collection and analysis is given in Table 4-1.

Zinc was the only contaminant detected in this well, but at a concentration (11.0 μg/L) well below the NYSDEC groundwater guidance value for this contaminant (Table 4-5).

4.5.2 *2008 Sampling Event*

Monitoring well OW-B was sampled in February 2008 as part of the ERP Site Investigation completed by Erie County and the City of Tonawanda. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater sample was submitted to ChemTech in Mountainside, New Jersey for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, TAL metals and cyanide. The analytical results for this sample are summarized in Table 4-5, while information concerning sample collection and analysis is given in Table 4-1.

The only contaminants detected in this well were metals and cyanide (Table 4-5). Of these contaminants, only iron, manganese, and cyanide were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-5; Figure 2-2). Neither metal, however, is an EPA priority pollutant metal. Cyanide was detected at a concentration of 2,010 μg/L, which is significantly above the NYSDEC groundwater standard for this contaminant (Table 4-5).

4.5.3 *2010 Sampling Event*

As described in Sections 4.5.1 and 4.5.2, groundwater from monitoring well OW-B was not impacted by volatile organic compounds and semivolatile organic compounds associated with the Spaulding Composites facility. Cyanide, however, was detected at a significant concentration in 2008 (Table 4-5). As a result, this well was sampled in November 2010 to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R, and to document post-remediation concentrations of cyanide. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-5, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that phenol (1.8 J μg/L) was the only volatile or semivolatile organic compound detected in groundwater from monitoring well OW-B (Table 4-5). The concentration of phenol only slightly exceeded the NYSDEC groundwater standard for this contaminant (Table 4-5; Figure 4-1).

Five metals were detected in groundwater from well OW-B (Table 4-4). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-5; Figure 4-1). Neither metal, however, is an EPA priority pollutant metal.

Cyanide, ethanol, methanol and formaldehyde were not detected in the November 2010 groundwater sample collected from well OW-B (Table 4-5).

4.5.4 *2011 Sampling Event*

Monitoring well OW-B was sampled in August 2011 to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R, and to further evaluate the 2008 presence of cyanide in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-5, while information concerning sample collection and analysis is given in

Table 4-1.

The results of the organic analyses revealed that di-n-butyl phthalate (0.37 JB μg/L) and naphthalene (1.1 J μg/L) were the only volatile or semivolatile organic compound detected in groundwater from monitoring well OW-B (Table 4-5). Neither concentration, however, exceeded the NYSDEC groundwater standards or guidance values (Table 4-5).

Eleven metals were detected in groundwater from well OW-B (Table 4-4). Of these metals, only iron and manganese were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-5; Figure 4-2). Neither metal, however, is an EPA priority pollutant metal.

Formaldehyde was detected at a concentration of 5.2 J μg/L, which did not exceed the NYSDEC groundwater standard for this contaminant (Table 4-5).

Cyanide, ethanol and methanol were not detected in the August 2011 groundwater sample collected from well OW-B (Table 4-5).

4.5.5 *2012 Sampling Event*

Monitoring well OW-B was sampled in January 2012 to help delineate the extent of post-remediation groundwater contamination in monitoring wells OW-8R and MW-43R, and to further evaluate the 2008 presence of cyanide in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The purge log is contained in Appendix B. The groundwater sample was submitted to Upstate Laboratories, Inc. in East Syracuse, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-5, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that bis(2-ethylhexyl)phthalate (1.3 J μg/L) and di-n-butyl phthalate (1.4 J μg/L) were the only volatile or semivolatile organic compound detected in groundwater from monitoring well OW-B (Table 4-5). Neither concentration, however, exceeded the NYSDEC groundwater standards or guidance values (Table 4-5).

Four metals were detected in groundwater from well OW-B (Table 4-5). Of these metals, only iron was detected at a concentration that exceeded the NYSDEC groundwater standards or guidance values (Table 4-5; Figure 4-3). Iron, however, is not an EPA priority pollutant metal.

Cyanide, ethanol, methanol and formaldehyde were not detected in the January 2012 groundwater sample collected from well OW-B (Table 4-5).

4.6 Monitoring Well MW-43 & MW-43R

4.6.1 *2007 Sampling Event*

Monitoring well MW-43 was sampled in December 2007 as part of the ERP Site Investigation completed by Erie County and the City of Tonawanda. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. The groundwater sample was submitted to ChemTech in Mountainside, New Jersey for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TCL PCBs, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-6, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed that acetone (85 J μg/L), 2-butanone (60 J μg/L) and 2-hexanone (58 J μg/L) were the only volatile or semivolatile organic compounds detected in groundwater from well MW-43 (Table 4-6). The concentration of each contaminant exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 2-2).

Fourteen metals were detected in groundwater from well MW-43 (Table 4-6). Of these metals, only antimony, iron, lead, and manganese were detected at concentrations that exceeded the

NYSDEC groundwater standards or guidance values (Table 4-6; Figure 2-2), with antimony and lead being EPA priority pollutant metals. These metals were detected at concentrations of 41.5 μg/L and 26.0 μg/L, respectively (Table 4-6).

Formaldehyde was detected at a concentration of 61.0 μg/L, which exceeded the NYSDEC groundwater standard for this contaminant (Table 4-6; Figure 2-2).

Cyanide, ethanol and methanol were not detected in the December 2007 groundwater samples collected from well MW-43 (Table 4-6).

4.6.2 *2010 Sampling Event*

For the 2010 sampling event, monitoring well MW-43 was replaced on November 10, 2010. The new well, designated MW-43R, was constructed at the same location and to the approximate elevation (with respect to mean sea level) as the original well so that the same water bearing zone was monitored. This was required so that the post-remediation results could be compared directly to the pre-remediation results. The boring logs and well construction diagrams for monitoring wells MW-43 and MW-43R are contained in Appendix A.

Monitoring well MW-43R was sampled in November 2010 to document post-remediation contamination levels in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. Also during purging, a distinct crushed concrete odor was noticed, which was undoubtedly due to the crushed concrete utilized as backfill in this area of the Site. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-6, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed the presence of volatile and semivolatile organic compounds in groundwater from well MW-43R (Table 4-6). Volatile organic compounds detected in the sample included: acetone (220.0 μg/L), benzene (5,800 μg/L), 1,2-dichloroethane (120.0 μg/L), and toluene (38.0 μg/L). The concentration of each contaminant exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-1).

Semivolatile organic compounds detected in groundwater from well MW-43R included: carbazole (4.1 J μg/L), 2,4-dimethylphenol (10 J μg/L), 2-methylphenol (17 J μg/L), 4-methylphenol (67.0 μg/L), naphthalene (12 J μg/L), phenanthrene (3.6 J μg/L) and phenol (410.0 μg/L). The concentrations of 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, naphthalene and phenol exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-1). There are no groundwater standards or guidance values for carbazole.

Eleven metals were detected in groundwater from well MW-43R (Table 4-6). Of these metals, only arsenic and iron were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-1), with arsenic being an EPA priority pollutant metal. This contaminant was detected at a concentration of 33.4 μg/L (Table 4-6).

Formaldehyde was detected at a concentration of 63.9 μg/L, which exceeded the NYSDEC groundwater standard for this contaminant (Table 4-6; Figure 4-1). Methanol was also detected in this well at a concentration of 10,000 μg/L (Table 4-6; Figure 4-1). There are no groundwater standards or guidance values for this contaminant.

Cyanide and ethanol were not detected in the November 2010 groundwater sample collected from well MW-43R (Table 4-6).

4.6.3 *2011 Sampling Event*

Monitoring well MW-43R was sampled in August 2011 to document post-remediation contamination levels in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. Also during purging, a distinct crushed concrete odor was noticed, and the purge water was light green in color and foamy. The purge log is contained in Appendix B. The groundwater sample was submitted to TestAmerica in Amherst, New

York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-6, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed the presence of volatile and semivolatile organic compounds in groundwater from well MW-43R (Table 4-6). Benzene (15,000 μg/L) was the only volatile organic compound detected in this well. This concentration was significantly higher than the concentration detected in November 2010, and significantly exceeded the NYSDEC groundwater standard for this contaminant (Table 4-6; Figure 4-2).

Semivolatile organic compounds detected in groundwater from well MW-43R included: acenaphthene (3.7 J μg/L), acetophenone (2.6 J μg/L), anthracene (1.3 J μg/L), carbazole (5.1 J μg/L), 2,4-dimethylphenol (14 J μg/L), fluorene (2.8 J μg/L), 2-methylnaphthalene (2.8 J μg/L), 2-methylphenol (20 J μg/L), 4-methylphenol (78.0 μg/L), naphthalene (19 J μg/L), phenanthrene (4.1 J μg/L) and phenol (530.0 μg/L). The concentrations of 2,4-dimethylphenol, 2-methylphenol, 4-methylphenol, naphthalene and phenol exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-2). There are no groundwater standards or guidance values for acetophenone, carbazole and 2-methylnaphthalene.

Thirteen metals were detected in groundwater from well MW-43R (Table 4-6). Of these metals, only arsenic and iron were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-2), with arsenic being an EPA priority pollutant metal. This contaminant was detected at a concentration of 44.0 μg/L (Table 4-6).

Formaldehyde was detected at a concentration of 14 J μg/L, which exceeded the NYSDEC groundwater standard for this contaminant (Table 4-6; Figure 4-2). Cyanide was also detected in this well, but at a concentration (6.0 J μg/L) well below the NYSDEC groundwater standard for this contaminant (Table 4-6).

Ethanol and methanol were not detected in the August 2011 groundwater sample collected from well MW-43R (Table 4-6).

4.6.4 *2012 Sampling Event*

Monitoring well MW-43R was sampled in January 2012 to document post-remediation contamination levels in this well. Prior to sampling, the well was purged dry using a disposable bailer. During purging, specific conductance, temperature, pH and turbidity of the groundwater were measured to ensure that the well had stabilized. Also during purging, a distinct crushed concrete odor was noticed, and the purge water was pale yellow in color and foamy. The purge log is contained in Appendix B. The groundwater sample was submitted to Upstate Laboratories, Inc. in East Syracuse, New York for chemical analysis of TCL volatile organic compounds, TCL semivolatile organic compounds, TAL metals, ethanol, methanol, formaldehyde, and cyanide. The analytical results for this sample are summarized in Table 4-6, while information concerning sample collection and analysis is given in Table 4-1.

The results of the organic analyses revealed the presence of volatile and semivolatile organic compounds in groundwater from well MW-43R (Table 4-6). Benzene (21,000 μg/L) was the only volatile organic compound detected in this well. This concentration increased from 2011 and was significantly higher than the concentration detected in November 2010. The concentration of benzene also significantly exceeded the NYSDEC groundwater standard for this contaminant (Table 4-6; Figure 4-3).

Semivolatile organic compounds detected in groundwater from well MW-43R included: acenaphthene (3.1 J μg/L), anthracene (1.2 J μg/L), carbazole (3.9 J μg/L), 2,4-dimethylphenol (23.0 μg/L), 2-methylphenol (14.0 μg/L), 3&4-methylphenol (54.0 μg/L), naphthalene (15.0 μg/L), phenanthrene (3.0 J μg/L) and phenol (760.0 μg/L). The concentrations of 2,4-dimethylphenol, 2-methylphenol, 3&4-methylphenol, naphthalene and phenol exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-3). There are no groundwater standards or guidance values for acetophenone, carbazole and 2-methylnaphthalene.

Six metals were detected in groundwater from well MW-43R (Table 4-6). Of these metals, only arsenic and iron were detected at concentrations that exceeded the NYSDEC groundwater standards or guidance values (Table 4-6; Figure 4-3), with arsenic being an EPA priority pollutant metal. This contaminant was detected at a concentration of 32.1 μg/L (Table 4-6).

Formaldehyde was detected at a concentration of 22.0 μg/L, which exceeded the NYSDEC groundwater standard for this contaminant (Table 4-6; Figure 4-3).

Cyanide, ethanol and methanol were not detected in the January 2012 groundwater sample collected from well MW-43R (Table 4-6).

5.0 SURFACE WATER MONITORING ACTIVITIES AND RESULTS

5.1 General

Construction of a storm water retention pond on the northern portion of the Spaulding property adjacent to the residences on Enterprise Avenue began in 2011. During December 2011 the contractor encountered contaminated soils while completing final grades on the pond. This contamination was encountered near Dodge and Gibson Streets where a former AST was located (SWMU 5 of State Superfund Operable Unit 4; Figure 2-1). Nearby residents began to detect odors emanating from the pond. The NYSDEC inspected the Site on December 30, 2011 but odors were not detected at that time.

The NYSDEC inspected the Site again on January 5, 2012 during the groundwater sampling activities. The retention pond was inspected in the morning and a faint phenolic or formaldehyde odor was detected in the southwest corner of the pond. This odor was more prevalent in the afternoon when the temperature increased. The exact source of this odor, however, could not be determined. The area of suspected soil contamination has since been covered with poly sheeting as prescribed in the Site Management Plan for the Site.

5.2 Retention Pond

5.2.1 *2012 Sampling Event*

During the January 2012 groundwater sampling activities a sample of surface water from the retention pond was collected and submitted to Upstate Laboratories, Inc. in East Syracuse, New York for chemical analysis of TCL semivolatile organic compounds and formaldehyde. The analytical results for this sample are summarized in Table 5-1, while information concerning sample collection and analysis is given in Table 4-1.

Surface water analytical results were evaluated against the August 1999 NYSDEC publication entitled *"Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations"* and the June 1998 NYSDEC publication entitled "*Technical and Operational Guidance Series (TOGS) 1.1.1: Ambient Water Quality Standards and Guidance Values* *and Groundwater Effluent Limitations*".

The results of the organic analyses revealed the presence of semivolatile organic compounds in surface water from the retention pond (Table 5-1). These compounds included: bis(2-ethylhexyl)phthalate (1.5 J μg/L), 2,4-dimethylphenol (2.4 J μg/L), di-n-butyl phthalate (5.1 μg/L), 2-methylphenol (230.0 μg/L), 3&4-methylphenol (37.0 μg/L) and phenol (1,300 μg/L). The concentrations of 2,4-dimethylphenol and phenol exceeded the NYSDEC surface water standards (Table 5-1). There are no surface water standards or guidance values for di-n-butyl phthalate, 2-methylphenol and 3&4-methylphenol.

Formaldehyde was detected at a concentration of 12.0 μg/L, which exceeded the NYSDEC surface water standard for this contaminant (Table 5-1).

6.0 Discussion and Recommendations

6.1 Discussion

The principal objective of the post-remediation groundwater monitoring activities was to obtain information sufficient to determine if long-term groundwater monitoring, as required by the 2003 Record of Decision/Statement of Basis, could be discontinued. This determination is critical to the preparation of the Site Management Plan (SMP) and has implications for future Site development. The principal objective of the surface water monitoring activities was to evaluate the impact of contaminated soil encountered during construction of a storm water retention pond on surface water in that pond. This section discusses the analytical results presented in Sections 3.0 through 5.0 of this report as they relate to the stated objectives.

6.1.1 *Soil*

Soil samples collected from boring OW-8R in November 2010 exhibited elevated organic vapor readings that ranged from background levels to 450 ppm. Due to these elevated readings, a sample was collected from 11 to 15 feet depth and submitted to a laboratory for chemical analysis. These results revealed that 4-methylphenol and phenol were detected at concentrations that exceeded the NYSDEC Part 375 soil cleanup objectives for unrestricted use and groundwater protection (Table 3-1). The concentrations of these contaminants (2.3 mg/kg for 4-methylphenol; 1.7 mg/kg for phenol) do not represent a significant source area, nor do they appear large enough to produce the concentrations detected in groundwater from well OW-8R (see Section 5.1.2 for more details).

6.1.2 *Groundwater*

Post-remediation groundwater samples indicate that Site related contaminants are not migrating from the Spaulding Composites Site. Although concentrations of phenol that slightly exceeded groundwater standards were detected in downgradient monitoring wells OW-A and OW-B in November 2010 (Tables 4-4 and 4-5), the groundwater results from August 2011 and January 2012 revealed that phenols are not currently migrating from the Site. Cyanide, detected at significant concentrations in well OW-B in 2008 (Table 4-5), was not detected in this well in any post-remediation sample. Iron and manganese, detected in both downgradient wells at concentrations that exceeded NYSDEC groundwater standards, are naturally occurring, so the presence of these metals in monitoring wells OW-A and OW-B is probably not Site related. Concentrations of these metals likely represent background concentrations in this area of Tonawanda.

Although off-site migration of contaminants via groundwater is not occurring at the Spaulding Composites Site, contaminant concentrations in monitoring wells OW-8R and MW-43R remain relatively high. In fact, concentrations of 2,4-dimethylphenol, 2-methylphenol and 4-methylphenol in well OW-8R have increased continuously since November 2010 (Table 4-2; Figures 6-1 and 6-2). These concentrations, however, are significantly lower than those detected in 1996 during the Remedial Investigation (Table 4-2; Figure 6-1).

Post-remediation groundwater results for monitoring well MW-43R indicate the presence of volatile and semivolatile organic compounds that were not detected during the 2007 Site Investigation. These contaminants include: benzene (all three sampling events), 1,2-dichloroethane (November 2010), toluene (November 2010), 2,4-dimethylphenol (all three sampling events), 2-methylphenol (all three sampling events), 3&4-methylphenol (all three sampling events), phenol (all three sampling events) and several PAH compounds (Table 4-6). The concentrations of benzene, 2,4-dimethylphenol and phenol have increased continuously since November 2010 (Table 4-6; Figures 6-3 and 6-4). Concentrations of 2-methylphenol and 3&4-methylphenol have also increased since November 2010, although slight decreases were observed in the January 2012 results (Figure 6-4).

6.1.3 *Surface Water*

Results from a surface water sample collected in January 2012 from the new storm water retention pond revealed the presence of several semivolatile organic compounds including bis(2-ethylhexyl)phthalate (1.5 J μg/L), 2,4-dimethylphenol (2.4 J μg/L), di-n-butyl phthalate (5.1 μg/L), 2-methylphenol (230.0 μg/L), 3&4-methylphenol (37.0 μg/L) and phenol (1,300 μg/L). Formaldehyde was also detected in this sample. The concentrations of 2,4-dimethylphenol, phenol and formaldehyde exceeded the NYSDEC surface water standards (Table 5-1).

6.2 *Source of the Groundwater and Surface Water Contamination*

As discussed in Section 2.3, monitoring well OW-8R is located in AOC 45 (Rail Spur). The rail spur ran a length of about 385 feet between the main manufacturing building and the Rag Shed (Figures 2-1 and 2-2). Along this length of track were several pipe connections where phenol, formaldehyde, cresylic acid [the major components in cresylic acid include the three cresols: o-cresol (2-methylphenol), m-cresol (3-methylphenol) and p-cresol (4-methylphenol)], methanol, and a sodium hydroxide solution were pumped directly from rail tank cars into the main manufacturing building. Rail delivery of chemicals reportedly took place from 1943 until 1985. During the period of operation, it is likely that spills and leaks occurred during unloading operations. During the RI/RFI completed by Spaulding, monitoring well OW-8 was installed in the center of the rail spur adjacent to one of the pipe connections. It is suspected that spilled and/or leaked chemicals migrated along vertical desiccation cracks in the native silty clay soil and is the source of the post-remediation groundwater contamination.

Monitoring well MW-43R is located close to the Rail Spur (AOC 45) and a Former Tank Farm (SWMU 36; Figures 2-1 and 2-2). As previously noted, the phenolic compounds detected in this well are known to have been unloaded from rail tank cars at several places along the rail spur. It is possible that the removal of building foundations along AOC 45 during remedial activities has allowed phenolic compounds to migrate from the Rail Spur to this well.

The Former Tank Farm (SWMU 36) contained five steel USTs and two steel ASTs that were utilized to store bulk raw chemicals prior to their transfer to process tanks situated in the main manufacturing building. The five USTs included two 15,000 gallon, carbon steel methanol tanks; one 15,000 gallon, carbon steel 50 percent methanol/50 percent toluene tank; one 15,000 gallon, carbon steel 50 percent sodium hydroxide solution tank; and one 3,750 gallon, carbon steel benzene tank. Both ASTs were 15,000 gallon, carbon steel tanks surrounded by earthen clay containment berms. One tank was utilized at alternating times to store methanol or ethanol, while the second tank was utilized to store methanol. The Former Tank Farm was put into service sometime prior to 1945 and taken out of service in late 1992. At that time all seven ASTs/USTs were emptied and cleaned, and subsequently removed from the Site between 1993 and 1995 as part of a plant-wide decommissioning program. During the period of operation, it is likely that spills and leaks occurred during loading and unloading operations. It is suspected that spilled and/or leaked chemicals migrated along vertical desiccation cracks in the native silty clay soil and is the source of benzene in the post-remediation groundwater samples.

The southwest corner of the new storm water retention pond is located close to a former Bulk Chemical Unloading Area (AOC 47). AOC 47 was immediately adjacent to the north wall of the bulk chemical storage room in the Spauldite® Sheet Department. Along this wall were several pipe connections where phenol, cresylic acid, aniline, formaldehyde, di-n-butyl phthalate, and phenolic resins were unloaded to bulk storage tanks inside the building. During the period of operation, it is likely that spills and leaks occurred during unloading operations. It is suspected that spilled and/or leaked chemicals migrated along vertical desiccation cracks in the native silty clay soil and is the source of the contamination in the post-remediation surface water sample collected from the retention pond.

Is there proof that chemicals migrating along vertical desiccation cracks in the native silty clay soil are the source of the contamination detected in post-remediation groundwater and surface water samples? Several lines of evidence support this hypothesis including: (1) the absence of soil source areas; (2) the historic presence of NAPL in vertical desiccation cracks at SWMU 38; and (3) high pH and a concrete odor in well MW-43R that was not exhibited prior to remediation.

Monitoring wells OW-8R and MW-43R, and the southwest corner of the retention pond, are located at areas of the Site where remedial activities took place. Post-remediation confirmatory samples from these areas met the restricted residential soil cleanup objectives. In addition, analytical results from a soil sample collected from boring OW-8R that exhibited elevated PID readings also met the restricted residential soil cleanup objectives. These results indicate that soils in the vicinity of the two wells and the southwest corner of the retention pond are not significant source areas, nor do contaminant concentrations from the OW-8R soil sample appear large enough to produce the concentrations detected in this well.

The presence of NAPL in vertical desiccation cracks was observed at the Site in 2004 during the remediation of SWMU 38 (Figures 6-5 and 6-6). In addition, a boring completed at SWMU 38 in 1995 was observed to be filled with NAPL during remedial activities. NAPL was not detected in this boring when it was installed, suggesting that NAPL flowed to the boring from vertical desiccation cracks over the intervening nine year period.

Further proof of this hypothesis comes from the high pH in monitoring well MW-43R and the faint concrete odor detected during purging. This area of the Site was backfilled with crushed concrete following remediation. Groundwater within the more permeable backfill began to flow under artesian conditions in November 2011 when a protective casing was installed on the well. In January 2012 the pH of this water was over 12.5. Monitoring well MW-43R is not in direct communication with the backfilled excavation because the well can be purged dry. The presence of high pH and a faint concrete odor indicates, however, that groundwater in the backfilled excavation is migrating to the well through the native silty clay soils. It is suspected that this "bathtub effect" provides a constant source of groundwater under sufficient head to produce groundwater movement through these soils. It seems likely that this groundwater becomes contaminated by chemicals in the vertical desiccation cracks as it flows from the more permeable backfill to the well. A similar phenomenon is likely occurring at well OW-8R, but since AOC 45 was backfilled with clean soil rather than crushed concrete, high pH and concrete odors are not observed.

6.3 Recommendations

The analytical results from post-remediation groundwater samples indicate that Site related contaminants are not migrating from the Spaulding Composites Site. These results, however, also indicate that Site related contaminants remain relatively high in two monitoring wells installed in former source areas, and that concentrations have generally increased in these wells since November 2010. Since the source of this contamination appears to be chemicals in the vertical desiccation cracks in the native silty clay soils that underlie the Site, it is expected that contaminant concentrations in groundwater will eventually start to decrease as the chemicals solublize over time. It is recommended, therefore, that periodic groundwater sampling and analysis of the four monitoring wells continue until sustained decreases in groundwater concentrations are documented.

The analytical results from the January 2012 surface water sample collected from the new storm water retention pond revealed the presence of Site related contaminants. Since the source of this contamination also appears to be chemicals in vertical desiccation cracks, it is expected that contaminant concentrations in surface water will eventually start to decrease as the chemicals solublize over time. It is recommended, therefore, that periodic sampling and analysis of surface water in the retention pond be conducted until sustained decreases in surface water concentrations are documented.

7.0 REFERENCES

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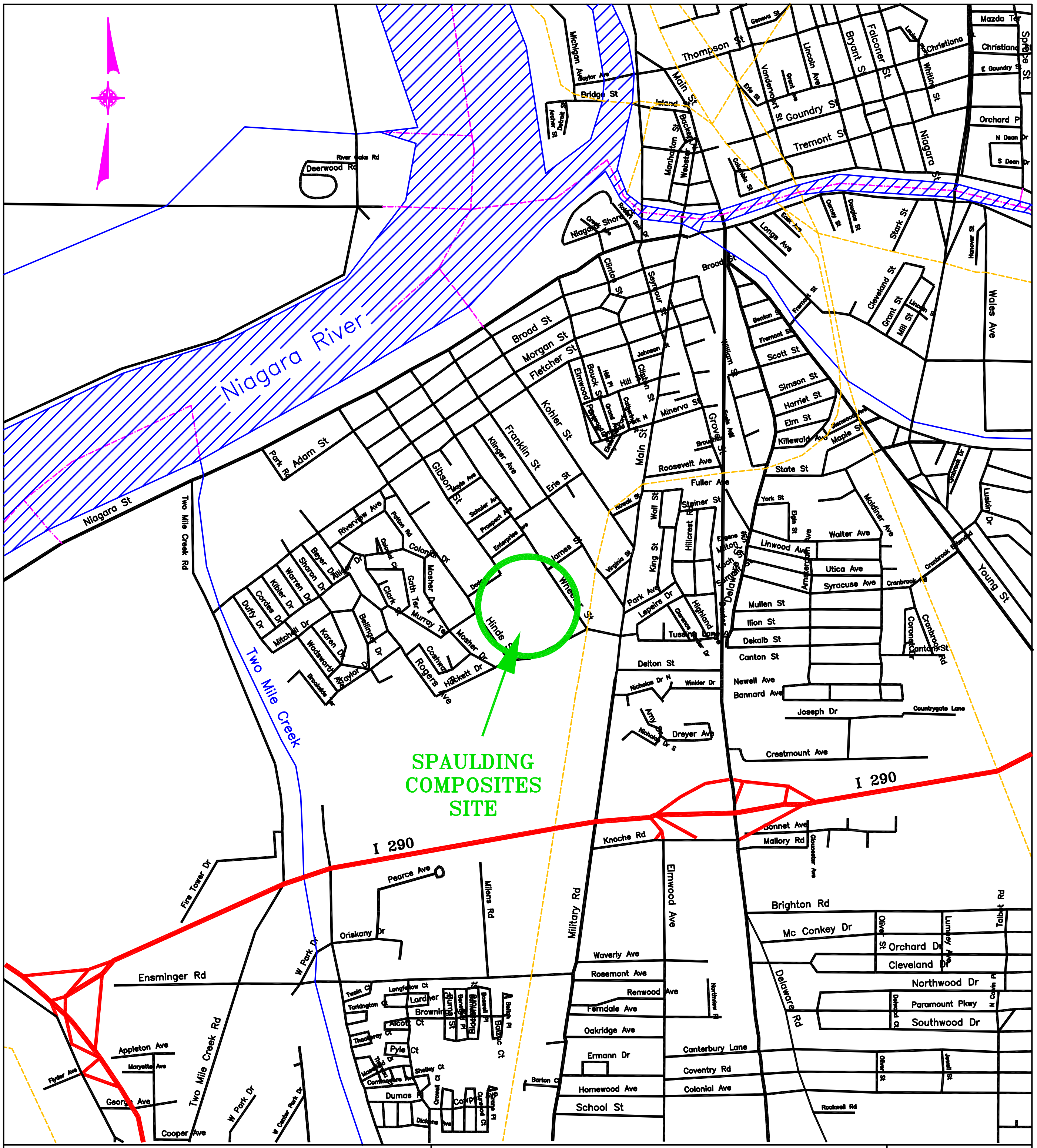


Tonawanda East & West Quadrangles; Buffalo East & West Quadrangles

Scale Depends on Final Plotted Size

SITE LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

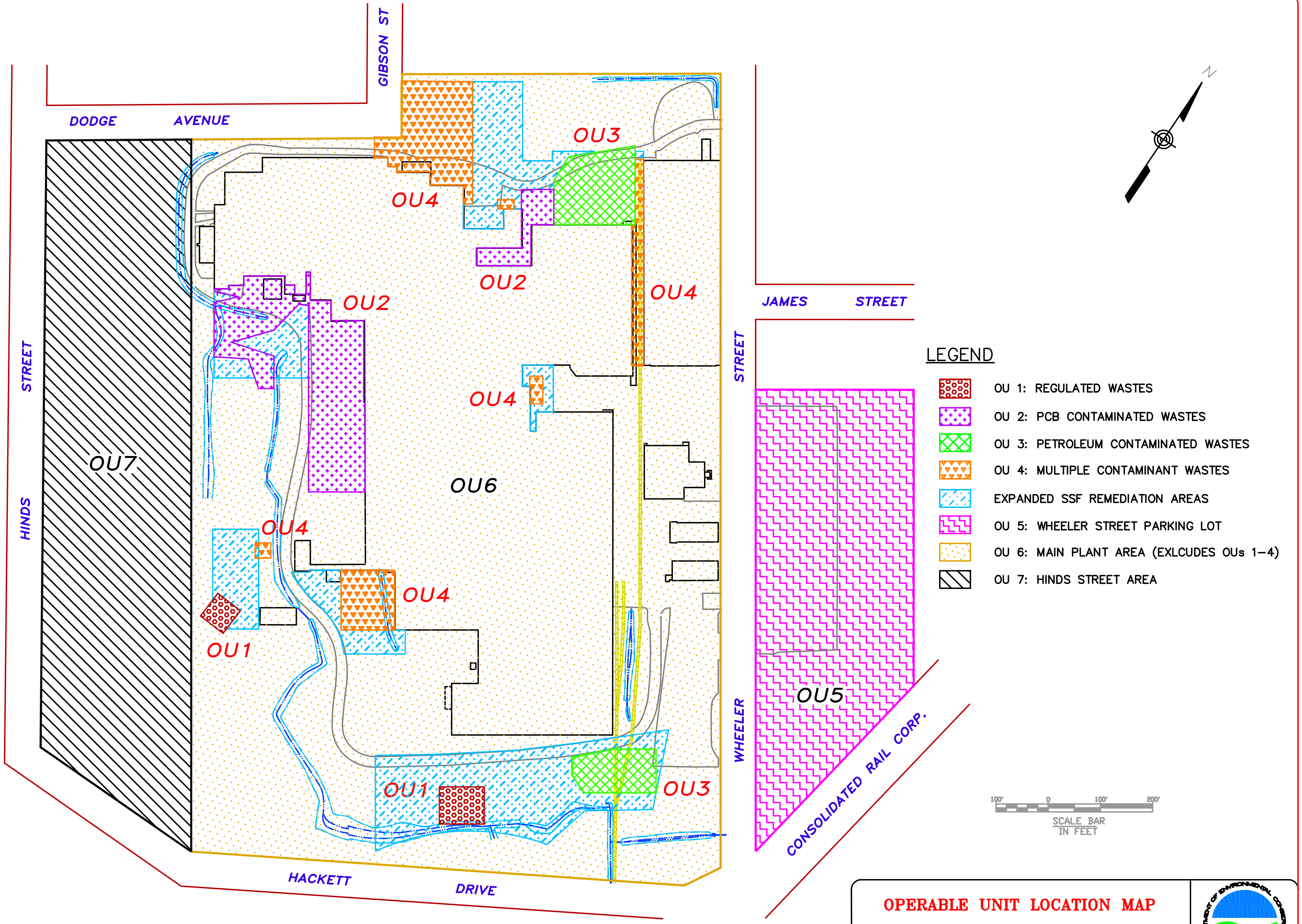
DATE: 01/25/01

DRAWING: Site Location Map.dwg

SITE: SPAULDING COMPOSITES SITE

FIGURE 1-1

DEPARTMENT OF ENVIRONMENTAL CONSERVATION • NEW YORK STATE •

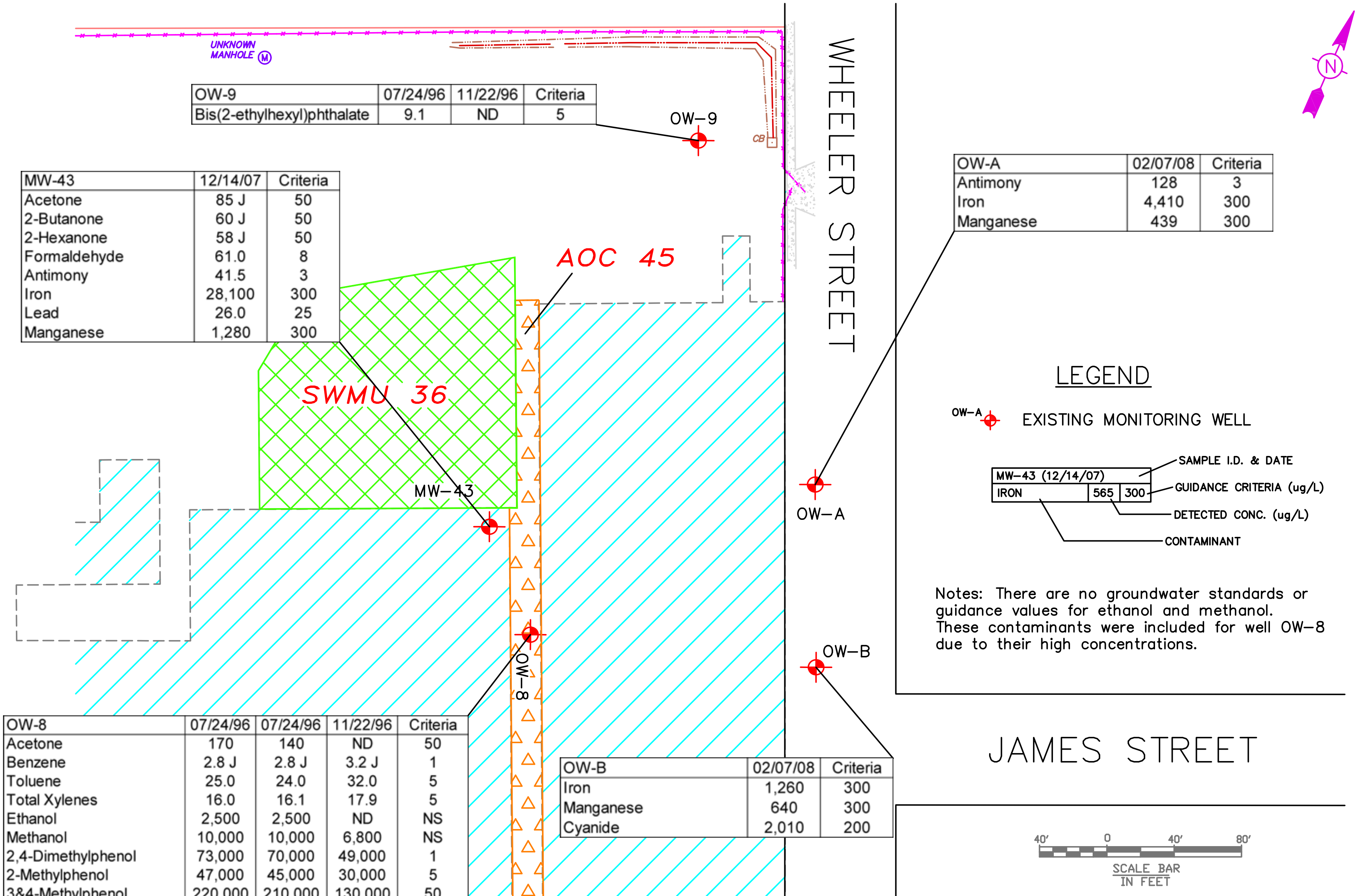


OPERABLE UNIT LOCATION MAP

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 11/05/08 DRAWING: Figures 2 & 3.dwg

SITE: **SPAULDING COMPOSITES SITE** **FIGURE 2–1**



OW-9	07/24/96	11/22/96	Criteria
Bis(2-ethylhexyl)phthalate	9.1	ND	5

MW-43	12/14/07	Criteria
Acetone	85 J	50
2-Butanone	60 J	50
2-Hexanone	58 J	50
Formaldehyde	61.0	8
Antimony	41.5	3
Iron	28,100	300
Lead	26.0	25
Manganese	1,280	300

OW-A	02/07/08	Criteria
Antimony	128	3
Iron	4,410	300
Manganese	439	300

OW-8	07/24/96	07/24/96	11/22/96	Criteria
Acetone	170	140	ND	50
Benzene	2.8 J	2.8 J	3.2 J	1
Toluene	25.0	24.0	32.0	5
Total Xylenes	16.0	16.1	17.9	5
Ethanol	2,500	2,500	ND	NS
Methanol	10,000	10,000	6,800	NS
2,4-Dimethylphenol	73,000	70,000	49,000	1
2-Methylphenol	47,000	45,000	30,000	5
3&4-Methylphenol	220,000	210,000	130,000	50
Phenol	190,000	180,000	100,000	1

OW-B	02/07/08	Criteria
Iron	1,260	300
Manganese	640	300
Cyanide	2,010	200

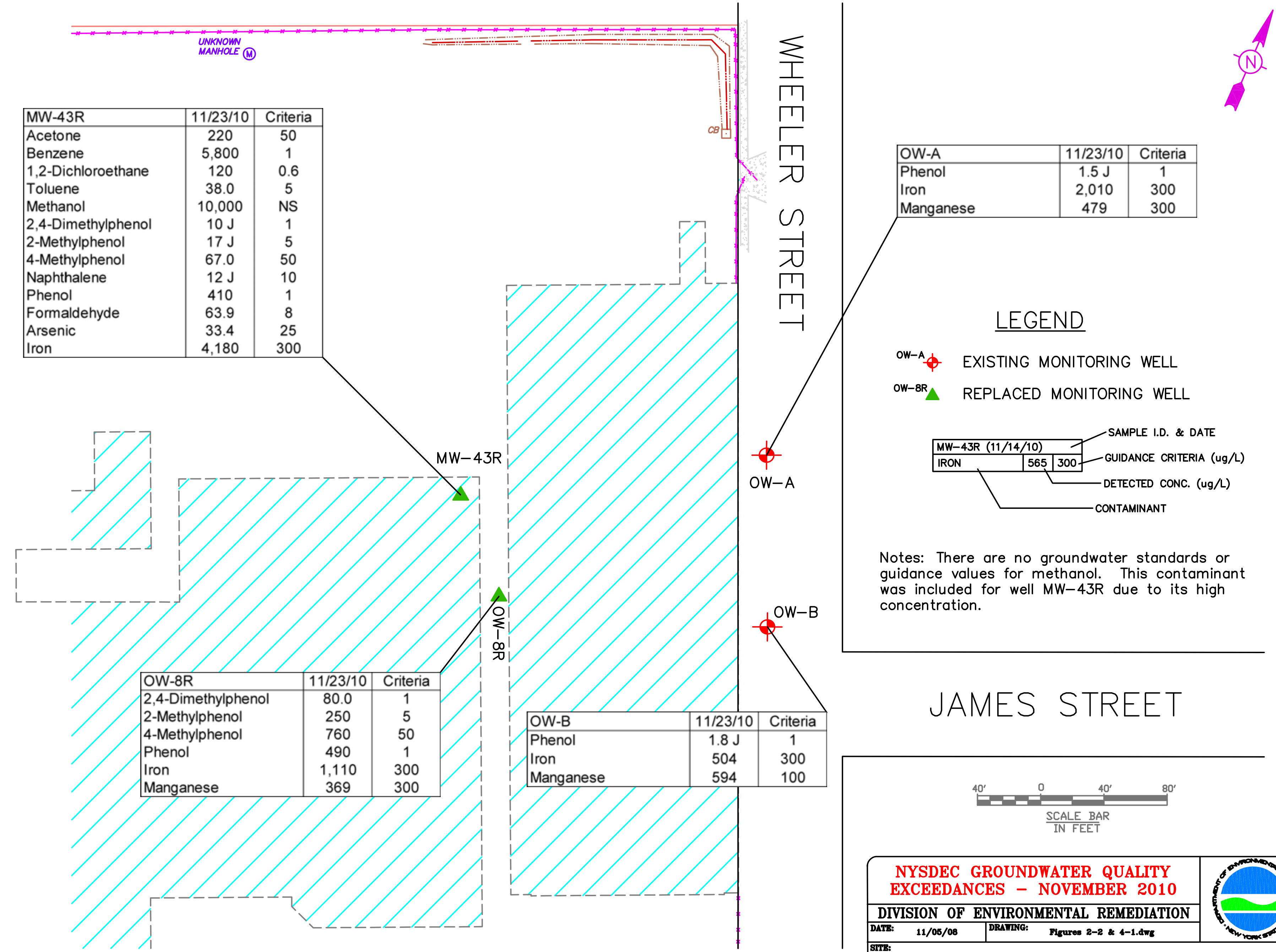
Notes: There are no groundwater standards or guidance values for ethanol and methanol. These contaminants were included for well OW-8 due to their high concentrations.

HISTORICAL NYSDEC GROUNDWATER QUALITY EXCEEDANCES

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 11/05/08
DRAWING: Figures 2-2 & 4-1.dwg
SITE: SPAULDING COMPOSITES SITE

FIGURE 2-2



MW-43R	11/23/10	Criteria
Acetone	220	50
Benzene	5,800	1
1,2-Dichloroethane	120	0.6
Toluene	38.0	5
Methanol	10,000	NS
2,4-Dimethylphenol	10 J	1
2-Methylphenol	17 J	5
4-Methylphenol	67.0	50
Naphthalene	12 J	10
Phenol	410	1
Formaldehyde	63.9	8
Arsenic	33.4	25
Iron	4,180	300

OW-8R	11/23/10	Criteria
2,4-Dimethylphenol	80.0	1
2-Methylphenol	250	5
4-Methylphenol	760	50
Phenol	490	1
Iron	1,110	300
Manganese	369	300

OW-A	11/23/10	Criteria
Phenol	1.5 J	1
Iron	2,010	300
Manganese	479	300

OW-B	11/23/10	Criteria
Phenol	1.8 J	1
Iron	504	300
Manganese	594	100

LEGEND

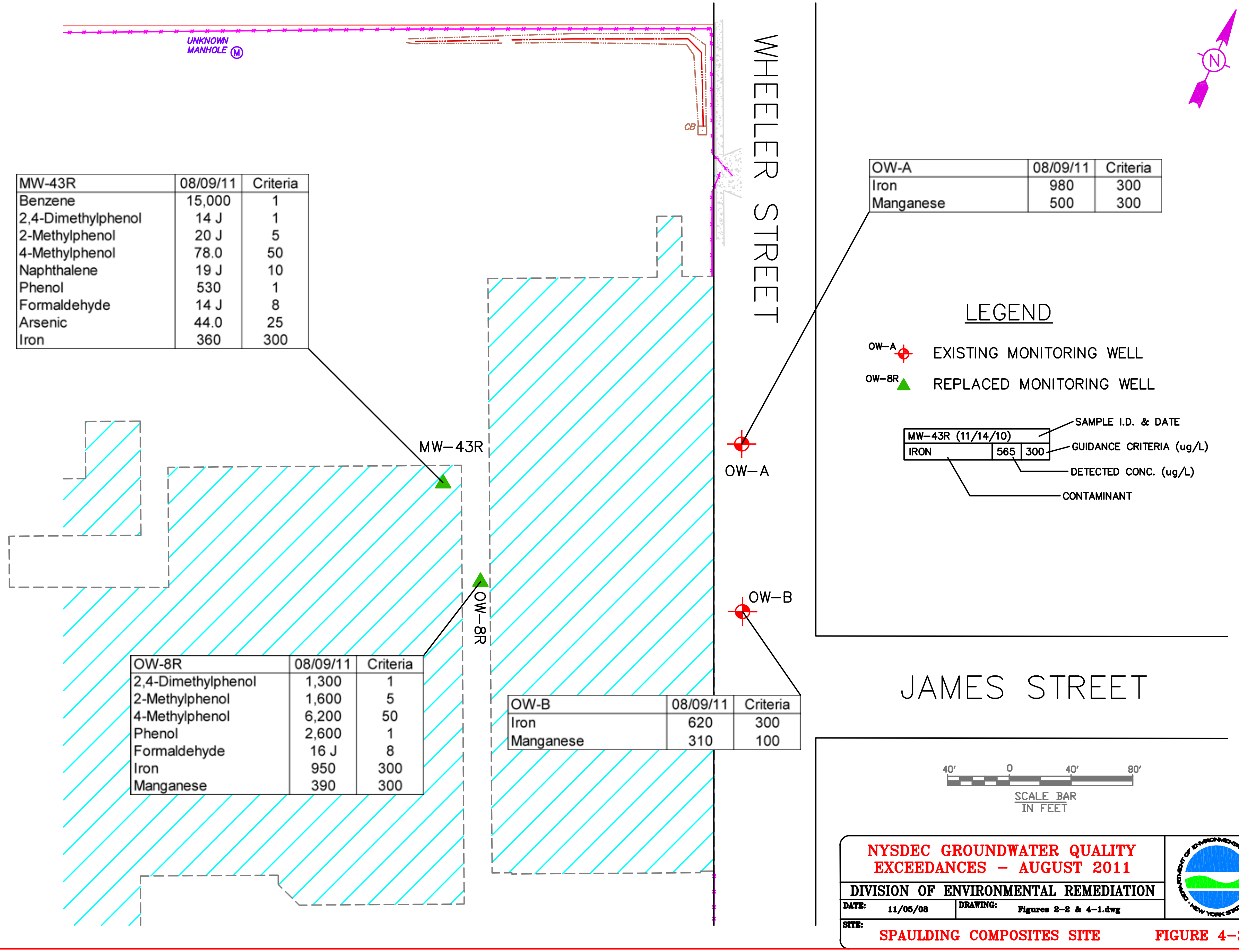
OW-A ⌖	EXISTING MONITORING WELL
OW-8R ▲	REPLACED MONITORING WELL

MW-43R (11/14/10)		
IRON	565	300

SAMPLE I.D. & DATE
GUIDANCE CRITERIA (ug/L)
DETECTED CONC. (ug/L)
CONTAMINANT

Notes: There are no groundwater standards or guidance values for methanol. This contaminant was included for well MW-43R due to its high concentration.

NYSDEC GROUNDWATER QUALITY EXCEEDANCES – NOVEMBER 2010
DIVISION OF ENVIRONMENTAL REMEDIATION
DATE: 11/05/08
DRAWING: Figures 2-2 & 4-1.dwg
SITE: **SPAULDING COMPOSITES SITE**
FIGURE 4-1



MW-43R	08/09/11	Criteria
Benzene	15,000	1
2,4-Dimethylphenol	14 J	1
2-Methylphenol	20 J	5
4-Methylphenol	78.0	50
Naphthalene	19 J	10
Phenol	530	1
Formaldehyde	14 J	8
Arsenic	44.0	25
Iron	360	300

OW-A	08/09/11	Criteria
Iron	980	300
Manganese	500	300

OW-8R	08/09/11	Criteria
2,4-Dimethylphenol	1,300	1
2-Methylphenol	1,600	5
4-Methylphenol	6,200	50
Phenol	2,600	1
Formaldehyde	16 J	8
Iron	950	300
Manganese	390	300

OW-B	08/09/11	Criteria
Iron	620	300
Manganese	310	100

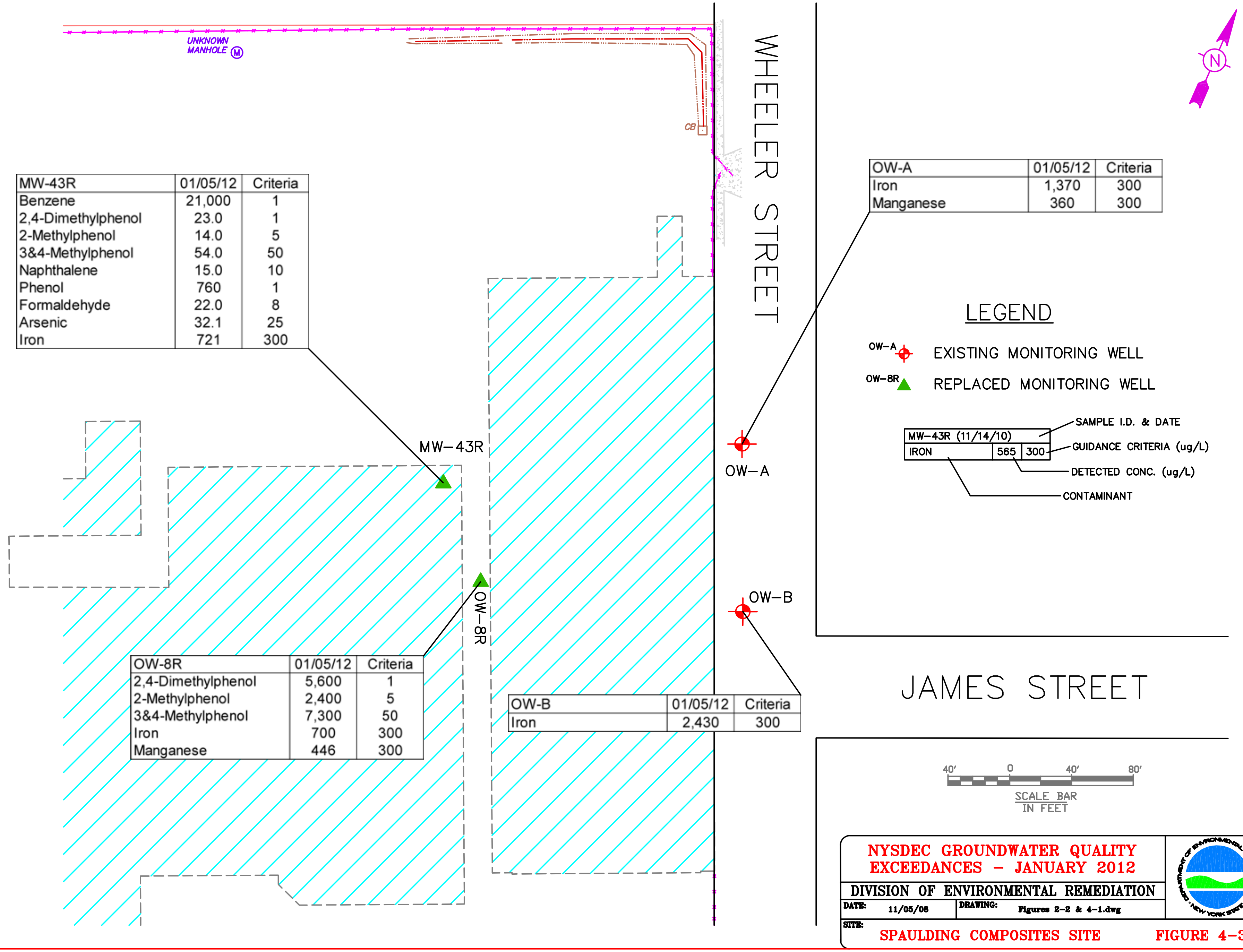
NYSDEC GROUNDWATER QUALITY EXCEEDANCES – AUGUST 2011

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 11/05/08
DRAWING: Figures 2-2 & 4-1.dwg

SITE: **SPAULDING COMPOSITES SITE**

FIGURE 4-2



MW-43R	01/05/12	Criteria
Benzene	21,000	1
2,4-Dimethylphenol	23.0	1
2-Methylphenol	14.0	5
3&4-Methylphenol	54.0	50
Naphthalene	15.0	10
Phenol	760	1
Formaldehyde	22.0	8
Arsenic	32.1	25
Iron	721	300

OW-A	01/05/12	Criteria
Iron	1,370	300
Manganese	360	300

OW-8R	01/05/12	Criteria
2,4-Dimethylphenol	5,600	1
2-Methylphenol	2,400	5
3&4-Methylphenol	7,300	50
Iron	700	300
Manganese	446	300

OW-B	01/05/12	Criteria
Iron	2,430	300

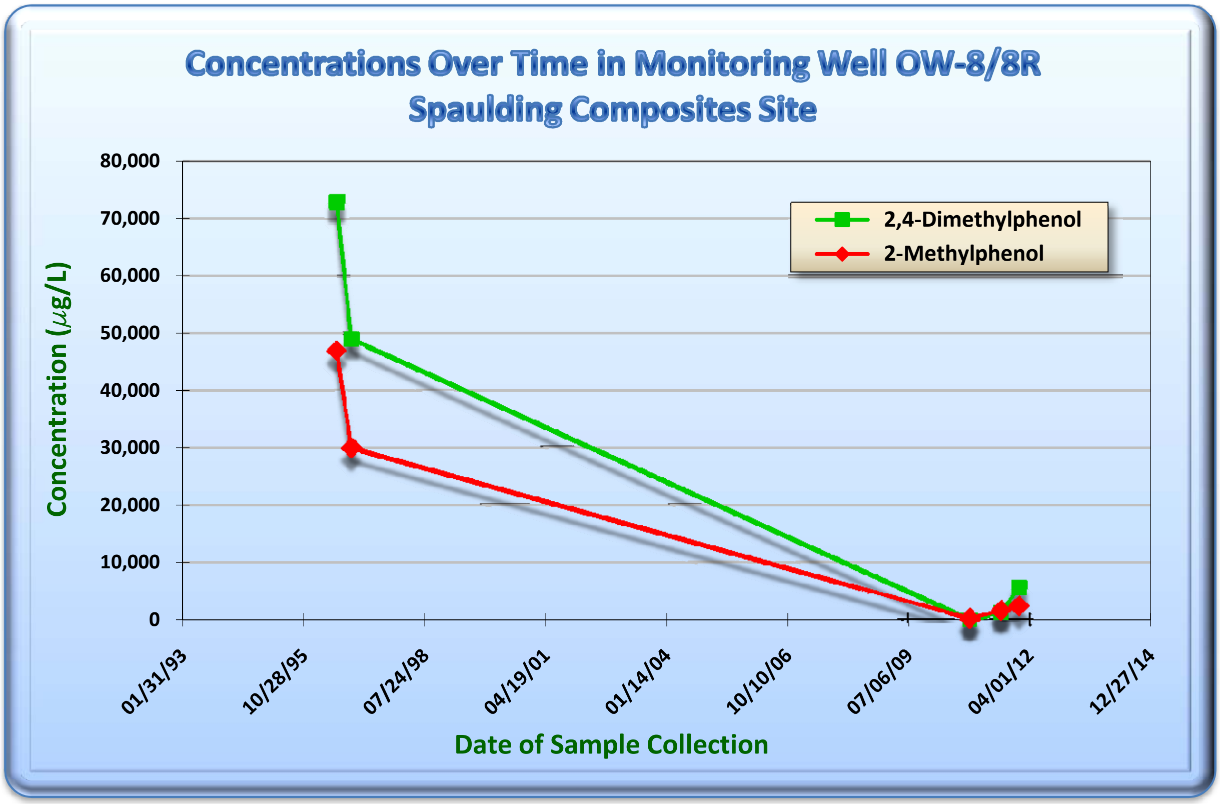
NYSDEC GROUNDWATER QUALITY
EXCEEDANCES – JANUARY 2012

DIVISION OF ENVIRONMENTAL REMEDIATION

DATE: 11/05/08 **DRAWING:** Figures 2-2 & 4-1.dwg

SITE: SPAULDING COMPOSITES SITE

FIGURE 4-3



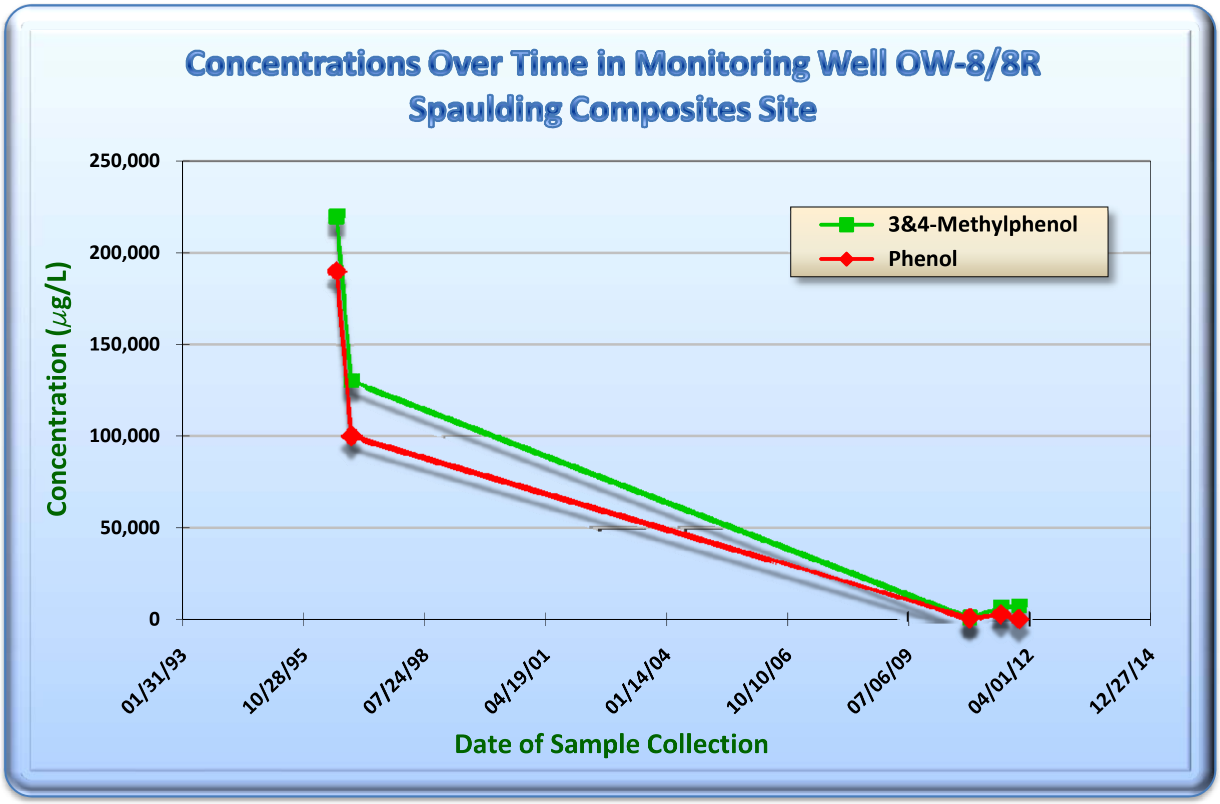
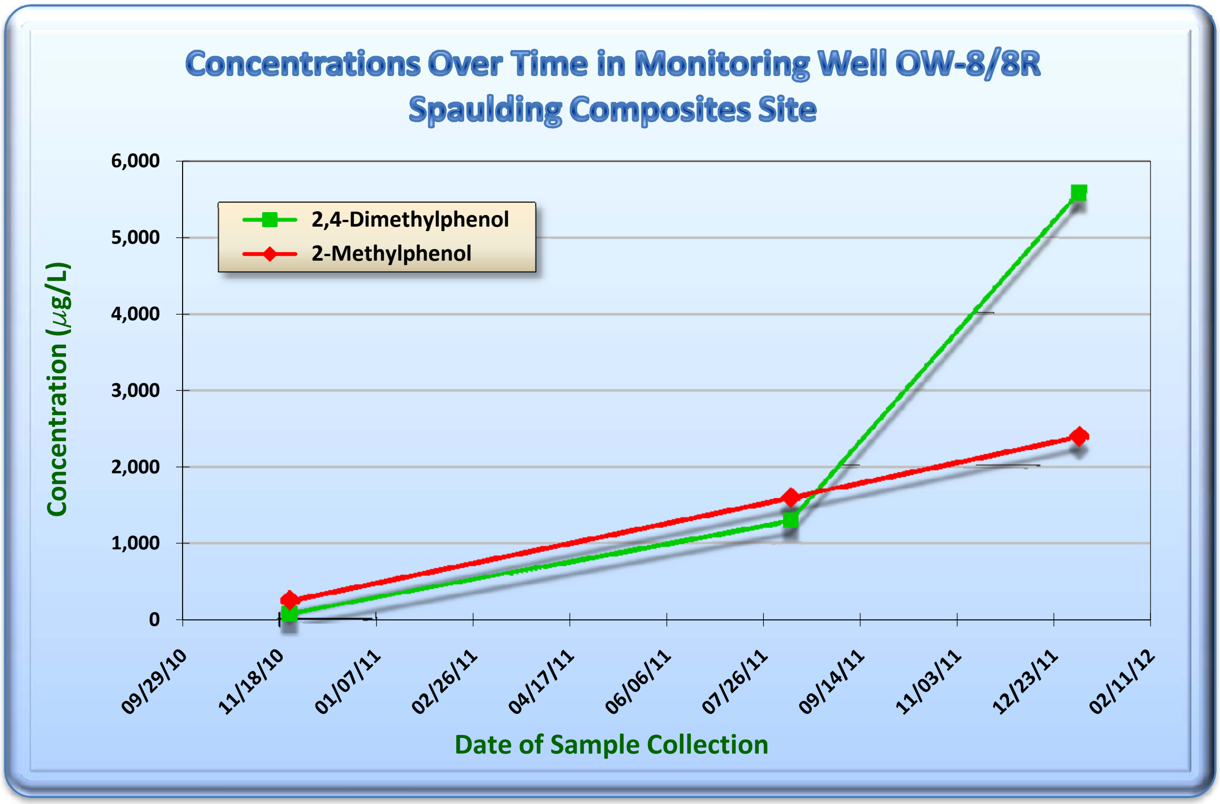


Figure 6-1. Pre- and post-remediation concentrations of select contaminants over time in well OW-8/8R. Remediation was completed in October 2010.



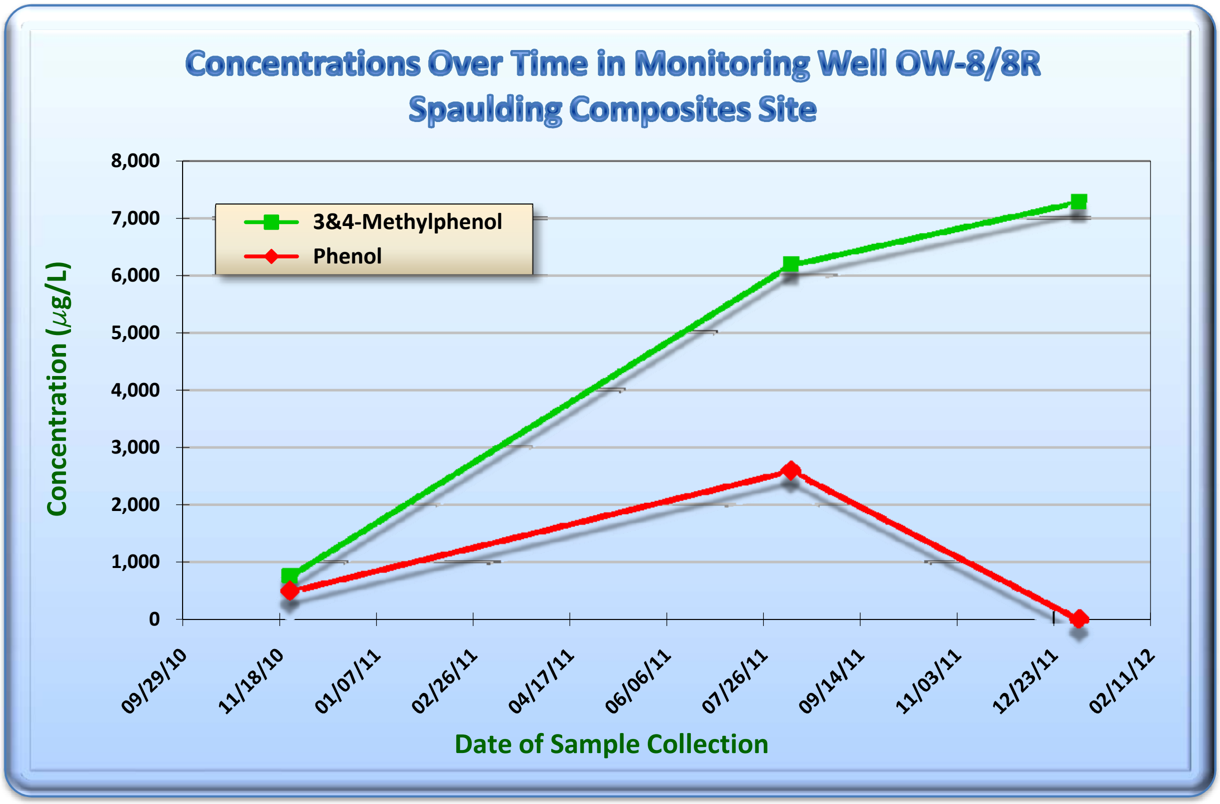
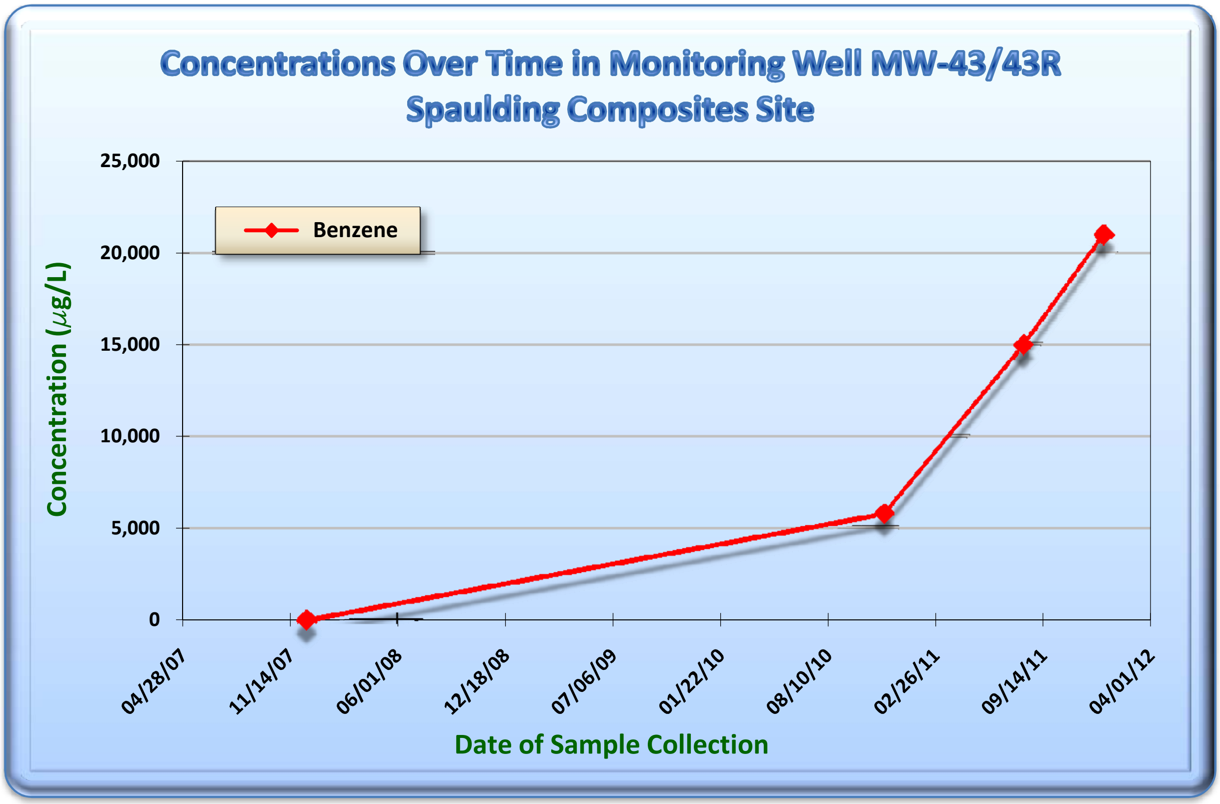


Figure 6-2. Post-remediation concentrations of select contaminants over time in well OW-8/8R. Remediation was completed in October 2010.



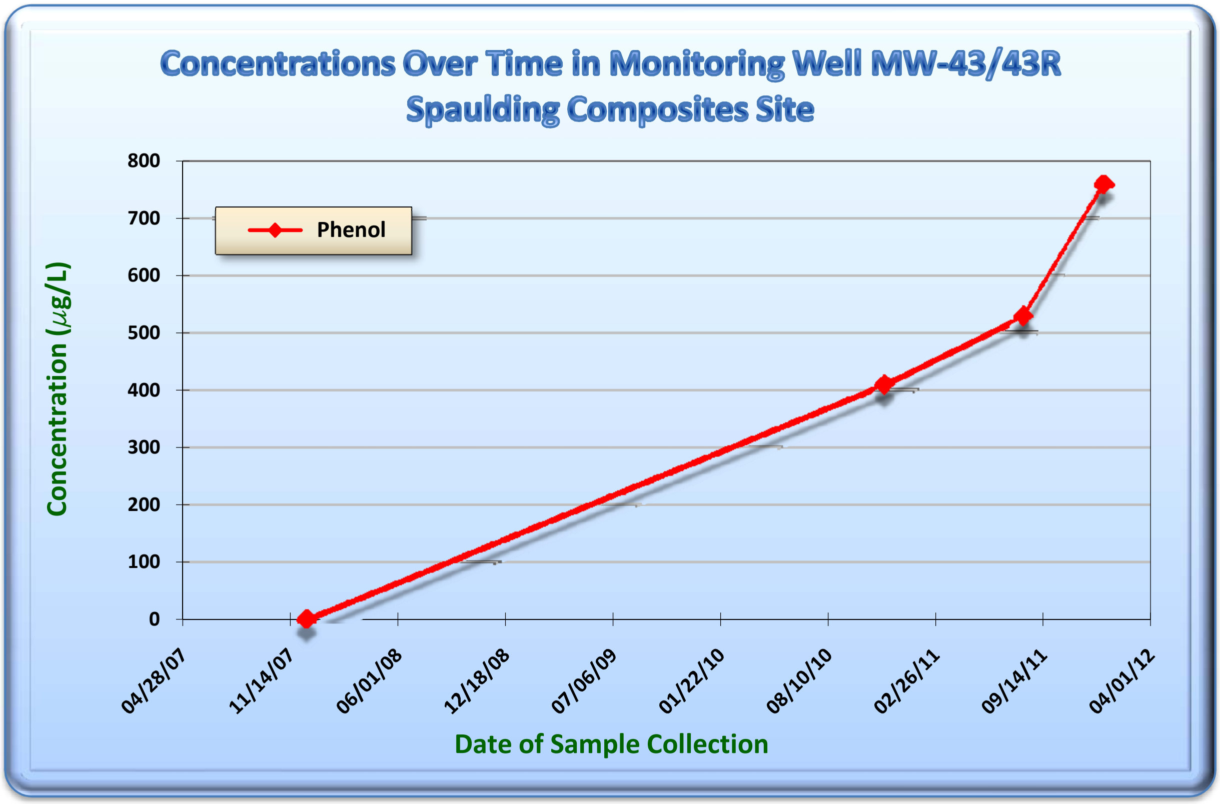
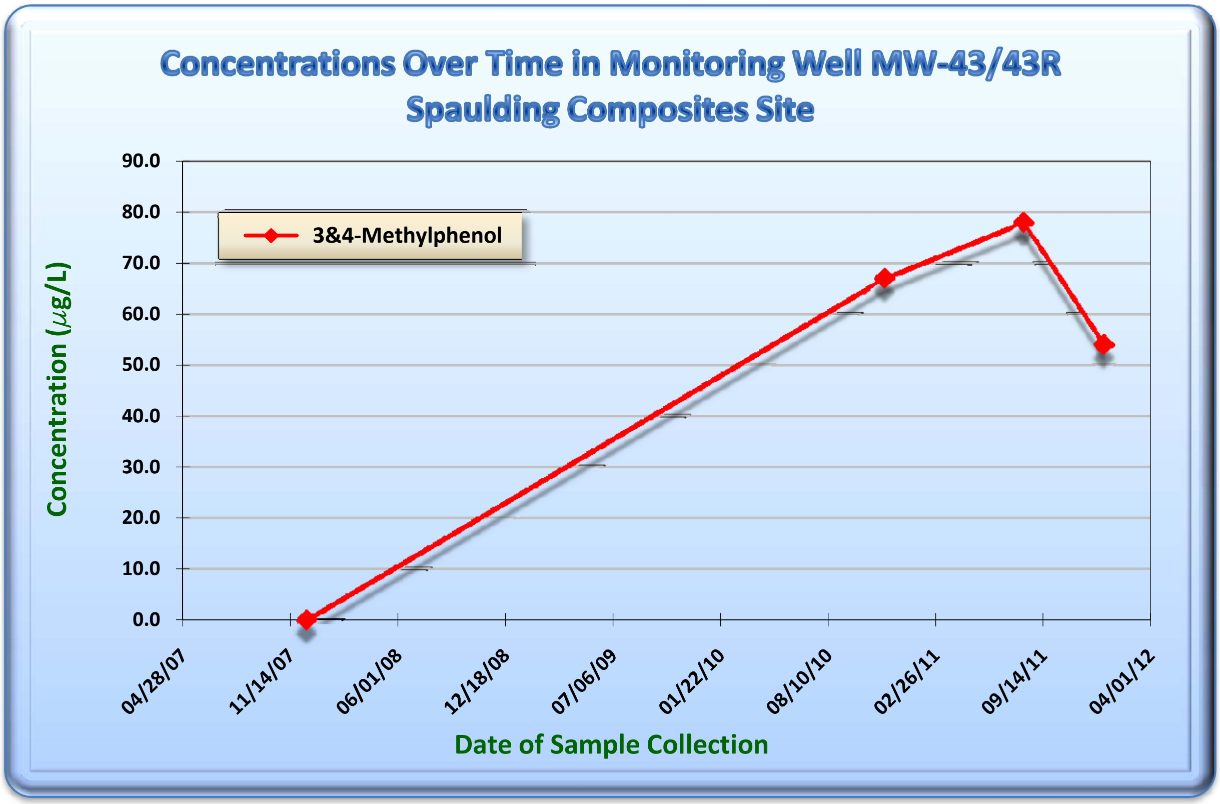


Figure 6-3. Pre- and post-remediation concentrations of select contaminants over time in well MW-43/43R. Remediation was completed in October 2010.



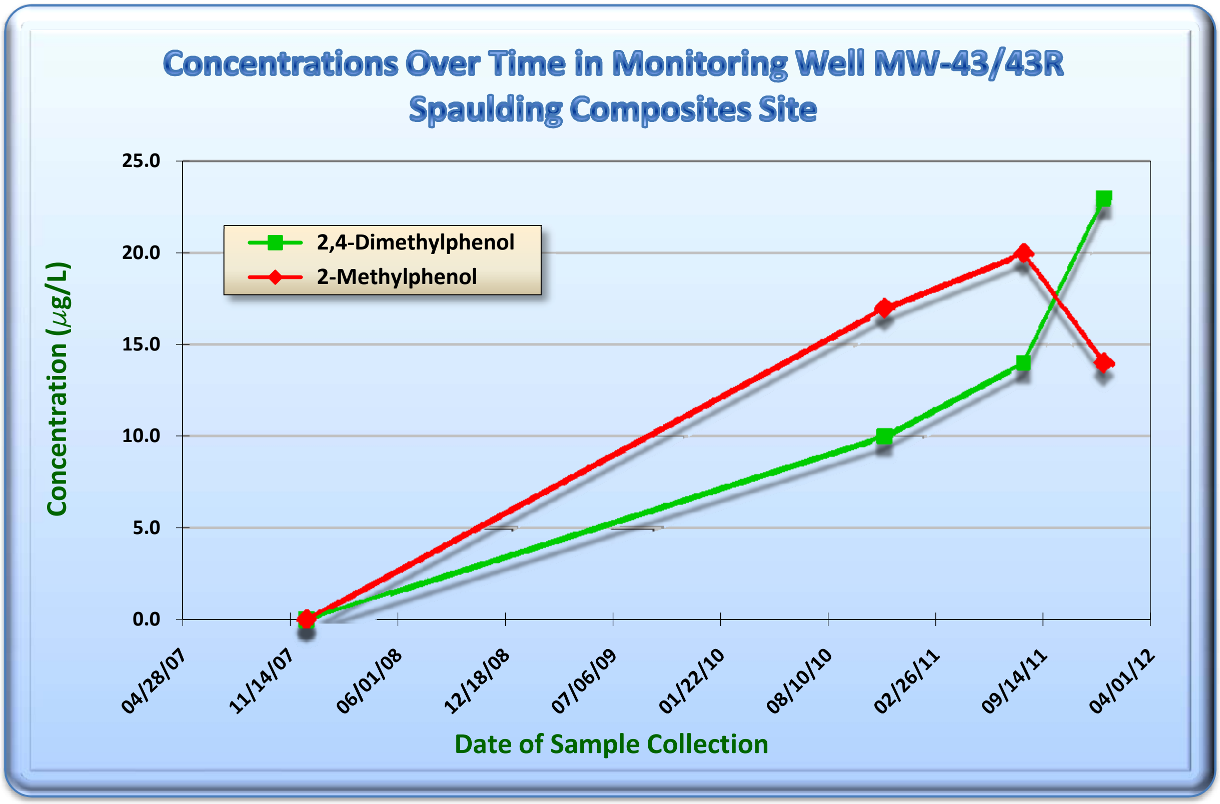


Figure 6-4. Pre- and post-remediation concentrations of select contaminants over time in well MW-43/43R. Remediation was completed in October 2010.

Figure 6-5. Photo showing the presence of NAPL along a vertical desiccation crack in the native silty clay soils that underlie the Spaulding Composites Site.

Figure 6-6. Photo showing the presence of NAPL along a vertical desiccation crack in the native silty clay soils that underlie the Spaulding Composites Site.

Table 3-1.
Summary of Detected Compounds in Soil Samples Collected from Boring OW-8R at the Spaulding Composites Site, Site No. 915050.

Sample Number Sample Depth Date Sampled Sample Type	NYSDEC Part 375 Unrestricted *	NYSDEC Part 375 Groundwater Protection *	NYSDEC Part 375 Restricted Residential *	OW-8R 11' - 15' 11/10/10 Silty Clay
Volatile Organic Compounds (mg/kg or ppm)				
Acetone	0.05	0.05	100	0.011 J
Methylene Chloride	0.05	0.05	100	0.0044 J
Semivolatile Organic Compounds (mg/kg or ppm)				
2,4-Dimethylphenol	NS	NS	NS	0.49
Bis(2-ethylhexyl)phthalate	NS	NS	50 +	0.31
2-Methylphenol	0.33	0.33	100	0.28
4-Methylphenol	0.33	0.33	100	**2.3**
Phenol	0.33	0.33	100	**1.7**

*** 6 NYCRR Part 375: Environmental Remediation Programs, Soil Cleanup Objectives, NYSDEC, 2006.**
+ Commissioner's Policy CP-51: Soil Cleanup Guidance, NYSDEC 2010.
J Compound reported at an estimated concentration below the reporting limit.
NS No standard available.
Purple Shading = Result exceeds the 6 NYCRR Part 375 Unrestriced and Groundwater Protection Objectives.
Yellow Shading = Result exceeds the 6 NYCRR Part 375 Restricted-Residential Objectives.

Table 4-1.
Summary Key for Samples Collected from Select Monitoring Wells and the Retention Pond at the Spaulding Composites Site, Site No. 915050.

Location ID	Sample ID	Date Sampled	Time Sampled	Analytical Parameters	Comments	Table Reference
Groundwater Samples						
Well OW-8	W-072496-DJT-015	07/24/96	1430	VOCs, SVOCs, PCBs, Zinc, Ethanol, Methanol, Petroleum Products	Duplicate sample collected for analysis	Table 4-2
Well OW-8	SC-1008	11/22/96	1710	VOCs, SVOCs, PCBs, Zinc, Ethanol, Methanol, Petroleum Products		Table 4-2
Well OW-8R	MW-8R	11/23/10	0910	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	Original well destroyed during the SSF remediation; replaced November 10, 2010. A phenol or formaldehyde-like odor was noted during purging.	Table 4-2
Well OW-8R	MW-8R	08/09/11	0900	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	Pressure was released when the J-plug was removed prior to purging.	Table 4-2
Well OW-8R	OW-8R	01/05/12	1130	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	Faint phenolic odor noted during purging.	Table 4-2
Well OW-9	W-072496-DJT-014	07/24/96	1415	VOCs, SVOCs, PCBs, Zinc, Ethanol, Methanol, Petroleum Products		Table 4-3
Well OW-9	SC-1007	11/22/96	1600	VOCs, SVOCs, PCBs, Zinc, Ethanol, Methanol, Petroleum Products		Table 4-3
Well OW-A	Well A	11/03/98	1100	VOCs, SVOCs, PCBs, Zinc, Ethanol, Methanol, Petroleum Products		Table 4-4
Well OW-A	Well A	08/05/99	0905	VOCs, SVOCs		Table 4-4
Well OW-A	MW-A	02/07/08	NA	VOCs, SVOCs, PCBs, Metals, Cyanide		Table 4-4
Well OW-A	OW-A	11/23/10	0955	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	A sulphur-like odor was noted during purging.	Table 4-4
Well OW-A	OW-A	08/09/11	0800	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	A slight sulphur-like odor was noted during purging.	Table 4-4
Well OW-A	OW-A	01/05/12	0900	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide		Table 4-4
Well OW-B	Well B	11/03/98	1100	VOCs, SVOCs, PCBs, Zinc, Ethanol, Methanol, Petroleum Products		Table 4-5
Well OW-B	MW-B	02/07/08	NA	VOCs, SVOCs, PCBs, Metals, Cyanide		Table 4-5
Well OW-B	OW-B	11/23/10	1030	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide		Table 4-5
Well OW-B	OW-B	08/09/11	0700	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide		Table 4-5
Well OW-B	OW-B	01/05/12	1530	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide		Table 4-5

Table 4-1.
Summary Key for Samples Collected from Select Monitoring Wells and the Retention Pond at the Spaulding Composites Site, Site No. 915050.

Location ID	Sample ID	Date Sampled	Time Sampled	Analytical Parameters	Comments	Table Reference
Groundwater Samples						
Well MW-43	MW-43	12/14/07	NA	VOCs, SVOCs, PCBs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide		Table 4-6
Well MW-43R	MW-43R	11/23/10	1120	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	Original well destroyed during ERP demolition activities; replaced November 10, 2010. A concrete odor was noted during purging.	Table 4-6
Well MW-43R	MW-43R	08/09/11	0850	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	Water was light green in color and foamy. A faint odor was noted during purging.	Table 4-6
Well MW-43R	MW-43R	01/05/12	1215	VOCs, SVOCs, Metals, Ethanol, Methanol, Formaldehyde, Cyanide	Water was pale yellow in color and foamy. A slight concrete odor was noted during purging.	Table 4-6
Surface Water Samples						
Retention Pond	Retention Pond	01/05/12	1400	SVOCs, Formaldehyde		Table 5-1

NA	**Not Available.**
VOCs	**Volatile Organic Compounds.**
SVOCs	**Semivolatile Organic Compounds.**
PCBs	**Polychlorinated Biphenyls.**

Table 4-2.
Summary of Detected Compounds in Groundwater Samples Collected from Well OW-8/8R
at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Groundwater Standard ***	**07/24/96** **CRA**	**07/24/96** **CRA**	**11/22/96** **CRA**	**11/23/10** **Empire**	**08/09/11** **Empire**	**01/05/12** **Empire**
Volatile Organic Compounds (µg/L or ppb)							
Acetone	50 G	**170.0**	**140.0**	ND (210)	4.9 J	5.8 J	ND (10)
Benzene	1.0	**2.8 J**	**2.8 J**	**3.2 J**	ND (1.0)	ND (1.0)	ND (5.0)
2-Butanone	50 G	19.0	18.0	26.0	ND (10)	ND (10)	ND (10)
Carbon Disulfide	NS	ND (10)	ND (10)	11.0	ND (1.0)	ND (1.0)	ND (5.0)
Chloroform	7.0	2.6 J	ND (5.0)	ND (5.0)	ND (1.0)	ND (1.0)	ND (5.0)
Ethylbenzene	5.0	3.4 J	3.4 J	3.8 J	ND (1.0)	ND (1.0)	ND (5.0)
Toluene	5.0	**25.0**	**24.0**	**32.0**	ND (1.0)	ND (1.0)	ND (5.0)
Total Xylenes	5.0	**16.0**	**16.1**	**17.9**	ND (2.0)	ND (2.0)	ND (5.0)
Semivolatile Organic Compounds (µg/L or ppb)							
Bis(2-ethylhexyl)phthalate	5.0	ND (13,000)	ND (13,000)	ND (5,000)	3.3 J	ND (470)	ND (500)
2,4-Dimethylphenol	1.0	**73,000**	**70,000**	**49,000**	**80.0**	**1,300**	**5,600**
2-Methylphenol	5.0	**47,000**	**45,000**	**30,000**	**250.0**	**1,600**	**2,400**
3&4-Methylphenol	50.0	**220,000**	**210,000**	**130,000**	**760.0 +**	**6,200 +**	**7,300**
Phenol	1.0	**190,000**	**180,000**	**100,000**	**490.0**	**2,600**	ND (500)
Inorganic Compounds (µg/L or ppb)							
Aluminum	NS	NA	NA	NA	1,820	330 B	ND (100)
Barium	1,000	"	"	"	54.7	29.0	ND (50)
Chromium **	50.0	"	"	"	ND (4.0)	2.2 J	ND (10)
Cobalt	NS	"	"	"	ND (4.0)	2.5 J	ND (20)
Iron	300.0	"	"	"	**1,110**	**950 B**	**700.0**
Manganese	300.0	"	"	"	**369.0**	**390 B**	**446.0**
Nickel **	100.0	"	"	"	ND (10)	3.7 J	ND (30)
Vanadium	NS	"	"	"	ND (5.0)	3.9 J	ND (30)
Zinc **	2,000 G	ND (10)	ND (20.7)	ND (11.3)	ND (10)	8.8 J	ND (10)

Table 4-2.
Summary of Detected Compounds in Groundwater Samples Collected from Well OW-8/8R at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Groundwater Standard ***	**07/24/96 CRA**	**07/24/96 CRA**	**11/22/96 CRA**	**11/23/10 Empire**	**08/09/11 Empire**	**01/05/12 Empire**
Miscellaneous Compounds (µg/L or ppb)							
Cyanide	200.0	NA	NA	NA	ND (10)	ND (10)	ND (10)
Ethanol	NS	2,500	2,500	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)
Methanol	NS	10,000	10,000	6,800	ND (1,000)	ND (1,000)	ND (1,000)
Formaldehyde	8.0	NA	NA	NA	ND (50)	**16 J**	ND (8.0)

***** **NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, and NYSDEC Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, August 1999.**

****** **EPA priority pollutant metal.**

+ **Results for 4-methylphenol only.**

B **Value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (metals).**

G **Guidance value.**

J **Compound reported at an estimated concentration below the reporting limit.**

NA **Not Analyzed.**

ND **Indicates that the compound was not detected at the method detection limit specified in parentheses, if known.**

NS **No standard or guidance value available.**

Shaded values equal or exceed the NYSDEC groundwater standards or guidance values.

Table 4-3.
Summary of Detected Compounds in Groundwater Samples Collected from Well OW-9 at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Groundwater Standard ***	**07/24/96** **CRA**	**11/22/96** **CRA**
Volatile Organic Compounds (µg/L or ppb)			
Acetone	50 G	25.0	ND (31)
Semivolatile Organic Compounds (µg/L or ppb)			
Bis(2-ethylhexyl)phthalate	5.0	**9.1**	ND (9.5)
Inorganic Compounds (µg/L or ppb)			
Aluminum	NS	NA	NA
Antimony **	3.0	"	"
Arsenic **	25.0	"	"
Barium	1,000	"	"
Beryllium **	3.0	"	"
Chromium **	50.0	"	"
Cobalt	NS	"	"
Copper **	200.0	"	"
Iron	300.0	"	"
Lead **	25.0	"	"
Manganese	300.0	"	"
Nickel **	100.0	"	"
Silver **	50.0	"	"
Vanadium	NS	"	"
Zinc **	2,000 G	ND (162)	ND (10)
Miscellaneous Compounds (µg/L or ppb)			
Cyanide	200.0	NA	NA
Ethanol	NS	ND (1,000)	ND (1,000)
Methanol	NS	ND (1,000)	ND (1,000)
Formaldehyde	8.0	NA	NA

***** **NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, and NYSDEC Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, August 1999.**

****** **EPA priority pollutant metal.**

G **Guidance value.**

J **Compound reported at an estimated concentration below the reporting limit.**

NA **Not Analyzed.**

ND **Indicates that the compound was not detected at the method detection limit specified in parentheses, if known.**

NS **No standard or guidance value available.**

Shaded values equal or exceed the NYSDEC groundwater standards or guidance values.

Table 4-4.
Summary of Detected Compounds in Groundwater Samples Collected from Well OW-A at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Groundwater Standard ***	**11/03/98** **Leader**	**08/05/99** **Leader**	**02/07/08** **LiRo**	**11/23/10** **Empire**	**08/09/11** **Empire**	**01/05/12** **Empire**
Volatile Organic Compounds (µg/L or ppb)							
Acetone	50 G	ND (10)	ND (10)	ND (5.0)	3.8 J	ND (10)	ND (10)
Semivolatile Organic Compounds (µg/L or ppb)							
Bis(2-ethylhexyl)phthalate	5.0	NA	ND (10)	ND (10)	ND (9.4)	ND (4.7)	1.3 J
Phenol	1.0	ND (10)	NA	ND (10)	**1.5 J**	0.56 J	ND (5.0)
Inorganic Compounds (µg/L or ppb)							
Aluminum	NS	NA	NA	ND (17.2)	ND (200)	260 B	514.0
Antimony **	3.0	"	"	**128.0**	ND (20)	ND (20)	ND (5.0)
Barium	1,000	"	"	ND (3.1)	9.0	14.0	ND (50)
Chromium **	50.0	"	"	13.9	ND (4.0)	2.6 J	ND (10)
Cobalt	NS	"	"	17.8	ND (4.0)	4.6	ND (20)
Copper **	200.0	"	"	24.2	ND (10)	1.6 J	ND (10)
Iron	300.0	"	"	**4,410**	**2,010**	**980 B**	**1,370**
Lead **	25.0	"	"	ND (1.9)	ND (5.0)	4.0 J	ND (3.0)
Manganese	300.0	"	"	**439.0**	**479.0**	**500 B**	**360.0**
Nickel **	100.0	"	"	10.3 J	ND (10)	5.5 J	ND (30)
Silver **	50.0	"	"	31.6	ND (3.0)	ND (3.0)	ND (10)
Vanadium	NS	"	"	17.0 J	ND (5.0)	4.1 J	ND (30)
Zinc **	2,000 G	32.0	"	23.2	21.9	23.0	23.5
Miscellaneous Compounds (µg/L or ppb)							
Cyanide	200.0	NA	NA	ND (10)	ND (10)	ND (10)	ND (10)
Ethanol	NS	ND (1,000)	"	NA	ND (1,000)	ND (1,000)	ND (1,000)
Methanol	NS	ND (1,000)	"	NA	ND (1,000)	ND (1,000)	ND (1,000)
Formaldehyde	8.0	NA	"	NA	ND (50)	6.7 J	ND (8.0)

*** NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, and NYSDEC Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, August 1999.**

**** EPA priority pollutant metal.**

B Value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (metals).

G Guidance value.

Table 4-4.
Summary of Detected Compounds in Groundwater Samples Collected from Well OW-A at the Spaulding Composites Site, Site No. 915050.

J	Compound reported at an estimated concentration below the reporting limit.
NA	Not Analyzed.
ND	Indicates that the compound was not detected at the method detection limit specified in parentheses, if known.
NS	No standard or guidance value available.
	Shaded values equal or exceed the NYSDEC groundwater standards or guidance values.

Table 4-5.

Summary of Detected Compounds in Groundwater Samples Collected from Well OW-B at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Groundwater Standard ***	**11/03/98** **Leader**	**02/07/08** **LiRo**	**11/23/10** **Empire**	**08/09/11** **Empire**	**01/05/12** **Empire**
Volatile Organic Compounds (µg/L or ppb)						
None Detected	NA					
Semivolatile Organic Compounds (µg/L or ppb)						
Bis(2-ethylhexyl)phthalate	5.0	NA	ND (10)	ND (9.4)	ND (4.7)	1.3 J
Di-n-butyl phthalate	50.0	NA	ND (10)	ND (9.4)	0.37 JB	1.4 J
Naphthalene	10 G	NA	ND (10)	ND (9.4)	1.1 J	ND (5.0)
Phenol	1.0	ND (10)	ND (10)	**1.8 J**	ND (4.7)	ND (5.0)
Inorganic Compounds (µg/L or ppb)						
Aluminum	NS	NA	435.0	370.0	300 B	1,280
Barium	1,000	"	ND (3.1)	19.4	19.0	ND (50)
Chromium **	50.0	"	ND (0.6)	4.0	2.6 J	ND (10)
Cobalt	NS	"	ND (1.3)	ND (4.0)	0.68 J	ND (20)
Copper **	200.0	"	ND (0.5)	ND (10)	3.1 J	ND (10)
Iron	300.0	"	**1,260**	**504.0**	**620 B**	**2,430**
Lead **	25.0	"	ND (1.9)	ND (5.0)	3.1 J	ND (15)
Manganese	300.0	"	**640.0**	**594.0**	**310 B**	274.0
Nickel **	100.0	"	8.59 J	ND (10)	6.4 J	ND (30)
Vanadium	NS	"	ND (1.0)	ND (5.0)	2.5 J	ND (30)
Zinc **	2,000 G	11.0	30.0	ND (10)	29.0	28.6
Miscellaneous Compounds (µg/L or ppb)						
Cyanide	200.0	NA	**2,010**	ND (10)	ND (10)	ND (10)
Ethanol	NS	ND (1,000)	NA	ND (1,000)	ND (1,000)	ND (1,000)
Methanol	NS	ND (1,000)	NA	ND (1,000)	ND (1,000)	ND (1,000)
Formaldehyde	8.0	NA	NA	ND (50)	5.2 J	ND (8.0)

*** NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, and NYSDEC Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, August 1999.**

**** EPA priority pollutant metal.**

B Value is greater than or equal to the instrument detection limit, but less than the contract required detection limit (metals), or, analyte detected in the associated blank, as well as in the sample (organics).

Table 4-5.

Summary of Detected Compounds in Groundwater Samples Collected from Well OW-B at the Spaulding Composites Site, Site No. 915050.

Date Sampled: Collected By:	Groundwater Standard *	11/03/98 Leader	02/07/08 LiRo	11/23/10 Empire	08/09/11 Empire	01/05/12 Empire

G	Guidance value.
J	Compound reported at an estimated concentration below the reporting limit.
NA	Not Analyzed or not applicable.
ND	Indicates that the compound was not detected at the method detection limit specified in parentheses, if known.
NS	No standard or guidance value available.
	Shaded values equal or exceed the NYSDEC groundwater standards or guidance values.

Table 4-6.
Summary of Detected Compounds in Groundwater Samples Collected from Well MW-43/43R at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Groundwater Standard ***	**12/14/07** **LiRo**	**11/23/10** **Empire**	**08/09/11** **Empire**	**01/05/12** **Empire**
Volatile Organic Compounds (µg/L or ppb)					
Acetone	50 G	**85 J**	**220.0**	ND (1,000)	ND (2,000)
Benzene	1.0	ND (25)	**5,800**	**15,000**	**21,000**
2-Butanone	50 G	**60 J**	ND (200)	ND (1,000)	ND (2,000)
1,2-Dichloroethane	0.6	ND (25)	**120.0**	ND (100)	ND (1,000)
2-Hexanone	50 G	**58 J**	ND (100)	ND (500)	ND (2,000)
Toluene	5.0	ND (25)	**38.0**	ND (100)	ND (1,000)
Semivolatile Organic Compounds (µg/L or ppb)					
Acenaphthene	20 G	ND (11)	ND (49)	3.7 J	3.1 J
Acetophenone	NS	ND (11)	NA	2.6 J	ND (5.0)
Anthracene	50 G	ND (11)	ND (49)	1.3 J	1.2 J
Carbazole	NS	ND (11)	4.1 J	5.1 J	3.9 J
2,4-Dimethylphenol	1.0	ND (11)	**10 J**	**14 J**	**23.0**
Fluorene	50 G	ND (11)	ND (49)	2.8 J	ND (5.0)
2-Methylnaphthalene	NS	ND (11)	ND (49)	2.8 J	ND (5.0)
2-Methylphenol	5.0	ND (11)	**17 J**	**20 J**	**14.0**
3&4-Methylphenol	50.0	ND (11)	**67.0 +**	**78.0 +**	**54.0**
Naphthalene	10 G	ND (11)	**12 J**	**19 J**	**15.0**
Phenanthrene	50 G	ND (11)	3.6 J	4.1 J	3.0 J
Phenol	1.0	ND (11)	**410.0**	**530.0**	**760.0**
Inorganic Compounds (µg/L or ppb)					
Aluminum	NS	22,300	4,460	750 B	741.0
Antimony **	3.0	**41.5**	ND (20)	7.6 J	ND (25)
Arsenic **	25.0	10.0	**33.4**	**44.0**	**32.1**
Barium	1,000	204.0	31.5	7.7	ND (50)
Beryllium **	3.0	1.35 J	ND (2.0)	ND (2.0)	ND (3.0)
Chromium **	50.0	30.0	5.8	1.9 J	ND (10)
Cobalt	NS	18.9	ND (4.0)	0.69 J	ND (20)

Table 4-6.
Summary of Detected Compounds in Groundwater Samples Collected from Well MW-43/43R at the Spaulding Composites Site, Site No. 915050.

Date Sampled:	**Groundwater Standard ***	**12/14/07**	**11/23/10**	**08/09/11**	**01/05/12**
Collected By:		**LiRo**	**Empire**	**Empire**	**Empire**
Copper **	200.0	55.2	18.1	8.7 J	ND (10)
Iron	300.0	**28,100**	**4,180**	**360 B**	**721.0**
Lead **	25.0	**26.0**	7.1	6.3	ND (15)
Manganese	300.0	**1,280**	88.8	5.7 B	21.7
Nickel **	100.0	42.0	51.4	52.0	57.1
Vanadium	NS	39.1	59.3	6.7	ND (30)
Zinc **	2,000 G	235.0	34.8	19.0	24.4
Miscellaneous Compounds (µg/L or ppb)					
Cyanide	200.0	ND (10)	ND (10)	6.0 J	ND (10)
Ethanol	NS	ND (100,000)	ND (10,000)	ND (10,000)	ND (1,000)
Methanol	NS	ND (100,000)	10,000	ND (10,000)	ND (1,000)
Formaldehyde	8.0	**61.0**	**63.9**	**14 J**	**22.0**

***** **NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, and NYSDEC Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, August 1999.**
****** **EPA priority pollutant metal.**
+ **Results for 4-methylphenol only.**
B **Value is greater than or equal to the instrument detection limit, but less than the contract required detection limit.**
G **Guidance value.**
J **Compound reported at an estimated concentration below the reporting limit.**
NA **Not Analyzed.**
ND **Indicates that the compound was not detected at the method detection limit specified in parentheses, if known.**
NS **No standard or guidance value available.**
Shaded values equal or exceed the NYSDEC groundwater standards or guidance values.

Table 5-1.
Summary of Detected Compounds in Surface Water Samples Collected from the Retention Pond at the Spaulding Composites Site, Site No. 915050.

Date Sampled: **Collected By:**	**Surface Water Standard ***	**01/05/12** **Empire**	
Semivolatile Organic Compounds (µg/L or ppb)			
Bis(2-ethylhexyl)phthalate	5.0	1.5 J	
2,4-Dimethylphenol	1.0	**2.4 J**	
Di-n-butyl phthalate	NS	5.1	
2-Methylphenol	NS	230.0	
3&4-Methylphenol	NS	37.0	
Phenol	1.0	**1,300**	
Miscellaneous Compounds (µg/L or ppb)			
Formaldehyde	8.0	**12.0**	

***** **NYSDEC Ambient Water Quality Standards and Guidance Values, June 1998, and NYSDEC Part 703: Surface Water and Groundwater Quality Standards and Groundwater Effluent Limitations, August 1999.**

J **Compound reported at an estimated concentration below the reporting limit.**

NS **No standard or guidance value available.**

Shaded values equal or exceed the NYSDEC surface water standards or guidance values.