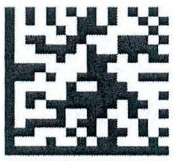




Write or Copy/Paste Document Title In This Space

report.hw.808018.2016-07-05.Annual_PRR_Q9_to_Q12

***DO NOT PHOTOCOPY. PRINT FROM PDF VERSION ONLY.***


ARCADIS Design & Consultancy for natural and built assets

NYSEG

# ANNUAL PERIODIC REVIEW REPORT (Q9 THROUGH Q12)

Madison Avenue Former MGP Site
Elmira, New York
NYSDEC Site Number: 808018

July 5, 2016

# ANNUAL PERIODIC REVIEW REPORT (Q9 THROUGH Q12)

Report Subtitle, Arial 10

Nicholas (Klaus) Beyrle

Project Geologist

Bruce W. Ahrens

Associate Vice President

Prepared for:

NYSEG

18 Link Drive

Binghamton, New York 13904

Prepared by:

Arcadis of New York, Inc.

295 Woodcliff Drive

Third Floor

Suite 301

Fairport

New York 14450

Tel 585 385 0090

Fax 585 385 4198

Our Ref.:

B0013134.0002

Date:

July 5, 2016

# VERSION CONTROL

| Issue | Revision No | Date Issued | Page No | Description | Reviewed by |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

# CONTENTS

# TABLES



# FIGURES

# GRAPHS



# APPENDICES

# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AW | Application Well |
| BDL | below detection limits |
| bgs | below ground surface |
| BTEX | benzene, toluene, ethylbenzene, xylene |
| COC | Compounds of Concern |
| cy | cubic yard |
| DO | dissolved oxygen |
| DNAPL | dense non-aqueous phase liquid |
| DUSR | data usability summary report |
| GV | guidance value |
| ISS | in-situ soil stabilization |
| MGP | manufactured gas plant |
| O&M | operation and maintenance |
| NAPL | non-aqueous phase liquid |
| NYSDEC | New York State Department of Environmental Conservation |
| PAH | polycyclic aromatic hydrocarbon |
| PMW | performance monitoring well |
| ppm | parts per million |
| ROD | Record of Decision |
| sf | square feet |
| SMP | Site Management Plan |
| SUs | Standard Units (for pH) |
| USEPA | United States Environmental Protection Agency |
| VOCs | volatile organic compounds |

# 1 INTRODUCTION

This *Annual Periodic Review Report* (report) summarizes monitoring results collected and operation and maintenance (O&M) activities conducted during the third year of operation of the New York State Department of Environmental Conservation- (NYSDEC-) selected remedy for the Madison Avenue former manufactured gas plant (MGP) site. The former MGP site is located in the City of Elmira, Chemung County, New York (**Figure 1**). The site is approximately 6 acres in size and occupies most of the city block bounded by East Clinton Street, Madison Avenue and East Fifth Street (**Figure 2**).This report covers the monitoring period from May 2015 (Q9 Quarterly Visit) through February 2016 (Q12 Annual Visit).

Recommendations based on evaluation of data collected during the reporting period are also included. Verification from NYSEG that site controls were in place and effective, and that no changes have occurred at the site that would impair the ability of the controls to protect public health and the environment, is included as an appendix.

## 1.1 Background

The NYSDEC-selected soil and groundwater remedies for the site are presented in the Record of Decision (NYSDEC, 2008) (ROD). The soil remedy for the site was completed in January 2012; remedial components associated with the groundwater treatment and non-aqueous phase liquid (NAPL) recovery systems were subsequently installed in October 2012.

In general, the soil remedy consisted of:

- Excavation of approximately 9,820 tons of soil/fill containing visual evidence of heavy MGP-related impacts from three areas of the site at depths up to 15 feet below ground surface (bgs)
- In-situ soil stabilization (ISS) of approximately 7,811 cubic yards (cy) of soil exhibiting visual evidence of heavy MGP-related impacts at depths up to 28 feet bgs in 10 discrete areas of the site
- Excavation and removal of an oil/tar separator

In addition, the following were encountered during implementation of the site remedy and were removed for off-site disposal:

- A shallow area (approximately 6,250 square feet [sf]) containing purifier waste that was observed on the eastern portion of the site during excavation of a test pit
- An abandoned electrical line encased in concrete
- An abandoned section of railroad

The groundwater remedy consists of increasing the oxygen content of groundwater in the southwest corner of the site to enhance natural biodegradation of MGP-related compounds of concern (COCs). The ROD identifies the following COCs for groundwater:

- Four (4) volatile organic compounds (VOCs), including benzene, toluene, ethylbenzene, and xylene

- Six (6) polycyclic aromatic hydrocarbons (PAHs), including benzo(a)anthracene, benzo(b) fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, benzo(k)fluoranthene, and chrysene

The technology of enhancing the population of naturally occurring indigenous bacteria is targeted at the single-ringed, less complex, more mobile benzene, toluene, ethylbenzene, and xylene (BTEX) compounds rather than the multi-ringed, complex PAH compounds. While some reduction in dissolved levels of PAHs associated with source removal/ISS may be anticipated, monitoring concentrations of BTEX compounds is most appropriate for evaluating the effectiveness of the groundwater remedy. However, PAHs (particularly the six identified as COCs) are also considered when evaluating the groundwater remedy.

Oxygen-enhancement of groundwater is accomplished through application of oxygen releasing compounds (i.e., Adventus EHC-O oxygen-releasing socks) in site Application Wells (AWs). The objective of the groundwater treatment system is to mitigate BTEX migration beyond the southwest property boundary. The in-situ groundwater remedy consists of:

- Nineteen (19) 4-inch diameter AWs (AW-1 through AW-19); each AW contains a stainless steel canister containing oxygen-releasing material
- Six Performance Monitoring Wells (PMW-1 through PMW-6); three PMWs are located hydraulically upgradient from the AWs, three are located hydraulically downgradient

NAPL monitoring and removal is also a component of the site remedy. The NAPL collection network consists of five NAPL collection wells for passive removal of MGP-related NAPL:

- NRW-1 through NRW-4 (installed during site remedial actions in 2012)
- NAPL Monitoring Well NMW-0402S (previously existing well installed in 2004)

Locations of the groundwater treatment and monitoring wells and NAPL collection wells are shown on **Figure 2**. Soil boring and well construction logs are included in the *Site Management Plan* (ARCADIS, 2014) (SMP). The SMP also includes an *Engineering and Institutional Control Plan*, a *Monitoring Plan*, an *Operation and Maintenance Plan*, and inspection and reporting requirements.

## 1.2 Objectives

As stated in the SMP, the objectives of this *Annual Report* are to:

- Present and evaluate the site-wide data collected during the monitoring period (i.e., Q9 through Q12)
- Present conclusions indicating whether the treatment system objectives, as defined in the ROD and SMP, and presented herein, are being achieved
- Present recommendations for modifications to the treatment system and/or monitoring requirements based on the evaluation of treatment system data

As required by the SMP, during this reporting period:

- Performance monitoring, effectiveness monitoring, and ECH-O sock replacement were conducted semi-annually
- NAPL was gauged, and removed as required, on a quarterly basis

- Well inspection and site inspection were conducted annually

A summary of monitoring and O&M tasks completed, along with associated dates tasks were conducted, is presented in **Table 1**.

# 2 PERFORMANCE MONITORING

The *Monitoring Plan* included in the SMP describes performance and effectiveness monitoring requirements for evaluating the site remedy. Performance monitoring is the assessment of physical and chemical parameters of the treatment system to determine if the remedy is performing as designed. The performance monitoring program presented in the SMP was developed to document that the groundwater treatment system is delivering oxygen to the groundwater within the AWs (i.e., treatment area). Enhancement of oxygen could stimulate growth of indigenous biological populations and thereby enhance biodegradation of COCs within the treatment area.

As stated above, the technology of enhancing biodegradation targets BTEX compounds rather than PAH compounds; therefore, monitoring concentrations of BTEX compounds is most appropriate for evaluating effectiveness of the treatment system. However, some reduction in dissolved levels of PAHs associated with source removal/ISS may be anticipated; therefore, PAHs are also considered during the evaluation of the remedy.

As required by the SMP, performance monitoring was conducted semi-annually during the third year of treatment system operation (August 2015 [Q10] and February 2016 [Q12]).

Performance monitoring consisted of:

- Measuring and recording dissolved oxygen (DO) concentrations from each of the 19 AWs to verify that the Adventus socks are contributing oxygen to groundwater
- Measuring and recording DO concentrations and depth to bottom at each of the six PMWs
- Collecting field measurements of pH from each of the 6 PMWs and 19 AWs

Measurements of DO concentrations were collected using two field methods:

- Flow-through cell equipped with a DO electrode (YSI, Inc.)
- Colorimetric testing using CHEMet ampoules

Two different CHEMet ampoules were used to measure DO. For concentrations greater than 1 part per million (ppm), CHEMet kit #K-7512 was used; for concentrations less than or equal to 1 ppm, kit #K-7501 was used.

DO and pH measurements were collected from the AWs and PMWs prior to change out of the Adventus oxygen-releasing socks during both the Q10 and Q12 visits. Tabulated concentrations of DO and pH collected prior to change out of the socks are presented in **Table 2** and **Table 3**, respectively. While not required as part of the performance monitoring, DO measurements within the AWs were also collected on several successive days after change out of the socks during both events. DO within the AWs over time data are presented in **Table 4**.

## 2.1 Comparison of DO Measurement Methods

Comparisons of DO data obtained using the two field methods for each of the six PMWs during the Baseline Event through Q12 are presented on **Graphs 1 through 3**. Including the baseline data, nine

data sets exist for comparing the two field methods. Based on data collected to date, the two methods generally exhibit similar trends with the exception of PMW-2, PMW-3, and PMW-4 during the Q8 sampling event and PMW-3 during the Q12 event.

Experience using both measuring devices (i.e., YSI meter and CHEMets) at similar sites have identified benefits and deficiencies of each method. Additionally, studies performed by White, et al. (1990), Walton-Day, et al. (1990) and Wilkin, et al. (2001), indicate that CHEMets colorimetric methods were found to be accurate and reproducible, particularly at low DO concentrations (<1 ppm). However, despite being found to be relatively accurate and reproducible, colorimetric methods can be subject to interferences that may affect the accuracy of readings. Because the colorimetric reagents involve oxidation-reduction reactions to indicate concentration of DO, redox species in groundwater other than DO can influence results (Wilkin et al. 2001). DO electrodes (i.e., as used in the YSI meter) were found to be generally less reliable and prone to problems such as membrane fouling that compromise electrode performance (hydrogen sulfide, thio-organic, and other organic compounds were found to be the most problematic compounds responsible for membrane fouling and subsequent inaccurate readings).

Regression analysis was used to calculate correlation between YSI readings and CHEMet readings (from the Baseline event through the Q12 sampling event); the analysis indicates a correlation factor ($R^2$) of 0.94. This correlation factor indicates that the two DO measurement techniques have a moderate correlation.

## 2.2 DO Concentration Results

This section summarizes DO data collected prior to installing the oxygen-releasing socks, followed by a discussion of the DO data collected within AWs at several time intervals after the oxygen-releasing socks were installed. Discussions include DO data collected from both AWs and PMWs. DO data are presented in **Table 2** and **Table 4**.

General observations based on data provided in **Table 2** for the Q10 and Q12 events include:

- DO concentration in groundwater during both the Q10 and Q12 events were significantly higher at PMW-3 than the other two upgradient PMWs (PMW-1 and PMW-5).
- When comparing DO concentrations in groundwater from PMW upgradient/downgradient "pairs" over the reporting period:
    - PMW-1/PMW-2: DO concentrations in groundwater increased in the downgradient well during both the Q10 and Q12 site visits using both methods
    - PMW-3/PMW-4: DO concentrations in groundwater decreased in the downgradient well during the Q10 event and increased during the Q12 event using both methods
    - PMW-5/PMW-6: During the Q10 event DO concentrations in groundwater were similar in the downgradient well as measured by the YSI meter and decreased as measured by the CHEMet Kit; and were similar during the Q12 event as measured by both the CHEMet Kit and the YSI.

Comparisons of DO data over time (Baseline Sampling through Q12) for each of the upgradient and downgradient PMW "pairs" are provided in **Graph 1** through **Graph 3**. Key dates, including dates for initial installation and subsequent replacement of oxygen-releasing material, are included on the graphs. While

some trends of increasing DO concentrations appear to exist, several variables make the data difficult to interpret, including:

- Variations between the field analytical methods
- Potential variations in localized groundwater flow patterns in the immediate area of the PMWs (described in Section 3.1)
- The presence of dissolved BTEX appears to influence/interfere with the CHEMets' DO measurements when DO data over time are compared with dissolved BTEX data over time
- The presence of dense nonaqueous phase liquid (DNAPL) in NRW-2, NMW-0402S, and AW-17 (Section 4) confirms problematic compounds/redox species that affect DO readings are dissolved in groundwater near the PMWs

## 2.3 pH

Groundwater samples were collected from AWs and PMWs during the Q10 and Q12 sampling events and field analyzed for pH. The pH values were measured prior to change out of the Adventus oxygen-releasing socks. Results from the pH measurements are presented in **Table 3**.

The average pH value for the three upgradient PMWs measured during the Q10 visit was 6.56 Standard Units (SUs), and the average pH for the three downgradient PMWs was 6.25 SUs (approximate 4.7% decrease). The average pH of groundwater within the AWs prior to change out of the socks was 6.57 SUs (equivalent/slightly higher compared to the upgradient average).

The average pH value for the three upgradient PMWs measured during the Q12 visit was 7.05 SUs, and the average pH for the three downgradient PMWs was 7.05 SUs (no change). However, the average pH of groundwater within the AWs prior to change out of the socks was 7.95 SUs (approximate 13% higher).

A potential connection may exist between higher DO concentrations and higher pH readings within wells. Higher pH values could be an indicator that DO is being released by the Adventus oxygen-releasing socks deployed in the wells because hydroxide in the form of $Ca(OH)_2$ is a byproduct of the oxygen producing reaction associated with the socks, which can therefore create high pH/alkaline conditions.

In general, when comparing pH values of groundwater collected during Q1 though Q12 events (with the exclusion of Q8) for all AWs, groundwater collected from AW-1 through AW-9 appear to be more alkaline than groundwater collected from AW-11 though AW-19 (pH measurements from Q8 appear to be relatively neutral in all AWs). Average pH values were much higher during the Q12 (i.e., spring) sampling event compared to the Q10 (i.e., summer) sampling event.

## 2.4 DO and pH Values After New Sock Deployment

DO and pH parameters were recorded several times during Q10 and Q12 site visits subsequent to replacement of oxygen-releasing socks to evaluate variations early in the change-out cycle. Parameters were recorded before sock replacement and approximately 24- and 48-hours after the new socks were installed. Results from DO and pH measurements over time are presented in **Table 4** and **Table 5**, respectively.

### 2.4.1 pH Values in AWs Over Time

Results of groundwater pH measurements from AWs subsequent to replacement of the oxygen-releasing socks for the Q10 and Q12 sampling events are presented below.

- **Q10 Sampling Event**
  - Prior to change out of the oxygen-releasing socks the average pH of groundwater across the 19 AWs was approximately 6.62 SUs
    - the average pH at AW-1 through AW-9 was 8.01 SUs
    - the average pH at AW-10 through AW-19 was 5.38 SUs.
  - 24-hours after installation of new oxygen-releasing socks the average pH of groundwater across the 19 AWs was approximately 6.68 SUs
    - the average pH at AW-1 through AW-9 was 7.23 SUs
    - the average pH at AW-10 through AW-19 was 5.62 SUs
  - 48-hours after installation of new oxygen-releasing socks the average pH of groundwater across the 19 AWs as approximately 6.74 SUs
    - the average pH at AW-1 through AW-9 was 7.39 SUs
    - the average pH at AW-10 through AW-19 was 5.61 SUs
  - The highest groundwater pH values were measured at the western end of the row of AWs (AW-1 through AW-9).
  - Average groundwater pH concentrations within AWs increased within 24-hours after change-out; this is consistent with historical results.
- **Q12 Sampling Event:**
  - Prior to change out of the oxygen-releasing socks, the average pH of groundwater across the 19 AWs was approximately 8.23 SUs
    - The average pH at AW-1 through AW-9 was 9.50 SUs
    - The average pH at AW-10 through AW-19 was 6.45 SUs
  - 24-hours after installation of new oxygen-releasing socks the average pH of groundwater across the 19 AWs material was 9.68 SUs
    - The average pH at AW-1 through AW-9 was 11.38 SUs
    - The average pH at AW-10 through AW-19 was 7.42 SUs
  - 48-hours after installation of new oxygen-releasing socks the average pH of groundwater across the 19AWs was approximately 9.80 SUs
    - The average pH at AW-1 through AW-9 was 11.43 SUs
    - The average pH at AW-10 through AW-19 was 7.57 SUs

- The highest groundwater pH values were measured at the western end of the row of AWs (AW-1 through AW-9).
- Average groundwater pH concentrations in the AWs increased within 24-hours after change-out; this is consistent with historical results.

### 2.4.2 DO Concentrations in AWs Over Time

Results of groundwater DO measurements in AWs subsequent to replacement of the oxygen-releasing socks are presented below.

- **Q10 Sampling Event**
  - Prior to change out of the oxygen-releasing socks, average DO concentration of groundwater across the 19 AWs was 4.70 mg/l as measured with the CHEMet ampoules (note that at two locations the DO was >12 mg/l; a value of 12 mg/l was used for calculating the average) and 5.29 mg/l measured with the YSI meter.
  - 24-hours after change out of the socks, average DO concentrations were 11.74 mg/l as measured with the CHEMet ampoules and 24.07 mg/l as measured with the YSI.
  - 48-hours after change out of the socks, average DO concentrations were 11.29 mg/l as measured with the CHEMet ampoules and 21.57 mg/l as measured with the YSI meter.
  - The highest groundwater DO values were recorded at AWs located at the western end of the row of AWs.
- **Q12 Sampling Event**
  - Prior to change out of the oxygen-releasing socks, average DO concentration of groundwater across the 19 AWs was 7.08 mg/l as measured with the CHEMet ampoules (note that at eight locations the DO was >12 mg/l; as stated above, a value of 12 mg/l was used for calculating average) and 12.55 mg/l measured with the YSI meter.
  - 24-hours after change out of the socks, average DO concentrations were 11.47 mg/l as measured with the CHEMet ampoules and 23.72 mg/l as measured with the YSI.
  - 48-hours after change out of the socks, average DO concentrations were 10.97 mg/l as measured with the CHEMet ampoules and 22.97 mg/l as measured with the YSI meter.
  - The highest groundwater DO values were recorded at AWs located at the western end of the row of AWs.

DO results collected during the Q10 and Q12 sampling events confirm that socks are liberating oxygen and increasing DO in groundwater within the AWs (i.e., consistent with historical results).

# 3 EFFECTIVENESS MONITORING

Effectiveness monitoring is the periodic chemical and physical analysis of a media (e.g., groundwater) to determine if the remedial action objectives are being achieved.

As presented in the SMP, the objectives of effectiveness monitoring are to:

- Assess groundwater movement patterns at the site using water-level data
- Document concentrations of dissolved BTEX downgradient from AWs
- Document dissolved COC (BTEX and six PAHs) concentration trends across the site

Effectiveness monitoring for the third year of system operation consisted of:

- Semi-annual (Q10 and Q12) gauging of 6 PMWs, 17 MWs, and 19 AWs (gauging of AWs not required by the SMP)
- Semi-annual (Q10 and Q12) sampling of groundwater from 10 monitoring wells for laboratory analysis of BTEX and PAHs

The results from the effectiveness monitoring are presented below.

## 3.1 Groundwater Movement

Groundwater movement beneath the site was assessed in two ways:

- Preparation of site-wide water table maps
- Review of groundwater elevation data collected from PMWs

Water-level data were collected during the Q10 and Q12 visits from the following locations:

- 6 PMWs (PMW-1 through PMW-6)
- 19 AWs (AW-1 through AW-19)
- 17 site monitoring wells (MW-1S, MW-1D, MW-2S, MW-2D, MW-4S, MW-6S, MW-7, MW-8S, MW-8D, MW-9S, MW-9D, MW-0304D, MW-0402S, MW-0403S, MW-0404S, MW-0404D, and MW-0405S)

**Table 6** presents water elevation data collected from the Baseline through Q12 sampling events.

**Figures 5** and **6** present the water table maps developed from the Q10 and Q12 gauging events, respectively. As shown on the figures, the general groundwater flow direction at the site is to the south during both gauging events. When comparing water table maps between the two gauging events, no significant differences are observable, indicating that no significant changes to site-wide groundwater flow direction occurred during the reporting period. Additionally, site-wide groundwater flow directions during this reporting period were very similar to the previous reporting period (i.e., Baseline event through Q8).

In addition to site-wide evaluation of groundwater movement, water-level data collected from PMWs were also examined to evaluate localized groundwater flow at the AWs. Upgradient/downgradient PMW pairs

were gauged with the objective of confirming groundwater elevations in PMWs designated as "upgradient" were higher than their "downgradient" counterparts.

The results from gauging events indicate that:

- Groundwater elevations at up/downgradient well pair PMW-1 and PMW-2 were consistently higher in downgradient well PMW-2 during the Q10 and Q12 gauging events (0.86 feet and 1.29 feet higher, respectively). Higher groundwater elevations in downgradient PMW-2 are consistent with historic groundwater measurements.
- Groundwater elevations in upgradient well PMW-3 were higher than in downgradient PMW-4 during both Q10 and Q12 monitoring events.
- Groundwater elevations in upgradient well PMW-5 were higher than in downgradient PMW-6 during both Q10 and Q12 monitoring events.

As presented in the *Annual Periodic Review Report, Baseline Event through Q4* (ARCADIS 2015) the surface completion at PMW-2 was observed to be deteriorated and the surrounding ground surface settled. It was suspected that the higher groundwater elevation at PMW-2 was the result of surface water infiltration due to failure of its surface completion. The surface completion at PMW-2 was repaired during the Q6 event; however, successive gauging events (Q8, Q10, and Q12) still indicate higher groundwater elevations in down gradient PMW-2.

## 3.2 Groundwater Quality

An ongoing program of groundwater monitoring was in place at the site since 1985. As reported in the *Supplemental Remedial Investigation Report* (ARCADIS, 2007), results from quantitative trend analysis using available data from 1985 to 2004 concluded that constituent plumes appeared to be shrinking over time due to a variety of naturally occurring processes.

Semi-annual (Q10) and annual (Q12) sampling of groundwater was conducted during this reporting period. During both events, groundwater from 10 monitoring wells identified in the SMP was collected for laboratory analysis of BTEX by United States Environmental Protection Agency (USEPA) SW-846 Method 8260 and PAHs by USEPA SW-846 Method 8270. The analytical results are summarized in **Table 7**. For comparison purposes, historical groundwater results collected in April 2004 and the Q1 through Q4 results are also included in the table.

Laboratory data packages from each sampling event were reviewed by an individual approved to validate data in New York State, and *Data Usability Summary Reports* (DUSRs) were prepared. Data review indicated that overall laboratory performance was acceptable and that the overall data quality was within the guidelines specified in the respective methods. A compact disc containing copies of the DUSRs is included as **Appendix A**.

Discussions of laboratory results for BTEX and PAHs are presented below.

### 3.2.1 Dissolved BTEX

Laboratory data for dissolved BTEX are presented in **Table 7**; dissolved total BTEX data are presented on **Figure 7**. The most recent historical sampling data (2004) and data collected during the first year of treatment system operation are also presented in **Table 7** and on **Figure 7**.

Total BTEX concentrations in groundwater collected from the 10 MWs during both the Q10 and Q12 reporting period were all below detection limits (BDL). Results from the third year of groundwater sampling are consistent with data reported since the 2004 sampling event.

### 3.2.2 Dissolved PAH COCs

Laboratory data for dissolved PAHs are also presented in **Table 7**; data for the six PAH COCs are presented on **Figure 8**. The most recent historical sampling data (2004) and data collected during the first three years of treatment system operation are also presented in **Table 7** and on **Figure 8**. Total PAHs (tPAHs) are also presented on **Figure 8**.

Results from groundwater collected from the 10 MWs during the reporting period are summarized below.

- **Q10 Sampling:**
  - None of the 6 PAH COCs were detected in groundwater from the 10 MWs
  - PAHs were not detected in groundwater from 9 of the 10 monitoring wells sampled (5 non-COC PAHs were detected in groundwater collected from MW-8).
  - None of the non-COC PAHs detected in groundwater collected from MW-8 (acenaphthene, anthracene, fluoranthene, fluorene, and pyrene) exceeded their respective groundwater guidance values (GVs).
- **Q12 Sampling:**
  - None of the 6 PAH COCs were detected in groundwater from 9 of the 10 MWs (5 of the 6 PAH COCs were detected at MW-8)
  - Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected at MW-8 above their respective groundwater GVs. These PAHs were detected below the laboratory reporting limit, however; slightly above the method detection limit, so, each of the results were reported with a "J" qualifier (i.e., estimated value).
  - The Q12 sampling event represents the second consecutive spring sampling event that these 5 analytes were detected at this location (PAH COCs have not been detected during any of the previous fall sampling events).
  - Groundwater from MW-9S (located north/hydraulically upgradient of the Trayer Products building) did not have any detections of PAHs (consistent with previous sampling events).
  - Groundwater from monitoring well MW-4S, located in the former MGP area, did not have any detected PAH COC analytes; historically at this location up to 4 PAH COCs have been reported during spring sampling events.

# 4 NAPL MONITORING RESULTS

Consistent with the SMP, NAPL gauging was conducted quarterly during the third year of system operation. As described in the SMP, the NAPL monitoring network at the site includes five NAPL recovery wells (NRW-1, NRW-2, NRW-3, NRW-4, and NMW-0402S). In addition, based on the presence of trace amounts of NAPL observed during the Q8 (February 2015) gauging event on the sock canister suspended in AW-17, a recommendation was included in the second *Annual Periodic Review Report* (Arcadis 2015) to include AW-17 in the quarterly gauging schedule. The objectives of the NAPL monitoring task were to identify whether NAPL had accumulated within a well, and to remove it if present and recoverable. Locations of the wells are shown on **Figure 2**. A summary of the NAPL gauging data is included in **Table 6**.

Similar to previous gauging events, DNAPL was present in NMW-0402S during the reporting period. DNAPL was measured in NMW-0402S during three of the four monitoring events (Q9, Q10, and Q12) ranging from 0.35 to 0.5 feet in apparent thickness within the well.

DNAPL was present in NRW-2 during only the Q12 sampling event, at an apparent thickness of 1.1 feet within the well. NAPL was not detected during the Q9, Q10, or Q11 sampling events.

As mentioned above, quarterly gauging of AW-17 was recommended in the second annual report; and subsequently implemented. A measurable amount of NAPL was only present during the Q10 (August 2015) event; only trace amounts were observed during the Q11 and Q12 visits.

Trace amounts of DNAPL had been historically detected on the interface probe at PMW-3 (April and May 2013), however; the quantity was not sufficient to measure or recover. During this reporting period (and the previous reporting period), no trace of DNAPL was detected at PMW-3.

Since the Baseline event in 2013, a total of approximately 2.8 gallons of DNAPL has been manually removed using a bailer (approximately 1.6 gallons removed during the first year of operation, 0.7 gallons during the second year, and approximately 0.5 gallons removed during the third year). As shown on the summary table and graph in **Appendix B**, the quantity of DNAPL recovered from the wells is decreasing over time.

Recovered DNAPL was containerized for disposal by NYSEG.

# 5 TREATMENT SYSTEM OPERATION AND MAINTENANCE

NYSEG is responsible for maintaining any aspect of the site that is associated with remediation activities for the former MGP facility.

Operation and maintenance activities during the reporting period included the following:

- Well maintenance (e.g., replacing missing or broken locks, repair/replacement of ground seals, protective casings, and/or locking caps, etc.)
- Replacement of the oxygen-releasing material.
- Annual site inspection.

In addition, any recommendations included in the *Annual Periodic Review Report, Q5 through Q8* were addressed during the Q10 visit.

A summary of these activities is presented below.

## 5.1 Treatment System Maintenance

The site remedy does not rely on any mechanical systems to protect public health or the environment. However, the SMP describes measures necessary to perform routine maintenance on the site cover materials, monitoring and treatment system components (i.e., well network), and replacement of oxygen-releasing material.

Visual inspections of the surface cover and treatment system wells conducted during the previous annual site visit (Q8) did not identify deficiencies to be addressed; however, snow was covering the site at the time of inspection. Therefore, as recommended, the site was inspected again during the Q10 site visit. Again, no deficiencies were identified.

Maintenance recommendations included in the second annual report based on gauging data included:

- Sediment removal at MW-2S, MW-9S, AW-16, AW-17, and AW-19
- Re-development of PMW-3

These activities were performed in August 2015 during the Q10 site visit.

A summary of the maintenance results from the Q10 through Q12 visits are presented below.

### 5.1.1 Monitoring Wells

Comparison of depth to bottom measurements collected during the reporting period for each of the 17 MWs to their respective well construction logs was conducted to determine accumulation of material within each well.

- Based on gauging data from the Q10 event compared to well installation information, three wells (MW-2S, MW-2D, and MW-7) contained sediments that occluded 10% or greater of the well screen (approximately 17%, 17%, and 10%, respectively) after sediment removal

- Based on gauging data from the Q12 event compared to well installation information, two MWs (MW-2S and MW-7) contained sediments that occluded greater than 10% or greater of the well screen (approximately 17% and 10%, respectively)

Sediment removal at MW-2S, MW-2D, and MW-7 should be attempted again during future site visits using non-manual methods (e.g., Waterra pump, air lift pump, whaler pump).

Based on visual inspections, no additional repairs to monitoring wells are required.

### 5.1.2 Application Wells

Comparison of depth to bottom measurements collected during the reporting period for each AW to their respective well construction logs was also conducted to determine accumulation of material within each well (note that each AW was constructed with a 2-foot-long collection sump). As mentioned above, accumulated sediment was manually removed with a bailer from AW-16, AW-17, and AW-19 during the Q10 event; depth to bottom measurements and accumulated thickness of sediments reported in **Table 6** were collected subsequent to removal of sediments.

Results from the gauging indicated:

- Gauging data from the Q10 event indicated that none of the AWs contained appreciable accumulation of sediments within the sumps; accumulation ranged from 0 to 0.80 feet.
- Gauging data from the Q12 event indicated that AW-16 contained approximately 2.8 feet of accumulated sediments (i.e., sediments accumulation exceeded the sump depth), and four AWs (AW-9, AW-13, AW-15 and AW-18) contained greater than 1.0 feet of accumulated sediments within their sumps (1.01 feet, 1.81 feet, 1.06 feet, and 1.41 feet, respectively).
- Sediment appears to be accumulating in many of the wells over time

While only AW-16 contained sediments greater than the sump depth and requires removal, removal of sediments from AW-9, AW-13, AW-15, and AW-18 is also recommended.

Based on visual inspections, no additional repairs to AWs are required.

### 5.1.3 Performance Monitoring Wells

Comparison of depth to bottom measurements collected during the reporting period for each of the six PMW to their respective well construction log was also conducted to determine accumulation of material within each well (note that each PMW was constructed with a 2-foot-long collection sump). Accumulated sediment was manually removed with a bailer from PMW-5 and PMW-6 during the Q10 event; depth to bottom measurements and accumulated thickness of sediments reported in **Table 6** were also collected subsequent to removal of sediments. Sediment removal from PMW-3 was also attempted during the Q10 site visit; however, the bailer got stuck at 9.5 feet below the top of casing due to deformation of the well.

Results from the gauging indicate:

- Sediment accumulation within PMW-1, PMW-2, PMW-4, PMW-5 and PMW-6 does not appear to be an issue (i.e., only occasional removal of sediments is required using a bailer as accumulated thickness is generally 0 to 1.0 feet)

- Removal of sediments using a bailer was not successful at PMW-3 due to the deformation of the well. Re-development of PMW-3 with a small diameter bailer/tubing is required. If sediment accumulation continues to be an issue, the integrity of the well should be evaluated.

Based on visual inspections, no additional repairs to PMWs are required.

### 5.1.4 NAPL Recovery Wells

Comparison of depth to bottom measurements collected during the reporting period for each of the four NRWs and NMW-0402S to their respective well construction logs was also conducted to determine accumulation of material within each well. Each NRW was constructed with a 5-foot long collection sump.

Results from the gauging indicated that none of the NRWs or NMW-0402S contained quantities of accumulated material in the sumps greater than 1 foot (accumulated material ranged from 0.0 to 0.86 feet). Therefore, based on gauging events conducted during the monitoring period, sediment removal is not required at this time.

## 5.2 Replacement of Oxygen-Releasing Material

Replacement of Adventus EHC-O oxygen-releasing socks was conducted during the following site visits during this reporting period:

- Replacement #5: August 2015 (Q10 semi-annual site visit)
- Replacement #6: February 2016 (Q12 annual site visit)

During the Q10 semi-annual and Q12 annual replacement of the oxygen-releasing socks, the stainless steel canisters that contain the socks were removed and brushed/scrubbed to remove accumulated material prior to re-deployment. Field measurements were used to set the EHC-O oxygen releasing socks in the wells at a depth such that the middle of the stainless steel canister containing the EHC-O sock was in the middle of the saturated well screen.

After each change out, spent socks were containerized for subsequent disposal by NYSEG.

## 5.3 Annual Site Inspection

As presented in the ROD, one of the remediation goals for the site is to maintain the surface cover materials that provide continued protection against potential human exposure to subsurface soil potentially containing MGP-related impacts. As required by the SMP, surface cover of the site (stone, gravel, vegetative, and/or asphalt cover) is visually evaluated annually and repaired as needed. Because potential MGP impacts can be encountered at depths as shallow as 2 feet bgs, the annual inspections focus on maintaining physical separation between site workers and the remaining MGP impacts.

A recommendation to re-perform the second annual site-wide inspection was included in the second annual report because 0.5 to 1.5 feet of snow covered the ground surface during the February 2015 (Q8) annual site visit that obscured any potential cover material deficiencies. The site was subsequently inspected again on August 27, 2015 during the Q10 site visit. No evidence of settling, obvious

obstructions within drainage features (e.g., catch basins) or disturbance activities were observed. The Site Inspection Form completed for the August 2015 inspection is included in **Appendix C**

The 2016 annual site inspection was conducted February 9, 2016. Again, no evidence of settling, obvious obstructions within drainage features (e.g., catch basins) or disturbance activities were observed. No deficiencies were observed. A Site Inspection Form associated with the 2016 inspection is also included in **Appendix C.** A photographic log documenting site conditions at the time of the 2016 annual inspection is included as **Appendix D**. The location where each photograph was taken, and the direction that the photographer was facing, is shown on **Figure 9**.

In addition, photographic documentation of the condition of each well associated with the site, including protective covers, locking devices, and overall integrity of the wells is also provided as **Appendix E**. No deficiencies were identified.

# 6 DISTURBANCE ACTIVITIES IN POTENTIALLY IMPACTED AREAS

NYSEG is not aware of any intrusive activities that were conducted in potentially impacted areas during the reporting period

# 7 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations based on the third year of treatment system monitoring and operation are presented below.

## 7.1 Conclusions

A summary of pertinent conclusions based on the third year of treatment system operation are presented below

### 7.1.1 Performance Monitoring

Semi-annual collection of DO and pH measurements from the AWs and PMWs indicated that:

- Concentrations of DO increased significantly within AWs after change out of oxygen-releasing socks; results confirm that the socks are liberating oxygen and increasing DO in groundwater
- A moderate correlation (0.94 factor) exits between the two DO monitoring techniques
- Significantly higher pH values were reported for groundwater collected from PMWs from the spring (Q12) sampling event compared to the summer (Q10) event.
- pH values of groundwater from AW-1 through AW-9 are more alkaline than groundwater collected from AW-10 though AW-19 (averages are 8.01 SU and 5.38 SU, respectively)
- Several variables make the pH and DO data difficult to interpret, including:
  - Variations between the field analytical methods
  - Potential variations in localized groundwater flow patterns in the immediate area of the PMWs
  - The presence of dissolved BTEX appears to influence/interfere with the CHEMets' measurements
  - The presence of dense nonaqueous phase liquid (DNAPL) in NRW-2, NMW-0402S, and AW-17 confirms problematic compounds/redox species that affect DO are present

Results from the Q10 and Q12 monitoring events are consistent with results from previous monitoring events.

### 7.1.2 Effectiveness Monitoring

Semi-annual effectiveness monitoring indicated that:

- Groundwater gauging conducted during the Q10 and Q12 events indicated that:
  - Site-wide groundwater flow direction was to the south
  - No significant differences in groundwater flow direction were observed between gauging events
  - Site-wide groundwater flow directions were very similar to historical reporting results (baseline through Q8)

- Total BTEX concentrations in groundwater collected from the 10 MWs located across the site were BDL during both the Q10 and Q12 sampling events;
- None of the PAH COCs were detected during the Q10 sampling event from the 10 MWs located across the site
- None of the PAH COCs were detected during the Q12 sampling event from 9 of the 10 MWs located across the site (five PAH COCs were detected in groundwater collected from MW-8S)
- Groundwater sampling results are similar to data reported from the first two years of groundwater sampling and from the 2004 sampling event

### 7.1.3 NAPL Monitoring

Quarterly NAPL monitoring indicated that:

- NAPL was detected at the same two NAPL recovery wells (NRW-2 and NMW-0402S) as previous monitoring periods
- NAPL was also detected at AW-17 during the Q10 gauging event; trace amounts were detected during the Q11 and Q12 events
- The total volume of NAPL removed to date by manual bailing is approximately 2.8 gallons

### 7.1.4 Treatment System O&M

Gauging data collected from treatment system wells during the reporting period indicated:

- Sediment continues to accumulate in three monitoring wells (MW-2S, MW-2D, and MW7), five AWs (AW-9, AW- 13, AW-15, AW-16, and AW-18) and one PMW (PMW-3).
- No issues were encountered during replacement of oxygen-releasing socks
- No evidence of settling, obvious obstructions within drainage features, or disturbance activities were observed during either the "re-performed" second annual (i.e., 2015) site inspection or the 2016 annual site inspection.

## 7.2 Recommendations

Recommendations based on the third year of treatment system operation are presented below.

### 7.2.1 Performance Monitoring

- Continue performance monitoring tasks identified in the SMP to further develop DO concentration and pH data

### 7.2.2 Effectiveness Monitoring

- Continue with effectiveness monitoring tasks identified in the SMP to further develop groundwater quality data

### 7.2.3 NAPL Monitoring

- Continue quarterly NAPL monitoring, and removal if required, as identified in the SMP
- Continue to gauge AW-17 during the quarterly site events for the presence of NAPL

### 7.2.4 Treatment System O&M

- Continue semi-annual (Q10) and annual (Q12) O&M as identified in the SMP
- Manual sediment removal at MW-2S, MW-2D, MW-7, AW-9, AW-13, AW-15, AW-16 (contained sediments greater than the sump depth), and AW-18 should be performed.
- A small diameter bailer should be brought to the site and used to re-develop PMW-3

# 8 CERTIFICATION STATEMENT

A statement from NYSEG confirming that site controls were in place and effective and, based on information provided and site conditions to the extent that they could be observed, no changes occurred during the reporting period that would impair the ability of the controls to protect public health and the environment is included as **Appendix F**.

# 9 REFERENCES

ARCADIS, 2015. *Annual Periodic Review Report, Baseline Event through Q4*. Madison Avenue Former MGP Site, Elmira, New York (February 2015).

ARCADIS. 2014. *Site Management Plan.* Prepared for NYSEG, Madison Avenue Former MGP Site, Chemung County, Elmira, New York (March 2014).

ARCADIS. 2007. *Supplemental Remedial Investigation Report*, Madison Avenue MGP Site, Elmira, New York (February 2007).

New York State Department of Environmental Conservation. 2008. *Record of Decision*, Madison Avenue Former manufactured Gas Plant (MGP) Site, City of Elmira, Chemung County, New York. Site Number 8-08-018. 2008.

Walton-Day, Katherine, Donald L. Macalady, Myron H. Brooks, and Vernon T. Tate. 1990. Field methods for measurement of ground water redox chemical parameters. *Ground Water Monitoring Review.* Vol.10, No. 4: 81-89.

White, Art F., Maria L. Peterson, and Ray D. Solbau. 1990. Measurement and interpretation of low levels of dissolved oxygen in ground water. *Ground Water* Vol. 28, No. 4: 584-590.

Wilkin, Richard T., Mary S. McNeil, Cherri J Adair, and John T. Wilson. 2001. Field measurement of dissolved oxygen: a comparison of methods. *Ground Water Monitoring Review.* Vol.21, No. 4: 124-132.

# TABLES

**Table 1**
**Monitoring, Gauging, and Operation & Maintenance Schedule**

**Annual Periodic Review Report, Q9 through Q12**
**Madison Avenue Former MGP Site, Elmira, New York**

| Event | Date | Scheduled Activities | | | | | |
|---|---|---|---|---|---|---|---|
| | | Performance Monitoring | Effectiveness Monitoring | NAPL Gauging | O&M | | |
| | | | | | Site Inspection | Well Inspections | ECH-O Socks Replacement |
| Q9 (Quarterly) Monitoring | May 2015 | | | X | | | |
| Q10 (Semi-annual) Monitoring | August 2015 | X | X | X | | | X |
| Q11 (Quarterly) Monitoring | November 2015 | | | X | | | |
| Q12 (Annual) Monitoring | February 2016 | X | X | X | X | X | X |

**Notes:**

- **Performance Monitoring** – Included measuring pH and DO concentrations at 6 PMWs and 19 AWs
- **Effectiveness Monitoring** – Included semi-annual gauging of 6 PMWs and 17 MWs and semi-annual sampling of 10 site MWs for BTEX and PAHs. Also included semi-annual change-out of ECH-O socks.
- **NAPL Gauging** – Included quarterly gauging of depth to water and depth to bottom at 4 NRWs, 1 NMW and AW-17, and removal of NAPL if present.
- **Site and Well Inspections** – Included visual inspections of the site cover materials and MWs, PMWs, NRWs, NMW, and AWs associated with the site

**Table 3**
**pH Within AWs and PMWs**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Location (Upgradient, Downgradient, Internal) | Baseline Sampling | 3-Month Sampling | 6-Month Sampling | 9-Month Sampling | 12-Month Sampling | 18-Month Sampling | 24-Month Sampling | 30-Month Sampling | 36-Month Sampling |
|---|---|---|---|---|---|---|---|---|---|---|
| | | April 1-5, 2013 | Q1 (May 28-30, 2013) | Q2 August 26-30, 2013 | Q3 November 19, 2013 | Q4 February 6, 2014 | Q6 August 4-5, 2014 | Q8 February 23-27, 2015 | Q10 August 24-28, 2015 | Q12 February 8-12, 2016 |
| | | pH | pH | pH | pH | pH | pH | pH | pH | pH |
| PMW-1 | Upgradient | 7.09 | 7.08 | 7.00 | 6.86 | 7.10 | 7.05 | 7.19 | 6.93 | 7.01 |
| PMW-2 | Downgradient | 7.06 | 7.05 | 6.67 | 6.59 | 6.95 | 6.92 | 6.87 | 6.47 | 6.97 |
| PMW-3 | Upgradient | 7.23 | 7.10 | 7.09 | 7.28 | 7.39 | 7.19 | 7.45 | 7.42 | 7.39 |
| PMW-4 | Downgradient | 7.24 | 7.18 | 7.04 | 7.32 | 7.09 | 6.96 | 7.24 | 6.89 | 7.29 |
| PMW-5 | Upgradient | 7.05 | 7.08 | 6.87 | 6.98 | 6.91 | 6.89 | 7.04 | 5.33 | 6.76 |
| PMW-6 | Downgradient | 7.10 | 6.95 | 6.97 | 6.87 | 7.06 | 6.96 | 6.92 | 5.38 | 6.88 |
| AW-1 | Internal | 7.03 | 10.11 | 9.52 | 8.55 | 11.18 | 11.79 | 6.91 | 6.63 | 9.92 |
| AW-2 | Internal | 7.21 | 10.18 | 7.13 | 7.33 | 7.17 | 9.86 | 7.33 | 8.10 | 7.05 |
| AW-3 | Internal | 7.08 | 8.5 | 7.41 | 6.96 | 7.07 | 7.20 | 6.99 | 7.33 | 7.00 |
| AW-4 | Internal | 7.31 | 7.78 | 7.05 | 7.7 | 7.36 | 7.14 | 7.41 | 7.23 | 7.39 |
| AW-5 | Internal | 7.25 | 12.32 | 9.97 | 12.04 | 12.31 | 10.77 | 7.15 | 8.72 | 10.65 |
| AW-6 | Internal | 7.34 | 12.17 | 10.32 | 11.66 | 11.21 | 10.64 | 7.08 | 9.84 | 11.41 |
| AW-7 | Internal | 7.16 | 11.52 | 9.38 | 10.2 | 11.21 | 11.49 | 7.11 | 8.59 | 11.47 |
| AW-8 | Internal | 7.39 | 9.22 | 8.03 | 9.12 | 7.97 | 7.93 | 6.67 | 8.16 | 10.30 |
| AW-9 | Internal | 7.45 | 11.91 | 11.34 | 12.27 | 12.25 | 12.25 | 6.63 | 7.49 | 10.28 |
| AW-10 | Internal | 7.29 | 7.33 | 7.28 | 7.47 | 7.27 | 7.40 | 7.23 | 5.36 | 8.87 |
| AW-11 | Internal | 7.17 | 7.19 | 7.04 | 7.78 | 7.13 | 7.07 | 7.24 | 5.43 | 7.01 |
| AW-12 | Internal | 7.92 | 8.57 | 7.32 | 7.78 | 7.33 | 7.42 | 7.31 | 5.53 | 7.56 |
| AW-13 | Internal | 7.2 | 7.04 | 7.02 | 7.14 | 7.07 | 7.01 | 7.22 | 5.42 | 6.80 |
| AW-14 | Internal | 7.21 | 7.33 | 7.22 | 7.67 | 7.14 | 7.19 | 7.27 | 5.43 | 7.15 |
| AW-15 | Internal | 7.25 | 7.09 | 6.94 | 6.99 | 7.03 | 7.17 | 7.09 | 5.45 | 6.84 |
| AW-16 | Internal | 7.08 | 6.84 | 6.73 | 6.68 | 6.74 | 6.76 | 6.97 | 5.34 | 6.74 |
| AW-17 | Internal | 6.86 | 6.67 | 6.64 | 6.77 | 6.86 | 6.90 | 6.93 | 5.26 | 6.5 |
| AW-18 | Internal | 7.07 | 6.83 | 6.69 | 6.73 | 6.93 | 6.84 | 7.05 | 5.29 | 6.65 |
| AW-19 | Internal | 7.02 | 6.83 | 6.64 | 6.59 | 6.72 | 6.82 | 6.95 | 5.26 | 6.78 |
| Average Conc. (all AWs) | | 7.23 | 8.71 | 7.88 | 8.29 | 8.31 | 8.06 | 7.09 | 6.57 | 7.95 |
| Average Conc. (Upgradient PWMs) | | 7.12 | 7.09 | 6.99 | 7.04 | 7.13 | 7.04 | 7.23 | 6.56 | 7.05 |
| Average Conc. (Downgradient PMWs) | | 7.13 | 7.06 | 6.89 | 6.93 | 7.03 | 6.95 | 7.01 | 6.25 | 7.05 |

**Notes:**
Upgradient = Indicates well is located hydraulically upgradient from the treatment system
Downgradient = Indicates well is located hydraulically downgradient from the treatment system
Internal = Indicates well is located within the line of Application Wells (i.e., treatment system)

**Table 2**
**Treatment System Dissolved Oxygen Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Location (Upgradient, Downgradient, Internal) | Baseline Sampling | | 3-Month Sampling (Q1) | | 6-Month Sampling (Q2) | | 9-Month Sampling (Q3) | | 12-Month Sampling (Q4) | | 18-Month Sampling (Q6) | | 24-Month Sampling (Q8) | | 30-Month Sampling (Q10) | | 36-Month Sampling (Q12) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | April 1-5, 2013 | | May 28-30, 2013 | | August 26-30, 2013 | | November 19, 2013 | | February 6, 2014 | | August 4-7, 2014 | | February 23-27, 2015 | | August 24-28, 2015 | | February 8-12, 2016 | |
| | | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) |
| PMW-1 | Upgradient | 0.35 | 0.11 | 0.40 | 0.29 | 0.80 | 0.12 | 0.60 | 0.12 | 1.00 | 0.79 | 0.80 | 0.11 | 0.80 | 0.19 | 0.35 | 0.20 | 0.60 | 0.33 |
| PMW-2 | Downgradient | 4.00 | 3.94 | 4.50 | 4.97 | 1.00 | 0.70 | 4.00 | 3.20 | 1.50 | 2.45 | 2.00 | 1.54 | 2.00 | 0.41 | 0.90 | 0.58 | 4.00 | 3.99 |
| PMW-3 | Upgradient | NA | 0.13 | 0.80 | 0.27 | NA | 0.68 | 4.00 | 1.35 | 0.80 | 0.76 | 1.00 | 1.95 | 2.00 | 0.96 | 6.50 | 6.72 | 5.00 | 2.75 |
| PMW-4 | Downgradient | 0.60 | 0.12 | 0.70 | 0.16 | 1.50 | 1.15 | 2.00 | 2.19 | 1.50 | 0.50 | 1.50 | 1.99 | 3.00 | 0.13 | 0.40 | 0.25 | 5.50 | 6.27 |
| PMW-5 | Upgradient | 1.50 | 0.73 | 5.50 | 5.68 | 1.00 | 0.58 | 1.50 | 1.35 | 1.50 | 0.00 | 1.50 | 1.18 | 0.60 | 0.29 | 1.00 | 0.27 | 0.40 | 0.37 |
| PMW-6 | Downgradient | 0.70 | 0.10 | 0.50 | 0.11 | 0.90 | 0.11 | 0.80 | 0.15 | 0.60 | 0.62 | 0.90 | 0.07 | 0.40 | 0.32 | 0.40 | 0.29 | 0.40 | 0.25 |
| AW-1 | Internal | 0.35 | 0.08 | >12* | 19.16 | 8.00 | 10.26 | 6.00 | 8.09 | >12* | 23.56 | >12* | 28.67 | 0.60 | 0.21 | 2.00 | 1.86 | >12* | 26.30 |
| AW-2 | Internal | 0.60 | 0.07 | >12* | 19.24 | 2.00 | 1.82 | 2.50 | 1.54 | 0.90 | 0.09 | >12* | 19.18 | 2.00 | 0.13 | >12* | 13.72 | 1.50 | 2.29 |
| AW-3 | Internal | 1.00 | 0.15 | 5.00 | 4.49 | 1.50 | 1.79 | 0.95 | 0.24 | 1.00 | 0.84 | 0.80 | 0.37 | 0.60 | 0.29 | 1.50 | 1.06 | 0.90 | 0.06 |
| AW-4 | Internal | 2.00 | 2.00 | >12* | 14.61 | 3.00 | 3.52 | >12* | 22.81 | 5.50 | 5.84 | 7.00 | 6.19 | 0.80 | 0.20 | 9.00 | 10.04 | 11.00 | 11.11 |
| AW-5 | Internal | 0.80 | 0.10 | >12* | 21.08 | >12* | 21.79 | >12* | 25.19 | >12* | 24.70 | >12* | 21.48 | 0.40 | 0.11 | 7.00 | 6.67 | >12* | 27.51 |
| AW-6 | Internal | 0.40 | 0.09 | >12* | 25.08 | >12* | 23.79 | >12* | 29.28 | >12* | 31.04 | >12* | 21.12 | 0.00 | 0.23 | 12.00 | 13.43 | >12* | 26.20 |
| AW-7 | Internal | 0.80 | 0.08 | >12* | 19.93 | >12* | 14.68 | >12* | 20.15 | >12* | 23.58 | >12* | 22.77 | 0.10 | 0.11 | 11.00 | 12.52 | >12* | 21.54 |
| AW-8 | Internal | 0.35 | 0.07 | 9.00 | 8.94 | 6.00 | 6.98 | >12* | 14.34 | 2.00 | 1.43 | 6.00 | 5.73 | 0.20 | 0.10 | 3.00 | 2.90 | >12* | 15.94 |
| AW-9 | Internal | 0.70 | 0.33 | >12* | 24.32 | >12* | 22.09 | >12* | 31.34 | >12* | 31.59 | >12* | 35.23 | 0.00 | 0.77 | >12* | 18.74 | >12* | 32.22 |
| AW-10 | Internal | 0.60 | 0.08 | 2.50 | 1.82 | 1.00 | 0.98 | 6.00 | 6.64 | 1.50 | 0.72 | 5.50 | 5.70 | 0.40 | 0.31 | 1.50 | 1.56 | >12* | 24.32 |
| AW-11 | Internal | 0.35 | 0.08 | 1.50 | 1.64 | 0.40 | 0.06 | 2.50 | 2.56 | 1.00 | 0.48 | 1.50 | 0.60 | 0.40 | 0.18 | 1.50 | 1.67 | 0.80 | 0.74 |
| AW-12 | Internal | 7.00 | 8.33 | 10.00 | 9.67 | 4.00 | 3.33 | 3.00 | 2.96 | 3.50 | 2.68 | 4.50 | 4.29 | 0.15 | 0.16 | 3.00 | 2.98 | 6.00 | 5.33 |
| AW-13 | Internal | 0.70 | 0.12 | 1.50 | 0.74 | 0.80 | 0.34 | 1.00 | 1.01 | 1.50 | 0.50 | 1.00 | 0.38 | 0.40 | 0.17 | 1.00 | 0.57 | 1.00 | 1.37 |
| AW-14 | Internal | 5.00 | 4.93 | 9.00 | 9.54 | 8.00 | 7.14 | 12.00 | 13.11 | 6.00 | 5.16 | 9.00 | 9.00 | 0.20 | 0.15 | 2.50 | 2.84 | 7.00 | 8.35 |
| AW-15 | Internal | 0.70 | 0.11 | 4.00 | 7.27 | 3.00 | 2.99 | 5.00 | 5.13 | 4.50 | 3.84 | 1.00 | 0.44 | 0.50 | 0.20 | 0.60 | 0.42 | 0.80 | 0.83 |
| AW-16 | Internal | 1.00 | 0.08 | 1.00 | 0.58 | 0.80 | 0.2 | 1.50 | 1.19 | 1.50 | 0.00 | 1.00 | 0.87 | 0.00 | 0.26 | 4.50 | 4.40 | >12* | 25.12 |
| AW-17 | Internal | 0.90 | 0.06 | 3.00 | 2.99 | 0.80 | 0.12 | 0.90 | 0.39 | 1.00 | 0.15 | 1.50 | 0.58 | 0.50 | 0.15 | 0.70 | 0.42 | 3.00 | 2.79 |
| AW-18 | Internal | 2.50 | 0.94 | 1.50 | 1.3 | 1.00 | 0.43 | 3.00 | 2.31 | 2.50 | 1.43 | 1.00 | 0.25 | 0.50 | 0.25 | 2.00 | 1.72 | 3.00 | 2.99 |
| AW-19 | Internal | 1.50 | 0.50 | 1.50 | 1.7 | 1.50 | 0.87 | 1.50 | 2.22 | 2.50 | 1.56 | 2.00 | 2.11 | 0.40 | 0.30 | 2.50 | 2.91 | 3.50 | 3.45 |
| MW-2S | (site monitoring well) | 1.00 | 0.15 | -- | -- | 0.60 | 0.23 | -- | -- | 1.00 | 0.00 | 1.50 | 0.24 | 0.40 | 0.33 | 1.00 | 0.40 | 0.80 | 0.16 |
| MW-4S | (site monitoring well) | 1.50 | 0.30 | -- | -- | 0.80 | 0.05 | -- | -- | 1.00 | 0.00 | 0.90 | 0.23 | 0.50 | 0.16 | 1.50 | 0.34 | 1.00 | 0.13 |
| MW-6S | (site monitoring well) | 1.50 | 0.85 | -- | -- | 0.80 | 0.42 | -- | -- | 2.00 | 0.69 | 0.90 | 0.83 | 2.50 | 2.98 | 1.50 | 0.72 | 1.50 | 1.10 |
| MW-7 | (site monitoring well) | 1.50 | 0.88 | -- | -- | 0.70 | 0.1 | -- | -- | 1.50 | 0.71 | 1.50 | 0.56 | 1.50 | 1.49 | 1.00 | 1.07 | 1.00 | 0.76 |
| MW-8S | (site monitoring well) | 1.00 | 0.41 | -- | -- | 0.80 | 0.09 | -- | -- | 0.80 | 0.00 | 1.00 | 0.06 | 0.80 | 0.32 | 0.70 | 0.16 | 0.30 | 0.25 |
| MW-9S | (site monitoring well) | 5.50 | 4.42 | -- | -- | 1.50 | 0.55 | -- | -- | 5.00 | 3.65 | 2.50 | 1.61 | 2.00 | 1.65 | 1.50 | 1.71 | 5.00 | 5.00 |
| MW-0402S | (site monitoring well) | 0.50 | 0.34 | -- | -- | 0.60 | 0.1 | -- | -- | 1.00 | 0.00 | 1.00 | 0.10 | 0.60 | 0.23 | 0.35 | 0.25 | 0.50 | 0.49 |
| MW-0403S | (site monitoring well) | 0.70 | 0.71 | -- | -- | 1.00 | 0.9 | -- | -- | 1.00 | 0.14 | 0.90 | 0.88 | 2.00 | 1.10 | 1.50 | 1.28 | 2.00 | 1.50 |
| MW-0404S | (site monitoring well) | 0.30 | 0.12 | -- | -- | 0.70 | 0.12 | -- | -- | 0.80 | 0.00 | 0.50 | 0.09 | 0.80 | 0.21 | 0.20 | 0.21 | 0.30 | 0.26 |
| MW-0405S | (site monitoring well) | 0.60 | 0.10 | -- | -- | 0.30 | 0.11 | -- | -- | 0.80 | 0.00 | 0.60 | 0.12 | 0.40 | 0.24 | 0.35 | 0.33 | 0.30 | 0.31 |
| Average Conc. (all PMWs) | | 1.43 | 0.86 | 2.07 | 1.91 | 1.04 | 0.56 | 2.15 | 1.39 | 1.15 | 0.85 | 1.28 | 1.14 | 1.47 | 0.38 | 1.59 | 1.39 | 2.65 | 2.33 |
| Average Conc. (Upgradient PMWs) | | 0.93 | 0.32 | 2.23 | 2.08 | 0.90 | 0.46 | 2.03 | 0.94 | 1.10 | 0.52 | 1.10 | 1.08 | 1.13 | 0.48 | 2.62 | 2.40 | 2.00 | 1.15 |
| Average Conc. (Downgradient PMWs) | | 1.77 | 1.39 | 1.90 | 1.75 | 1.13 | 0.65 | 2.27 | 1.85 | 1.20 | 1.19 | 1.47 | 1.20 | 1.80 | 0.29 | 0.57 | 0.37 | 3.30 | 3.50 |

**Notes:**
mg/l = milligrams per liter
Upgradient = Indicates well is located hydraulically upgradient from the treatment system
Downgradient = Indicates well is located hydraulically downgradient from the treatment system
Internal = Indicates well is located within the treatment system
DO measurements collected prior to deployment / replacement of oxygen-releasing socks (Baseline, Q2, Q4, Q6, Q8, Q10 and Q12 events)
* = DO concentration exceeded operating range of CHEMets

Table 4
Dissolved Oxygen in Application Wells Over Time

Annual Periodic Review Report
Madison Avenue Former MGP Site, Elmira, New York

| Well ID | Baseline Event | | | | Q4 Sampling | | | | | | Q6 Sampling | | | | | | Q8 Sampling | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | April 2-3, 2013 | | April 5, 2013 | | February 4-5, 2013 | | February 6, 2014 | | February 7, 2014 | | August 4-5, 2013 | | August 7, 2014 | | August 8, 2014 | | February 23-25, 2015 | | February 26, 2015 | | February 27, 2015 | |
| | Before Sock Replacement | | 24 Hours | | Before Sock Replacement | | 24 Hours | | 48 Hours | | Before Sock Replacement | | 24 Hours | | 48 Hours | | Before Sock Replacement | | 24 Hours | | 48 Hours | |
| | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI | CHEMet | YSI |
| | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) | (mg/l) |
| AW-1 | 0.35 | 0.08 | >12* | 18.44 | >12* | 23.56 | >12* | 41.17 | >12* | 40.31 | >12* | 28.67 | >12* | 12.53 | 5.00 | 5.13 | 0.60 | 0.21 | 4.50 | 1.7 | 3.00 | 2.92 |
| AW-2 | 0.60 | 0.07 | >12* | 15.15 | 0.90 | 0.09 | >12* | 24.40 | >12* | 19.24 | >12* | 19.18 | 3.50 | 3.14 | 4.50 | 4.23 | 2.00 | 0.13 | 4.50 | 3.95 | 3.50 | 3.30 |
| AW-3 | 1.00 | 0.15 | 9.00 | 8.69 | 1.00 | 0.84 | 7.00 | 9.01 | 5.50 | 6.50 | 0.80 | 0.37 | 1.00 | 0.94 | 1.00 | 1.01 | 0.60 | 0.29 | 5.00 | 4.40 | 3.50 | 3.30 |
| AW-4 | 2.00 | 2.00 | >12* | 17.33 | 5.50 | 5.84 | >12* | 31.79 | >12* | 27.79 | 7.00 | 6.19 | 2.00 | 2.32 | 1.50 | 2.33 | 0.80 | 0.20 | >12* | 5.27 | 12.00 | 6.50 |
| AW-5 | 0.80 | 0.10 | >12* | 17.30 | >12* | 24.70 | >12* | 30.56 | >12* | 31.00 | >12* | 21.48 | 11.00 | 12.70 | 10.00 | 10.12 | 0.40 | 0.11 | 11.00 | 7.20 | 8.00 | 5.23 |
| AW-6 | 0.40 | 0.09 | >12* | 16.79 | >12* | 31.04 | >12* | 28.16 | >12* | 31.40 | >12* | 21.12 | >12* | 12.84 | 9.00 | 9.90 | 0.00 | 0.23 | 6.00 | 5.99 | 4.50 | 4.60 |
| AW-7 | 0.80 | 0.08 | >12* | 15.63 | >12* | 23.58 | >12* | 32.91 | >12* | 31.70 | >12* | 22.77 | 10.00 | 10.83 | 9.00 | 8.70 | 0.10 | 0.11 | 5.50 | 5.00 | 7.00 | 5.18 |
| AW-8 | 0.35 | 0.07 | >12* | 13.40 | 2.00 | 1.43 | >12* | 25.64 | >12* | 22.38 | 6.00 | 5.73 | 4.00 | 4.46 | 1.50 | 2.34 | 0.20 | 0.10 | 4.00 | 3.06 | 3.50 | 3.35 |
| AW-9 | 0.70 | 0.33 | >12* | 15.54 | >12* | 31.59 | >12* | 38.81 | >12* | 39.25 | >12* | 35.23 | >12* | 15.20 | 12.00 | 12.88 | 0.00 | 0.77 | 5.00 | 3.98 | 10.00 | 5.93 |
| AW-10 | 0.60 | 0.08 | 11.00 | 10.42 | 1.50 | 0.72 | >12* | 19.88 | >12* | 18.79 | 5.50 | 5.70 | 1.00 | 0.93 | 1.00 | 1.27 | 0.40 | 0.31 | 12.00 | 8.04 | 10.00 | 7.45 |
| AW-11 | 0.35 | 0.08 | 8.00 | 8.32 | 1.00 | 0.48 | >12* | 18.48 | >12* | 13.40 | 1.50 | 0.60 | 0.80 | 0.79 | 1.00 | 1.02 | 0.40 | 0.18 | 12.00 | 7.42 | 8.00 | 7.49 |
| AW-12 | 7.00 | 8.33 | 11.00 | 11.02 | 3.50 | 2.68 | >12* | 19.02 | >12* | 15.00 | 4.50 | 4.29 | 4.50 | 4.59 | 2.50 | 3.06 | 0.15 | 0.16 | 8.00 | 8.00 | 10.00 | 6.84 |
| AW-13 | 0.70 | 0.12 | 11.00 | 10.00 | 1.50 | 0.50 | >12* | 15.14 | 8.00 | 10.00 | 1.00 | 0.38 | 1.00 | 1.00 | 0.90 | 0.83 | 0.40 | 0.17 | 8.00 | 7.51 | 10.00 | 7.75 |
| AW-14 | 5.00 | 4.93 | 11.00 | 11.96 | 6.00 | 5.16 | >12* | 32.67 | >12* | 31.40 | 9.00 | 9.00 | 5.00 | 5.47 | 4.00 | 4.30 | 0.20 | 0.15 | 12.00 | 10.05 | 12.00 | 9.14 |
| AW-15 | 0.70 | 0.11 | 9.00 | 9.35 | 4.50 | 3.84 | >12* | 35.12 | >12* | 25.30 | 1.00 | 0.44 | 5.50 | 4.79 | 1.50 | 1.30 | 0.50 | 0.20 | 6.00 | 6.15 | 5.50 | 5.52 |
| AW-16 | 1.00 | 0.08 | 9.00 | 9.15 | 1.50 | 0.00 | >12* | 35.90 | >12* | 32.52 | 1.00 | 0.87 | 1.50 | 0.59 | 0.20 | 0.85 | 0.00 | 0.26 | >12* | 11.36 | 12.00 | 11.24 |
| AW-17 | 0.90 | 0.06 | 8.50 | 8.15 | 1.00 | 0.15 | >12* | 31.64 | >12* | 29.40 | 1.50 | 0.58 | 0.90 | 0.66 | 1.00 | 0.88 | 0.50 | 0.15 | 10.00 | 10.61 | 12.00 | 11.45 |
| AW-18 | 2.50 | 0.94 | 4.00 | 3.47 | 2.50 | 1.43 | 4.50 | 4.84 | 3.50 | 4.00 | 1.00 | 0.25 | 0.80 | 0.83 | 1.00 | 0.96 | 0.50 | 0.25 | 10.00 | 10.26 | 9.00 | 8.69 |
| AW-19 | 1.50 | 0.50 | 2.50 | 2.56 | 2.50 | 1.56 | >12* | 15.15 | 5.50 | 7.80 | 2.00 | 2.11 | 0.90 | 0.70 | 1.50 | 1.10 | 0.40 | 0.30 | 11.00 | 11.60 | 10.00 | 9.95 |
| Average Conc. (all wells) | 1.43 | 0.96 | 10.00 | 11.72 | 4.99 | 8.38 | 11.34 | 25.80 | 10.66 | 23.01 | 5.99 | 9.73 | 4.71 | 5.02 | 3.58 | 3.80 | 0.43 | 0.23 | 8.34 | 6.92 | 8.08 | 6.62 |

**Notes:**
'Before Sock Replacement' readings collected prior to replacing the Adventus ECH-O socks
mg/l = milligrams per liter
* = DO concentration exceeded operating range of CHEMets

**Table 4**
**Dissolved Oxygen in Application Wells Over Time**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Q10 Sampling | | | | | | Q12 Sampling | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | August 24-26, 2015 | | August 27, 2015 | | August 28, 2015 | | February 8-10, 2016 | | February 11, 2016 | | February 12, 2016 | |
| | Before Sock Replacement | | 24 Hours | | 48 Hours | | Before Sock Replacement | | 24 Hours | | 48 Hours | |
| | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) | CHEMet (mg/l) | YSI (mg/l) |
| AW-1 | 2.00 | 1.86 | >12* | 28.07 | >12* | 26.50 | >12* | 26.30 | >12* | 33.03 | >12* | 33.84 |
| AW-2 | >12* | 13.72 | >12* | 23.20 | >12* | 24.64 | 1.50 | 2.29 | >12* | 24.32 | >12* | 20.17 |
| AW-3 | 1.50 | 1.06 | >12* | 24.38 | >12* | 20.04 | 0.90 | 0.06 | >12* | 21.81 | >12* | 20.55 |
| AW-4 | 9.00 | 10.04 | >12* | 23.47 | >12* | 18.25 | 11.00 | 11.11 | >12* | 28.43 | >12* | 28.11 |
| AW-5 | 7.00 | 6.67 | >12* | 34.00 | >12* | 27.71 | >12* | 27.51 | >12* | 31.50 | >12* | 31.42 |
| AW-6 | 12.00 | 13.43 | >12* | 28.38 | >12* | 25.50 | >12* | 26.20 | >12* | 29.84 | >12* | 28.65 |
| AW-7 | 11.00 | 12.52 | >12* | 31.56 | >12* | 27.81 | >12* | 21.54 | >12* | 29.39 | >12* | 26.99 |
| AW-8 | 3.00 | 2.90 | >12* | 30.16 | >12* | 27.72 | >12* | 15.94 | >12* | 29.35 | >12* | 27.06 |
| AW-9 | >12* | 18.74 | >12* | 35.43 | >12* | 33.39 | >12* | 32.22 | >12* | 31.85 | >12* | 31.82 |
| AW-10 | 1.50 | 1.56 | >12* | 22.02 | >12* | 18.50 | >12* | 24.32 | >12* | 27.17 | >12* | 26.12 |
| AW-11 | 1.50 | 1.67 | >12* | 18.92 | >12* | 16.54 | 0.80 | 0.74 | >12* | 19.50 | >12* | 16.64 |
| AW-12 | 3.00 | 2.98 | >12* | 18.36 | >12* | 15.41 | 6.00 | 5.33 | >12* | 19.09 | >12* | 16.21 |
| AW-13 | 1.00 | 0.57 | >12* | 15.10 | 11.00 | 10.95 | 1.00 | 1.37 | >12* | 15.20 | >12* | 12.95 |
| AW-14 | 2.50 | 2.84 | >12* | 28.30 | >12* | 26.73 | 7.00 | 8.35 | >12* | 19.78 | >12* | 19.88 |
| AW-15 | 0.60 | 0.42 | >12* | 22.18 | >12* | 22.87 | 0.80 | 0.83 | >12* | 19.80 | >12* | 18.82 |
| AW-16 | 4.50 | 4.40 | >12* | 32.24 | >12* | 32.80 | >12* | 25.12 | >12* | 33.70 | >12* | 33.46 |
| AW-17 | 0.70 | 0.42 | >12* | 22.25 | >12* | 21.20 | 3.00 | 2.79 | >12* | 23.07 | >12* | 29.14 |
| AW-18 | 2.00 | 1.72 | 7.00 | 7.05 | 4.50 | 6.25 | 3.00 | 2.99 | 7.00 | 6.83 | 2.00 | 8.16 |
| AW-19 | 2.50 | 2.91 | 12.00 | 12.18 | 7.00 | 7.07 | 3.50 | 3.45 | 7.00 | 6.95 | 2.50 | 6.44 |
| Average Conc. (all wells) | 4.70 | 5.29 | 11.74 | 24.07 | 11.29 | 21.57 | 7.08 | 12.55 | 11.47 | 23.72 | 10.97 | 22.97 |

**Notes:**
'Before Sock Replacement' readings collected prior to replacing the Adventus ECH-O socks
mg/l = milligrams per liter
* = DO concentration exceeded operating range of CHEMets

**Table 5**
**pH in Application Wells Over Time**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Baseline Event | | Q4 Sampling | | | Q6 Sampling | | | Q8 Sampling | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | April 2-3, 2013 | April 5, 2013 | February 4-5, 2014 | February 6, 2014 | February 7, 2014 | August 4-5, 2014 | August 7, 2014 | August 8, 2014 | February 23-25, 2015 | February 26, 2015 | February 27, 2015 |
| | Before Sock Deployment | 24 Hours | Before Sock Replacement | 24 Hours | 48 Hours | Before Sock Replacement | 24 Hours | 48 Hours | Before Sock Replacement | 24 Hours | 48 Hours |
| | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units |
| AW-1 | 7.03 | 12.07 | 11.18 | 12.85 | 12.97 | 11.79 | 9.70 | 9.49 | 9.61 | 6.93 | 8.54 |
| AW-2 | 7.21 | 10.34 | 7.17 | 10.05 | 9.26 | 9.86 | 7.06 | 7.19 | 7.33 | 7.16 | 8.08 |
| AW-3 | 7.08 | 8.98 | 7.07 | 8.39 | 8.34 | 7.20 | 7.03 | 7.05 | 6.99 | 7.43 | 7.81 |
| AW-4 | 7.31 | 11.54 | 7.36 | 12.55 | 12.56 | 7.14 | 7.29 | 7.30 | 7.41 | 9.78 | 10.36 |
| AW-5 | 7.25 | 11.70 | 12.31 | 12.51 | 12.62 | 10.77 | 9.24 | 9.02 | 7.15 | 8.81 | 9.73 |
| AW-6 | 7.34 | 12.54 | 11.21 | 12.23 | 12.47 | 10.64 | 8.87 | 8.28 | 7.08 | 8.90 | 10.21 |
| AW-7 | 7.16 | 10.67 | 11.21 | 12.12 | 12.37 | 11.49 | 8.49 | 8.17 | 7.11 | 7.94 | 9.41 |
| AW-8 | 7.39 | 10.99 | 7.97 | 12.30 | 12.36 | 7.93 | 8.07 | 7.80 | 6.67 | 7.09 | 8.76 |
| AW-9 | 7.45 | 12.70 | 12.25 | 12.74 | 12.94 | 12.25 | 10.07 | 9.67 | 6.63 | 7.14 | 9.42 |
| AW-10 | 7.29 | 8.15 | 7.27 | 8.68 | 8.82 | 7.40 | 7.11 | 7.16 | 7.23 | 7.98 | 8.84 |
| AW-11 | 7.17 | 8.01 | 7.13 | 9.07 | 7.80 | 7.07 | 6.98 | 7.00 | 7.24 | 8.12 | 8.52 |
| AW-12 | 7.92 | 9.15 | 7.33 | 8.20 | 8.02 | 7.42 | 7.14 | 7.24 | 7.31 | 8.08 | 8.43 |
| AW-13 | 7.20 | 8.25 | 7.07 | 7.90 | 7.44 | 7.01 | 6.90 | 6.93 | 7.22 | 7.61 | 7.93 |
| AW-14 | 7.21 | 10.22 | 7.14 | 10.21 | 10.05 | 7.19 | 6.91 | 6.96 | 7.27 | 8.35 | 8.85 |
| AW-15 | 7.25 | 9.40 | 7.03 | 10.13 | 9.99 | 7.17 | 6.83 | 6.89 | 7.09 | 8.06 | 7.71 |
| AW-16 | 7.08 | 10.45 | 6.74 | 9.50 | 9.48 | 6.76 | 6.63 | 6.75 | 6.97 | 9.57 | 9.78 |
| AW-17 | 6.86 | 10.60 | 6.86 | 9.64 | 9.43 | 6.90 | 6.55 | 6.68 | 6.93 | 9.48 | 9.64 |
| AW-18 | 7.07 | 6.99 | 6.93 | 7.05 | 7.05 | 6.84 | 6.71 | 6.82 | 7.05 | 8.26 | 8.31 |
| AW-19 | 7.02 | 6.89 | 6.72 | 7.16 | 6.95 | 6.82 | 6.58 | 6.96 | 6.95 | 7.93 | 7.90 |
| Average pH Concentration | 7.23 | 9.98 | 8.31 | 10.17 | 10.05 | 8.40 | 7.59 | 7.55 | 7.22 | 8.14 | 8.85 |

**Notes:**
'Before Sock Replacement" indicates readings collected prior to replacing the Adventus ECH-O socks

**Table 5**
**pH in Application Wells Over Time**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Q10 Sampling | | | Q12 Sampling | | |
|---|---|---|---|---|---|---|
| | August 24-26, 2015 | August 27, 2015 | August 28, 2015 | February 8-10, 2016 | February 11, 2016 | February 12, 2016 |
| | Before Sock Replacement | 24 Hours | 48 Hours | Before Sock Replacement | 24 Hours | 48 Hours |
| | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units | Standard Units |
| AW-1 | 6.63 | 5.85 | 7.00 | 9.92 | 12.09 | 12.35 |
| AW-2 | 8.10 | 6.30 | 6.37 | 7.05 | 9.42 | 8.79 |
| AW-3 | 7.33 | 6.94 | 6.86 | 7.00 | 10.17 | 9.96 |
| AW-4 | 7.23 | 6.07 | 6.06 | 7.39 | 10.28 | 10.37 |
| AW-5 | 8.72 | 7.90 | 7.91 | 10.65 | 12.02 | 12.17 |
| AW-6 | 9.84 | 7.91 | 7.98 | 11.41 | 11.97 | 12.30 |
| AW-7 | 8.59 | 8.06 | 8.08 | 11.47 | 12.08 | 12.34 |
| AW-8 | 8.16 | 8.04 | 8.12 | 10.30 | 12.24 | 12.34 |
| AW-9 | 7.49 | 8.01 | 8.11 | 10.28 | 12.12 | 12.26 |
| AW-10 | 5.36 | 6.42 | 6.44 | 8.87 | 9.67 | 9.79 |
| AW-11 | 5.43 | 6.08 | 6.06 | 7.01 | 7.88 | 7.81 |
| AW-12 | 5.53 | 5.94 | 5.97 | 7.56 | 8.09 | 7.97 |
| AW-13 | 5.42 | 5.63 | 5.64 | 6.80 | 7.54 | 7.51 |
| AW-14 | 5.43 | 6.51 | 6.58 | 7.15 | 8.05 | 8.15 |
| AW-15 | 5.45 | 6.85 | 6.57 | 6.84 | 8.50 | 8.48 |
| AW-16 | 5.34 | 7.54 | 7.55 | 6.74 | 10.26 | 10.34 |
| AW-17 | 5.26 | 5.51 | 5.45 | 6.50 | 7.81 | 7.93 |
| AW-18 | 5.29 | 5.80 | 5.90 | 6.65 | 6.94 | 7.95 |
| AW-19 | 5.26 | 5.55 | 5.50 | 6.78 | 6.85 | 7.36 |
| Average pH Concentration | 6.62 | 6.68 | 6.74 | 8.23 | 9.68 | 9.80 |

**Notes:**
'Before Sock Replacement" indicates readings collected prior to replacing the Adventus ECH-O socks

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| MW-1S | 852.88 | 13.78 | 04/01/13 | 8.44 | 844.44 | -- | 13.75 | 0.03 |
| | | | 05/28/13 | 8.55 | 844.33 | -- | 13.75 | 0.03 |
| | | | 08/26/13 | 8.63 | 844.25 | -- | 13.71 | 0.07 |
| | | | 11/18/13 | 8.60 | 844.28 | -- | 13.69 | 0.09 |
| | | | 02/03/14 | 8.50 | 844.38 | -- | 13.75 | 0.03 |
| | | | 08/04/14 | 8.35 | 844.53 | -- | 13.74 | 0.04 |
| | | | 02/23/15 | 8.81 | 844.07 | -- | 13.70 | 0.08 |
| | | | 08/24/15 | 8.37 | 844.51 | -- | 13.71 | 0.07 |
| | | | 02/08/16 | 8.41 | 844.47 | -- | 13.70 | 0.08 |
| MW-1D | 852.98 | 61.44 | 04/01/13 | 10.54 | 842.44 | -- | 60.77 | 0.67 |
| | | | 05/28/13 | 10.75 | 842.23 | -- | 60.76 | 0.68 |
| | | | 08/26/13 | 10.83 | 842.15 | -- | 60.72 | 0.72 |
| | | | 11/18/13 | 10.87 | 842.11 | -- | 60.67 | 0.77 |
| | | | 02/03/14 | 10.70 | 842.28 | -- | 60.91 | 0.53 |
| | | | 08/04/14 | 11.01 | 841.97 | -- | 60.92 | 0.52 |
| | | | 02/23/15 | 11.13 | 841.85 | -- | 60.81 | 0.63 |
| | | | 08/24/15 | 10.85 | 842.13 | -- | 60.85 | 0.59 |
| | | | 02/08/16 | 10.48 | 842.50 | -- | 60.84 | 0.60 |
| MW-2S | 854.06 | 20.22 | 04/01/13 | 10.02 | 844.04 | -- | 16.54 | 3.68 |
| | | | 05/28/13 | 10.06 | 844.00 | -- | 16.20 | 4.02 |
| | | | 08/26/13 | 10.03 | 844.03 | -- | 16.60 | 3.62 |
| | | | 11/18/13 | 10.03 | 844.03 | -- | 17.00 | 3.22 |
| | | | 02/04/14 | 10.27 | 843.79 | -- | 18.50 | 1.72 |
| | | | 08/04/14 | 9.79 | 844.27 | -- | 18.56 | 1.66 |
| | | | 02/23/15 | 11.03 | 843.03 | -- | 18.64 | 1.58 |
| | | | 08/24/15 | 9.82 | 844.24 | -- | 18.49 | 1.73 |
| | | | 02/08/16 | 10.03 | 844.03 | -- | 18.48 | 1.74 |
| MW-2D | 855.66 | 68.19 | 04/01/13 | 14.87 | 840.79 | -- | 64.51 | 3.68 |
| | | | 05/28/13 | 15.16 | 840.50 | -- | 64.54 | 3.65 |
| | | | 08/26/13 | 15.35 | 840.31 | -- | 64.53 | 3.66 |
| | | | 11/18/13 | 15.43 | 840.23 | -- | 64.44 | 3.75 |
| | | | 02/03/14 | 15.09 | 840.57 | -- | 64.64 | 3.55 |
| | | | 08/04/14 | 15.43 | 840.23 | -- | 67.25 | 0.94 |
| | | | 02/23/15 | 15.73 | 839.93 | -- | 67.17 | 1.02 |
| | | | 08/24/15 | 15.32 | 840.34 | -- | 67.18 | 1.01 |
| | | | 02/08/16 | 14.73 | 840.93 | -- | 67.21 | 0.98 |
| MW-4S | 851.47 | 16.67 | 04/01/13 | 7.65 | 843.69 | -- | 15.65 | 1.15 |
| | | | 05/28/13 | 7.80 | 843.54 | -- | 15.56 | 1.24 |
| | | | 08/26/13 | 7.78 | 843.56 | -- | 15.55 | 1.25 |
| | | | 11/18/13 | 7.98 | 843.36 | -- | 15.30 | 1.50 |
| | | | 02/03/14 | 8.09 | 843.25 | -- | 16.10 | 0.70 |
| | | | 08/04/14 | 7.64 | 843.70 | -- | 15.96 | 0.75 |
| | | | 02/23/15 | 9.73 | 841.74 | -- | 15.88 | 0.79 |
| | | | 08/24/15 | 6.97 | 844.50 | -- | 15.91 | 0.76 |
| | | | 02/08/16 | 7.22 | 844.25 | -- | 15.87 | 0.80 |
| MW-6S | 852.54 | 24.84 | 04/01/13 | 5.41 | 847.13 | -- | 20.91 | 3.93 |
| | | | 05/28/13 | 5.70 | 846.84 | -- | 20.90 | 3.94 |
| | | | 08/26/13 | 5.39 | 847.15 | -- | 20.85 | 3.99 |
| | | | 11/18/13 | 5.68 | 846.86 | -- | 20.72 | 4.12 |
| | | | 02/03/14 | 4.66 | 847.88 | -- | 24.80 | 0.04 |
| | | | 08/04/14 | 5.75 | 846.79 | -- | 24.80 | 0.04 |
| | | | 02/23/15 | 6.71 | 845.83 | -- | 24.69 | 0.15 |
| | | | 08/24/15 | 5.43 | 847.11 | -- | 24.80 | 0.04 |
| | | | 02/08/16 | 5.41 | 847.13 | -- | 24.77 | 0.07 |

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| MW-7 | 854.14 | 39.56 | 04/01/13 | 10.62 | 843.52 | -- | 32.80 | 6.76 |
| | | | 05/28/13 | 10.71 | 843.43 | -- | 32.76 | 6.80 |
| | | | 08/26/13 | 10.68 | 843.46 | -- | 33.00 | 6.56 |
| | | | 11/18/13 | 10.69 | 843.45 | -- | 33.07 | 6.49 |
| | | | 02/03/14 | 10.68 | 843.46 | -- | 39.33 | 0.23 |
| | | | 08/04/14 | 10.51 | 843.63 | -- | 39.17 | 0.39 |
| | | | 02/23/15 | 10.82 | 843.32 | -- | 39.18 | 0.38 |
| | | | 08/24/15 | 10.62 | 843.52 | -- | 39.22 | 0.34 |
| | | | 02/08/16 | 10.56 | 843.58 | -- | 38.53 | 1.03 |
| MW-8S | 850.38 | 14.70 | 04/01/13 | 6.76 | 843.62 | -- | 6.93 | 7.77 |
| | | | 05/28/13 | 6.89 | 843.49 | -- | 6.94 | 7.76 |
| | | | 08/26/13 | 6.79 | 843.59 | -- | 6.98 | 7.72 |
| | | | 11/18/13 | 6.85 | 843.53 | -- | 7.02 | 7.68 |
| | | | 02/03/14 | 6.84 | 843.54 | -- | 14.01 | 0.69 |
| | | | 08/04/14 | 6.68 | 843.70 | -- | 14.02 | 0.68 |
| | | | 02/23/15 | 7.09 | 843.29 | -- | 13.98 | 0.72 |
| | | | 08/24/15 | 6.80 | 843.58 | -- | 14.00 | 0.70 |
| | | | 02/08/16 | 6.75 | 843.63 | -- | 13.98 | 0.72 |
| MW-8D | 850.08 | 69.58 | 04/01/13 | 10.17 | 839.91 | -- | 69.28 | 0.30 |
| | | | 05/28/13 | 10.57 | 839.51 | -- | 69.24 | 0.34 |
| | | | 08/26/13 | 10.56 | 839.52 | -- | 69.30 | 0.28 |
| | | | 11/18/13 | 10.73 | 839.35 | -- | 70.43 | -0.85 |
| | | | 02/03/14 | 10.42 | 839.66 | -- | 69.36 | 0.22 |
| | | | 08/04/14 | 10.68 | 839.40 | -- | 69.44 | 0.14 |
| | | | 02/23/15 | 11.19 | 838.89 | -- | 70.30 | -0.72 |
| | | | 08/24/15 | 10.61 | 839.47 | -- | 69.30 | 0.28 |
| | | | 02/08/16 | 9.74 | 840.34 | -- | 69.29 | 0.29 |
| MW-9S | 849.03 | 14.47 | 04/01/13 | 5.67 | 843.01 | -- | 14.43 | 0.39 |
| | | | 05/28/13 | 5.91 | 842.77 | -- | 14.41 | 0.41 |
| | | | 08/26/13 | 6.09 | 842.59 | -- | 14.50 | 0.32 |
| | | | 11/18/13 | 6.32 | 842.36 | -- | 14.47 | 0.35 |
| | | | 02/03/14 | 5.93 | 842.75 | -- | 14.55 | 0.27 |
| | | | 08/04/14 | 5.03 | 843.65 | -- | 14.40 | 0.42 |
| | | | 02/23/15 | 6.89 | 842.14 | -- | 12.25 | 2.22 |
| | | | 08/24/15 | 5.16 | 843.87 | -- | 14.27 | 0.20 |
| | | | 02/08/16 | 5.44 | 843.59 | -- | 14.95 | -0.48 |
| MW-9D | 849.06 | 71.44 | 04/01/13 | 8.05 | 840.67 | -- | 67.96 | 3.82 |
| | | | 05/28/13 | 8.36 | 840.36 | -- | 67.90 | 3.88 |
| | | | 08/26/13 | 8.39 | 840.33 | -- | 67.93 | 3.85 |
| | | | 11/18/13 | 8.51 | 840.21 | -- | 67.89 | 3.89 |
| | | | 02/03/14 | 8.20 | 840.52 | -- | 67.95 | 3.83 |
| | | | 08/04/14 | 8.14 | 840.58 | -- | 72.65 | -0.87 |
| | | | 02/23/15 | 8.85 | 840.21 | -- | 72.58 | -1.14 |
| | | | 08/24/15 | 8.21 | 840.85 | -- | 72.60 | -1.16 |
| | | | 02/08/16 | 8.01 | 841.05 | -- | 72.50 | -1.06 |
| MW-0304D | 851.18 | 59.64 | 04/01/13 | 9.78 | 841.40 | -- | 59.60 | 0.04 |
| | | | 05/28/13 | 9.89 | 841.29 | -- | 59.55 | 0.09 |
| | | | 08/26/13 | 9.57 | 841.61 | -- | 59.60 | 0.04 |
| | | | 11/18/13 | 9.78 | 841.40 | -- | 59.58 | 0.06 |
| | | | 02/03/14 | 9.78 | 841.40 | -- | 59.65 | -0.01 |
| | | | 08/04/14 | 10.00 | 841.18 | -- | 59.58 | 0.06 |
| | | | 02/23/15 | 10.35 | 840.83 | -- | 59.56 | 0.08 |
| | | | 08/24/15 | 9.95 | 841.23 | -- | 59.55 | 0.09 |
| | | | 02/08/16 | 9.51 | 841.67 | -- | 59.50 | 0.14 |

## Table 6
## Gauging Data

## Annual Periodic Review Report
## Madison Avenue Former MGP Site, Elmira, New York

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| MW-0402S | 850.09 | 22.38 | 04/01/13 | 7.78 | 842.31 | -- | 22.48 | -0.10 |
| | | | 05/28/13 | 7.89 | 842.20 | -- | 22.49 | -0.11 |
| | | | 08/26/13 | 7.97 | 842.12 | -- | 22.50 | -0.12 |
| | | | 11/18/13 | 8.15 | 841.94 | -- | 22.49 | -0.11 |
| | | | 02/03/14 | 7.94 | 842.15 | -- | 22.54 | -0.16 |
| | | | 08/04/14 | 7.39 | 842.70 | -- | 22.55 | -0.17 |
| | | | 02/23/15 | 8.36 | 841.73 | -- | 22.48 | -0.10 |
| | | | 08/24/15 | 7.65 | 842.44 | -- | 22.51 | -0.13 |
| | | | 02/08/16 | 7.77 | 842.32 | -- | 22.50 | -0.12 |
| MW-0403S | 849.66 | 39.32 | 04/01/13 | 9.45 | 840.21 | -- | 39.40 | -0.08 |
| | | | 05/28/13 | 9.75 | 839.91 | -- | 39.36 | -0.04 |
| | | | 08/26/13 | 9.81 | 839.85 | -- | 39.32 | 0.00 |
| | | | 11/18/13 | 9.97 | 839.69 | -- | 39.34 | -0.02 |
| | | | 02/03/14 | 9.54 | 840.12 | -- | 39.38 | -0.06 |
| | | | 08/04/14 | 9.49 | 840.17 | -- | 39.39 | -0.07 |
| | | | 02/23/15 | 10.05 | 839.61 | -- | 39.30 | 0.02 |
| | | | 08/24/15 | 9.62 | 840.04 | -- | 39.33 | -0.01 |
| | | | 02/08/16 | 9.48 | 840.18 | -- | 39.34 | -0.02 |
| MW-0404S | 849.99 | 28.57 | 04/01/13 | 9.71 | 840.28 | -- | 27.94 | 0.63 |
| | | | 05/28/13 | 10.02 | 839.97 | -- | 27.89 | 0.68 |
| | | | 08/26/13 | 10.06 | 839.93 | -- | 27.81 | 0.76 |
| | | | 11/18/13 | 10.19 | 839.80 | -- | 27.85 | 0.72 |
| | | | 02/03/14 | 9.80 | 840.19 | -- | 28.25 | 0.32 |
| | | | 08/04/14 | 9.71 | 840.28 | -- | 28.20 | 0.37 |
| | | | 02/23/15 | 10.39 | 839.60 | -- | 28.20 | 0.37 |
| | | | 08/24/15 | 9.82 | 840.17 | -- | 28.22 | 0.35 |
| | | | 02/08/16 | 9.70 | 840.29 | -- | 28.20 | 0.37 |
| MW-0404D | 849.55 | 59.77 | 04/01/13 | 9.45 | 840.10 | -- | 59.43 | 0.34 |
| | | | 05/28/13 | 9.89 | 839.66 | -- | 59.45 | 0.32 |
| | | | 08/26/13 | 9.94 | 839.61 | -- | 59.38 | 0.39 |
| | | | 11/18/13 | 10.22 | 839.33 | -- | 60.21 | -0.44 |
| | | | 02/03/14 | 9.73 | 839.82 | -- | 59.40 | 0.37 |
| | | | 08/04/14 | 9.67 | 839.88 | -- | 59.40 | 0.37 |
| | | | 02/23/15 | 10.50 | 839.05 | -- | 59.33 | 0.44 |
| | | | 08/24/15 | 9.74 | 839.81 | -- | 59.40 | 0.37 |
| | | | 02/08/16 | 9.35 | 840.20 | -- | 59.20 | 0.57 |
| MW-0405S | 850.59 | 35.27 | 04/01/13 | 10.33 | 840.26 | -- | 35.43 | -0.16 |
| | | | 05/28/13 | 10.81 | 839.78 | -- | 35.44 | -0.17 |
| | | | 08/26/13 | 10.83 | 839.76 | -- | 35.38 | -0.11 |
| | | | 11/18/13 | 11.16 | 839.43 | -- | 35.41 | -0.14 |
| | | | 02/03/14 | 10.66 | 839.93 | -- | 35.50 | -0.23 |
| | | | 08/04/14 | 10.61 | 839.98 | -- | 35.42 | -0.15 |
| | | | 02/23/15 | 11.54 | 839.05 | -- | 35.39 | -0.12 |
| | | | 08/24/15 | 10.43 | 840.16 | -- | 35.44 | -0.17 |
| | | | 02/08/16 | 10.25 | 840.34 | -- | 35.41 | -0.14 |
| AW-1 | 850.94 | 19.78 | 04/01/13 | 7.04 | 843.90 | -- | 20.00 | -0.22 |
| | | | 05/28/13 | 7.05 | 843.89 | -- | 19.99 | -0.21 |
| | | | 08/26/13 | 7.00 | 843.94 | -- | 19.92 | -0.14 |
| | | | 11/18/13 | 7.17 | 843.77 | -- | 19.91 | -0.13 |
| | | | 02/03/14 | 7.21 | 843.73 | -- | 19.94 | -0.16 |
| | | | 08/04/14 | 6.74 | 844.20 | -- | 19.91 | -0.13 |
| | | | 02/23/15 | 7.42 | 843.52 | -- | 19.83 | -0.05 |
| | | | 08/24/15 | 6.79 | 844.15 | -- | 19.59 | 0.19 |
| | | | 02/08/16 | 6.85 | 844.09 | -- | 19.68 | 0.10 |

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| AW-2 | 851.23 | 20.04 | 04/01/13 | 7.51 | 843.44 | -- | 20.17 | 0.15 |
| | | | 05/28/13 | 7.25 | 843.70 | -- | 20.19 | 0.13 |
| | | | 08/26/13 | 7.61 | 843.34 | -- | 20.18 | 0.14 |
| | | | 11/18/13 | 7.76 | 843.19 | -- | 20.15 | 0.17 |
| | | | 02/03/14 | 7.75 | 843.20 | -- | 20.13 | 0.19 |
| | | | 08/04/14 | 6.91 | 844.04 | -- | 20.09 | 0.23 |
| | | | 02/23/15 | 8.43 | 842.80 | -- | 20.10 | -0.06 |
| | | | 08/24/15 | 6.91 | 844.32 | -- | 19.96 | 0.08 |
| | | | 02/08/16 | 7.29 | 843.94 | -- | 20.06 | -0.02 |
| AW-3 | 850.38 | 19.10 | 04/01/13 | 6.83 | 843.55 | -- | 19.59 | -0.49 |
| | | | 05/28/13 | 6.84 | 843.54 | -- | 19.60 | -0.50 |
| | | | 08/26/13 | 7.02 | 843.36 | -- | 19.55 | -0.45 |
| | | | 11/18/13 | 6.98 | 843.40 | -- | 19.81 | -0.71 |
| | | | 02/03/14 | 6.94 | 843.44 | -- | 19.59 | -0.49 |
| | | | 08/04/14 | 6.31 | 844.07 | -- | 19.53 | -0.43 |
| | | | 02/23/15 | 7.47 | 842.91 | -- | 19.50 | -0.40 |
| | | | 08/24/15 | 6.27 | 844.11 | -- | 19.33 | -0.23 |
| | | | 02/08/16 | 6.63 | 843.75 | -- | 19.08 | 0.02 |
| AW-4 | 850.62 | 19.77 | 04/01/13 | 6.30 | 844.32 | -- | 20.01 | -0.24 |
| | | | 05/28/13 | 6.22 | 844.40 | -- | 19.83 | -0.06 |
| | | | 08/26/13 | 6.91 | 843.71 | -- | 19.96 | -0.19 |
| | | | 11/18/13 | 7.74 | 842.88 | -- | 19.97 | -0.20 |
| | | | 02/03/14 | 7.50 | 843.12 | -- | 19.98 | -0.21 |
| | | | 08/04/14 | 5.49 | 845.13 | -- | 19.75 | 0.02 |
| | | | 02/23/15 | 8.47 | 842.15 | -- | 19.73 | 0.04 |
| | | | 08/24/15 | 5.91 | 844.71 | -- | 19.78 | -0.01 |
| | | | 02/08/16 | 6.57 | 844.05 | -- | 19.56 | 0.21 |
| AW-5 | 850.38 | 19.80 | 04/01/13 | 7.16 | 843.22 | -- | 19.78 | 0.02 |
| | | | 05/28/13 | 7.24 | 843.14 | -- | 19.73 | 0.07 |
| | | | 08/26/13 | 7.30 | 843.08 | -- | 19.73 | 0.07 |
| | | | 11/18/13 | 7.71 | 842.67 | -- | 19.70 | 0.10 |
| | | | 02/03/14 | 7.26 | 843.12 | -- | 19.75 | 0.05 |
| | | | 08/04/14 | 6.81 | 843.57 | -- | 19.75 | 0.05 |
| | | | 02/23/15 | 8.42 | 841.96 | -- | 19.64 | 0.16 |
| | | | 08/24/15 | 6.83 | 843.55 | -- | 19.71 | 0.09 |
| | | | 02/08/16 | 6.84 | 843.54 | -- | 19.62 | 0.18 |
| AW-6 | 849.85 | 19.28 | 04/01/13 | 7.72 | 842.13 | -- | 19.04 | 0.24 |
| | | | 05/28/13 | 7.87 | 841.98 | -- | 19.10 | 0.18 |
| | | | 08/26/13 | 7.87 | 841.98 | -- | 19.03 | 0.25 |
| | | | 11/18/13 | 8.24 | 841.61 | -- | 18.98 | 0.30 |
| | | | 02/03/14 | 7.77 | 842.08 | -- | 19.02 | 0.26 |
| | | | 08/04/14 | 7.45 | 842.40 | -- | 19.02 | 0.26 |
| | | | 02/23/15 | 8.64 | 841.21 | -- | 18.79 | 0.49 |
| | | | 08/24/15 | 7.38 | 842.47 | -- | 18.99 | 0.29 |
| | | | 02/08/16 | 7.11 | 842.74 | -- | 18.72 | 0.56 |
| AW-7 | 849.72 | 18.74 | 04/01/13 | 8.49 | 841.23 | -- | 18.86 | -0.12 |
| | | | 05/28/13 | 8.72 | 841.00 | -- | 18.85 | -0.11 |
| | | | 08/26/13 | 8.72 | 841.00 | -- | 18.82 | -0.08 |
| | | | 11/18/13 | 9.00 | 840.72 | -- | 18.80 | -0.06 |
| | | | 02/03/14 | 8.59 | 841.13 | -- | 18.85 | -0.11 |
| | | | 08/04/14 | 8.43 | 841.29 | -- | 18.82 | -0.08 |
| | | | 02/23/15 | 9.32 | 840.40 | -- | 18.75 | -0.01 |
| | | | 08/24/15 | 8.46 | 841.26 | -- | 18.81 | -0.07 |
| | | | 02/08/16 | 8.10 | 841.62 | -- | 18.38 | 0.36 |

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| AW-8 | 849.78 | 19.32 | 04/01/13 | 8.86 | 840.92 | -- | 19.35 | -0.03 |
| | | | 05/28/13 | 9.07 | 840.71 | -- | 19.34 | -0.02 |
| | | | 08/26/13 | 9.13 | 840.65 | -- | 19.31 | 0.01 |
| | | | 11/18/13 | 9.35 | 840.43 | -- | 19.25 | 0.07 |
| | | | 02/03/14 | 8.90 | 840.88 | -- | 19.22 | 0.10 |
| | | | 08/04/14 | 8.71 | 841.07 | -- | 19.20 | 0.12 |
| | | | 02/23/15 | 9.55 | 840.23 | -- | 18.85 | 0.47 |
| | | | 08/24/15 | 8.76 | 841.02 | -- | 18.85 | 0.47 |
| | | | 02/08/16 | 8.41 | 841.37 | -- | 18.88 | 0.44 |
| AW-9 | 849.61 | 22.27 | 04/01/13 | 8.30 | 841.31 | -- | 22.22 | 0.05 |
| | | | 05/28/13 | 9.00 | 840.61 | -- | 21.88 | 0.39 |
| | | | 08/26/13 | 9.05 | 840.56 | -- | 21.92 | 0.35 |
| | | | 11/18/13 | 9.21 | 840.40 | -- | 22.11 | 0.16 |
| | | | 02/03/14 | 8.87 | 840.74 | -- | 22.10 | 0.17 |
| | | | 08/04/14 | 8.73 | 840.88 | -- | 21.92 | 0.35 |
| | | | 02/23/15 | 9.54 | 840.07 | -- | 21.71 | 0.56 |
| | | | 08/24/15 | 8.89 | 840.72 | -- | 21.78 | 0.49 |
| | | | 02/08/16 | 8.39 | 841.22 | -- | 21.26 | 1.01 |
| AW-10 | 849.60 | 24.20 | 04/01/13 | 9.18 | 840.42 | -- | 24.28 | -0.08 |
| | | | 05/28/13 | 9.42 | 840.18 | -- | 24.27 | -0.07 |
| | | | 08/26/13 | 9.51 | 840.09 | -- | 24.20 | 0.00 |
| | | | 11/18/13 | 9.91 | 839.69 | -- | 24.20 | 0.00 |
| | | | 02/03/14 | 9.25 | 840.35 | -- | 24.18 | 0.02 |
| | | | 08/04/14 | 9.45 | 840.15 | -- | 24.19 | 0.01 |
| | | | 02/23/15 | 9.67 | 839.93 | -- | 23.76 | 0.44 |
| | | | 08/24/15 | 9.06 | 840.54 | -- | 24.10 | 0.10 |
| | | | 02/08/16 | 8.92 | 840.68 | -- | 23.54 | 0.66 |
| AW-11 | 849.49 | 24.27 | 04/01/13 | 8.99 | 840.50 | -- | 24.14 | 0.13 |
| | | | 05/28/13 | 9.22 | 840.27 | -- | 24.13 | 0.14 |
| | | | 08/26/13 | 9.34 | 840.15 | -- | 24.02 | 0.25 |
| | | | 11/18/13 | 9.45 | 840.04 | -- | 24.06 | 0.21 |
| | | | 02/03/14 | 9.01 | 840.48 | -- | 24.10 | 0.17 |
| | | | 08/04/14 | 9.01 | 840.48 | -- | 24.02 | 0.25 |
| | | | 02/23/15 | 9.71 | 839.78 | -- | 23.50 | 0.77 |
| | | | 08/24/15 | 9.05 | 840.44 | -- | 23.95 | 0.32 |
| | | | 02/08/16 | 8.76 | 840.73 | -- | 23.48 | 0.79 |
| AW-12 | 849.19 | 37.58 | 04/01/13 | 8.68 | 840.51 | -- | 37.67 | -0.09 |
| | | | 05/28/13 | 9.00 | 840.19 | -- | 37.68 | -0.10 |
| | | | 08/26/13 | 9.15 | 840.04 | -- | 37.50 | 0.08 |
| | | | 11/18/13 | 9.29 | 839.90 | -- | 37.50 | 0.08 |
| | | | 02/03/14 | 8.90 | 840.29 | -- | 37.52 | 0.06 |
| | | | 08/04/14 | 8.78 | 840.41 | -- | 37.15 | 0.43 |
| | | | 02/23/15 | 9.49 | 839.70 | -- | 36.92 | 0.66 |
| | | | 08/24/15 | 8.93 | 840.26 | -- | 37.10 | 0.48 |
| | | | 02/08/16 | 8.70 | 840.49 | -- | 36.79 | 0.79 |
| AW-13 | 849.07 | 27.46 | 04/01/13 | 8.59 | 840.48 | -- | 27.40 | 0.06 |
| | | | 05/28/13 | 9.42 | 839.65 | -- | 27.34 | 0.12 |
| | | | 08/26/13 | 8.98 | 840.09 | -- | 27.24 | 0.22 |
| | | | 11/18/13 | 9.10 | 839.97 | -- | 27.28 | 0.18 |
| | | | 02/03/14 | 8.72 | 840.35 | -- | 27.32 | 0.14 |
| | | | 08/04/14 | 8.59 | 840.48 | -- | 27.26 | 0.20 |
| | | | 02/23/15 | 9.32 | 839.75 | -- | 26.97 | 0.49 |
| | | | 08/24/15 | 8.63 | 840.44 | -- | 27.16 | 0.30 |
| | | | 02/08/16 | 8.42 | 840.65 | -- | 25.85 | 1.61 |

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| AW-14 | 849.45 | 28.88 | 04/01/13 | 8.86 | 840.59 | -- | 30.90 | -2.02 |
| | | | 05/28/13 | 9.22 | 840.23 | -- | 30.57 | -1.69 |
| | | | 08/26/13 | 9.27 | 840.18 | -- | 30.54 | -1.66 |
| | | | 11/18/13 | 9.34 | 840.11 | -- | 30.57 | -1.69 |
| | | | 02/03/14 | 8.99 | 840.46 | -- | 30.44 | -1.56 |
| | | | 08/04/14 | 8.83 | 840.62 | -- | 30.30 | -1.42 |
| | | | 02/23/15 | 9.58 | 839.87 | -- | 29.70 | -0.82 |
| | | | 08/24/15 | 9.00 | 840.45 | -- | 30.40 | -1.52 |
| | | | 02/08/16 | 8.78 | 840.67 | -- | 29.40 | -0.52 |
| AW-15 | 849.11 | 34.68 | 04/01/13 | 8.67 | 840.44 | -- | 34.57 | 0.11 |
| | | | 05/28/13 | 8.92 | 840.19 | -- | 34.40 | 0.28 |
| | | | 08/26/13 | 9.02 | 840.09 | -- | 34.20 | 0.48 |
| | | | 11/18/13 | 9.23 | 839.88 | -- | 34.42 | 0.26 |
| | | | 02/03/14 | 8.75 | 840.36 | -- | 33.85 | 0.83 |
| | | | 08/04/14 | 8.72 | 840.39 | -- | 34.42 | 0.26 |
| | | | 02/23/15 | 9.40 | 839.71 | -- | 33.89 | 0.79 |
| | | | 08/24/15 | 8.80 | 840.31 | -- | 34.16 | 0.52 |
| | | | 02/08/16 | 8.59 | 840.52 | -- | 33.62 | 1.06 |
| AW-16 | 849.12 | 34.80 | 04/01/13 | 8.56 | 840.56 | -- | 34.44 | 0.36 |
| | | | 05/28/13 | 8.72 | 840.40 | -- | 34.31 | 0.49 |
| | | | 08/26/13 | 8.85 | 840.27 | -- | 34.20 | 0.60 |
| | | | 11/18/13 | 8.97 | 840.15 | -- | 34.25 | 0.55 |
| | | | 02/03/14 | 8.60 | 840.52 | -- | 34.23 | 0.57 |
| | | | 08/04/14 | 8.44 | 840.68 | -- | 34.45 | 0.35 |
| | | | 02/23/15 | 9.14 | 839.98 | -- | 31.78 | 3.02 |
| | | | 08/24/15 | 8.60 | 840.52 | -- | 34.46 | 0.34 |
| | | | 02/08/16 | 8.44 | 840.68 | -- | 31.97 | 2.83 |
| AW-17 | 849.08 | 31.84 | 04/01/13 | 8.53 | 840.55 | -- | 34.56 | -2.72 |
| | | | 05/28/13 | 8.75 | 840.33 | -- | 31.34 | 0.50 |
| | | | 08/26/13 | 8.81 | 840.27 | -- | 31.52 | 0.32 |
| | | | 11/18/13 | 8.99 | 840.09 | -- | 31.43 | 0.41 |
| | | | 02/03/14 | 8.62 | 840.46 | -- | 31.10 | 0.74 |
| | | | 08/04/14 | 8.45 | 840.63 | -- | 31.27 | 0.57 |
| | | | 02/23/15 | 9.13 | 839.95 | -- | 30.49 | 1.35 |
| | | | 08/24/15 | 8.67 | 840.41 | 31.02 | 31.22 | 0.62 |
| | | | 11/18/15 | 8.45 | 840.63 | TR | 31.04 | 0.80 |
| | | | 02/08/16 | 8.54 | 840.54 | TR | 31.10 | 0.74 |
| AW-18 | 848.81 | 33.51 | 04/01/13 | 7.94 | 840.87 | -- | 33.75 | -0.24 |
| | | | 05/28/13 | 7.49 | 841.32 | -- | 33.75 | -0.24 |
| | | | 08/26/13 | 8.36 | 840.45 | -- | 33.69 | -0.18 |
| | | | 11/18/13 | 8.62 | 840.19 | -- | 33.67 | -0.16 |
| | | | 02/03/14 | 8.10 | 840.71 | -- | 33.40 | 0.11 |
| | | | 08/04/14 | 6.78 | 842.03 | -- | 33.15 | 0.36 |
| | | | 02/23/15 | 8.73 | 840.08 | -- | 32.95 | 0.56 |
| | | | 08/24/15 | 7.83 | 840.98 | -- | 33.01 | 0.50 |
| | | | 02/08/16 | 7.05 | 841.76 | -- | 32.10 | 1.41 |
| AW-19 | 849.01 | 34.33 | 04/01/13 | 7.99 | 841.02 | -- | 33.91 | 0.42 |
| | | | 05/28/13 | 8.29 | 840.72 | -- | 33.89 | 0.44 |
| | | | 08/26/13 | 8.59 | 840.42 | -- | 33.87 | 0.46 |
| | | | 11/18/13 | 8.74 | 840.27 | -- | 33.90 | 0.43 |
| | | | 02/03/14 | 8.27 | 840.74 | -- | 33.15 | 1.18 |
| | | | 08/04/14 | 7.39 | 841.62 | -- | 34.05 | 0.28 |
| | | | 02/23/15 | 8.85 | 840.16 | -- | 32.74 | 1.59 |
| | | | 08/24/15 | 8.44 | 840.57 | -- | 34.05 | 0.28 |
| | | | 02/08/16 | 8.22 | 840.79 | -- | 33.55 | 0.78 |

## Table 6
## Gauging Data

## Annual Periodic Review Report
## Madison Avenue Former MGP Site, Elmira, New York

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| PMW-1 | 851.19 | 18.81 | 04/01/13 | 7.78 | 843.41 | -- | 19.24 | -0.43 |
| | | | 05/28/13 | 7.89 | 843.30 | -- | 19.35 | -0.54 |
| | | | 08/26/13 | 8.02 | 843.17 | -- | 19.29 | -0.48 |
| | | | 11/18/13 | 8.35 | 842.84 | -- | 19.41 | -0.60 |
| | | | 02/03/14 | 7.97 | 843.22 | -- | 19.38 | -0.57 |
| | | | 08/04/14 | 7.50 | 843.69 | -- | 19.32 | -0.51 |
| | | | 02/23/15 | 9.21 | 841.98 | -- | 19.29 | -0.48 |
| | | | 08/24/15 | 7.53 | 843.66 | -- | 19.36 | -0.55 |
| | | | 02/08/16 | 7.56 | 843.63 | -- | 19.34 | -0.53 |
| PMW-2 | 849.93 | 19.76 | 04/01/13 | 5.45 | 844.40 | -- | 19.67 | 0.17 |
| | | | 05/28/13 | 5.01 | 844.84 | -- | 19.65 | 0.19 |
| | | | 08/26/13 | 6.00 | 843.85 | -- | 19.64 | 0.20 |
| | | | 11/18/13 | 5.68 | 844.17 | -- | 19.62 | 0.22 |
| | | | 02/03/14 | 6.44 | 843.41 | -- | 19.62 | 0.22 |
| | | | 08/04/14 | 4.96 | 844.89 | -- | 19.53 | 0.31 |
| | | | 02/23/15 | 7.25 | 842.68 | -- | 19.23 | 0.53 |
| | | | 08/24/15 | 4.98 | 844.95 | -- | 19.24 | 0.52 |
| | | | 02/08/16 | 5.44 | 844.49 | -- | 19.21 | 0.55 |
| PMW-3 | 849.64 | 19.29 | 04/01/13 | 8.45 | 841.19 | -- | 14.60 | 4.69 |
| | | | 05/28/13 | 8.98 | 840.66 | -- | 15.33 | 3.96 |
| | | | 08/26/13 | 8.73 | 840.91 | -- | 15.41 | 3.88 |
| | | | 11/18/13 | 8.76 | 840.88 | -- | 15.15 | 4.14 |
| | | | 02/03/14 | 8.37 | 841.27 | -- | 18.19 | 1.10 |
| | | | 08/04/14 | 7.75 | 841.89 | -- | 15.35 | 3.94 |
| | | | 02/23/15 | 9.36 | 840.28 | -- | 14.29 | 5.00 |
| | | | 05/22/15 | 7.33 | 842.31 | -- | 19.29 | 0.00 |
| | | | 08/24/15 | 8.35 | 841.29 | -- | 14.26 | 5.03 |
| | | | 11/18/15 | 7.51 | 842.13 | -- | 14.18 | 5.11 |
| | | | 02/08/16 | 7.76 | 841.88 | -- | 14.10 | 5.19 |
| PMW-4 | 850.02 | 19.78 | 04/01/13 | 9.20 | 840.82 | -- | 19.85 | -0.07 |
| | | | 05/28/13 | 9.45 | 840.57 | -- | 19.85 | -0.07 |
| | | | 08/26/13 | 9.51 | 840.51 | -- | 19.85 | -0.07 |
| | | | 11/18/13 | 9.73 | 840.29 | -- | 19.81 | -0.03 |
| | | | 02/03/14 | 9.26 | 840.76 | -- | 19.82 | -0.04 |
| | | | 08/04/14 | 9.13 | 840.89 | -- | 19.86 | -0.08 |
| | | | 02/23/15 | 9.70 | 840.32 | -- | 19.81 | -0.03 |
| | | | 08/24/15 | 9.19 | 840.83 | -- | 19.80 | -0.02 |
| | | | 02/08/16 | 8.83 | 841.19 | -- | 19.80 | -0.02 |
| PMW-5 | 849.08 | 32.77 | 04/01/13 | 8.58 | 840.50 | -- | 32.65 | 0.12 |
| | | | 05/28/13 | 8.77 | 840.31 | -- | 32.36 | 0.41 |
| | | | 08/26/13 | 8.95 | 840.13 | -- | 32.26 | 0.51 |
| | | | 11/18/13 | 9.11 | 839.97 | -- | 32.20 | 0.57 |
| | | | 02/03/14 | 8.74 | 840.34 | -- | 32.30 | 0.47 |
| | | | 08/04/14 | 8.60 | 840.48 | -- | 32.69 | 0.08 |
| | | | 02/23/15 | 9.25 | 839.83 | -- | 31.69 | 1.08 |
| | | | 08/24/15 | 8.70 | 840.38 | -- | 33.65 | -0.88 |
| | | | 02/08/16 | 8.57 | 840.51 | -- | 32.50 | 0.27 |
| PMW-6 | 849.59 | 38.81 | 04/01/13 | 9.19 | 840.40 | -- | 37.97 | 0.84 |
| | | | 05/28/13 | 9.35 | 840.24 | -- | 37.45 | 1.36 |
| | | | 08/26/13 | 9.50 | 840.09 | -- | 37.35 | 1.46 |
| | | | 11/18/13 | 9.68 | 839.91 | -- | 37.23 | 1.58 |
| | | | 02/03/14 | 9.23 | 840.36 | -- | 37.25 | 1.56 |
| | | | 08/04/14 | 9.19 | 840.40 | -- | 38.33 | 0.48 |
| | | | 02/23/15 | 9.90 | 839.69 | -- | 38.06 | 0.75 |
| | | | 08/24/15 | 9.29 | 840.30 | -- | 38.32 | 0.49 |
| | | | 02/08/16 | 9.09 | 840.50 | -- | 38.10 | 0.71 |

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| NMW-0402S | 849.77 | 31.29 | 04/01/13 | 9.24 | 840.53 | 29.87 | 31.07 | 0.22 |
| | | | 05/28/13 | 9.59 | 840.18 | 30.77 | 31.17 | 0.12 |
| | | | 08/26/13 | 9.89 | 839.88 | 29.25 | 31.25 | 0.04 |
| | | | 11/18/13 | 9.98 | 839.79 | 29.25 | 31.25 | 0.04 |
| | | | 02/03/14 | 5.42 | 844.35 | 30.08 | 31.28 | 0.01 |
| | | | 05/30/14 | 8.75 | 841.02 | 29.92 | 31.41 | -0.12 |
| | | | 08/04/14 | 9.48 | 840.29 | 29.93 | 31.33 | -0.04 |
| | | | 11/20/14 | 10.08 | 839.69 | 30.28 | 31.38 | -0.09 |
| | | | 02/23/15 | 10.13 | 839.64 | 30.15 | 31.35 | -0.06 |
| | | | 05/22/15 | 9.10 | 840.67 | 30.88 | 31.38 | -0.09 |
| | | | 08/24/15 | 9.55 | 840.22 | 31.03 | 31.38 | -0.09 |
| | | | 11/18/15 | 9.02 | 840.75 | -- | 31.39 | -0.10 |
| | | | 02/08/16 | 9.21 | 840.56 | 31.04 | 31.44 | -0.15 |
| NRW-1 | 852.45 | 33.74 | 04/01/13 | 11.21 | 841.15 | -- | 33.82 | 0.01 |
| | | | 05/28/13 | 11.48 | 840.88 | -- | 33.75 | 0.08 |
| | | | 08/26/13 | 11.42 | 840.94 | -- | 33.70 | 0.13 |
| | | | 11/18/13 | 11.61 | 840.75 | -- | 33.68 | 0.15 |
| | | | 02/03/14 | 11.29 | 841.07 | -- | 33.75 | 0.08 |
| | | | 05/30/14 | 10.87 | 841.07 | -- | 33.62 | 0.08 |
| | | | 08/04/14 | 11.11 | 841.25 | -- | 33.65 | 0.18 |
| | | | 11/20/14 | 11.54 | 840.91 | -- | 33.59 | 0.15 |
| | | | 02/23/15 | 11.62 | 840.83 | -- | 33.46 | 0.28 |
| | | | 05/22/15 | 10.96 | 841.49 | -- | 33.46 | 0.28 |
| | | | 08/24/15 | 11.06 | 841.39 | -- | 33.45 | 0.29 |
| | | | 11/18/15 | 10.68 | 841.77 | -- | 33.45 | 0.29 |
| | | | 02/08/16 | 10.80 | 841.65 | -- | 33.46 | 0.28 |
| NRW-2 | 849.80 | 58.25 | 04/01/13 | 9.36 | 840.44 | 57.54 | 57.87 | 0.38 |
| | | | 05/28/13 | 9.62 | 840.18 | -- | 57.31 | 0.94 |
| | | | 08/26/13 | 9.80 | 840.00 | 56.73 | 57.20 | 1.05 |
| | | | 11/18/13 | 9.98 | 839.82 | 56.93 | 57.63 | 0.62 |
| | | | 02/03/14 | 7.20 | 842.60 | -- | 57.70 | 0.55 |
| | | | 05/30/14 | 8.94 | 840.86 | -- | 57.92 | 0.33 |
| | | | 08/04/14 | 9.46 | 840.34 | 56.61 | 57.81 | 0.44 |
| | | | 11/20/14 | 10.05 | 839.75 | 57.44 | 57.83 | 0.42 |
| | | | 02/23/15 | 10.13 | 839.67 | 57.30 | 57.70 | 0.55 |
| | | | 05/22/15 | 9.23 | 840.57 | -- | 57.80 | 0.45 |
| | | | 08/24/15 | 9.50 | 840.30 | -- | 57.82 | 0.43 |
| | | | 11/18/15 | 9.12 | 840.68 | -- | 57.82 | 0.43 |
| | | | 02/08/16 | 9.31 | 840.49 | 56.74 | 57.84 | 0.41 |
| NRW-3 | 849.78 | 53.76 | 04/01/13 | 9.33 | 840.45 | -- | 52.97 | 0.79 |
| | | | 05/28/13 | 9.59 | 840.19 | -- | 52.49 | 1.27 |
| | | | 08/26/13 | 9.77 | 840.01 | -- | 52.13 | 1.63 |
| | | | 11/18/13 | 9.93 | 839.85 | -- | 52.34 | 1.42 |
| | | | 02/03/14 | 9.43 | 840.35 | -- | 52.30 | 1.46 |
| | | | 05/30/14 | 8.93 | 840.85 | -- | 52.24 | 1.52 |
| | | | 08/04/14 | 9.44 | 840.34 | -- | 52.12 | 1.64 |
| | | | 11/20/14 | 10.02 | 839.76 | -- | 52.23 | 1.53 |
| | | | 02/23/15 | 10.10 | 839.68 | -- | 52.32 | 1.44 |
| | | | 05/22/15 | 9.22 | 840.56 | -- | 52.09 | 1.67 |
| | | | 08/24/15 | 9.49 | 840.29 | -- | 53.78 | -0.02 |
| | | | 11/18/15 | 9.97 | 839.81 | -- | 53.12 | 0.64 |
| | | | 02/08/16 | 9.25 | 840.53 | -- | 52.90 | 0.86 |

**Table 6**
**Gauging Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Well ID | Measuring Point Elevation | Actual Depth to Bottom (feet TOC) | Date | Depth to Water (feet TOC) | Groundwater Elevation | Depth to Product (feet TOC) | Depth to Bottom (feet TOC) | Accumulated Thickness of Sediments (feet) |
|---|---|---|---|---|---|---|---|---|
| NRW-4 | 849.52 | 56.68 | 04/01/13 | 9.06 | 840.46 | -- | 57.40 | -0.72 |
| | | | 05/28/13 | 9.35 | 840.17 | -- | 57.34 | -0.66 |
| | | | 08/26/13 | 9.53 | 839.99 | -- | 56.57 | 0.11 |
| | | | 11/18/13 | 9.69 | 839.83 | -- | 56.59 | 0.09 |
| | | | 02/03/14 | 9.21 | 840.31 | -- | 56.99 | -0.31 |
| | | | 05/30/14 | 8.66 | 840.86 | -- | 56.64 | 0.04 |
| | | | 08/04/14 | 9.18 | 840.34 | -- | 56.58 | 0.10 |
| | | | 11/20/14 | 9.76 | 839.76 | -- | 56.62 | 0.06 |
| | | | 02/23/15 | 9.88 | 839.64 | -- | 56.40 | 0.28 |
| | | | 05/22/15 | 8.83 | 840.69 | -- | 56.48 | 0.20 |
| | | | 08/24/15 | 9.23 | 840.29 | -- | 57.05 | -0.37 |
| | | | 11/18/15 | 8.82 | 840.70 | -- | 56.55 | 0.13 |
| | | | 02/08/16 | 8.98 | 840.54 | -- | 56.55 | 0.13 |

**Notes:**

All measurements from Top of Casing (TOC).

Elevations in feet above mean sea level (ft amsl), 1988 North American Vertical Datum (NAVD88).

-- Indicates measurement not taken or not avaliable.

Due to well repairs, MW-4S, MW-9S, MW-9D, AW-2, PMW-2 and NRW-1 were resurveyed during the August 2014 site visit but after the gauging dated 8/4/2014. *Measuring Point Elevations* and *Actual Depth to Bottom* values have been updated and used starting with the gauging dated 2/23/2015.

TR - Indicates DNAPL product observed but not in a quantifiable amount.

Table 7
Groundwater Analytical Data

Annual Periodic Review Report
Madison Avenue Former MGP Site, Elmira, New York

| Location ID: | NYSDEC TOGS 1.1.1 Std. or Guidance Values | Units | MW-2S | | | | | | | | MW-4S | | | | | | | | | MW-6S | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Historical | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 |
| Date Collected: | | | 04/21/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/06/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/22/04 | 08/23/11 | 04/04/13 | 08/27/13 | 02/06/14 | 08/06/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/22/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/07/14 | 02/26/15 | 08/27/15 | 02/11/16 |
| **BTEX** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | 1 | µg/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Ethylbenzene | 5 | µg/L | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Toluene | 5 | µg/L | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Xylenes (total) | 5 | ug/L | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | NA | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U |
| Total BTEX | - - | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **PAHs** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 20 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 UJ | 4.8 U | 4.7 U | 4.9 U | 10 U | **0.07** | 4.9 U | 4.8 U | 4.8 UJ | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 U | 4.8 U | 5 U |
| Acenaphthylene | - - | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | **0.1** | 4.9 U | 4.8 U | 4.8 UJ | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 U | 4.8 U | 5 U |
| Anthracene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.8 UB | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | 5 U | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 U | 4.8 U | 5 U |
| Benzo(a)anthracene* | 0.002 (GV) | µg/L | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 1 U | **0.06** | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 1 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(a)pyrene* | 0 | µg/L | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 1 U | 0.05 U | **1.2 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(b)fluoranthene* | 0.002 (GV) | µg/L | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 1 U | **0.07** | **1.2 J** | 4.8 U | 4.8 U | 9.6 U | **0.48 J** | 4.8 U | 5 U | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(g,h,i)perylene | - - | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | 3 U | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(k)fluoranthene* | 0.002 (GV) | µg/L | 1 UJ | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 1 UJ | 0.05 U | **0.75 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 1 UJ | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Chrysene* | 0.002 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | 0.05 U | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Dibenzo(a,h)anthracene | - - | µg/L | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 1 U | **0.03** | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Fluoranthene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | 5 U | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 U | 4.8 U | 5 U |
| Fluorene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 UJ | 4.8 U | 4.7 U | 4.9 U | 10 U | 5 U | 4.9 U | 4.8 U | 4.8 UJ | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 U | 4.8 U | 5 U |
| Indeno(1,2,3-cd)pyrene* | 0.002 (GV) | µg/L | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 1 U | 0.05 U | **1.7 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 U | 4.8 U | 5 U |
| Naphthalene | 10 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 UJ | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | 5 U | 4.9 U | 4.8 U | 4.8 UJ | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 U | 4.8 U | 5 U |
| Phenanthrene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 UB | 4.9 U | 10 U | **0.09** | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 UB | 5 U | 10 U | 4.8 U | **0.45 J** | 4.8 U | 9.8 U | 5 U | 4.8 UB | 5 U |
| Pyrene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U | 10 U | 5 U | **0.42 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 U | 4.8 U | 5 U |
| PAH COCs | - - | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | **0.13** | **4.85 J** | ND | ND | ND | **0.48 J** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Total PAHs | - - | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | **0.42** | **5.27 J** | ND | ND | ND | **0.48 J** | ND | ND | ND | ND | **0.45 J** | ND | ND | ND | ND | ND | ND |
| **Oxygen Demand** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Biochemical Oxygen Demand | - - | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbonaceous Biochemical Oxygen Demand | - - | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
* Indicates analytes is COC per Record of Decision (Table 1)
1. D - Compound quantitated using a secondary dilution.
2. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
3. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
4. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
5. ND - not detected
6. NA - not analyzed
7. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
8. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
9. "GV" indicates value is a guidance value (i.e., not a standard)

Table 7
Groundwater Analytical Data

Annual Periodic Review Report
Madison Avenue Former MGP Site, Elmira, New York

| Location ID: | NYSDEC TOGS 1.1.1 Std. or Guidance Values | Units | MW-7 | | | | | | | | MW-8S | | | | | | | | MW-9S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 |
| Date Collected: | | | 04/22/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/06/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/22/04 | 04/05/13 | 08/27/13 | 02/07/14 | 08/07/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/27/04 | 04/05/13 | 08/27/13 | 02/07/14 | 08/06/14 | 02/26/15 | 08/27/15 | 02/11/16 |
| **BTEX** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | 1 | µg/L | 1 U | 1 U | 1 U | **0.45 J** | 1 U | 1 U | 1 U | 1 U | **0.5 J** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Ethylbenzene | 5 | µg/L | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | **1.3 J** | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Toluene | 5 | µg/L | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Xylenes (total) | 5 | ug/L | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | **6** | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U |
| Total BTEX | -- | µg/L | ND | ND | ND | **0.45 J** | ND | ND | ND | ND | **7.8 J** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **PAHs** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 20 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | **2 J** | 4.8 U | 4.8 U | **6 J** | **6.8 J** | **8** | **7.5** | **7.5** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Acenaphthylene | -- | µg/L | **1.1 J** | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 10 U | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **0.46 J** | 4.7 U | **0.5 J** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Anthracene | 50 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 10 U | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **0.97 J** | **0.61 J** | **1 J** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(a)anthracene* | 0.002 (GV) | µg/L | 1 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 1 U | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **1.2 J** | 4.7 U | **1.2 J** | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(a)pyrene* | 0 | µg/L | 1 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **1.2 J** | 4.7 U | **1.2 J** | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(b)fluoranthene* | 0.002 (GV) | µg/L | 1 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **1.4 J** | 4.7 U | **1.2 J** | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(g,h,i)perylene | -- | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 10 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **0.49 J** | 4.7 U | **0.53 J** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(k)fluoranthene* | 0.002 (GV) | µg/L | 1 UJ | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 1 UJ | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **4.9 U** | 4.7 U | 5.3 U | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Chrysene* | 0.002 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 10 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **0.97 J** | 4.7 U | **1 J** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Dibenzo(a,h)anthracene | -- | µg/L | 1 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **4.9 U** | 4.7 U | 5.3 U | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Fluoranthene | 50 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U | **0.4 J** | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **3.4 J** | **2 J** | **3.6 J** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Fluorene | 50 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | **1.7 J** | 4.8 U | 4.8 U | **3.5 J** | **5.1 J** | **4.8 J** | **5.4** | **5.5** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Indeno(1,2,3-cd)pyrene* | 0.002 (GV) | µg/L | 1 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **0.55 J** | 4.7 U | **0.7 J** | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Naphthalene | 10 (GV) | µg/L | **17** | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U | **14** | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **2.5 J** | 4.7 U | 5.3 U | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Phenanthrene | 50 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 UB | 4.8 U | **0.2 J** | 4.8 U | **0.44 J** | 23 UJ | 9.6 U | **0.57 J** | 4.7 UB | 5.3 U | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 UB | 4.8 U |
| Pyrene | 50 (GV) | µg/L | 10 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U | **0.3 J** | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **2.6 J** | **1.3 J** | **2.8 J** | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| PAH COCs | -- | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **4.78 J** | ND | **5.3** | ND | ND | ND | ND | ND | ND | ND | ND |
| Total PAHs | -- | µg/L | **18.1 J** | ND | ND | ND | ND | ND | ND | ND | **18.6 J** | ND | **0.44 J** | **9.5 J** | **11.9 J** | **29.1 J** | **16.8J** | **26.7 J** | ND | ND | ND | ND | ND | ND | ND | ND |
| **Oxygen Demand** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbonaceous Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
* Indicates analytes is COC per Record of Decision (Table 1)
1. D - Compound quantitated using a secondary dilution.
2. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
3. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
4. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
5. ND - not detected
6. NA - not analyzed
7. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
8. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
9. "GV" indicates value is a guidance value (i.e., not a standard)

**Table 7**
**Groundwater Analytical Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Location ID: | NYSDEC TOGS 1.1.1 Std. or Guidance Values | Units | MW-0402S | | | | | | | | MW-0403S | | | | | | | | MW-0404S | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 |
| Date Collected: | | | 04/28/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/07/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/28/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/07/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/29/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/07/14 | 02/26/15 | 08/27/15 | 02/11/16 |
| **BTEX** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | 1 | µg/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Ethylbenzene | 5 | µg/L | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Toluene | 5 | µg/L | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |
| Xylenes (total) | 5 | ug/L | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U |
| Total BTEX | -- | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| **PAHs** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 20 (GV) | µg/L | 10 U | 4.8 U | 4.6 U | 4.7 U | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | **1.3 J** | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Acenaphthylene | -- | µg/L | 10 U | 4.8 UJ | 4.6 U | 4.7 U | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Anthracene | 50 (GV) | µg/L | 10 U | 4.8 UJ | 4.6 U | 4.7 U | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Benzo(a)anthracene* | 0.002 (GV) | µg/L | 1 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Benzo(a)pyrene* | 0 | µg/L | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Benzo(b)fluoranthene* | 0.002 (GV) | µg/L | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | **0.33 J** | 4.9 U | 4.9 U |
| Benzo(g,h,i)perylene | -- | µg/L | 10 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 UJ | 10 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Benzo(k)fluoranthene* | 0.002 (GV) | µg/L | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Chrysene* | 0.002 (GV) | µg/L | 10 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Dibenzo(a,h)anthracene | -- | µg/L | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Fluoranthene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.6 U | 4.7 U | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | **0.49 J** | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Fluorene | 50 (GV) | µg/L | 10 U | 4.8 UJ | 4.6 U | 4.7 U | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | **1.2 J** | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Indeno(1,2,3-cd)pyrene* | 0.002 (GV) | µg/L | 1 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 UJ | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Naphthalene | 10 (GV) | µg/L | 10 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | **0.94 J** | 4.7 U | 5.2 U | 10 U | 4.7 U | 4.6 U | 4.7 UJ | 9.8 U | **3.2 J** | 4.9 U | 4.9 U |
| Phenanthrene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.6 U | 4.7 U | 9.9 U | 4.9 U | 4.9 UB | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 UB | 5.2 U | 10 U | 4.7 U | **0.45 J** | 4.7 U | 9.8 U | 4.7 U | 4.9 UB | 4.9 U |
| Pyrene | 50 (GV) | µg/L | 10 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U | 10 U | 4.7 U | **0.38 J** | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| PAH COCs | -- | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **0.33 J** | ND | ND |
| Total PAHs | -- | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **0.94 J** | ND | ND | ND | ND | **3.82 J** | ND | ND | **3.53 J** | ND | ND |
| **Oxygen Demand** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbonaceous Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**
* Indicates analytes is COC per Record of Decision (Table 1)
1. D - Compound quantitated using a secondary dilution.
2. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
3. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
4. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
5. ND - not detected
6. NA - not analyzed
7. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
8. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
9. "GV" indicates value is a guidance value (i.e., not a standard)

**Table 7**
**Groundwater Analytical Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Location ID: | NYSDEC TOGS 1.1.1 Std. or Guidance Values | Units | MW-0405S | | | | | | | | PMW-1 | | | | PMW-2 | | | | | PMW-3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Historical | Baseline | Q2 | Q4 | Q6 | Q8 | Q10 | Q12 | Baseline | Q2 | Q6 | Q8 | Baseline | Q2 | Q4 | Q6 | Q8 | Baseline | Q2 | Q6 | Q8 |
| Date Collected: | | | 04/29/04 | 04/04/13 | 08/27/13 | 02/06/14 | 08/07/14 | 02/26/15 | 08/27/15 | 02/11/16 | 04/03/13 | 08/28/13 | 08/06/14 | 02/24/15 | 04/03/13 | 08/28/13 | 02/05/14 | 08/06/14 | 02/24/15 | 04/03/13 | 08/30/13 | 08/06/14 | 02/24/15 |
| **BTEX** | | | | | | | | | | | | | | | | | | | | | | | |
| Benzene | 1 | µg/L | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | NA | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U | NA | NA | NA | NA |
| Ethylbenzene | 5 | µg/L | 4 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | NA | NA | NA | 1 U | 1 U | **0.92 J** | 1 U | 1 U | NA | NA | NA | NA |
| Toluene | 5 | µg/L | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | NA | NA | NA | 1 U | 1 U | 1 U | 1 U | 1 U | NA | NA | NA | NA |
| Xylenes (total) | 5 | ug/L | 5 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | NA | NA | NA | NA | 2 U | 2 U | 2 U | 2 U | 2 U | NA | NA | NA | NA |
| Total BTEX | -- | µg/L | ND | ND | ND | ND | ND | ND | ND | ND | NA | NA | NA | NA | ND | ND | **0.92 J** | ND | ND | NA | NA | NA | NA |
| **PAHs** | | | | | | | | | | | | | | | | | | | | | | | |
| Acenaphthene | 20 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | -- | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 50 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene* | 0.002 (GV) | µg/L | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene* | 0 | µg/L | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene* | 0.002 (GV) | µg/L | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | **0.35 J** | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | -- | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene* | 0.002 (GV) | µg/L | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene* | 0.002 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | -- | µg/L | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 50 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 50 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene* | 0.002 (GV) | µg/L | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 10 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 50 (GV) | µg/L | 10 U | 4.7 U | **0.45 J** | 4.6 U | 9.7 U | 5 U | 4.9 UB | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 50 (GV) | µg/L | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA | NA | NA | NA | NA |
| PAH COCs | -- | µg/L | ND | ND | ND | ND | ND | **0.35 J** | ND | ND | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| Total PAHs | -- | µg/L | ND | ND | **0.45 J** | ND | ND | **0.35 J** | ND | ND | NA | NA | NA | NA | ND | NA | NA | NA | NA | NA | NA | NA | NA |
| **Oxygen Demand** | | | | | | | | | | | | | | | | | | | | | | | |
| Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | **4,500** | **3,500** | 2,000U | NA | NA | NA | NA | NA | NA | **99,000** | **13,000** | **6,900** | NA |
| Carbonaceous Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | NA | NA | NA | **2,400** | NA | 2,000U | NA | NA | NA | NA | NA | NA | **79,400** | NA | **10,600** | NA |

**Notes:**
* Indicates analytes is COC per Record of Decision (Table 1)
1. D - Compound quantitated using a secondary dilution.
2. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
3. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
4. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
5. ND - not detected
6. NA - not analyzed
7. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
8. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
9. "GV" indicates value is a guidance value (i.e., not a standard)

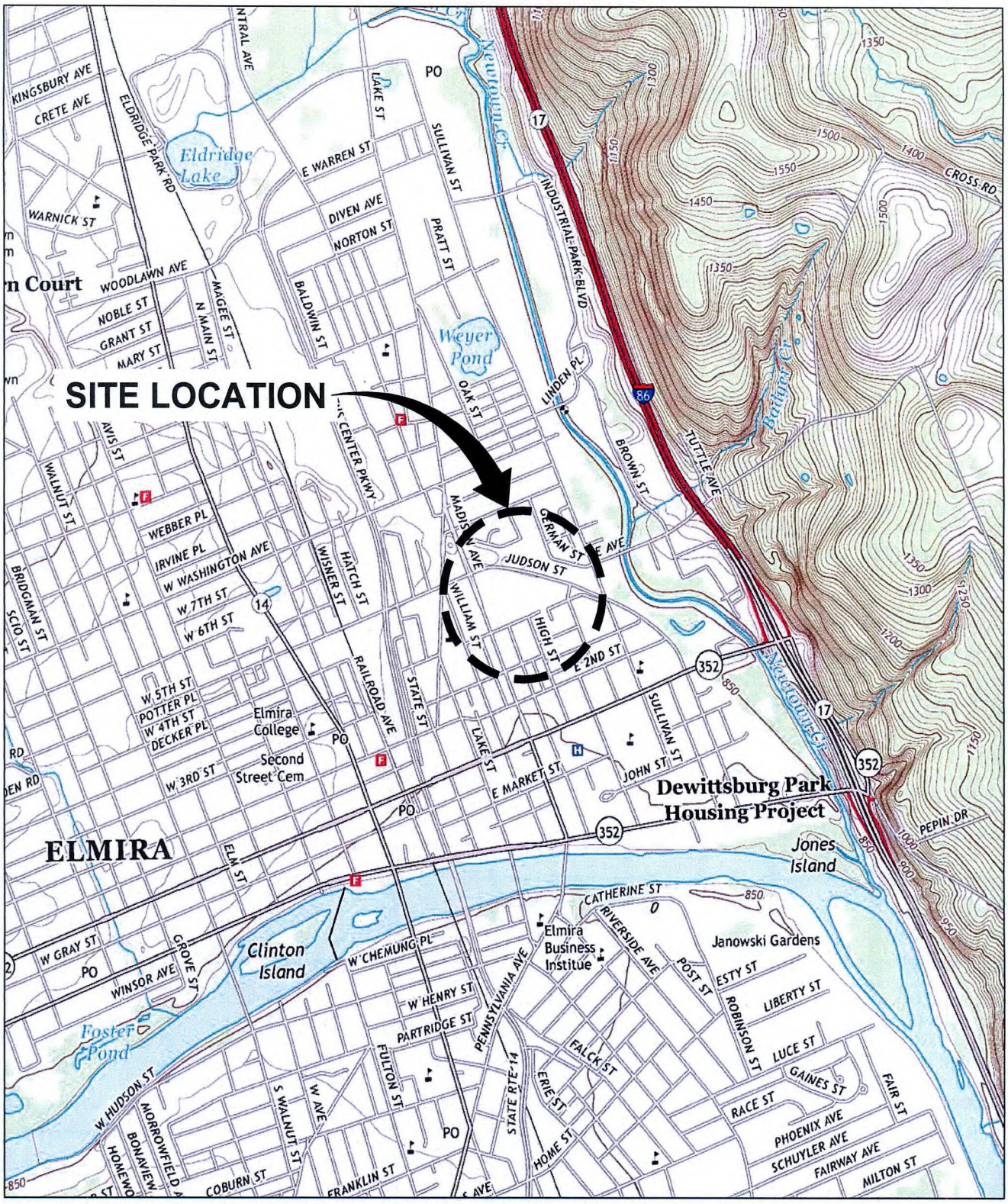
**Table 7**
**Groundwater Analytical Data**

**Annual Periodic Review Report**
**Madison Avenue Former MGP Site, Elmira, New York**

| Location ID: | NYSDEC TOGS 1.1.1 Std. or Guidance Values | Units | PMW-4 | | | | | PMW-5 | | | | PMW-6 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Baseline | Q2 | Q4 | Q6 | Q8 | Baseline | Q2 | Q6 | Q8 | Baseline | Q2 | Q4 | Q6 | Q8 |
| Date Collected: | | | 04/03/13 | 08/28/13 | 02/05/14 | 08/06/14 | 02/25/15 | 04/03/13 | 08/28/13 | 08/06/14 | 02/24/15 | 04/03/13 | 08/28/13 | 02/05/14 | 08/06/14 | 02/25/15 |
| **BTEX** | | | | | | | | | | | | | | | | |
| Benzene | 1 | µg/L | **230 D** | **81** | **150** | 4 U | **81** | NA | NA | NA | NA | **3.4** | **25** | **89** | **90** | **1,200 D** |
| Ethylbenzene | 5 | µg/L | **110 D** | **36** | **55** | 4 U | **29** | NA | NA | NA | NA | **1.4** | **6.4** | **42** | **57** | **290 D** |
| Toluene | 5 | µg/L | **9.3** | **2.9 J** | **5.4** | 4 U | **4.9** | NA | NA | NA | NA | 1 U | **0.54 J** | **1** | **3.4** | **10** |
| Xylenes (total) | 5 | ug/L | **80** | **21** | **33** | 8 U | **21** | NA | NA | NA | NA | **1.1 J** | **8.9** | **30** | **95** | **290 D** |
| Total BTEX | -- | µg/L | **429** | **141 J** | **243** | ND | **136** | NA | NA | NA | NA | **5.9 J** | **40.8 J** | **162** | **245** | **1,790 D** |
| **PAHs** | | | | | | | | | | | | | | | | |
| Acenaphthene | 20 (GV) | µg/L | **110 D** | NA | NA | NA | NA | NA | NA | NA | NA | **7.2** | NA | NA | NA | NA |
| Acenaphthylene | -- | µg/L | **6.2** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Anthracene | 50 (GV) | µg/L | **8.8** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Benzo(a)anthracene* | 0.002 (GV) | µg/L | **0.88 J** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Benzo(a)pyrene* | 0 | µg/L | **1.3 J** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Benzo(b)fluoranthene* | 0.002 (GV) | µg/L | **1.3 J** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Benzo(g,h,i)perylene | -- | µg/L | **1 J** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Benzo(k)fluoranthene* | 0.002 (GV) | µg/L | **0.71 J** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Chrysene* | 0.002 (GV) | µg/L | **0.70 J** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | -- | µg/L | 4.7 U | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Fluoranthene | 50 (GV) | µg/L | **5.4** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Fluorene | 50 (GV) | µg/L | **29** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene* | 0.002 (GV) | µg/L | 4.7 U | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Naphthalene | 10 (GV) | µg/L | **800 D** | NA | NA | NA | NA | NA | NA | NA | NA | **7.3** | NA | NA | NA | NA |
| Phenanthrene | 50 (GV) | µg/L | **33** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| Pyrene | 50 (GV) | µg/L | **9.5** | NA | NA | NA | NA | NA | NA | NA | NA | 4.8 U | NA | NA | NA | NA |
| PAH COCs | -- | µg/L | **4.89 J** | NA | NA | NA | NA | NA | NA | NA | NA | ND | NA | NA | NA | NA |
| Total PAHs | -- | µg/L | **1,008 J** | NA | NA | NA | NA | NA | NA | NA | NA | **14.5** | NA | NA | NA | NA |
| **Oxygen Demand** | | | | | | | | | | | | | | | | |
| Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | 2,000 U | 2,000 U | 2,000U | NA | NA | NA | NA | NA | NA |
| Carbonaceous Biochemical Oxygen Demand | -- | µg/L | NA | NA | NA | NA | NA | 2,000 U | NA | 2,000U | NA | NA | NA | NA | NA | NA |

**Notes:**
* Indicates analytes is COC per Record of Decision (Table 1)
1. D - Compound quantitated using a secondary dilution.
2. J - Indicates that the analyte was detected at a concentration less than the practical quantitation limit (PQL).
3. U - Indicates the constituent was not detected at the PQL. The value preceding the U indicates the PQL.
4. UB - Indicates the constituent was not detected at a concentration less than the PQL due to associated blank contamination.
5. ND - not detected
6. NA - not analyzed
7. Sample results detected above the Method Detection Limit (MDL) are presented in bold font.
8. Shading indicates that the result exceeds the NYSDEC TOGS 1.1.1 Water Quality Standard or Guidance Value.
9. "GV" indicates value is a guidance value (i.e., not a standard)

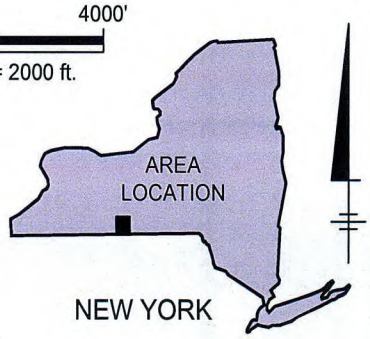
# FIGURES




REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., ELMIRA, NY-PA., 2013.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.



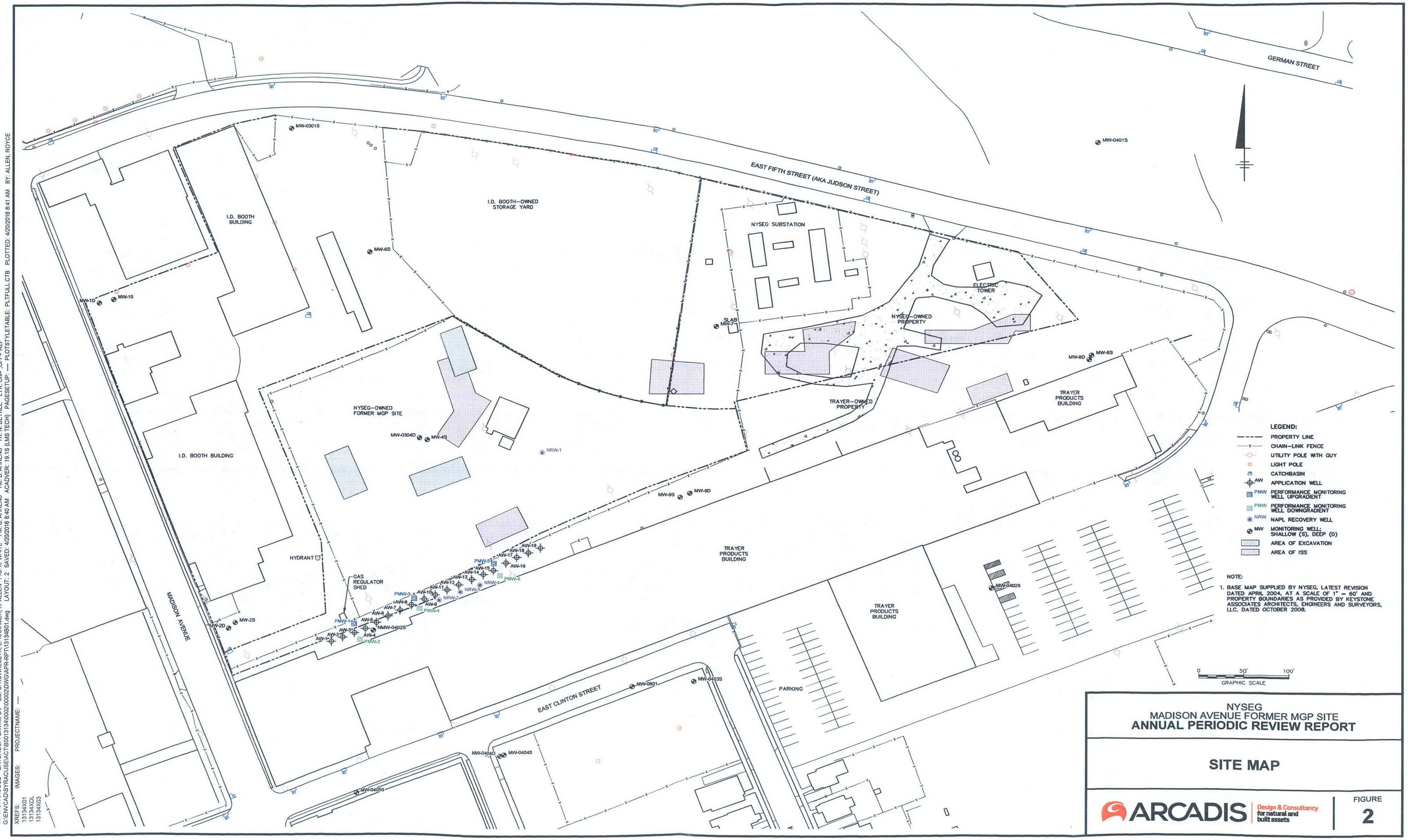

NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

## SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: SYRACUSE NY DIV/GROUP: ENVCAD DB: E. KRAHMER, R. ALLEN LD:(Opt) PIC: K. WHITE PM: B. AHRENS TM: B. AHRENS TR: N. BEYRLE LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\SYRACUSE\ACTIB0013134\0002\00002\DWG\APR-RPTY13134N01.dwg LAYOUT: 1 SAVED: 4/19/2016 11:19 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: PDF LTR PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/19/2016 11:20 AM BY: ALLEN, ROYCE
XREFS: IMAGES: PROJECTNAME: ---
NY_Elmira_20130219_TM_geo.png



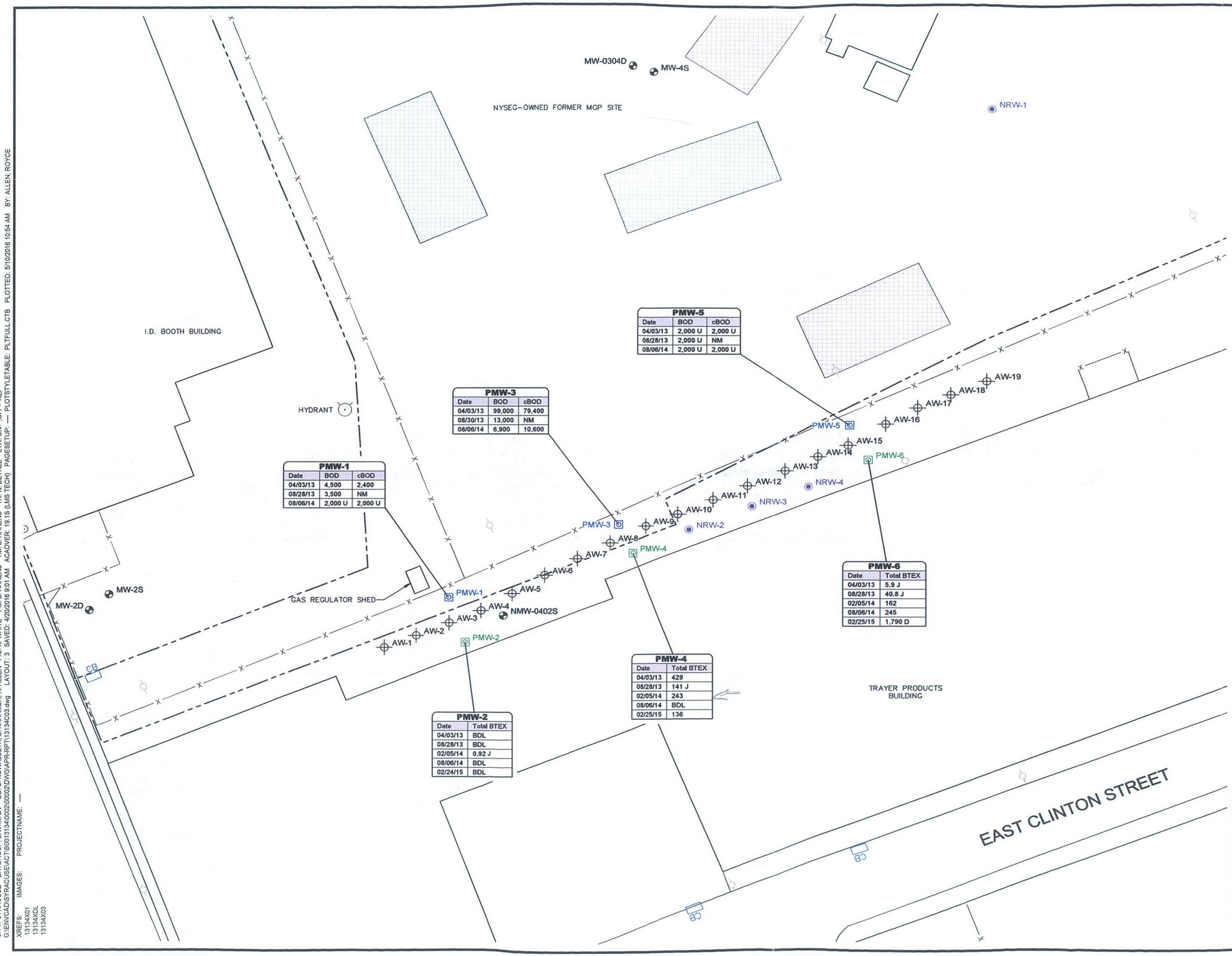

NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

**SITE MAP**

ARCADIS Design & Consultancy for natural and built assets

FIGURE
**2**


CITY: SYRACUSE DIV/GROUP: ENV/IM-DV DB: S. KOWALCZYK, E. KRAHMER, R. ALLEN PIC: K. WHITE PM: B. AHRENS TM: B. AHRENS TR: N. BEYRLE LYR: ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\AGTB0\13134\0002\0002\DWG\APR-RPT\13134B01.dwg LAYOUT: 2 SAVED: 4/20/2016 8:40 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/20/2016 8:41 AM BY: ALLEN, ROYCE
XREFS: IMAGES: PROJECTNAME: —
13134X01
13134XDL
13134X03




**PMW-1**

| Date | BOD | cBOD |
|---|---|---|
| 04/03/13 | 4,500 | 2,400 |
| 08/28/13 | 3,500 | NM |
| 08/06/14 | 2,000 U | 2,000 U |

**PMW-2**

| Date | Total BTEX |
|---|---|
| 04/03/13 | BDL |
| 08/28/13 | BDL |
| 02/05/14 | 0.92 J |
| 08/06/14 | BDL |
| 02/24/15 | BDL |

**PMW-3**

| Date | BOD | cBOD |
|---|---|---|
| 04/03/13 | 99,000 | 79,400 |
| 08/30/13 | 13,000 | NM |
| 08/06/14 | 6,900 | 10,600 |

**PMW-4**

| Date | Total BTEX |
|---|---|
| 04/03/13 | 429 |
| 08/28/13 | 141 J |
| 02/05/14 | 243 |
| 08/06/14 | BDL |
| 02/25/15 | 136 |

**PMW-5**

| Date | BOD | cBOD |
|---|---|---|
| 04/03/13 | 2,000 U | 2,000 U |
| 08/28/13 | 2,000 U | NM |
| 08/06/14 | 2,000 U | 2,000 U |

**PMW-6**

| Date | Total BTEX |
|---|---|
| 04/03/13 | 5.9 J |
| 08/28/13 | 40.8 J |
| 02/05/14 | 162 |
| 08/06/14 | 245 |
| 02/25/15 | 1,790 D |

**LEGEND:**

- PROPERTY LINE
- CHAIN-LINK FENCE
- UTILITY POLE WITH GUY
- LIGHT POLE
- CATCHBASIN
- AW — APPLICATION WELL
- PMW — PERFORMANCE MONITORING WELL UPGRADIENT
- PMW — PERFORMANCE MONITORING WELL DOWNGRADIENT
- NRW — NAPL RECOVERY WELL
- MW — MONITORING WELL; SHALLOW (S), DEEP (D)
- AREA OF EXCAVATION
- AREA OF ISS

NOTES:

1. ALL RESULTS ARE IN MICROGRAMS PER LITER (µg/L).
2. BTEX = BENZENE, TOLUENE, ETHYLBENZENE, XYLENE.
3. PAH = POLYCYCLIC AROMATIC HYDROCARBONS.
4. BDL = BELOW DETECTION LIMITS.
5. NM = NOT MEASURED.
6. BOD = BIOCHEMICAL OXYGEN DEMAND.
7. cBOD = CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND.
8. J = QUALIFIER INDICATES AN ESTIMATED VALUE.
9. U = QUALIFIER INDICATES CONSTITUENT NOT DETECTED ABOVE THE LIMIT OF DETECTION. THE PRECEDING VALUE IS THE LIMIT OF DETECTION.
10. D = COMPOUND QUANTITATED USING A SECONDARY DILUTION.
11. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004, AT A SCALE OF 1" = 60' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008.

0 20' 40'
GRAPHIC SCALE

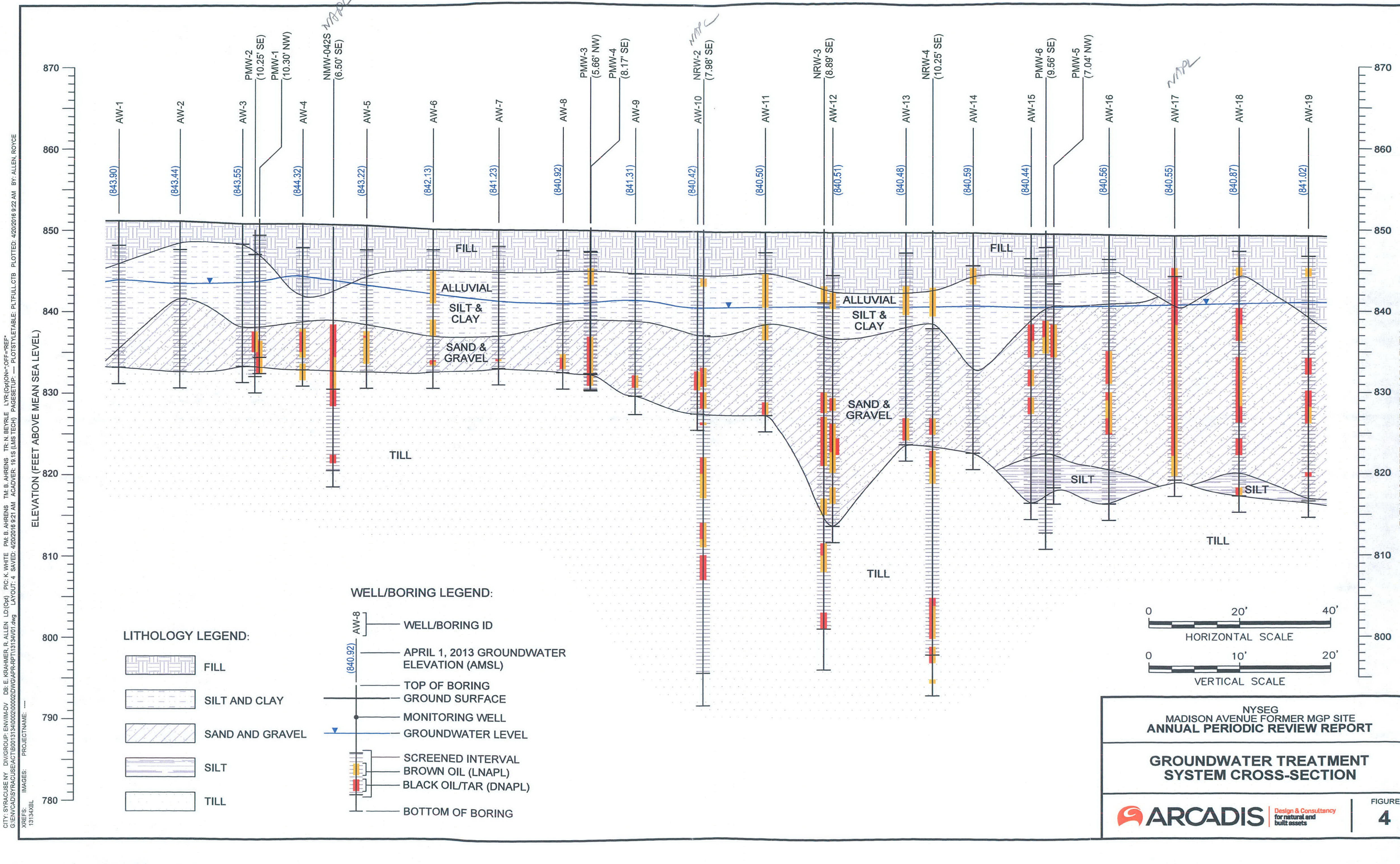
NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

# PERFORMANCE MONITORING WELL DATA

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3

CITY: SYRACUSE DIV/GROUP: ENV/M-OV DB: S. KOWALCZYK, E. KRAHMER, R. ALLEN PIC: K. WHITE PM: B. AHRENS TM: B. AHRENS TR: N. BEYRLE LYR: ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIVE\01313400020002\DWG\APR-RPT\13134C03.dwg LAYOUT: 3 SAVED: 4/20/2016 9:01 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: ---
XREFS: IMAGES: PROJECTNAME: ---
13134X01
13134XDL
13134X03



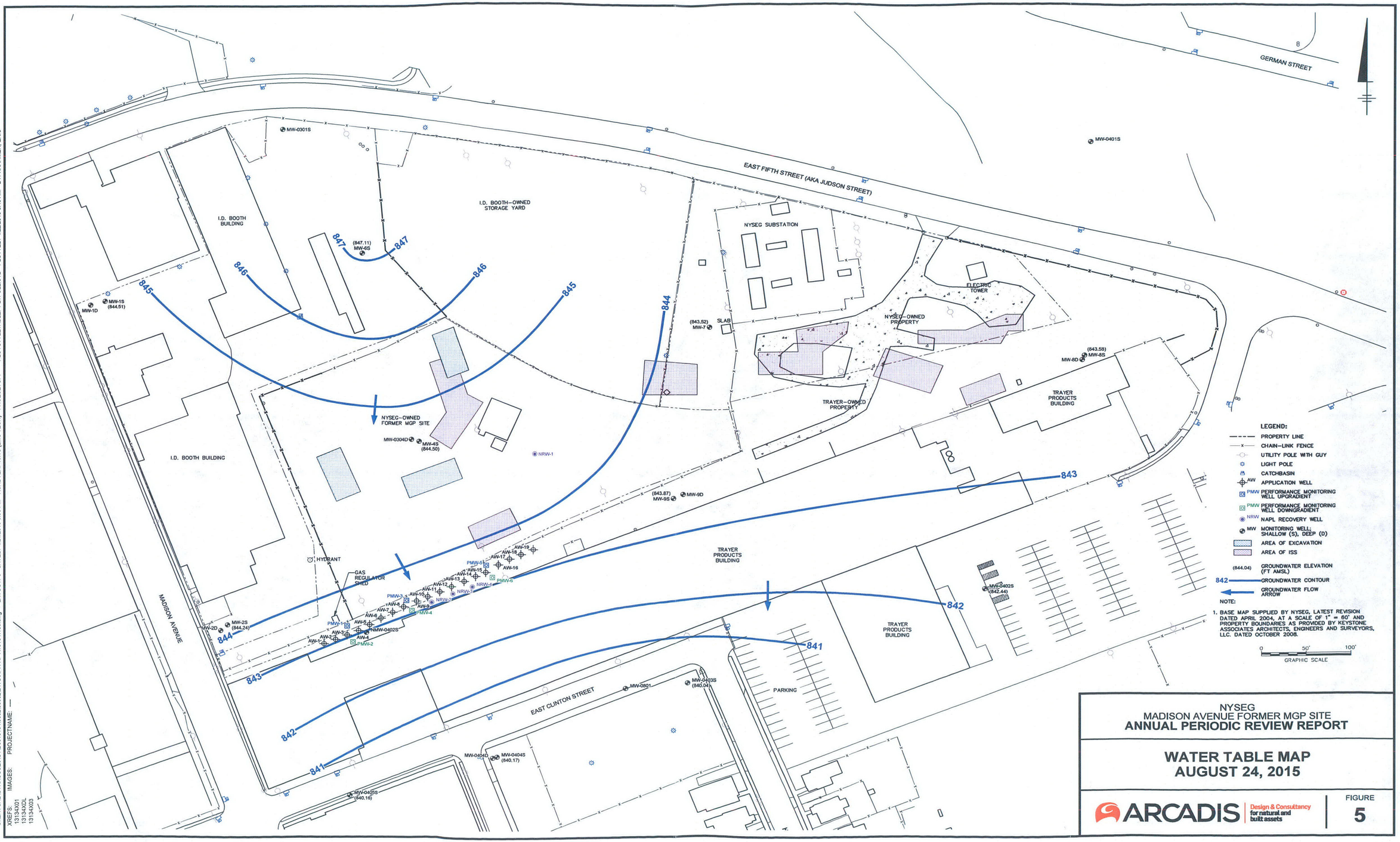

NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

## GROUNDWATER TREATMENT SYSTEM CROSS-SECTION

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY: SYRACUSE NY DIV/GROUP: ENV/IM-DV DB: E. KRAHMER, R. ALLEN LD:(Opt) PIC: K. WHITE PM: B. AHRENS TM: B. AHRENS TR: N. BEYRLE LYR:(On)ON=*;OFF=*REF*
G:\ENV\CAD\SYRACUSE\ACTIVE\60131340002000002\DWG\APR-RPT\13134V01.dwg LAYOUT: 4 SAVED: 4/20/2016 9:21 AM ACADVER: 19.1S (LMS TECH) PAGESETUP: --- PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 4/20/2016 9:22 AM BY: ALLEN, ROYCE
XREFS: IMAGES: PROJECTNAME: ---
13134XBL




LEGEND:

- PROPERTY LINE
- CHAIN-LINK FENCE
- UTILITY POLE WITH GUY
- LIGHT POLE
- CATCHBASIN
- AW — APPLICATION WELL
- PMW — PERFORMANCE MONITORING WELL UPGRADIENT
- PMW — PERFORMANCE MONITORING WELL DOWNGRADIENT
- NRW — NAPL RECOVERY WELL
- MW — MONITORING WELL; SHALLOW (S), DEEP (D)
- AREA OF EXCAVATION
- AREA OF ISS
- (844.04) GROUNDWATER ELEVATION (FT AMSL)
- 842 GROUNDWATER CONTOUR
- GROUNDWATER FLOW ARROW

NOTE:

1. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004, AT A SCALE OF 1" = 80' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008.

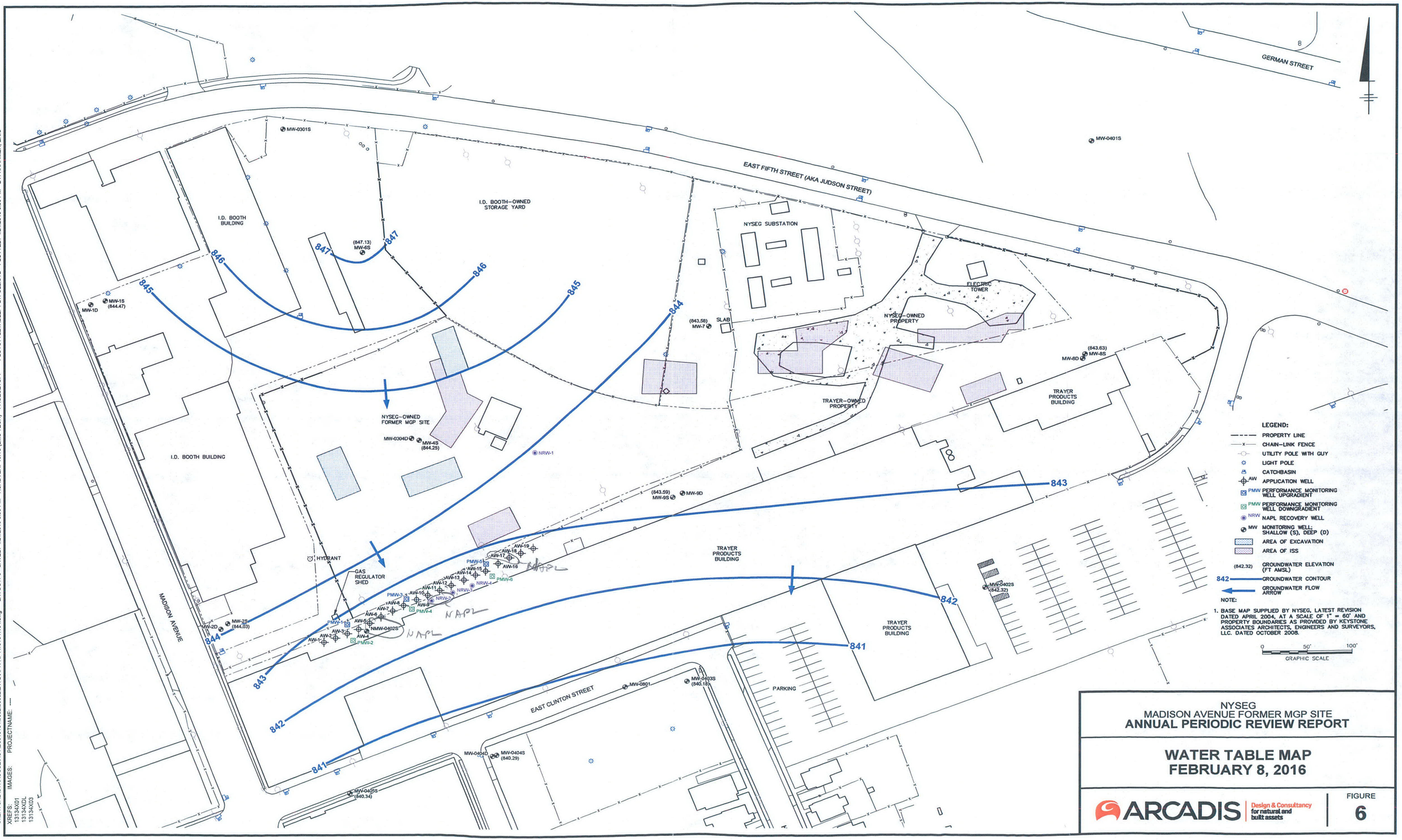
0 50' 100'
GRAPHIC SCALE

NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

# WATER TABLE MAP
# AUGUST 24, 2015

ARCADIS Design & Consultancy for natural and built assets

FIGURE
**5**




LEGEND:

- PROPERTY LINE
- CHAIN-LINK FENCE
- UTILITY POLE WITH GUY
- LIGHT POLE
- CATCHBASIN
- AW — APPLICATION WELL
- PMW — PERFORMANCE MONITORING WELL UPGRADIENT
- PMW — PERFORMANCE MONITORING WELL DOWNGRADIENT
- NRW — NAPL RECOVERY WELL
- MW — MONITORING WELL: SHALLOW (S), DEEP (D)
- AREA OF EXCAVATION
- AREA OF ISS
- (842.32) GROUNDWATER ELEVATION (FT AMSL)
- 842 — GROUNDWATER CONTOUR
- GROUNDWATER FLOW ARROW

NOTE:

1. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004, AT A SCALE OF 1" = 50' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008.

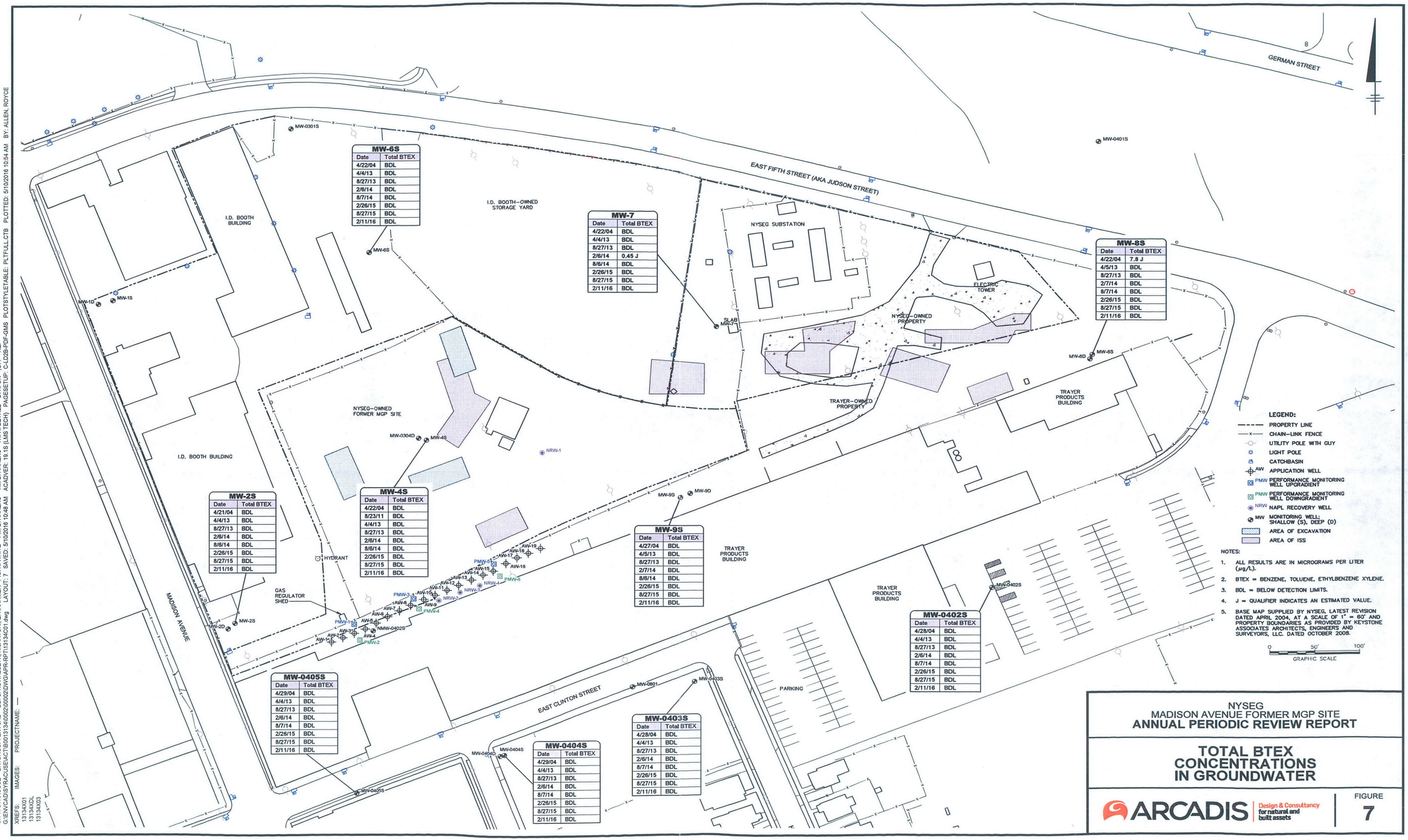
0 50' 100'
GRAPHIC SCALE

NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

## WATER TABLE MAP
## FEBRUARY 8, 2016

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6




NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

# TOTAL BTEX CONCENTRATIONS IN GROUNDWATER

ARCADIS Design & Consultancy for natural and built assets

FIGURE 7

**MW-6S**

| Date | 4/22/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/7/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(a)pyrene | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(b)fluoranthene | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Benzo(k)fluoranthene | 1 UJ | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Chrysene | 10 U | 4.8 U | 4.7 U | 4.8 UJ | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.8 U | 4.7 U | 4.8 U | 9.8 U | 5 UJ | 4.8 U | 5 U |
| Total PAHs | ND | ND | **0.45 J** | ND | ND | ND | ND | ND |

**MW-4S**

| Date | 4/22/04 | 8/23/11 | 4/4/13 | 8/27/13 | 2/6/14 | 8/6/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | **0.06** | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U |
| Benzo(a)pyrene | 1 U | 0.05 U | **1.2 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U |
| Benzo(b)fluoranthene | 1 U | **0.07** | **1.2 J** | 4.8 U | 4.8 U | 9.6 U | **0.48 J** | 4.8 U | 5 U |
| Benzo(k)fluoranthene | 1 UJ | 0.05 U | **0.75 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U |
| Chrysene | 10 U | 0.05 U | 4.9 U | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 0.05 U | **1.7 J** | 4.8 U | 4.8 U | 9.6 U | 5 U | 4.8 U | 5 U |
| Total PAHs | ND | **0.42** | **5.27 J** | ND | ND | ND | **0.48 J** | ND | ND |

**MW-2S**

| Date | 4/21/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/6/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U |
| Benzo(a)pyrene | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U |
| Benzo(b)fluoranthene | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U |
| Benzo(k)fluoranthene | 1 UJ | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U |
| Chrysene | 10 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.8 U | 4.8 U | 4.8 U | 10 U | 4.8 U | 4.7 U | 4.9 U |
| Total PAHs | ND | ND | ND | ND | ND | ND | ND | ND |

**MW-0405S**

| Date | 4/29/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/7/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U |
| Benzo(a)pyrene | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U |
| Benzo(b)fluoranthene | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | **0.35 J** | 4.9 U | 5 U |
| Benzo(k)fluoranthene | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U |
| Chrysene | 10 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.7 U | 4.7 U | 4.6 U | 9.7 U | 5 U | 4.9 U | 5 U |
| Total PAHs | ND | ND | **0.45 J** | ND | ND | **0.35 J** | ND | ND |

**MW-7**

| Date | 4/22/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/6/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U |
| Benzo(a)pyrene | 1 U | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U |
| Benzo(b)fluoranthene | 1 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U |
| Benzo(k)fluoranthene | 1 UJ | 4.9 U | 4.9 U | 4.9 U | 9.9 U | 4.7 U | 4.9 U | 4.8 U |
| Chrysene | 10 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.9 U | 4.9 U | 4.9 UJ | 9.9 U | 4.7 U | 4.9 U | 4.8 U |
| Total PAHs | **18.1 J** | ND | ND | ND | ND | ND | ND | ND |

**MW-9S**

| Date | 4/27/04 | 4/5/13 | 8/27/13 | 2/7/14 | 8/6/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(a)pyrene | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(b)fluoranthene | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Benzo(k)fluoranthene | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Chrysene | 11 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Indeno(1,2,3-cd)pyrene | 1.1 U | 5.1 U | 4.8 U | 4.9 U | 9.6 U | 4.9 U | 4.7 U | 4.8 U |
| Total PAHs | ND | ND | ND | ND | ND | ND | ND | ND |

**MW-0404S**

| Date | 4/29/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/7/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Benzo(a)pyrene | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Benzo(b)fluoranthene | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | **0.33 J** | 4.9 U | 4.9 U |
| Benzo(k)fluoranthene | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Chrysene | 10 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.7 U | 4.6 U | 4.7 U | 9.8 U | 4.7 U | 4.9 U | 4.9 U |
| Total PAHs | ND | ND | **3.82 J** | ND | ND | **3.53 J** | ND | ND |

**MW-0403S**

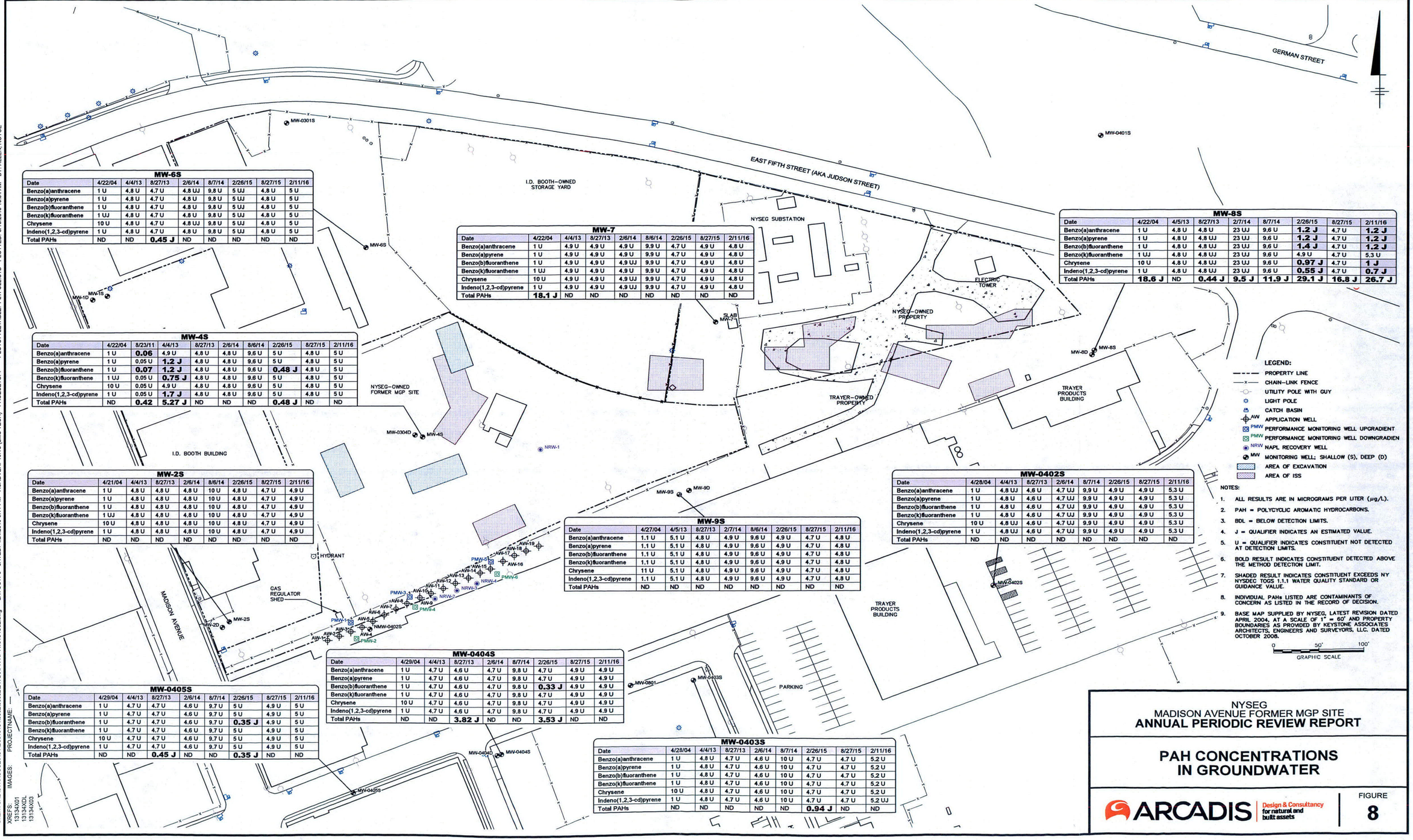
| Date | 4/28/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/7/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U |
| Benzo(a)pyrene | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U |
| Benzo(b)fluoranthene | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U |
| Benzo(k)fluoranthene | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U |
| Chrysene | 10 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.8 U | 4.7 U | 4.6 U | 10 U | 4.7 U | 4.7 U | 5.2 UJ |
| Total PAHs | ND | ND | ND | ND | ND | **0.94 J** | ND | ND |

**MW-8S**

| Date | 4/22/04 | 4/5/13 | 8/27/13 | 2/7/14 | 8/7/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.8 U | 4.8 U | 23 UJ | 9.6 U | **1.2 J** | 4.7 U | **1.2 J** |
| Benzo(a)pyrene | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **1.2 J** | 4.7 U | **1.2 J** |
| Benzo(b)fluoranthene | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **1.4 J** | 4.7 U | **1.2 J** |
| Benzo(k)fluoranthene | 1 UJ | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | 4.9 U | 4.7 U | 5.3 U |
| Chrysene | 10 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **0.97 J** | 4.7 U | **1 J** |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.8 U | 4.8 UJ | 23 UJ | 9.6 U | **0.55 J** | 4.7 U | **0.7 J** |
| Total PAHs | **18.6 J** | ND | **0.44 J** | **9.5 J** | **11.9 J** | **29.1 J** | **16.8 J** | **26.7 J** |

**MW-0402S**

| Date | 4/28/04 | 4/4/13 | 8/27/13 | 2/6/14 | 8/7/14 | 2/26/15 | 8/27/15 | 2/11/16 |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U |
| Benzo(a)pyrene | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U |
| Benzo(b)fluoranthene | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U |
| Benzo(k)fluoranthene | 1 U | 4.8 U | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U |
| Chrysene | 10 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U |
| Indeno(1,2,3-cd)pyrene | 1 U | 4.8 UJ | 4.6 U | 4.7 UJ | 9.9 U | 4.9 U | 4.9 U | 5.3 U |
| Total PAHs | ND | ND | ND | ND | ND | ND | ND | ND |




NOTES:

1. ALL RESULTS ARE IN MICROGRAMS PER LITER (µg/L).
2. PAH = POLYCYCLIC AROMATIC HYDROCARBONS.
3. BDL = BELOW DETECTION LIMITS.
4. J = QUALIFIER INDICATES AN ESTIMATED VALUE.
5. U = QUALIFIER INDICATES CONSTITUENT NOT DETECTED AT DETECTION LIMITS.
6. BOLD RESULT INDICATES CONSTITUENT DETECTED ABOVE THE METHOD DETECTION LIMIT.
7. SHADED RESULT INDICATES CONSTITUENT EXCEEDS NY NYSDEC TOGS 1.1.1 WATER QUALITY STANDARD OR GUIDANCE VALUE.
8. INDIVIDUAL PAHs LISTED ARE CONTAMINANTS OF CONCERN AS LISTED IN THE RECORD OF DECISION.
9. BASE MAP SUPPLIED BY NYSEG, LATEST REVISION DATED APRIL 2004, AT A SCALE OF 1" = 60' AND PROPERTY BOUNDARIES AS PROVIDED BY KEYSTONE ASSOCIATES ARCHITECTS, ENGINEERS AND SURVEYORS, LLC. DATED OCTOBER 2008.

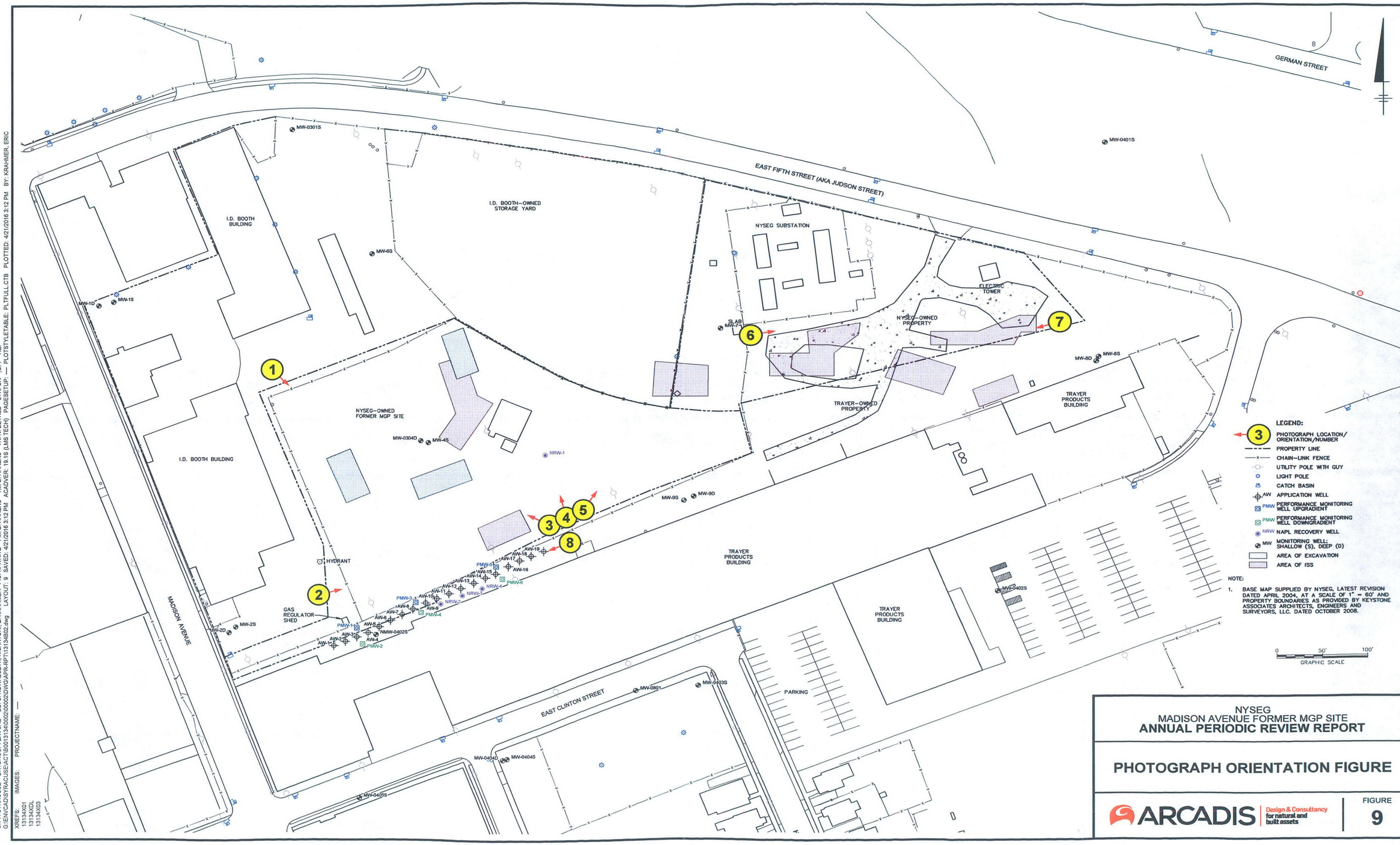
0 50' 100'
GRAPHIC SCALE

NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

**PAH CONCENTRATIONS IN GROUNDWATER**

ARCADIS Design & Consultancy for natural and built assets

FIGURE
**8**




NYSEG
MADISON AVENUE FORMER MGP SITE
**ANNUAL PERIODIC REVIEW REPORT**

## PHOTOGRAPH ORIENTATION FIGURE

ARCADIS Design & Consultancy for natural and built assets

FIGURE
9