Final April 2015
Long-Term Monitoring
Data Summary Report

AOC 9 (SD-62)
Former Griffiss Air Force Base
Rome, New York

Contract No. W912DQ-09-D-3013

December 2015

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Final April 2015 Long-Term Monitoring
Data Summary Report
AOC 9
Former Griffiss Air Force Base, Rome, New York.

December 2015

On behalf of Ecology and Environment Engineering, P.C. (EEEPC), the undersigned certify that the attached document(s) were developed in conformance with EEEPC's Scope of Work, contract requirements, and EEEPC's Quality Control Plan.

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List of Abbreviations and Acronyms

AFCEC	Air Force Civil Engineering Center
AOC 9	Area of Concern 9
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
CD	compact disk
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	contaminant of concern
DCB	dichlorobenzene
DCE	dichloroethylene
DO	dissolved oxygen
DUSR	Data Usability Summary Report
EEEPC	Ecology and Environment Engineering, P.C.
EPA	(United States) Environmental Protection Agency
ERPIMS	Environmental Restoration Program Information Management System
ESI	Expanded Site Investigation
FID	flame ionization detector
Griffiss AFB	former Griffiss Air Force Base
MAROS	Monitoring and Remediation Optimization System Software Version 2.2
MCL	maximum contaminant level
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MW	monitoring well

List of Abbreviations and Acronyms (cont.)

NYSDEC	New York State Department of Environmental Conservation
ORP	oxidation reduction potential
Parsons	Parsons Government Services, Inc.
PCE	tetrachloroethylene
PDI	Predesign Investigation
PDI 2	second predesign investigation
PID	photoionization detector
QA	quality assurance
QC	quality control
RAO	remedial action objective
SI	Supplemental Investigation
SW	surface water
TCE	trichloroethylene
USACE	U.S. Army Corps of Engineers
VOC	volatile organic compound
WSA	Weapons Storage Area

1 Introduction

Ecology and Environment Engineering, P.C. (EEEPC), under contract to Parsons Government Services, Inc. (Parsons), which is under contract to the U.S. Army Corps of Engineers (USACE) Kansas City District (Contract No. W912DQ-09-D-3013) performed the third round of long-term groundwater and surface water monitoring at Area of Concern 9 (AOC 9) of the former Griffiss Air Force Base (Griffiss AFB) in Rome, New York, on April 6 to 8, 2015 (see Figure 1-1). Two previous rounds of long-term groundwater and surface water monitoring and four previous rounds of performance groundwater and surface water monitoring were provided under separate cover in the *Final May 2011 and October 2011 Performance Monitoring Data Summary Report*, the *Final April and September 2012 Performance Monitoring Data Summary Report*, the *Final April 2013 Long-Term Monitoring Data Summary Report*, and the *Final April 2014 Long-Term Monitoring Data Summary Report* (EEEPC 2013a, 2013b, 2014, and 2015). The field activities for the third round of long-term monitoring are described in Section 2. The results of the third round of long-term monitoring data are presented in Section 3 and the effectiveness of the remedy is presented in Section 4. In addition, figures from the first and second rounds of long-term groundwater and surface water monitoring, and four rounds of performance monitoring sampling are provided in Appendix A for comparison purposes.

1.1 Purpose of Investigation

The three-phased groundwater monitoring program consists of baseline, performance, and long-term monitoring of volatile organic compound (VOC) levels in the groundwater and in Six Mile Creek. A phased approach is consistent with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) response action process. Monitoring well data are screened against the most stringent of either the New York State Department of Environmental Conservation (NYSDEC) Class GA groundwater criteria or the United States Environmental Protection Agency (EPA) maximum contaminant levels (MCLs) (NYSDEC 2009; EPA 2006), which also represent the remedial action objectives (RAOs) established in the *Final Record of Decision* for this site (EEEPC 2010a). For the contaminants of concern (COCs) at AOC 9, the NYSDEC Class GA criteria for groundwater are the more stringent of the screening criteria (see Table 1-1). Surface water samples are screened against the NYSDEC Class GA groundwater criteria (NYSDEC 2009).

The baseline sampling conducted from July 27 to 29, 2010 consisted of groundwater sampling of eight monitoring wells (G009-MW01, G009-MW02, AOC9-MW05, MW06, MW14, MW15, MW17, and MW18) and surface water sampling of three locations (AOC9-SW01, SW02, and SW03). These groundwater and surface water samples were analyzed to establish baseline VOC concentrations in the groundwater plume and Six Mile Creek before remediation began (EEEPC 2010c).

The performance monitoring was conducted to evaluate the short-term effectiveness of the remediation efforts with a total of four sampling events over two years (May 2011, October 2011, April 2012, and September 2012). The performance monitoring consisted of groundwater sampling of five monitoring wells (AOC9-MW06, MW14, MW15, MW17, and MW19) and surface water sampling of three locations (AOC9-SW01, SW02, and SW03).

The long-term effectiveness of the remediation efforts is monitored during the first three years of annual long-term monitoring with annual sampling events. The long-term monitoring consists of groundwater sampling of nine monitoring wells (G009-MW01, G009-MW02, AOC9-MW05, MW06, MW14, MW15, MW17, MW18, and MW19) and surface water sampling of three locations (AOC9-SW01, SW02, and SW03). This third sampling event is identified as the April 2015 long-term monitoring. Sampling events for the first and second long-term monitoring events were performed in April 2013 and April 2014, respectively.

Following the first three years of annual long-term monitoring, it is anticipated that monitoring will continue on an every-other-year basis, with the next long-term monitoring event to occur in April 2017, until concentrations of hazardous substances in groundwater are below the RAOs. Once the RAOs have been achieved, monitoring will continue until three consecutive rounds of sampling indicate that the concentrations of groundwater contaminants remain below RAOs (for a total of four consecutive sampling rounds). At that point, the Air Force will petition the regulatory agencies for no further action. Modeling performed during evaluation of the remedial alternatives for AOC 9 indicated that the total duration of the remedial action would likely span 11 years beginning in November 2013 with the completion of the remedial action (EEEPC 2010d). While the Monitoring and Remediation Optimization System Software Version 2.2 (MAROS) trends indicate that the remedy is operating successfully, insufficient data is available to determine if RAOs will be met in 11 years (i.e., only two datasets are available since the injection occurred). However, an approximate 98% reduction in total VOC concentration for all wells has been seen since baseline sampling. Total VOC concentration from temporary well TW39 was included as MW19, since MW19 was installed in the location of TW39 and the screened interval for MW19 targets the previously screened interval by TW39.

1.2 AOC 9 Site Description

AOC 9 is a grass-covered area approximately 1,500 feet long and 650 feet wide located in the southwest portion of the inactive Weapons Storage Area (WSA; see Figure 1-1). The site is part of a strip of land that lies between an airplane runway to the southwest and extends into the WSA to the northeast. Perimeter Road runs through the site and Six Mile Creek borders the southwestern edge of the site.

The area comprising AOC 9 was originally farmland in the 1930s before the base was constructed. In the 1940s and 1950s, the first landfill for the base was established beneath the northern portion of the WSA extending south between Perimeter Road and Six Mile Creek. Aerial photographs show that the landfill was active between 1943 and 1957 but no later than 1960. The type of material buried at this site is unknown; however, it is reported that large quantities of the landfill material were removed during construction of the WSA.

Two munitions storage bunkers were erected between Perimeter Road and Six Mile Creek in the early 1950s. One of the bunkers (also referred to as igloos) was removed in the late 1970s or early 1980s (before 1981), and the other bunker was removed in 1992. Although the bunkers were initially used for munitions storage, they were later used to store hazardous materials.

The site's status was changed from "Area of Interest" to "Area of Concern" in 1998 when groundwater samples collected during the Expanded Site Investigation (ESI) were found to contain chlorinated solvents at concentrations exceeding NYSDEC Class GA standards and EPA MCLs (EPA 2006; NYSDEC 2009).

AOC 9 is currently inactive and access is somewhat restricted by Perimeter Road Gates 4 and 11. The southern portion of this area is expected to remain vacant in the future, acting as a buffer zone between the runway and future development in adjacent areas. The northern portion of the site extends into the former WSA boundary and is expected to be zoned as a nonresidential, industrial area.

The ground surface at AOC 9 slopes gently downward toward Six Mile Creek. Groundwater flows southwest toward the creek. Depth to groundwater is approximately 10 to 12 feet but is closer to the ground surface between Perimeter Road and Six Mile Creek. There are several locations in this area where shallow groundwater discharges to the surface. Three intermittent drainageways that discharge to Six Mile Creek exist on the southern portion of the site.

Debris (e.g., glass, slag, bricks, ceramics, cinderblocks, asphalt, concrete, wire, and metal) encountered during test pit excavations in the southern portion of the former landfill (south of the WSA) accounted for less than 1% by volume of excavated material. The lack of waste materials observed from the test pit excavations support reports that the contents of the former WSA landfill had been removed before the WSA was built.

Prior to excavation of the contaminant source area, a contaminated groundwater plume (chlorobenzene, trichloroethylene [TCE], dichloroethylene [DCE]) extended downgradient from AOC 9 for approximately 1,500 feet and covered approximately 14.6 acres. The lateral extent of the plume was approximately 400 feet and the vertical extent range was from ground surface to approximately 20 feet below ground surface (BGS). The leading edge of the plume had reached Six Mile Creek.

The contaminated aquifer is composed of silty-fine to medium-grained sands with little coarse sand with discontinuous gravel seams. North of Perimeter Road, the aquifer is found in an interval from approximately 3 to 28 feet BGS. South of Perimeter Road there is less overburden and the aquifer extends from 1 to 18 feet BGS. A thin till layer above the Utica Shale bedrock underlies the aquifer, but contamination has not been detected in the bedrock.

1.3 AOC 9 Previous Investigation Background

In 1997, an ESI was performed (E & E 1998). The main objective of the ESI was to investigate the nature and extent of environmental contamination from historical releases at the site in order to determine whether any remedial action was necessary to prevent potential threats to human health and the environment arising from exposure to site conditions.

The ESI included the installation and sampling of four permanent monitoring wells. Analytical results indicated the presence of benzene, chlorobenzene, cis-1,2-DCE, 1,2-dichlorobenzene (DCB), 1,3-DCB, 1,4-DCB, tetrachloroethylene (PCE), and TCE in one or more wells in concentrations that exceeded screening criteria. Several metals, including aluminum, iron, manganese, and potassium, were also detected in concentrations that exceeded screening criteria in one or more wells.

In 2000, a Supplemental Investigation (SI) was performed. A total of 88 Geoprobe and six Hydropunch groundwater screening samples were collected from 45 locations. Twenty-six of the 45 locations were vertically profiled (i.e., up to three samples were collected from different depths at the same location). In addition, four new monitoring wells were installed and sampled, and four existing monitoring wells were resampled. Analytical results for the Geoprobe/samples indicated the presence of 16 VOCs at levels exceeding the most stringent criteria. Analytical results for the monitoring wells indicated the presence of 14 VOCs and five metals at concentrations exceeding the most stringent screening criteria.

In 2002, a second SI was performed to collect additional data to further delineate the chlorinated hydrocarbon plume and determine if petroleum hydrocarbons were present within the groundwater. A total of 56 Geoprobe groundwater screening samples were collected from 14 locations. Eleven of the 14 locations were vertically profiled (i.e., up to five samples were collected from different depths at the same location). Analytical results for the Geoprobe samples indicat-

ed the presence of 15 VOCs at levels that exceeded the most stringent screening criteria.

Based on these results, the overall shape of the contaminant plume at that time appeared to be linear and oriented northeast/southwest (approximately 850 feet long) with a relatively narrow center. The downgradient portion appeared to be the widest due to natural dispersion and the change in direction of groundwater flow in proximity to the creeks. Subsequent investigations provided additional data to better define the entire plume.

During the SI, five test pits were excavated to the water table and groundwater samples were collected to determine if petroleum hydrocarbons were present within the groundwater. Analytical results indicated that there was no significant petroleum hydrocarbon contamination in the test pit samples.

During the first predesign investigation (PDI) conducted in September through November 2006 by EEEPC, four additional groundwater monitoring wells (MWs; AOC9-MW14 through MW17) were installed at the site. Twenty-three different VOCs were detected in at least one of the groundwater samples collected during this investigation. The highest concentrations of total VOCs (1,2-DCB, 1,4-DCB, chlorobenzene, and benzene) were detected in presumed upgradient wells MW14 and MW15 at 2,082 micrograms per liter (µg/L) and 1,989 µg/L, respectively. These concentrations at presumed upgradient wells prompted further investigation and a potential source of groundwater contamination was found in the soil upgradient of Six Mile Creek and Perimeter Road. Two additional PDIs were conducted to determine the extent and nature of this source.

The second predesign investigation (PDI 2) was performed in February through April 2007. This study included the installation of 25 temporary monitoring wells and identified areas containing significantly higher levels of chlorobenzene and related compounds east of Building 913. Monitoring wells TW39 and TW32 had chlorobenzene concentrations of 14,400 µg/L and 8,580 µg/L, respectively. These concentrations were five to 10 times higher than the highest concentrations historically detected at AOC 9.

A third predesign investigation (Additional PDI) was performed in June through October 2007 to better define the plume and further identify the potential soil contaminant source area. During this investigation, a total of 56 new temporary monitoring wells were installed around the site. Twenty-two different VOCs were detected in the groundwater samples collected from the temporary monitoring wells at concentrations exceeding the groundwater standards. The highest total VOC concentrations were detected in groundwater samples collected from temporary wells TW45 (3,100 µg/L), TW71 (3,300 µg/L), and TW100 (3,400 µg/L). In addition, 42 boreholes were installed in the soil and soil cores were screened continuously with a photoionization detector and flame ionization detector (PID/FID) from ground surface to refusal (in the glacial till layer, approximately between 20 and 30 feet BGS). Samples were taken at depth intervals where the highest

PID/FID readings were measured. Twelve VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-DCB, 1,3-DCB, 1,4-DCB, chlorobenzene, ethylbenzene, naphthalene, n-butylbenzene, n-propylbenzene, sec-butylbenzene, and toluene) were detected at concentrations exceeding screening criteria in the soil samples collected from the 42 soil borings. The highest total VOC concentrations were detected in soil samples collected from boreholes SB01 (1,100 milligrams/kilogram [mg/kg]) and SB12 (1,600 mg/kg) with chlorobenzenes representing the largest fraction of VOCs. The sample results and field observations indicated that there was a 6-foot-thick gray-to-black smear zone of contamination at the top of the saturated zone, which is located at depths ranging from 8 to 17 feet BGS.

Based on the above PDIs, the soil east of Building 913 was identified as the source of the AOC 9 groundwater contamination.

Baseline sampling was conducted at AOC 9 from July 27 to July 29, 2010, to establish baseline VOC concentrations in the groundwater plume and Six Mile Creek, before the remedial action (source excavation) began on September 1, 2010 and are presented in the *Final Baseline Monitoring Data Summary Report, AOC 9 Former Griffiss Air Force Base, Rome, New York* (EEEPC 2010c). Baseline sampling consisted of sampling eight monitoring wells (G009-MW01, G009-MW02, AOC9-MW05, MW06, MW14, MW15, MW17, and MW18) and three surface water (SW) locations (AOC9-SW01, SW02, and SW03). Groundwater and surface water samples were analyzed for VOCs (EPA Method SW8260B).

Twenty-one VOCs, including chlorobenzene; 1,2-DCB; 1,4-DCB; TCE; PCE; and several petroleum compounds including benzene, toluene, ethylbenzene, and xylene (BTEX) were detected in the groundwater samples collected. Eleven of the contaminants were detected in at least one sample at concentrations exceeding NYSDEC Class GA Groundwater standards. The highest total VOC concentrations were detected in monitoring wells MW14 (2,100 µg/L), MW15 (1,700 µg/L), and MW17 (890 µg/L). Monitoring wells MW14, MW15, and MW17 are located in the center of the plume downgradient of the contaminant source area (see Figure 1-2 in Appendix A).

A comparison of baseline analytical results to the historical analytical results indicated that the AOC 9 groundwater plume had, in general, remained relatively stable. Based on the analytical results obtained from monitoring wells MW01 and MW02, the plume did not appear to have widened south of Perimeter Road, nor does the leading edge of the plume appear to have continued to advance based on the analytical results obtained from monitoring wells MW05 and MW06. Surface water sample results obtained from sample locations SW01, SW02, and SW03 have also been relatively consistent. The upstream location (SW01) has had total VOC concentrations ranging from non-detect to 1.78 µg/L. The location where the center of the groundwater contaminant plume intersects Six Mile Creek (SW02) has had total VOC concentrations ranging from non-detect to 5 µg/L, and sample location SW03, at the downstream edge of the groundwater plume's inter-

section with Six Mile Creek has had total VOC concentrations ranging from non-detect to 4 µg/L.

1.4 AOC 9 Remedial Design and Monitoring Summary

The remedial design included removal of the source area through excavation of contaminated soil, which was completed in December 2010, treatment of contaminated groundwater using chemical oxidation, which was completed in November 2013, and land use controls (EEEPC 2010d). Additionally, three groundwater and surface water monitoring phases, baseline sampling, performance monitoring, and long-term monitoring, will be performed in conjunction with the remedial action as described in the *Final Work Plan Baseline, Performance, and Long-Term Monitoring at AOC 9* (EEEPC 2010e). Baseline sampling was conducted to provide a snapshot of the groundwater contaminant levels prior to implementation of the remedial action for comparison to the groundwater monitoring, which will be performed after the remedial action. The May 2011, October 2011, April 2012, and September 2012 performance monitoring events were performed to evaluate the short-term effectiveness of the remediation efforts; by confirming the downward trend during the first two years following excavation, and determining which of the RAOs have been or have not been achieved, for each monitoring well sampled. The long-term monitoring will be performed to monitor the long-term effectiveness of the remediation efforts. The first and second long-term monitoring events were completed in April 2013 and April 2014, respectively.

As described in the work plan for the current contract, a total of eight sampling events are currently planned: one baseline sampling, four biannual performance monitoring, and three annual long-term monitoring. However, following the first three years of annual long-term monitoring, it is anticipated that monitoring will continue on an every-other-year basis by a new contractor until concentrations of hazardous substances in groundwater are below RAOs. After reaching the RAOs, the monitoring will again be performed until three consecutive rounds of sampling indicate that the concentrations of groundwater contaminants remain below the RAOs (for a total of four consecutive sampling rounds), allowing for unrestricted use of the site (EEEPC 2010e). If an increasing trend in contaminants of concern concentration is identified in any monitoring well or surface water sampling location (e.g., three consecutive monitoring events showing a statistically increasing trend), the Air Force will propose to the EPA and NYSDEC that additional action be performed. Additional oxidant injections or additional excavations may be executed without requiring either an Explanation of Significant Differences or Record of Decision amendment (EEEPC 2010a).

Additional activities at this site included installation and development of two new permanent monitoring wells (AOC9-MW18 and MW19). Monitoring well MW18 was installed by Parsons, prior to the baseline sampling, east of the treatment area and serves as an upgradient well (see Figure 2-1 for well locations). Total VOC concentration during baseline sampling in MW18 was 3.2 µg/L. The remedial action at AOC 9 was conducted following the installation of MW18. Well MW19 was installed in the spring 2011, prior to the May 2011 performance

sampling, following the remedial excavation in the eastern portion of the groundwater contaminant source area at the location of former temporary well TW39, to function as a former source area well (see Figure 2-1 for well locations). The screened interval in MW19 targets the interval previously screened by temporary well TW39 (9.3 to 19.3 feet BGS), which contained a total VOC concentration of 21,610 µg/L. MW19 was constructed with a 10-foot (0.01-inch slot) PVC screen in accordance with USACE protocols.

All existing monitoring wells were surveyed by the subcontractor, LaFave White & McGivern, during previous investigations to obtain horizontal locations and vertical elevations of each monitoring well. The surveys utilized the existing benchmarks located on Griffiss AFB and are in the New York Central North American Datum 83 State Plane coordinate system. Horizontal measurements and vertical measurements were obtained to accuracy of 0.001 foot and 0.01 foot, respectively.

Table 1-1 AOC 9 Groundwater Cleanup Goals/Remedial Action Objectives

Contaminants of Concern[a]	Groundwater Cleanup Goal[b] (µg/L)
1,2-Dichlorobenzene	3
1,2-Dichloroethane	0.6
1,2,4-Trimethylbenzene	5
1,3,5-Trimethylbenzene	5
1,3-Dichlorobenzene	3
1,4-Dichlorobenzene	3
Acetone	50
Benzene	1
Chlorobenzene	5
cis-1,2-Dichloroethylene	5
Ethylbenzene	5
Isopropylbenzene	5
Methylene Chloride	5
Naphthalene	10
n-Butylbenzene	5
n-Propylbenzene	5
o-Xylene	5
sec-Butylbenzene	5
Trichloroethylene	5
tert-Butylbenzene	5
Tetrachloroethylene	5
Vinyl Chloride	2
Xylene (Total)	5

Notes:
[a] From the *Final Record of Decision for Area of Concern 9 (SD-62)* (EEEPC 2010a).
[b] New York State Department of Environmental Conservation (NYSDEC 2009) Class GA groundwater standard.

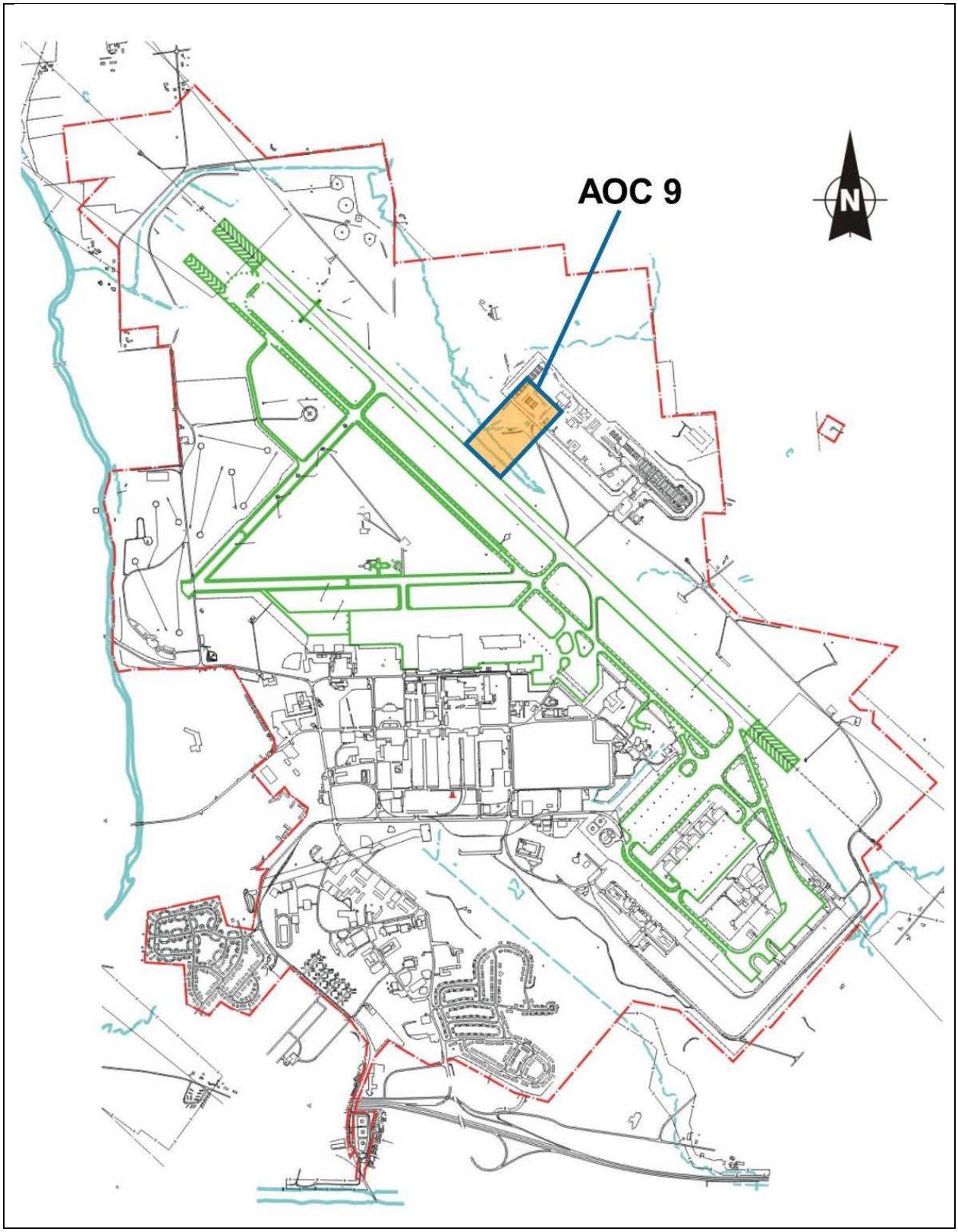


Figure 1-1 AOC 9, Former Griffiss Air Force Base, Rome, New York

2 AOC 9 Long-Term Monitoring Activities

This section presents the field activities performed during the AOC 9 April 2015 long-term monitoring (see Appendix B, Daily Activity Forms). The work performed at AOC 9 described in this report was performed in accordance with the work plan (EEEPC 2010e), with minor deviations from the work plan described in Section 2.5.

2.1 Scope of Work

April 2015 long-term sampling was conducted at AOC 9 in accordance with the work plan as described in Section 1.4 (EEEPC 2010e). Long-term sampling consisted of sampling nine monitoring wells (G009-MW01, MW02, AOC9-MW05, MW06, MW14, MW15, MW17, MW18, and MW19) and three surface water locations (AOC9-SW01, SW02, and SW03; see Figure 2-1):

- Wells MW01 and MW02 were sampled to monitor the width of the contaminant plume and the effectiveness of the remedial action in the lateral portions of the plume.
- Wells MW05 and MW06 were sampled as sentinel wells to evaluate the stability of the leading edge of the contaminant plume and to monitor the effectiveness of the remedial action in the area downgradient of the remedial action treatment area.
- Wells MW14, MW15, and MW17 were sampled to monitor the effectiveness of the remedial action in the center of the plume in the area being treated during the remedial action and downgradient of the treatment area.
- Well MW18 was sampled to monitor contaminant concentrations upgradient of the groundwater plume.
- Well MW19 was sampled to monitor the effectiveness of the remedial action in the center of the former source area, following completion of the source area excavation.
- Surface water sample locations SW01 through SW03 were sampled to monitor contaminant concentrations within Six Mile Creek.

April 2015 long-term sampling results, in conjunction with the results from the previous four performance monitoring and first (April 2013) and second (April

2014) long-term sampling events will be used to continue to evaluate the effectiveness of the remediation efforts. Sampling was conducted from April 6 to 8, 2015.

2.1.1 Groundwater Sampling

Groundwater samples were collected from MW01, MW02, MW05, MW06, MW14, MW15, MW17, MW18, and MW19 and analyzed by Katahdin Analytical Services, located in Scarborough, Maine. Groundwater samples were analyzed for VOCs (EPA Method SW8260B), in accordance with the *Final Work Plan, Baseline, Performance, and Long-Term Monitoring at AOC 9* (EEEPC 2010e). Prior to collection of the groundwater samples, a minimum of three well volumes of groundwater was purged from each well using EPA low-flow procedures. The wells were purged and sampled with a pump/controller and dedicated bladder pumps and associated tubing. Field parameters (i.e., turbidity, pH, temperature, conductivity, oxidation reduction potential [ORP], and dissolved oxygen [DO]) were collected and recorded on groundwater sampling forms during purging. The completed groundwater sampling forms are provided in Appendix C and a complete list of samples collected is provided in Table 2-1. Static water levels were also measured and recorded for each monitoring well listed on Table 2-2 to create a current groundwater contour map (see Figure 2-2). A photograph of each groundwater sample collected is provided in Appendix D in accordance with USACE protocols.

2.1.2 Surface Water Sampling

Surface water samples were collected from SW01 through SW03, and analyzed by Katahdin Analytical Services. Surface water samples were analyzed for VOCs (EPA Method SW8260B), in accordance with the work plan (EEEPC 2010e). The samples were collected by filling a dedicated sample jar with water directly from Six Mile Creek, then transferring the creek water to pre-preserved approved sample containers, leaving no head space. Field parameters (i.e., turbidity, pH, temperature, conductivity, ORP, and DO) were collected and recorded during sampling. The completed surface water sampling forms are provided in Appendix C and a complete list of samples collected is provided in Table 2-1.

2.1.3 Groundwater Elevation Measurements

Groundwater elevations were collected in accordance with the work plan (EEEPC 2010e) by measuring the depth to water at 16 locations (see Table 2-2) using an electronic water level indicator to measure the static water levels from the top of the casing at each location. These measurements were used to create groundwater contour maps for each event (see Figure 2-2).

2.1.4 Well Inspections and Maintenance

During groundwater elevation measurements, inspections were performed at each permanent well location and recorded on the well status log (see Appendix E). Any necessary well maintenance activities were completed by Parsons on September 30 to October 1, 2015. A summary of all work completed is provided in Appendix E.

2.2 Equipment Decontamination

Equipment decontamination was performed in accordance with the work plan (EEEPC 2010e).

Groundwater and surface water field testing instruments were decontaminated by rinsing the water level indicator, flow-through cell and pH, temperature, conductivity, DO, and ORP probes with deionized water between each use.

2.3 Investigation Derived Waste

Investigation-derived water was handled in accordance with the work plan (EEEPC 2010e). Purge water generated during groundwater sampling was collected in 5-gallon buckets and field-screened with a PID to evaluate if it was contaminated. PID readings were taken directly from the surface of the collected purge water. No PID readings above zero parts per million were detected from the field screening of the purge water; therefore, water was discharged to the ground adjacent to the sampled well.

2.4 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) samples were collected in accordance with the work plan (EEEPC 2010e). Analytical data have been validated for samples collected as part of this investigation. Raw data and the Data Usability Summary Report (DUSR) are presented in Appendices F and G, respectively.

Field QC samples included two groundwater duplicates and one trip blank during the April 2015 sampling event. Duplicate samples provide insight as to the homogeneity of the sample matrix and establish a degree of confidence that the sample represents site conditions. Field duplicates were collected at the rate of one duplicate per 10 original samples (10%); therefore, two duplicates were collected for the nine groundwater and three surface water samples collected. The field duplicate collected during April 2015 showed good precision.

A trip blank was collected to establish that the transport of sample containers to and from the field did not result in the contamination of the sample from external sources. No compounds were detected in the trip blank for the April 2015 sampling event.

A few sample results were qualified “J” as estimated because of minor calibration deviations, laboratory control sample recovery and matrix spike recoveries. Some results that are deemed to be estimated are reported to be above the site clean-up goals, therefore, no significant impact of data usability is deemed to have occurred. Other results that are in the range of site clean-up goals could impact usability of the results to evaluate whether concentrations exceed site clean-up goals. The results should be usable with supporting data, trend analysis, and evaluation of laboratory error.

2.5 Work Plan Deviations

For the April 2015 sampling event, groundwater measurements were only collected from the 16 permanent monitoring wells on site. Measurements were not taken at temporary wells or piezometers as called for in the work plan, as many of them were removed during the remedial excavation. Approval for this change was received from the USACE prior to the start of the previous performance monitoring sampling rounds; therefore, a field adjustment form was not generated. There were no other deviations to the work plan during the April 2015 sampling event.

2.6 PermeOx Injection Pre-Design Sampling Summary

Prior to the PermeOx injections, pre-design sampling was conducted by Parsons. Pre-design sampling was completed in May 2013 for use by Parsons in designing the injection mixture. Groundwater samples were collected from MW-14 and MW-19 and a soil sample was collected near MW-14. Results of this sampling are presented in Table 2-3.

Based on these results, Parsons determined that PermeOx injected within the 100-parts-per-billion total VOC contour immediately downgradient of the source area would be the preferred treatment method. The PermeOx injection was used for two reasons: it creates an oxygen-rich environment, which allows for chlorobenzene reduction through aerobic microbe degradation; and it is more persistent, allowing it to treat the site over a one-year period. The injection was completed November 5 to 18, 2013. Information describing the PermeOx injections can be found in Appendices I and J of the April 2014 LTM Report (EEEPC 2015).

Table 2-1 AOC 9 Long-Term Monitoring, Groundwater and Surface Water Sample Summary, Former Griffiss Air Force Base, Rome, New York

Monitoring Well			Analyses
Sample Number	Screen Interval (feet BGS)	Comment	TCL VOCs – SW8260B
April 2015 Long-Term Monitoring			
G009-MW01LTM040715	4.0-9.0		X
G009-MW02LTM040715	4.0-9.0		X
AOC9-MW05LTM040615	4.0-14.0		X
AOC9-MW06LTM040715	4.2-14.2		X
AOC9-MW14LTM040815	14.0-24.0		X
AOC9-MW15LTM040715	9.0-14.0		X
AOC9-MW15/DLTM040715	9.0-14.0	Duplicate	X
AOC9-MW17LTM040715	9.0-14.0		X
AOC9-MW17/DLTM040715	9.0-14.0	Duplicate	X
AOC9-MW18LTM040815	9.0-19.0	MS/MSD	X
AOC9-MW19LTM040815	9.0-19.0		X
AOC9-SW01LTM040615	-		X
AOC9-SW02LTM040615	-		X
AOC9-SW03LTM040615	-		X
AOC9-TB1-040615	-	Trip Blank	X

Key:

AOC = area of concern
BGS = below ground surface
/D = duplicate
MS/MSD = matrix spike/matrix spike duplicate
TB = trip blank
TCL = target compound list
VOC = volatile organic compound

Table 2-2 AOC 9 Long-Term Monitoring Groundwater Elevation Data, Former Griffiss Air Force Base, Rome, New York

Monitoring Well ID	Date	Ground Surface Elevation (feet AMSL)	Water Level (feet bgs)	Water Level Elevation (feet AMSL)	Comments
April 2015 Long-Term Monitoring					
G009-MW01	4/6/2015	492.67	-0.36	493.03	Negative value indicates water was above ground surface.
G009-MW02	4/6/2015	494.54	4.24	490.30	
G009-MW03	4/6/2015	485.10	0.89	484.21	
G009-MW04	4/6/2015	483.97	7.61	476.36	
AOC9-MW05	4/6/2015	482.72	3.17	479.55	
AOC9-MW06	4/6/2015	482.57	4.85	477.72	
AOC9-MW07	4/6/2015	483.25	3.12	480.13	
AOC9-MW08	4/6/2015	514.28	8.53	505.75	
AOC9-MW12	4/6/2015	509.09	4.20	504.89	
AOC9-MW13	4/6/2015	508.53	3.41	505.12	
AOC9-MW14	4/6/2015	519.05	12.14	506.91	
AOC9-MW15	4/6/2015	500.04	1.05	498.99	
AOC9-MW16	4/6/2015	497.31	1.42	495.89	
AOC9-MW17	4/6/2015	487.51	1.74	485.77	
AOC9-MW18	4/6/2015	527.84	12.48	515.36	
AOC9-MW19	4/6/2015	523.38	9.73	513.65	

Key:

AMSL = above mean sea level
AOC = area of concern
BGS = below ground surface
MW = monitoring well

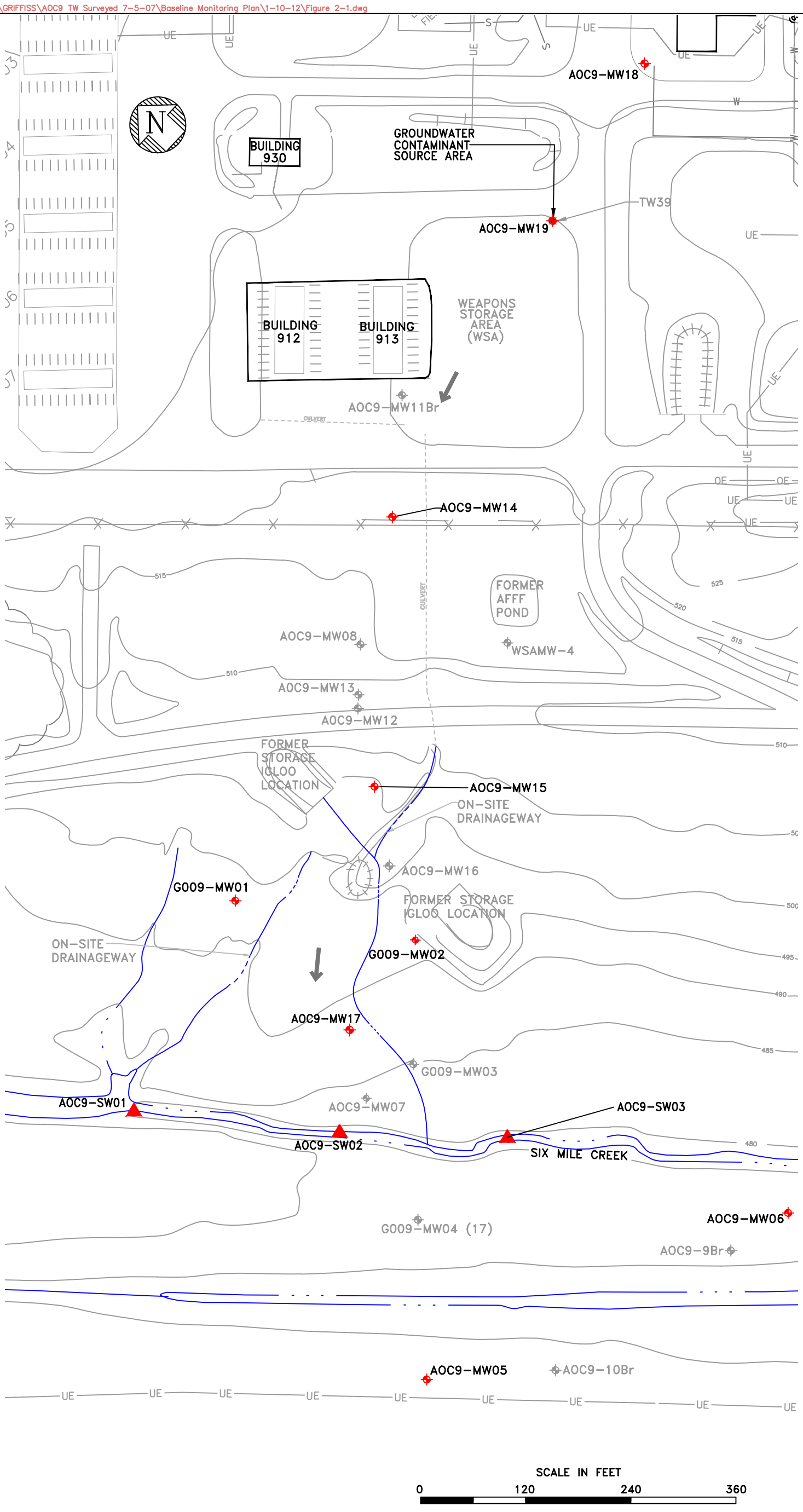
Table 2-3 PermeOx Injection Pre-Design Sampling Results

Parameter	Units	AOC9-MW14 05/02/13	AOC9-MW19 05/02/13	GAFB-AOC9-SS001 05/02/13
Alkalinity	mg/L	220	300	-
Chemical Oxygen Demand	mg/L	10 U	10 U	-
Dissolved Oxygen	mg/L	6.6	7.4	-
Ferrous Iron	mg/L	0.053 J	0.05 U	-
Hardness	mg/L	200	180	-
Oxidation-Reduction Potential (ORP)	mV	241	276	-
Total Biochemical Oxygen Demand	mg/L	20.71	0.81 J	-
Total Organic Carbon (TOC)	mg/L	2.6	3.2	-
pH (laboratory)	pH	7.7	7.4	-
TOC in Soil	µg/gdrywt	-	-	910
Total Solids	%	-	-	95

Key:

- = not applicable
% = percent
J = estimated value
mg/L = milligram per liter
mV = millivolt
U = non-detect
µg/gdrywt = microgram per gram dry weight

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 2-1.dwg



LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- AOC9-MW14 — LONG-TERM MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- GROUNDWATER FLOW DIRECTION
- SURFACE WATER SAMPLING LOCATIONS
- TW39 — TEMPORARY MONITORING WELL

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.

SCALE IN FEET

0 120 240 360

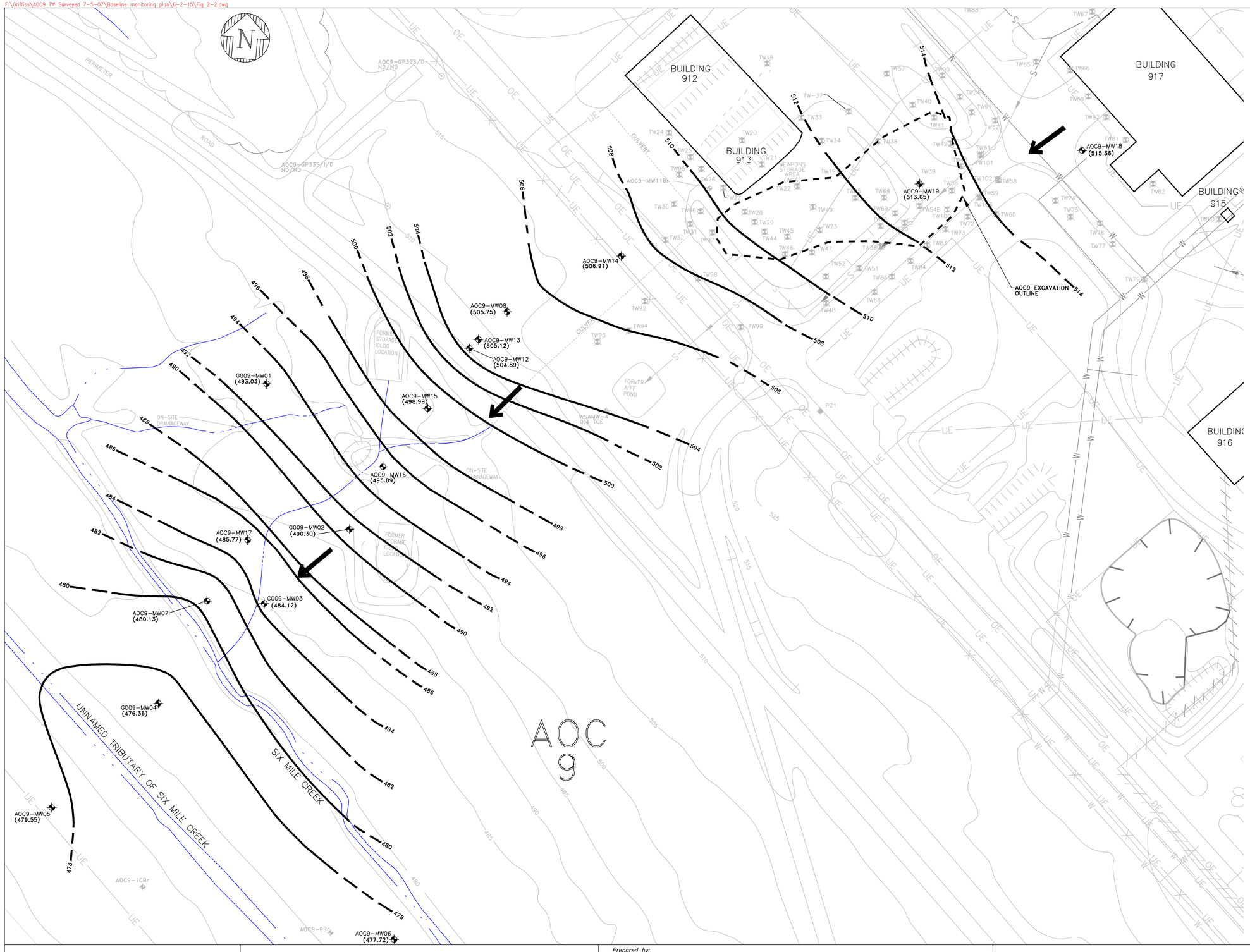
FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE:
AOC 9
LONG-TERM MONITORING
SAMPLE LOCATION MAP

FIGURE 2-1

F:\Griffiss\AOC9_TW_Surveyed_7-5-07\Baseline_monitoring_plan\6-2-15\Fig_2-2.dwg



LEGEND

- FENCE
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- UE — UNDERGROUND ELECTRIC
- W — WATER LINE
- S — SANITARY SEWER
- OE — OVERHEAD ELECTRIC
- ABANDONED UNDERGROUND ELECTRIC
- AMSL — ABOVE MEAN SEA LEVEL
- 476 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DIRECTION OF GROUNDWATER FLOW
- G009-MW01 — PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- TW44 — TEMPORARY MONITORING WELL LOCATION
- PZ-1 — PIEZOMETER LOCATION
- (517.35) — APRIL 6, 2015 GROUNDWATER ELEVATION (FEET AMSL)
- (NM) — NOT MEASURED

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 4/6/2015.

60 0 60 120

SCALE: 1"=60'

GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by: ecology and environment engineering p.c.

In Association with: parsons

DRAWING TITLE:
AOC 9: GROUNDWATER CONTOUR MAP
APRIL 6, 2015

FIGURE 2-2

3 AOC 9 Long-Term Monitoring Findings

This section presents the results from the April 2015 long-term monitoring conducted at AOC 9 at the former Griffiss AFB in Rome, New York, as described in Section 2.

The AOC 9 April 2015 long-term monitoring was intended to evaluate the long-term effectiveness of the remediation efforts on VOC concentrations in the groundwater and Six Mile Creek. The AOC 9 April 2015 long-term monitoring groundwater data are screened against the most stringent of either the NYSDEC Class GA groundwater criteria or the EPA MCLs. For groundwater COCs at AOC 9, the NYSDEC Class GA criteria are the more stringent of the screening criteria. Surface water data is screened against the NYSDEC Class GA groundwater criteria. Data collected during the AOC 9 April 2015 long-term monitoring have been provided by the laboratory in Environmental Restoration Program Information Management System (ERPIMS)-compatible format. The April 2015 long-term monitoring data was added to the Air Force database (ERPIMS) in June 2015.

3.1 April 2015 Long-Term Monitoring

3.1.1 Groundwater Sampling Results

Eleven groundwater samples (includes two duplicate samples) were collected from nine monitoring wells and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. The purpose of the groundwater sampling was to evaluate VOC concentrations within the contaminant plume following the remedial excavation activities and subsequent PermeOx injection. The groundwater samples were collected between April 6 and 8, 2015.

Groundwater samples were collected from monitoring wells screened predominately in very fine- to medium-grained sand at depths ranging from 4 to 24 feet BGS and constructed with either a 5-foot or a 10-foot (2-inch diameter, 0.01-inch slot) PVC screen. Each sample was analyzed for VOCs (EPA Method SW8260B) as described in Section 2. A summary of the positive analytical results for April 2015 long-term groundwater samples is presented in Table 3-1. Historical groundwater sampling results are presented in Table 3-3. Figure 2-1 shows the locations of the monitoring wells.

The completed groundwater sampling forms are provided in Appendix C; the complete analytical data are included on compact disk (CD) in Appendix F; a complete list of samples collected is provided in Table 2-1; and Figure 3-1 shows the locations of the monitoring wells with total VOC contaminant concentrations.

The primary COCs for AOC 9 include; chlorobenzene, 1,2-DCB, 1,4-DCB, and TCE, which constitute approximately 97% of the total VOCs detected on site within the center line of the plume. Figure 3-1 illustrates the total VOC concentrations in groundwater based on the analytical data obtained during the April 2015 long-term monitoring event and the historical Geoprobe data that was used to generate the non-detect contour lines.

Source Area Well (MW19)

Seven VOCs were detected in the groundwater sample collected at MW19. However, only chlorobenzene (33 µg/L) exceeded NYSDEC Class GA groundwater standards.

Upgradient Well (MW18)

One VOC, chlorobenzene was detected in the groundwater samples collected at MW18 at a concentration of 0.25 µg/L, which is below the screening criteria of 5 µg/L.

Center Line of Plume (Downgradient of Source Area) Wells (MW14, MW15, and MW17)

Twelve VOCs, including the four primary COCs, chlorobenzene, TCE, and 1,2-DCB, and 1,4-DCB were detected in the groundwater samples collected. Six of the contaminants exceeded the NYSDEC Class GA groundwater standards. Chlorobenzene, 1,2-DCB, and 1,4-DCB exceeded the screening criteria in all three monitoring wells. TCE (18 µg/L) only exceeded the screening criteria in MW17. Benzene (2.9 and 1.3 µg/L, respectively) exceeded the screening criteria in both MW14 and MW15. The highest total VOC concentrations were detected in monitoring wells MW17 (210 µg/L), MW14 (170 µg/L), and MW15 (150 µg/L) during this April 2015 sampling event.

Sentinel (Downgradient) Wells (MW05 and MW06)

Three contaminants were detected in the sentinel groundwater samples collected at MW05 and MW06 including one primary COC. TCE (0.76 µg/L), a primary COC, was only detected at MW06, however, it did not exceed the screening criteria. Carbon disulfide and cis-1,2-DCE were detected in both MW05 and MW06. No contaminant exceeded the screening criteria.

Lateral Wells (MW01 and MW02)

One contaminant, TCE, was detected in both MW01 (0.40 µg/L) and MW02 (0.29 µg/L). TCE is a primary COC; however, concentrations detected do not exceed the screening criteria. No other contaminants were detected in the lateral wells.

Groundwater Elevation Measurements

Groundwater elevations were collected in accordance with the work plan by measuring the depth to water at 16 locations (see Table 2-2) using a water level indicator to measure the static water levels from the top of the casing at each location. These measurements were used to create a groundwater contour map (see Figure 2-2).

Based on these data, the groundwater on the site flows generally to the southwest from the vicinity of Building 917, through the AOC 9 contaminant source area, and ultimately towards Six Mile Creek. The depth to groundwater and direction of groundwater flow has remained consistent following the excavation and backfill of the contaminant source area, while exhibiting typical seasonal variations.

3.1.2 Surface Water Sampling Results

Three surface water samples were collected from Six Mile Creek (SW01, SW02, SW03) and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. The purpose of the surface water samples collected was to establish April 2015 long-term monitoring VOC concentrations within Six Mile Creek following the remedial excavation activities. The surface water samples were collected on April 6, 2015.

Figure 2-1 shows the location of the surface water sampling locations and Figure 3-1 shows the total VOC contaminants in surface water based on analytical data obtained from this sampling event.

Three VOCs were detected in the surface water samples collected during this investigation (see Table 3-2). Chlorobenzene was detected in surface water samples SW02 and SW03 (0.40 µg/L and 0.61 µg/L, respectively). Acetone was also detected in samples SW02 and SW03 (4.3 µg/L and 3.4 µg/L, respectively). Carbon disulfide was detected in surface water sample SW03 (0.36 µg/L). There is no screening criterion for carbon disulfide. Chlorobenzene and acetone were detected at concentrations below the screening criteria.

The completed surface water sampling forms are provided in Appendix C, the complete analytical data are included on CD in Appendix F, a complete list of samples collected is provided in Table 2-1, a summary of the positive analytical results for the surface water samples is presented in Table 3-2, and Figure 3-1 shows the locations of the surface water sample locations with total VOC concentrations.

3.1.3 Trend Analysis

Available historic data collected from monitoring wells MW01, MW02, MW05, MW06, MW014, MW15, MW17, MW18, and MW19 and surface water sample locations SW01, SW02, and SW03 are provided in Tables 3-3 and 3-4, respectively. Data collected in 2003 during the groundwater treatability study, during which Fenton's reagent was injected into the groundwater in the vicinity of moni-

toring well MW08, have not been included in the historical data summary tables as the analytical results were impacted by the treatability study.

However, available data for each sample location, excluding MW05 as it has historically been non-detect until this sampling event, have been plotted on trend graphs and are provided in Figures 3-5 through 3-12. Data from the earliest sampling event identified on Table 3-3 to the current sampling event is provided for all wells. MW19 was first sampled during the May 2011 performance monitoring event, although data from TW39 (temporary well previously at the same location and screened over the same depth BGS as the current permanent monitoring well) is provided on Table 3-3 under the 2006 sampling event. The trend graphs show total VOC concentration for each sampling event and a discussion of the changes observed is described below.

Source Area Well (MW19)

Initial high contaminant concentrations detected at this location, prior to the remedial excavation, dropped significantly after excavation was completed and total VOCs have stabilized at less than 100 µg/L. MW19, installed following the remedial excavation, was first sampled during the first performance monitoring event. The total VOC concentration detected during that first performance sampling in May 2011 was 31 µg/L. The total VOC concentration in MW19 increased during both the second and third rounds of performance monitoring, 42 µg/L and 57 µg/L, respectively, before showing a slight decrease in total VOC concentration (43 µg/L) during the fourth round of performance monitoring in September 2012. During the first round of long-term monitoring, MW19 had an increase in total VOC concentrations (69 µg/L). During the second round of long-term monitoring, MW19 decreased in total VOC concentrations (36 µg/L). During this third round of long-term monitoring, MW19 remained relatively stable in total VOC concentrations (39 µg/L) (see Figure 3-12).

Upgradient Well (MW18)

MW18, installed prior to the remedial excavation and baseline sampling, was first sampled during the baseline event. MW18 was not sampled as part of the performance monitoring program. The total VOC concentration detected during the baseline event in July 2010 was 3.2 µg/L. During the first and second rounds of long-term monitoring, MW18 total VOC concentrations had decreased and remained non-detect. During this third round of long-term monitoring, total VOC concentrations increased to 0.25 µg/L (see Figure 3-11).

Center Line of Plume (Downgradient of Source Area) Wells (MW14, MW15, and MW17)

Initial high contaminant concentrations in MW14 dropped significantly following the remedial excavation and continued to drop to a total VOC concentration of less than 50 µg/L, following the PermeOx injections performed in November 2013. During this sampling round, MW14 showed an increase in concentration, primarily due to an increase in the concentration of chlorobenzene. Since baseline sampling at MW14 in July 2010; chlorobenzene has decreased in concentra-

tion from 1,400 to 150 µg/L, 1,2-DCB has decreased from 130 to 10 µg/L, 1,4-DCB has decreased from 87 to 8.9 µg/L, and TCE has decreased from 28 to non-detect. The total VOC concentration in MW14 decreased from 2,100 µg/L during baseline sampling to 170 µg/L during this third long-term monitoring sampling event.

Three primary COCs (chlorobenzene, 1,2-DCB, and 1,4-DCB) exceeded the screening criteria during this April 2015 performance monitoring event for MW-14. However, they have all decreased in concentration from the first long-term monitoring to the third long-term monitoring sampling event, but have shown an increase from the second long-term monitoring to the third long-term monitoring sampling event (chlorobenzene 31 µg/L to 150 µg/L; 1,2-DCB 4.8 µg/L to 10 µg/L; and 1,4-DCB 4.7 µg/L to 8.9 µg/L) (see Figure 3-8).

MW15 has shown a decrease in concentration in three of the primary COCs since baseline sampling. Chlorobenzene has decreased in concentration from 1,300 to 120 µg/L, 1,4-DCB has decreased from 64 to 14 µg/L, and 1,2-DCB decreased from 55 to 16 µg/L. TCE also decreased in concentration since baseline sampling from 2.0 to 0.28 µg/L. The total VOC concentrations at MW15 decreased from 1,700 µg/L, during baseline sampling, to 150 µg/L during this third long-term monitoring sampling event (see Figure 3-9).

MW15 increased in concentration in all of the primary COCs from the fourth performance monitoring sampling event to the first long-term monitoring event. However, the concentrations of the primary COCs (and total VOC concentrations) have continued to decrease from the first long-term monitoring event to this third long-term monitoring event.

MW15 has shown a decrease in concentration in three of the primary COCs, with all three exceeding the screening criteria since the first long-term monitoring event in April 2013. Chlorobenzene has decreased in concentration from 380 to 120 µg/L, 1,4-DCB has decreased from 24 to 14 µg/L, and 1,2-DCB has decreased from 73 to 16 µg/L. TCE has also decreased from the second long-term monitoring to this third long-term monitoring sampling event (0.83 to 0.28 µg/L, respectively). At the same time, total VOC concentrations at MW15 decreased from 490 to 150 µg/L (see Figure 3-9).

MW17 has shown a decrease in concentration in three of the primary COCs since baseline sampling in July 2010. Chlorobenzene has decreased in concentration from 760 to 130 µg/L, 1,4-DCB has decreased from 38 to 8.9 µg/L, and 1,2-DCB has decreased from 50 to 44 µg/L. TCE has shown fluctuations in concentration since baseline sampling. Over the same time period, total VOC concentrations at MW17 decreased from 890 to 210 µg/L.

MW17 has shown a decrease in concentration in three of the primary COCs, with all three exceeding the screening criteria since the first long-term monitoring event in April 2013. Chlorobenzene has decreased in concentration from 180 to

130 µg/L, 1,4-DCB has decreased from 12 to 8.9 µg/L, and 1,2-DCB has decreased from 60 to 44 µg/L. However, TCE has increased slightly from 15 to 18 µg/L. At the same time, total VOC concentrations at MW17 decreased from 270 to 210 µg/L. Historically, total VOC concentrations in MW17 have fluctuated, but there has been an overall decrease since baseline sampling in July 2010 (see Figure 3-10).

Sentinel (Downgradient) Wells (MW05 and MW06)

Total VOC concentrations have remained non-detect in MW05 for all sampling events through the second long-term monitoring event. During this third long-term monitoring event, total VOCs were detected at 1.4 µg/L.

Total VOC concentrations detected at MW06 were 1.0 µg/L during the baseline sampling. Total VOC concentrations have fluctuated within MW06 during the performance monitoring sampling rounds, from a high of 6.9 µg/L detected during the second performance monitoring event to non-detect during the third performance monitoring event. Since the first long-term monitoring event, total VOC concentrations have decreased from 1.2 µg/L to 0.77 µg/L, and then increase during this third long-term monitoring event to 2.0 µg/L (see Figure 3-7).

Lateral Wells (MW01 and MW02)

MW01 and MW02 were sampled during the baseline sampling performed in July 2010, although they were not included in the performance monitoring sampling performed from May 2011 through September 2012. Sampling of MW01 and MW02 resumed in April 2013 as part of the long-term monitoring program.

MW01 has shown a decrease in total VOC concentration since baseline sampling, 1.4 to 0.40 µg/L. Historically, an overall decrease in total VOC concentrations can be observed since the initial sampling at MW01 in 1997 (see Figure 3-5).

MW02 has shown a decrease in total VOC concentration since baseline sampling through the second long-term monitoring event, 0.70 µg/L to non-detect. Historically, total VOC concentrations in MW02 have shown slight fluctuations, but an overall decrease can be observed since sampling from 2004 to 2014. During this third long-term monitoring event, total VOC concentrations increased from non-detect to 0.29 µg/L (see Figure 3-6).

Surface Water (SW01, SW02, and SW03)

Total VOC concentrations detected during baseline sampling at surface water locations SW01, SW02, and SW03 were non-detect, 5.2 µg/L, and 3.6 µg/L, respectively. During the performance monitoring events surface water sample results showed fluctuations in total VOC concentrations (see Table 3-4). During the first and second long-term monitoring events surface water sample results increased from non-detect to 3.4 µg/L at SW01 and non-detect to 2.6 µg/L at SW02. SW03 showed a decrease in concentration from 0.81 µg/L to non-detect. During this third long-term monitoring event, total VOCs were non-detect at SW01, but increased from 2.6 to 4.7 µg/L at SW02, and increased from non-detect to 4.0 µg/L

at SW03. The increase in total VOCs at SW02 and SW03 were mainly due to the detection of acetone at each location, 4.3 µg/L and 3.4 µg/L, respectively. The only primary COC to exceed the screening criteria in surface water was chlorobenzene (9.0 µg/L), detected at SW02 during the second performance monitoring event.

Trend Analysis Summary

Overall, the April 2015 long-term monitoring analytical results indicate that the AOC 9 total VOC concentration is decreasing in comparison to the 2010 baseline sampling, performance monitoring results, and April 2013 long-term monitoring results. Slight increases in total VOC concentrations relative to the 2014 long-term monitoring results were identified in monitoring wells MW02, MW05, MW06, MW18, and MW19, and a more significant increase was identified in MW14. The increase in MW14 is likely due to a rebound effect following the November 2013 PermeOx injection in that portion of the plume, while the slight increases in MW02, MW05, MW06, MW18, and MW19 could be attributed to low levels of residual contamination present within the AOC 9 boundaries, natural fluctuations in precipitation and groundwater flow, and the associated contaminant transport.

The plume appears to have remained stable in size compared to the second long-term monitoring event results. There was a slight increase in size within the 100 µg/L contour due to increases in concentrations during this third long-term monitoring event downgradient of the source area, primarily in MW14. The chlorobenzene plume overall, has decreased in size and concentration since baseline sampling, but shows a small increase in size from the 2014 long-term monitoring event (see Figure 3-2). The TCE plume size has remained relatively stable since the first performance monitoring event (see Figure 3-3), although concentrations have decreased in wells that historically contained low levels of TCE (MW01, MW02, MW06, MW14, MW15, and MW19 [MW05 and MW18 do not contain TCE]) and continue to fluctuate in MW17, which is the only well that contains concentrations of TCE above the screening criteria. The total DCB plume has also decreased in overall total VOC concentration and size of the plume (see Figure 3-4). Based on the concentrations of contaminants detected at monitoring wells MW05 and MW06, excluding carbon disulfide as it is not a site-related contaminant, the leading edge of the plume has remained stable.

The analytical results from monitoring wells, MW01 and MW02 show that the plume has not expanded laterally. The analytical results from MW18 indicated a low detection of chlorobenzene (0.25 µg/L); this well was previously non-detect through performance monitoring and the first two rounds of long-term monitoring. The contaminant concentrations in MW19 remain relatively stable and may be attributed to residual contamination within the excavation area reaching the vicinity of the well. Additional historical data are tabulated and trend graphs are provided in Section 3.3. Although the plume remained relatively stable during this sampling event, a comparison of April 2015 long-term analytical results to the baseline, performance monitoring, long-term monitoring, and historical ana-

lytical results indicates that the AOC 9 groundwater plume has generally continued to show a decrease in total VOC concentration and size. The plume has decreased in size from 14.6 acres at baseline sampling to 9.9 acres during this sampling round. Figures 3-2 through 3-4 show the changes in plume size based on the concentrations of the primary COCs.

3.1.4 MAROS Evaluation

The historical and long-term sampling results collected at AOC 9 were analyzed for statistical trend analyses using the Air Force Civil Engineering Center (AFCEC's) MAROS program to assess trends in contaminant concentrations along the observed plume and evaluate the effectiveness of the remedy implemented at the site (see Appendix H). Currently, long-term monitoring at the site consists of sampling for VOCs at nine wells along the center line and edges of the plume. These wells include: MW01, MW02, MW05, MW06, MW14, MW15, MW17, MW18, and MW19. Additional well data was added to the program for MW01, MW02, and MW05 as necessitated by the program to fully perform plume computations; MAROS requires input of data for a minimum of six well locations with at least four sampling events to perform several of the analyses. These three additional well data sets will also provide historical reference of the plume concentrations and further delineate the plume in MAROS. Figures 3-5 through 3-12 are trend graphs for wells MW01, MW02, MW06, MW14, MW15, MW17, MW18, and MW19. A trend graph was not completed for MW05, as total VOC concentration has historically been non-detect, prior to this sampling event.

Model input required by MAROS included analytical results for each sampling event as observed at individual well locations, coordinates of each well, estimates of current plume geometry (e.g., length and width), aquifer characteristics (e.g., seepage velocity, porosity, and thickness) and the type of treatment implemented at the source location.

Several trend analyses were performed in the model for the primary COCs: 1,2-DCB, 1,4-DCB, chlorobenzene, and TCE. Output results from the MAROS evaluations are attached (see Appendix H), showing the Mann-Kendall statistics, linear regression, statistical trend, spatial moment analysis and plume analysis summaries. Mann-Kendall will be the analysis used for evaluating the treatment effectiveness for AOC 9; this is the most common statistical approach in the MAROS program used for groundwater assessment applications as it is a nonparametric analysis that accounts for the assumptions made for the plume geometry and aquifer characteristics and does not assume a statistical distribution (i.e., normal distribution) of the groundwater data. Most groundwater data is not distributed normally, due to the problem of left censoring (no values recorded below the detection limit) and the occasional very high concentration, orders of magnitude above the detection limit.

The statistical analysis performed using the Mann-Kendall model indicates that concentrations of chlorobenzene and 1,4-DCB are decreasing within the wells (MW14, MW15, and MW17) downgradient of the former source area. 1,2-DCB

also shows a decreasing trend in MW14 and a stable trend in MW15 and MW17 (see Appendix H). Concentration trends in the former source area MW19 are decreasing for 1,2-DCB and are stable for 1,4-DCB. Concentration trends were non-detect for PCE in all wells except MW17 in the center line of the plume, which was stable. TCE trends are decreasing in wells MW01 and MW15 and are stable in MW06. Overall, the Mann-Kendall model indicates a downward trend within the contaminant plume immediately downgradient of the groundwater remediation area, and does not indicate any increasing trends for the primary COCs at any well.

Additionally, a spatial moment analysis was conducted; however, there was insufficient data to determine trends for the first and second moments. The zeroth moment or the total mass of the plume indicates that all contaminants are decreasing (see Appendix H). Further long-term monitoring of the site is necessary to fully examine the effectiveness of the AOC 9 remedial action and to further evaluate potential migration of contaminants.

3.1.5 April 2015 Summary

The April 2015 long-term sampling conducted at AOC 9 consists of groundwater and surface water sampling and analysis to evaluate the VOC concentrations in the groundwater plume and Six Mile Creek following the remedial excavation and injection activities.

Eleven groundwater (including two duplicates) and three surface water samples were collected from the nine monitoring wells and Six Mile Creek, and analyzed for VOCs (EPA Method SW8260B) by Katahdin Analytical Services. Figure 2-1 shows the sampling locations and Figure 3-1 shows the total VOC contaminant concentrations in groundwater and surface water based on the analytical data obtained during this monitoring event.

A comparison of April 2015 long-term analytical results to the baseline and historical analytical results indicates that the AOC 9 VOC concentrations have generally continued to decrease, although contaminant concentrations in MW14 increased slightly during this sampling round (see Table 3-3). Based on the analytical results obtained from monitoring wells MW05 and MW06, excluding carbon disulfide, the leading edge of the plume has remained stable. Monitoring wells MW01 and MW02 indicated that the plume has not expanded laterally. MW19 results indicate the plume has remained stable in concentration within the vicinity of the source area for total DCBs, chlorobenzene, and TCE. The results obtained from MW15 and MW17 indicate that total VOC concentrations within the plume have continued to decrease in VOC concentrations farther downgradient from the source area.

Surface water sample results obtained from sample location SW01 were non-detect for all VOCs. SW02 and SW03 contained low levels of chlorobenzene and acetone during this long-term sampling. Carbon disulfide was also detected in surface water sample SW03. No contaminants were detected above the screening levels during this April 2015 long-term monitoring event.

Overall, wells MW01 and MW02 have shown contaminant concentrations that have decreased since the baseline sampling. Well MW05 has historically been non-detect since the baseline sampling, although a minor concentration increase was noted during this sampling event. MW18 showed a slight increase in concentration, although it remains significantly decreased from the baseline levels. MW15 and MW17 have shown contaminant concentrations that have decreased since the baseline sampling. MW14 has shown a decrease in contaminant concentrations; however, an increase was noted during this event. Additionally, MW06 and MW19 also showed slight increases in contaminant concentration.

Per the work plan, the next round of sampling (biennial sampling) will take place in the spring of 2017, to continue monitoring the long-term effectiveness of the remedial efforts. No changes to the approved long-term monitoring plan are proposed at this time.

3.2 PermeOx® Injection Summary

PermeOx® Injection Summary

Based on the results of the PermeOx injection pre-design sampling described in Section 2.6, it was determined that PermeOx injected within the 100 parts per billion total VOC contour immediately downgradient of the source area would be the preferred treatment method. A total of 9,981 pounds of PermeOx® Plus was mixed with 5,971 gallons of water and injected via 53 temporary injection points installed to a depth of approximately 15 to 25 feet within the treatment area between November 5 and November 18, 2013, to enhance aerobic bioremediation of the contaminated groundwater plume. The slurry was injected at each location using a grout pump located on a Geoprobe rig. The complete details of the PermeOx injection are provided as a separate document, *Final April 2014 Long-Term Monitoring Data Summary Report* (EEEPC 2015). The injection targeted the area immediately downgradient of the former source area to ensure that the downward trend in groundwater contaminants continues. PermeOx® Plus is a time-release grade of calcium peroxide made by FMC Corporation that adds oxygen to the groundwater. Injections were performed in general accordance with the Remedial Action Work Plan Addendum (Parsons 2013).

Prior to installing the temporary injection points on July 30, 2013, Parsons prepared an Inventory of Injection Wells form on behalf of the United States Air Force Real Property Agency and submitted it to the EPA Region 2, Office of Groundwater and Drinking Water as part of the Underground Injection Control Program. A copy of the submittal is presented as Appendix I in the April 2014 LTM report (EEEPC 2015).

The injections were performed in the south western portion of the remedial excavation area immediately downgradient of the former source area and located between MW-14 and MW-19 using a standard Geoprobe rig. A figure depicting the injection areas from the Remedial Action Work Plan Addendum and a summary of the PermeOx® injections and quantities are presented in Appendix J of the

April 2014 LTM report (EEEPC 2015). In addition, the efficacy of the injections will be documented in the *Demonstration of Remedial Actions Operating Properly and Successfully at AOC 9 Report* (EEEPC forthcoming).

Table 3-1 AOC 9 April 2015 Long-Term Monitoring, Summary of Positive Results for Groundwater Samples
Former Griffiss Air Force Base, Rome, NY

Analyte	Sample ID: Date: Screening Criteria [1]	G009-MW01LTM040715 04/07/15	G009-MW02LTM040715 04/07/15	AOC9-MW05LTM040615 04/06/15	AOC9-MW06LTM040715 04/07/15	AOC9-MW14LTM040815 04/08/15	AOC9-MW15LTM040715 04/07/15
VOCs by Method SW8260B (µg/L)							
1,2-DICHLOROBENZENE	3	U	U	U	U	**10**	**16**
1,3-DICHLOROBENZENE	3	U	U	U	U	**0.64 J**	**0.92 J**
1,4-DICHLOROBENZENE	3	U	U	U	U	**8.9**	**14**
1,2-DICHLOROETHANE	0.6	U	U	U	U	U	U
BENZENE	1	U	U	U	U	**2.9**	**1.3**
CARBON DISULFIDE	NA	U	U	**0.51 J**	**0.47 J**	U	U
CHLOROBENZENE	5	U	U	U	U	**150**	**120**
CIS-1,2-DICHLOROETHYLENE	5	U	U	**0.84 J**	**0.75 J**	**0.50 J**	U
ISOPROPYLBENZENE	5	U	U	U	U	U	**0.68 J**
SEC-BUTYLBENZENE	5	U	U	U	U	U	**0.66 J**
TETRACHLOROETHYLENE	5	U	U	U	U	U	U
TRICHLOROETHYLENE	5	**0.40 J**	**0.29 J**	U	**0.76 J**	U	U
VINYL CHLORIDE	2	UJ	UJ	U	U	U	**0.40 J**
TOTAL VOCs	**NA**	**0.40 J**	**0.29 J**	**1.4 J**	**2.0 J**	**170 J**	**150 J**
Groundwater Field Parameters							
pH	NA	7.75	6.93	6.43	7.22	7.14	7.29
Temperature (°C)	NA	6.3	3.8	6.0	5.9	8.4	6.6
Conductivity (µs/cm)	NA	352.1	398.1	117.5	343.9	411.6	460.0
Turbidity (NTU)	NA	0.08	2.09	4.59	1.68	6.3	1.43
Dissolved Oxygen (mg/L)	NA	0.11	2.05	9.98	2.41	1.68	0.09
ORP (mV)	NA	69.4	32.4	197.1	170.1	-32.7	-100.5

Key:

J = Estimated value
U = Not detected
UJ = Not detected/estimated detection limit
µg/L = Micrograms per liter
VOCs = Volatile organic compounds
NA = Guidance value not available
* Designates field duplicate sample
ORP = Oxidation-Reduction Potential
°C = Degrees Celsius
µs/cm = Microsiemen per centimeter
NTU = Nephelometric turbidity unit
mg/L = Milligram per liter
mV = Millivolt

Notes:

1. New York State Department of Environmental Conservation, Technical and Operational Guidance Series Memorandum #1.1.1: *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, 1998 (with updates), Class GA Groundwater Standards and Guidance Values.
2. Shaded cells exceed the screening value.
3. Bold values denote positive hits.

Table 3-1 AOC 9 April 2015 Long-Term Monitoring, Summary of Positive Results for Groundwater Samples
Former Griffiss Air Force Base, Rome, NY

Analyte	Sample ID: Date: Screening Criteria [1]	AOC9-MW15/DLTM040715 * 04/07/15	AOC9-MW17LTM040715 04/07/15	AOC9-MW17/DLTM040715 * 04/07/15	AOC9-MW18LTM040815 04/08/15	AOC9-MW19LTM040815 04/08/15
VOCs by Method SW8260B (µg/L)						
1,2-DICHLOROBENZENE	3	**16**	**44**	**43**	U	**0.97 J**
1,3-DICHLOROBENZENE	3	**0.99 J**	**0.70 J**	**0.70 J**	U	U
1,4-DICHLOROBENZENE	3	**14**	**8.9**	**8.6**	U	**1.4**
1,2-DICHLOROETHANE	0.6	U	**0.48 J**	**0.64 J**	U	U
BENZENE	1	**1.2**	**0.79 J**	**0.84 J**	U	**0.52 J**
CARBON DISULFIDE	NA	U	U	U	U	U
CHLOROBENZENE	5	**120**	**130**	**130**	**0.25 J**	**33**
CIS-1,2-DICHLOROETHYLENE	5	U	**2.6**	**2.6**	U	**1.9**
ISOPROPYLBENZENE	5	**0.64 J**	U	U	U	U
SEC-BUTYLBENZENE	5	**0.68 J**	U	U	U	U
TETRACHLOROETHYLENE	5	U	**1.8**	**1.9**	U	U
TRICHLOROETHYLENE	5	**0.28 J**	**16**	**18**	U	**0.37 J**
VINYL CHLORIDE	2	**0.27 J**	**1.1 J**	**1.1 J**	U	**0.74 J**
TOTAL VOCs	**NA**	**150 J**	**210 J**	**210 J**	**0.25 J**	**39 J**
Groundwater Field Parameters						
pH	NA	7.29	7.66	7.66	7.22	7.07
Temperature (°C)	NA	6.6	6.7	6.7	7.9	6.8
Conductivity (µs/cm)	NA	460.0	365.5	365.5	257.0	527.1
Turbidity (NTU)	NA	1.43	10.9	10.9	7.79	11.7
Dissolved Oxygen (mg/L)	NA	0.09	0.04	0.04	1.19	4.90
ORP (mV)	NA	-100.5	-94.4	-94.4	98.6	13.1

Key:

J = Estimated value
U = Not detected
UJ = Not detected/estimated detection limit
µg/L = Micrograms per liter
VOCs = Volatile organic compounds
NA = Guidance value not available
* Designates field duplicate sample
ORP = Oxidation-R
°C = Degrees Celsi
µs/cm = Microsiem
NTU = Nephelome
mg/L = Milligram p
mV = Millivolt

Notes:

1. New York State Department of Environmental Conservation, Technical and Operational Guidance Series Memorandum #1.1.1: *Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations*, 1998 (with updates), Class GA Groundwater Standards and Guidance Values.
2. Shaded cells exceed the screening value.
3. Bold values denote positive hits.

Table 3-2 AOC 9 April 2015 Long-Term Monitoring; Summary of Positive Results for Surface Water Samples
Former Griffiss Air Force Base; Rome, NY

Analyte	Sample ID: Date: Screening Criteria [1]	AOC9-SW01LTM040615 04/06/15	AOC9-SW02LTM040615 04/06/15	AOC9-SW03LTM040615 04/06/15
VOCs by Method SW8260B (µg/L)				
ACETONE	50	U	**4.3 J**	**3.4 J**
CARBON DISULFIDE	NA	U	U	**0.36 J**
CHLOROBENZENE	5	U	**0.40 J**	**0.61 J**
TOTAL VOCs	NA	**ND**	**4.7 J**	**4.4 J**
Surface Water Field Parameters				
pH	NA	7.49	7.36	7.57
Temperature (°C)	NA	10.3	10.3	10.6
Conductivity (µs/cm)	NA	142.6	159.5	160.0
Turbidity (NTU)	NA	3.59	3.88	2.90
Dissolved Oxygen (mg/L)	NA	NA	NA	NA
ORP (mV)	NA	126.3	163.3	122.5

Key:

J = Estimated value
U = Not detected
µg/L = Micrograms per liter
VOCs = Volatile organic compounds
NA = Guidance value not available
ORP = Oxidation-Reduction Potential
°C = Degrees Celsius
µs/cm = Microsiemen per centimeter
NTU = Nephelometric turbidity unit
mg/L = Milligram per liter
mV = Millivolt

Notes:

1. New York State Department of Environmental Conservation, Technical and Operational Guidance Series Memorandum #1.1.1: Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, 1998 (with updates), Class GA Groundwater Standards and Guidance Values.
2. Shaded cells exceed the screening value.
3. Bold values denote positive hits.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
G009-MW01	5	1,1-Dichloroethene	U	U	U	-	U	-	-	-	-	UJ	UJ	U
	3	1,2-Dichlorobenzene	U	**0.36**	**0.6**	-	**0.80 J**	-	-	-	-	**0.42 J**	**0.44 J**	U
	0.6	1,2-Dichloroethane	U	U	U	-	U	-	-	-	-	U	U	U
	5	1,2,4-Trimethylbenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	5	1,3,5-Trimethylbenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	3	1,3-Dichlorobenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	3	1,4-Dichlorobenzene	U	U	U	-	U	-	-	-	-	U	U	U
	5	4-Chlorotoluene	NA	U	U	-	NA	-	-	-	-	U	U	U
	1	Benzene	U	U	U	-	U	-	-	-	-	U	U	U
	5	Chlorobenzene	U	U	U	-	U	-	-	-	-	U	U	U
	5	cis-1,2-Dichloroethylene	U	U	**0.123**	-	U	-	-	-	-	UJ	U	U
	NA	Cyclohexane	NA	NA	NA	-	U	-	-	-	-	U	U	U
	5	Ethylbenzene	U	U	U	-	U	-	-	-	-	U	U	U
	5	Isopropylbenzene (Cumene)	NA	U	U	-	U	-	-	-	-	U	U	U
	NA	Methylcyclohexane	NA	NA	NA	-	U	-	-	-	-	U	U	U
	5	Methylene Chloride	U	U	U	-	U	-	-	-	-	U	U	U
	NA	m-p-Xylene	NA	U	U	-	U	-	-	-	-	U	U	U
	10	Naphthalene	NA	U	U	-	U	-	-	-	-	U	UJ	U
	5	n-Butylbenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	5	n-Propylbenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene)	NA	U	U	-	U	-	-	-	-	U	U	U
	5	p-Isopropyltoluene	NA	NA	NA	-	U	-	-	-	-	U	U	U
	5	sec-Butylbenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	5	Styrene	U	U	U	-	U	-	-	-	-	U	U	U
	5	t-Butylbenzene	NA	U	U	-	U	-	-	-	-	U	U	U
	5	Tetrachloroethylene (PCE)	U	U	U	-	U	-	-	-	-	U	U	U
	5	Toluene	U	U	U	-	U	-	-	-	-	U	U	U
	5	Trans-1,2-Dichloroethene	NA	U	U	-	U	-	-	-	-	U	U	U
	5	Trichloroethylene (TCE)	U	**0.87**	**0.88**	-	**0.60 J**	-	-	-	-	**0.46 J**	**0.34 J**	**0.40 J**
	2	Vinyl Chloride	U	U	U	-	U	-	-	-	-	U	U	U
	NA	Total VOCs	0	**1.2**	**1.6**	-	**1.4**	-	-	-	-	**0.88**	**0.78**	**0.40**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
G009-MW02	5	1,1-Dichloroethene	U	U	U	U	U	-	-	-	-	UJ	U	U
	3	1,2-Dichlorobenzene	U	U	U	U	U	-	-	-	-	U	U	U
	0.6	1,2-Dichloroethane	U	U	U	U	U	-	-	-	-	U	U	U
	5	1,2,4-Trimethylbenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	5	1,3,5-Trimethylbenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	3	1,3-Dichlorobenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	3	1,4-Dichlorobenzene	U	U	U	U	U	-	-	-	-	U	U	U
	5	4-Chlorotoluene	NA	U	U	U	NA	-	-	-	-	U	U	U
	1	Benzene	U	U	U	U	U	-	-	-	-	U	U	U
	5	Chlorobenzene	U	U	U	U	U	-	-	-	-	U	U	U
	5	cis-1,2-Dichloroethylene	U	U	U	U	U	-	-	-	-	UJ	U	U
	NA	Cyclohexane	NA	NA	NA	NA	U	-	-	-	-	U	U	U
	5	Ethylbenzene	U	U	U	U	U	-	-	-	-	U	U	U
	5	Isopropylbenzene (Cumene)	NA	U	U	U	U	-	-	-	-	U	U	U
	NA	Methylcyclohexane	NA	NA	NA	NA	U	-	-	-	-	U	U	U
	5	Methylene Chloride	U	U	U	U	U	-	-	-	-	U	U	U
	NA	m-p-Xylene	NA	U	U	U	U	-	-	-	-	U	U	U
	10	Naphthalene	NA	U	U	U	U	-	-	-	-	U	UJ	U
	5	n-Butylbenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	5	n-Propylbenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene)	NA	U	U	U	U	-	-	-	-	U	U	U
	5	p-Isopropyltoluene	NA	NA	NA	U	U	-	-	-	-	U	U	U
	5	sec-Butylbenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	5	Styrene	U	U	U	U	U	-	-	-	-	U	U	U
	5	t-Butylbenzene	NA	U	U	U	U	-	-	-	-	U	U	U
	5	Tetrachloroethylene (PCE)	U	U	U	U	U	-	-	-	-	U	U	U
	5	Toluene	U	U	U	U	U	-	-	-	-	U	U	U
	5	Trans-1,2-Dichloroethene	NA	U	U	U	U	-	-	-	-	U	U	U
	5	Trichloroethylene (TCE)	U	**0.89**	**1.8**	**0.61 J**	**0.70 J**	-	-	-	-	**0.36 J**	U	**0.29 J**
	2	Vinyl Chloride	U	U	U	U	U	-	-	-	-	U	U	U
	NA	Total VOCs	0	**0.89**	**1.8**	**0.61**	**0.70**	-	-	-	-	**0.36**	0	**0.29**

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW05	5	1,1-Dichloroethene	-	U	U	U	U	-	-	-	-	UJ	U	U
	3	1,2-Dichlorobenzene	-	U	U	U	U	-	-	-	-	U	U	U
	0.6	1,2-Dichloroethane	-	U	U	U	U	-	-	-	-	U	U	U
	5	1,2,4-Trimethylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	1,3,5-Trimethylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	3	1,3-Dichlorobenzene	-	U	U	U	U	-	-	-	-	U	U	U
	3	1,4-Dichlorobenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	4-Chlorotoluene	-	U	U	U	NA	-	-	-	-	U	U	U
	1	Benzene	-	U	U	U	U	-	-	-	-	U	U	U
	NA	Carbon Disulfide	-	U	U	U	U	-	-	-	-	U	U	**0.51 J**
	5	Chlorobenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	cis-1,2-Dichloroethylene	-	U	U	U	U	-	-	-	-	UJ	U	**0.84 J**
	NA	Cyclohexane	-	NA	NA	NA	U	-	-	-	-	U	U	U
	5	Ethylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	Isopropylbenzene (Cumene)	-	U	U	U	U	-	-	-	-	U	U	U
	NA	Methylcyclohexane	-	NA	NA	NA	U	-	-	-	-	U	U	U
	5	Methylene Chloride	-	U	U	U	U	-	-	-	-	U	U	U
	NA	m-p-Xylene	-	U	U	U	U	-	-	-	-	U	U	U
	10	Naphthalene	-	U	U	U	U	-	-	-	-	U	UJ	U
	5	n-Butylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	n-Propylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene)	-	U	U	U	U	-	-	-	-	U	U	U
	5	p-Isopropyltoluene	-	NA	NA	U	U	-	-	-	-	U	U	U
	5	sec-Butylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	Styrene	-	U	U	U	U	-	-	-	-	U	U	U
	5	t-Butylbenzene	-	U	U	U	U	-	-	-	-	U	U	U
	5	Tetrachloroethylene (PCE)	-	U	U	U	U	-	-	-	-	U	U	U
	5	Toluene	-	U	U	U	U	-	-	-	-	U	U	U
	5	Trans-1,2-Dichloroethene	-	U	U	U	U	-	-	-	-	U	U	U
	5	Trichloroethylene (TCE)	-	U	U	U	U	-	-	-	-	U	U	U
	2	Vinyl Chloride	-	U	U	U	U	-	-	-	-	U	U	U
	NA	Total VOCs	-	0	0	0	0	-	-	-	-	0	0	**1.4**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW06	5	1,1-Dichloroethene	-	U	U	-	U	U	U	U	U	UJ	U	U
	3	1,2-Dichlorobenzene	-	U	U	-	U	U	U	U	U	U	U	U
	0.6	1,2-Dichloroethane	-	U	U	-	U	U	U	U	U	U	U	U
	5	1,2,4-Trimethylbenzene		U	U	-	U	U	U	U	U	U	U	U
	5	1,3,5-Trimethylbenzene	-	U	U	-	U	U	U	U	U	U	U	U
	3	1,3-Dichlorobenzene	-	U	U	-	U	U	U	U	U	U	U	U
	3	1,4-Dichlorobenzene	-	U	U	-	U	U	U	U	U	U	U	U
	5	4-Chlorotoluene	-	U	U	-	NA	U	U	U	U	U	U	U
	1	Benzene	-	U	U	-	U	U	U	U	U	U	U	U
	NA	Carbon Disulfide	-	U	U	-	U	U	U	U	U	U	U	**0.47 J**
	5	Chlorobenzene	-	U	U	-	U	UJ	**0.90 J**	U	U	U	U	U
	5	cis-1,2-Dichloroethylene	-	U	U	-	U	U	U	U	U	UJ	U	**0.75 J**
	NA	Cyclohexane	-	NA	NA	-	U	U	U	U	U	U	U	U
	5	Ethylbenzene	-	U	U	-	U	U	U	U	U	U	U	U
	5	Isopropylbenzene (Cumene)	-	U	U	-	U	U	U	U	U	U	U	U
	NA	Methylcyclohexane	-	NA	NA	-	U	U	U	U	U	U	U	U
	5	Methylene Chloride	-	U	U	-	U	U	U	U	U	U	U	U
	NA	m-p-Xylene	-	U	U	-	U	U	U	U	U	U	U	U
	10	Naphthalene	-	U	U	-	U	U	**3.0**	U	U	U	UJ	U
	5	n-Butylbenzene	-	U	U	-	U	U	U	U	U	U	U	U
	5	n-Propylbenzene	-	U	U	-	U	U	**2.0**	U	U	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene	-	U	U	-	U	U	U	U	U	U	U	U
	5	p-Isopropyltoluene	-	NA	NA	-	U	U	U	U	U	U	U	U
	5	sec-Butylbenzene	-	U	U	-	U	U	U	U	U	U	U	U
	5	Styrene	-	U	U	-	U	U	U	U	U	U	U	U
	5	t-Butylbenzene	-	U	U	-	U	U	U	U	U	U	U	U
	5	Tetrachloroethylene (PCE)	-	U	U	-	U	U	U	U	U	U	U	U
	5	Toluene	-	U	U	-	U	U	U	U	U	U	U	U
	5	Trans-1,2-Dichloroethene	-	U	U	-	U	U	U	U	U	U	U	U
	5	Trichloroethylene (TCE)	-	**0.85**	**1.8**	-	**1.0**	**1.0**	**1.0**	U	**1.4**	**1.2**	**0.77 J**	**0.76 J**
	2	Vinyl Chloride	-	U	U	-	U	U	U	U	U	U	U	U
	NA	Total VOCs	-	**0.85**	**1.8**	-	**1.0**	**1.0**	**6.9**	0	**1.4**	**1.2**	**0.77**	**2.0**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW14	5	1,1-Dichloroethene	-	-	-	U	**0.70 J**	U	U	U	U	UJ	U	U
	3	1,2-Dichlorobenzene	-	-	-	**170**	**130**	**76**	**40**	**22 J**	**24**	**26**	**4.8**	**10**
	0.6	1,2-Dichloroethane	-	-	-	U	U	U	U	U	U	U	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	**220**	**180**	**15**	**1.0**	U	U	**4.0**	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	**79**	**64**	U	U	U	U	U	U	U
	3	1,3-Dichlorobenzene	-	-	-	**7.6**	**6.0**	**4.0**	**2.0**	**1.1**	**1.3**	**1.5**	**0.34 J**	**0.64 J**
	3	1,4-Dichlorobenzene	-	-	-	**110**	**87**	**53**	**34**	**20**	**21**	**22**	**4.7**	**8.9**
	5	4-Chlorotoluene	-	-	-	**0.33 J**	NA	U	U	U	U	U	U	U
	1	Benzene	-	-	-	**3.5**	**19**	**1.0**	**1.0**	**0.43 J**	**0.94 J**	**0.99 J**	U	**2.9**
	5	Chlorobenzene	-	-	-	**1700**	**1400**	**950 J**	**350**	**200**	**190**	**250 J**	**31**	**150**
	5	cis-1,2-Dichloroethylene	-	-	-	**2.7**	**23**	**2.0**	**2.0**	**1.6**	**2.4**	**1.4 J**	**0.23 J**	**0.50 J**
	NA	Cyclohexane	-	-	-	NA	**22**	**12**	**1.0**	U	**0.55 J**	**2.4**	U	U
	5	Ethylbenzene	-	-	-	**21**	**10**	**7.0**	**1.0**	**0.28 J**	**0.37 J**	**1.5**	U	U
	5	Isopropylbenzene (Cumene)	-	-	-	**17**	**14**	**11**	**3.0**	**0.58 J**	**0.93 J**	**3.3**	U	U
	NA	Methylcyclohexane	-	-	-	NA	**46 J**	**17**	**2.0**	**0.55 J**	**1.3**	**4.5**	U	U
	5	Methylene Chloride	-	-	-	U	NA	U	U	U	U	U	U	U
	NA	m-p-Xylene	-	-	-	**68**	**50**	**11**	**0.70 J**	U	U	U	U	U
	10	Naphthalene	-	-	-	**51**	**27**	**4.0**	U	U	U	U	UJ	U
	5	n-Butylbenzene	-	-	-	**4.3**	**4.0**	**2.0**	**2.0 J**	**0.33 J**	**0.46 J**	**1.4**	U	U
	5	n-Propylbenzene	-	-	-	**15**	**14**	**8.0**	**3.0**	**0.70 J**	**1.0**	**2.6**	U	U
	5	o-Xylene (1,2-Dimethylbenzene	-	-	-	**5.9**	**5.0**	**0.30 J**	U	U	U	**0.27 J**	U	U
	5	p-Isopropyltoluene	-	-	-	**5.5**	**5.0**	U	U	U	U	U	U	U
	5	sec-Butylbenzene	-	-	-	**8.3**	**7.0**	**4.0**	**3.0**	**0.75 J**	**1.0**	**1.9**	U	U
	5	Styrene	-	-	-	U	U	U	U	U	U	U	U	U
	5	t-Butylbenzene	-	-	-	**3.2**	**2.0**	**2.0**	**1.0**	U	**0.32 J**	**0.73 J**	U	U
	5	Tetrachloroethylene (PCE)	-	-	-	U	UJ	U	U	U	U	U	U	U
	5	Toluene	-	-	-	**0.75 J**	**3.0**	U	U	U	U	U	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	**2.0**	U	U	U	U	UJ	U	U
	5	Trichloroethylene (TCE)	-	-	-	**4.8**	**28**	**2.0**	**2.0**	U	**1.2**	**1.0**	U	U
	2	Vinyl Chloride	-	-	-	**1.6**	**17**	**1.0 J**	**1.0 J**	U	**0.83 J**	U	U	U
	NA	Total VOCs	-	-	-	**2500**	**2100**	**1200**	**450**	**250**	**250**	**330**	**41**	**170**

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW15	5	1,1-Dichloroethene	-	-	-	U	**0.40 J**	U	U	U	U	UJ	U	U
	3	1,2-Dichlorobenzene	-	-	-	**60 J**	**55**	**74**	**26**	**19**	**31**	**73**	**40**	**16**
	0.6	1,2-Dichloroethane	-	-	-	U	U	U	U	U	U	U	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	**8.0 J**	**35**	**0.90 J**	U	U	U	U	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	**10 J**	**18**	U	U	U	U	U	U	U
	3	1,3-Dichlorobenzene	-	-	-	**8.0 J**	**6.0**	**5.0**	**2.0**	**1.3**	**1.8**	**2.4**	**1.6**	**0.99 J**
	3	1,4-Dichlorobenzene	-	-	-	**110**	**64**	**58**	**28**	**17**	**19**	**24**	**19**	**14**
	5	4-Chlorotoluene	-	-	-	U	NA	U	U	U	U	U	U	U
	1	Benzene	-	-	-	**12 J**	**26**	**1.0**	**2.0**	**1.4**	**2.8**	**0.94 J**	**1.5**	**1.3**
	5	Chlorobenzene	-	-	-	**1900**	**1300**	**990 J**	**390**	**320**	**290**	**380 J**	**270**	**120**
	5	cis-1,2-Dichloroethylene	-	-	-	U	**10**	**2.0**	**0.40 J**	**0.80**	**0.65 J**	**0.63 J**	**0.75 J**	U
	NA	Cyclohexane	-	-	-	NA	**50**	**2.0**	**0.60 J**	U	**0.67 J**	U	U	U
	5	Ethylbenzene	-	-	-	U	**12**	**3.0**	**0.70 J**	U	UJ	U	U	U
	5	Isopropylbenzene (Cumene)	-	-	-	**12 J**	**22**	**7.0**	**2.0**	**1.4**	**2.0 J**	**2.0**	**1.6**	**0.68 J**
	NA	Methylcyclohexane	-	-	-	NA	**40 J**	**6.0**	**0.60 J**	U	U	U	U	U
	5	Methylene Chloride	-	-	-	**87**	U	U	U	U	U	U	U	U
	NA	m-p-Xylene	-	-	-	U	**11**	**0.70 J**	U	U	U	U	U	U
	10	Naphthalene	-	-	-	U	U	**0.40 J**	U	U	U	U	UJ	U
	5	n-Butylbenzene	-	-	-	U	**3.0**	**2.0**	**0.50 J**	U	**0.23 J**	**1.2**	U	U
	5	n-Propylbenzene	-	-	-	U	**8.0**	**5.0**	U	U	U	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene	-	-	-	U	**2.0**	U	U	U	U	U	U	U
	5	p-isopropyltoluene	-	-	-	U	**0.70 J**	U	U	U	U	U	U	U
	5	sec-Butylbenzene	-	-	-	U	**7.0**	**6.0**	**2.0**	**1.1**	**1.5**	**2.1**	**1.3**	**0.68 J**
	5	Styrene	-	-	-	U	**2.0**	U	U	U	U	U	U	U
	5	t-Butylbenzene	-	-	-	U	**3.0**	**1.0**	**1.0**	**0.42 J**	**0.53 J**	**0.58 J**	**0.39 J**	U
	5	Tetrachloroethylene (PCE)	-	-	-	U	UJ	U	U	U	U	U	U	U
	5	Toluene	-	-	-	U	**2.0**	**0.30 J**	U	U	U	U	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	**0.30 J**	U	U	U	U	U	U	U
	5	Trichloroethylene (TCE)	-	-	-	U	**2.0**	**2.0**	**0.40 J**	U	**0.34 J**	**0.78 J**	**0.83 J**	**0.28 J**
	2	Vinyl Chloride	-	-	-	U	**14**	**0.50 J**	**0.70 J**	**1.6 J**	**2.5**	U	**0.74 J**	**0.40 J**
	NA	Total VOCs	-	-	-	**2200**	**1700**	**1100**	**460**	**360**	**350**	**490**	**340**	**150**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW17	5	1,1-Dichloroethene	-	-	-	U	U	U	U	U	U	UJ	U	U
	3	1,2-Dichlorobenzene	-	-	-	**66**	**50**	**44**	**69**	**67**	**91**	**60**	**49**	**44**
	0.6	1,2-Dichloroethane	-	-	-	**0.68**	**0.40 J**	U	**0.40 J**	U	U	U	U	**0.64 J**
	5	1,2,4-Trimethylbenzene	-	-	-	U	U	U	U	U	U	U	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	U	U	U	U	U	U	U	U	U
	3	1,3-Dichlorobenzene	-	-	-	**1.5**	**3.0**	**2.0**	**2.0**	**0.91 J**	**1.7**	**1.1**	**0.79 J**	**0.70 J**
	3	1,4-Dichlorobenzene	-	-	-	**17**	**38**	**24**	**26**	**15**	**22**	**12**	**10**	**8.9**
	5	4-Chlorotoluene	-	-	-	U	NA	U	U	U	U	U	U	U
	1	Benzene	-	-	-	**2.6**	**4.0**	**5.0**	**6.0 J**	**1.6**	**1.6**	**0.94 J**	**0.77 J**	**0.84 J**
	5	Chlorobenzene	-	-	-	**250**	**760**	**450 J**	**540**	**270**	**300**	**180**	**150**	**130**
	5	cis-1,2-Dichloroethylene	-	-	-	**12**	**5.0**	**5.0**	**4.0**	**3.9**	**5.2**	**3.0 J**	**2.7**	**2.6**
	NA	Cyclohexane	-	-	-	NA	**2.0**	**3.0**	**0.70 J**	U	U	U	U	U
	5	Ethylbenzene	-	-	-	U	**0.80 J**	**0.40 J**	**1.0 J**	U	U	U	U	U
	5	Isopropylbenzene (Cumene)	-	-	-	**0.25 J**	**2.0**	**2.0 J**	**2.0 J**	U	U	U	U	U
	NA	Methylcyclohexane	-	-	-	NA	**0.60 J**	**1.0**	U	U	U	U	U	U
	5	Methylene Chloride	-	-	-	U	U	U	U	U	U	U	U	U
	NA	m-p-Xylene	-	-	-	U	U	U	U	U	U	U	U	U
	10	Naphthalene	-	-	-	U	U	U	**3.0**	U	U	U	UJ	U
	5	n-Butylbenzene	-	-	-	U	U	U	U	U	U	U	U	U
	5	n-Propylbenzene	-	-	-	U	U	U	**2.0**	U	U	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene	-	-	-	U	U	U	U	U	U	U	U	U
	5	p-Isopropyltoluene	-	-	-	U	U	U	U	U	U	U	U	U
	5	sec-Butylbenzene	-	-	-	**0.33 J**	**1.0 J**	**0.80 J**	**0.60 J**	U	U	U	U	U
	5	Styrene	-	-	-	U	U	U	U	U	U	U	U	U
	5	t-Butylbenzene	-	-	-	**0.26 J**	**0.60 J**	**0.50 J**	U	U	U	U	U	U
	5	Tetrachloroethylene (PCE)	-	-	-	**3.0**	**2.0 J**	**0.90 J**	**2.0**	**4**	**2.2**	**1.8**	**1.8**	**1.9**
	5	Toluene	-	-	-	**0.39 J**	U	U	U	U	U	U	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	**0.90 J**	**1.0**	U	U	**0.62 J**	U	U	U
	5	Trichloroethylene (TCE)	-	-	-	**19**	**14**	**12**	**14**	**20**	**19**	**15**	**16**	**18**
	2	Vinyl Chloride	-	-	-	**0.92 J**	**4.0**	**4.0**	**3.0**	**1.2 J**	**2.5 J**	U	**1.0 J**	**1.1 J**
	NA	Total VOCs	-	-	-	**370**	**890**	**560**	**680**	**380**	**450**	**270**	**230**	**210**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW18	5	1,1-Dichloroethene	-	-	-	-	U	-	-	-	-	UJ	U	U
	3	1,2-Dichlorobenzene	-	-	-	-	**0.20 J**	-	-	-	-	U	U	U
	0.6	1,2-Dichloroethane	-	-	-	-	U	-	-	-	-	U	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	3	1,3-Dichlorobenzene	-	-	-	-	U	-	-	-	-	U	U	U
	3	1,4-Dichlorobenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	4-Chlorotoluene	-	-	-	-	NA	-	-	-	-	U	U	U
	1	Benzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	Chlorobenzene	-	-	-	-	**3.0**	-	-	-	-	U	U	**0.25 J**
	5	cis-1,2-Dichloroethylene	-	-	-	-	U	-	-	-	-	UJ	U	U
	NA	Cyclohexane	-	-	-	-	U	-	-	-	-	U	U	U
	5	Ethylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	Isopropylbenzene (Cumene)	-	-	-	-	U	-	-	-	-	U	U	U
	NA	Methylcyclohexane	-	-	-	-	UJ	-	-	-	-	U	U	U
	5	Methylene Chloride	-	-	-	-	U	-	-	-	-	U	U	U
	NA	m-p-Xylene	-	-	-	-	U	-	-	-	-	U	U	U
	10	Naphthalene	-	-	-	-	U	-	-	-	-	U	UJ	U
	5	n-Butylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	n-Propylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	p-Isopropyltoluene	-	-	-	-	U	-	-	-	-	U	U	U
	5	sec-Butylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	Styrene	-	-	-	-	U	-	-	-	-	U	U	U
	5	t-Butylbenzene	-	-	-	-	U	-	-	-	-	U	U	U
	5	Tetrachloroethylene (PCE)	-	-	-	-	UJ	-	-	-	-	U	U	U
	5	Toluene	-	-	-	-	U	-	-	-	-	U	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	-	U	-	-	-	-	UJ	U	U
	5	Trichloroethylene (TCE)	-	-	-	-	U	-	-	-	-	U	U	U
	2	Vinyl Chloride	-	-	-	-	U	-	-	-	-	U	U	U
	NA	Total VOCs	-	-	-	-	**3.2**	-	-	-	-	0	0	**0.25**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3
AOC9-MW19[2]	5	1,1-Dichloroethene	-	-	-	-	-	U	U	U	U	UJ	U	U
	3	1,2-Dichlorobenzene	-	-	-	**4930**	-	**6.0**	**6.0**	**3.8**	**5.4**	**2.1**	**1.3**	**0.97 J**
	0.6	1,2-Dichloroethane	-	-	-	-	-	U	U	U	U	U	U	U
	5	1,2,4-Trimethylbenzene	-	-	-	**170**	-	U	U	U	U	U	U	U
	5	1,3,5-Trimethylbenzene	-	-	-	**90**	-	U	U	U	U	U	U	U
	3	1,3-Dichlorobenzene	-	-	-	**100**	-	U	U	U	U	U	U	U
	3	1,4-Dichlorobenzene	-	-	-	**1380**	-	**3.0**	**4.0**	**4.5 J**	**4.4**	**3.0**	**1.7**	**1.4**
	5	4-Chlorotoluene	-	-	-	U	-	U	U	U	U	U	U	U
	1	Benzene	-	-	-	**90**	-	U	**0.40 J**	**0.90 J**	U	**2.0**	**0.65 J**	**0.52 J**
	5	Chlorobenzene	-	-	-	**14400**	-	**18 J**	**14**	**33**	**31**	**58**	**29**	**33**
	5	cis-1,2-Dichloroethylene	-	-	-	U	-	**3.0**	**15**	**12**	**1.4**	**3.2 J**	**2.1**	**1.9**
	NA	Cyclohexane	-	-	-	-	-	U	U	U	U	U	U	U
	5	Ethylbenzene	-	-	-	U	-	U	U	U	UJ	U	U	U
	5	Isopropylbenzene (Cumene)	-	-	-	U	-	U	U	U	UJ	U	U	U
	NA	Methylcyclohexane	-	-	-	-	-	U	U	U	U	U	U	U
	5	Methylene Chloride	-	-	-	U	-	U	U	U	U	U	U	U
	NA	m-p-Xylene	-	-	-	**85**	-	U	U	U	U	U	U	U
	10	Naphthalene	-	-	-	**230**	-	U	U	U	U	U	UJ	U
	5	n-Butylbenzene	-	-	-	U	-	U	U	U	U	U	U	U
	5	n-Propylbenzene	-	-	-	U	-	U	U	U	U	U	U	U
	5	o-Xylene (1,2-Dimethylbenzene	-	-	-	**75**	-	U	U	U	U	U	U	U
	5	p-Isopropyltoluene	-	-	-	U	-	U	U	U	U	U	U	U
	5	sec-Butylbenzene	-	-	-	U	-	U	U	U	U	U	U	U
	5	Styrene	-	-	-	-	-	U	U	U	U	U	U	U
	5	t-Butylbenzene	-	-	-	U	-	U	U	U	U	U	U	U
	5	Tetrachloroethylene (PCE)	-	-	-	U	-	U	U	U	U	U	U	U
	5	Toluene	-	-	-	**60**	-	U	U	U	U	U	U	U
	5	Trans-1,2-Dichloroethene	-	-	-	U	-	U	U	U	U	UJ	U	U
	5	Trichloroethylene (TCE)	-	-	-	U	-	**0.50 J**	**0.50 J**	U	**0.30 J**	**0.55 J**	**0.29 J**	**0.37 J**
	2	Vinyl Chloride	-	-	-	U	-	**0.60 J**	**2.0**	**2.9**	**U**	U	**0.80 J**	**0.74 J**
	NA	Total VOCs	-	-	-	**21610**	-	**31**	**42**	**57**	**43**	**69**	**36**	**39**

Key and References at the end of Table.

Table 3-3 AOC 9 Historic Groundwater Sample Results

Well Number	Screening Criteria [1]	Parameter	12/19/97 Ref 1	5/25/00 Ref 2	9/9/04 Ref 3	11/13/06 Ref 4	7/29/10 E & E 2010 AOC 9 Baseline Sampling	5/18/11 E & E 2011 AOC 9 Performance Sampling Event 1	10/25/11 E & E 2011 AOC 9 Performance Sampling Event 2	4/17/12 E & E 2012 AOC 9 Performance Sampling Event 3	9/26/12 E & E 2012 AOC 9 Performance Sampling Event 4	4/10/13 E & E 2013 AOC 9 Long-Term Sampling Event 1	4/3/14 E & E 2014 AOC 9 Long-Term Sampling Event 2	4/8/15 E & E 2015 AOC 9 Long-Term Sampling Event 3

Key:
J = Estimated concentration.
U = Analyte not detected.
mg/L = Micrograms per liter.
- = Well was not Sampled
NA = Not Applicable.

0.411 J	Bolded values denote positive hits (detections).
14.9	Shaded values denote hits exceeding the NYSDEC standard.

Note:
[1] New York State Department of Environmental Conservation, Class GA Groundwater Standards and Guidance Values.
[2] Data presented under Reference 4 for MW19 is the most recent sampling data for TW39, which was in the same location as MW19. These results are presented for comparison.

References:
(1) E & E. July 1998. Draft Report for Expanded Site Investigation and Confirmatory Sampling of Areas of Interest and Drywell/Wastewater-Related Systems
(2) E & E. August 2001. AOC 9: Weapons Storage Area (WSA) Landfill Supplemental Investigation Final data Summary Report.
(3) FPM Group. February 2005. Groundwater Monitoring Report.
(4) FPM Group. August 2007. Baseline and PDI2 Sampling Final Monitoring Report.

Key and References at the end of Table.

Table 3-4 AOC 9 Historic Surface Water Sample Results

Surface Water Sample Number	Screening Criteria[1]	Parameter	Analytical Results by Sample Date(s) (µg/L)										
			11/4/97	5/10/00	11/13/06	7/27/10	5/17/11	10/24/11	4/16/12	9/25/12	4/8/2013	4/1/2014	4/8/2015
			Ref 1	Ref 2	Ref 3	E & E 2010 AOC 9 Baseline Sampling	E & E 2011 AOC 9 Performance Sampling Event 1	E & E 2011 AOC 9 Performance Sampling Event 2	E & E 2012 AOC 9 Performance Sampling Event 3	E & E 2012 AOC 9 Performance Sampling Event 4	E & E 2013 AOC 9 Long-Term Sampling Event 1	E & E 2014 AOC 9 Long-Term Sampling Event 2	E & E 2015 AOC 9 Long-Term Sampling Event 3
SW01[2]	5	Chlorobenzene	U	**0.85 J**	U	U	**0.60 J**	U	U	U	U	U	U
	3	1,2-DCB	NA	U	U	U	U	U	U	U	U	U	U
	3	1,4-DCB	NA	U	U	U	U	U	U	U	U	U	U
	NA	Total DCB	NA	U	U	U	U	U	U	U	U	U	U
	50	Acetone	U	NA	**1.8 J**	U	U	U	**2.5 J**	U	U	**3.4 J**	U
	5	cis-1,2-Dichloroethene	U	U	U	U	U	**0.40 J**	U	U	UJ	U	U
	5	Tetrachloroethene	U	U	U	U	U	**1.0 J**	U	U	U	U	U
	5	Trichloroethene	U	U	U	U	U	**0.70 J**	U	U	U	U	U
	NA	Total VOCs	0	**0.85**	**1.8**	0	**0.60 J**	**2.1 J**	**2.5 J**	0	0	**3.4 J**	0
SW02[3]	5	Chlorobenzene	U	**0.84**	**4.0**	**3.0**	**2.0 J**	**9.0**	U	U	U	U	**0.40 J**
	3	1,2-DCB	NA	**0.41 J**	**0.29 J**	**0.20 J**	U	**0.30 J**	U	U	U	U	U
	3	1,4-DCB	NA	U	**0.26 J**	U	U	**0.40 J**	U	U	U	U	U
	NA	Total DCB	NA	**0.41 J**	**0.55 J**	**0.20 J**	U	**0.70 J**	U	U	U	U	U
	50	Acetone	U	NA	**1.8 J**	**2.0 J**	U	U	**3.2 J**	**2.4 J**	U	**2.6 J**	**4.3 J**
	NA	Total VOCs	0	**1.3**	**4.5**	**5.2**	**2.0 J**	**9.7 J**	**3.2 J**	**2.4 J**	0	**2.6 J**	**4.7 J**
SW03[4]	5	Chlorobenzene	U	**0.24 J**	**1.2**	**3.0**	**2.0 J**	**2.0**	U	U	U	U	**0.61 J**
	3	1,2-DCB	NA	U	**0.12 J**	**0.30 J**	**0.20 J**	**0.20 J**	U	U	**0.45 J**	U	U
	3	1,4-DCB	NA	U	U	**0.30 J**	U	U	U	U	U	U	U
	NA	Total DCB	NA	U	**0.12 J**	**0.60 J**	**0.20 J**	**0.20 J**	U	U	U	U	U
	50	Acetone	U	NA	**1.9 J**	U	U	U	**2.9 J**	U	U	U	**3.4 J**
	NA	Carbon Disulfide	U	U	U	U	U	U	U	U	U	U	**0.36 J**
	10	Naphthalene	U	U	U	U	U	U	U	U	**0.36 J**	U	U
	NA	Total VOCs	0	**0.24**	**1.3**	**3.6**	**2.2 J**	**2.2 J**	**2.9 J**	0	**0.81 J**	0	**4.4 J**

Key:
J = Estimated concentration.
U = Analyte not detected.
mg/L = Micrograms per liter.
NA = Not Applicable.

0.411 J	Bolded values denote positive hits (detections).
14.9	Shaded values denote hits exceeding the NYSDEC standard.

Note:
[1] New York State Department of Environmental Conservation, Class GA Groundwater Standards and Guidance Values.
[2] SW01 is labeled as SW05 in Reference 1; SW01 is labeled as SW09 in Reference 2
[3] SW02 is labeled as SW07 in Reference 1; SW02 is labeled as SW10 in Reference 2
[4] SW03 is labeled as SW06 in Reference 1; SW03 is labeled as SW11 in Reference 2

References:
(1) E & E. July 1998. Draft Report for Expanded Site Investigation and Confirmatory Sampling of Areas of Interest and Drywell/Wastewater-Related Systems
(2) E & E. August 2001. AOC 9: Weapons Storage Area (WSA) Landfill Supplemental Investigation Final data Summary Report.
(3) FPM Group. August 2007. Baseline and PDI2 Sampling Final Monitoring Report.

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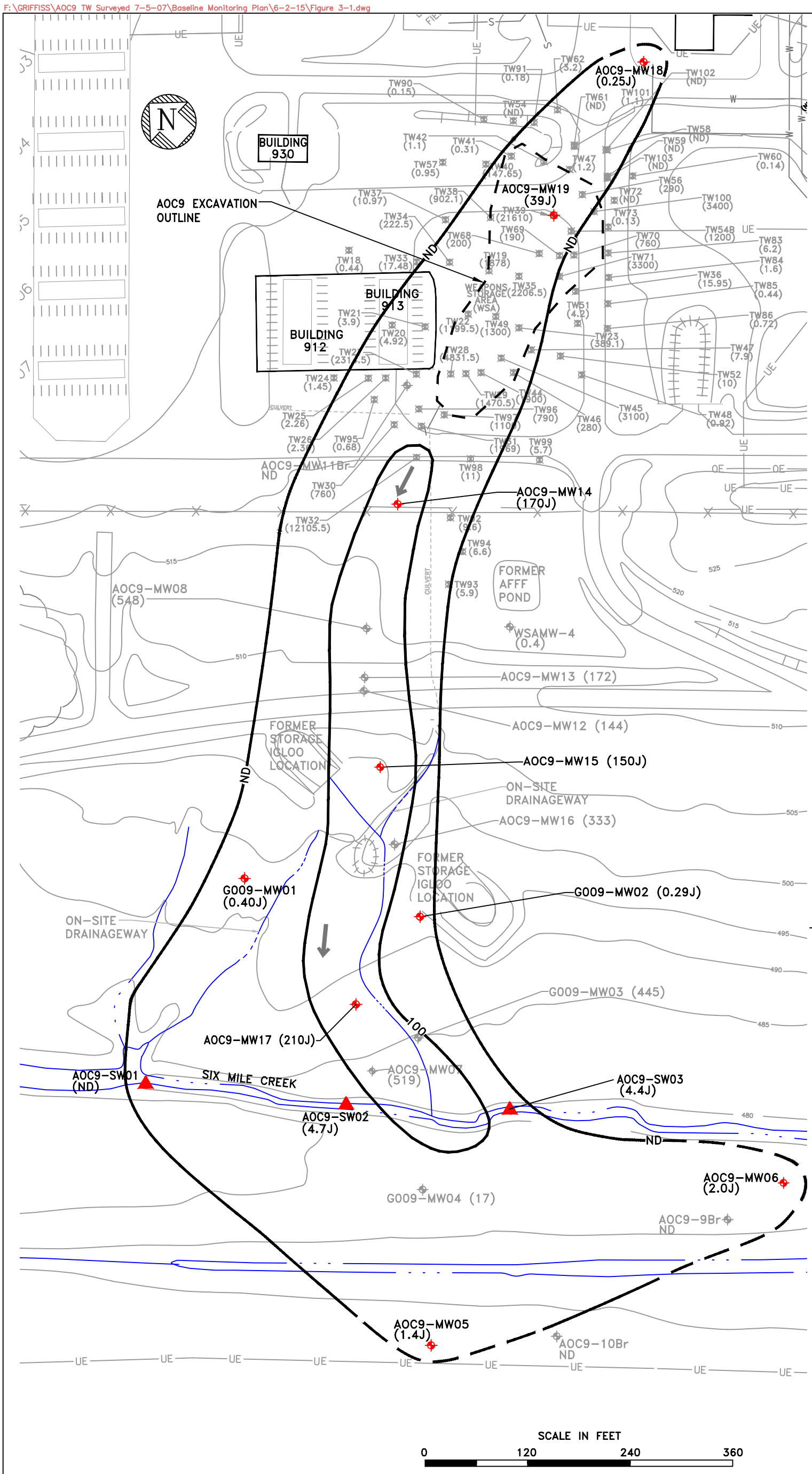

LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- ND — NOT DETECTED
- 10000 — TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
- AOC9-MW14 — LONG-TERM MONITORING WELL SAMPLE LOCATION
- AOC9-MW08 (548) — EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
- (39J) — APRIL 2015 LONG-TERM SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
- → GROUNDWATER FLOW DIRECTION
- ▲ SURFACE WATER SAMPLING LOCATIONS
- TW99 (5.7) — 2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

NOTES:

1. MONITORING WELL AOC9-MW19 WAS A WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

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In association with:
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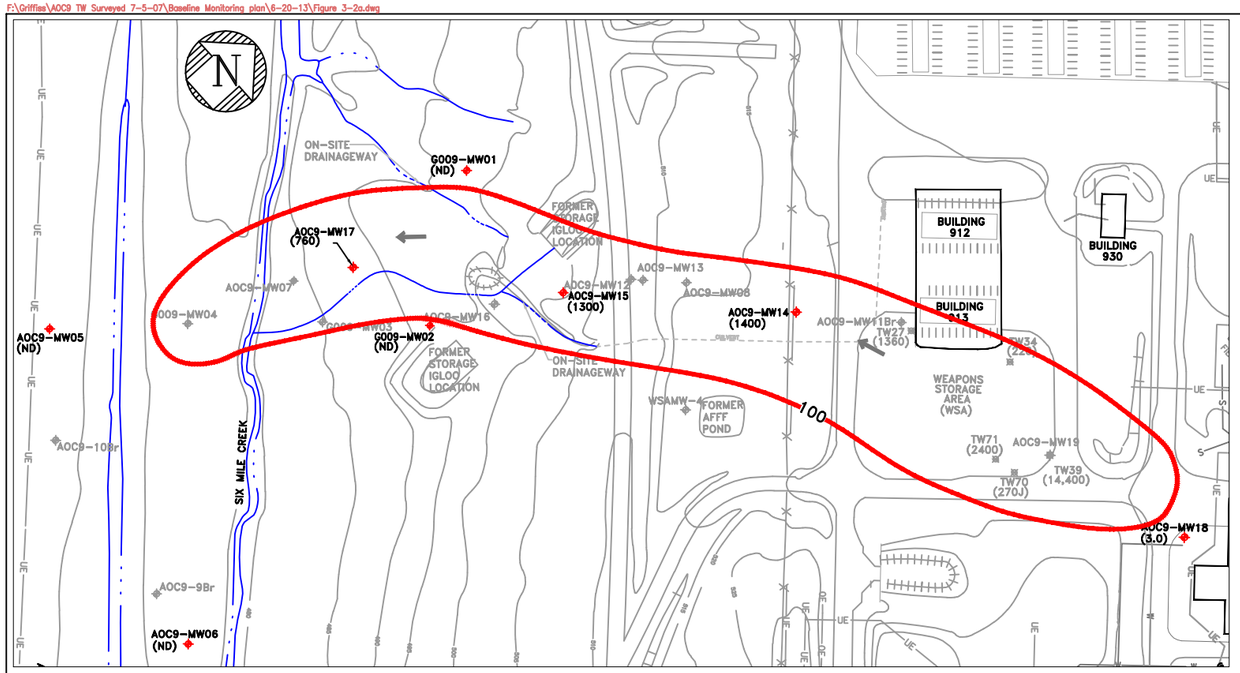
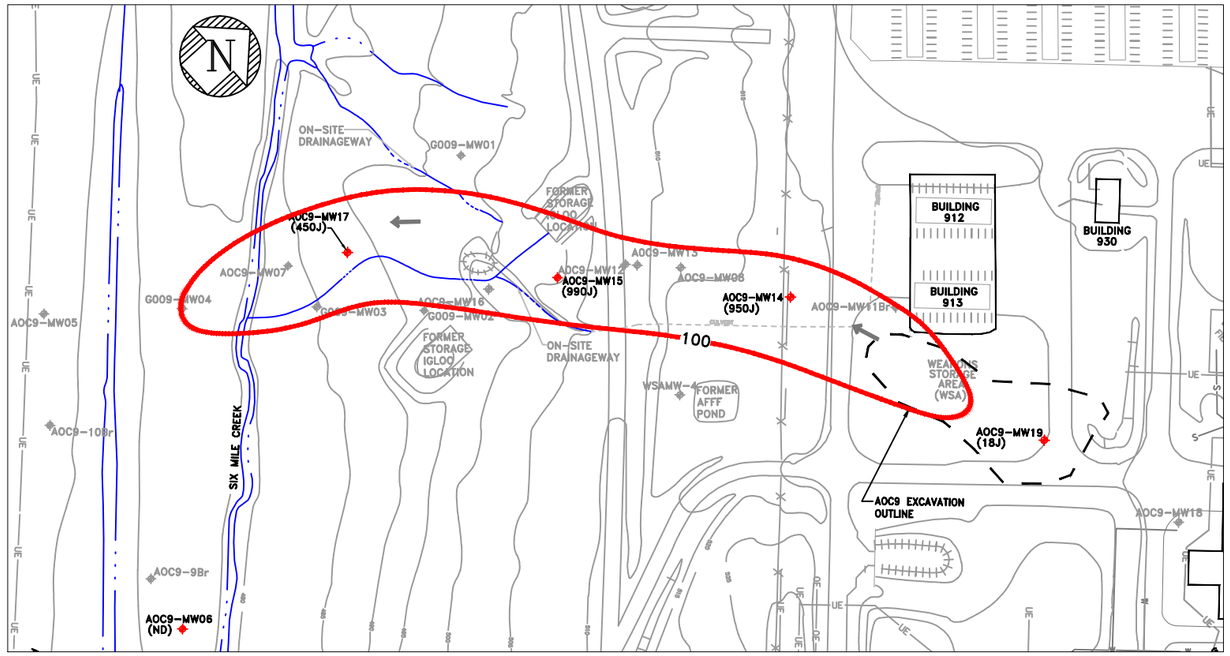
APRIL 2015 LONG-TERM MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1

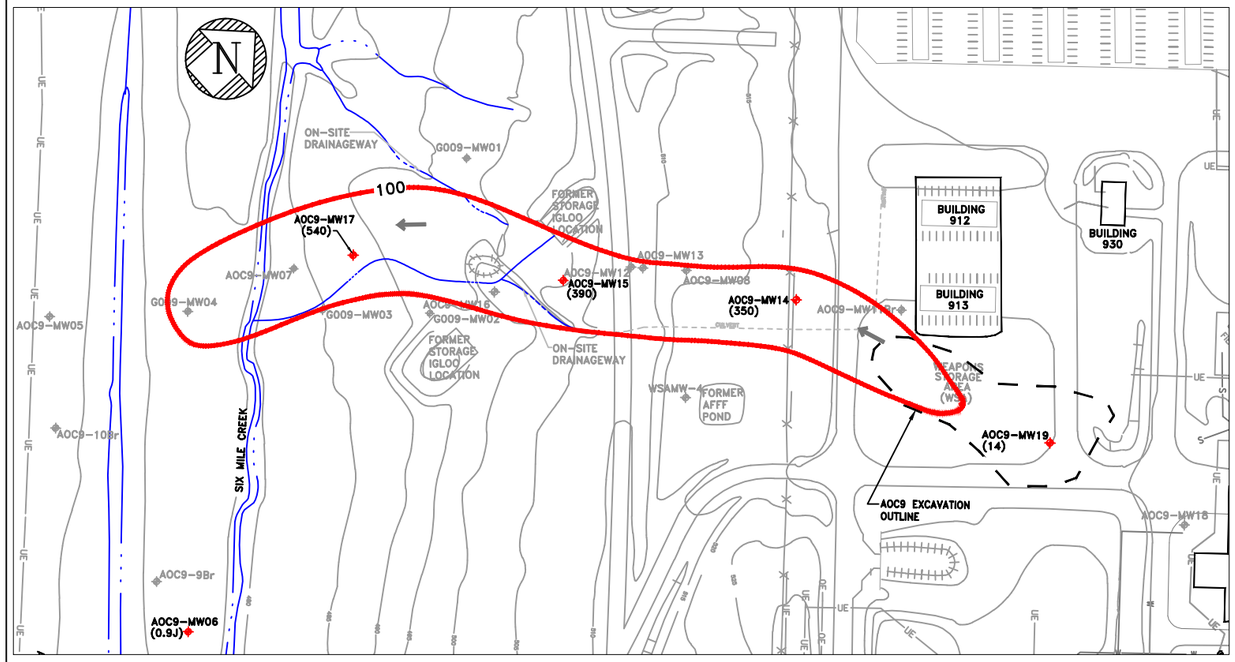
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\6-20-13\Figure 3-2a.dwg



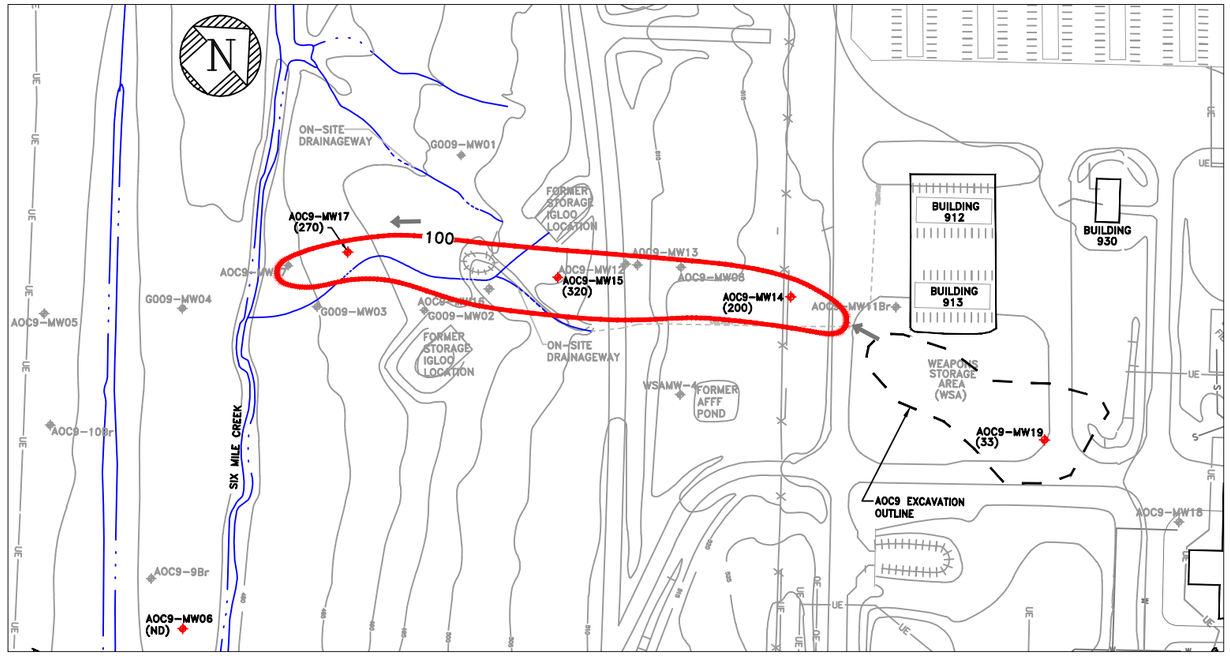
BASELINE SAMPLING JULY 2010



PERFORMANCE MONITORING MAY 2011



PERFORMANCE MONITORING OCTOBER 2011



PERFORMANCE MONITORING APRIL 2012

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 100 — CHLOROBENZENE PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — CHLOROBENZENE IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

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NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

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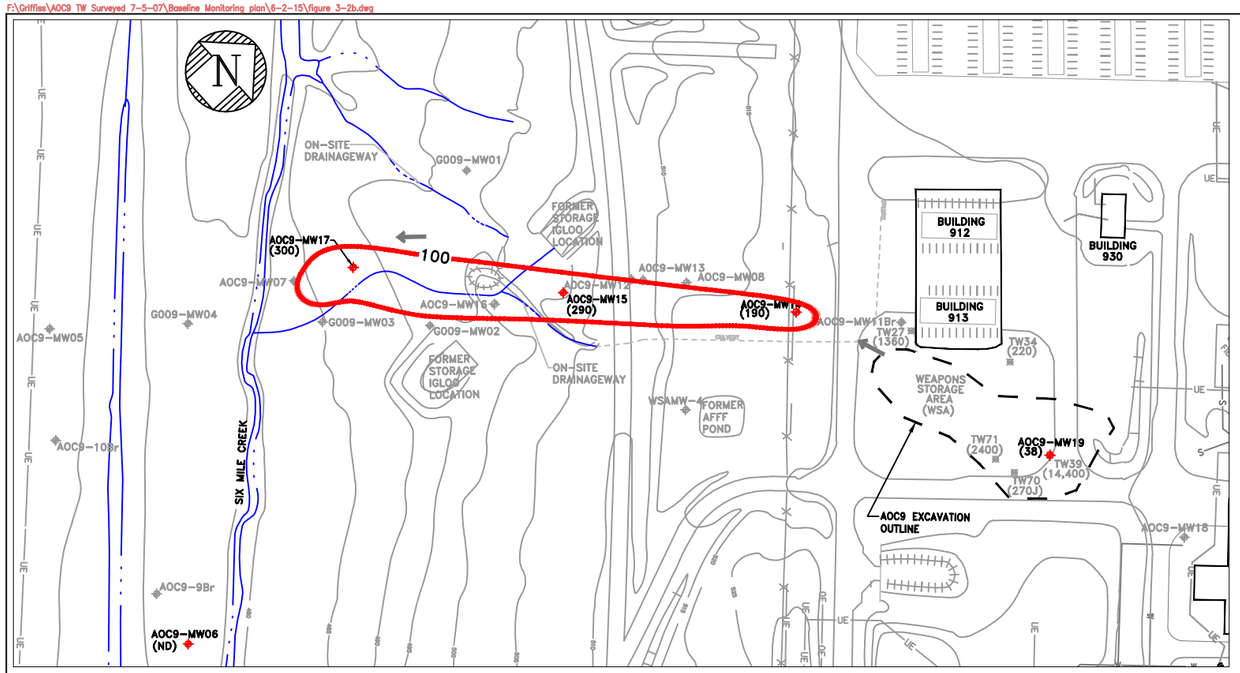
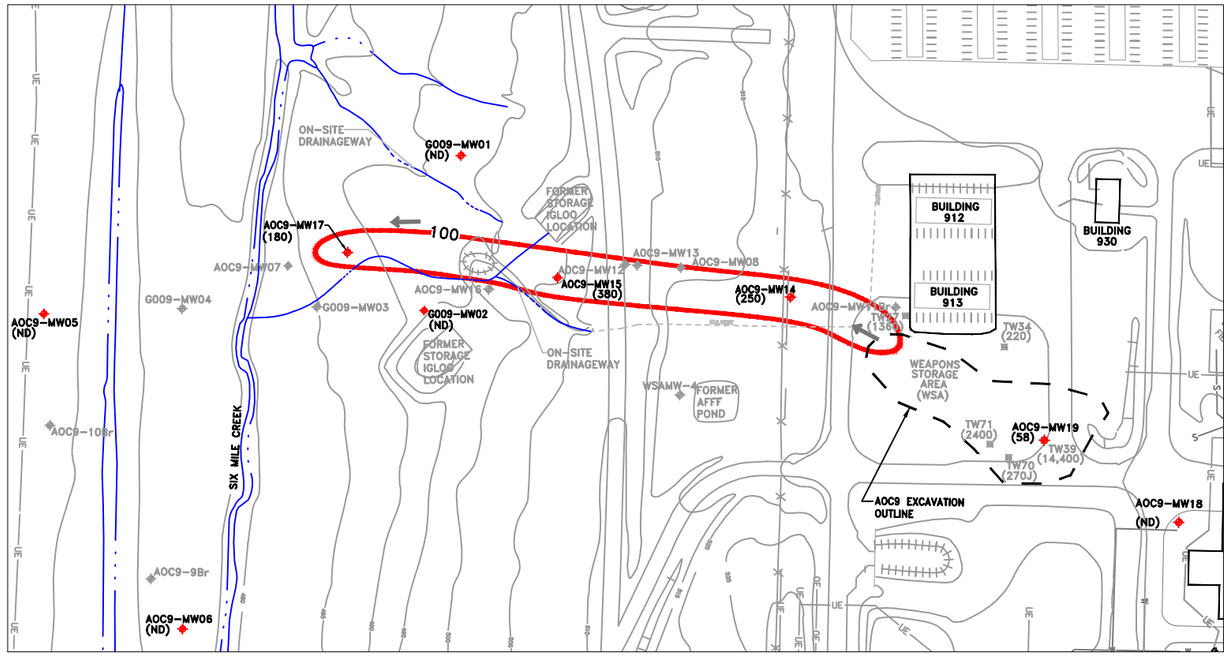
CHLOROBENZENE PLUME

FIGURE 3-2a

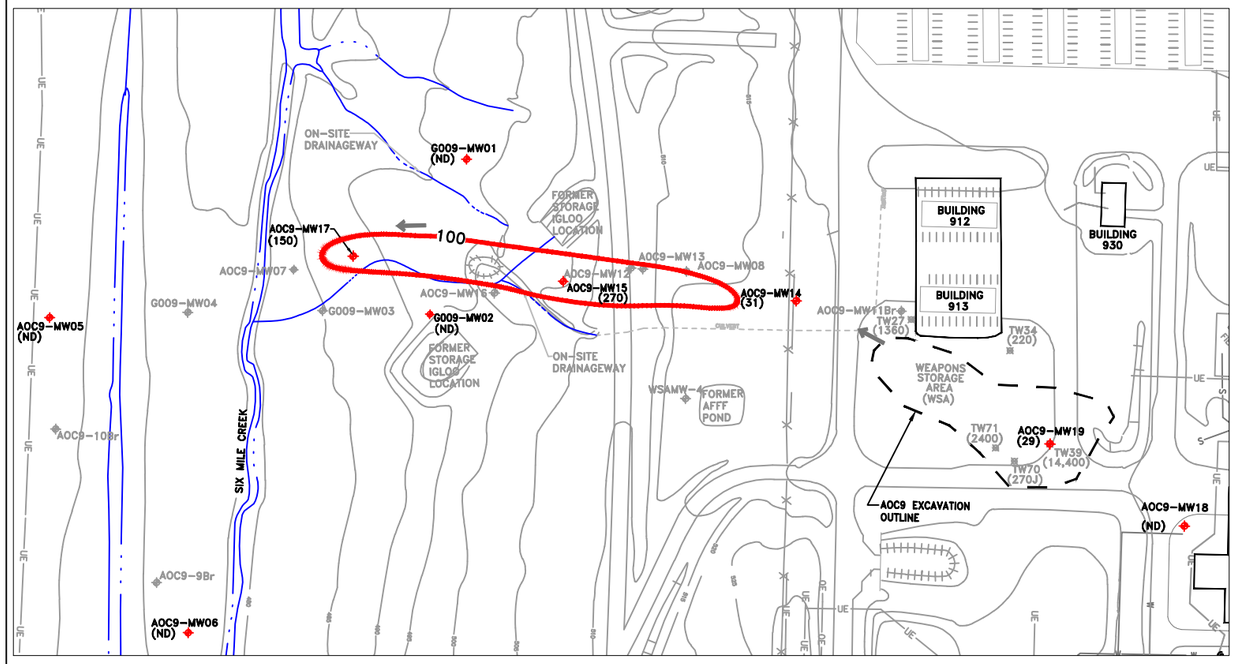
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\6-2-15\figure 3-2b.dwg



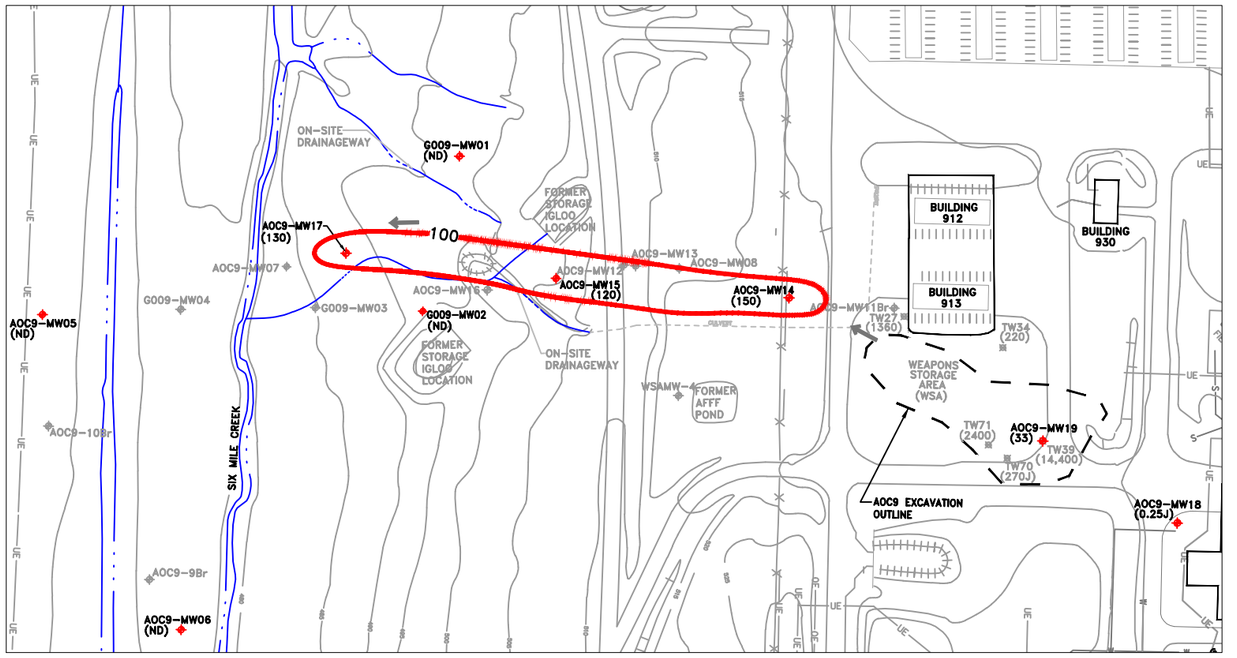
PERFORMANCE MONITORING SEPTEMBER 2012



LONG-TERM MONITORING APRIL 2013



LONG-TERM MONITORING APRIL 2014



LONG-TERM MONITORING APRIL 2015

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 100 — CHLOROBENZENE PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — CHLOROBENZENE IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

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NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

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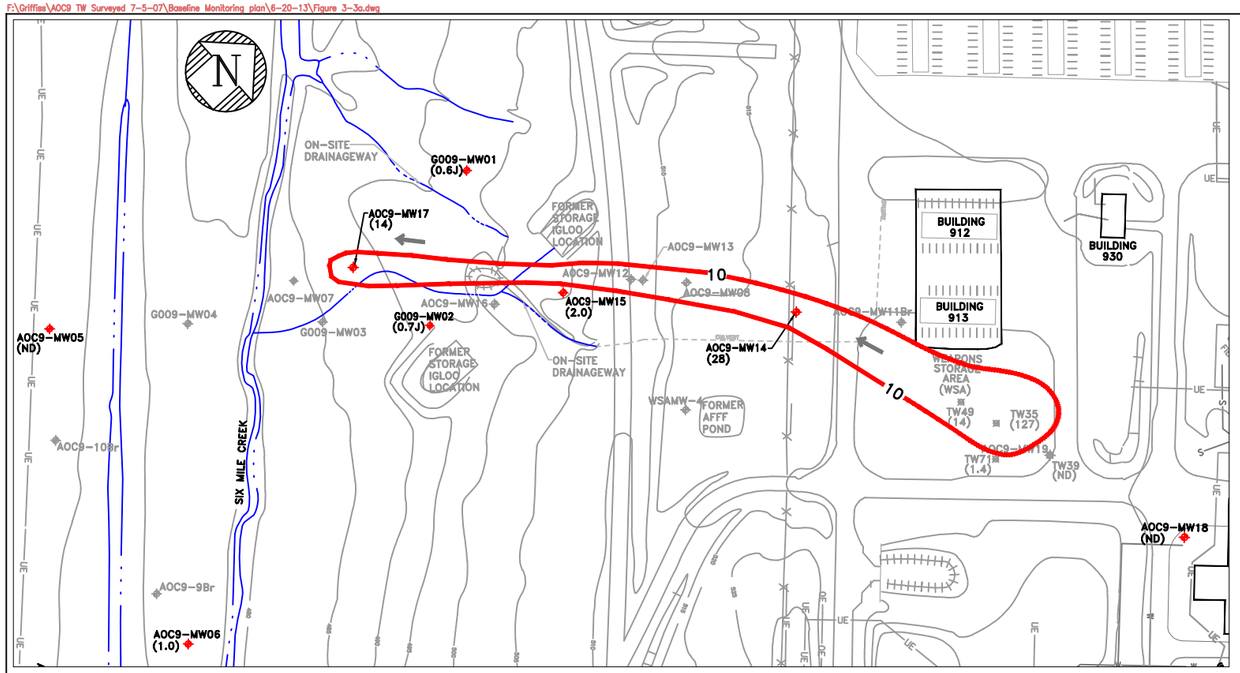
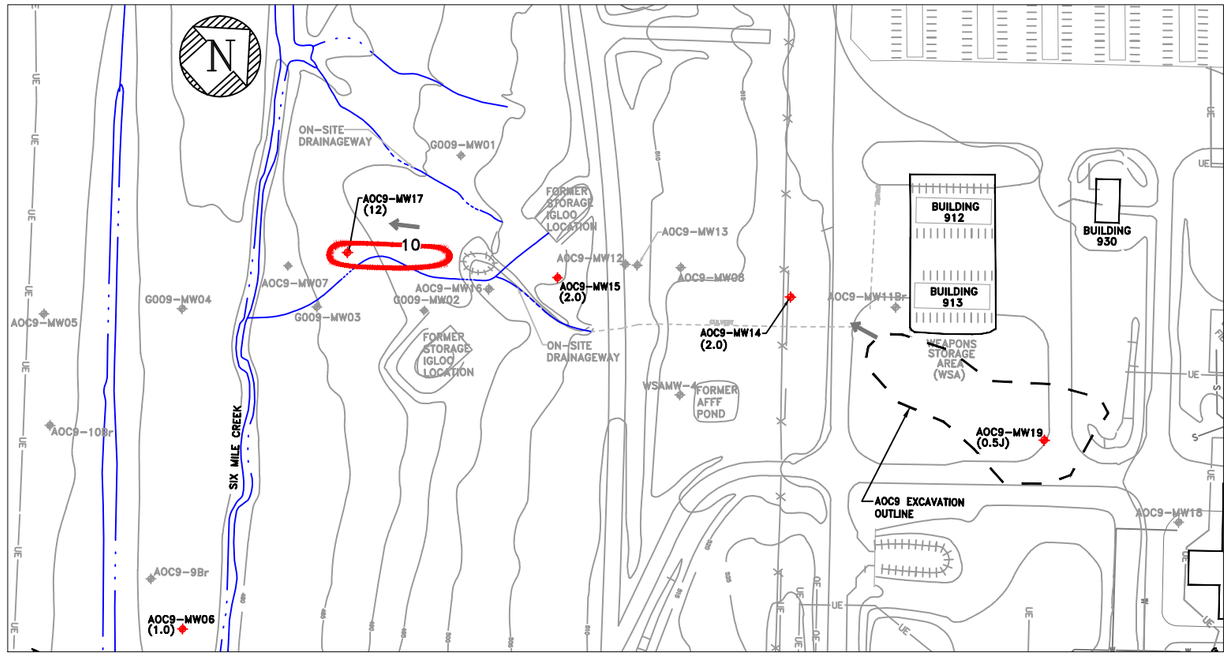
FIGURE 3-2b

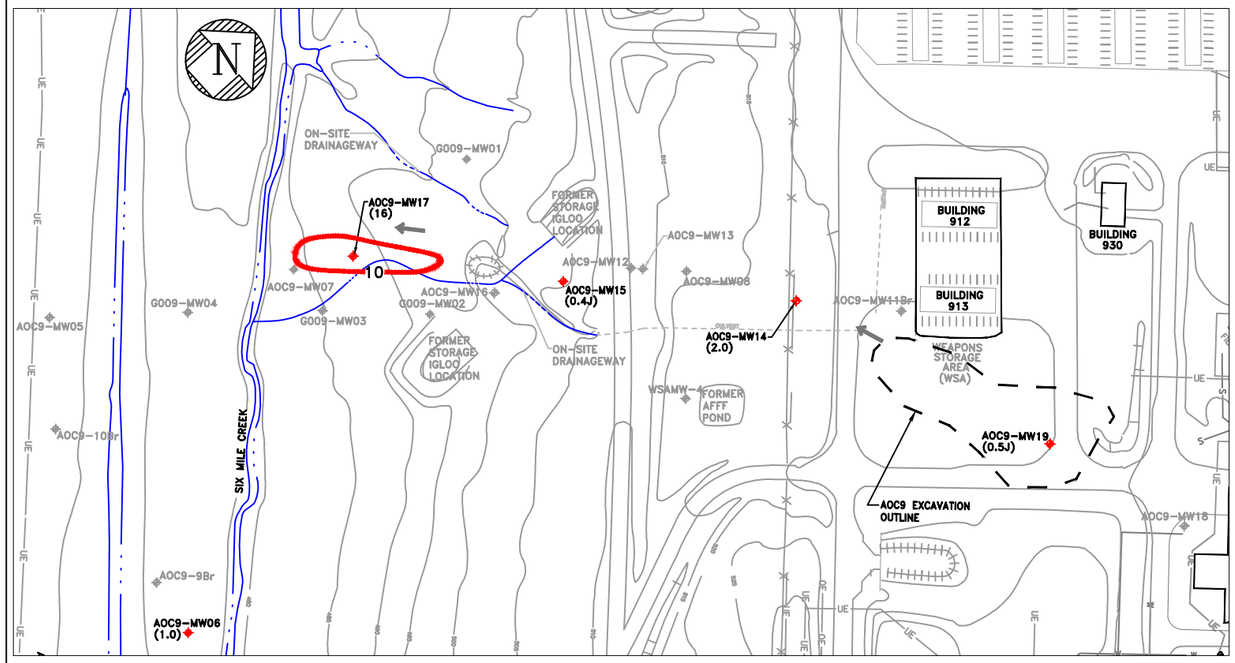
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\6-20-13\Figure 3-3a.dwg



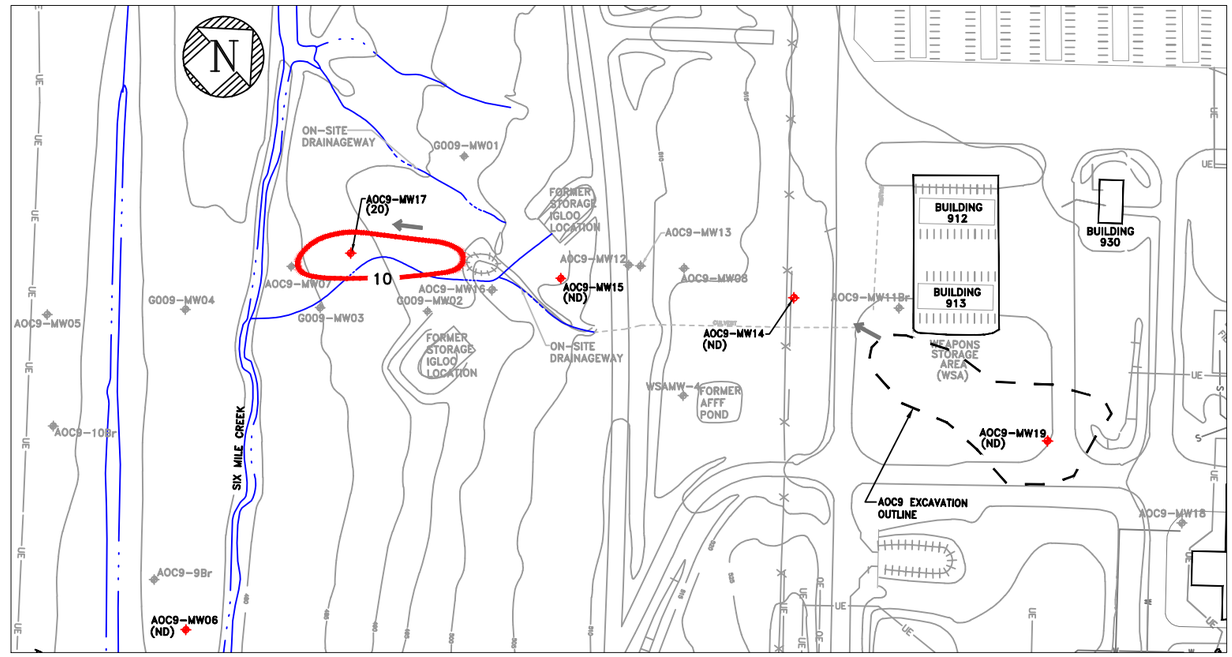
BASELINE SAMPLING JULY 2010



PERFORMANCE MONITORING MAY 2011



PERFORMANCE MONITORING OCTOBER 2011



PERFORMANCE MONITORING APRIL 2012

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 10 — TCE PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — TCE IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

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NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

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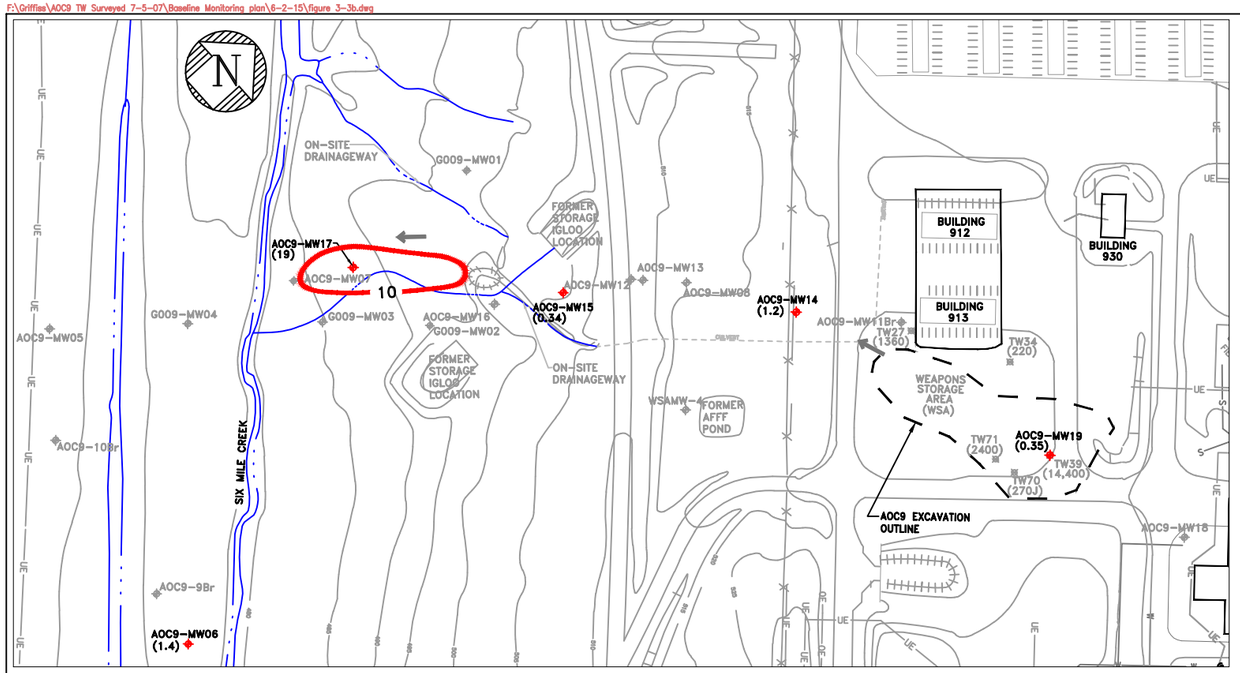
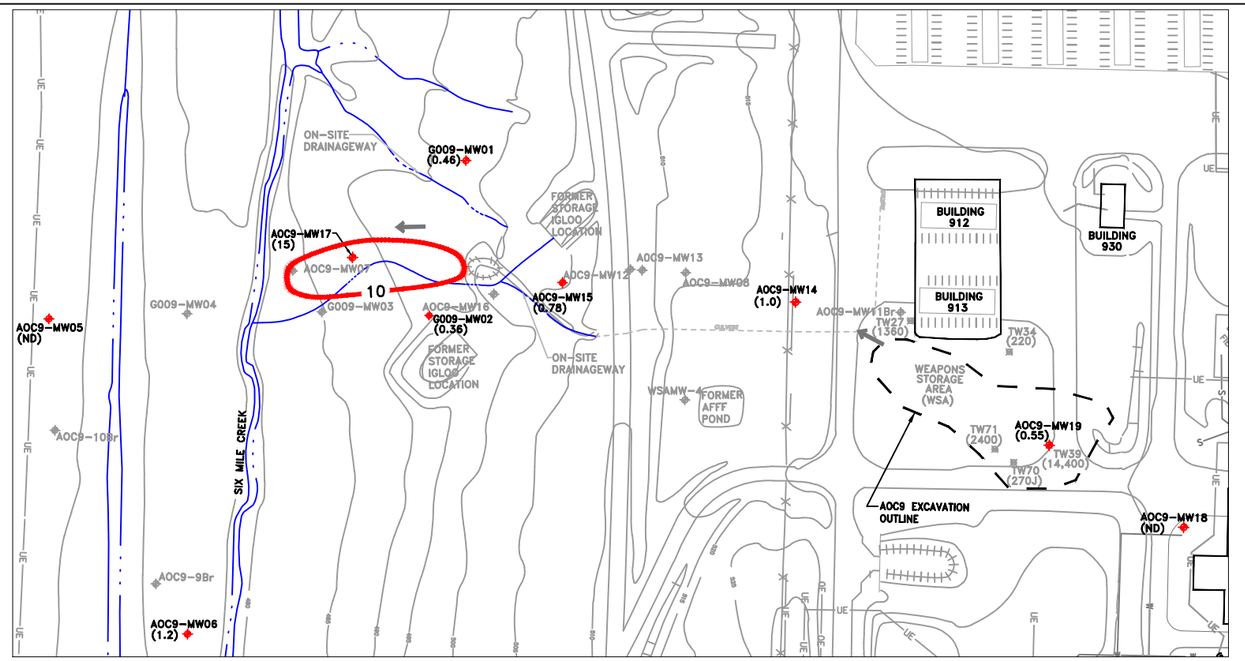
FIGURE 3-3a

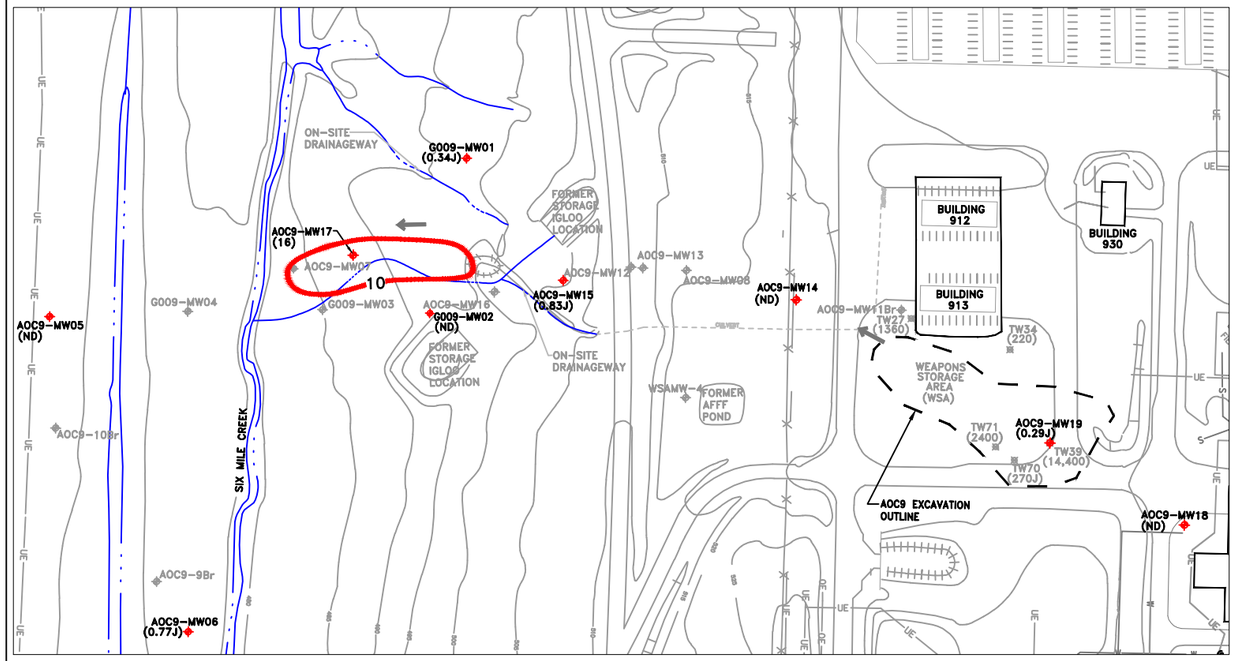
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\6-2-15\figure 3-3b.dwg



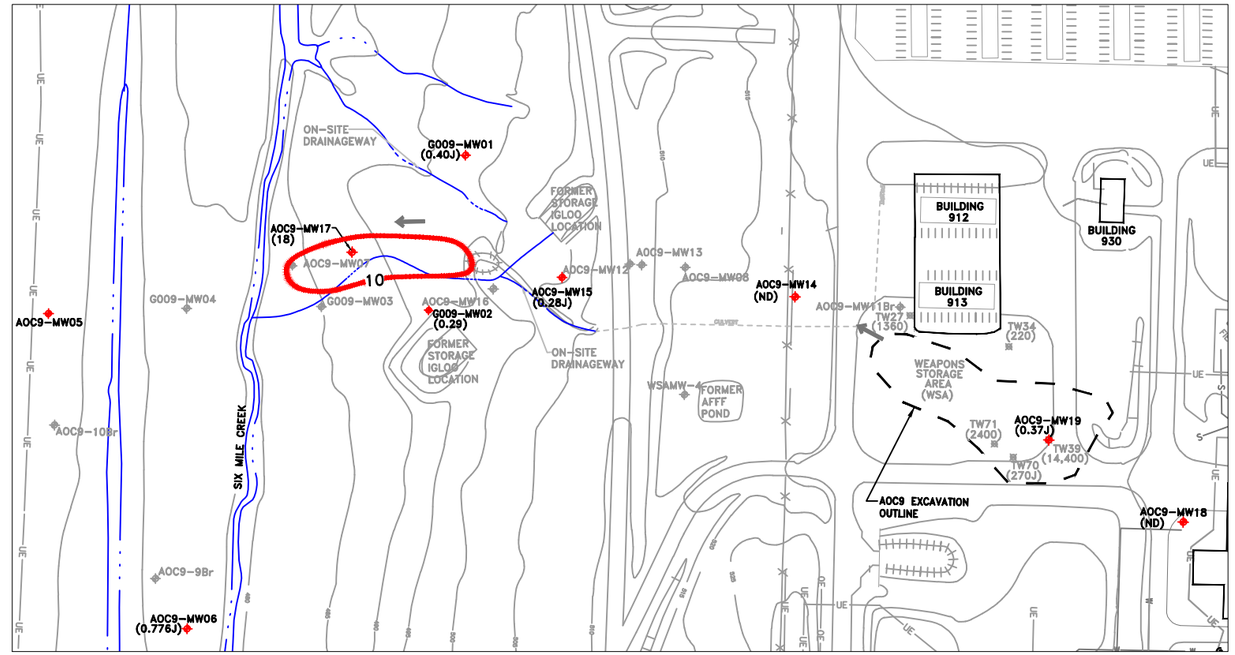
PERFORMANCE MONITORING SEPTEMBER 2012



LONG-TERM MONITORING APRIL 2013



LONG-TERM MONITORING APRIL 2014



LONG-TERM MONITORING APRIL 2015

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 10 — TCE PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — TCE IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

GRIFFISS AFB OBGW SITES
AOC 9 SITE
ROME, NEW YORK

NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

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FIGURE 3-3b

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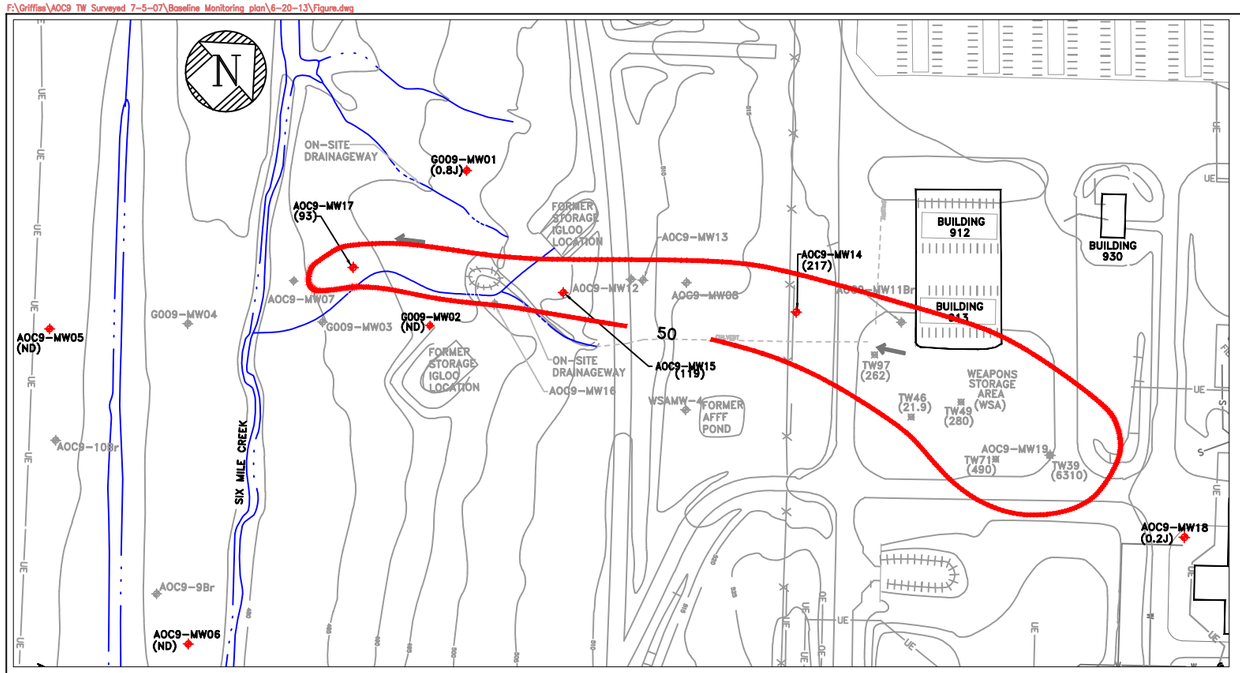
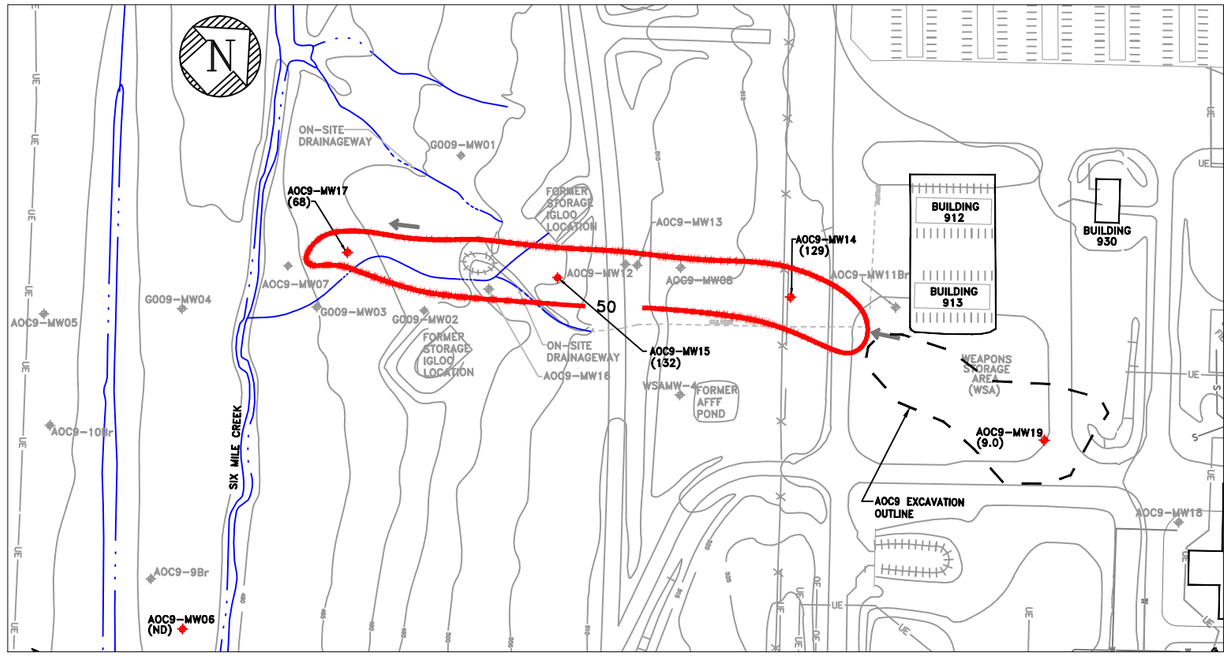
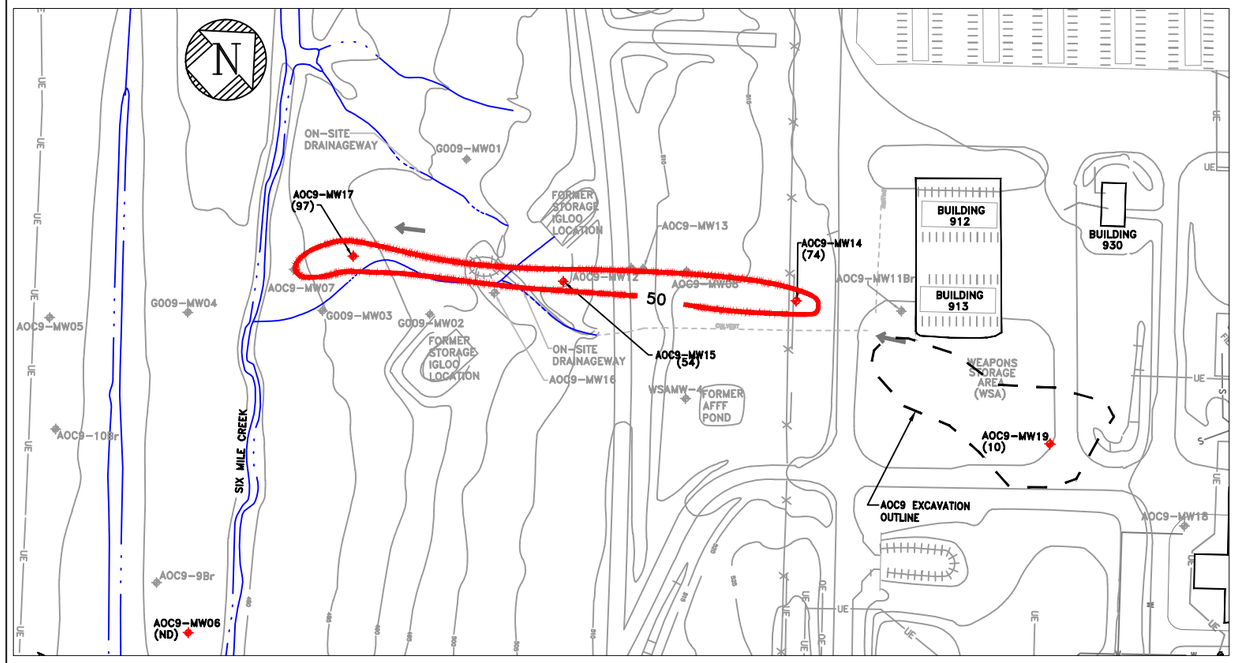


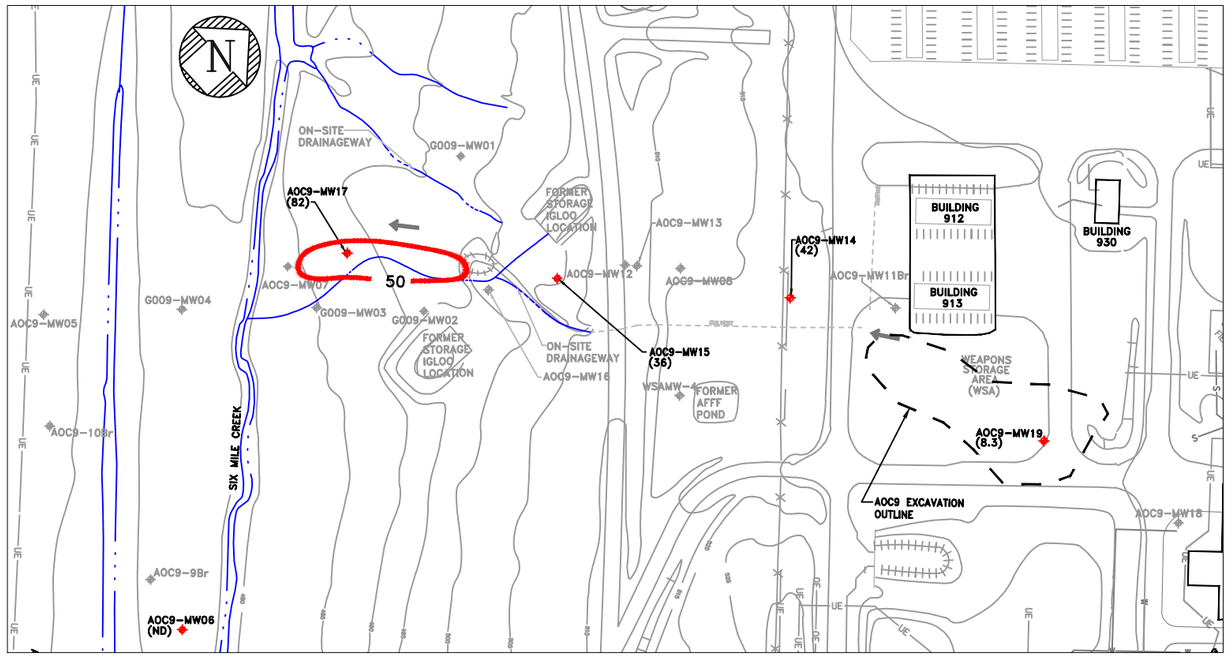
BASELINE SAMPLING JULY 2010



PERFORMANCE MONITORING MAY 2011



PERFORMANCE MONITORING OCTOBER 2011



PERFORMANCE MONITORING APRIL 2012

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 50 — TOTAL DCB PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — TOTAL DCB IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

GRIFFISS AFB OBGW SITES
AOC 9 SITE
ROME, NEW YORK

NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

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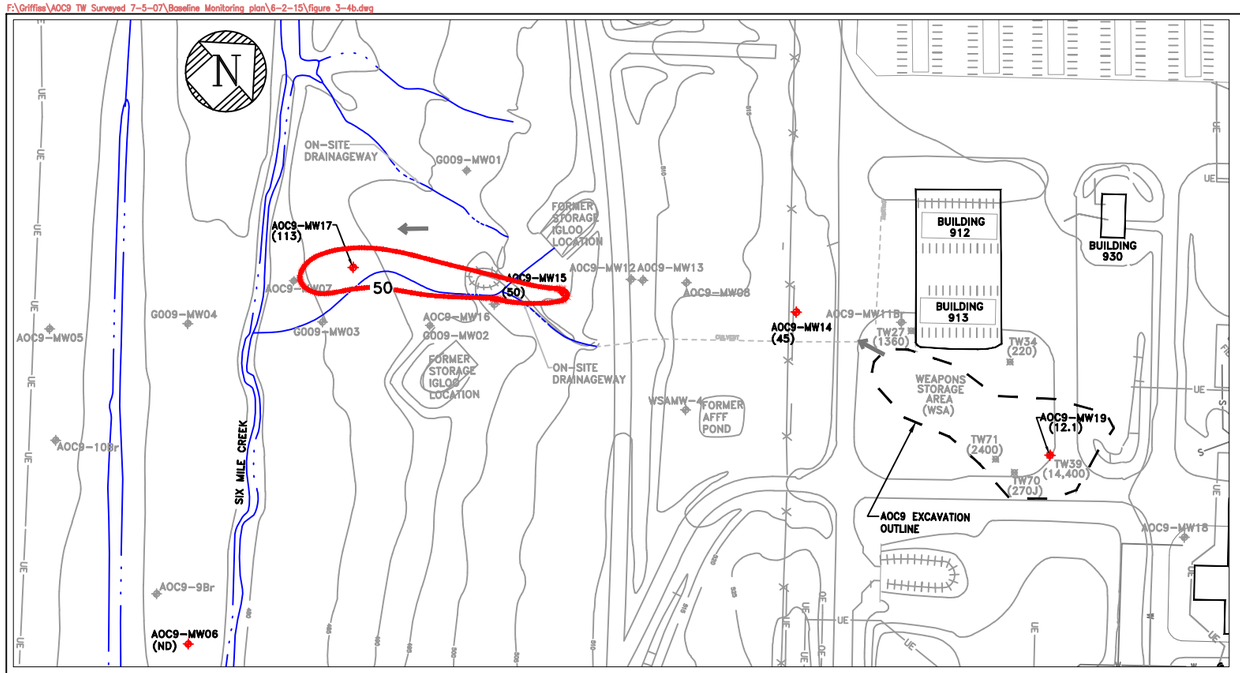
In Association with: parsons

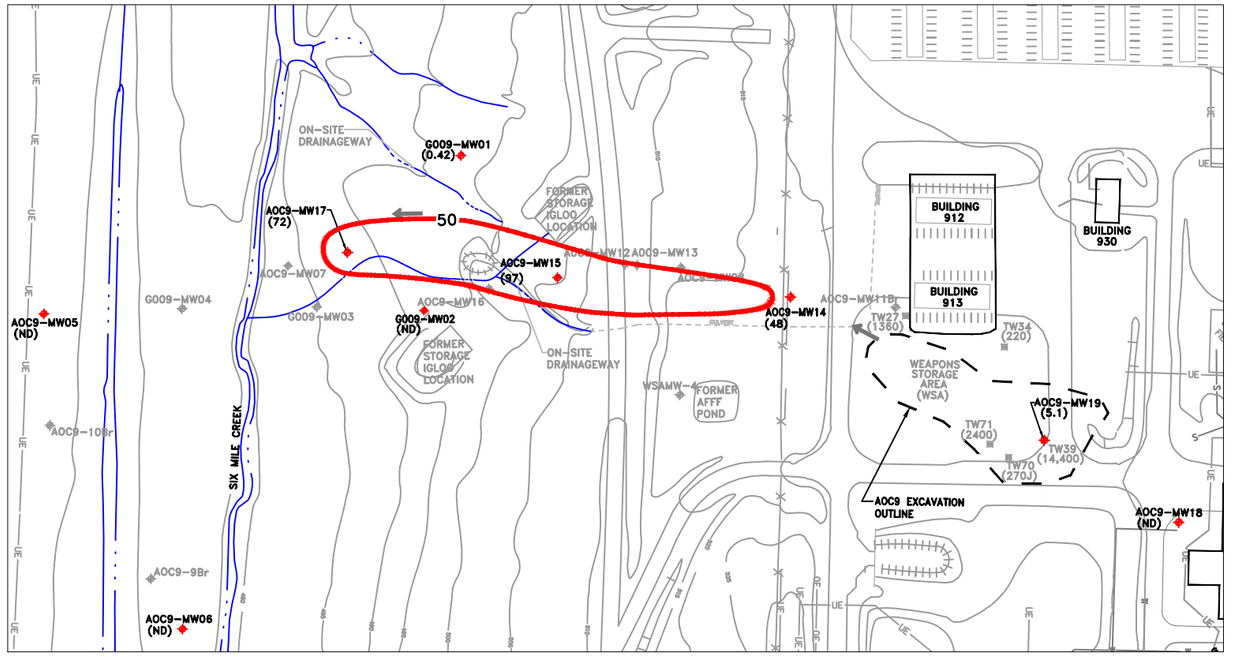
DRAWING TITLE:
AOC 9
REMEDIAL MONITORING
TOTAL DCB PLUME

FIGURE 3-4a

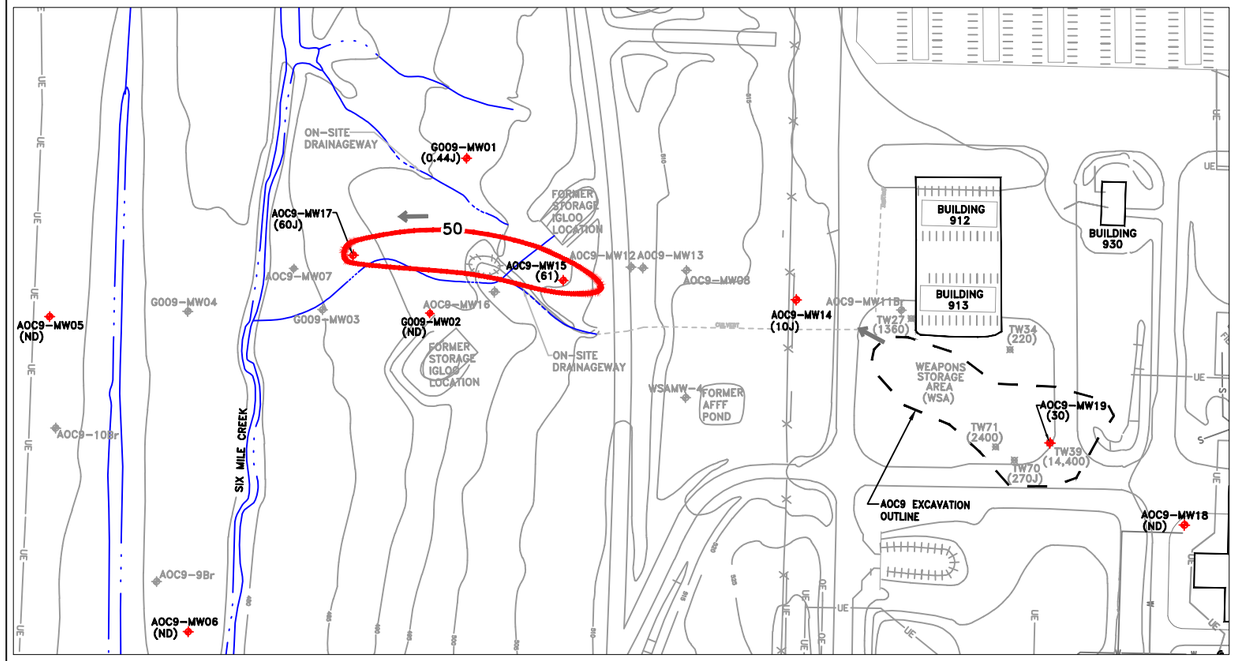
F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline Monitoring plan\6-2-15\figure 3-4b.dwg



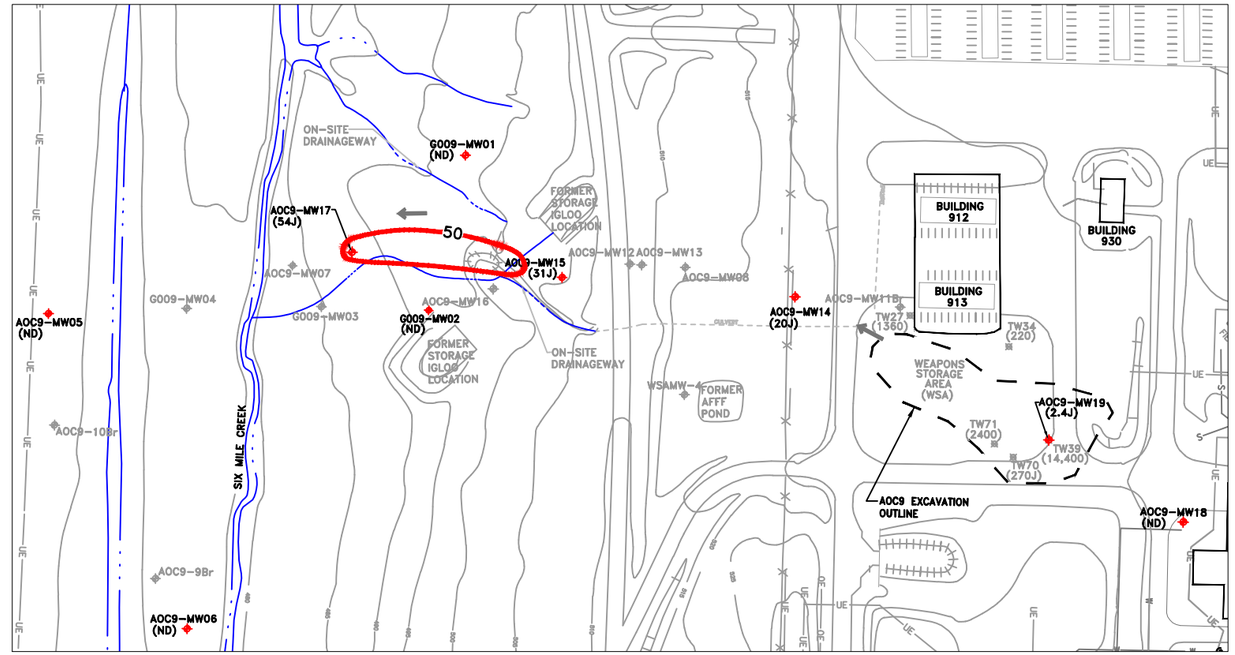
PERFORMANCE MONITORING SEPTEMBER 2012



LONG-TERM MONITORING APRIL 2013



LONG-TERM MONITORING APRIL 2014



LONG-TERM MONITORING APRIL 2015

LEGEND

- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- EXISTING WELL
- 50 — TOTAL DCB PLUME CONTOUR IN PARTS PER BILLION
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- GROUNDWATER FLOW DIRECTION
- (0.5J) — TOTAL DCB IN PARTS PER BILLION
- TW39 — PREDESIGN INVESTIGATION TEMPORARY MONITORING WELL
- (ND) — NOT DETECTED

SCALE IN FEET
0 200 400 600

GRIFFISS AFB OBGW SITES
AOC 9 SITE
ROME, NEW YORK

NOTE: HISTORICAL MONITORING WELL DATA WAS USED TO ESTIMATE CONTOUR LINES WHEN NEW DATA WAS NOT AVAILABLE (SEE FIG 1-2).

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AOC 9
REMEDIAL MONITORING
TOTAL DCB PLUME

FIGURE 3-4b

Figure 3-5 G009-MW01 Trend Analysis

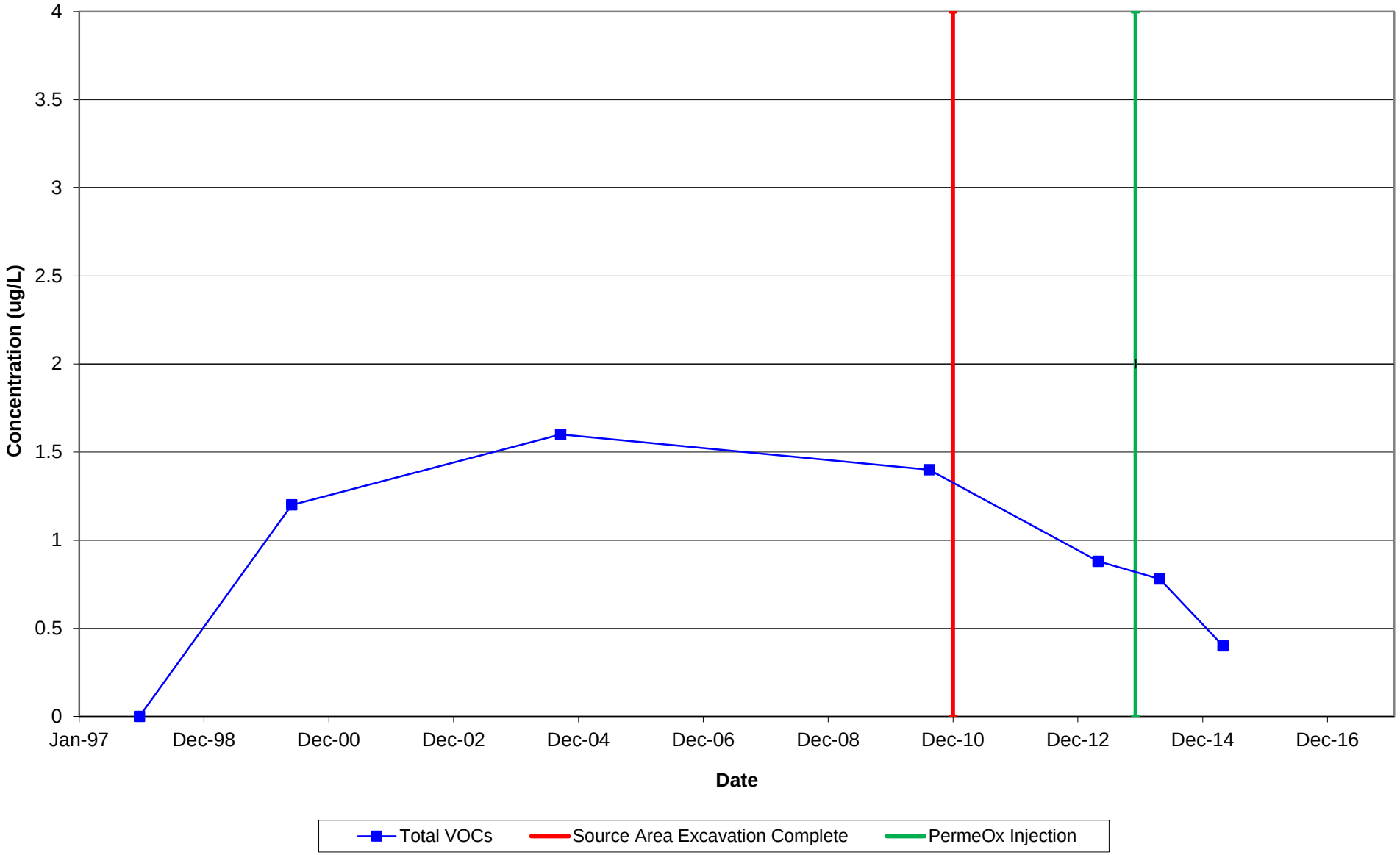


Figure 3-6 G009-MW02 Trend Analysis

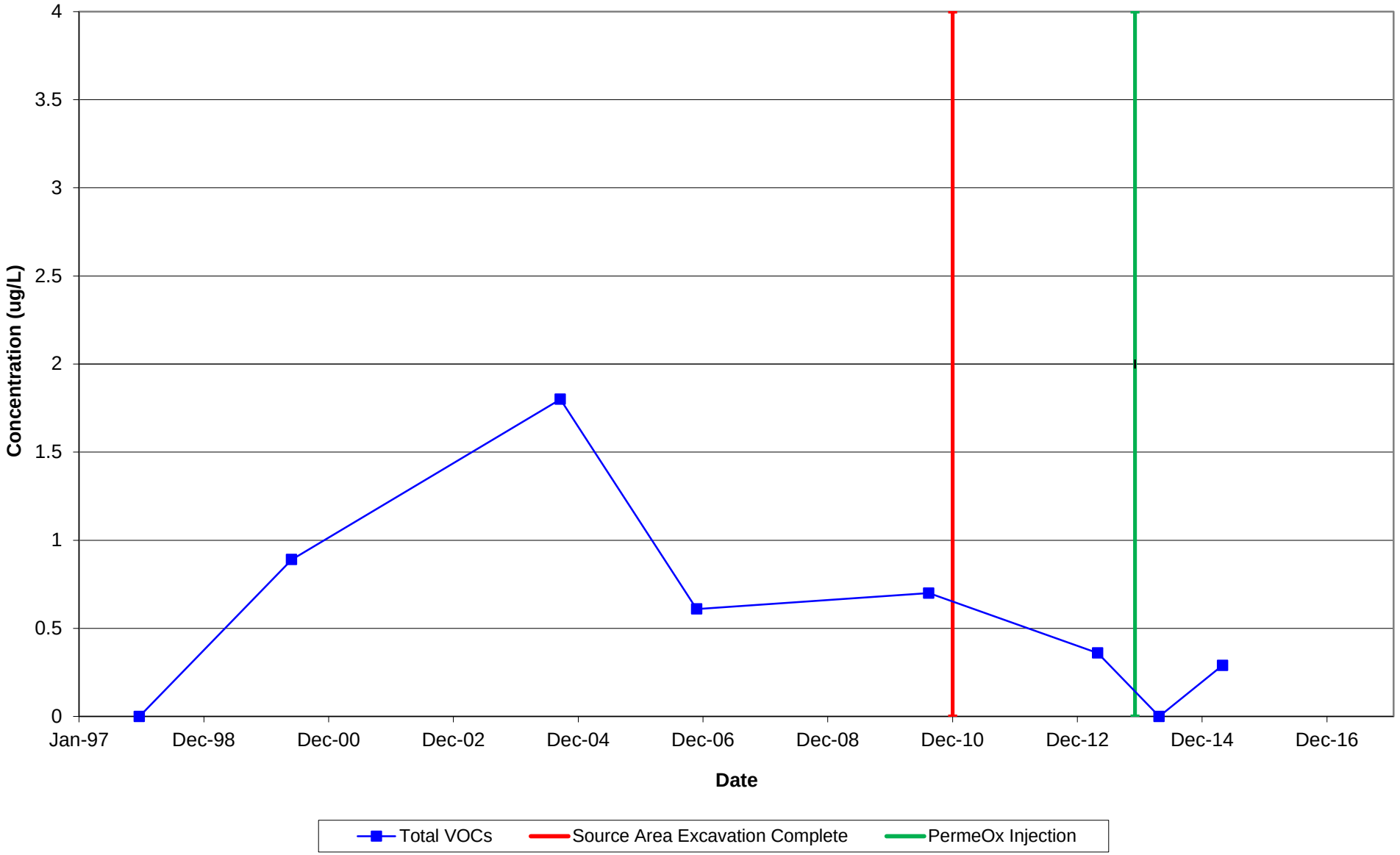


Figure 3-7 AOC9-MW06 Trend Analysis

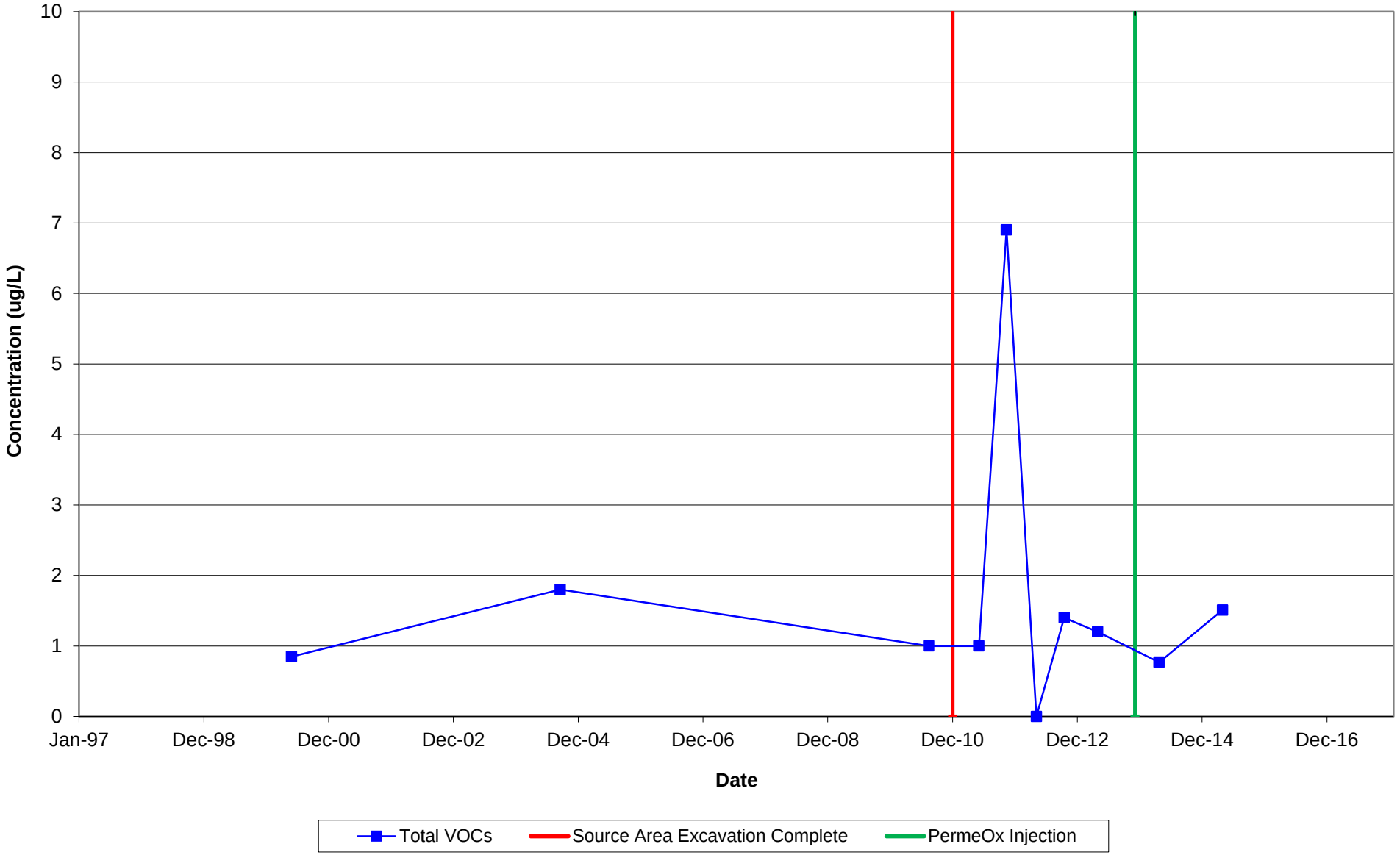


Figure 3-8 AOC9-MW14 Trend Analysis

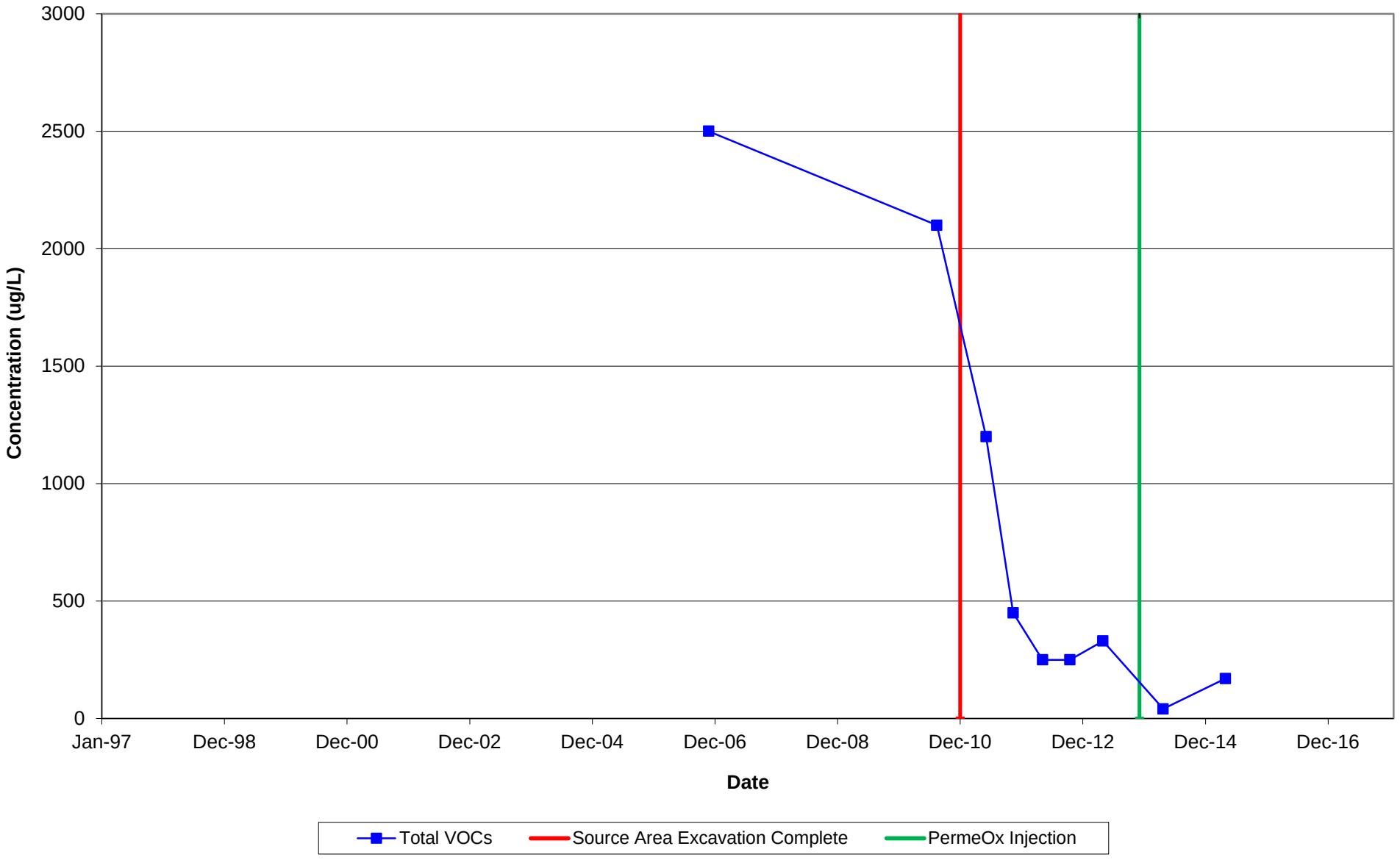


Figure 3-9 AOC9-MW15 Trend Analysis

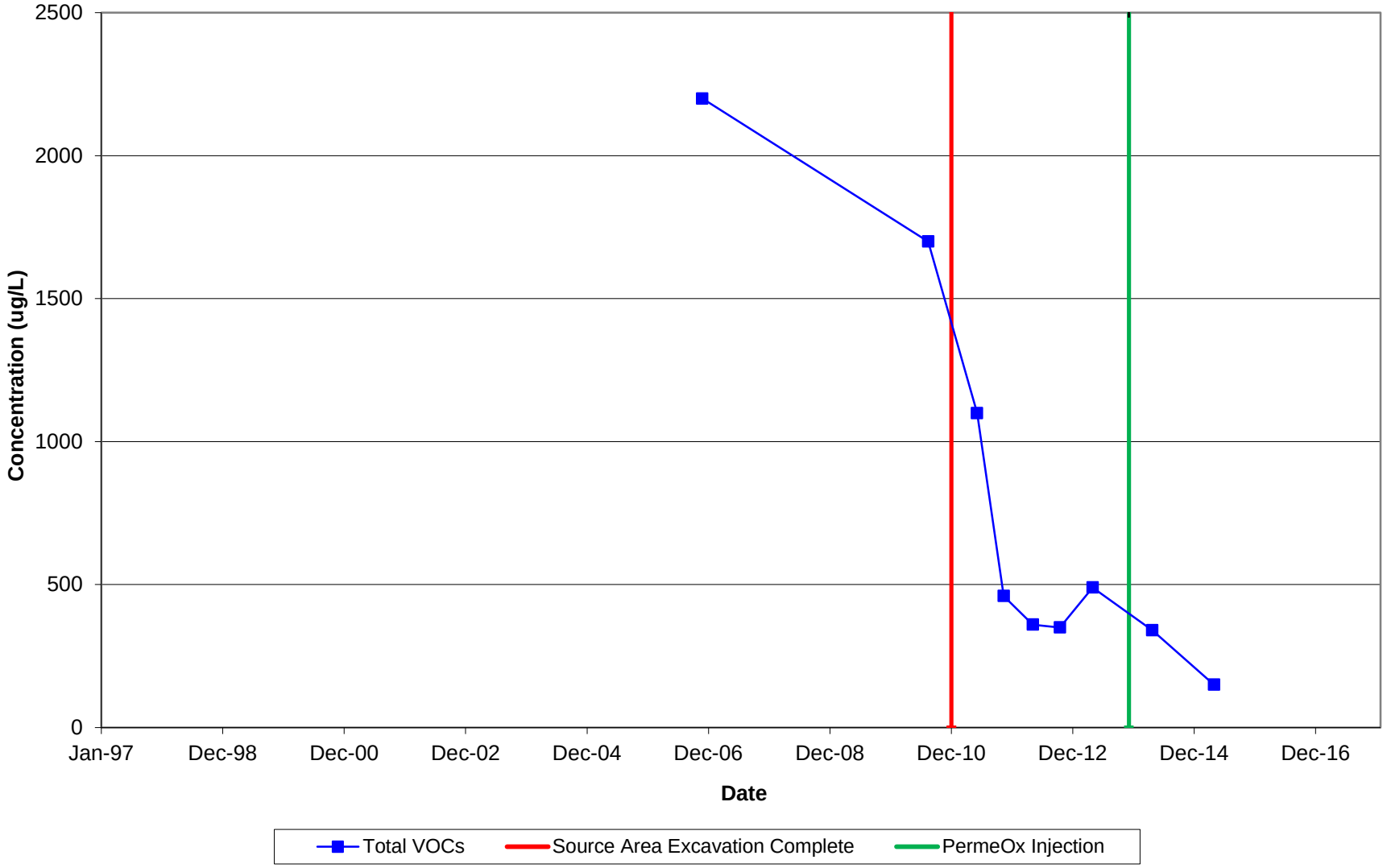


Figure 3-10 AOC9-MW17 Trend Analysis

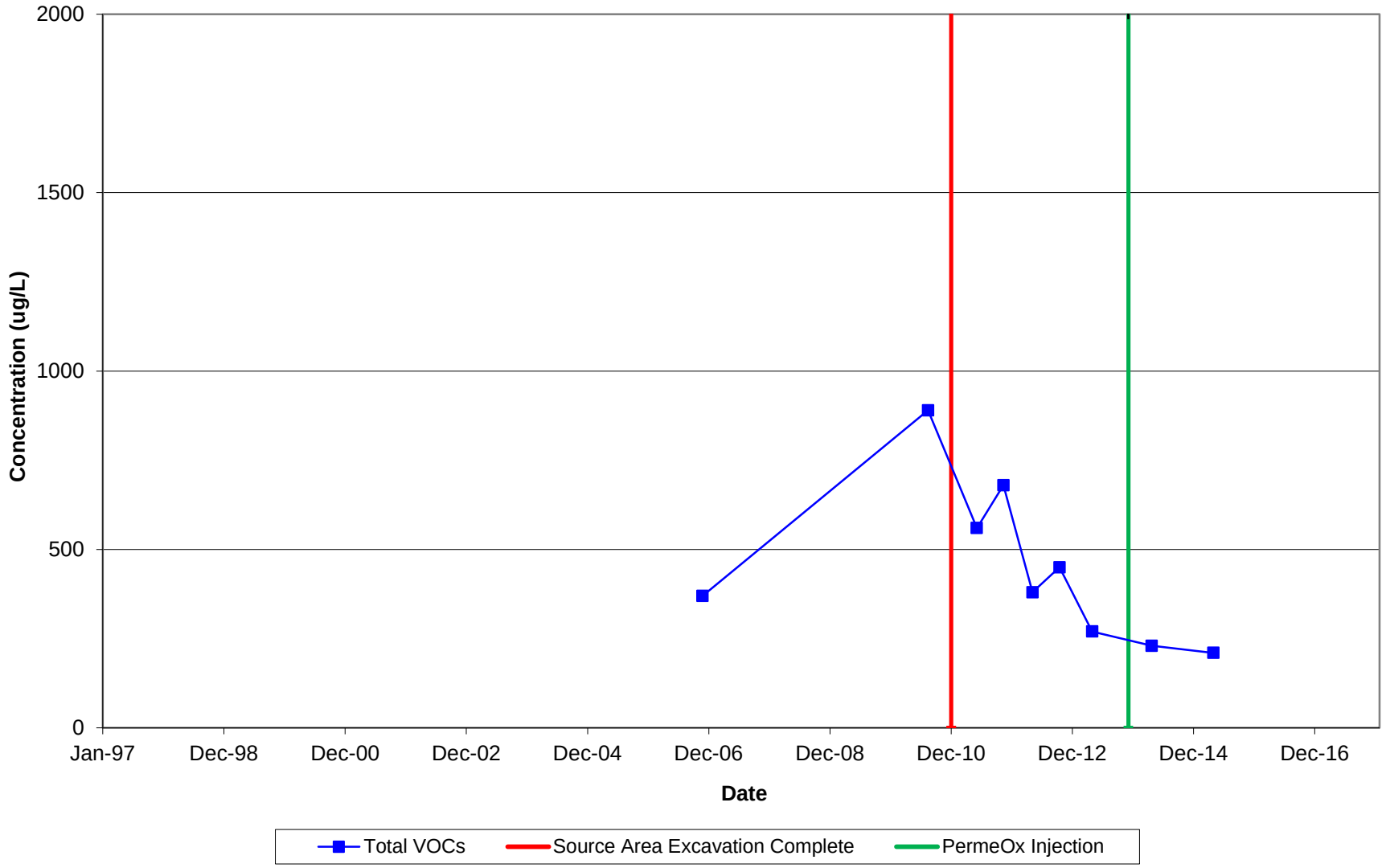


Figure 3-11 AOC9-MW18 Trend Analysis

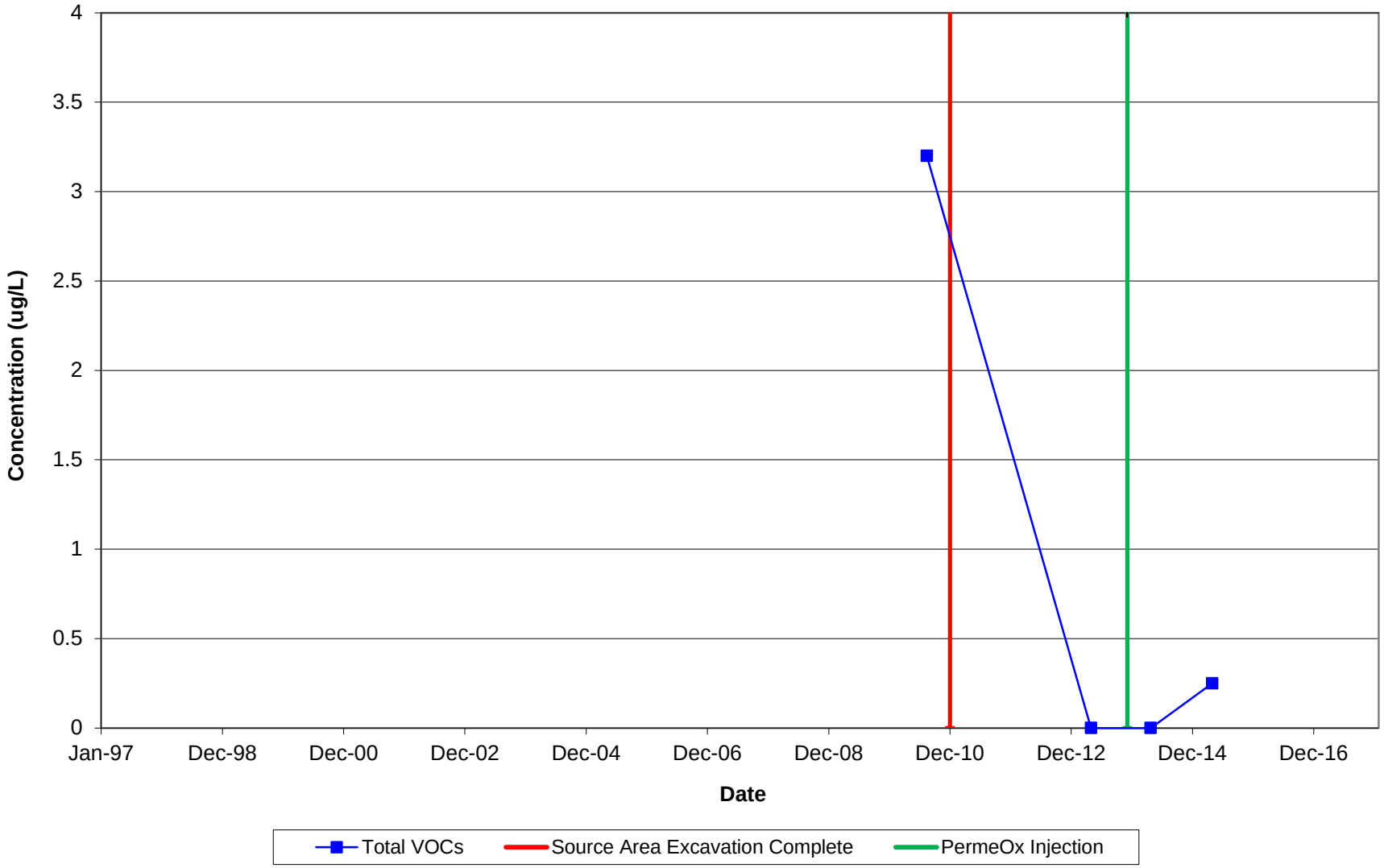
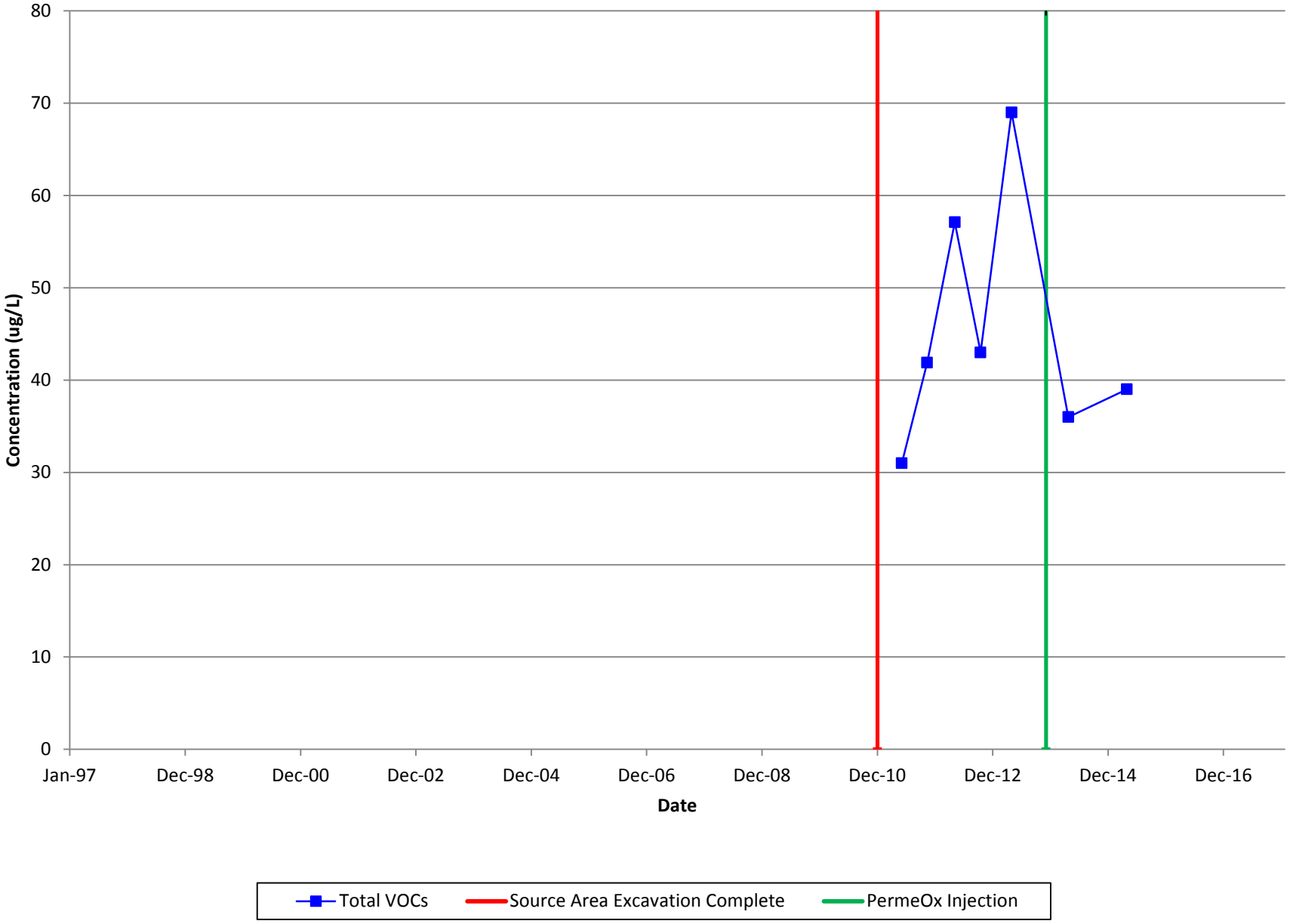


Figure 3-12 AOC9-MW19 Trend Analysis



4 Effectiveness of Remedy

Since baseline sampling, the center line of plume monitoring wells (MW14, MW15, and MW17) have seen a significant reduction in total VOC contamination concentration with only some slight seasonal variations and rebounding following the PermeOx injection at MW14. Downgradient wells MW05 and MW06 continue to be below RAOs. The lateral wells, MW01 and MW02, and the upgradient well, MW18, have shown a decrease in concentration since baseline sampling. The source area concentrations have decreased since the excavation and continue to show some seasonal variation with concentrations remaining less than 100 µg/L at MW19.

Based on the significant reductions seen in VOC concentrations in source area well MW19 and within the centerline of the contaminant plume in comparison to sample data collected prior to the remedial excavation, and the stability of the leading edge of the plume as indicated by the VOC concentrations obtained from MW06, the AOC 9 groundwater remedy has been effective during this long-term monitoring period.

The performance of the remedy will continue to be monitored through biennial monitoring to evaluate the groundwater chemistry and contamination biodegradation and/or migration. Monitoring will be ongoing according to the following schedules:

- Long-term monitoring is planned for the spring of 2017. Nine wells (MW-01, MW-02, MW-05, MW-06, MW-14, MW-15, MW-17, MW-18, and MW-19) and three surface water locations (SW-01, SW-02, and SW-03) will be sampled as part of long-term monitoring.
- No quarterly sampling is planned for 2015 to monitor the performance of the PermeOx injections.

In accordance with the Record of Decision, monitoring of the groundwater plume and treatment performance will be performed by the Air Force until RAOs are achieved, i.e., until four consecutive sampling rounds are below the remediation goals listed in Table 2-1.

It is anticipated that a report will be prepared in late 2015 supporting a recommendation that the site has met operating properly and successfully criteria. A CERCLA five-year review of the site will be completed in 2015.

4.1 Recommendations

No changes to the approved long-term monitoring plan sampling protocols or locations are proposed at this time.

5 References

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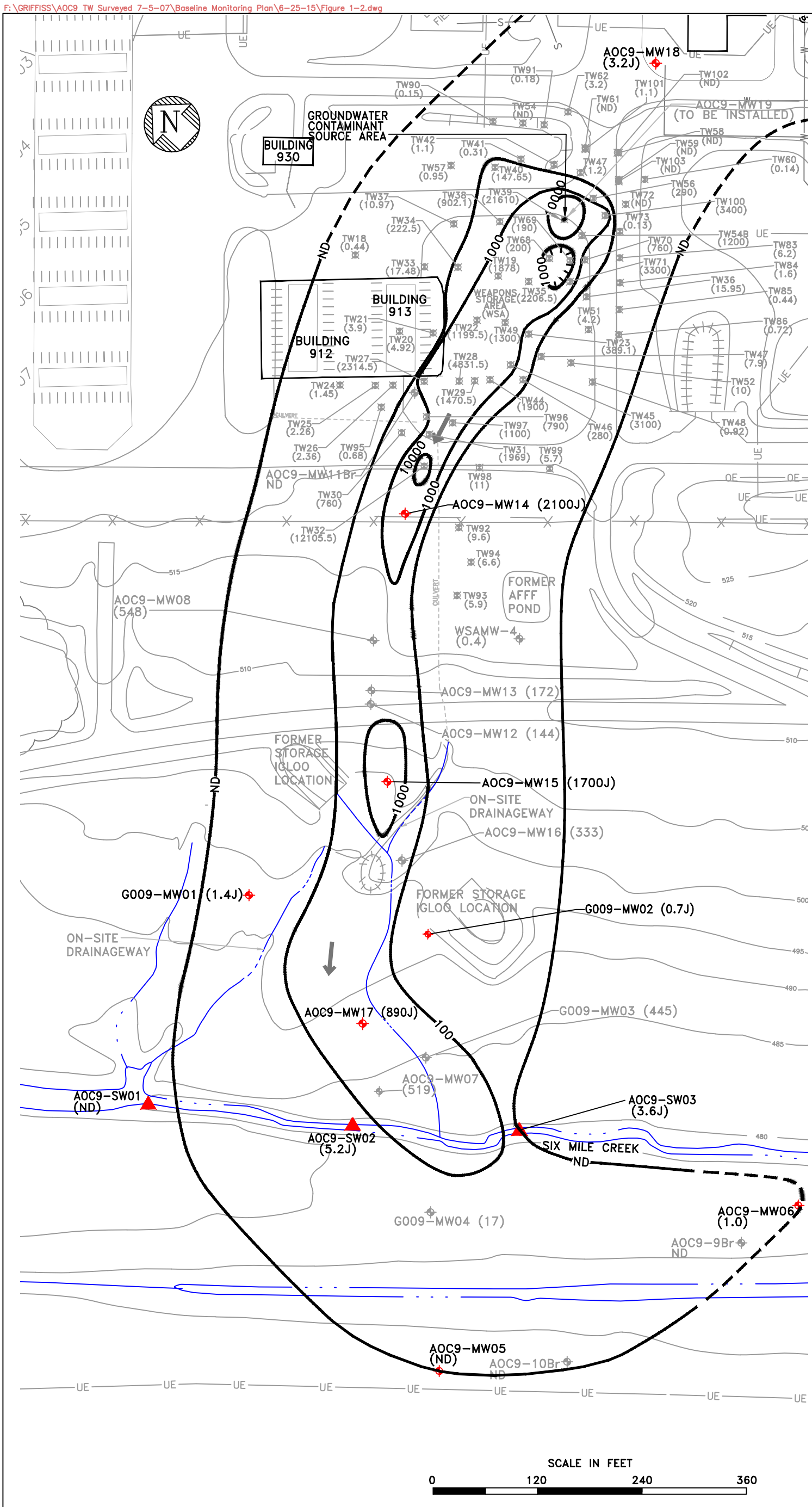
A

Final Performance Monitoring Data Summary Report Figures

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\6-25-15\Figure 1-2.dwg



LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- ND — NOT DETECTED
- 10000 — TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
- AOC9-MW14 — BASELINE MONITORING WELL SAMPLE LOCATION
- AOC9-MW08 (548) — EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
- (140) — 2010 BASELINE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
- → GROUNDWATER FLOW DIRECTION
- ▲ SURFACE WATER SAMPLING LOCATIONS
- TW99 (5.7) — 2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

NOTES:

1. MONITORING WELL AOC9-MW19 WAS INSTALLED AFTER THE BASELINE MONITORING AND REMEDIAL EXCAVATION WERE PERFORMED.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

SCALE IN FEET
0 120 240 360

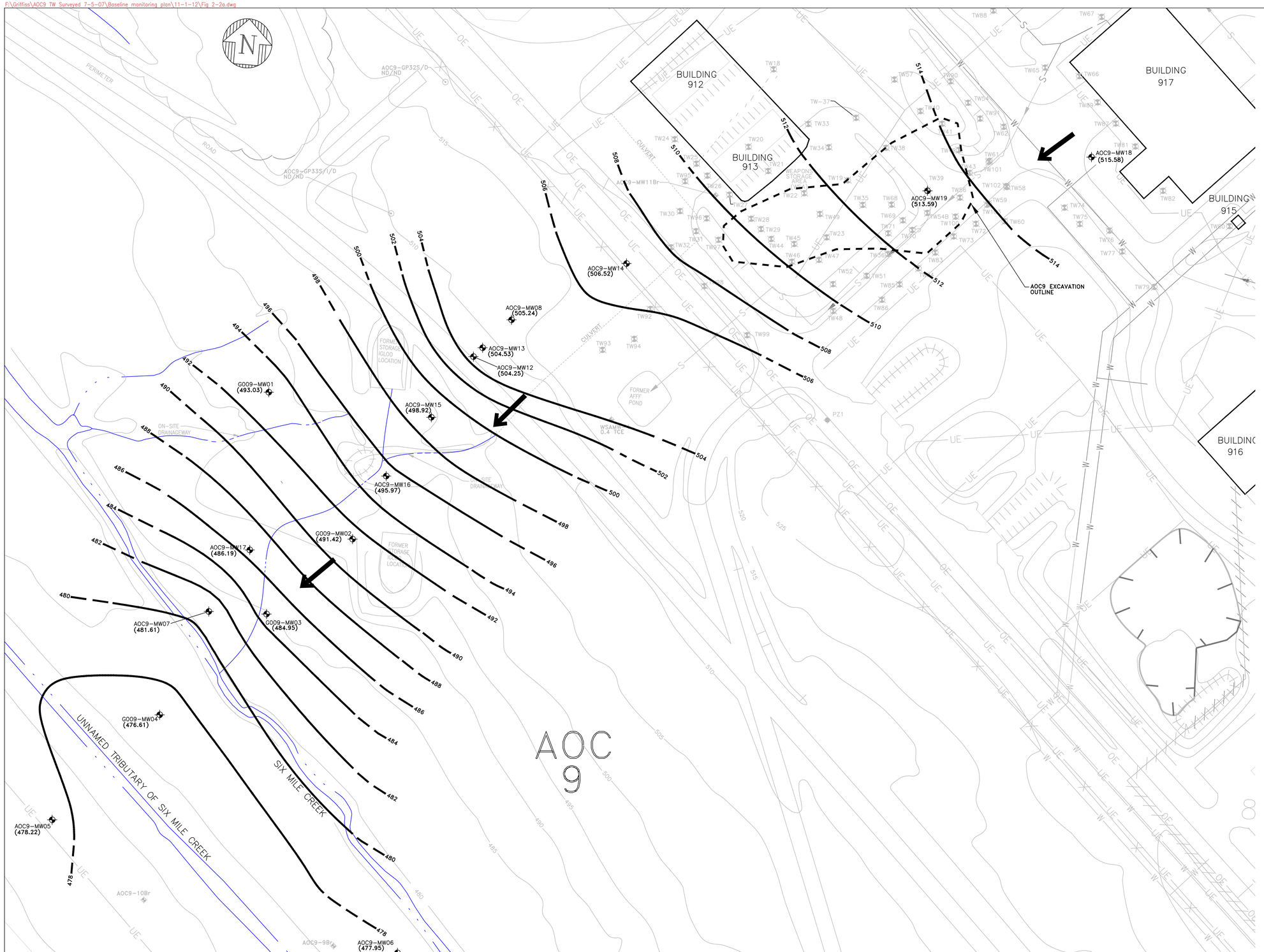
FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE: AOC 9
2010 BASELINE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 1-2

F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline monitoring plan\11-1-12\Fig 2-2a.dwg



LEGEND

- FENCE
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- UE — UNDERGROUND ELECTRIC
- W — WATER LINE
- S — SANITARY SEWER
- OE — OVERHEAD ELECTRIC
- ABANDONED UNDERGROUND ELECTRIC
- AMSL — ABOVE MEAN SEA LEVEL
- 476 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DIRECTION OF GROUNDWATER FLOW
- G009-MW01 — PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- TW44 — TEMPORARY MONITORING WELL LOCATION
- PZ-1 — PIEZOMETER LOCATION
- (517.35) — APRIL 16, 2012 GROUNDWATER ELEVATION (FEET AMSL)

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 4/16/2012.

60 0 60 120
SCALE: 1"=60'

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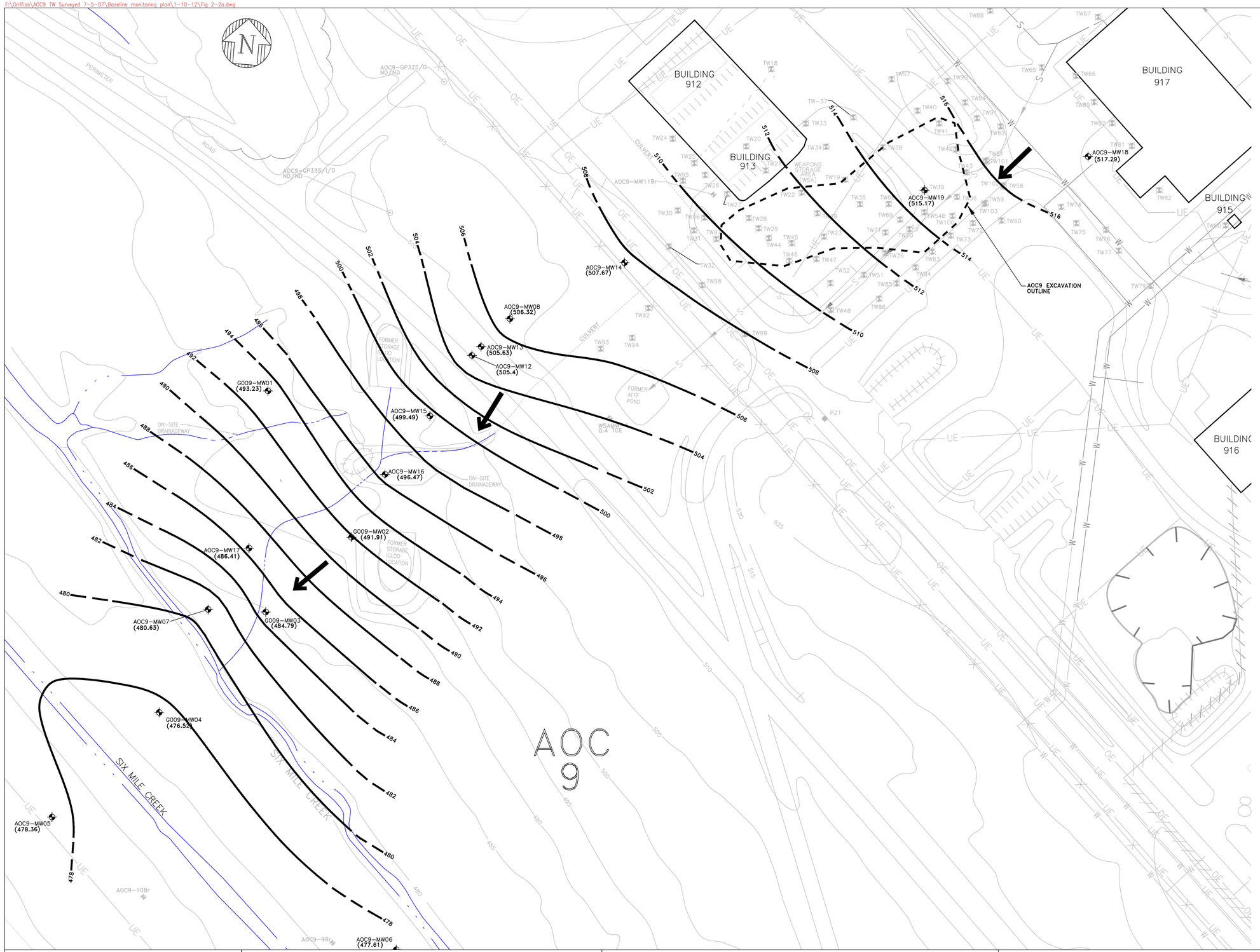
AOC 9: GROUNDWATER CONTOUR MAP
APRIL 16, 2012

FIGURE 2-2a

F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline monitoring plan\1-10-12\Fig 2-2a.dwg



LEGEND

X	FENCE
525	TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
UE	UNDERGROUND ELECTRIC
W	WATER LINE
S	SANITARY SEWER
OE	OVERHEAD ELECTRIC
	ABANDONED UNDERGROUND ELECTRIC
AMSL	ABOVE MEAN SEA LEVEL
476	GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
	DIRECTION OF GROUNDWATER FLOW
G009-MW01	PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
TW44	TEMPORARY MONITORING WELL LOCATION
PZ-1	PIEZOMETER LOCATION
(517.35)	MAY 17, 2011 GROUNDWATER ELEVATION (FEET AMSL)

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 5/17/2011.

60 0 60 120
SCALE: 1"=60'

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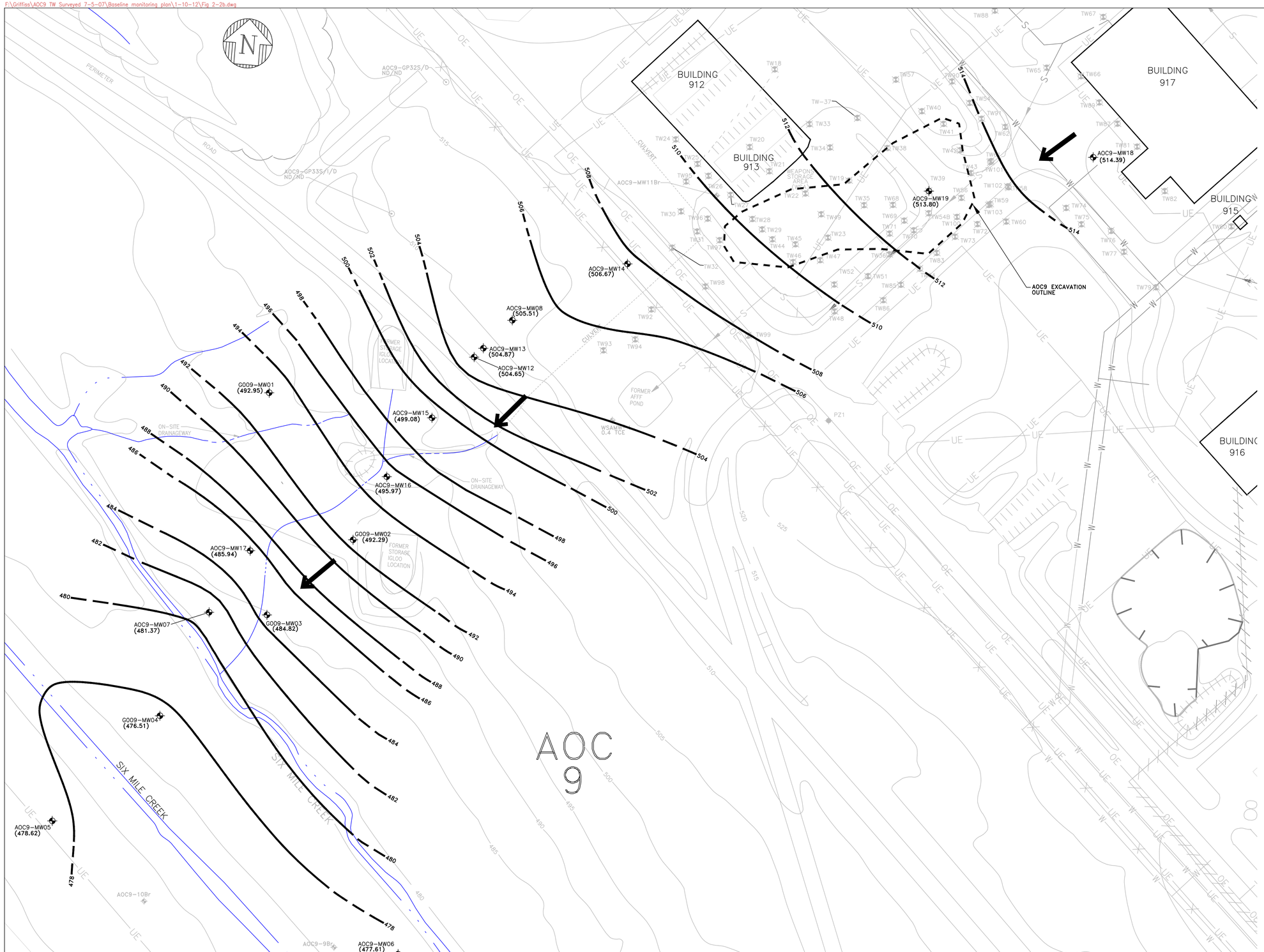
AOC 9: GROUNDWATER CONTOUR MAP
MAY 17, 2011

FIGURE 2-2a

F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline monitoring plan\1-10-12\Fig 2-2b.dwg



LEGEND

X	FENCE
525	TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
UE	UNDERGROUND ELECTRIC
W	WATER LINE
S	SANITARY SEWER
OE	OVERHEAD ELECTRIC
	ABANDONED UNDERGROUND ELECTRIC
AMSL	ABOVE MEAN SEA LEVEL
476	GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
	DIRECTION OF GROUNDWATER FLOW
G009-MW01	PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
TW44	TEMPORARY MONITORING WELL LOCATION
PZ-1	PIEZOMETER LOCATION
(517.35)	MAY 17, 2011 GROUNDWATER ELEVATION (FEET AMSL)

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 10/24/2011.

60 0 60 120
SCALE: 1"=60'

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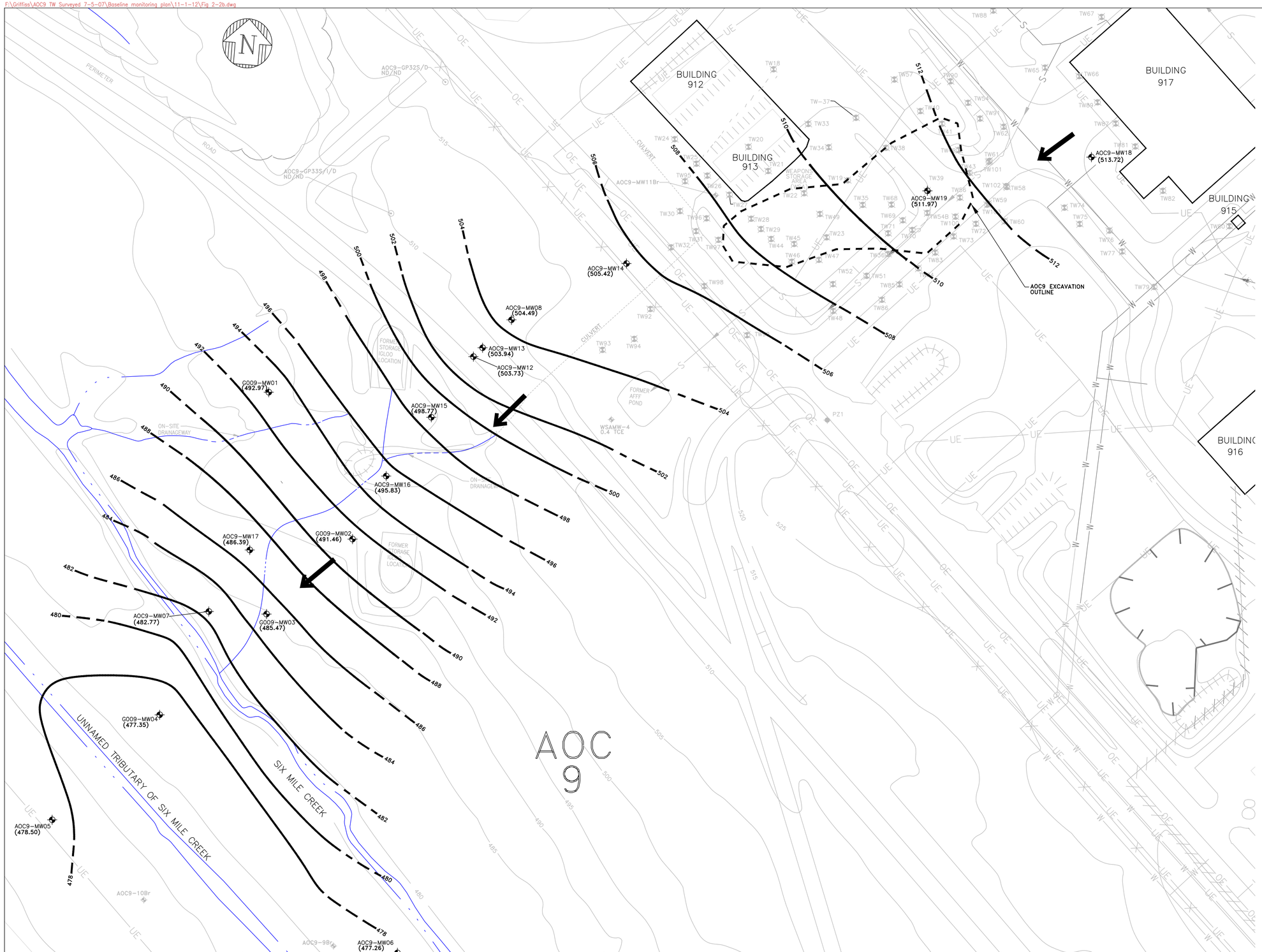
AOC 9: GROUNDWATER CONTOUR MAP
OCTOBER 24, 2011

FIGURE 2-2b

F:\Griffiss\AOC9 TW Surveyed 7-5-07\Baseline monitoring plan\11-1-12\Fig 2-2b.dwg



LEGEND

- FENCE
- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- UE — UNDERGROUND ELECTRIC
- W — WATER LINE
- S — SANITARY SEWER
- OE — OVERHEAD ELECTRIC
- ABANDONED UNDERGROUND ELECTRIC
- AMSL — ABOVE MEAN SEA LEVEL
- 476 — GROUNDWATER CONTOUR (DASHED WHERE INFERRED)
- DIRECTION OF GROUNDWATER FLOW
- G009-MW01 — PERMANENT MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION
- TW44 — TEMPORARY MONITORING WELL LOCATION
- PZ-1 — PIEZOMETER LOCATION
- (517.35) — SEPTEMBER 25, 2012 GROUNDWATER ELEVATION (FEET AMSL)

NOTE:
1. GROUNDWATER ELEVATIONS WERE COLLECTED ON 9/25/2012.

60 0 60 120

SCALE: 1"=60'

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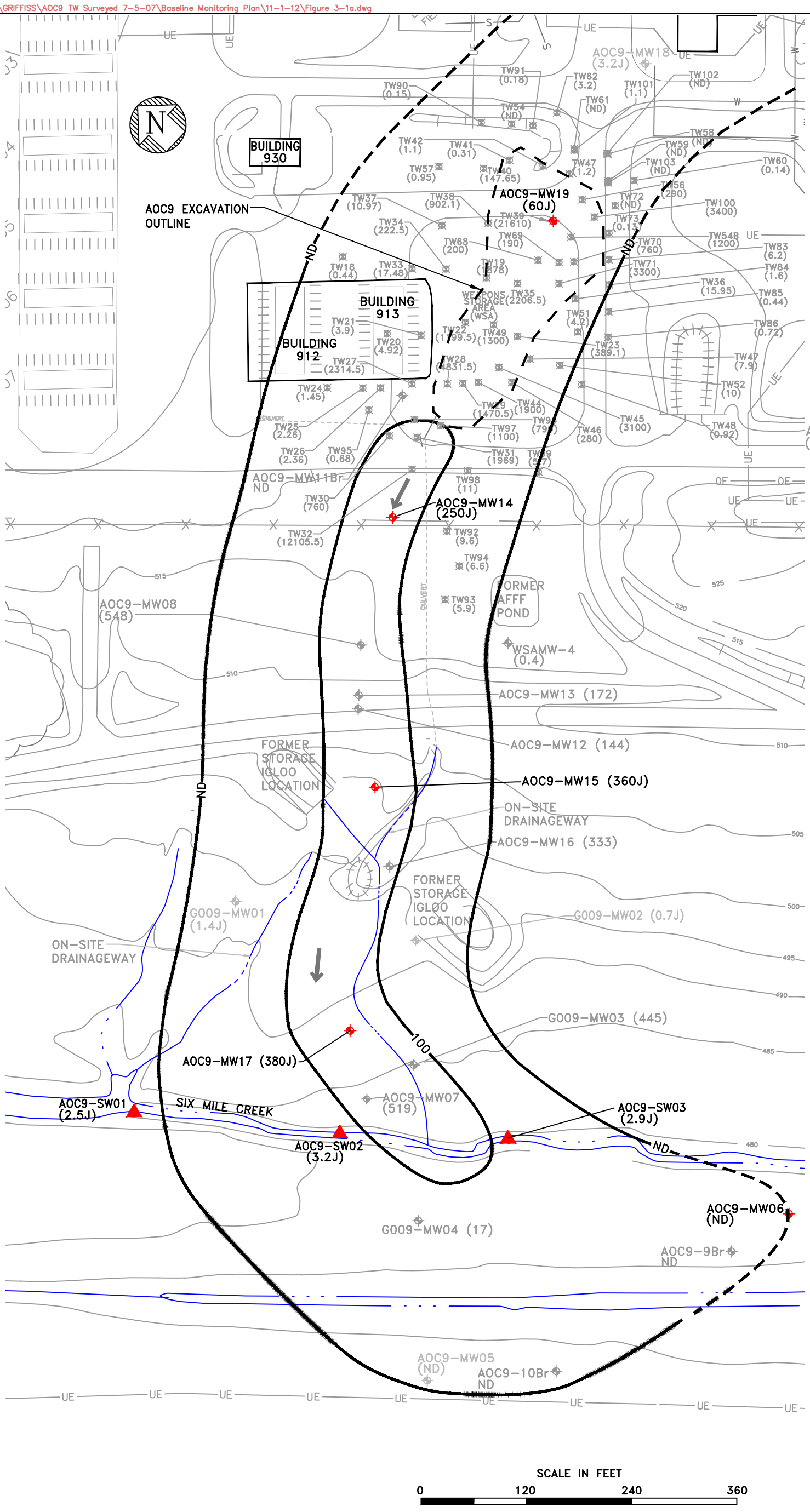
AOC 9: GROUNDWATER CONTOUR MAP
SEPTEMBER 25, 2012

FIGURE 2-2b

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\11-1-12\Figure 3-1a.dwg



LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- ND — NOT DETECTED
- 10000 — TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
- AOC9-MW14 — PERFORMANCE MONITORING WELL SAMPLE LOCATION
- AOC9-MW08 (548) — EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
- (31) — APRIL 2012 PERFORMANCE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
- → GROUNDWATER FLOW DIRECTION
- ▲ SURFACE WATER SAMPLING LOCATIONS
- TW99 (5.7) — 2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

SCALE IN FEET
0 120 240 360

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

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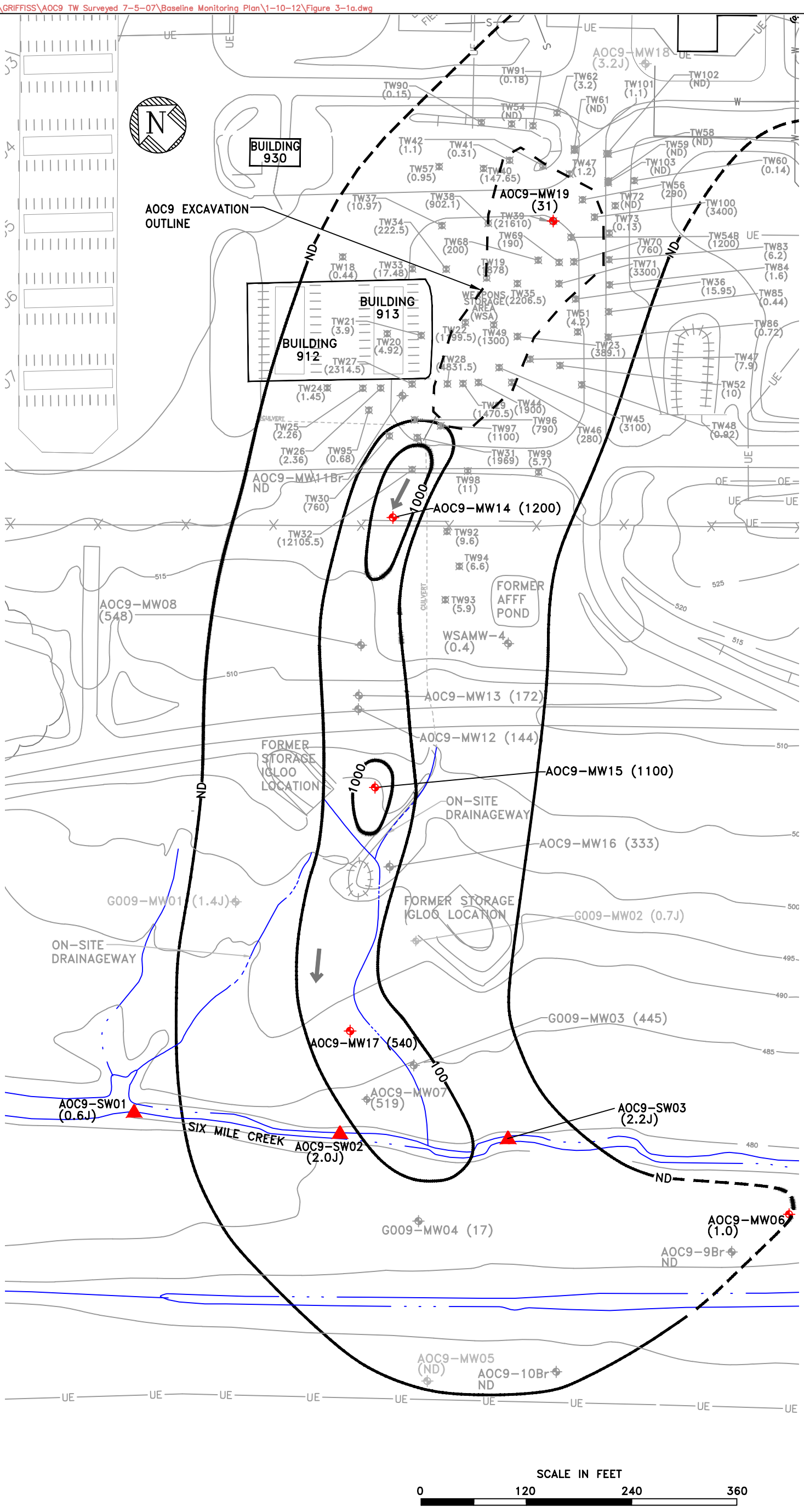
APRIL 2012 PERFORMANCE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1a

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 3-1a.dwg



SCALE IN FEET

0 120 240 360

LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- ND — NOT DETECTED
- 10000 — TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
- AOC9-MW14 — PERFORMANCE MONITORING WELL SAMPLE LOCATION
- AOC9-MW08 (548) — EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
- (31) — MAY 2011 PERFORMANCE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
- → GROUNDWATER FLOW DIRECTION
- ▲ SURFACE WATER SAMPLING LOCATIONS
- TW99 (5.7) — 2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
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   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

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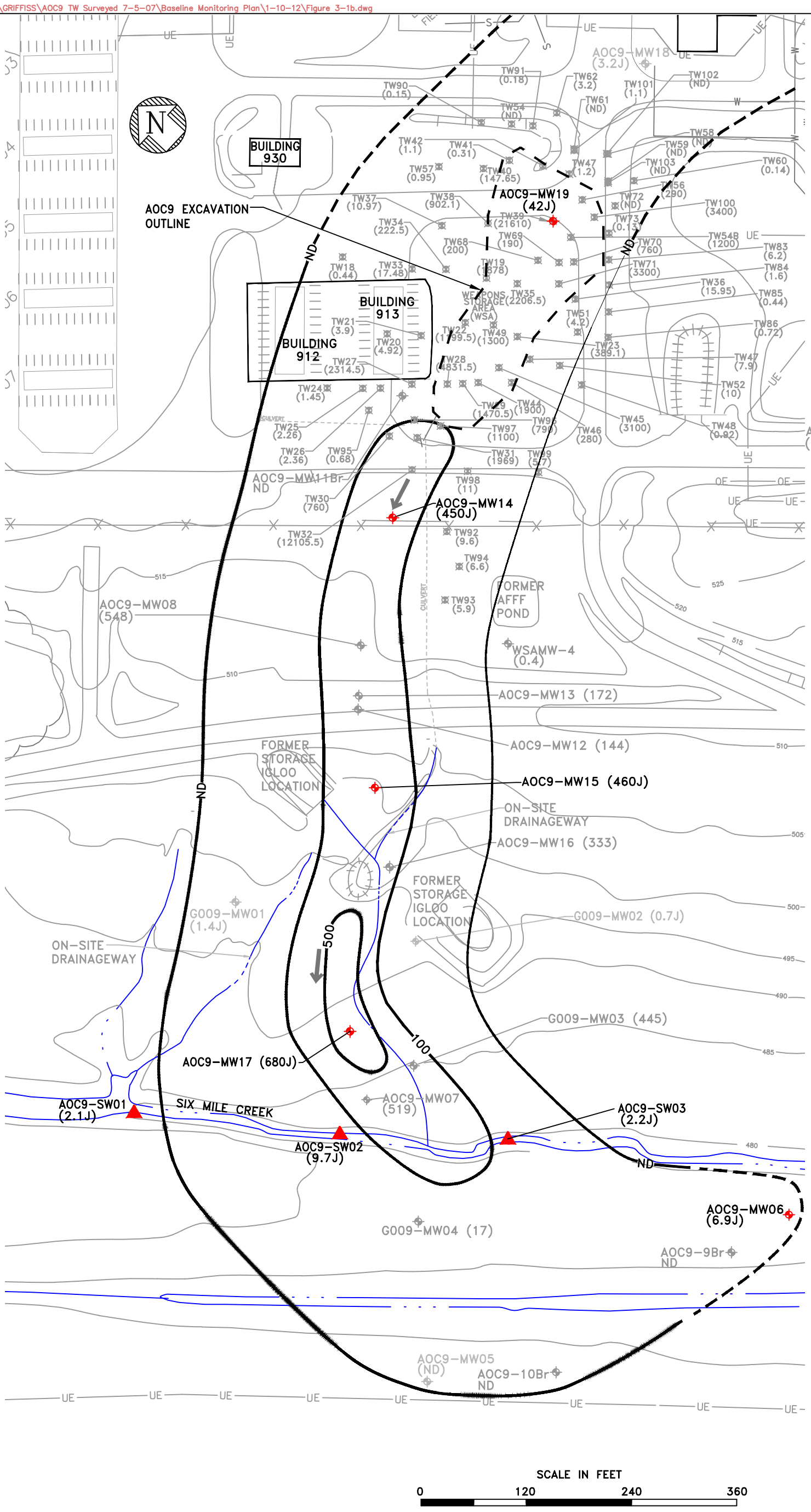
DRAWING TITLE: AOC9
MAY 2011 PERFORMANCE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1a

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\1-10-12\Figure 3-1b.dwg



LEGEND

525	TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
ND	NOT DETECTED
10000	TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
AOC9-MW14	PERFORMANCE MONITORING WELL SAMPLE LOCATION
AOC9-MW08 (548)	EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
(31)	OCTOBER 2011 PERFORMANCE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
→	GROUNDWATER FLOW DIRECTION
▲	SURFACE WATER SAMPLING LOCATIONS
TW99 (5.7)	2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

SCALE IN FEET
0 120 240 360

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

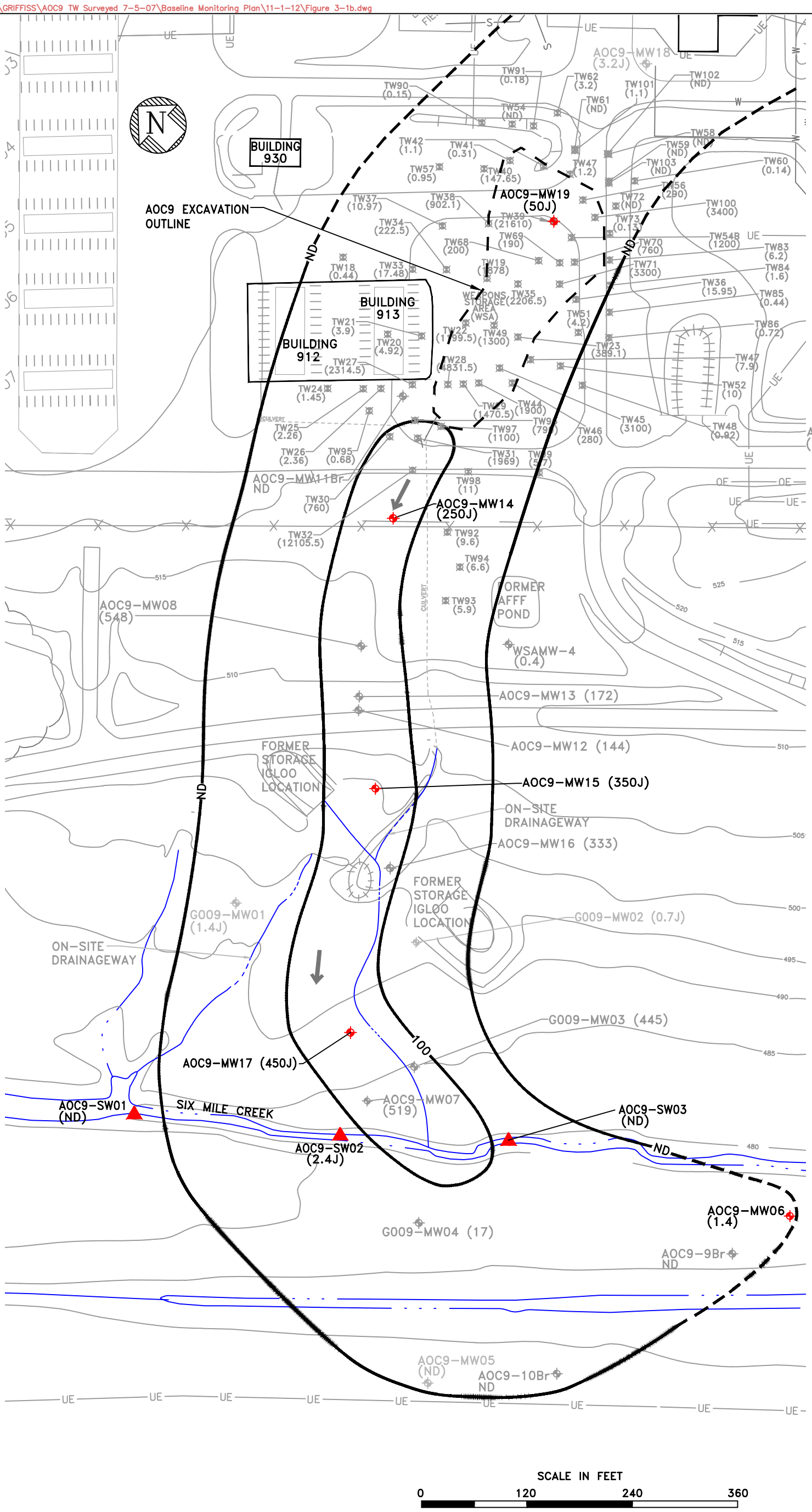
FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE: AOC9
OCTOBER 2011 PERFORMANCE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1b

F:\GRIFFISS\AOC9 TW Surveyed 7-5-07\Baseline Monitoring Plan\11-1-12\Figure 3-1b.dwg



LEGEND

- 525 — TOPOGRAPHIC CONTOUR LINE (CONTOUR INTERVAL = 5 FT)
- ND — NOT DETECTED
- 10000 — TOTAL VOC CONTOUR IN ug/L (DASHED WHERE INFERRED)
- AOC9-MW14 — PERFORMANCE MONITORING WELL SAMPLE LOCATION
- AOC9-MW08 (548) — EXISTING WELL WITH HISTORIC TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L), SEE NOTES BELOW
- (31) — SEPTEMBER 2012 PERFORMANCE SAMPLING TOTAL VOC CONCENTRATION IN GROUNDWATER AND SURFACE WATER (ug/L)
- → GROUNDWATER FLOW DIRECTION
- ▲ SURFACE WATER SAMPLING LOCATIONS
- TW99 (5.7) — 2006 AND 2007 PREDESIGN TEMPORARY MONITORING WELL TOTAL VOC CONCENTRATION IN GROUNDWATER (ug/L)

SCALE IN FEET
0 120 240 360

NOTES:

1. MONITORING WELL AOC9-MW19 IS A NEW WELL INSTALLED IN THE PLUME SOURCE AREA AFTER THE AOC9 GROUNDWATER REMEDY WAS COMPLETED, AND PRIOR TO PERFORMANCE MONITORING. AOC9-MW19 WAS INSTALLED AT THE LOCATION OF TEMPORARY WELL TW-39, WHICH CONTAINED 21,610 ug/L OF TOTAL VOCs IN GROUNDWATER.
2. WHEN DUPLICATE SAMPLES ARE COLLECTED, THE HIGHEST VALUE OBTAINED IS USED ON THIS FIGURE.
3. TOTAL VOC CONCENTRATIONS IN GROUNDWATER FOR:
   - AOC9-MW03, MW04, MW07, MW08 MW12, AND MW16 ARE SAMPLES COLLECTED DURING THE ON-BASE GROUNDWATER BASELINE SAMPLING IN 2006.
   - BEDROCK MONITORING WELLS AOC9-9Br, 10Br, AND 11Br ARE FROM SAMPLES COLLECTED DURING THE BEDROCK GROUNDWATER STUDY IN 2002.
   - MONITORING WELLS AOC9-MW13 AND WSAMW-4 ARE FROM SAMPLES COLLECTED IN 2004 DURING BASEWIDE GROUNDWATER MONITORING.

FORMER GRIFFISS AFB
AOC 9 SITE
ROME, NEW YORK

Prepared by:
ecology and environment engineering p.c.
In association with:
parsons

DRAWING TITLE: AOC9
SEPTEMBER 2012 PERFORMANCE MONITORING TOTAL VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER AND SURFACE WATER

FIGURE 3-1b

B Daily Activity Forms

Daily Activity Summary

Date: Monday, April 6, 2015 | Report No.: 001

Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB | Weather: Cloudy with some sun, windy, 52°F

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Fronckowiak	12	EEEPC			
L. Roedl	12	EEEPC			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Water level indicator	water levels, surface water	- measure depth to water in wells
PID		- screen wells before/after opening, screen purge water
YSI water quality meter	sampling, purge and sample groundwater	- measure pH, temp, cond., DO, ORP of groundwater
		- measure pH, temp, cond, ORP of surface water
LaMotte 2020we turbidimeter	↓	- measure turbidity of ground and surface water
Geo Control	↓	- control flow rate of bladder pump

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary	
Date: Monday, 4/6/15	Report No.: 001
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: See page 1

Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)

Screen wells and purge water with PID. Sampled surface water locations (SW01, SW02, SW03). Sampled permanent well MW05. Measured pH, temp, cond, turbidy, ORP of all samples and purge water. Measure DO of groundwater.

Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)

None.

Problems Encountered and Deviations From Work Plan

No deviations. ~~or problems~~ MF

Lock at MW-16 was jammed, able to eventually open, but should be changed out.

Written and Verbal Instruction by the Government

None.

Safety Issues

None.

Planned Activities for Next Work Day

Continue with purging and sampling of permanent wells (& location left to sample).

Remarks: (Visitors, Completion of Field Work at an AOC, etc.)

Water levels and surface water sampling complete.

Site Manager [signature] Date 4/6/15

Figure 3-5 Daily Activity Summary Form

Page 2 of 2

Daily Activity Summary

Date: Tuesday, April 7, 2015	Report No.: 002
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: Cloudy, 38°F Possible rain, expected high 52°F

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Fronckowiak	11.5	EEEPC			
L. Roedl	11.5	EEEPC			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Water level indicator	Purge and Sample groundwater	-measure depth to water in wells
PID		-screen wells upon opening, screen purge water
YSI water quality meter		-measure pH, temp, cond., DO, ORP of groundwater
LaMotte 2020we turbidimeter		-measure turbidity of groundwater
GeoControl		-control flowrate of bladder pump

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary	
Date: Tuesday, 4/7/15	Report No.: 002
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: See page 1

Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)

Screen wells and purge water with PID. Sampled permanent wells, MW06, MW02, MW01, MW17, and MW15. Measured pH, temp., cond., turbidity, DO, and ORP of all samples and purge water.

Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)

~1 hr. delay due to dead battery on GeoControl system. New battery purchased.
~15 min. delay due to problems at MW15 (see below).

Problems Encountered and Deviations From Work Plan

MW15 was not functioning properly at start up. No water being purged due to stuck check valve ball. Pulled pump up and tapped to release. Air line to bladder pump was also leaking on MW15, able to tighten and remove leak.

Written and Verbal Instruction by the Government

None

Safety Issues

None.

Planned Activities for Next Work Day

Continue purging and sampling of permanent wells (3 locations left to sample). Ship samples to lab via FedEx.

Remarks: (Visitors, Completion of Field Work at an AOC, etc.)

None.

Site Manager [signature] Date 4/7/15

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary

Date: Wednesday, April 8, 2015	**Report No.:** 003
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	**Weather:** Cloudy, 36°F rain possible

Personnel	Hrs.	Affiliation	Personnel	Hrs.	Affiliation
M. Frondkowiak	6	EEEPC			
L. Roedl	6	EEEPC			

Summary of Activities

Equipment	AOC/Task	Activities Performed
Water level indicator	Purge and sample groundwater	- measure depth to water in wells
PID		- screen wells upon opening, screen purge water
YSI Water quality meter		- measure pH, temp, cond., DO, ORP of groundwater
LaMotte 2020we turbidimeter		- measure turbidity of groundwater
GeoControl		- control flow rate of bladder pump

Figure 3-5 Daily Activity Summary Form

Daily Activity Summary	
Date: Wednesday, 4/8/15	Report No.: 003
Project Name: AOC 9 Baseline, Performance, and Long-Term Monitoring, Former Griffiss AFB	Weather: See page 1

Field Tests Performed (Sampling, Field Screening, Chemical Testing, etc.)

Screen wells and purge water with PID. Sampled permanent wells MW14, MW18, and MW19. Measured pH, temp, cond, turbidity, DO, and ORP of all samples and purge water.

Work Delays (Due to Weather, Maintenance, Breakdowns, Waiting for Decisions)

None.

Problems Encountered and Deviations From Work Plan

None.

Written and Verbal Instruction by the Government

None.

Safety Issues

None.

Planned Activities for Next Work Day

None.

Remarks: (Visitors, Completion of Field Work at an AOC, etc.)

All sampling complete. Samples shipped to Katahdin Lab via FedEx.

Site Manager	Date 4/8/15

Figure 3-5 Daily Activity Summary Form

C Sampling Forms

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, (Long Term Monitoring)
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-01
Sample Date: 4/7/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 9.0
Screen Interval (feet BGS): 4-9
Casing Inner Diameter (inches): 2
Initial PID Reading (ppm): 0.0

Sample ID: G009-MW01LTM040715
Sample Time: 1250
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 0.06
Initial Water Level (Feet TOIC): 1.90
Final Water Level (feet TOIC): 2.35
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1200									→ No readings flow rate caused	
1205	7.74	6.3	352.2	0.35	1.07	73.00	2.55	300mL/min	0.5 too much drawdown - attempting	
1210	7.75	6.4	352.5	0.19	0.63	72.4	2.53	"	0.9	to adjust
1215	7.75	6.4	352.8	0.04	0.28	71.2	2.53	"	1.3	
1220	7.75	6.6	351.7	0.13	0.17	69.7	2.53	"	1.7	
1225	7.75	6.5	353.7	0.09	0.14	68.8	2.53	"	2.1	
1230	7.75	6.4	353.3	0.12	0.13	68.7	2.53	"	2.5	
1235	7.75	6.4	352.2	0.16	0.12	68.9	2.53	"	2.9	
1240	7.75	6.3	352.0	0.17	0.12	69.2	2.53	"	3.3	
1245	7.75	6.3	352.1	0.08	0.11	69.4	2.53	"	3.7	

4/7/15

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

9.0
-1.90
7.10 x .163 = 1.16 = 1 vol
x3 = 3.5 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, ~~Long Term Monitoring~~
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-02
Sample Date: 4/7/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 9.0
Screen Interval (feet BGS): 4-9
Casing Inner Diameter (inches): 2
Initial PID Reading (ppm): 0.0

Sample ID: ~~AMF~~ GOO9-MW02LTM040715
Sample Time: 1140
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 2.09
Initial Water Level (Feet TOIC): ~~4.50MF~~ 5.84
Final Water Level (feet TOIC): 5.80
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1105	7.19	3.9	319.5	18.4	4.37	163.7	5.84	300 mL/min	0	
1110	6.92	3.9	377.8	17.8	2.24	58.0	5.80	250 mL/min	0.3	
1115	6.93	3.8	385.6	7.41	1.95	44.9	5.80	"	.6	
1120	6.93	3.8	388.7	5.08	2.22	43.0	5.80	"	.9	
1125	6.93	3.8	394.6	4.22	2.18	37.8	5.80	"	1.2	
1130	6.93	3.8	399.1	2.57	2.09	33.5	5.80	"	1.5	
1135	6.93	3.8	398.1	2.09	2.05	32.4	5.80	"	1.8	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

9.0
−5.84
3.16 x .163 = 0.52 = 1 vol
x 3
1.55 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-05
Sample Date: 4/6/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0
Screen Interval (feet BGS): 4-14
Casing Inner Diameter (inches): 2
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW05LTM040615
Sample Time: 1740
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 4.61
Initial Water Level (Feet TOIC): 4.56
Final Water Level (feet TOIC): 5.05
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1645	6.57	4.3	105.3	16.9	14.15	177.2	4.56	400mL/min	0	Initial draw-down at set up greater than 0.3 ft.
1650	6.27	4.3	109.1	14.4	10.85	180.2	5.81	"	0.5	
1655	6.43	4.4	112.7	11.75	10.85	185.5	6.05	"	1.0	
1700	6.43	4.4	113.1	7.50	10.94	186.2	6.01	"	1.5	
1705	6.44	4.5	113.6	6.01	10.70	188.1	6.09	"	2.0	
1710	6.44	4.6	114.2	5.38	10.68	191.0	6.09	"	2.5	
1715	6.48	5.8	115.4	4.40	10.31	190.5	5.86	"	3.0	
1720	6.48	6.0	114.2	3.88	10.22	193.0	5.81	"	3.5	
1725	6.45	5.9	116.8	4.55	10.13	195.1	5.81	"	4.0	
1730	6.45	5.9	117.3	4.51	10.05	196.3	5.81	"	4.5	
1735	6.43	6.0	117.5	4.59	9.98	197.1	5.81	"	5.0	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

4/6/15

Figure 3-4 Groundwater Sampling Form

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-06
Sample Date: 4/7/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.2
Screen Interval (feet BGS): 4.2 - 14.2
Casing Inner Diameter (inches): 2
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW06LTM040715
Sample Time: 1030
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 1.68
Initial Water Level (Feet TOIC): 6.34
Final Water Level (feet TOIC): 6.38
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
0935	7.03	5.6	277.9	12.28	5.68	232.7	6.34	300 mL/min	0	
0940	6.90	5.6	306.0	7.68	3.73	215.4	6.54	"	0.4	
0945	6.98	5.6	318.8	6.93	3.10	203.5	6.55	"	0.8	
0950	7.03	5.7	325.7	5.60	2.89	198.5	6.55	"	1.2	
0955	7.09	5.7	331.7	3.98	2.70	191.8	6.55	"	1.6	
1000	7.13	5.8	335.8	4.04	2.60	187.0	6.55	"	2.0	
1005	7.17	5.9	338.9	3.54	2.50	181.5	6.55	"	2.4	
1010	7.18	5.9	340.7	2.86	2.47	178.4	6.55	"	2.8	
1015	7.20	5.9	342.4	2.58	2.44	174.6	6.55	"	3.2	
1020	7.21	5.8	343.2	2.14	2.42	172.2	6.55	"	3.6	
1025	7.22	5.9	343.9	1.68	2.41	170.1	6.55	"	4.0	

Key:
°C = Degrees centigrade.
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DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

14.2
- 6.34
7.86 x .163 = 1.28 = 1 vol
x3
3.8 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-14
Sample Date: 4/8/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 24.0
Screen Interval (feet BGS): 14-24
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW14LTM040815
Sample Time: 0930
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 6.25
Initial Water Level (Feet TOIC): 13.98
Final Water Level (feet TOIC): 13.96
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
0825	7.25	8.3	415.5	>1000	1.71	8.5	13.98	500 ml/min	0	
0830	7.14	8.4	422.8	190	1.44	-12.7	13.98	"	0.7	
0835	7.12	8.4	420.5	64.0	1.57	-15.0	13.98	"	1.4	
0840	7.13	8.4	414.0	40.6	1.72	-21.0	13.98	"	2.1	
0845	7.13	8.4	413.6	32.0	1.60	-24.8	13.98	"	2.8	
0850	7.13	8.4	413.2	23.5	1.70	-25.4	13.98	"	3.5	
0855	7.13	8.4	414.3	13.7	1.66	-28.0	13.98	"	4.2	
0900	7.15	8.4	408.7	11.5	1.60	-30.4	13.98	"	4.9	
0905	7.14	8.4	412.2	7.73	1.61	-31.5	13.98	"	5.6	
0910	7.14	8.4	409.6	8.20	1.66	-31.7	13.98	"	6.3	
0915	7.14	8.4	411.6	6.25	1.68	-32.7	13.98	"	7.0	

4/8/15

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

24
−13.98
10.02 x .163 = 1.63 = 1 vol
x 3
4.9 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-15
Sample Date: 4/7/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0
Screen Interval (feet BGS): 9-14
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW15LTM040715 / AOC9-MW15DLTM040715
Sample Time: 1730
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 1.43
Initial Water Level (Feet TOIC): 3.01
Final Water Level (feet TOIC): 3.01
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µS/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1630	7.30	6.5	455.8	10.62	1.93	-75.7	3.01	350 ml/min	0	
1635	7.27	6.5	461.0	7.60	0.19	-87.6	3.01	"	0.5	
1640	7.27	6.5	462.3	5.20	0.12	-91.8	3.01	"	1.0	
1645	7.27	6.5	463.0	3.78	0.11	-93.8	3.01	"	1.5	
1650	7.28	6.6	461.8	3.23	0.10	-95.2	3.01	"	2.0	
1655	7.28	6.6	461.3	2.97	0.13	-96.1	3.01	"	2.5	
1700	7.28	6.6	460.4	3.49	0.11	-97.1	3.01	"	3.0	
1705	7.28	6.6	461.8	2.79	0.09	-98.3	3.01	"	3.5	
1710	7.28	6.6	460.8	2.26	0.09	-98.8	3.01	"	4.0	
1715	7.28	6.6	460.7	2.49	0.08	-99.4	3.01	"	4.5	
1720	7.29	6.6	459.8	1.70	0.09	-100.1	3.01	"	5.0	
1725	7.29	6.6	460.0	1.43	0.09	-100.5	3.01	"	5.5	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

14.0
-3.01
10.99 x .163 = 1.79 = 1 vol
x3
5.4 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-17
Sample Date: 4/7/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 14.0
Screen Interval (feet BGS): 9-14
Casing Inner Diameter (inches): 2
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW17LTM040715 / AOC9-MW17DLTM040715
Sample Time: 1600
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 10.9
Initial Water Level (Feet TOIC): 3.64
Final Water Level (feet TOIC): 4.24
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1425	7.80	6.1	345.0	11.8	2.92	113.8	3.93	150 mL/min	0	
1430	9.70	6.2	351.1	12.4	0.33	-18.1	3.93	"	.2	
1435	7.69	6.3	351.1	14.2	0.49	-36.0	4.42	250 mL/min	.4	
1440	7.69	6.3	352.0	13.3	0.22	-49.0	4.44	"	.7	
1445	9.70	6.4	352.7	15.0	0.13	-68.5	4.45	"	1.0	
1450	9.71	6.5	351.8	13.7	0.09	-73.9	4.45	"	1.3	
1455	7.71	6.6	351.2	12.4	0.08	-80.6	4.45	"	1.6	
1500	7.71	6.6	350.7	12.4	0.07	-84.1	4.45	"	1.9	
1505	7.71	6.6	350.6	12.30	0.07	-86.3	4.45	"	2.2	
1510	7.71	6.7	351.6	11.07	0.07	-87.7	4.45	"	2.5	
1515	7.70	6.7	352.2	11.2	0.06	-89.5	4.45	"	2.8	
1520	7.71	6.7	352.6	11.0	0.06	-89.6	4.45	"	3.1	
1525	7.70	6.7	351.6	12.99	0.05	-89.7	4.45	"	3.4	
1530	7.69	6.6	357.5	11.05	0.05	-90.6	4.45	"	3.7	
1535	7.68	6.6	360.4	9.61	0.05	-91.7	4.45	"	4.0	
1540	7.68	6.7	362.4	8.23	0.04	-92.3	4.45	"	4.3	
1545	7.67	6.6	365.0	9.83	0.04	-93.9	4.45	"	4.6	
1550	7.66	6.7	365.1	10.7	0.04	-94.3	4.45	"	4.9	
1555	7.66	6.7	365.5	10.9	0.04	-94.4	4.45	"	5.2	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

4/7/15

Figure 3-4 Groundwater Sampling Form

14.0
-3.64
10.36 x .163 = 1.69 = 1 vol
x3
5.1 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-18
Sample Date: 4/8/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 19.0
Screen Interval (feet BGS): 9-19
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW18LTM040815 MS/MSD collected
Sample Time: 1035
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 7.79
Initial Water Level (Feet TOIC): 14.22
Final Water Level (feet TOIC): 14.23
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
0950	7.45	7.8	259.1	11.02	3.06	70.7	14.22	250ml/min	0	
0955	7.32	7.8	258.0	7.30	1.30	77.6	14.23	"	0.3	
1000	7.28	7.8	257.1	6.52	1.04	81.8	14.23	"	0.6	
1005	7.25	7.8	256.9	7.52	1.00	86.3	14.23	"	0.9	
1010	7.24	8.0	256.9	9.04	1.15	89.3	14.23	"	1.2	
1015	7.22	7.9	257.9	9.89	1.15	92.2	14.23	"	1.5	
1020	7.22	8.0	257.0	8.33	1.17	94.5	14.23	"	1.8	
1025	7.22	8.0	256.8	6.75	1.15	96.6	14.23	"	2.1	
1030	7.22	7.9	257.0	7.79	1.19	98.6	14.23	"	2.4	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

19.0
−14.22
4.78 × .163 = .78 = 1 vol
× 3
2.3 = 3 vol

Groundwater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: MW-19
Sample Date: 7/8/15
Sampling Device: QED T1200 bladder pump
Well Depth (feet TOIC): 19.0
Screen Interval (feet BGS): 9-19
Casing Inner Diameter (inches): 2.0
Initial PID Reading (ppm): 0.0

Sample ID: AOC9-MW19LTM040815
Sample Time: 1150
Sample Tubing: QED teflon-lined polyethylene
Sample Turbidity (NTUs): 11.7
Initial Water Level (Feet TOIC): 9.32
Final Water Level (feet TOIC): 9.36
Casing Type: PVC

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1055	6.75	6.5	983	71000	1.97	10.4	9.32	450 mls	0	
1100	6.78	6.7	833	66.0	2.82	10.7	9.36	"	0.6	
1105	6.82	6.6	753.6	43.3	3.40	12.9	9.36	"	1.2	
1110	6.91	6.7	635.4	21.3	4.17	11.4	9.36	"	1.8	
1115	6.91	6.7	625.1	20.5	4.22	10.7	9.36	"	2.4	
1120	6.97	6.8	587.1	13.2	4.51	10.9	9.36	"	3.0	
1125	6.97	6.8	584.8	12.7	4.52	11.1	9.36	"	3.6	
1130	6.99	6.8	565.7	11.0	4.66	11.4	9.36	"	4.2	
1135	7.03	6.8	540.3	11.9	4.76	12.2	9.36	"	4.8	
1140	7.07	6.7	527.6	11.5	4.93	13.3	9.36	"	5.4	
1145	7.07	6.8	527.1	11.7	4.90	13.1	9.36	"	6.0	

MK Sampling 7/8/15

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Groundwater Sampling Form

19.0
- 9.32
= 9.68 x .163 = 1.6 = 1 vol
x3
4.7 = 3 vol

Surfacewater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 4/6/15
Sampling Device: clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW01LTM040615
Sample Time: 1548
Sample Tubing: NA
Sample Turbidity (NTUs): 3.59
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: NA

Time	pH	Temperature (°C)	Conductivity (us/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1548	7.49	10.3	142.6	3.59	NA	126.3	NA	NA	NA	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Surfacewater Sampling Form

Surfacewater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 4/6/15
Sampling Device: clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW02LTM040615
Sample Time: 1535
Sample Tubing: NA
Sample Turbidity (NTUs): 3.88
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1535	7.30	10.3	159.5	3.88	NA	163.3	NA	NA	NA	

4/6/15

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Surfacewater Sampling Form

Surfacewater Sampling Form

Project: AOC 9 Baseline, Performance, Long Term Monitoring
Site: AOC 9-Former Griffiss Air Force Base
Well No.: NA
Sample Date: 4/6/15
Sampling Device: clean jar by hand
Well Depth (feet TOIC): NA
Screen Interval (feet BGS): NA
Casing Inner Diameter (inches): NA
Initial PID Reading (ppm): NA

Sample ID: AOC9-SW03-LTM040615
Sample Time: 1605
Sample Tubing: NA
Sample Turbidity (NTUs): 3.90
Initial Water Level (Feet TOIC): NA
Final Water Level (feet TOIC): NA
Casing Type: NA

Time	pH	Temperature (°C)	Conductivity (µs/cm)	Turbidity (NTUs)	DO (mg/L)	ORP (mV)	Water Level (ft TOIC)	Flow Rate (LPM)	Purge Volume (gallons)	Comments
1605	7.57	10.6	160.0	3.90	NA	122.5	NA	NA	NA	

Key:
°C = Degrees centigrade.
BGS = Below ground surface.
DO = Dissolved Oxygen
LPM = Liters per minute
mg/L = Milligrams per liter
mS/cm = microSiemens per centimeter
NTU = Nephelometric turbidity unit.
NTU = Nephelometric turbidity unit.
ORP = Redox potential
ppm = Parts per million.
PVC = Polyvinyl chloride.
TOIC = Top of inner (PVC) casing.

Figure 3-4 Surfacewater Sampling Form

D Photolog

Photo No.:	0526	**Description:** Sample: G009-MW01LTM040715 Time Collected: 12:50
Date:	4/7/15	
Photographer:	M. Fronckowiak	

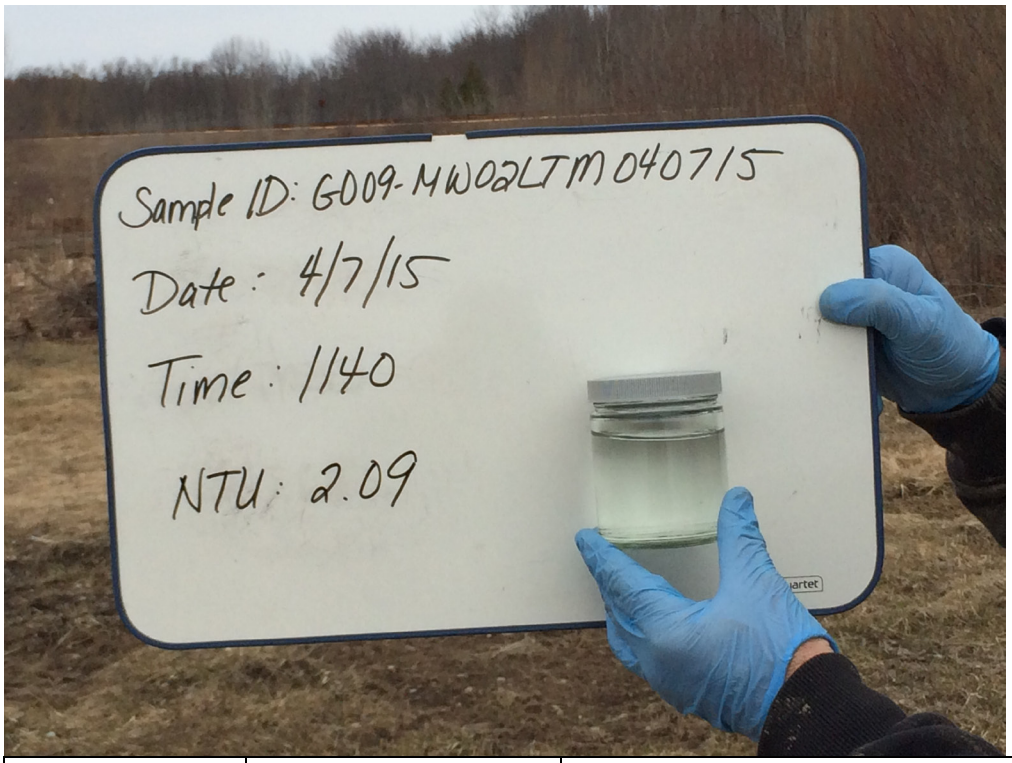

Photo No.:	0525	**Description:** Sample: G009-MW02LTM040715 Time Collected: 11:40
Date:	4/7/15	
Photographer:	M. Fronckowiak	

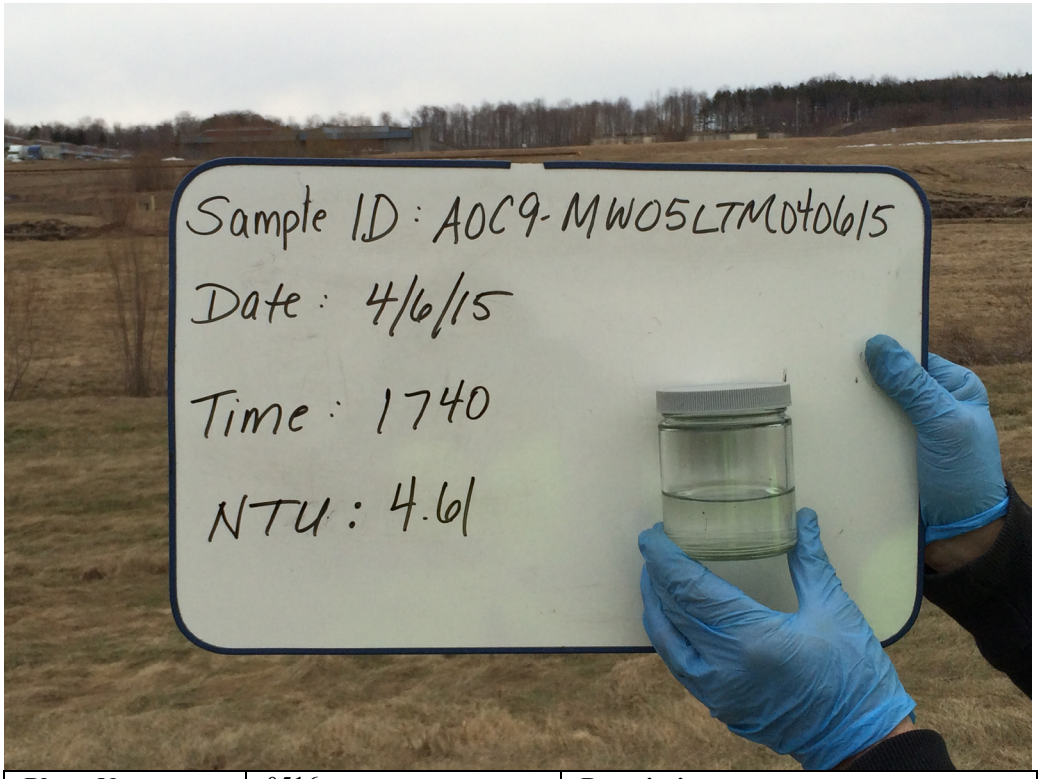

Photo No.:	0516	**Description:** Sample: AOC9-MW05LTM040615 Time Collected: 17:40
Date:	4/6/15	
Photographer:	M. Fronckowiak	

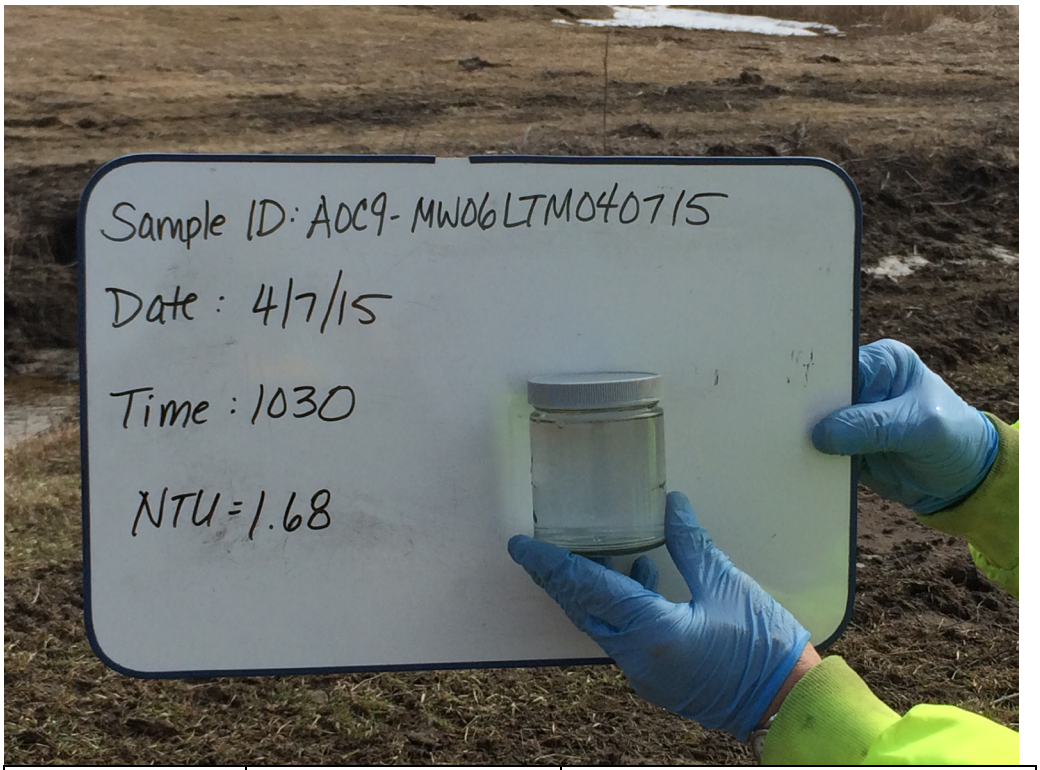

Photo No.:	0523	**Description:** Sample: AOC9-MW06LTM040715 Time Collected: 10:30
Date:	4/7/15	
Photographer:	M. Fronckowiak	

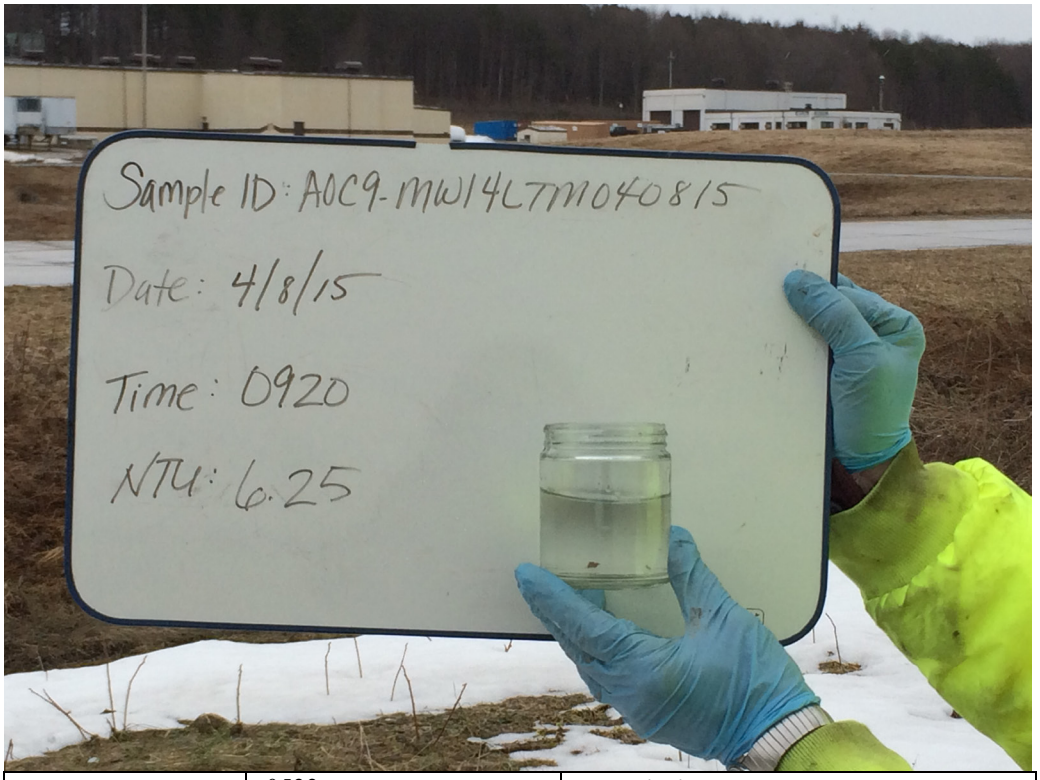

Photo No.:	0533	**Description:** Sample: AOC9-MW14LTM040815 Time Collected: 09:20
Date:	4/8/15	
Photographer:	M. Fronckowiak	

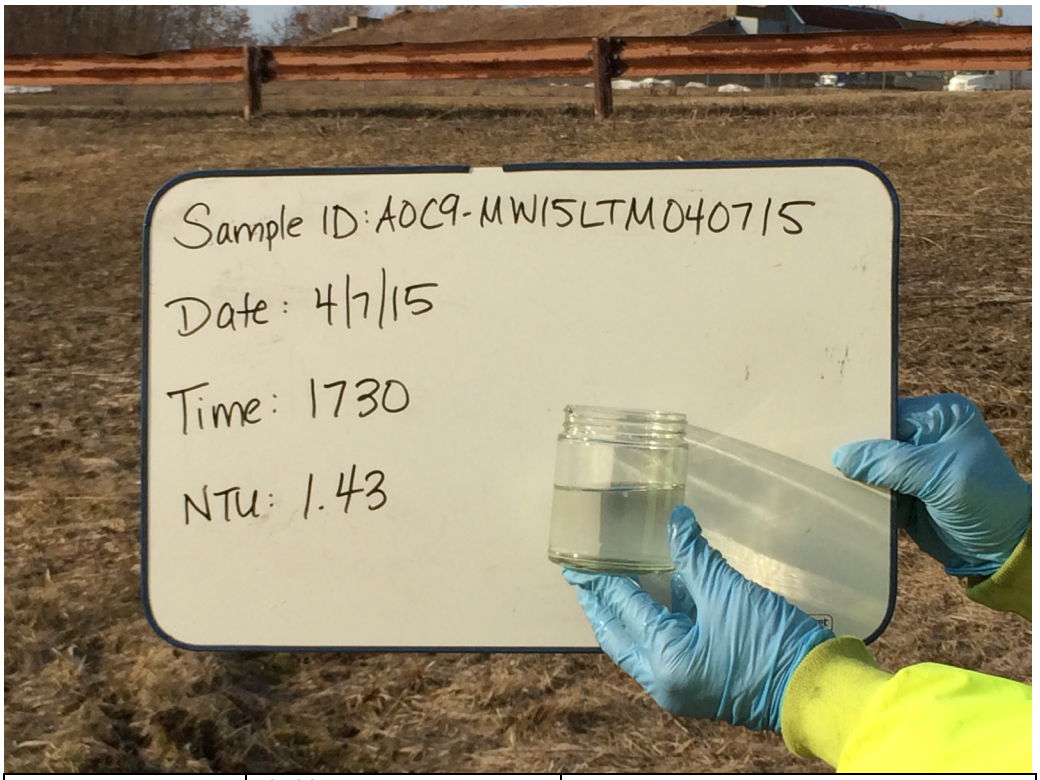

Photo No.:	0529	**Description:** Sample: AOC9-MW15LTM040715 Time Collected: 17:30
Date:	4/7/15	
Photographer:	M. Fronckowiak	

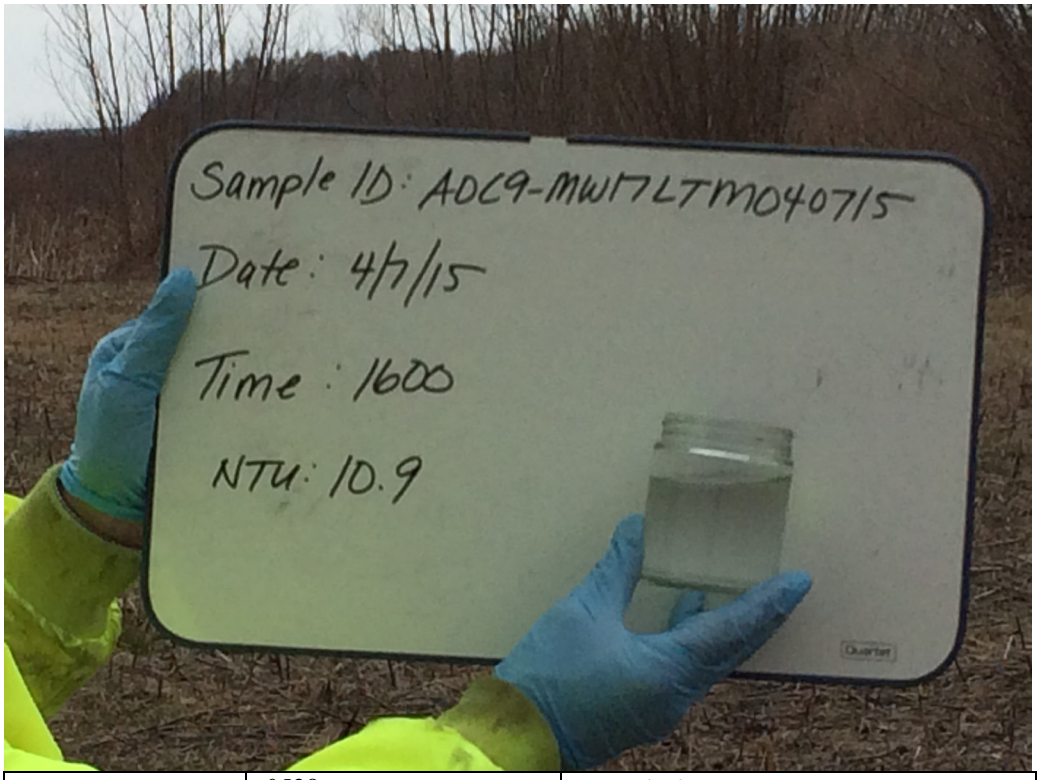

Photo No.:	0528	**Description:** Sample: AOC9-MW17LTM040715 Time Collected: 16:00
Date:	4/7/15	
Photographer:	M. Fronckowiak	

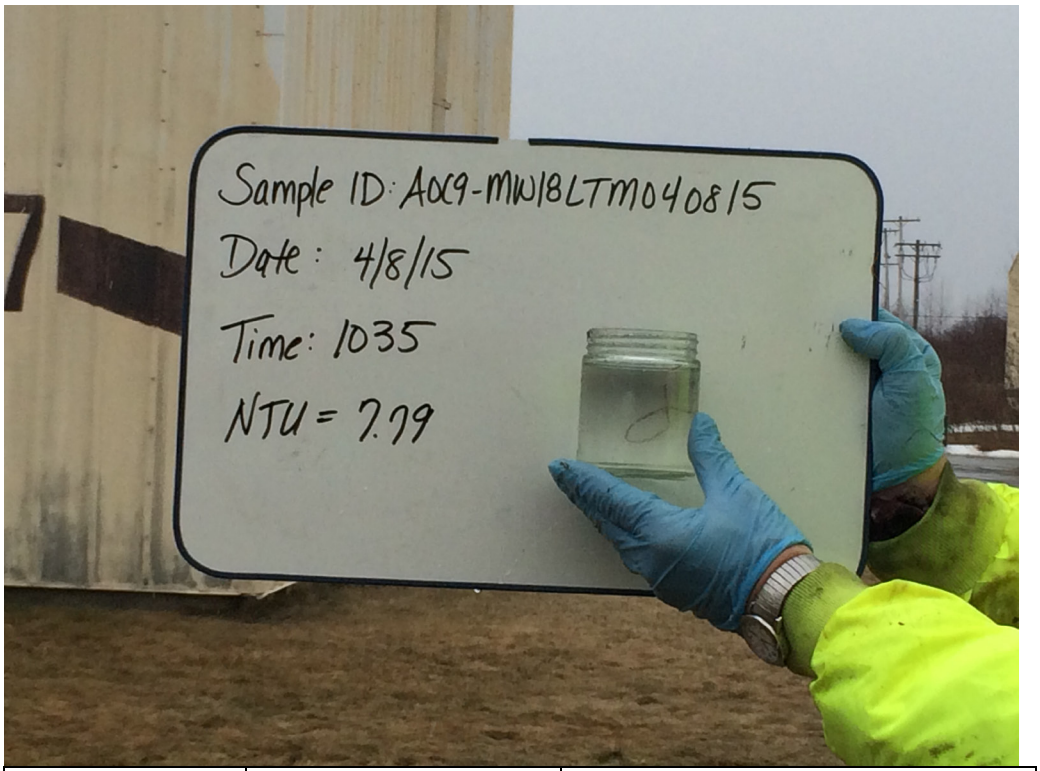

Photo No.:	0535	**Description:** Sample: AOC9-MW18LTM040815 Time Collected: 10:35
Date:	4/8/15	
Photographer:	M. Fronckowiak	

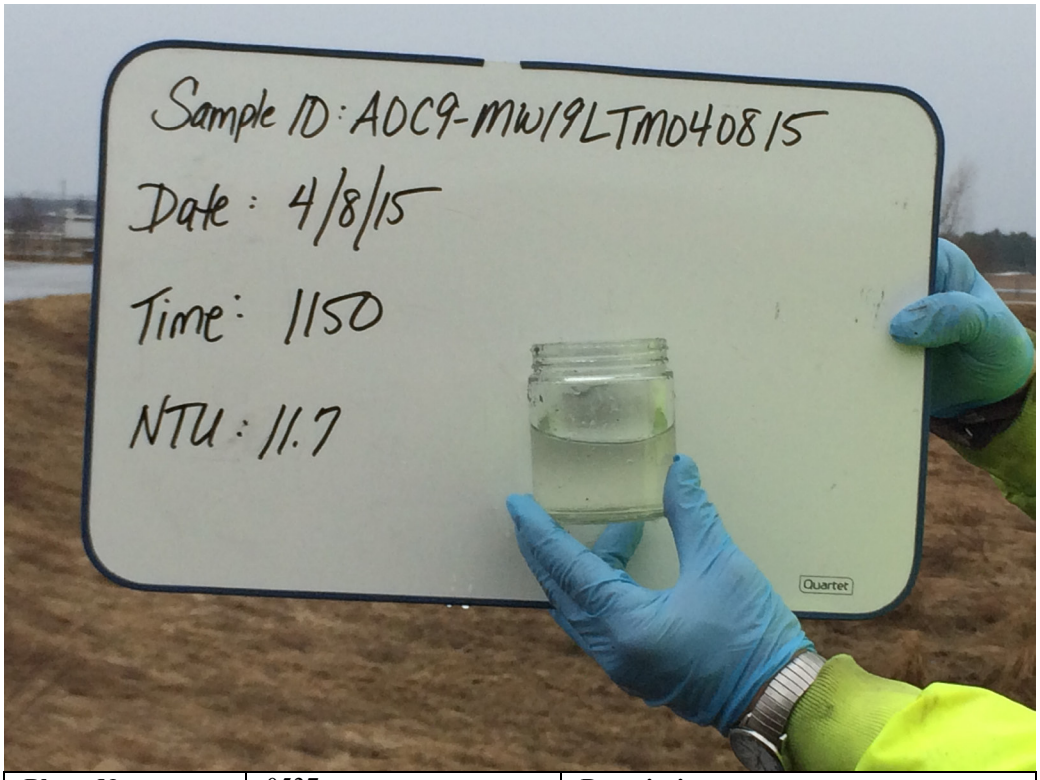

Photo No.:	0537	**Description:** Sample: AOC9-MW19LTM040815 Time Collected: 11:50
Date:	4/8/15	
Photographer:	M. Fronckowiak	

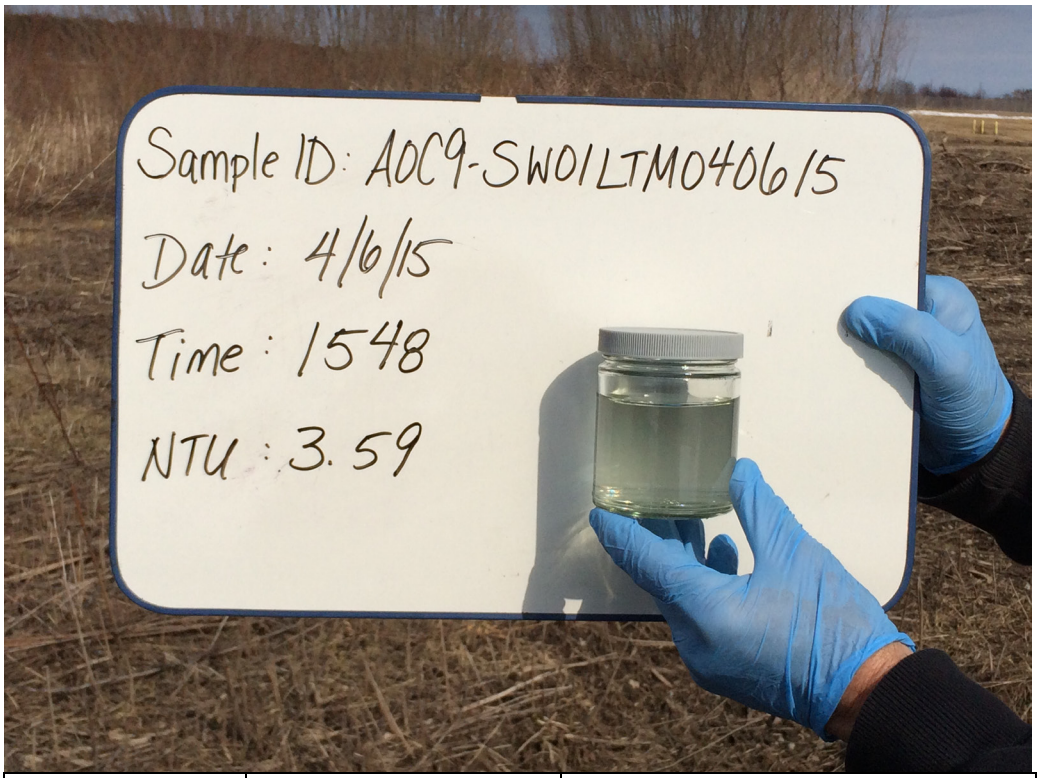

Photo No.:	0513	**Description:** Sample: AOC9-SW01LTM040615 Time Collected: 15:48
Date:	4/6/15	
Photographer:	M. Fronckowiak	

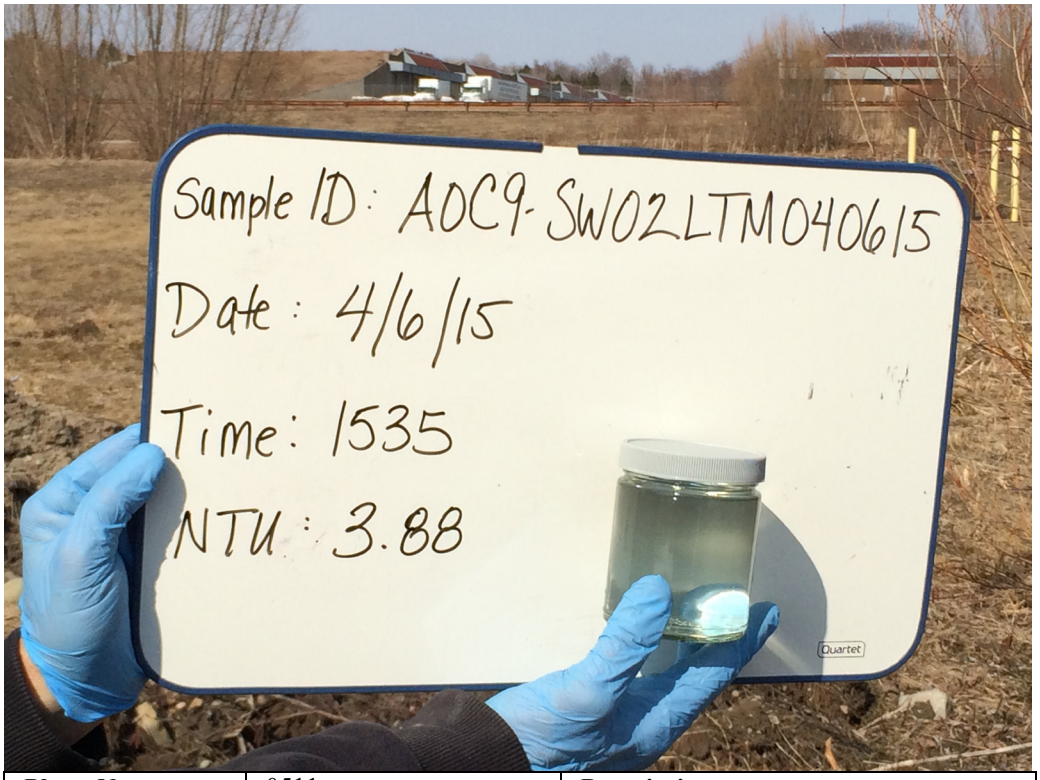

Photo No.:	0511	**Description:** Sample: AOC9-SW02LTM040615 Time Collected: 15:35
Date:	4/6/15	
Photographer:	M. Fronckowiak	

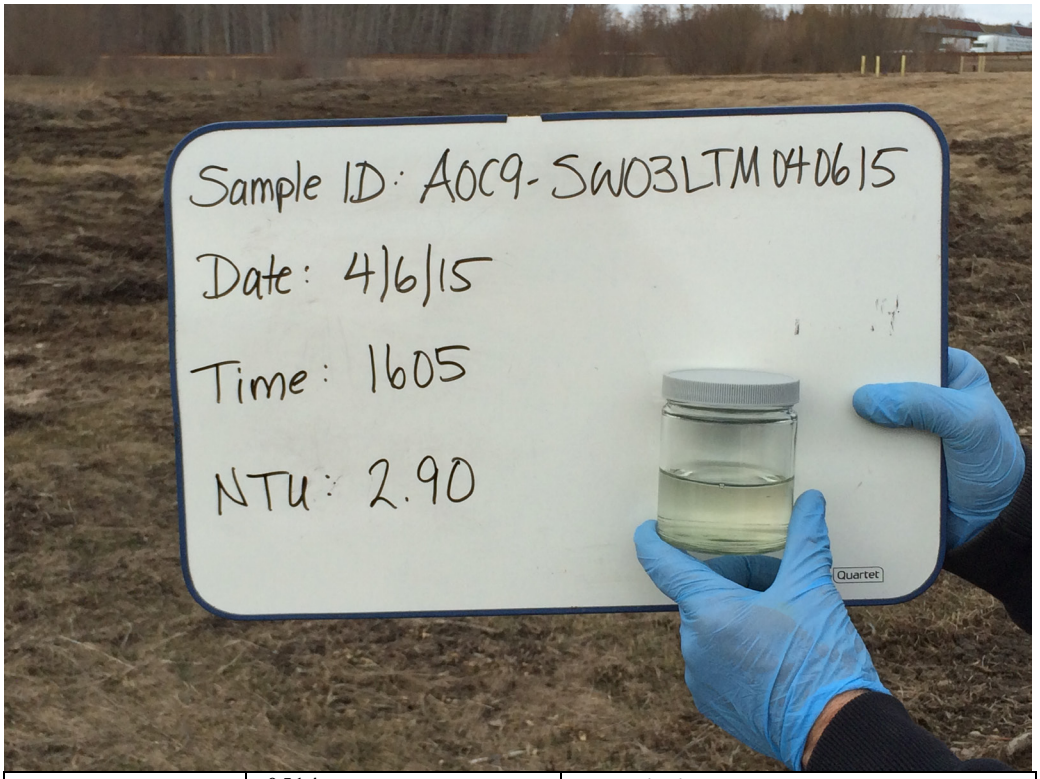

Photo No.:	0514	**Description:** Sample: AOC9-SW03LTM040615 Time Collected: 16:05
Date:	4/6/15	
Photographer:	M. Fronckowiak	

E Well Status Log and Maintenance Summary

GRIFFISS AFB AOC 9 NETWORK WELLS
STATUS APRIL 2015

AOC 9												Date: 4/6/2015
				Well Condition								
Well Name	Well Type	Screened Groundwater Zone	Screen Interval (ft bgs)	Bollards or flush mount, Condition	Well Plate / Well Identification	Pad Condition	Lock	Well Cap	Dedicated Pump Condition	Clarification	Comments	Actions Completed / Date
G009-MW01	Stick Up	Shallow	4.0-9.0 ft bgs	bollards	Painted on stick up	Good	Yes	Yes	Good	-	Well tag inside well also. Casing needs painting.	Well protective casing painted. / September 30, 2015
G009-MW02	Stick Up	Shallow	4.0-9.0 ft bgs	bollards	Painted on stick up	Good	Yes	Yes	Good	-	Well tag inside well also. Casing needs painting.	Well protective casing painted. / September 30, 2015
G009-MW03	Stick Up	Shallow	4.0-9.0 ft bgs	bollards	Painted on stick up	Good	Yes	Yes	NA	Pump not used. Pad covered by debris.	Well tag inside well also. 2 of 3 bollards knocked over.	Bollards replaced and painted. / September 30, 2015
G009-MW04	Stick Up	Shallow	6.7-16.7 ft bgs	bollards	ID tag inside casing	Good	Yes	Yes	NA	Pump not used.	Lock stiff. Area around pad could be filled with more dirt.	Protective casing repaired and painted. Area around well cleared and holes filled. / September 30, 2015.
AOC9-MW05	Flush Mount	Shallow	4.0-14.0 ft bgs	flush mount	None	Good	No	Yes	Good	No lock. No well tag or identification.	Can't add lock or well lid won't close.	New lock installed. / September 30, 2015
AOC9-MW06	Stick Up	Shallow	4.2-14.2 ft bgs	bollards	Painted on cap	Good	Yes	Yes	Good	-	Well tag inside well also.	None at this time.
AOC9-MW07	Stick Up	Shallow	4.2-9.2 ft bgs	bollards	Painted on stick up	Good	Yes	Yes	NA	Pump not used.	Well tag inside well also. One bollard knocked over.	Bollard replaced and painted. / September 30, 2015
AOC9-MW08	Stick Up	Shallow	15.4-20.4 ft bgs	bollards	Painted on stick up	Good	Yes	Yes	NA	Pump not used.	Well tag inside well also.	None at this time.
AOC9-MW12	Flush Mount	Shallow	10.0-20.0 ft bgs	flush mount	Stamped on cover	Good	Yes	Yes	NA	Pump not used.	Well tag inside well also.	None at this time.
AOC9-MW13	Stick Up	Shallow	10.0-20.0 ft bgs	bollards	Painted on stick up	Good	Yes	Yes	NA	Pump not used.	Well tag inside well also.	None at this time.
AOC9-MW14	Stick Up	Shallow	14.0-24.0 ft bgs	bollards	None	Good	Yes	Yes	Good	No well tag or identification.	Needs well identification.	Installed brass identification tag and labeled exterior of well. / October 1, 2015
AOC9-MW15	Stick Up	Shallow	9.0-14.0 ft bgs	bollards	None	Good	Yes	Yes	Good	No well tag or identification.	Needs well identification.	Installed brass identification tag and labeled exterior of well. / October 1, 2015
AOC9-MW16	Stick Up	Shallow	9.0-14.0 ft bgs	bollards	Written on inside of cap	Good	Yes	Yes	NA	Lock was jammed, did unjam, but new lock needed.	Something jamming lock. Lock needs to be replaced.	Lock was oiled and labeled exterior of well. / October 1, 2015
AOC9-MW17	Stick Up	Shallow	9.0-14.0 ft bgs	bollards	None	Good	Yes	Yes	Good	No well tag or identification.	Needs well identification.	Installed brass identification tag and labeled exterior of well. / October 1, 2015
AOC9-MW18	Stick Up	Shallow	9.0-19.0 ft bgs	bollards	None	Good	Yes	Yes	Good	No well tag or identification.	Needs well identification.	Installed brass identification tag and labeled exterior of well. / October 1, 2015
AOC9-MW19	Flush Mount	Shallow	9.0-19.0 ft bgs	flush mount	Stamped on cover	Good	Yes	Yes	Good	Well cap lock is broken.	Water in annulus. Ice in sampling tubing, able to clear out.	None at this time.
Surface Water												
AOC9-SW01	--	--	--	--	None	--	--	--	--	Stake missing	Replaced stake with orange marking pole.	Installed new sign. / October 1, 2015
AOC9-SW02	--	--	--	--	Good	--	--	--	--	-	Replaced stake with orange marking pole.	Installed new sign. / October 1, 2015
AOC9-SW03	--	--	--	--	None	--	--	--	--	Stake missing	Replaced stake with orange marking pole.	Installed new sign. / October 1, 2015

bgs = below ground surface
TBD = To Be Determined. Regarding pump condition, well has not been sampled in over two years. Regarding Pad Condition, pads are overgrown by vegetation and will be inspected next sampling round.
F = Fair
G = Good
NA = Not applicable
P = Poor

Signature:  Date: 4/6/2015

F

Analytical Data

The analytical data are provided on the attached CD.

G Data Usability Summary Report

Data Usability Summary Report	Project: Griffiss AFB Long-Term Monitoring
Date Completed: May 07, 2015	Completed by: Lynne Kalmbach

The analytical data provided by the laboratory were reviewed for precision, accuracy, and completeness per NYSDEC Division of Environmental Remediation Guidance for the Development of DUSRs (June 1999). Specific criteria for QC limits were obtained from the Department of Defense (DoD) Quality Systems Manual for Environmental Laboratories Version 5.0. Compliance with the project QA program is indicated on the in the checklist and tables. Any major or minor concerns affected data usability are summarized listed below. The checklist and tables also indicate whether data qualification is required and/or the type of qualifier assigned.

Reference:

Project ID	Lab Work Order	Laboratory Report
10C3186.0001.07	SI2201	Katahdin Analytical Services

Table 1 – Sample Listing Summary

Lab Sample ID	Client Sample ID	Matrix	Sample Date	MS/MSD	ID Corrections
SI2201-1	AOC9-TB1040615	WQ	4/06/15		
SI2201-2	AOC9-SW02LTM040615	WS	4/06/15		
SI2201-3	AOC9-SW01LTM040615	WS	4/06/15		
SI2201-4	AOC9-SW03LTM040615	WS	4/06/15		
SI2201-5	AOC9-MW05LTM040615	WG	4/06/15		
SI2201-6	AOC9-MW06LTM040715	WG	4/07/15		
SI2201-7	G009-MW02LTM040715	WG	4/07/15		
SI2201-8	G009-MW01LTM0040715	WG	4/07/15		
SI2201-9	AOC9-MW17LTM040715	WG	4/07/15		
SI2201-10	AOC9-MW17DLTM040715	WG	4/07/15		AOC9-MW17/DLTM040715
SI2201-11	AOC9-MW15LTM040715	WG	4/07/15		
SI2201-12	AOC9-MW15DLTM040715	WG	4/07/15		AOC9-MW15/DLTM040715
SI2201-13	AOC9-MW14LTM040815	WG	4/08/15		
SI2201-14	AOC9-MW18LTM040815	WG	4/08/15	MS/MSD	
SI2201-15	AOC9-MW19LTM040815	WG	4/08/15		

Table 1A – Sample Test Summary

Lab Work Orders	Matrix	Test Method	Test Name	Number of Samples
SI2201	WQ	SW8260B	VOCs – by GC/MS	1
SI2201	WS	SW8260B	VOCs – by GC/MS	3
SI2201	WG	SW8260B	VOCs – by GC/MS	11

Data Usability Summary Report	Project: Griffiss AFB Long-Term Monitoring
Date Completed: May 07, 2015	Completed by: Lynne Kalmbach

General Sample Information	
Do Samples and Analyses on COC check against Lab Sample Tracking Form?	Yes Note: Some of the client IDs on the Chain of Custody exceeded the 19-character limit of the Katahdin Analytical Information Management System. Therefore, the middle character "/" in the client IDs for SI2201-10 and -12 were omitted on all forms.
Did coolers arrive at lab between 2 and 6°C and in good condition as indicated on COC and Cooler Receipt Form?	No. The cooler arrived at a temperature of 1.3°C. It was noted that the samples were received in good condition and with no indication of freezing.
Frequency of Field QC Samples Correct? Field Duplicate - 1/20 samples Trip Blank - Every cooler with VOCs waters only Equipment Blank - 1/ set of samples per day?	Yes 1 Trip Blank 2 Field Duplicates 1 MS/MSD Equipment Blank Not Required
Case narrative present and complete?	Yes
Any holding time violations (See table below)?	No

The following tables are presented at the end of this DUSR and provided summaries of results outside QC criteria.

- Method Blanks Results (Table 2)
- Surrogates Outside Limits (Table 3)
- MS/MSD Outside Limits (Table 4)
- LCS Outside Limits (Table 5)
- Re-analysis Results (Table 6)
- Field Duplicate Results (Table 7)

Go to Tables List

Volatile Organics by GC/MS	
Description	**Notes and Qualifiers**
Any compounds present in method, trip and field blanks (see Table 2)?	No
For samples, if results are <5 times the blank or < 10 times blank for common laboratory contaminants then "U" flag data. Qualification also applies to TICs.	No results qualified.
Surrogate for method blanks and LCS within limits?	Yes
Surrogate for samples and MS/MSD within limits? (See Table 3). All samples should be re-analyzed for VOCs? Matrix effects should be established.	Yes
Laboratory QC frequency one blank and LCS with each batch and one set of MS/MSD per 20 samples?	Yes
MS/MSD within QC criteria (see Table 4)? If out and LCS is compliant, then J flag positive data in original sample due to matrix?	No. See Table 4. Sample AOC9-MW18LTM040815 was submitted for MS/MSD analysis. Carbon tetrachloride, 4-methyl-2-pentanone, o-xylene, bromodichloromethane, styrene, and 1,3-dichlorobenzene were recovered high in the MS and/or MSD. The results were non-detect in the sample; therefore, no qualification of the data was made. Chlorobenzene was recovered high in the MS. The results were already qualified J as estimated; therefore, no action was taken. 1,4-Dioxane exhibited poor precision between the MS and MSD recoveries. The individual recoveries were acceptable; therefore, no qualification of the data was made.
LCS within QC criteria (see Table 5)? If out, and the recovery high with no positive values, then no data qualification is required.	No. See Table 5. Chloromethane, vinyl chloride, and bromomethane were recovered low in LCS WG161248-1. Carbon disulfide was recovered low in LCS WG161286-1, and 4-methyl-2-pentanone was recovered high in LCS WG161476-1. Positive detections for vinyl chloride were already qualified J as estimated, and non-detect results were qualified UJ as estimated non-detect. Carbon disulfide, chloromethane, and 4-methyl-2-pentanone are poor performing analytes in a multi-parameter spike. The analytes were not detected in the samples and no qualification of the data was made. The associated results for bromomethane were non-detect and qualified UJ as estimated non-detect.
Do internal standards areas and retention time meet criteria? If not was sample re-analyzed to establish matrix (see Table 6)?	Yes

Data Usability Summary Report	Project: Griffiss AFB Long-Term Monitoring
Date Completed: May 07, 2015	Completed by: Lynne Kalmbach

Volatile Organics by GC/MS	
Description	**Notes and Qualifiers**
Is initial calibration for target compounds <20 %RSD or curve fit?	1,4-Dioxane failed initial calibration with a %RSD of 52%. The analyte is a poor performing compound in a multi-parameter spike. The sample results were non-detect, and the analyte is not a contaminant of concern. The results were qualified UJ as estimated non-detect.
Is continuing calibration for target compounds < 20.5%D.	No Chloroethane and 1,4-dioxane exceeded the DoD QSM acceptance limits criteria in CV WG161195-4. Chloroethane and 1,4-dioxane are poor performing analytes. Chloroethane was not detected in the associated samples; therefore, no qualification of the data was made. 1,4-Dioxane results were already qualified for initial calibration failures. Bromomethane and 1,4-dioxane exceeded the DoD QSM acceptance limits criteria in CV WG161248-4, WG161286-4, and WG161476-4. Bromomethane was not detected in the associated samples; therefore, the results were UJ qualified as estimated. 1,4-Dioxane results were already qualified for initial calibration failures.
Were any samples re-analyzed or diluted (see Table 6)? For any sample re-analysis and dilutions is only one reportable result by flagged?	No.
For TICs are there any system related compounds that should not be reported?	N/A
Do field duplicate results show good precision for all compounds except TICs (see Table 7)?	Yes.

Data Usability Summary Report	Project: Griffiss AFB Long-Term Monitoring
Date Completed: May 07, 2015	Completed by: Lynne Kalmbach

Summary of Concerns
• 1,4-Dioxane failed the initial calibration and several continuing calibrations. The analyte is a known poor performing compound. The results were qualified UJ as estimated non-detect. There is no impact to data usability. • There were several failures in the LCS's. Chloromethane, 4-methyl-2-pentanone, and carbon disulfide are poor performing compounds. The associated results were non-detect; therefore, no qualification of the data was made. The associated results for bromomethane were non-detect and qualified UJ as estimated non-detect. One positive detection for vinyl chloride was already qualified J; however, the non-detect results were qualified UJ as estimated non-detect. There is no impact to data usability. • Several analytes failed recovery high in the MS and MSD. All of the analytes were non-detect in the parent sample except for chlorobenzene. Chlorobenzene was already qualified J; therefore, no further action was required. The other analytes were not qualified. There is no impact to data usability.

Table 2 - List of Positive Results for Blank Samples
None

Table 2A - List of Samples Qualified for Method Blank Contamination
None

Table 2B - List of Samples Qualified for Field Blank Contamination
None

Table 3 - List of Samples with Surrogates outside Control Limits
None

Table 4 - List MS/MSD Recoveries and RPDs outside Control Limits

Method	Parent Sample	Sample Type	Analyte	Orig. Result	Spike Amount	Rec.	Dil Fac	Low Limit	High Limit	Sample Qual.
SW8260B	AOC9-MW18LTM040815	MS	CARBON TETRACHLORIDE	ND	67.3	135	1	87	126	None
SW8260B	AOC9-MW18LTM040815	MSD	CARBON TETRACHLORIDE	ND	64.0	128	1	87	126	None
SW8260B	AOC9-MW18LTM040815	MS	BROMODICHLOROMETHANE	ND	61.8	124	1	85	122	None
SW8260B	AOC9-MW18LTM040815	MS	4-METHYL-2-PENTANONE	ND	63.2	126	1	83	122	None
SW8260B	AOC9-MW18LTM040815	MSD	4-METHYL-2-PENTANONE	ND	61.9	124	1	83	122	None
SW8260B	AOC9-MW18LTM040815	MS	CHLOROBENZENE	0.25 J	58.5	116	1	89	113	J Flag
SW8260B	AOC9-MW18LTM040815	MS	O-XYLENE	ND	63.0	126	1	90	116	None
SW8260B	AOC9-MW18LTM040815	MSD	O-XYLENE	ND	60.9	122	1	90	116	None
SW8260B	AOC9-MW18LTM040815	MS	STYRENE	ND	59.3	119	1	88	117	None
SW8260B	AOC9-MW18LTM040815	MS	1,3-DICHLOROBENZENE	ND	55.3	111	1	86	110	None

Method	Parent Sample	Analyte	Dil Fac	Unit	RPD	RPD Limit	Qualifier	Sample Type
SW8260B	AOC9-MW18LTM040815	1,4-DIOXANE	1	µg/L	25	20	None	MS/MSD

Data Usability Summary Report	Project: Griffiss AFB Long-Term Monitoring
Date Completed: May 07, 2015	Completed by: Lynne Kalmbach

Table 5 - List LCS Recoveries outside Control Limits

Sample ID	Analyte	Method	Rec.	Low Limit	High Limit	No. of Affected Samples	Sample Qual
WG161248-1	CHLOROMETHANE	SW8260B	48.0	59	123	5	None: Poor performer
WG161248-1	VINYL CHLORIDE	SW8260B	62.6	64	131	5	J/UJ Flag
WG161248-1	BROMOMETHANE	SW8260B	51.8	57	135	5	UJ Flag
WG161286-1	CARBON DISULFIDE	SW8260B	66.6	71	129	6	None: Poor performer
WG161476-1	4-METHYL-2-PENTANONE	SW8260B	123	83	122	1	None: High & ND

Table 6 –Samples that were Reanalyzed
None

Table 7 – Summary of Field Duplicate Results

Method	Analyte	Unit	Matrix	PQL	Anal Type	AOC9-MW15LTM040715	AOC9-MW15/DLTM040715	RPD	RPD Rating	Sample Qual
SW8260B	1,2-DICHLOROBENZENE	ug/L	Water	1.0	A	16	16	0.0%	Good	None
SW8260B	1,3-DICHLOROBENZENE	ug/L	Water	1.0	A	0.92	0.99	7.3%	Good	None
SW8260B	1,4-DICHLOROBENZENE	ug/L	Water	1.0	A	14	14	0.0%	Good	None
SW8260B	BENZENE	ug/L	Water	1.0	A	1.3	1.2	8.0%	Good	None
SW8260B	CHLOROBENZENE	ug/L	Water	1.0	A	120	120	0.0%	Good	None
SW8260B	ISOPROPYLBENZENE	ug/L	Water	1.0	A	0.68	0.64	6.1%	Good	None
SW8260B	SEC-BUTYLBENZENE	ug/L	Water	1.0	A	0.66	0.68	3.0%	Good	None
SW8260B	TRICHLOROETHYLENE	ug/L	Water	1.0	A	ND	0.28	NC		
SW8260B	VINYL CHLORIDE	ug/L	Water	2.0	A	0.4	0.27	38.8%	Good	None

Method	Analyte	Unit	Matrix	PQL	Anal Type	AOC9-MW15LTM040715	AOC9-MW15/DLTM040715	RPD	RPD Rating	Sample Qual
SW8260B	1,2-DICHLOROBENZENE	ug/L	Water	1.0	A	44	43	2.3%	Good	None
SW8260B	1,3-DICHLOROBENZENE	ug/L	Water	1.0	A	0.7	0.7	0.0%	Good	None
SW8260B	1,4-DICHLOROBENZENE	ug/L	Water	1.0	A	8.9	8.6	3.4%	Good	None

Data Usability Summary Report	Project: Griffiss AFB Long-Term Monitoring
Date Completed: May 07, 2015	Completed by: Lynne Kalmbach

Method	Analyte	Unit	Matrix	PQL	Anal Type	AOC9-MW15LTM040715	AOC9-MW15/DLTM040715	RPD	RPD Rating	Sample Qual
SW8260B	1,2-DICHLOROETHANE	ug/L	Water	1.0	A	0.48	0.64	28.6%	Good	None
SW8260B	BENZENE	ug/L	Water	1.0	A	0.79	0.84	6.1%	Good	None
SW8260B	CHLOROBENZENE	ug/L	Water	1.0	A	130	130	0.0%	Good	None
SW8260B	CIS-1,2-DICHLOROETHYLENE	ug/L	Water	1.0	A	2.6	2.6	0.0%	Good	None
SW8260B	TETRACHLOROETHYLENE	ug/L	Water	1.0	A	1.8	1.9	5.4%	Good	None
SW8260B	TRICHLOROETHYLENE	ug/L	Water	1.0	A	16	18	11.8%	Good	None
SW8260B	VINYL CHLORIDE	ug/L	Water	2.0	A	1.1	1.1	0.0%	Good	None

Key:
A = Analyte
NC = Not Calculated
ND = Not Detected
PQL = Practical Quantitation Limit
RPD = Relative Percent Difference
TIC = Tentatively Identified Compound

H MAROS

MAROS Site Results

Project: Former GAFB AOC 9

User Name: Mfronckowiak

Location: Rome

State: New York

User Defined Site and Data Assumptions:

Hydrogeology and Plume Information:

Groundwater Seepage Velocity: 87.5 ft/yr

Current Plume Length: 1140 ft

Current Plume Width 400 ft

Number of Tail Wells: 7

Number of Source Wells: 1

Down-gradient Information:

Distance from Edge of Tail to Nearest:

Down-gradient receptor: 1 ft

Down-gradient property: 1 ft

Distance from Source to Nearest:

Down-gradient receptor: 1140 ft

Down-gradient property: 1140 ft

Source Information:

Source Treatment: In-situ Biodegradation

NAPL is not observed at this site.

Data Consolidation Assumptions:

Time Period: 12/18/1997 **to** 4/8/2015
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Detection Limit
J Flag Values : Actual Value

Plume Information Weighting Assumptions:

Consolidation Step 1. Weight Plume Information by Chemical
Summary Weighting: Weighting Applied to All Chemicals Equally
Consolidation Step 2. Weight Well Information by Chemical
Well Weighting: No Weighting of Wells was Applied.
Chemical Weighting: No Weighting of Chemicals was Applied.

Note: These assumptions were made when consolidating the historical montoring data and lumping the Wells and COCs.

1. Compliance Monitoring/Remediation Optimization Results:

Preliminary Monitoring System Optimization Results: Based on site classification, source treatment and Monitoring System Category the following suggestions are made for site Sampling Frequency, Duration of Sampling before reassessment, and Well Density. These criteria take into consideration: Plume Stability, Type of Plume, and Groundwater Velocity.

COC	Tail Stability	Source Stability	Level of Effort	Sampling Duration	Sampling Frequency	Sampling Density
1,2-DICHLOROBENZENE	PD	D	L	Continue remediation mechanism unitl reach stable trend or	No Recommendation	27
1,4-DICHLOROBENZENE	ND	PD		Continue remediation mechanism unitl reach stable trend or	No Recommendation	27
CHLOROBENZENE	D	NT	M	Remove treatment system if previously reducing concentation	No Recommendation	27
TETRACHLOROETHYLENE(PCE)	ND	ND			No Recommendation	27
TRICHLOROETHYLENE (TCE)	PD	NT	M	Remove treatment system if previously reducing concentation	No Recommendation	27

Note:

Plume Status: (I) Increasing; (PI)Probably Increasing; (S) Stable; (NT) No Trend; (PD) Probably Decreasing; (D) Decreasing

Design Categories: (E) Extensive; (M) Moderate; (L) Limited (N/A) Not Applicable, Insufficient Data Available

Level of Monitoring Effort Indicated by Analysis Moderate

2. Spatial Moment Analysis Results:

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2-DICHLOROBENZENE	3.00	-3	52.7%	NT
	1,4-DICHLOROBENZENE	3.06	-3	52.7%	NT
	CHLOROBENZENE	3.19	-3	52.7%	NT
	TETRACHLOROETHYLENE(PCE)	3.05	-1	50.0%	NT
	TRICHLOROETHYLENE (TCE)	3.02	-1	50.0%	NT
1st Moment: Distance to Source					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TETRACHLOROETHYLENE(PCE)	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma XX					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TETRACHLOROETHYLENE(PCE)	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma YY					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TETRACHLOROETHYLENE(PCE)	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A

Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.40 **Saturated Thickness:** Uniform: 20 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

MAROS Linear Regression Statistics Summary

Project: Former GAFB AOC 9

User Name: Mfronckowiak

Location: Rome

State: New York

Time Period: 12/18/1997 **to** 4/8/2015
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Detection Limit
J Flag Values : Actual Value

Well	Source/ Tail	Average Conc (mg/L)	Median Conc (mg/L)	Standard Deviation	All Samples "ND" ?	Ln Slope	Coefficient of Variation	Confidence in Trend	Concentration Trend
1,2-DICHLOROBENZENE									
AOC9-MW05	T	2.5E-01	3.0E-03	5.0E-01	Yes	4.8E-04	1.98	71.3%	ND
AOC9-MW06	T	1.0E-01	3.0E-03	3.2E-01	Yes	3.8E-04	3.07	84.0%	ND
AOC9-MW14	T	5.6E-02	2.6E-02	5.8E-02	No	-1.2E-03	1.04	99.9%	D
AOC9-MW15	T	4.4E-02	4.1E-02	2.2E-02	No	-3.1E-04	0.51	90.8%	PD
AOC9-MW17	T	6.0E-02	6.0E-02	1.5E-02	No	-6.9E-05	0.25	74.2%	S
AOC9-MW19	S	3.9E-03	3.8E-03	2.4E-03	No	-1.4E-03	0.63	99.8%	D
G009-MW01	T	1.4E-01	5.7E-04	3.8E-01	No	3.5E-04	2.63	75.6%	NT
G009-MW02	T	1.3E-01	3.0E-03	3.5E-01	Yes	3.9E-04	2.76	87.2%	ND
1,4-DICHLOROBENZENE									
AOC9-MW05	T	2.5E-01	3.0E-03	5.0E-01	Yes	4.8E-04	1.98	71.3%	ND
AOC9-MW06	T	1.0E-01	3.0E-03	3.2E-01	Yes	3.8E-04	3.07	84.0%	ND
AOC9-MW14	T	4.0E-02	2.2E-02	3.6E-02	No	-1.0E-03	0.91	99.9%	D
AOC9-MW15	T	3.9E-02	2.4E-02	3.2E-02	No	-7.3E-04	0.82	100.0%	D
AOC9-MW17	T	1.9E-02	1.7E-02	9.3E-03	No	-2.9E-04	0.49	93.4%	PD
AOC9-MW19	S	3.3E-03	3.0E-03	1.4E-03	No	-7.7E-04	0.44	98.2%	D
G009-MW01	T	1.5E-01	3.0E-03	3.8E-01	Yes	3.9E-04	2.59	84.6%	ND
G009-MW02	T	1.3E-01	3.0E-03	3.5E-01	Yes	3.9E-04	2.76	87.2%	ND
CHLOROBENZENE									
AOC9-MW05	T	2.5E-01	5.0E-03	5.0E-01	Yes	4.4E-04	1.96	71.3%	ND
AOC9-MW06	T	1.0E-01	5.0E-03	3.1E-01	No	3.2E-04	3.02	79.8%	NT
AOC9-MW14	T	5.8E-01	2.5E-01	6.1E-01	No	-1.2E-03	1.06	99.6%	D
AOC9-MW15	T	6.6E-01	3.8E-01	6.0E-01	No	-9.0E-04	0.91	100.0%	D
AOC9-MW17	T	3.4E-01	2.7E-01	2.1E-01	No	-3.3E-04	0.62	91.1%	PD
AOC9-MW19	S	3.2E-02	3.3E-02	1.4E-02	No	4.7E-04	0.45	87.4%	NT
G009-MW01	T	1.5E-01	5.0E-03	3.8E-01	Yes	3.5E-04	2.56	84.6%	ND
G009-MW02	T	1.3E-01	5.0E-03	3.5E-01	Yes	3.6E-04	2.72	87.2%	ND
TETRACHLOROETHYLENE(PCE)									
AOC9-MW05	T	2.5E-01	5.0E-03	5.0E-01	Yes	4.4E-04	1.96	71.3%	ND
AOC9-MW06	T	1.0E-01	5.0E-03	3.1E-01	Yes	3.5E-04	3.01	84.0%	ND
AOC9-MW14	T	1.2E-01	5.0E-03	3.3E-01	Yes	9.9E-04	2.87	91.4%	ND
AOC9-MW15	T	1.2E-01	5.0E-03	3.3E-01	Yes	9.9E-04	2.87	91.3%	ND
AOC9-MW17	T	2.2E-03	2.0E-03	8.7E-04	No	-1.1E-04	0.40	73.0%	S
AOC9-MW19	S	1.5E-01	5.0E-03	3.8E-01	Yes	2.9E-03	2.56	96.7%	ND
G009-MW01	T	1.5E-01	5.0E-03	3.8E-01	Yes	3.5E-04	2.56	84.6%	ND
G009-MW02	T	1.3E-01	5.0E-03	3.5E-01	Yes	3.6E-04	2.72	87.2%	ND

Project: Former GAFB AOC 9 **User Name:** Mfronckowiak

Location: Rome **State:** New York

Well	Source/ Tail	Average Conc (mg/L)	Median Conc (mg/L)	Standard Deviation	All Samples "ND" ?	Ln Slope	Coefficient of Variation	Confidence in Trend	Concentration Trend
TRICHLOROETHYLENE (TCE)									
TRICHLOROETHYLENE (TCE)									
AOC9-MW05	T	2.5E-01	5.0E-03	5.0E-01	Yes	4.4E-04	1.96	71.3%	ND
AOC9-MW06	T	1.5E-03	1.0E-03	1.3E-03	No	-2.8E-06	0.87	100.0%	D
AOC9-MW14	T	1.2E-01	4.8E-03	3.3E-01	No	7.3E-04	2.84	78.6%	NT
AOC9-MW15	T	1.8E-03	8.3E-04	1.9E-03	No	-8.6E-04	1.03	98.0%	D
AOC9-MW17	T	1.6E-02	1.6E-02	2.8E-03	No	-6.6E-10	0.17	100.0%	D
AOC9-MW19	S	1.1E-03	5.0E-04	1.7E-03	No	-6.9E-04	1.60	78.5%	NT
G009-MW01	T	1.2E-03	6.0E-04	1.7E-03	No	-3.1E-04	1.38	99.5%	D
G009-MW02	T	1.8E-03	7.9E-04	2.0E-03	No	-2.0E-04	1.10	85.8%	NT

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Non-detect (ND); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); COV = Coefficient of Variation

MAROS Mann-Kendall Statistics Summary

Project: Former GAFB AOC 9

User Name: Mfronckowiak

Location: Rome

State: New York

Time Period: 12/18/1997 **to** 4/8/2015
Consolidation Period: No Time Consolidation
Consolidation Type: Median
Duplicate Consolidation: Average
ND Values: Detection Limit
J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
1,2-DICHLOROBENZENE								
AOC9-MW05	T	4	0	1.98	3	72.9%	Yes	ND
AOC9-MW06	T	10	0	3.07	9	75.8%	Yes	ND
AOC9-MW14	T	9	9	1.04	-28	99.9%	No	D
AOC9-MW15	T	9	9	0.51	-12	87.0%	No	S
AOC9-MW17	T	9	9	0.25	-7	72.8%	No	S
AOC9-MW19	S	7	7	0.63	-14	97.5%	No	D
G009-MW01	T	7	5	2.63	3	61.4%	No	NT
G009-MW02	T	8	0	2.76	7	76.4%	Yes	ND
1,4-DICHLOROBENZENE								
AOC9-MW05	T	4	0	1.98	3	72.9%	Yes	ND
AOC9-MW06	T	10	0	3.07	9	75.8%	Yes	ND
AOC9-MW14	T	9	9	0.91	-28	99.9%	No	D
AOC9-MW15	T	9	9	0.82	-27	99.8%	No	D
AOC9-MW17	T	9	9	0.49	-24	99.4%	No	D
AOC9-MW19	S	7	7	0.44	-8	84.5%	No	S
G009-MW01	T	7	0	2.59	6	76.4%	Yes	ND
G009-MW02	T	8	0	2.76	7	76.4%	Yes	ND
CHLOROBENZENE								
AOC9-MW05	T	4	0	1.96	3	72.9%	Yes	ND
AOC9-MW06	T	10	1	3.02	9	75.8%	No	NT
AOC9-MW14	T	9	9	1.06	-30	100.0%	No	D
AOC9-MW15	T	9	9	0.91	-32	100.0%	No	D
AOC9-MW17	T	9	9	0.62	-22	98.8%	No	D
AOC9-MW19	S	7	7	0.45	8	84.5%	No	NT
G009-MW01	T	7	0	2.56	6	76.4%	Yes	ND
G009-MW02	T	8	0	2.72	7	76.4%	Yes	ND
TETRACHLOROETHYLENE(PCE)								
AOC9-MW05	T	4	0	1.96	3	72.9%	Yes	ND
AOC9-MW06	T	10	0	3.01	9	75.8%	Yes	ND
AOC9-MW14	T	9	0	2.87	8	76.2%	Yes	ND
AOC9-MW15	T	9	0	2.87	8	76.2%	Yes	ND
AOC9-MW17	T	9	9	0.40	-8	76.2%	No	S
AOC9-MW19	S	7	0	2.56	6	76.4%	Yes	ND
G009-MW01	T	7	0	2.56	6	76.4%	Yes	ND
G009-MW02	T	8	0	2.72	7	76.4%	Yes	ND

Project: Former GAFB AOC 9

User Name: Mfronckowiak

Location: Rome

State: New York

Well	Source/ Tail	Number of Samples	Number of Detects	Coefficient of Variation	Mann-Kendall Statistic	Confidence in Trend	All Samples "ND" ?	Concentration Trend
TRICHLOROETHYLENE (TCE)								
TRICHLOROETHYLENE (TCE)								
AOC9-MW05	T	4	0	1.96	3	72.9%	Yes	ND
AOC9-MW06	T	10	9	0.87	-8	72.9%	No	S
AOC9-MW14	T	9	6	2.84	0	46.0%	No	NT
AOC9-MW15	T	9	7	1.03	-18	96.2%	No	D
AOC9-MW17	T	9	9	0.17	6	69.4%	No	NT
AOC9-MW19	S	7	6	1.60	-6	76.4%	No	NT
G009-MW01	T	7	6	1.38	-17	99.5%	No	D
G009-MW02	T	8	6	1.10	-13	92.9%	No	PD

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)- Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Spatial Moment Analysis Summary

Project: Former GAFB AOC 9

Location: Rome

User Name: Mfronckowiak

State: New York

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	Estimated Mass (Kg)	Xc (ft)	Yc (ft)	Source Distance (ft)	Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,2-DICHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						4
9/5/2004	0.0E+00						1
9/7/2004	0.0E+00						2
11/1/2006	0.0E+00						4
7/28/2010	7.2E-01	1,133,840	1,181,559	727	4,246	10,747	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
4/16/2012	0.0E+00						1
4/17/2012	0.0E+00						4
9/25/2012	0.0E+00						1
9/26/2012	0.0E+00						4
4/9/2013	6.9E-01	1,133,765	1,181,466	845	15,215	24,385	7
4/10/2013	0.0E+00						1
4/2/2014	0.0E+00						5
4/3/2014	0.0E+00						3
4/6/2015	0.0E+00						1
4/7/2015	0.0E+00						5
4/8/2015	0.0E+00						2
1,4-DICHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						4
9/5/2004	0.0E+00						1
9/7/2004	0.0E+00						2
11/1/2006	0.0E+00						4
7/28/2010	7.4E-01	1,133,833	1,181,574	723	4,604	12,803	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
4/16/2012	0.0E+00						1
4/17/2012	0.0E+00						4
9/25/2012	0.0E+00						1
9/26/2012	0.0E+00						4
4/9/2013	4.9E-01	1,133,764	1,181,496	826	14,671	26,895	7
4/10/2013	0.0E+00						1
4/2/2014	0.0E+00						5
4/3/2014	0.0E+00						3
4/6/2015	0.0E+00						1
4/7/2015	0.0E+00						5

Project: Former GAFB AOC 9

Location: Rome

User Name: Mfronckowiak

State: New York

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	Estimated Mass (kg)	Xc (ft)	Yc (ft)	Source Distance (ft)	Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
1,4-DICHLOROBENZENE							
4/8/2015	0.0E+00						2
CHLOROBENZENE							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						4
9/5/2004	0.0E+00						1
9/7/2004	0.0E+00						2
11/1/2006	0.0E+00						4
7/28/2010	5.3E+00	1,133,847	1,181,587	703	3,117	11,265	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
4/16/2012	0.0E+00						1
4/17/2012	0.0E+00						4
9/25/2012	0.0E+00						1
9/26/2012	0.0E+00						4
4/9/2013	2.6E+00	1,133,797	1,181,531	778	12,273	23,492	7
4/10/2013	0.0E+00						1
4/2/2014	0.0E+00						5
4/3/2014	0.0E+00						3
4/6/2015	0.0E+00						1
4/7/2015	0.0E+00						5
4/8/2015	0.0E+00						2
TETRACHLOROETHYLENE(PCE)							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						4
9/5/2004	0.0E+00						1
9/7/2004	0.0E+00						2
11/1/2006	0.0E+00						4
7/28/2010	2.0E-01	1,133,801	1,181,546	765	6,282	14,803	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
4/16/2012	0.0E+00						1
4/17/2012	0.0E+00						4
9/25/2012	0.0E+00						1
9/26/2012	0.0E+00						4
4/9/2013	2.9E-01	1,133,735	1,181,465	867	14,728	27,543	7
4/10/2013	0.0E+00						1
4/2/2014	0.0E+00						5
4/3/2014	0.0E+00						3
4/6/2015	0.0E+00						1
4/7/2015	0.0E+00						5
4/8/2015	0.0E+00						2

Project: Former GAFB AOC 9

Location: Rome

User Name: Mfronckowiak

State: New York

	0th Moment	1st Moment (Center of Mass)			2nd Moment (Spread)		
Effective Date	Estimated Mass (kg)	Xc (ft)	Yc (ft)	Source Distance (ft)	Sigma XX (sq ft)	Sigma YY (sq ft)	Number of Wells
TRICHLOROETHYLENE (TCE)							
TRICHLOROETHYLENE (TCE)							
12/18/1997	0.0E+00						2
5/15/2000	0.0E+00						4
9/5/2004	0.0E+00						1
9/7/2004	0.0E+00						2
11/1/2006	0.0E+00						4
7/28/2010	1.2E-01	1,133,822	1,181,554	743	5,937	13,616	6
5/17/2011	0.0E+00						5
10/24/2011	0.0E+00						5
4/16/2012	0.0E+00						1
4/17/2012	0.0E+00						4
9/25/2012	0.0E+00						1
9/26/2012	0.0E+00						4
4/9/2013	1.5E-01	1,133,644	1,181,341	1,018	10,706	20,407	7
4/10/2013	0.0E+00						1
4/2/2014	0.0E+00						5
4/3/2014	0.0E+00						3
4/6/2015	0.0E+00						1
4/7/2015	0.0E+00						5
4/8/2015	0.0E+00						2

Project: Former GAFB AOC 9

Location: Rome

User Name: Mfronckowiak

State: New York

Moment Type	Constituent	Coefficient of Variation	Mann-Kendall S Statistic	Confidence in Trend	Moment Trend
Zeroth Moment: Mass					
	1,2-DICHLOROBENZENE	3.00	-3	52.7%	NT
	1,4-DICHLOROBENZENE	3.06	-3	52.7%	NT
	CHLOROBENZENE	3.19	-3	52.7%	NT
	TETRACHLOROETHYLENE(PCE)	3.05	-1	50.0%	NT
	TRICHLOROETHYLENE (TCE)	3.02	-1	50.0%	NT
1st Moment: Distance to Source					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TETRACHLOROETHYLENE(PCE)	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma XX					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TETRACHLOROETHYLENE(PCE)	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A
2nd Moment: Sigma YY					
	1,2-DICHLOROBENZENE	0.00	0	0.0%	N/A
	1,4-DICHLOROBENZENE	0.00	0	0.0%	N/A
	CHLOROBENZENE	0.00	0	0.0%	N/A
	TETRACHLOROETHYLENE(PCE)	0.00	0	0.0%	N/A
	TRICHLOROETHYLENE (TCE)	0.00	0	0.0%	N/A

Note: The following assumptions were applied for the calculation of the Zeroth Moment:

Porosity: 0.40 **Saturated Thickness:** Uniform: 20 ft

Mann-Kendall Trend test performed on all sample events for each constituent. Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A)-Due to insufficient Data (< 4 sampling events).

Note: The Sigma XX and Sigma YY components are estimated using the given field coordinate system and then rotated to align with the estimated groundwater flow direction. Moments are not calculated for sample events with less than 6 wells.

MAROS Statistical Trend Analysis Summary

Project: Former GAFB AOC 9

Location: Rome

User Name: Mfronckowiak

State: New York

Time Period: 12/18/1997 **to** 4/8/2015

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Detection Limit

J Flag Values : Actual Value

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
1,2-DICHLOROBENZENE								
AOC9-MW05	T	4	0	2.5E-01	3.0E-03	Yes	ND	ND
AOC9-MW06	T	10	0	1.0E-01	3.0E-03	Yes	ND	ND
AOC9-MW14	T	9	9	5.6E-02	2.6E-02	No	D	D
AOC9-MW15	T	9	9	4.4E-02	4.1E-02	No	S	PD
AOC9-MW17	T	9	9	6.0E-02	6.0E-02	No	S	S
AOC9-MW19	S	7	7	3.9E-03	3.8E-03	No	D	D
G009-MW01	T	7	5	1.4E-01	5.7E-04	No	NT	NT
G009-MW02	T	8	0	1.3E-01	3.0E-03	Yes	ND	ND
1,4-DICHLOROBENZENE								
AOC9-MW05	T	4	0	2.5E-01	3.0E-03	Yes	ND	ND
AOC9-MW06	T	10	0	1.0E-01	3.0E-03	Yes	ND	ND
AOC9-MW14	T	9	9	4.0E-02	2.2E-02	No	D	D
AOC9-MW15	T	9	9	3.9E-02	2.4E-02	No	D	D
AOC9-MW17	T	9	9	1.9E-02	1.7E-02	No	D	PD
AOC9-MW19	S	7	7	3.3E-03	3.0E-03	No	S	D
G009-MW01	T	7	0	1.5E-01	3.0E-03	Yes	ND	ND
G009-MW02	T	8	0	1.3E-01	3.0E-03	Yes	ND	ND
CHLOROBENZENE								
AOC9-MW05	T	4	0	2.5E-01	5.0E-03	Yes	ND	ND
AOC9-MW06	T	10	1	1.0E-01	5.0E-03	No	NT	NT
AOC9-MW14	T	9	9	5.8E-01	2.5E-01	No	D	D
AOC9-MW15	T	9	9	6.6E-01	3.8E-01	No	D	D
AOC9-MW17	T	9	9	3.4E-01	2.7E-01	No	D	PD
AOC9-MW19	S	7	7	3.2E-02	3.3E-02	No	NT	NT
G009-MW01	T	7	0	1.5E-01	5.0E-03	Yes	ND	ND
G009-MW02	T	8	0	1.3E-01	5.0E-03	Yes	ND	ND
TETRACHLOROETHYLENE(PCE)								
AOC9-MW05	T	4	0	2.5E-01	5.0E-03	Yes	ND	ND
AOC9-MW06	T	10	0	1.0E-01	5.0E-03	Yes	ND	ND
AOC9-MW14	T	9	0	1.2E-01	5.0E-03	Yes	ND	ND
AOC9-MW15	T	9	0	1.2E-01	5.0E-03	Yes	ND	ND
AOC9-MW17	T	9	9	2.2E-03	2.0E-03	No	S	S

MAROS Statistical Trend Analysis Summary

Well	Source/ Tail	Number of Samples	Number of Detects	Average Conc. (mg/L)	Median Conc. (mg/L)	All Samples "ND" ?	Mann-Kendall Trend	Linear Regression Trend
TETRACHLOROETHYLENE(PCE)								
AOC9-MW19	S	7	0	1.5E-01	5.0E-03	Yes	ND	ND
G009-MW01	T	7	0	1.5E-01	5.0E-03	Yes	ND	ND
G009-MW02	T	8	0	1.3E-01	5.0E-03	Yes	ND	ND
TRICHLOROETHYLENE (TCE)								
AOC9-MW05	T	4	0	2.5E-01	5.0E-03	Yes	ND	ND
AOC9-MW06	T	10	9	1.5E-03	1.0E-03	No	S	D
AOC9-MW14	T	9	6	1.2E-01	4.8E-03	No	NT	NT
AOC9-MW15	T	9	7	1.8E-03	8.3E-04	No	D	D
AOC9-MW17	T	9	9	1.6E-02	1.6E-02	No	NT	D
AOC9-MW19	S	7	6	1.1E-03	5.0E-04	No	NT	NT
G009-MW01	T	7	6	1.2E-03	6.0E-04	No	D	D
G009-MW02	T	8	6	1.8E-03	7.9E-04	No	PD	NT

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); No Detectable Concentration (NDC)

The Number of Samples and Number of Detects shown above are post-consolidation values.

MAROS Plume Analysis Summary

Project: Former GAFB AOC 9

Location: Rome

User Name: Mfronckowiak

State: New York

Time Period: 12/18/1997 **to** 4/8/2015

Consolidation Period: No Time Consolidation

Consolidation Type: Median

Duplicate Consolidation: Average

ND Values: Detection Limit

J Flag Values : Actual Value

Constituent	Well	Source/ Tail	Number of Samples	Number of Detects	Average (mg/L)	Median (mg/L)	All Samples "ND" ?	Mann-Kendall	Linear Regression	Modeling	Empirical
1,2-DICHLOROBENZENE											
	AOC9-MW05	T	4	0	2.5E-01	3.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW06	T	10	0	1.0E-01	3.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW14	T	9	9	5.6E-02	2.6E-02	No	D	D	N/A	N/A
	AOC9-MW15	T	9	9	4.4E-02	4.1E-02	No	S	PD	N/A	N/A
	AOC9-MW17	T	9	9	6.0E-02	6.0E-02	No	S	S	N/A	N/A
	AOC9-MW19	S	7	7	3.9E-03	3.8E-03	No	D	D	N/A	N/A
	G009-MW01	T	7	5	1.4E-01	5.7E-04	No	NT	NT	N/A	N/A
	G009-MW02	T	8	0	1.3E-01	3.0E-03	Yes	ND	ND	N/A	N/A
1,4-DICHLOROBENZENE											
	AOC9-MW05	T	4	0	2.5E-01	3.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW06	T	10	0	1.0E-01	3.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW14	T	9	9	4.0E-02	2.2E-02	No	D	D	N/A	N/A
	AOC9-MW15	T	9	9	3.9E-02	2.4E-02	No	D	D	N/A	N/A
	AOC9-MW17	T	9	9	1.9E-02	1.7E-02	No	D	PD	N/A	N/A
	AOC9-MW19	S	7	7	3.3E-03	3.0E-03	No	S	D	N/A	N/A
	G009-MW01	T	7	0	1.5E-01	3.0E-03	Yes	ND	ND	N/A	N/A
	G009-MW02	T	8	0	1.3E-01	3.0E-03	Yes	ND	ND	N/A	N/A
CHLOROBENZENE											
	AOC9-MW05	T	4	0	2.5E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW06	T	10	1	1.0E-01	5.0E-03	No	NT	NT	N/A	N/A
	AOC9-MW14	T	9	9	5.8E-01	2.5E-01	No	D	D	N/A	N/A

Project: Former GAFB AOC 9 **User Name:** Mfronckowiak

Location: Rome **State:** New York

Constituent	Well	Source/ Tail	Number of Samples	Number of Detects	Average (mg/L)	Median (mg/L)	All Samples "ND" ?	Mann-Kendall	Linear Regression	Modeling	Empirical
CHLOROBENZENE											
	AOC9-MW15	T	9	9	6.6E-01	3.8E-01	No	D	D	N/A	N/A
	AOC9-MW17	T	9	9	3.4E-01	2.7E-01	No	D	PD	N/A	N/A
	AOC9-MW19	S	7	7	3.2E-02	3.3E-02	No	NT	NT	N/A	N/A
	G009-MW01	T	7	0	1.5E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	G009-MW02	T	8	0	1.3E-01	5.0E-03	Yes	ND	ND	N/A	N/A
TETRACHLOROETHYLENE(PCE)											
	AOC9-MW05	T	4	0	2.5E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW06	T	10	0	1.0E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW14	T	9	0	1.2E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW15	T	9	0	1.2E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW17	T	9	9	2.2E-03	2.0E-03	No	S	S	N/A	N/A
	AOC9-MW19	S	7	0	1.5E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	G009-MW01	T	7	0	1.5E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	G009-MW02	T	8	0	1.3E-01	5.0E-03	Yes	ND	ND	N/A	N/A
TRICHLOROETHYLENE (TCE)											
	AOC9-MW05	T	4	0	2.5E-01	5.0E-03	Yes	ND	ND	N/A	N/A
	AOC9-MW06	T	10	9	1.5E-03	1.0E-03	No	S	D	N/A	N/A
	AOC9-MW14	T	9	6	1.2E-01	4.8E-03	No	NT	NT	N/A	N/A
	AOC9-MW15	T	9	7	1.8E-03	8.3E-04	No	D	D	N/A	N/A
	AOC9-MW17	T	9	9	1.6E-02	1.6E-02	No	NT	D	N/A	N/A
	AOC9-MW19	S	7	6	1.1E-03	5.0E-04	No	NT	NT	N/A	N/A
	G009-MW01	T	7	6	1.2E-03	6.0E-04	No	D	D	N/A	N/A
	G009-MW02	T	8	6	1.8E-03	7.9E-04	No	PD	NT	N/A	N/A

Note: Increasing (I); Probably Increasing (PI); Stable (S); Probably Decreasing (PD); Decreasing (D); No Trend (NT); Not Applicable (N/A) - Due to insufficient Data (< 4 sampling events); Source/Tail (S/T)

The Number of Samples and Number of Detects shown above are post-consolidation values.