On-Base Groundwater Remediation
On-Base Groundwater Areas of Concern
Former Griffiss Air Force Base
Rome, New York

Final
PERFORMANCE MONITORING WORK PLAN

Contract No. W912DQ-06-D-0012
Project No. 717-06-03

Revision 0.0
September 2008

FPM group

FINAL

PERFORMANCE MONITORING WORK PLAN

Prepared for:

On-Base Groundwater Remediation
On-Base Groundwater Areas of Concern
Former Griffiss Air Force Base
Rome, New York

through

United States Army Corps of Engineers
Kansas City District
Kansas City, MO 68102

Prepared by:

FPM Group, Ltd.
153 Brooks Road
Rome, NY 13441

In association with:
Parsons Infrastructure & Technology Group, Inc.
290 Elwood Davis Rd, Suite 312
Liverpool, NY 13088

Contract No. W912DQ-06-D-0012
Project No. 717-06-03

Revision 0.0
September 2008

DEPARTMENT OF THE AIR FORCE
AIR FORCE REAL PROPERTY AGENCY

29 SEP 2008

MEMORANDUM FOR SEE DISTRIBUTION LIST

FROM: AFRPA-Griffiss
Environmental Section
153 Brooks Road
Rome NY 13441-4105

SUBJECT: Final Performance Monitoring Work Plan, On-Base Groundwater Areas of Concern.

1. Enclosed please find the final Performance Monitoring Work Plan for the On- Base Groundwater Areas of Concern dated September 2008. The Response to Comments to the comments on the draft version of the Work Plan received from the U.S. EPA on September 12th, 2008 is included.

2. If you have any questions, please contact Cathy Jerrard at (315) 356-0810 ext. 204.

MICHAEL F. MCDERMOTT
BRAC Environmental Coordinator

Attachment: As Noted

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RESPONSE TO EPA COMMENTS ON
TECHNICAL REVIEW OF THE DRAFT
PERFORMANCE MONITORING WORK PLAN
ON-BASE GROUNDWATER AREAS OF CONCERN
FORMER GRIFFISS AIR FORCE BASE
ROME, NEW YORK
AUGUST 2008

RECEIVED ON SEPTEMBER 12, 2008

#	EPA Comment	Response
General Comments		
1	All reports associated with the performance monitoring of the implemented remedies are not clearly delineated within the PM Work Plan. Section 1, Introduction, and Section 7, Reporting Requirements, indicate quarterly performance monitoring reports and annual performance monitoring reports will be developed and issued. Sections 2.3, 3.3, 4.3, and 5.3 (all entitled Performance Monitoring Sampling) indicate a data evaluation report will be prepared and submitted annually. The PM Work Plan does not clearly establish the relationship between the annual performance monitoring report identified in Sections 1 and 7 and the data evaluation report discussed in Sections 2.3, 3.3, 4.3, and 5.3. Please revise the PM Work Plan to clearly indicate if the data evaluation report referred to in Sections 2.3, 3.3, 4.3, and 5.3 is, in fact, the annual performance monitoring report identified in Sections 1 and 7. If it is not, please revise Sections 2.3, 3.3, 4.3, and 5.3 to indicate that an annual performance monitoring report will be developed and submitted in addition to the data evaluation report and revise Section 7 to list the types of information that will be included in the annual data evaluation report.	For consistency, reference to the data evaluation reports will be replaced with quarterly or annual performance monitoring reports.
Specific Comments		
1	Section 2.1, Site Background, Page 2-1: Three times, Section 2.1 references well LF6MW-12 citing figures from past documents related to this site. For example, the first paragraph refers to two contaminants exceeding the New York State Department of Environmental Conservation (NYSDEC) Class GA Groundwater Standards,	The well will be added to the figure.

	trichloroethene (TCE) and dichloroethene (DCE), "located within a 1,600-square-foot area around well LF6MW-12 shown on Figure 2-1 (EEEPC, February 2008)." Well LF6MW-12 appears to be an important part of the site background. For increased clarity and transparency in the presentation of information related to site conditions, please add well LF6MW-12 to Figure 2-1 of the PM Work Plan.	
2	Section 2.1, Site Background, Page 2-1: The third and fourth paragraphs of Section 2.1 indicate that the results of sampling conducted in November 2006 and February through April 2007 are presented in the Final Monitoring Report, Baseline and PDI2 Sampling at On-Base Groundwater AOCs, Griffiss Air Force Base dated August 2007 (Final Monitoring Report). However, the impact of the results on the performance monitoring sampling strategy for the TCE plume at Landfill 6 is not presented or discussed. It is suggested that the results of this sampling event be presented and summarized in the PM Work Plan. Further, the revised text should demonstrate how the results were used to develop the performance monitoring strategy for the implemented remedy, enhanced bioremediation. Alternatively, indicate that presentation and discussion of the results is unwarranted as they did not influence the performance monitoring strategy.	The Baseline, PDI, and PDI2 results from 2006/2007 were evaluated to confirm the sampling networks during the preparation of the Remedial Design Work Plan (RD WP) and 90% Design Drawings dated February 2008. The Performance Monitoring Work Plan (PM WP) summarizes the sampling networks detailed in the RD WP. It is prepared as a stand alone document and is intended as a reference document for field personnel to provide guidance for site identification, site layout, sampling locations, analyses to be collected, sampling procedures, and documentation and shipping procedures. The PM WP also establishes future reporting. The baseline monitoring network proved sufficient to track the nature and extent of the plume and no changes were recommended.
3	Table 2-1, Landfill 6 Performance Monitoring Sample Analysis Summary, Page 2-4: The list of Target Analytes/EPA Method Numbers included in Table 2-1 differs slightly from that provided in Table 2-3, Monitoring Plan, Landfill 6 Site, in the Final Remedial Design Work Plan and 90% Design Drawings dated February 2008 (RD Work Plan). Specifically, Table 2-1 lists Method SM5310B for dissolved organic carbon (DOC) while Table 2-3 of the RD Work Plan lists Method E415.1. Please revise the PM Work Plan to identify this	The EPA has withdrawn several analytical methods including the method E415.1. Alternate Test Procedure (ATP) methods (i.e.: Standard Methods) were adopted to replace the withdrawn methods. The new methods are similar to the withdrawn methods, but more up to date. A paragraph has been added to the introduction to explain the

	change. For clarity and transparency in the description of the methods to be employed as part of the performance monitoring effort, please include a discussion summarizing the reason(s) for the change.	discrepancies in analytical methods.
4	Section 3.1, Site Background, Page 3-1: The second and third paragraphs of Section 3.1 indicate that the results of sampling conducted in October/November 2006 and February 2007 are presented in the Final Monitoring Report. The results are not presented or discussed; thus, their impact on the performance monitoring sampling strategy is unknown. It is suggested that the results of these sampling events be presented and summarized in the PM Work Plan. Further, the revised text should demonstrate how the results were used to develop the performance monitoring strategy for the remedy implemented at Building 817/WSA. Alternatively, indicate that presentation and discussion of the results is unwarranted as they did not influence the performance monitoring strategy.	The Baseline, PDI, and PDI2 results from 2006/2007 were evaluated to confirm the sampling networks during the preparation of the Remedial Design Work Plan (RD WP) and 90% Design Drawings dated February 2008. The Performance Monitoring Work Plan (PM WP) summarizes the sampling networks detailed in the RD WP. It is prepared as a stand alone document and is intended as a reference document for field personnel to provide guidance for site identification, site layout, sampling locations, analyses to be collected, sampling procedures, and documentation and shipping procedures. The PM WP also establishes future reporting. The baseline monitoring network proved sufficient to track the nature and extent of the plume and no changes were recommended.
5	Table 3-1, Building 817/WSA Baseline Sample Analysis Summary, Page 3-4: The list of Target Analytes/EPA Method Numbers included in Table 3-1 differs slightly from that provided in Table 4-3, Monitoring Plan, Building 817/WSA Site, in the RD Work Plan. Specifically, Table 3-1 lists Method SM5310B for DOC while Table 4-3 of the RD Work Plan lists Method E415.1. Please revise the PM Work Plan to identify this change. For clarity and transparency in the description of the methods to be employed as part of the performance monitoring effort, please include a discussion summarizing the reason(s) for the change.	The EPA has withdrawn several analytical methods including the method E415.1. Alternate Test Procedure (ATP) methods (i.e.: Standard Methods) were adopted to replace the withdrawn methods. The new methods are similar to the withdrawn methods, but more up to date. A paragraph has been added to the introduction to explain the discrepancies in analytical methods.
6	Section 4.1, Site Background, Page 4-1: The third paragraph of Section 4.1 indicates that the	The Baseline, PDI, and PDI2 results from 2006/2007 were evaluated to

	results of sampling conducted in November 2006 are presented in the Final Monitoring Report. The results are not presented or discussed; thus, their impact on the performance monitoring sampling strategy for the proposed remedy at Building 775/Pumphouse 3 is unknown. It is suggested that the results of this sampling event be presented and summarized in the PM Work Plan. Further, the revised text should demonstrate how the results were used to develop the performance monitoring strategy for the remedy implemented at Building 775/Pumphouse 3. Alternatively, indicate that presentation and discussion of the results is unwarranted as they did not influence the performance monitoring strategy.	confirm the sampling networks during the preparation of the Remedial Design Work Plan (RD WP) and 90% Design Drawings dated February 2008. The Performance Monitoring Work Plan (PM WP) summarizes the sampling networks detailed in the RD WP. It is prepared as a stand alone document and is intended as a reference document for field personnel to provide guidance for site identification, site layout, sampling locations, analyses to be collected, sampling procedures, and documentation and shipping procedures. The PM WP also establishes future reporting. The baseline monitoring network proved sufficient to track the nature and extent of the plume and no changes were recommended.
7	Section 5.1, Site Background, Pages 5-1 and 5-3: The third paragraph of Section 5.1 indicates that the results of sampling conducted in November 2006 are presented in the Final Monitoring Report. However, the impact of the results on the performance monitoring sampling strategy for the chlorinated VOC plume in the Apron 2 area is not presented or discussed. It is suggested that the results of this sampling event be presented and summarized in the PM Work Plan. Further, the revised text should demonstrate how the results were used to develop the performance monitoring strategy for the implemented remedy, monitored natural attenuation (MNA). Alternatively, indicate that presentation and discussion of the results is unwarranted as they did not influence the performance monitoring strategy.	The Baseline, PDI, and PDI2 results from 2006/2007 were evaluated to confirm the sampling networks during the preparation of the Remedial Design Work Plan (RD WP) and 90% Design Drawings dated February 2008. The Performance Monitoring Work Plan (PM WP) summarizes the sampling networks detailed in the RD WP. It is prepared as a stand alone document and is intended as a reference document for field personnel to provide guidance for site identification, site layout, sampling locations, analyses to be collected, sampling procedures, and documentation and shipping procedures. The PM WP also establishes future reporting. The baseline monitoring network proved sufficient to track the nature

		and extent of the plume and no changes were recommended.
8	Section 5.3, Performance Monitoring Sampling, Page 5-3: While Section 5.3 indicates an annual data evaluation report will be developed and submitted on the performance of the identified remedy, MNA, the text does not detail the types of information specific to MNA that will be included in the evaluation. Please revise Section 5.3 to address this issue. It is envisioned that the annual evaluation will address items similar to those listed in Section 5.6.1, Data Evaluation and Reports, of the RD Work Plan.	The text will be revised to include the details from Section 5.6.1 of the RD WP.
9	Section 5.3, Performance Monitoring Sampling, Page 5-3: Section 5.3 closes by indicating that data evaluations will be used to optimize the monitoring well network and that sampling frequency will be adjusted "as necessary or appropriate." Based on the information provided, it is not clear why the proposed sampling frequencies might be changed. Please revise Section 5.3 to include examples of performance monitoring results that would dictate a change in sampling frequency. Further, identify and discuss the criterion/criteria to be used in determining if a change in sampling frequency is warranted.	Proposed sampling network changes may be warranted due to data gaps (e.g. plume extends further downgradient than initially thought or current network provides redundant data). Sampling optimization will be performed by reviewing trend charts and statistical analysis of water quality and level data. E.g., the decision to discontinue the monitoring of a well will be guided by the results of a non-parametric test, such as the Mann-Kendall test. The trending and statistical analysis will be used to propose any changes which will be evaluated by the project team. The text in Section 5.3 will be revised to reflect the response above.
10	Table 5-1, Apron 2 Chlorinated Plume Site Baseline Sample Analysis Summary, Page 5-4: The list of Target Analytes/EPA Method Numbers included in Table 5-1 of the PM Work Plan differs from that provided in Table 5-1, Monitoring Plan, Nosedocks/Apron 2 Site, in the RD Work Plan. Specifically: • Table 5-1 in the PM Work Plan lists Method SM5310B for DOC while Table 5-1 of the RD Work Plan lists Method E415.1; • Table 5-1 in the PM Work Plan lists Method SW9056 for Nitrate while Table	The EPA has withdrawn several analytical methods including the methods E415.1, E353.2, and E310.1 Alternate Test Procedure (ATP) methods (i.e.: Standard Methods) were adopted to replace the withdrawn methods. The new methods are similar to the withdrawn methods, but more up to date. A paragraph has been added to the introduction to explain the discrepancies in analytical methods.

	5-1 of the RD Work Plan lists Method E353.2; and • Table 5-1 in the PM Work Plan lists Method SM2320B for Total alkalinity while Table 5-1 of the RD Work Plan lists Method E310.1. Please revise the PM Work Plan to identify these changes. For clarity and transparency in the description of the methods to be employed as part of the performance monitoring effort, please include a discussion summarizing the reason(s) for these changes.	
	////////**END OF COMMENTS**////	

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APPENDICES

LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEE	Air Force Center for Engineering and the Environment
AFRPA	Air Force Real Property Agency
AOC	Area of Concern
ASTM	American Society for Testing and Materials
bgs	Below ground surface
CFR	Code of Federal Regulations
CoC	Chain of Custody
COC	Contaminant of Concern
CQCR	Contractor Quality Control Report
DCE	Dichlorethene
DOC	dissolved organic carbon
DOT	Department of Transportation
EEEPC	Ecology and Environment Engineering, P.C.
EPA	Environmental Protection Agency
ERPIMS	Environmental Resources Program Information Management System
FPM	FPM Group. Ltd.
FSP	Field Sampling Plan
LF6 TCE	Landfill 6 Trichloroethene
MNA	Monitored natural attenuation
MS/MSD	Matrix Spike/ Matrix Spike Duplicate
MSL	Mean Sea Level
MTBE	Methyl Tert Butyl Ether
NAPL	Non-aqueous phase liquid
NYSDEC	New York State Department of Environmental Conservation
OBGW	On-Base Groundwater
ORP	Oxygen Reduction Potential
Parsons	Parsons Infrastructure and Technology Group, Inc.
PCE	Perchloroethene
PM WP	Performance Monitoring Work Plan

POTW	Publicly Owned Treatment Works
ppb	Parts per billion
QAPP	Quality Assurance/ Project Plan
QA/QC	Quality Assurance/ Quality Control
RA WP	Remedial Action Work Plan
RD WP	Remedial Design Work Plan
RIP	Remedy in place
SAP	Sampling and Analysis Plan
SDG	Sample Delivery Group
SMC	Six Mile Creek
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
TCA	Trichloroethane
TCE	Trichloroethene
TOIC	Top of inner casing
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VOC	Volatile Organic Compound
WP	Work Plan
WSA	Weapon Storage Area

1 Introduction

This Performance Monitoring Work Plan (PM WP) has been prepared by FPM Group, Ltd. (FPM) in association with Parsons Infrastructure and Technology Group, Inc. (Parsons), under contract to the United States Army Corps of Engineers (USACE), Kansas City District, Contract No. W912DQ-06-D-0012. FPM will conduct performance monitoring at the following On-Base Groundwater (OBGW) Areas of Concern (AOCs): Landfill 6 Trichloroethene (LF6 TCE), Building 817/Weapons Storage Area (WSA), Building 775/Pumphouse 3, and the Nosedocks/ Apron 2 Chlorinated Plume Site at the former Griffiss Air Force Base [AFB] (Figure 1-1). The first round of monitoring will start in summer/fall 2008, depending on the site.

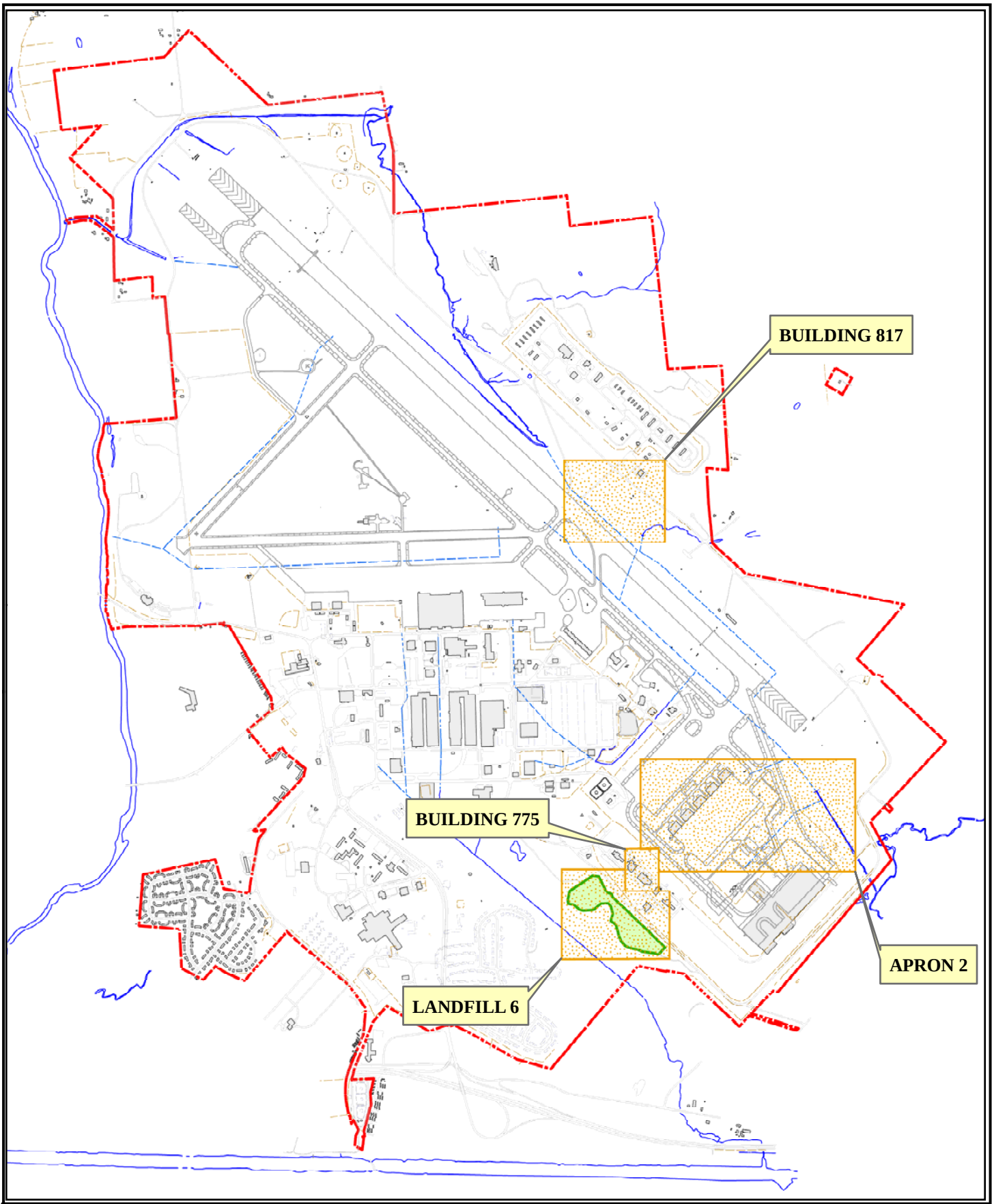
The objective of performance monitoring is to collect groundwater data which will support decision making and assessment of the implemented remedy. This assessment will be made based on the results from performance sampling while applying the criteria as discussed in the Final Remedial Design Work Plan (RD WP) and Design Drawings by Ecology and Environment Engineering, P.C. (EEEPC, February 2008). The performance monitoring networks follow the RD WP. A more detailed history of each of the sites is provided in separate sections below, along with a brief synopsis of the planned remedial action.

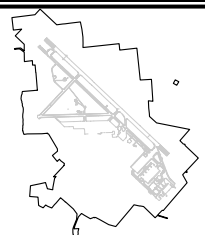
FPM was informed by the laboratory (Life Science Laboratories, Inc.) of a recent EPA ruling that affected the analytical methods proposed in the RD WP. The EPA has withdrawn multiple methods or these methods are not available. As a result, FPM has adopted several Alternate Test Procedure (ATP) methods (i.e.: Standard Methods) to replace the withdrawn methods. The new methods are similar to the withdrawn methods, but more up to date. A list of prior methods and the new adopted methods is provided below:

Analyte	Prior Method	Adopted Method
Alkalinity	E310.1	SM2320B
DOC	E415.1	SM5310B
Nitrate	E353.2	SW9056

During groundwater sampling, all work practices will comply with the Draft Site Safety and Health Plan [SSHP]. Long-Term Monitoring Program (FPM, June 2003) and operating requirements from the final Remedial Action Work Plan [RA WP] (Parsons, July 2008) or later version to ensure that the most conservative approach towards workers health, site safety and protection of the environment is utilized. Project health and safety forms and tailgate meeting forms will be utilized during this site work.

All groundwater samples shall be collected using bladder pumps and sampling shall be performed in accordance with United States Environmental Protection Agency (USEPA)-recommended practices and the Field Sampling Plan [FSP], Long-Term Monitoring Program (FPM, March 2005). The relevant sampling methodology details are described in Section 6. All data obtained from the sampling event will be reviewed and evaluated in accordance with the





Key to Features

- Road
- Airfield
- Base Boundary
- Fenceline
- Storm Drain
- Surface Water
- Sites
- Landfill
- Existing Facilities
- Demolished Facilities

FIGURE 1-1
On Base Groundwater AOCs Sites Map

1,200 600 0 1,200 2,400
Feet

N

UNITED STATES AIR FORCE
GRIFFISS AIR FORCE BASE
ROME, NEW YORK

July 14, 2008

FPM group

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Draft Quality Assurance Project Plan (QAPP), Long-Term Monitoring Program, based on the Air Force Center for Engineering and the Environment (AFCEE) QAPP (Version 4.0) (FPM, October 2006), with AFCEE- and USACE-approved variances, and the AFCEE QAPP 4.0 qualifiers will apply. The QAPP and the FSP form the Sampling and Analysis Plan (SAP).

During sampling, daily chemical quality control reports (CQCRs) will be prepared to log all daily activities and to provide a record of any deviations from the approved SAP. These CQCRs will contain all field sampling forms, calibration data, signed Chains of Custody (CoCs), and applicable health and safety forms (Appendix A, adapted from Parsons, June 2006). The CQCRs will be added to the quarterly and annual performance monitoring reports in an appendix. Data shall be compared to New York State Department of Environmental Conservation (NYSDEC) Groundwater Standards and Surface Water Standards, as applicable.

All applicable health and safety documentation will be collected at the end of each day and submitted with the daily reporting requirements and documentation. A site safety and health officer (SSHO) will be responsible for ensuring all health and safety meetings, audits and work practices comply with existing health and safety protocols and changing site conditions.

The reporting requirements for the results from this sampling are detailed in Section 7. Validation reports and raw lab data will be summarized in an appendix to the quarterly and annual performance monitoring reports.

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2 Landfill 6 TCE

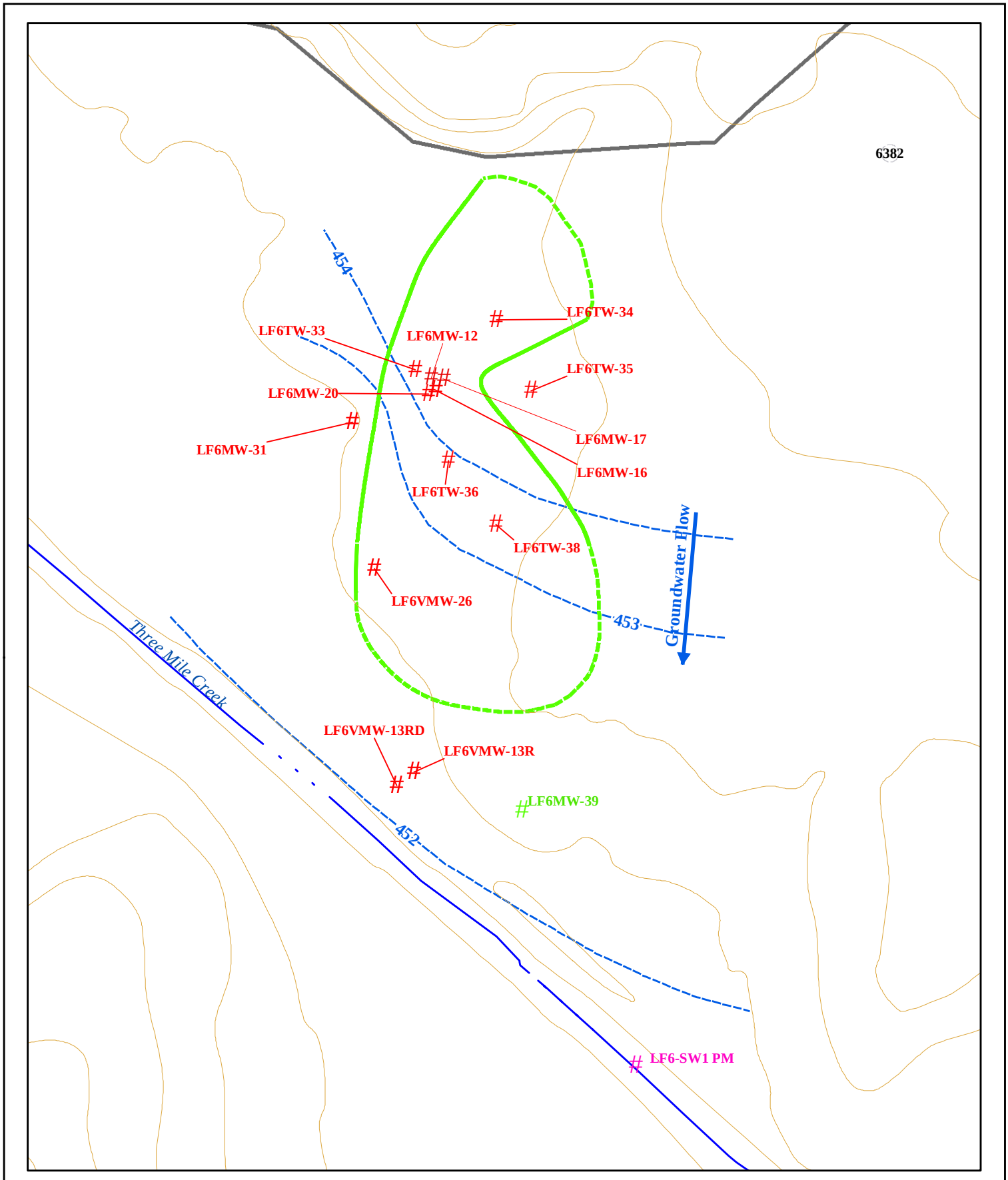
2.1 Site Background

The Landfill 6 TCE site plume is located downgradient to the west of the former Landfill 6. The most contaminated portion of the plume is located southwest of the landfill beneath the floodplain of Three Mile Creek. There is no evidence that volatile organic compound (VOC) contaminants have migrated to the creek. The contaminants exceeding NYSDEC Class GA Groundwater Standards are trichloroethene (TCE), dichloroethene (DCE) and vinyl chloride (VC). In March 2004, the maximum TCE concentration was 2,140 parts per billion (ppb) and the maximum DCE concentration was 346 ppb. Both of these maximums were detected in wells located within a 1,600-square-foot area centered around well LF6MW-12 as shown on Figure 2-1 (EEEPC, February 2008).

The contaminated aquifer is comprised of silty sands with an average saturated thickness extending from 19 feet below ground surface (bgs) to 80 feet bgs, where shale bedrock is encountered. Contamination is not found in the bedrock. Due to a flat gradient, groundwater velocities at this site are extremely slow and have been estimated at less than 4 feet per year. In general, the direction of groundwater flow at the site is southwest. Groundwater studies at the site found relatively aerobic conditions and low dissolved organic carbon (DOC) within the TCE/DCE plume. The cis-1,2 DCE present in the plume may have been formed years ago when the TCE degraded in the presence of landfill organics (EEEPC, February 2008). There is evidence that reductive dechlorination is occurring in a limited downgradient section of the plume (LF6VMW-26 and LF6MW-12).

FPM sampled the LF6 TCE site on 16 November 2006 in accordance with the final Baseline Letter Work Plan [WP] (FPM, November 2006). FPM sampled six monitoring wells. The samples were analyzed for the following parameters: VOCs, sulfate, DOC, and methane/ethane/ethene. Field parameters collected were Oxygen Reduction Potential (ORP), oxygen, and pH. EEEPC installed and sampled seven new monitoring wells. The samples collected by EEEPC were analyzed for VOCs only. Results confirmed significant cis-1,2-DCE and TCE detections exceeding the NYSDEC GA Groundwater Standards in a relatively small area centered around LF6MW-12. Results are discussed in detail in the Final Monitoring Report, Baseline and PDI2 Sampling for On-base Groundwater Area of Concern (FPM, August 2007).

The February through April 2007 sampling was performed in accordance with the Final WP for PDI Investigations (EEEPC, July 2006). This sampling event was planned for February 2007, but due to adverse weather conditions, samples were collected from February through April 2007. Six additional temporary wells at Landfill 6 TCE (LF6TW-33 through -38) were installed in February 2007 and sampled in April 2007. The detected results can be found in the Final Monitoring Report (FPM, August 2007).



Legend

- # Monitoring Well
- # Surface Water Sample
- **LF6 Total VOCs (2006)**
  - 50 µg/L
  - GW Contour (2006)
- # Proposed monitoring well
- Landfill Boundary

30 15 0 30 60

Feet

Figure 2-1: LF6 TCE Sampling Locations

UNITED STATES AIR FORCE
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ROME, NY

FPM group

Date: 8/15/2008

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2.2 Proposed Remedial Action Summary

The remedy for the Landfill 6 TCE Site is enhanced bioremediation. As listed in the final RA WP (Parsons, July 2008), this process is intended to increase biodegradation of the groundwater contaminants by injecting a vegetable oil emulsion into the ground. The vegetable oil emulsion increases the natural breakdown of the chemicals, reducing the concentration of contaminants.

One additional monitoring well will be installed by Parsons at the Landfill 6 TCE site, in accordance with the final RA WP (Parsons, July 2008). The installation is currently planned for July 2008. The vegetable oil injection is planned for mid to end of July 2008.

2.3 Performance Monitoring Sampling

Following injection, performance monitoring will include sampling of monitoring wells, temporary wells and surface water sampling locations as shown in Figure 2-1 and listed in Table 2-1 to evaluate the effectiveness of the remedial approach. All performance monitoring will be conducted by FPM personnel and all sampling documentation will be included in the associated CQCR. Monitoring will be conducted quarterly for one year following the initial injection and semi-annually thereafter until remedy effectiveness is demonstrated and monitoring optimization is conducted.

Following sampling, data will be reviewed. Quarterly or annual performance monitoring reports will be prepared by FPM, in association with Parsons, and submitted annually to NYSDEC, USEPA, Air Force Real Property Agency (AFRPA), and USACE. Each evaluation will be used to optimize the monitoring well network in order to collect data of sufficient quantity and quality to support the remedy performance. The sampling frequency will be adjusted as necessary if additional injections occur.

Table 2-1
Landfill 6 Performance Monitoring Sample Analysis Summary

Sampling Locations	Screen Interval (ft Mean Sea Level [MSL])	Sampling Rationale	Target Analytes/ EPA Method Numbers	Initial Monitoring (quarterly after injections)	Performance (Semi-annual, after 1st year)	# of Samples[1]
LF6VMW-13R	416.12 - 436.12	Downgradient extent	• VOCs - SW8260B	√	√	14
LF6VMW-13RD	411.51 - 431.51	Potential vertical migration	• Sulfate - SW9056	√	√	
LF6MW-16	408.41 - 418.41	Within 500 ppb contour	• DOC - SM5310B	√	√	
LF6MW-17	401.04 - 411.04	Within 500 ppb contour	• Methane/Ethane/ Ethene - RSK-175	√	√	
LF6MW-20	404.35 - 414.35	Within 500 ppb contour		√	-	
LF6VMW-26	400.08 - 410.08	Within 50 ppb contour	• Field Parameters: ORP, oxygen, pH, water levels	√	√	
LF6MW-31	398.20 - 418.20	Downgradient extent		√	√	
LF6TW-33	417.17 - 437.17	Within 50 ppb contour		√	√	
LF6TW-34	402.60 - 422.60	Within 50 ppb contour		√	√	
LF6TW-35	402.39 - 422.39	Upgradient extent		√	√	
LF6TW-36	400.08 - 420.08	Within 50 ppb contour		√	√	
LF6TW-38	402.35 - 422.35	Within 50 ppb contour		√	√	
LF6MW-39[2]	10-30 feet bgs[2]	Downgradient extent		√	√	
Surface Water						
LF6-SW1 PM		Between surface water samples LF6/TMCSW-1 and 2			√	

Notes:

1 Please refer to FSP for details concerning the number of QA/QC samples and their locations. At least one MS/MSD and two field duplicates will be collected per SDG; one equipment blank per day and one ambient blank per day; one trip blank per cooler containing VOCs.

2 New monitoring well to be installed.

3 Building 817/WSA

3.1 Site Background

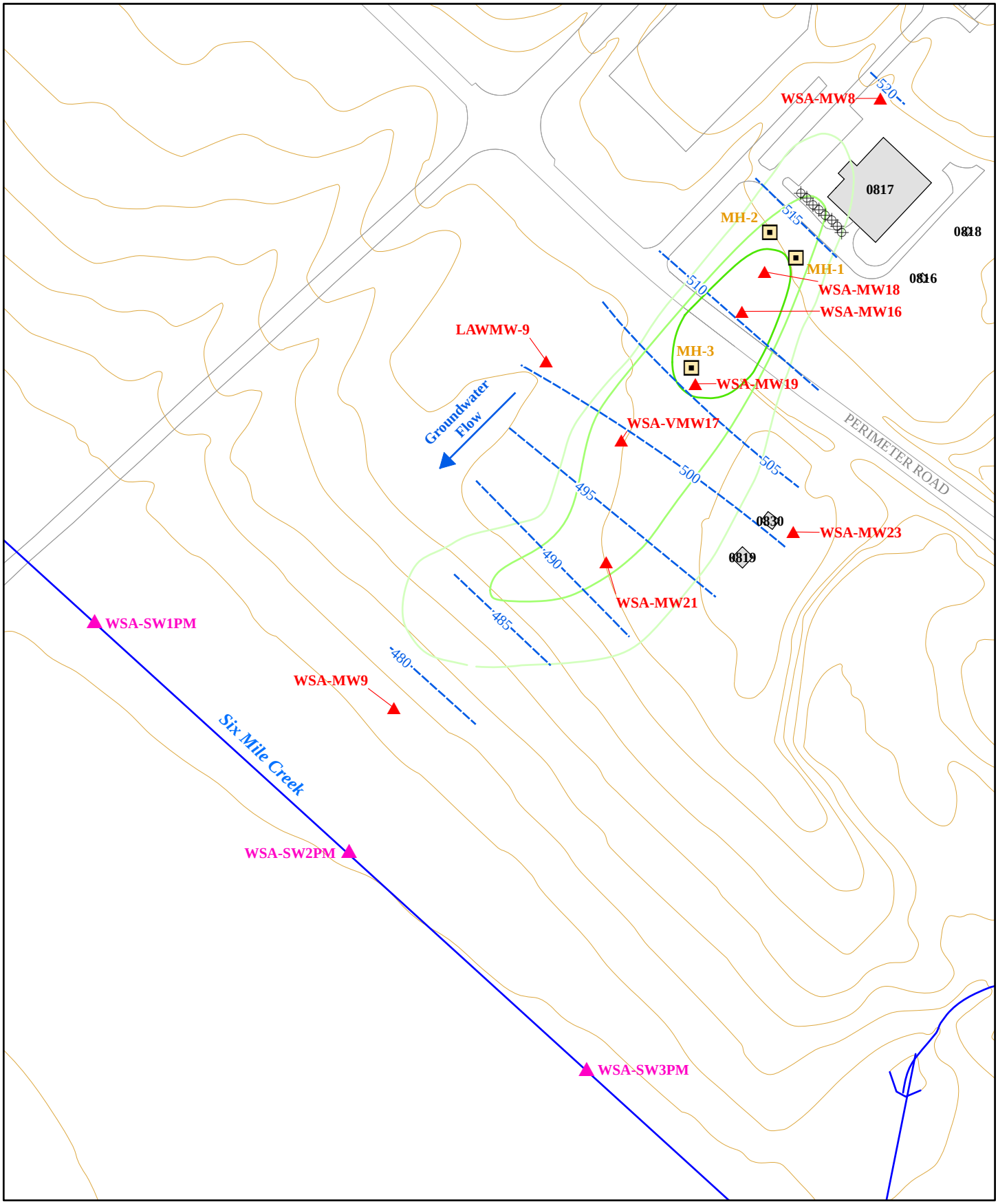
The Building 817/WSA site is located on the north side of the main runway between Building 817 and the culverted section of Six Mile Creek (SMC) south of the former WSA. Building 817 was formerly used for electronics parts maintenance, and TCE and perchloroethene (PCE) were solvents used in small quantities at this location. The contaminants exceeding NYSDEC Class GA Groundwater Standards are TCE and PCE. In September 2004, the maximum TCE concentration was 90 ppb and the maximum PCE concentration was 72 ppb. Site groundwater flows south toward the culverted section of SMC. The contaminated aquifer is composed of relatively uniform fine sands that begin 5 feet bgs and extend to shale bedrock at approximately 20 to 25 feet bgs. Contamination is not found in the bedrock. Groundwater velocities at this site have been estimated as high as 110 feet per year. In September 2004, a TCE concentration of 90 ppb was detected in downgradient well WSA-VMW17, shown on Figure 3-1. Although there is no indication that the plume has migrated to SMC, the level of contamination at WSAVMW-17 does indicate the potential for additional migration. The TCE/PCE plume does not contain other petroleum-based organics to stimulate reductive dechlorination. There is no significant cis-1,2-DCE in the plume (EEEPC, February 2008).

In October/November 2006, FPM and EEEPC performed sampling at the Building 817/WSA site in accordance with the final Baseline Letter WP (FPM, November 2006). FPM sampled five monitoring wells. The samples were analyzed for the following parameters: VOCs, sulfate, DOC, and methane/ethane/ethene. Field parameters collected were ORP, oxygen, and pH. EEEPC installed and sampled four monitoring wells and Parsons installed and sampled three. The samples collected by EEEPC and Parsons were analyzed for VOCs only. Results confirmed the PCE and TCE detections exceeding NYSDEC GA Groundwater Standards within the plume. Results are discussed in detail in the Final Monitoring Report (FPM, August 2007).

Additional sampling was performed February 2007, to monitor the effect of an initial soybean oil emulsion/high fructose corn syrup injection in October 2006. This injection was a 1,000-gallon mixture containing 143 pounds of a 60% soybean oil emulsion, 150 pounds of an 80% high fructose corn syrup, and drinking water. FPM collected four samples at B817-MW-001 through -003 (not shown) and monitoring well WSA-MW18. The detected results are reported in the Final Monitoring Report (FPM, August 2007).

3.2 Proposed Remedial Action Summary

The remedy for the Building 817/WSA site is enhanced bioremediation. This process is intended to increase biodegradation of the groundwater contaminants by injecting a vegetable oil emulsion into the ground. The vegetable oil emulsion increases the natural breakdown of the chemicals,



Legend

- Surface Water Location (Culvert Manhole)
- Manhole
- Monitoring Well
- Injection Point
- GW Contour (2006)

Total VOCs (2006)

- 100 µg/L
- 30 µg/L
- 10 µg/L

N

50 25 0 50 100 Feet

Figure 3-1: Building 817 Sampling Locations

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reducing the concentration of contaminants. The vegetable oil injection at the Building 817/WSA site is planned for the end of July 2008.

3.3 Performance Monitoring Sampling

Performance monitoring groundwater sampling will follow the injection of vegetable oil to enhance bioremediation. The performance monitoring sampling will evaluate groundwater conditions at wells shown in Figure 3-1 and outlined in Table 3-1. Surface water samples are located along SMC upstream, at, and downstream of the potential plume discharge location. The surface water samples will be collected from the SMC culvert manholes.

Manholes MH-1, -2, and -3 near the injection zone will be opened and inspected visually for presence of substrate and findings will be recorded in permanent field books and field sampling forms. Four of the monitoring wells were designated for annual sampling. This sampling frequency is based on their location relative to the plume contour. The sampling frequency is lower because these monitoring wells are either upgradient, substantially crossgradient, or far downgradient (POC) wells. All performance monitoring will be conducted by FPM personnel and all sampling documentation will be included in the associated CQCR. Monitoring will be conducted quarterly for one year following the initial injection and semi-annually thereafter until remedy effectiveness is demonstrated and monitoring optimization is conducted.

Following sampling, data will be reviewed. Quarterly or annual performance monitoring reports will be prepared by FPM, in association with Parsons, and submitted annually to NYSDEC, USEPA, AFRPA, and USACE. Each evaluation will be used to optimize the monitoring well network in order to collect data of sufficient quantity and quality to support the remedy performance. The sampling frequency will be adjusted as necessary if additional injections occur.

Table 3-1
Building 817/WSA Baseline Sample Analysis Summary

Sampling Locations	Screen Interval Depth (ft MSL)	Sampling Rationale	Target Analytes/ EPA Method Numbers	Initial Monitoring (quarterly after injections)	Performance (semi-annual, after 1st year)	# of Samples[1]
LAWMW-9	490.84 - 500.84	Downgradient	• VOCs - SW8260B	√[2]	√[2]	12
WSA-MW8	506.37 - 516.37	Upgradient	• Sulfate - SW9056	√[2]	√[2]	
WSA-MW9	474.60 - 479.60	Downgradient	• DOC - SM5310B	√	√	
WSA-MW16	491.86 - 501.86	Within 100 ppb contour	• Methane/Ethane/ Ethene - RSK-175	√	√	
WSA-VMW17	483.24 - 493.24	Within 30 ppb contour		√	√	
WSA-MW18	499.23 - 504.23	Within 100 ppb contour	• Field Parameters - ORP, oxygen, pH, water levels	√	√	
WSA-MW19	493.79 - 498.79	Between MW-16 and VMW-17		√	√	
WSA-MW21	484.72 - 494.72	Downgradient, within plume		√	√	
WSA-MW23	493.16 - 503.16	Cross-gradient, outside plume boundary		√[2]	√[2]	
Surface Water						
WSA-SW1PM[3]		Upstream 400 ft, in manhole	• VOCs - SW8260B		√	
WSA-SW2PM[3]		Central manhole slightly downgradient from where plume potentially will intersect the creek	• Field Parameters-water levels		√	
WSA-SW3PM[3]		Downstream 400 ft, in manhole			√	
MH-1		Identify preferential pathway	Visual Monitoring (look for presence of substrate)	√		
MH-2		Identify preferential pathway		√		
MH-3		Identify preferential pathway		√		

Notes:
1 Please refer to FSP for details concerning the number of QA/QC samples and their locations. At least one MS/MSD and two field duplicates will be collected per SDG; one equipment blank per day and one ambient blank per day; one trip blank per cooler containing VOCs.
2 Annual sampling only.
3 Surface water samples will only be collected if results from WSA-MW9 are above NYSDEC Class GA GW standards.

4 Building 775/Pumphouse 3

4.1 Site Background

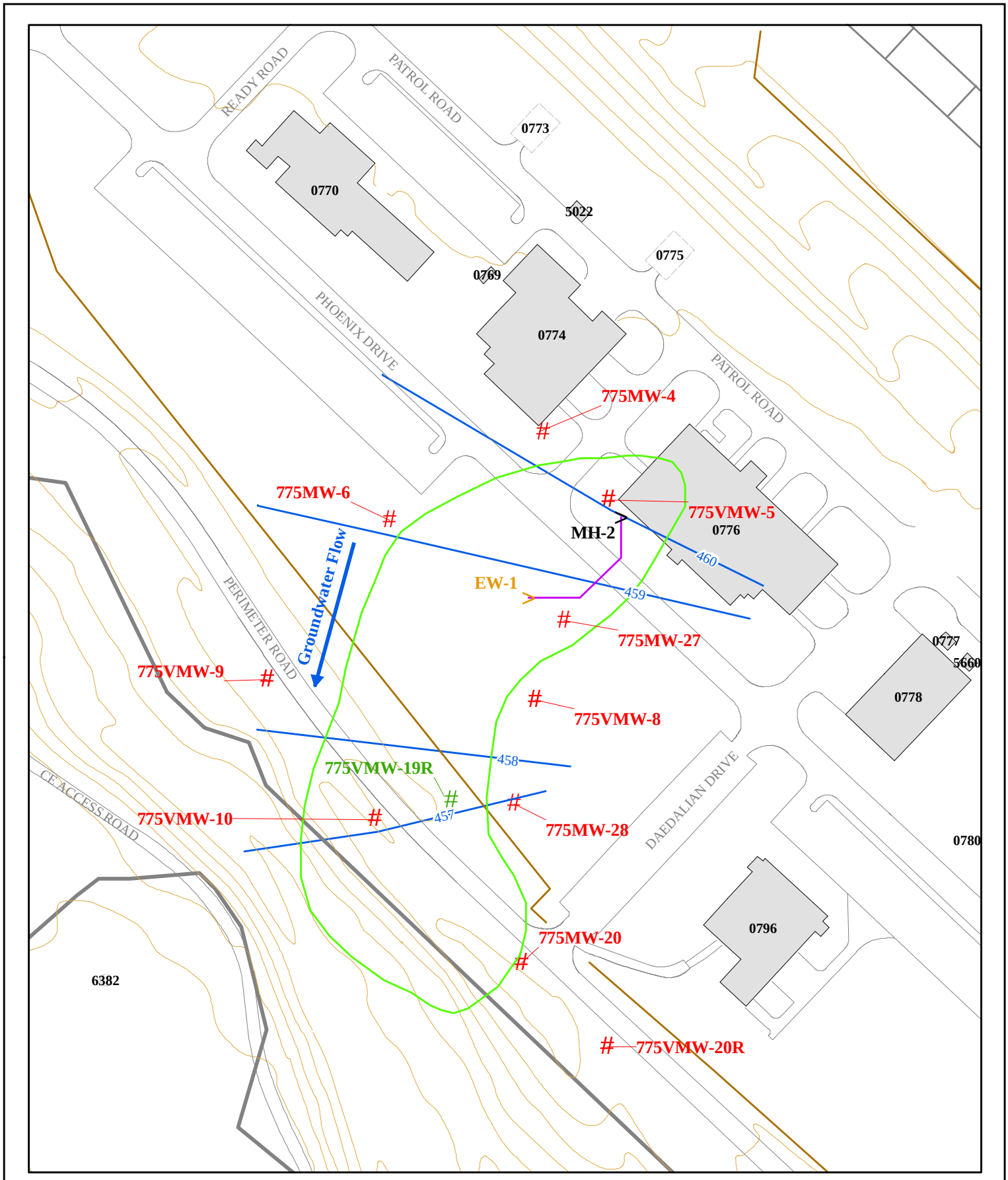
The Building 775 plume is located downgradient to the south of former maintenance facilities in Building 774 and 776, and former fuel pump house Building 775. Although the source has not been identified, solvent use in Building 775 was thought to be a primary source of TCE contamination. Solvent use was widespread in these facilities in the 1950s, 1960s and early 1970s. The primary contaminant exceeding NYSDEC Class GA Groundwater Standards is TCE with minor detections of 1,1,1-trichloroethane (TCA) and PCE. Monitoring well 775VMW-5, located near the corner of Building 776, is the only well in the maintenance area that contains significant levels of TCE (99 ppb in September 2004). Most of the Building 775 plume appears to have migrated south toward Landfill 6 as shown on Figure 4-1. In September 2004, the maximum TCE concentration was 134 ppb (detected at well 775MW-20, located near the leading edge of the plume near Perimeter Road). TCE was detected at 132 ppb in well 775VMW-10, which is also located near the leading edge of the plume near Perimeter Road. TCE in both of these wells was detected in the bottom half of the sandy aquifer in screened intervals from 88 to 120 feet bgs. Nearby well LF6MW-1 is screened in the upper 10 feet of the aquifer and does not have detectable TCE concentrations. Based on the current TCE distribution, it appears that the TCE was likely spilled in the upgradient maintenance area and has migrated southward and downward in the aquifer (EEEPC, February 2008).

The contaminated aquifer is comprised of silty sands with an average thickness extending from 60 feet bgs to 120 feet bgs where shale bedrock is encountered. Due to a relatively flat gradient, average groundwater velocities at this site are slow and have been estimated at approximately 10 feet per year. Higher velocities may exist in discontinuous seams of coarse sand and gravel. Contamination is not found in the bedrock. Groundwater studies at nearby Landfill 6 TCE site found relatively aerobic conditions and low DOC concentrations. The general absence of cis-1,2 DCE in the Building 775 plume confirms that reductive dechlorination is not occurring (EEEPC, February 2008).

FPM and EEEPC sampled the Building 775 site in November 2006 in accordance with the final Baseline Letter WP (FPM, November 2006). FPM sampled eight monitoring wells. The samples were analyzed for VOCs only. EEEPC installed and sampled two new monitoring wells (775MW-27 and -28). Sampling confirmed that TCE is the main contaminant and that future sampling will monitor VOCs at the site. Detailed results are discussed in the Final Monitoring Report (FPM, August 2007).

4.2 Proposed Remedial Action Summary

The final RA WP (Parsons, July 2008) details the chosen remedy as a groundwater extraction and discharge for off site treatment for the Building 775 site. The pump and treat system is designed to contain the contaminated plume (>50 ppb) and extract the contaminants from the



Legend

- Extraction Well
- Manhole
- Proposed
- LF6 Boundary
- Total VOCs 50 ug/L (2006)
- GW Contour (2006)
- Monitoring Well
- Proposed Mon. Well

50 25 0 50 100 Feet

Figure 4-1: Building 775 Sampling Locations

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aquifer. Extraction well(s) and a submersible pump(s) will be installed by Parsons to extract the contaminated groundwater and discharge to the existing sanitary sewer system for treatment at the publicly owned treatment work (POTW). One additional monitoring well (775MW-19R) will be installed to monitor the plume remediation, in accordance with the final RA WP (Parsons, July 2008).

A pumping test will be performed following extraction well installation as described in Section 7.4.2 of the final RA WP (Parsons, July 2008). The results of the test will be included in the Interim Remedial Action Completion Report. The results will indicate required pumping rate for plume containment.

4.3 Performance Monitoring Sampling

Performance monitoring groundwater sampling will follow the installation and operation of the groundwater extraction groundwater treatment system. The performance monitoring sampling will evaluate groundwater conditions at wells shown in Figure 4-1 and outlined in Table 4-1. All performance monitoring will be conducted by FPM personnel and all sampling documentation will be included in the associated CQCR. Groundwater monitoring will be conducted quarterly during the first year and semi-annually thereafter until remedy effectiveness is shown. Following sampling, data will be reviewed. Quarterly or annual performance monitoring reports will be prepared by FPM, in association with Parsons, and submitted annually to NYSDEC, USEPA, AFRPA, and USACE. Each evaluation will be used to optimize the monitoring well network in order to collect data of sufficient quantity and quality to support the remedy performance. The sampling frequency will be adjusted as necessary if additional injections occur.

Quarterly discharge measurements will be used to calculate the average pumping rate during that quarterly period. This pumping rate will be used to evaluate extraction well performance and to determine when well maintenance is required. In addition, water levels from performance monitoring wells will be collected and evaluated to assess the extraction well radius of influence relative to design parameters.

As part of the discharge permit, effluent sampling will be performed every 90 days at the point of discharge. After discussions with POTW and lab personnel, the requested quarterly EPA method 624 was substituted for annual EPA method SW8260. EPA method SW8260 meets and exceeds all requirements of EPA method 624 (detection limits, analyte list, etc), is included in the project QAPP, and is the generally accepted VOC analytical method. The samples will be analyzed by a NYSDOH certified lab (Life Science Laboratories, Inc., Syracuse, NY). The parameters must not exceed limits outlined in the City of Rome discharge permit shown in Appendix C.

Table 4-1
Building 775/Pumphouse 3 Performance Monitoring Sample Analysis Summary

Sampling Locations	Screen Interval Depth (ft MSL)	Sampling Rationale	Target Analytes/ EPA Method Numbers	Performance (Quarterly)	Performance (Semi-annual, after 1st year)	# of Samples[1]
775VMW-4	447.64 - 457.64	Upgradient	• VOCs - SW8260B • Field parameters - water levels [4]	√[5]	√[5]	12
775VMW-5	442.94 - 452.94	Within 50 ppb contour		√	√	
775MW-6	439.18 - 449.18	Within 50 ppb contour		√	√	
775VMW-8	439.29 - 449.29	Within 50 ppb contour		√	√	
775VMW-9	412.92 - 427.92	Outside 50 ppb contour, downgradient		√[5]	√[5]	
775VMW-10	412.14 - 427.14	Within 50 ppb contour		√	√	
775VMW-19R[2]	80-120 feet bgs	Downgradient		√	√	
775MW-20	398.33 - 408.33	Within 500 ppb contour		√	√	
775VMW-20R	403.85 - 413.85	Downgradient		√[5]	√[5]	
775MW-27	435.19 - 455.19	Within 50 ppb contour		√	√	
775MW-28	424.72 - 444.72	Within 50 ppb contour		√	√	
			Effluent			
Effluent Sample 1[3]		At discharge point from pipe into manhole	• VOCs - SW8260B (EPA Method 624 list)	√	√	

Notes:
1 Please refer to FSP for details concerning the number of QA/QC samples and their locations. At least one MS/MSD and two field duplicates will be collected per SDG; one equipment blank per day and one ambient blank per day; one trip blank per cooler containing VOCs.
2 New monitoring well to be installed.
3 The total discharge flow will be recorded during sampling.
4 Water levels will be collected to verify the capture zone of the system.
5 Annual sampling only.

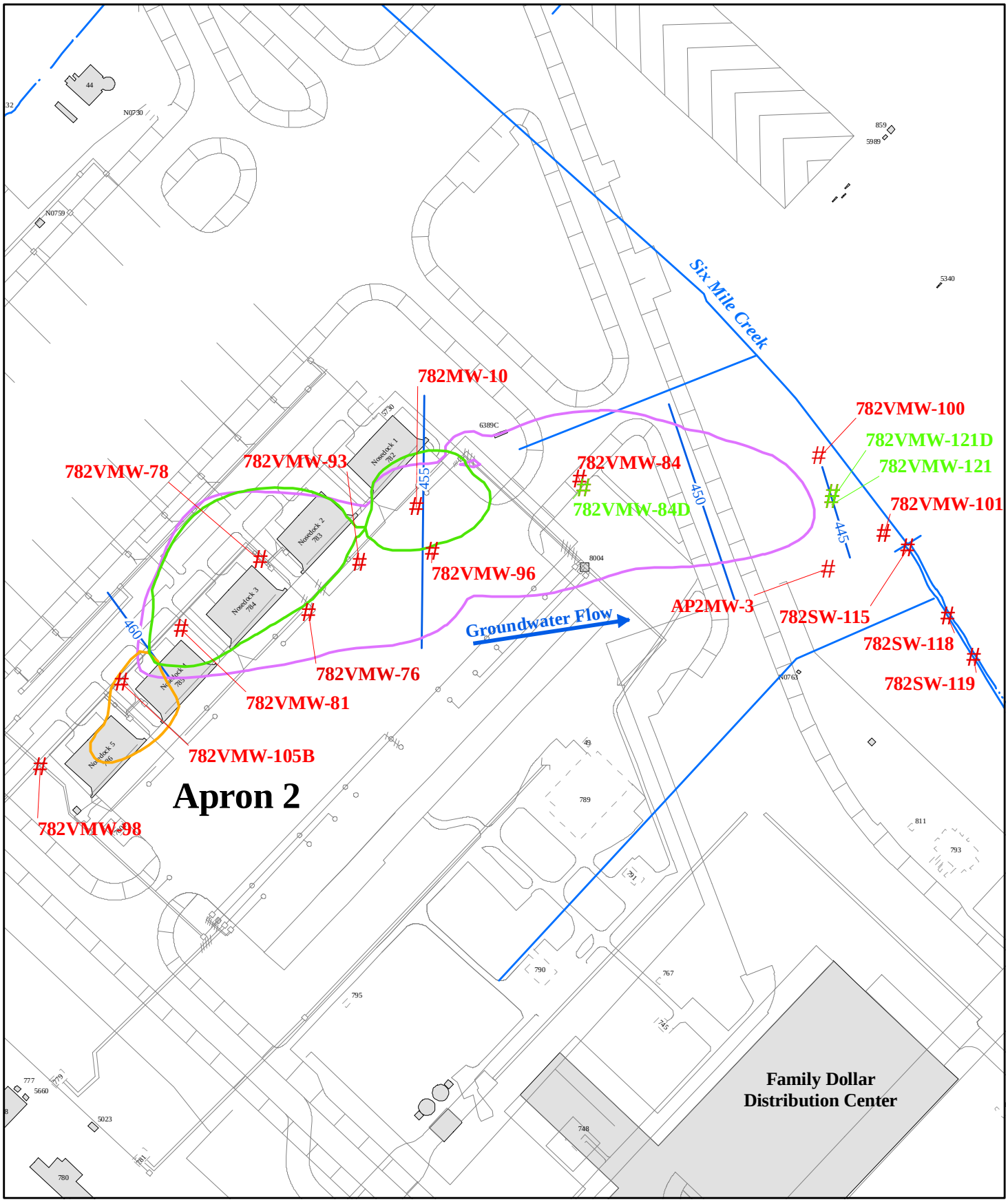
5 Apron 2 Chlorinated Plume

5.1 Site Background

The chlorinated VOC contamination in the Apron 2 area is present as a plume approximately 2,800 feet long and 500 feet wide and appears to originate in the area of the nosedock wash water system near Building 786. Chlorinated solvent use probably occurred in all nosedock facilities and multiple small sources could exist along floor drains, sewer lines, and oil water separators. There are three primary contaminants exceeding NYSDEC Class GA Groundwater Standards: TCE, and its breakdown products cis-1,2 DCE and VC. The plume is commingled with several petroleum fuel plumes originating from the Apron 2 fueling system. At locations where TCE and fuel contaminants are commingled, significant reductive dechlorination is occurring and TCE is almost completely degraded to cis-1,2 DCE and VC. In April 2005, the maximum TCE concentration was 24 ppb as detected in well 782VMW-97. The level of TCE has been steadily decreasing and it appears that no significant source of TCE remains at the site. In April 2005, the maximum cis-1,2 DCE concentration was 54 ppb in well 782MW-10, located in the plume in an area with commingled fuel contamination. The maximum VC concentration was 130 ppb at well 782MW-96 which is also located in the center of fuel-contaminated groundwater. The commingled fuel plume is providing significant reductions in TCE and cis-1,2 DCE through well-documented reductive dechlorination processes. At many locations, Methyl Tert Butyl Ether (MTBE) and benzene are also present at levels exceeding NYSDEC Class GA Groundwater Standards. MTBE and benzene plumes are being remediated under a separate contract (EEEPC, February 2008).

The contaminated aquifer is located at 9 to 25 feet bgs with the shallow depth occurring in the vicinity of SMC. The aquifer is composed of several well-defined layers, including a silty-sand layer in the upper 5 feet, a 5 to 15 feet thick coarse sand and gravel layer in the middle of the aquifer, and a 15 to 20 feet thick layer of till composed of fine sand, silt, and gravel resting on the shale bedrock. The total aquifer thickness ranges from 45 feet in the source areas to less than 20 feet in the downgradient areas near SMC. Although the site has a relatively flat gradient, the high hydraulic conductivity of gravel layers has produced an estimated average groundwater velocity of 106 feet per year. This velocity seems reasonable given the 2,800 feet the VOC plume has migrated. Monitored Natural Attenuation (MNA) is specified based on the reductive dechlorination occurring at the site. Aerobic degradation of VC is occurring near the leading edge of the plume; however, VC in the southern plume has migrated eastward to well 782MW-101 within 100 feet of SMC (EEEPC, February 2008).

FPM sampled the Apron 2 Chlorinated Plume Site in November 2006 in accordance with the final Baseline Letter WP (FPM, November 2006). FPM sampled ten monitoring wells and three surface water locations. The samples were analyzed for the following parameters: VOCs, nitrate, chloride, sulfate, DOC, and total alkalinity. Sampling results confirmed the presence of TCE, cis-1,2-DCE and VC as main contaminants. Ferrous iron was also field measured. Detailed



Legend

- # Monitoring Well
- # Proposed Mon. Well
- cisDCE 5 µg/L (2006)
- TCE 5 µg/L (2006)
- VC 2 µg/L (2006)
- GW Contour (2006)

200 100 0 200 400 Feet

Figure 5-1: Apron 2 Sampling Locations

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results are discussed in the Final Monitoring Report (FPM, August 2007).

5.2 Proposed Remedial Action Summary

The final RA WP (Parsons, July 2008) specifies MNA as the remedial action using the ongoing physical, chemical, and/or natural biological process that reduces the contaminants within the aquifer. Based on previous investigations and studies, it has been determined that MNA is evident at the Nosedocks/Apron 2 site. Three additional monitoring wells (782VMW-84D, -121, and -121D) will be installed by Parsons to monitor the plume remediation, in accordance with the final RA WP (Parsons, July 2008).

The monitoring wells all have dedicated bladder pumps and will be sampled according to EPA low-stress sampling procedures. The surface water samples will be collected with a disposable plastic sampling bottle. Sediment interference with the surface water sample collection will be minimized. Surface water results will be reviewed and a contingency plan is described below.

During the first year, wells will be monitored quarterly for VOCs, DOC, and geochemical parameters to assess MNA progress and biochemical conditions. The aquifer at this location has a thick gravel layer that can be easily sparged to remove the VC approaching SMC. An air sparging system is a contingency measure if VC concentrations in SMC exceed 2 ppb, as described in the flow chart of Figure 5-1 of the final RD WP (EEEPC, February 2008).

5.3 Performance Monitoring Sampling

The performance monitoring sampling will evaluate groundwater conditions at wells shown in Figure 5-1 and outlined in Table 5-1. All performance monitoring will be conducted by FPM personnel and all sampling documentation will be included in the associated CQCR. Following sampling, data will be reviewed. Each evaluation will assess the status and progress of MNA and achievement of monitoring objectives at the site. Quarterly or annual performance monitoring reports will be prepared by FPM, in association with Parsons, and submitted annually to NYSDEC, USEPA, AFRPA, and USACE. Elements of the MNA evaluation report for this site will include (USEPA, 2004):

- A summary of data interpretation.,
- Background and site description,
- Monitoring network and schedule description,
- An evaluation of new data and comparisons with previous data and established performance criteria, which would consist of presentation of the following:
    - Data in tabular format;
    - Graphs (contaminant concentration versus time for individual wells; contaminant concentrations versus distance downgradient for several wells along the groundwater flowpath);

Table 5-1
Apron 2 Chlorinated Plume Site Baseline Sample Analysis Summary

Sampling Locations	Screen Interval Depth (ft MSL)	Sampling Rationale	Target Analytes/ EPA Method Numbers	1st Year (quarterly)	After 1st Year (semi-annual)	# of Samples[1]
AP2MW-3	432.41 - 446.97	Cross-gradient	• VOCs – 8260B • Natural Attenuation Parameters: Nitrate, Chloride, Sulfate - SW9056, DOC - SM5310B, Total Alkalinity - SM2320B. • Field Measurements: ORP, temperature, oxygen, pH, conductivity, turbidity, water levels, ferrous iron.	√[3]	√[3]	18
782VMW-76	434.86 - 444.86	Downgradient within plume		√	√	
782VMW-78	436.26 - 446.26	Downgradient within plume		√	√	
782VMW-81	427.71 - 437.71	Downgradient within plume (source)		√	√	
782VMW-84	431.9 - 441.9	Downgradient within plume		√	√	
782VMW-84D[2]	420 - 430[2]	Potential vertical migration of plume		√	√[3]	
782VMW-93	437.79 - 447.79	Downgradient within plume		√	√	
782VMW-96	434.13 - 444.13	Downgradient within plume		√	-	
782VMW-98	442.06 - 452.06	Upgradient (source area)		√[4]	-	
782VMW-100	432.10- 447.10	Crossgradient		√	√	
782VMW-101	429.11 - 444.11	Downgradient within plume		√	√	
782VMW-105B	435.37 -450.37	Within plume (source area)		√	√	
782MW-10	443.79 -458.79	Downgradient within plume		√	√	
782VMW-121[2]	430 - 440[2]	Downgradient		√	√	
782VMW-121D[2]	420 - 430[2]	Potential vertical migration of plume		√	√	
Surface Water						
782SW-115	--	Potential contaminant receptor	• VOCs – SW8260B Water Levels			
782SW-118	--	Potential contaminant receptor				
782SW-119	--	Potential contaminant receptor				

Notes:
1. Please refer to FSP for details concerning the number of QA/QC samples and their locations. At least one MS/MSD and two field duplicates will be collected per SDG; one equipment blank per day and one ambient blank per day; one trip blank per cooler containing VOCs.
2. New monitoring well to be installed; well screen interval is an approximation based on nearby wells.
3. Annual sampling only.
4. To be sampled during first performance sampling round only.

    - Figures (contaminant contours);
    - Statistical analysis; and
    - An evaluation of the need for implementation of the contingency plan.
- Interpretation of new data with respect to the conceptual site model for natural attenuation, which would include a discussion on:
    - COCs and geochemical parameters,
    - Continuation of institutional controls, and
    - Progress towards achieving monitoring objectives.
- Conclusions, and
- Recommendations.

USEPA guidance (USEPA, 2004) provides details on the content that can be discussed in each of these sections. AFCEE guidance (AFCEE, 2000) provides methods that can be used to develop/present graphs, figures, and statistical analyses tailored to demonstrate the effectiveness of MNA.

Each evaluation will be used to optimize the monitoring well network in order to collect data of sufficient quantity and quality to support the remedy performance. The sampling frequency will be adjusted as necessary or appropriate.

Proposed sampling network changes may be warranted due to data gaps (e.g. plume extends further downgradient than initially thought or current network provides redundant data). Sampling optimization will be performed by reviewing trend charts and statistical analysis of water quality and level data, as summarized above. E.g., the decision to discontinue the monitoring of a well will be guided by the results of a non-parametric test, such as the Mann-Kendall test. The trending and statistical analysis will be used to propose any changes which will be evaluated by the project team.

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6 Proposed Sampling Activity And Reporting Requirements

This section summarizes the procedures that will be used to carry out the sampling rounds of the performance monitoring program. All field procedures shall be performed in accordance with EPA-recommended low-flow practices, the site-specific QAPP based on the AFCEE QAPP (FPM, October 2006), and the FSP (FPM, March 2005).

All monitoring wells will be sampled via a dedicated bladder pump.

6.1 Mobilization

Several tasks will be performed before the project team proceeds with field work. These tasks comprise of an internal mobilization effort and include the following:

- briefing field personnel on the scope and objectives of the field assignment, the organizational responsibilities of the field team, the specific field tasks to be performed, health and safety measures to be followed, and any unique aspects of the work;
- acquiring and preparing equipment for transport to the field; and
- acquiring and preparing expendable supplies for transport to the field.

External mobilization efforts will be coordinated with outside personnel and organizations. A list of these matters includes, but is not limited to, the following:

- identifying water-level measurement locations;
- identifying access points for water quality sampling;
- establishing a location for equipment decontamination;
- providing a storage area for drummed wastes and identifying a location for disposal of miscellaneous solid and liquid wastes; and
- coordinating procedures for project personnel to gain access to the various sites.

6.2 Field Documentation

Several procedures will be utilized for recording and documenting data during the execution of the performance monitoring program field activities at the former Base. In general, handwritten documentation will be completed in permanent, black ink, and following project completion, all documentation related to the program will be stored in the FPM project files. Written documentation includes the following documents:

6.2.1 Project Field Logbooks

The project logbooks are the master field-investigation documents. They are bound books with hard covers and sequentially numbered pages. Their primary purpose is to contain, within one

series of documents, detailed records of all activities related to specific field tasks, and specific references to other field documents used on a daily basis. The front of each logbook will show the project name, logbook number, and the dates of use. The logbooks will be numbered sequentially as they are completed.

The project logbooks will be maintained on a daily basis and, where appropriate, the following information will be included as a minimum:

- dates and times of entries;
- daily weather conditions;
- names of all personnel who entered the project area during the day;
- brief descriptions of water-level monitoring and water quality sampling;
- activities, including well and piezometer identification numbers and sample identifications;
- chain-of-custody (CoC) details, including CoC identification numbers, delivery group numbers, and sample identification numbers;
- identification numbers of monitoring instruments used during the day;
- equipment calibration check data;
- specific comments relative to problems, if any, that occurred during the day; and
- signature of the person responsible for completing the daily entry in the project logbook.

6.2.2 Field Data Logsheets

Additional information shall be recorded on field data logsheets (data sheets), copies of which are included in Appendix B. For the groundwater-level measurements, this will include a list of the monitoring wells to be measured on the Base and measured water-level depths on the "Monitor Well/Piezometer Static Water Level Form." For the water quality sampling for the performance monitoring program, these data sheets will include the "Well Purging & Sampling Form." Originals of all completed forms will be kept in the project files and copies of these forms will be included in the annual report. Information that will be recorded on these forms, as appropriate, includes the following:

- identification of well;
- total depth of well;
- static water level;
- purge volume and pumping rate;
- time well purged;
- well evacuation procedures;
- sample withdrawal procedures;
- date and time of collection;
- types of sample containers and sample identification numbers;
- preservatives used;

- parameters requested; and
- field analysis data and methods.

6.2.3 Field Instrument Calibration Records

Calibration logs will be used to document the calibration of all field testing equipment, including pH meters, conductivity instruments, and turbidity meters. The calibration logs will be completed and maintained in the FPM field office and will be transferred to the FPM project files following the completion of each sampling round. Each instrument will be calibrated by its supplier before delivery to the field, and the calibration will be checked with field calibration fluids or gases, as appropriate, prior to each day's field activities.

Calibration checks of all field instruments will be made to the manufacturer's specifications. Field calibration check results will be documented on calibration logs and will include the following:

- date of calibration check;
- identification number(s) of the instrument(s);
- initials of person(s) performing the calibration; and
- instrument readings.

6.2.4 Chain of Custody

Possession of all samples will be tracked from the time of sample collection through sample analysis by the use of a CoC form. The list of items to be recorded on the completed CoC forms includes the following:

- the project name;
- signature of sampler;
- sampling station;
- unique sample number;
- date and time of collection;
- matrix;
- analysis to be performed;
- preservatives;
- pertinent field data (including Environmental Resources Program Information Management System [ERPIMS] codes);
- custody transfer signatures and dates and times of sample transfer from the field to transporters and to the laboratory;
- sequential CoC number; and
- sample delivery group (SDG) number.

Samples will be labeled, placed in a cooler, and put on ice immediately after collection. Entries will be made on the CoC form associated with each cooler when the samples are placed in the coolers.

All individuals involved in handling the samples, including those individuals collecting, shipping, and receiving the samples, shall sign and date the CoC forms to document the actual chain of possession of the samples. A copy of each completed CoC form will be sealed in a plastic bag and shipped in the appropriate cooler. A copy of each completed CoC form will be placed in the FPM project files. The CoC forms will be numbered sequentially for tracking purposes. Copies of all completed CoC forms will be included in the annual status report.

6.2.5 Well-Numbering System

The contractors who installed the wells and piezometers also assigned the well identifiers. In some cases the well identifier contains an acronym or reference to the contractor which established the well and a sequence number (i.e., LAWMW-9 was constructed by Law Engineering and Environmental Services, Inc.). In many cases the well identifiers are assigned based on the area of the Base where they are located along with a sequence number (e.g., LF6MW-16 is monitoring well 16 in the Landfill 6 area).

6.3 Decontamination Procedures

The decontamination of sampling equipment is necessary to minimize the spread of contamination to clean zones, to reduce exposure of personnel, and to reduce cross-contamination when equipment must be used more than once. Sampling equipment will be either dedicated to each sample or will be decontaminated, either at the FPM field office or at each sampling site. Disposable material (e.g., gloves, Tyvek® suits) that will be generated during decontamination shall be bagged and placed in a disposal area designated by the Base. Equipment blank samples will be collected, as required, from the dedicated or decontaminated sampling equipment by rinsing the cleaned equipment with laboratory-supplied field blank water.

As stated above, the sampling performed under this work plan will be conducted with bladder pumps. All hoses used to connect the water quality system to the bladder pump are disposable and will be discarded after each use. The water quality system meter and flow through cell will be decontaminated after each well.

6.4 Groundwater Sampling Field Procedures

6.4.1 Water Level Measurements During Water Quality Sampling

Monitoring well water levels will be measured to the nearest hundredth of a foot using an electronic hydrocarbon-water interface probe or electronic water-level meter. The potential

presence of nonaqueous-phase liquid (NAPL), although not expected, will be evaluated at each well. Depths will be measured from a permanent reference measurement point (top of inner casing [TOIC]) marked on each well casing. The reference points have been previously surveyed to provide accurate water-level elevations. The measuring device will be decontaminated between measurements by the procedures discussed in Section 6.3. Water-level measurements will be recorded on the well sampling forms. To more easily track potential measuring errors, or to identify possible changes in groundwater flow conditions, the previously recorded well depths for each well will also be recorded on the well water quality sampling forms.

6.4.2 Groundwater Monitoring Well Sampling

The performance monitoring program is intended to provide information on groundwater flow direction and Contaminant of Concern (COC) concentrations present in groundwater at each site. Technical field staff from FPM will complete the groundwater quality sampling. Groundwater samples will be collected in appropriate containers and properly preserved. The appropriate sample containers and sizes, methods of preservation, and holding times for each of the analytical parameters are presented in Section 5.1 of the AFCEE QAPP (Version 4.0).

In general, the sampling sequence at each site will begin with the well expected to be the least contaminated and progress to the one expected to be the most contaminated. This sequence will occasionally be modified to accommodate restrictions to well access.

Groundwater samples will be collected from each monitoring well via a dedicated bladder pump. Groundwater samples will be collected using low-flow sampling techniques (USEPA, March 1998). Monitoring wells will be sampled directly after stability has been reached. Stability is defined as three consecutive readings within the following parameters:

- pH within 0.1;
- Conductivity within 3%; and
- Turbidity within 10 % (or below 50 NTU);
- Dissolved oxygen within 10%; and
- ORP within 10 mV.

Five sampling locations at the Landfill 6 TCE site are designated as temporary wells. These wells were installed during the PDI2 work performed by EEEPC in early 2007. These sampling locations were installed with direct push technology and have a 0.75-inch diameter. These five sampling locations cannot be sampled with a bladder pump, are too deep to be sampled with a peristaltic pump and samples will therefore be collected with a bailer.

Groundwater samples will be transferred directly into the sample containers. If VOCs will be analyzed, the portion of the sample to be analyzed for VOCs will be collected first. VOC vials

will be filled completely to the top by slowly allowing the water from the discharge hose to fill the vials without agitation to reduce the loss of VOCs. VOC vials will be checked for bubbles by inverting the vials and gently tapping them to dislodge any possible bubbles. If bubbles are present in the VOC vials after they are filled, the vials will be discarded and additional vials will be filled for analysis. After the bottles are filled they were immediately placed in a sample cooler. A CoC will be completed and kept in a plastic bag in each cooler to document the sequence of sample possession. Copies of the CoC forms will be kept on file at the FPM field office and will be included in future status reports.

6.5 Surface Water Sampling Field Procedures

Surface water samples will be collected using the following procedures:

- Assess the presence of "normal" conditions at the sampling location;
- Assess the presence of surface water; and
- Sample the surface water.

"Normal" conditions constitute no excessively high or low water levels. Water quality measurements will be collected with a water quality monitoring system before sampling and will include pH, temperature, specific conductance, and dissolved oxygen (when required) at each surface water sampling location. The probe to collect these measurements can be directly inserted in the water or a sample can be collected while minimizing disturbance to the surface water or sediment in the creek. The probe will be inserted in sample and measurements will be recorded immediately. The sample locations will be permanently marked with an obvious and hard to move object (e.g., flagged stake in stream bank). The location will be recorded on project maps.

After water quality parameter collection, the surface water sample will be collected. Generally, a large unpreserved sample bottle will be used to collect sample water and previously preserved sample bottles will be filled by pouring sample water from the unpreserved bottle. If VOCs will be analyzed, the associated sample bottles will be filled first. VOC vials will be checked for bubbles by inverting the vials and gently tapping them to dislodge any possible bubbles. If bubbles are present in the VOC vials after they are filled, the vials will be open once to eliminate the bubbles. If this is unsuccessful, the vial will be discarded and replaced. After the bottles are filled they will immediately be placed in a sample cooler with ice and the sample will be recorded on the CoC. Copies of the CoC forms will be included in the daily CQCRs which will also become an appendix to the report.

6.6 Quality Control Water Samples

Environmental monitoring and measurement projects require the use of quality assurance/quality control (QA/QC) samples as an integral part of the sampling plan. Field duplicate and matrix

spike/matrix spike duplicate (MS/MSD) samples as well as equipment, ambient, and trip blanks will be prepared and analyzed. Temperature blank measurements will also be obtained for each cooler transported to the laboratory.

Duplicate samples are groundwater samples that are collected independently from a sample location during a single act of sampling. Trip blanks are 40-mL VOC vials of American Society for Testing and Materials (ASTM) Type II reagent grade water that are filled in the laboratory, transported to the sampling site, and returned to the laboratory with VOC samples. Equipment blanks are samples of ASTM Type II reagent grade water passed through decontaminated or dedicated disposable sampling equipment and are used as a measure of decontamination effectiveness. Ambient blanks are samples of ASTM Type II reagent grade water that are poured into sample containers at the sampling site at locations downwind of possible VOC sources and are used as a measure of potential VOC cross-contamination.

The estimated numbers, frequencies, and types of field QA/QC samples that were collected are based on the following guidelines:

- **Trip Blanks:** One shall be provided for each cooler containing samples for VOC analysis;
- **Equipment Blanks:** At least one equipment blank shall be collected per day per matrix. In general, equipment blanks shall be performed so as to evaluate each of the types of sampling equipment utilized during the field-sampling event. Additional equipment blank samples may be collected if field conditions warrant;
- **Ambient Blanks:** At least one ambient blank shall be collected per day during each VOC sampling event. Additional ambient blank samples may be collected if conditions warrant;
- **Field Duplicates:** Field duplicate samples shall be collected at a rate of at least ten percent of the primary groundwater samples collected per event. Therefore, each SDG of up to 20 environmental samples will include up to two field duplicate samples;
- **Matrix Spike/Matrix Spike Duplicates:** Matrix spike and matrix spike duplicates shall be collected and analyzed at a rate of one each per SDG of up to 20 analytical samples collected per matrix per event; and
- **Temperature Blanks:** One temperature blank measurement shall be obtained for each cooler shipped to the laboratory.

The results of the field quality control samples will be used by the data validator together with the laboratory quality control sample results to evaluate the quality of the laboratory chemical analytical data and apply data qualifiers as necessary as specified in the AFCEE QAPP (Version 4.0). Special care will be taken in the collection of the quality control samples to increase the potential for application of accurate data qualifiers.

6.7 Sample Identification

Each sample will be assigned a unique alphanumeric number that identifies the installation, the site, the specific sampling location, and the matrix sampled. These numbers will be used to track the sample from collection, through laboratory analysis, and into the performance monitoring report. The sample identification numbering system described below was formulated to be consistent with many laboratory information systems and ERPIMS.

The sample identification numbers shall consist of up to eleven characters divided into four segments. The four segments are as follows:

- Sampling location identifier;
- Sample type and sampling location indicator;
- Sample depth identifier; and
- Sample type qualifier.

This particular identification is slightly complex due to the adoption of the nomenclature of existing wells installed under other historic sampling regimes, continued for consistency during the performance monitoring program. Due to the complexity of the sample identification, the indication that these samples were taken at Griffiss AFB has been omitted and is instead implied.

6.7.1 Sample Location Identifier

The first segment consists of two to five alphanumeric characters that designate the site code. Site codes for monitoring wells named in previous Griffiss AFB sampling efforts (Law, December 1996) are listed below:

- 775 Building 775
- 782 Nosedocks 1&2, Apron 2 Site
- LAW Law Engineering and Environmental Services, Inc. (part of Building 817)
- LF6 LF6 TCE
- WSA Weapon Storage Area (part of Building 817)

For the sample designated “782VM105B25AA”, the “782” indicates that the site from which the sample was obtained, “782”, is the Apron 2 Site.

6.7.1.1 Sample Type and Sampling Location Indicator

The second segment consists of three or four alphanumeric characters that indicate the sample type and sampling location. Sample types are as shown below:

- S Surface water sampling locations

- M Groundwater from monitoring well sampling locations
- VM Groundwater from vertically profiled monitoring well sampling locations, and
- T Groundwater from direct-push groundwater samples that were not completed as permanent monitoring wells (i.e., temporary well point).

The two-to-four-digit alphanumeric 'name' following the sample indicator completes the identification of the sampling location at a specific site. For example, for the sample "782VM105B25AA", the "VM" indicates that the sample was groundwater taken from a vertically profiled monitoring well, and the "105B" indicates that this sample was taken from monitoring well 782VMW-105B.

6.7.1.2 Sample Depth Identifier

The third segment consists of two numerical characters that will be used to identify the depth in feet below TOIC the sample was taken. For the sample designated "782VM105B25AA", the "25" indicates that the sample was obtained at a depth of 25 feet below TOIC.

6.7.1.3 Sample Type Qualifier

The fourth segment is two alphabetic characters used to designate the type of sample. The first letter denotes the round of sampling completed (e.g., "A" for first quarterly sampling round, "B" for second quarterly sampling round, etc.). The sample types will be identified by the second character as listed below:

- A = Primary sample
- B = Primary sample
- C = Field duplicate groundwater sample
- D = Matrix Spike Duplicate (MSD)
- E = Equipment blank
- F = Ambient blank
- S = Matrix Spike (MS)
- P = Performance evaluation sample
- R = Trip blank
- X = Resample of Confirmation

The letter A or B appearing at the end of a sample number indicates that the sample is a primary sample. These letters will be selected randomly to mask the predominance of primary samples over QA/QC samples. This system was devised to minimize the likelihood that the laboratory personnel can distinguish the primary samples from the QA/QC samples using the sample identification.

To complete the example, the sample number "782VM105B25AA", would, therefore, indicate a primary first-round groundwater sample taken from vertically profiled monitoring well 782VMW-105B at 25 feet below TOIC at the former Griffiss AFB Apron 2 Site.

6.8 Sample Packaging and Shipping

6.8.1 Sample Bottle and Container Preparation

The subcontract laboratory will provide clean sample bottles with the proper preservatives to the field sampling team. The preservatives and types of containers provided will be based on the requirements specified in the AFCEE QAPP (Version 4.0) and will be determined by the analyses to be performed on the samples. All bottles will be stored in a clean area of the FPM field office before sampling.

The laboratory will maintain a sample bottle preparation log in which the preparation of each set of bottles is documented. Documentation includes:

- bottle lot numbers;
- type and number of bottles;
- date of preparation;
- preservative added (reagent and lot number);
- special cleaning procedures; and
- initials of the shipping clerk.

Labels will be placed on all prepared bottles indicating the preservatives used and the date of preparation.

When sample bottles are ready to be shipped to the field, the shipping clerk places the sample bottles and sample custody tags in coolers. The coolers will be sealed with custody tape to guard against tampering. The seals will be applied such that they will break when the container is opened. The clerk will complete the appropriate sections of the CoC record indicating the number and type of bottles contained in the coolers. When a member of the sampling team receives the sample containers, he or she will review the contents of the coolers and initial the CoC indicating that he or she accepts custody of them.

6.8.2 Packaging and Shipping Procedures

Packaging and shipping procedures will be based on the presumption that the samples are classified as low concentration environmental samples. Low concentration environmental samples are those collected in an area surrounding a spill or dumpsite. They are considered to be low in pollutant concentration and are collected from naturally occurring media such as lakes, streams, soil, and groundwater.

The following packing and shipping procedures will be utilized for low concentration environmental samples and are in general compliance with the AFCEE QAPP and U.S. Department of Transportation (DOT) regulations (49 Code of Federal Regulations (CFR) 171-179):

- Seal sample containers by firmly affixing the lids to the containers;
- Wrap all glass containers in non-water-absorbent packing materials (bubble-wrap bags or similar) so as to reduce the potential for container breakage during shipment;
- Place each sample container with the lid facing upward in a DOT-approved cooler;
- Check to assure that all required QA/QC samples are present inside each cooler;
- Place sufficient ice above and around the sealed sample containers to depress the sample temperatures to 4°C;
- Fill the balance of the cooler with non-water-absorbent packing materials so as to reduce the potential for container movement or breakage during shipment;
- Place a copy of the appropriate completed CoC form in a sealed plastic bag inside the top of the cooler;
- Close the cooler, seal the lid opening with strapping tape, secure the lid by placing additional strapping tape around the body of the cooler, and assure that any drains that may be present are also sealed with tape;
- Place a signed dated custody seal over the cooler lid opening; and
- Transfer the sealed cooler to the lab courier. The courier will sign the completed CoC form as a record of sample transfer. FPM will copy the CoC before the CoC and associated samples are transported to the lab.

6.9 Investigation-Derived Waste Management

During the program field activities, several types of solid and liquid wastes will be generated, including disposable equipment and supplies, decontamination fluids, and well purging fluids. The ultimate disposal of these wastes will be dependent upon the degree of environmental contamination present at each site. The following discussion outlines the general strategy for waste management at the Base.

6.9.1 Miscellaneous Solid Wastes

Miscellaneous solid wastes such as disposable gloves, disposable protective clothing, and paper towels will be placed in trash bags and disposed in a trash disposal bin as directed by Base personnel.

6.9.2 Decontamination Fluids

Investigation-derived water from either decontamination procedures or well purging activities will be field screened by visual and/or olfactory inspection. The potential for hazardous

conditions is expected to be low, because concentrations are generally within one order of magnitude of the NYS Groundwater Standards. If volatile contamination is noted, the wastes from these sites will be contained at each sampling site and transferred to labeled 55-gallon drums. The wastes will be characterized, manifested, and disposed off-Base or disposed in sanitary sewers following POTW approval. If wastes are disposed off-Base, the Air Force will sign the manifests as generator.

Uncontaminated groundwater (based on field screening) or decontamination fluid will be disposed of adjacent to the well or at a location approved by the AFRPA and USACE.

6.10 Field Audits

FPM oversight personnel, in association with Parsons, will audit field operations during the performance of the program field work to verify that field activities were performed in accordance with approved work procedures as cited in the FSP and the QAPP associated with this Work Plan.

7 Reporting Requirements

The results of the groundwater sampling will be summarized in quarterly performance monitoring reports that will be issued within 2 months following the sampling event and annual performance monitoring reports that will be issued within 3 months from the last annual sampling event. In addition, the Building 775 City of Rome discharge permit has compliance monitoring requirements. The permit requires the submittal of the effluent monitoring report as summarized in Table 7-1. Details can be reviewed in the permit attached to this report in Appendix C.

Table 7-1
Building 775 Permit Reporting Periods and Report Due Dates

90-Day Reporting Period	Report Due Date
January – March	April 30
April – June	July 30
July – September	October 30
October – December	January 30

Quarterly Performance Monitoring Reports will include:

- Summary of field activities;
- Summary of analytical results;
- Updated plume contour map; and
- Issues and recommendations necessary for evaluation prior to next monitoring round.

Annual Performance Monitoring Reports will include:

- Summary of field sampling activities (including field documentation logs);
- Data Assessment (including laboratory results and data validation reports, when applicable);
- A comparison between current data, past data, and established performance criteria;
- Updated plume contour maps, if applicable;
- Updated water-level contour maps;
- Summary of analytical results in tables;
- Trend charts and statistical analysis for water quality and level data;
- Predictions of plume movement rate and direction and any recommendations for further study; and
- A detailed discussion of monitoring re-evaluation and resulting recommendations for performance optimization.

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8 References

Ecology and Environment Engineering, P.C. (EEEPC), Final Work Plan for Predesign Investigations at Landfill 6 TCE, Building 817/WSA, Building 775, and AOC 9, Former Griffiss Air Force Base, Rome, New York, Contract No. W912DQ-06-D-0012, July 2006.

EEEPC, Final Remedial Design Work Plan (RD WP) and 90% Drawings for Landfill 6 TCE, Building 817/WSA, Building 775, Apron 2, Former Griffiss Air Force Base, Rome, New York, Contract No. W912DQ-06-D-0012, February 2008.

FPM Group, Ltd. (FPM), Draft Quality Assurance Project Plan (QAPP) for Long Term Monitoring Program, Griffiss Air Force Base, October 2006.

FPM, Draft Site Safety and Health Plan (SSHP), Long-Term Monitoring Program, Former Griffiss Air Force Base, Revision 0.0, June 2003.

FPM, Field Sampling Plan (FSP), Long Term Monitoring Program, Former Griffiss Air Force Base, Revision 3.0, March 2005.

FPM, Final Baseline Letter Work Plan (WP), On-Base Groundwater Areas of Concern, Former Griffiss Air Force Base, Rome, New York, November 2006.

FPM, Final Monitoring Report, Baseline and PDI2 Sampling at On-Base Groundwater AOCs, Griffiss Air Force Base, August 2007.

Law Engineering and Environmental Services, Inc., Draft Final Primary Report, Remedial Investigation at Griffiss Air Force Base, December 1996.

Parsons, Accident Prevention Plan, On-Base Groundwater Remediation Work Plan, Former Griffiss Air Force Base, June 2006.

Parsons, Final Remedial Action Work Plan (RA WP), On-Base Groundwater Remediation Work Plan, Former Griffiss Air Force Base, July 2008.

United States Environmental Protection Agency (USEPA), Region II Ground Water Sampling Procedure, Low Stress (Low Flow) Purging and Sampling, March 1998.

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APPENDIX A
Health and Safety Forms

Health and Safety Check List
Daily Health and Safety Meeting Form
AHA Training Record
Safety Meeting Sign-in Sheet
Safety and Health Inspection Checklist
Notice of Subcontractor Violation of Safety and Health Regulations
Parsons Project Incident/ Accident Report Form
Parsons Near Miss Report Form
USACE Accident Investigation Report
Health and Safety Checklist
AHA (Sampling)

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Health and Safety Checklist (FPM Group Ltd. Performance Monitoring)

Date:_____

Daily Health and Safety Meeting Form ☐ complete

Exhibit 2. AHA Training Record ☐ complete

Exhibit 3. Sign in Sheet ☐ complete

Exhibit 4. Safety and Health Inspection Checklist ☐ complete

Exhibit 5. Health and Safety Violations Form

☐ not applicable for today ☐ complete

Any injuries reported ☐ No ☐ Yes

if yes, explain:_____

_____

_____

_____

Any required corrective action: _____

_____

Decontamination Checklist ☐ complete

Field Documentation Checklist ☐ complete

Sample and Water Level Collection Checklist ☐ complete

Packing, Storing, and Shipping of Samples Checklist ☐ complete

Daily Health and Safety Meeting Form

Date: _____ *Time :* _____

Location: FPM office (garage)

Weather Conditions: _____

Meeting Type: Daily Health and Safety

Personnel Present:

_____

_____

Visitors Present: _____

Visitor Training: _____

PPE Required: Modified D

Possible risks, injuries, concerns:

_____

_____

_____

Anticipated Releases to Environment (if so, describe and detail response action/control measures implemented):

_____

_____

Property Damage:

_____

_____

Description (include sequence of events describing step by step how incident happened):

_____

_____

Analysis for, and Implementation of Corrective/Preventative Procedure to Prevent Future Occurrences (to be formulated by SSHO + FOM, approved by PM, and SSHO implemented):

_____

_____

_____

Report made by (Name): _____

SSHP Organization Title: Site Safety and Health Officer

EXHIBIT 2
ACTIVITY HAZARDS ANALYSIS TRAINING RECORD

Job Number:_____

AHA Number:_____

Job Location:_____

Date:_____

Name of Trainer:_____

Subjects/AHAs Covered:_____

_____

_____

_____

Training Aids Used:_____

_____

_____

Attendees (Please sign name legibly):

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

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_____ _____

_____ _____

_____ _____

(Use additional sheets if necessary)

EXHIBIT 3
SAFETY MEETING SIGN-IN SHEET

Safety Meeting Presenter: _____ Date: _____

Current Weather Conditions:

Temperature (^{o}F) = _____ Wind Direction = _____ Wind Speed = _____

Clear - Sunny – Cloudy – Rain - Snow Forecast = _____

Current Site Conditions (circle as appropriate): Dry - Wet - Muddy - Frozen - Snow Covered - Other (describe) _____

1. Incidents or Injuries to report from Previous Day Activities: No □ Yes □ - explain below:
_____

2. Safe and/or At-Risk Observations from Previous Day Activities: _____

_____

_____

3. Activities Taking Place Today: _____

_____

_____

3. Anticipated Hazards: _____

_____

_____

4. Engineering Controls-Work Practices-PPE to Protect Against Hazards:_____

_____

_____

5. Additional Safety Topic or Comments: _____

_____

_____

EXHIBIT 3
SAFETY MEETING SIGN-IN SHEET

PRINTED NAME	SIGNATURE	COMPANY

EXHIBIT 4
SAFETY AND HEALTH INSPECTION CHECKLIST

Project: _____ Date: _____

Name: _____ Time: _____

Any items that have been found deficient must be corrected before work or use.

This checklist includes, but is not limited to, the following:

	Yes	No
Safe Access and Workspace		
Are safe access and adequate space for movement available for:		
Emergencies		
Work area		
Walkways and passageways		
Are ladders, stairways, and elevators properly located and functioning?		
Is protection provided for floor and roof openings?		
Is overhead protection provided for all areas of exposure?		
Is lighting adequate?		
Planning Work for Safety		
Are employees provided with all required protective equipment?		
Have other contractors and trades been coordinated with to prevent congestion and avoid hazards?		
Is all temporary flooring, safety nets, and scaffolding provided where required?		
Utilities and Services Identification		
High voltage lines		
Have all been identified by signs?		
Have high voltage lines been moved or de-energized, or barriers erected to prevent employee contact?		
Sanitary Facilities		
Drinking water		

Are toilet facilities adequate?

Work Procedures – Materials Handling

Is material handling space adequate?

Is material handling equipment adequate and proper?

Is material handling equipment in good condition?

Physicals Hazards

Slip, trip, fall hazards

Heat or cold stress

Pinch points

Insect bites

Muscle strain from improper lifting

Noise exposure

Chemical Hazards

Inhaling, touching, ingesting contaminants

Review and Reporting

AHAs reviewed daily?

Incidents/Near Miss reported?

Other (e.g., tunnels, excavations, shafts)

Comments:

_____
_____
_____
_____
_____

(Use additional pages if necessary)

EXHIBIT 5
NOTICE OF SUBCONTRACTOR VIOLATION OF SAFETY AND HEALTH REGULATIONS

Date: _____

Contractor Name: _____
Address: _____

_____

_____

Attention: _____

This letter officially notifies you that you have been found to be in violation of the following Safety Regulations:

_____

on (date) _____, by_____.

Confined Space Entry	____	Lockout/ Tagout	____	Hot Work	____	Personal Protective Equipment	____
Knowledge of the environment	____	Awareness of warning alarms	____	Evacuation routes	____	Back-up Alarms	____
Assembly locations	____	Fall Protection	____	Scaffolding	____	Environmental/ Hazardous Material Storage	____
Safe Work Practices	____	Security Practices	____		____		____

Other: _____

_____

_____

This/These violations occurred at the following locations: _____

_____

at the following times_____ and dates _____

The name of the employees was/were _____

under the supervision of_____.

Parsons Project Incident/Accident Report Form

PLEASE PRINT

Attach all supplemental documentation, including photos, diagrams, witness statements and field reports

PROJECT Information	Project Title		Location	
	Subcontractor			
	Address			
	City, State, Zip			
	Contact Name		Phone Number	

INCIDENT Type	☐ **Worker's Compensation** ☐ Emergency Response Notified (Police, Fire, Medic, etc.) ☐ First-Aid Only ☐ Recordable Injury	☐ **General Liability** ☐ Bodily Injury/Illness ☐ Real Property Damage ☐ Personal Property Damage ☐ Utility Property Damage	☐ **Builder's Risk** ☐ Equipment ☐ Supplies ☐ Machinery ☐ Work

Incident Location	Date of Loss		Time of Loss	
	Place (exact location)			

Incident Description	Detailed Description of Accident

Worker's Comp Or Personal Injury (circle one)	Injured Name			
	Address			
	City, State, Zip			
	Home Phone		Date of Birth	
	Nature of Injury			
	Medical Facility		Work Status	
	Treatment Received			

Property Damage Or Builder's Risk (circle one)	Owner's Name			
	Address			
	City, State, Zip			
	Home Phone		Work Phone	
	Damage Type		Estimated Cost	
	Utility Type		Marked or Unmarked	
	Description of Damage			

WITNESS Information	Name			
	Address			
	City, State, Zip			
	Home Phone		Work Phone	
	Where to contact		Time to contact	

Contractor Subcontractor Action	Describe actions taken

Signature _____ Employer _____

Print Name _____ Date _____

Phone No. _____ Fax Number _____

PARSONS	NEAR MISS REPORT FORM

EMPLOYER

1. Name: _____
2. Mail Address: _____
   (No. and Street) (City or Town) (State and Zip)
3. Location :_____
   (if different from mail address)

NEAR MISS DESCRIPTION

4. Location of near miss:_____
   (No. and Street) (City or Town) (State and Zip)
5. Project: _____
6. Was place of near miss on employer's premises? Yes ( ) No ( )
7. Time of near miss: _____
8. Date of near miss: _____
9. How did the near miss occur? _____
   (Describe fully the events that resulted in the near miss.)

   _____

   Tell what happened and how. Name objects and substances involved. Give details on all factors that led to

   _____

   near miss. Use separate sheet for additional space).
10. What was employee doing when near miss occurred?_____
    (be specific-was employee using tools or equipment

    _____

    or handling material?)

    _____

WITNESS TO MISS

_____ _____
(Name) (Affiliation) (Phone No.)

_____ _____
(Name) (Affiliation) (Phone No.)

RECOMMENDATIONS TO PREVENT NEAR MISS FROM RECURRING

_____

_____

(For Safety Staff only)	REPORT NO.	EROC CODE **GO**	**UNITED STATES ARMY CORPS OF ENGINEERS** **ACCIDENT INVESTIGATION REPORT** *(For Use of this Form See Attached Instructions and USACE Suppl to AR 385-40)*	REQUIREMENT CONTROL SYMBOL: CEEC-S-8(R2)

1. ACCIDENT CLASSIFICATION

PERSONNEL CLASSIFICATION	INJURY/ILLNESS/FATAL	PROPERTY DAMAGE	MOTOR VEHICLE INVOLVED	DIVING
GOVERNMENT ☐ CIVILIAN ☐ MILITARY	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ CONTRACTOR	☐	☐ FIRE INVOLVED ☐ OTHER	☐	☐
☐ PUBLIC	☐ FATAL ☐ OTHER		☐	

2. PERSONAL DATA

a. NAME (Last, First, MI)	b. AGE	c. SEX ☐ MALE ☐ FEMALE	d. SOCIAL SECURITY NUMBER	e. GRADE

f. JOB SERIES/TITLE	g. DUTY STATUS	h. EMPLOYMENT STATUS AT TIME OF ACCIDENT
	☐ ON DUTY ☐ TDY ☐ OFF DUTY	☐ ARMY ACTIVE ☐ ARMY RESERVE ☐ VOLUNTEER ☐ PERMANENT ☐ FOREIGN NATIONAL ☐ SEASONAL ☐ TEMPORARY ☐ STUDENT ☐ OTHER (Specify)

3. GENERAL INFORMATION

a. DATE OF ACCIDENT *(month/day/year)*	b. TIME OF ACCIDENT *(military time)* hrs	c. EXACT LOCATION OF ACCIDENT	d. CONTRACTOR'S NAME (1) PRIME: (2) SUBCONTRACTOR

e. CONTRACT NUMBER	f. TYPE OF CONTRACT	g. HAZARDOUS/TOXIC WASTE
☐ CIVIL WORKS ☐ MILITARY ☐ OTHER (SPECIFY)	☐ CONSTRUCTION ☐ SERVICE ☐ A/E ☐ DREDGE ☐ OTHER (SPECIFY)_____	☐ SUPERFUND ☐ DERP ☐ IRP ☐ OTHER (SPECIFY) _____

4. CONSTRUCTION ACTIVITIES ***(Fill in line and corresponding code number in box from list - see instructions)***

a. CONSTRUCTION ACTIVITY	(CODE)	b. TYPE OF CONSTRUCTION EQUIPMENT	(CODE)
	#		#

5. INJURY/ILLNESS INFORMATION ***(Include name on line and corresponding code number in box for items e, f & g - see instructions)***

a. SEVERITY OF ILLNESS/INJURY	(CODE)	b. ESTIMATED DAYS LOST	c. ESTIMATED DAYS HOSPITALIZED	d. ESTIMATED DAYS REST. DUTY
	#			

e. BODY PART AFFECTED	(CODE)	g. TYPE AND SOURCE OF INJURY/ILLNESS	(CODE)
PRIMARY	#		
_____	(CODE) #	**TYPE**	(CODE) #
f. NATURE OF ILLNESS/INJURY	(CODE)	_____	(CODE)
	#		#

6. PUBLIC FATALITY ***(Fill in line and correspondence code number in box - see instructions)***

a. ACTIVITY AT TIME OF ACCIDENT	(CODE)	b. PERSONAL FLOATATION DEVICE USED?
	#	☐ YES ☐ NO ☐ N/A

7. MOTOR VEHICLE ACCIDENT

a. TYPE OF VEHICLE	b. TYPE OF COLLISION	c. SEAT BELTS	USED	NOT USED	NOT AVAILABLE
☐ PICKUP/VAN ☐ AUTOMOBILE ☐ TRUCK ☐ OTHER (Specify)	☐ SIDE SWIPE ☐ HEAD ON ☐ REAR END ☐ BROADSIDE ☐ ROLL OVER ☐ BACKING ☐ OTHER (Specify)	(1) FRONT SEAT (2) REAR SEAT			

8. PROPERTY/MATERIAL INVOLVED

a. NAME OF ITEM	b. OWNERSHIP	c. $ AMOUNT OF DAMAGE
(1)		
(2)		
(3)		

9. VESSEL/FLOATING PLANT ACCIDENT ***(Fill in line and correspondence code number in box from list - see instructions)***

a. TYPE OF VESSEL/FLOATING PLANT	(CODE)	b. TYPE OF COLLISION/MISHAP	(CODE)
	#		#

10. ACCIDENT DESCRIPTION (Use Additional paper, if necessary)

See attached page.

11. CASUAL FACTORS *(Read Instructions Before Completing)*

a. (Explain YES answers in item 13	YES	NO
DESIGN: Was design of facility, workplace or equipment a factor?	☐	☐
INSPECTION/MAINTENANCE: Were inspection & maintenance procedures a factor?	☐	☐
PERSON'S PHYSICAL CONDITION: In your opinion, was the physical condition of the person a factor?	☐	☐
OPERATING PROCEDURES: Were operating procedures a factor?	☐	☐
JOB PRACTICES: Were any job safety/health practices not followed when the accident occurred?	☐	☐
HUIMAN FACTORS: Did any human factors such as size or strength of person, etc., contribute to accident?	☐	☐
ENVIRONMENTAL FACTORS: Did heat, cold, dust, sun, glare, etc. contribute to the accident?	☐	☐

a. (CONTINUED)	YES	NO
CHEMICAL AND PHYSICAL AGENT FACTORS: Did exposure to chemical agents, such as dust, fumes, mists, vapors, or physical agents such as noice, radiation, etc. contribute to accident?	☐	☐
OFFICE FACTORS: Did office setting such as, lifting office furniture, carrying, stooping, etc. contribute to the accident?	☐	☐
SUPPORT FACTORS: Were inappropriate tools/resources provided to properly perform the activity/task?	☐	☐
PERSONAL PROTECTIVE EQPT: Did the improper selection, use or maintenance of personal protective eqpt contribute to the accident?	☐	☐
DRUGS/ALCOHOL: In your opinion, was deugs or alcohol factor to the accident?	☐	☐

b. WAS A WRITTEN JOB/ACTIVITY HAZARD ANALYSIS COMPLETED FOR TASK BEING PERFORMED AT TIME OF ACCIDENT?

☐ YES (If yes, attach a copy) ☐ NO

12. TRAINING

a. WAS PERSON TRAINED TO PERFORM ACTIVITY/TASK?	b. TYPE OF TRAINING	c. DATE OF MOST RECENT FORMAL TRAINING
☐ YES ☐ NO	☐ CLASSROOM ☐ ON JOB	Month/Day/Year

13. FULLY EXPLAIN WHAT ALLOWED OR CAUSED THE ACCIDENT: INCLUDE DIRECT AND INDIRECT CAUSES (See instruction for definition of direct and indirect causes.) (Use additional paper, if necessary)

a. DIRECT CAUSE

See attached page.

b. INDIRECT CAUSE(S)

See attached page.

14. ACTION(S) TAKEN, ANTICIPATED OR RECOMMENDED TO ELIMINATE CAUSE(S)

DESCRIBE FULLY:

See attached page.

15. DATES FOR ACTIONS IDENTIFIED IN BLOCK 14

a. BEGINNING (Month/Day/Year)	b. ANTICIPATED COMPLETION (Month/Day/Year)

c. SIGNATURE AND TITLE OF SUPERVISOR CORPS CONTRACTOR	d. DATE (Month/Day/Year)	e. ORGANIZATION IDENTIFIER (Div,Br,Sect)	f. OFFICE SYMBOL

16. MANAGEMENT REVIEW (1st)

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

17. MANAGEMENT REVIEW (2nd - Chief Operations, Construction, Engineering, etc.)

a. ☐ CONCUR b. ☐ NON CONCUR c. COMMENTS

SIGNATURE	TITLE	DATE

18. SAFETY AND OCCUPATIONAL HEALTH OFFICE REVIEW

a. ☐ CONCUR b. ☐ NON CONCUR c. ADDITIONAL ACTIONS/COMMENTS

SIGNATURE	TITLE	DATE

19. COMMAND APPROVAL

COMMENTS

COMMANDER SIGNATURE DATE

* U.S. GOVERNMENT PRINTING OFFICE: 1993-0-791-757

10. ACCIDENT DESCRIPTION (Continuation)

13a. DIRECT CAUSE (Continuation)

(Addition to ENG Form 3394)

13b. INDIRECT CAUSES (Continuation)
14. ACTION(S) TAKEN, ANTICIPATED, OR RECOMMENDED TO ELIMINATE CAUSE(S) (Continuation)

HEALTH AND SAFETY CHECKLIST

Project Name/Number: _____

Site: _____

Date: _____

Personnel Observed and Locations: _____

_____

_____

Complete weekly for each site. Answer each question by checking the appropriate column (yes, no, or N/A). If a No *is checked, provide an explanation on the Noncompliance and Corrective Actions form.*

Documentation	**Yes**	**No**	**N/A**
1. Is the APP/SSHP on-site?	☐	☐	☐
2. Has the APP/SSHP been reviewed, dated, and signed within the last year?	☐	☐	☐
3. Are the tasks being completed reflected in the hazard task analysis?	☐	☐	☐
4. Is there a written acknowledgement that all employees, including subcontractors have been briefed and read the APP/SSHP?	☐	☐	☐
5. Are the following training records current and available in the field:			
• 40-Hour HAZWOPER/8-hour refresher for ALL employees and subcontractors?	☐	☐	☐
• 24 Hours Supervised Field Experience?	☐	☐	☐
• 8-Hour HAZWOPER Annual Refresher?	☐	☐	☐
• CPR/First Aid?	☐	☐	☐
• 8-Hour Hazardous Waste Site Supervisor, and refresher?	☐	☐	☐
• Initial Site Health and Safety Briefing?	☐	☐	☐
• Site Health and Safety Briefing for each location or site?	☐	☐	☐
6. Are emergency maps posted at the Site and maintained in vehicles?	☐	☐	☐
7. Was the route to the hospital driven prior to beginning field work?	☐	☐	☐
8. Was the hospital ER/EMS informed of the work, dates and times of field operations, and provided a map to the site?	☐	☐	☐

HEALTH AND SAFETY CHECKLIST

	Yes	No	N/A
9. Were daily safety checklists completed and fire extinguishers checked?	☐	☐	☐
10. Were applicable Material Safety Data Sheets at the Site?	☐	☐	☐
11. Are documents current and available that indicate employees and subcontractors are medically fit to work and wear the required personal protective equipment?	☐	☐	☐
12. Were wells allowed to vent for 5 to 10 minutes after opening and prior to sampling?	☐	☐	☐
Observations	☐	☐	☐
13. Are exclusion zones and contaminant reduction zone adequately marked?	☐	☐	☐
14. Is required personal protective equipment available and correctly used, maintained, and stored?	☐	☐	☐
15. Is the following emergency equipment located at each site:	☐	☐	☐
• Fire extinguisher?	☐	☐	☐
• Eyewash (15 minutes fresh water)?	☐	☐	☐
• Communications (walkie-talkie or phone)?	☐	☐	☐
• First aid kit?	☐	☐	☐
16. Is the buddy system in use?	☐	☐	☐
17. Are personnel refraining from drinking, chewing, smoking, taking medications, or other hand-to-mouth contact while working in the exclusion zone?	☐	☐	☐
18. Is air monitoring equipment being used appropriately?	☐	☐	☐
19. Is the site organized to allow the use of lifting equipment, and avoid tripping hazards and spreading contamination?	☐	☐	☐
20. Was a random employee asked if he/she know site hazard and emergency procedures?	☐	☐	☐

The Parsons Representative shall sign this checklist upon completion of all items on the checklist.

Parsons Representative Signature: _____

Printed Name and Title: _____

Date: _____

4.6 Activity Hazard Analysis

Table 4-6
Activity Hazard Table

Activity: Sampling **Analyzed by/date:**

Principal Steps	Potential Safety & Health Hazards
Conduct basewide, surface water, monitoring well, leachate, and sediment sampling along with sample preparation and shipment.	**Chemical Hazards**: Potential exposure to fuel contaminants and VOCs during monitoring well sampling. Potential exposure to preservatives, during sample preparation. **Biological Hazards**: Potential exposure to poisonous plants, snakes, spiders, rodents, insects, and ticks. **Physical Hazards**: Potential exposure to physical hazards: material handling, tools, machinery, and equipment use, electrical equipment, noise exposure, heat stress, cold stress, and miscellaneous physical hazards.
Recommended Hazard Controls	
Chemical Hazards: Jet fuel contaminants may be present during sampling along with preservatives during sample preparation and shipment**.** Use prescribed levels of protection described in the PPE section of the SSHP for the applicable work task; properly don and doff protective gear; avoid contact with contaminated surfaces whenever possible and use prescribed decontamination procedures**.**	
Biological Hazards: Biological hazards will be present in work areas. Be cognizant for contact with, poisonous plants, snakes spiders, rodents, insects, and ticks. Wearing insect repellant is recommended to field crews working in areas that may have insects and ticks.	
Material Handling: Material handling will involve lifting and carrying during sampling work. Wear prescribed levels of PPE when handling materials; watch out for items that can cut, puncture, pinch, or crush; use proper lifting techniques, lift with legs not with back, and do not twist when lifting.	
Tools, Machinery, and Equipment Use: Hand power tools and equipment may be used during sampling. Use proper tool for the job; wear appropriate PPE; asses tool condition, do not use damaged tools; make sure area is adequately clear of possible obstructions; inspect all cords and hoses**.**	
Electrical Equipment and Lockout/Tagout: Generators or batteries may be used to proved electrical power. Inspect electrical extension cords for damage; keep equipment/cords away from water and fuel materials; use lockout/tagout procedures.	
Heat Stress: Heat stress may occur when elevated levels ambient temperatures, moderate to heavy work loads, and/or use of impermeable protective clothing occur. Adjust work-rest schedule as needed; work at a comfortable pace; drink plenty of fluids; use shaded rest area; know signs and symptoms of heat exposure and emergency treatment**.**	
Cold Stress: Cold stress may occur during fall/winter/spring months when decreased ambient temperatures are present. For cold stress prevention, minimize exposure to temperatures below 45°F; wear insulated clothing for cold temperature work; know the signs/symptoms of cold exposure and emergency treatment.	
Inclement Weather and Adverse Environmental Conditions: Strong winds, heavy rain or lightning, may occur during outdoor operations. Suspend operations during inclement weather or when other adverse environmental conditions exist**.**	

Activity Hazard Analysis (continued)

Recommended Hazard Controls		
Miscellaneous Physical Hazards: General safety hazards will be present during all work tasks. Use PPE for head, eye, hand, foot, and body; follow safe work practices; watch for slip trip and fall hazards from uneven, wet, slippery ground surfaces; keep areas clear of tripping hazards; look where walking; maintain balance; use short steps when walking on slippery surfaces; communicate general safety information during safety meetings**.**		
Site Emergencies: Preparation for site emergencies is always a requirement for site work. Set up emergency communications; prepare supplies; post contact and hospital route information. Maintain emergency phone list/hospital location/route map on site; have first aid kit, and safety supplies available; have phones available; designate evacuation location and emergency signals**.**		
Equipment to be Used	**Inspection Requirements**	**Training Requirements**
Note taking supplies Electronic control boxes Compressor Batteries Collection supplies Photoionization detector Decontamination supplies Various associated tools PPE	Safety Inspection	Site orientation briefing and SSHP review HazWoper training First-aid/CPR training (use buddy system)

APPENDIX B
Sampling Forms

Decontamination Checklist
Field Documentation Checklist
Sample and Water Level Collection Checklist
Packing, Storing and Shipment of Samples Checklist
Well Purging and Sampling Form (Low Flow)
USACE Chain of Custody Record
Daily Chemical Quality Control Report
Equipment Calibration Log
Monitoring Well/ Piezometer Static Water Level Form

This page is intentionally left blank.

DECONTAMINATION CHECKLIST

Project Name/Number: _____

Site: _____

Boring/Monitoring Well Number(s): _____

Date: _____

Answer each question by checking the appropriate column (yes, no, not observed (N/O) or N/A). If "no" is checked, provide an explanation on the form.

Equipment	**Yes**	**No**	**N/O**	**N/A**
1. Was all sampling equipment decontaminated properly prior to use and between sample intervals or locations?				
2. Was each decontamination event recorded in the field logbook?				

Corrective Actions:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

The Parsons Representative shall sign this checklist upon completion of all items on the checklist.

Parsons Representative Signature: _____

Printed Name and Title: _____

Date: _____

FIELD DOCUMENTATION CHECKLIST

Project Name/Number: _____

_____

Site: _____

_____

Answer each question by checking the appropriate column (yes, no, or N/A). If a No *is checked, provide an explanation on the Noncompliance and Corrective Actions form.*

Field Documentation	**Yes**	**No**	**N/A**
1. Was all original field data recorded in black indelible ink?	☐	☐	☐
2. Were logbooks filled out properly; accurately recounting the day's events?	☐	☐	☐
3. Were all field forms completed and information accurately recorded:	☐	☐	☐
• (list documents below)	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐
•	☐	☐	☐

List additional field forms completed: _____

_____

_____

_____

_____

_____

4. Was field documentation forwarded to office for peer review and QC?	☐	☐	☐
5. Were deficiencies reported to the Project Manager?	☐	☐	☐

The Parsons Representative shall sign this checklist upon completion of all items on the checklist.

FIELD DOCUMENTATION CHECKLIST

Parsons Representative Signature: _____

Printed Name and Title: _____

Date: _____

SAMPLE AND WATER LEVEL COLLECTION CHECKLIST

Project Name/Number: _____

Monitoring Well Number(s):

Sampling Date:

Complete for each monitoring well sampling location inspected. Answer each question by checking the appropriate column (yes, no, not observed (N/O) or N/A). If "no" is checked, provide an explanation on the form.

General	**Yes**	**No**	**N/O**	**N/A**
1. Were new protective gloves worn between sampling locations and/or intervals?	☐	☐	☐	☐
2. Were samples collected using methods described in the FSP?	☐	☐	☐	☐
3. If applicable, were sample containers filled in the correct order?	☐	☐	☐	☐
4. Was sampling equipment appropriate for the purpose and site conditions?	☐	☐	☐	☐
5. Were bottles adequately protected from contamination prior to sampling collection?	☐	☐	☐	☐
6. Were procedures for collecting QA/QC samples followed as per the FSP?	☐	☐	☐	☐
7. Were monitoring wells scheduled to have water levels taken and sampled properly identified?	☐	☐	☐	☐
8. Were water levels recorded to the nearest 0.01 feet and obtained on the same day?	☐	☐	☐	☐
9. Was in situ groundwater parameter data collected from each well and obtained in accordance with the FSP and manufacturer's recommendations?	☐	☐	☐	☐
Groundwater for Chemical Analysis				
10. Were groundwater parameters stable before sample collection (as per FSP)?	☐	☐	☐	☐
11. Were turbidity readings below 50 NTU (or if all other field parameters are stable and turbidity cannot be lowered below 50 NTU, were turbidity readings within + or – 10% over three, five-minute readings)? Note: approval must be obtained from the project geologist and project manager prior to sampling in turbid conditions.	☐	☐	☐	☐
12. Was a field sampling form completed?	☐	☐	☐	☐

13. Were the analytical parameters and QA/QC samples recorded on the field sampling form?	☐	☐	☐	☐
14. Was low-flow sampling conducted in accordance with the approved SAP?	☐	☐	☐	☐
15. Was headspace in sample containers for volatiles eliminated?	☐	☐	☐	☐

Corrective Actions:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

QC Inspectors Signature:

_____

Date: _____

PACKING, STORING, AND SHIPMENT OF SAMPLES CHECKLIST

Project Name/Number: _____

Site: _____

Monitoring Well Number(s): _____

Residential Well(s): _____

Sampling Date: _____

Complete daily. Answer each question by checking the appropriate column (yes, no, or not applicable N/A). If a No *is checked, provide an explanation on the Noncompliance and Corrective Actions form.*

	Packing, Storing, and Shipment of Samples	**Yes**	**No**	**N/A**
1.	Were the samples handled according to the Work Plans?	☐	☐	☐
2.	Was preservative verified to be present in pre-preserved containers prior to sample collection?	☐	☐	☐
3.	Did the samples remain on ice from collection until cooler was taped for shipment?	☐	☐	☐
4.	Were CoC forms filled out accurately and completely including project name and number, sampling date, sampling time, analytical parameters, preservatives, size and number of containers for each analytical parameter, and matrix sampled?	☐	☐	☐
5.	Were CoC forms signed and dated by the preparer, placed in a resealable plastic bag, and the bag taped to the inside of the cooler lid?	☐	☐	☐
6.	Were signed and dated custody seals properly placed on the cooler and the cooler sealed with strapping tape?	☐	☐	☐
7.	Was a shipping label attached to the cooler?	☐	☐	☐
8.	Was custody documentation intact until receipt by the laboratory?	☐	☐	☐

The QC Inspector shall sign this checklist upon completion of all items on the checklist.

QC Inspector Signature: _____

Date: _____

WELL PURGING & SAMPLING FORM
(LOW FLOW)

Project: _____ Sampled by: _____

Location and Site Code (**SITEID**): _____

Well No. (**LOCID**): _____ Well Diameter (**SDIAM**): _____

Date (**LOGDATE**): _____ Weather: _____

CASING VOLUME INFORMATION:

Casing ID (inch)	1.0	1.5	2.0	2.2	3.0	4.0	4.3	5.0	6.0	7.0	8.0
Unit Casing Volume (A) (gal/ft)	0.04	0.09	0.16	0.2	0.37	0.65	0.75	1.0	1.5	2.0	2.6

PURGING INFORMATION:

Measured Well Depth (B) (**TOTDEPTH**) _____ft. (optional)

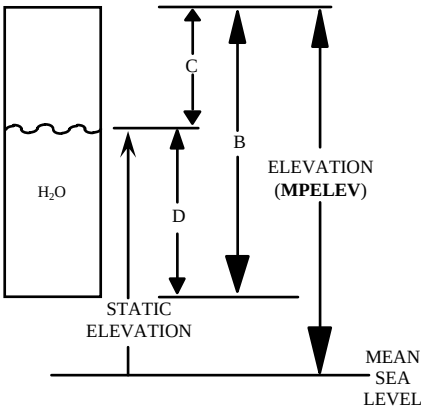
Measured Water Level Depth (C) (**STATDEP**)_____ft.

Length of Static Water Column (D) = _____ - _____ = _____ ft. (optional)
(B) (C) (D)

Pump Intake Depth (ft):_____

Depth during Purging/Sampling:_____ft
(provide range)

Comments (re: Depth during purging/sampling):_____



Purge Date and Method: BLADDER PUMP_____

Physical Appearance/Comments: _____

Dissolved Ferrous Iron (mg/L): _____

FIELD MEASUREMENTS:

Allowable Range:		± 0.1	± 3%		± 10%	± 10%	± 10mV	
Time	Depth to Water (ft BTOC)	pH	EC (mS/cm)	Temp. (F or C)	Turbidity (NTU)	D.O. (mg/L)	ORP (mV)	Flow Rate (mL/min)

Sample Time: _____ Sample ID: _____

Note: Maintain a flow rate of 200-500 mL/min during purging. Purge a minimum of 1L between readings. Collect samples at a flow rate between 100-250 mL/min. VOC and gas sensitive (e.g. alkalinity, Fe^{2+}, CH_4, H_2S) parameters should be sampled first.

USACE
CHAIN OF CUSTODY RECORD

COC#: _N_ SDG#: _NNN_ Cooler ID: _A_

Ship to: Monika Santucci Life Science Laboratories, Inc. 5000 Brittonfield Pkwy, Suite 200 East Syracuse, NY 13057 Tel: (315)437-0200	Project Name: Griffiss AFB Sampling Sampler Name:	Send Results to: Niels van Hoesel FPM Group 153 Brooks Road Rome, NY 13441 Phone: (315) 336-7721 ext. 205
Carrier: LSL courier.	Sampler Signature:	

Analyses Requested

Field Sample ID	Location ID (LOCID)	Date 2008	Time	MATRIX	SMCODE	SBD/SED	SACODE	Preservative	Filt./UnFilt.	No. of Containers	VOCs Note 1 40 mL vials (HCL)			Comments
		M/DD	TTTT	WG	B	0/0	N	HCl	Unf.	3	3	-	-	
		M/DD	TTTT	WG	B	0/0	FD	HCl	Unf.	3	3	-	-	
		M/DD	TTTT	WG	B	0/0	MS	HCl	Unf.	3	3			
		M/DD	TTTT	WG	B	0/0	SD	HCl	Unf.	3	3			
	FIELDQC	M/DD	TTTT	WQ	B	0/0	EB	HCl	Unf.	3	3	-	-	
	FIELDQC	M/DD	TTTT	WQ	NA	0/0	AB	HCl	Unf.	3	3	-	-	
	FIELDQC	M/DD	TTTT	WQ	NA	0/0	TB	HCl	Unf.	3	3	-	-	

Sample Condition Upon Receipt at Laboratory:	Cooler temperature:
Special Instructions/Comments: Analyses to be conducted in compliance with ELAP and DoD QSM 3.0. Note 1: VOCs: SW8260 List:	

#1 Released by: (Sig)	Date:	#2 Released by: (Sig)	Date: M/DD/YY	#3 Released by: (Sig)	Date:
Company Name:	Time:	Company Name: FPM Group Ltd	Time:	Company Name:	Time:
#1 Received by: (Sig) Niels van Hoesel	Date: M/DD/YY	#2 Received by: (Sig)	Date:	#3 Received by: (Sig)	Date:
Company Name: FPM Group Ltd	Time: 1000	Company Name:	Time:	Company Name:	Time:

MATRIX
WG = Ground water
WQ = Water Quality Control Matrix
SO = Soil

SMCODE
B = Bailer
G = Grab (only for EB).
NA = Not Applicable (only for AB/TB)
PP = Peristaltic Pump
BP = Bladder Pump
SP = Submersible Pump
SS = Split Spoon

SACODE
N = Normal Sample
AB = Ambient Blank
TB = Trip Blank
EB = Equipment Blank
FD = Field Duplicate
MS = Matrix Spike
SD = Matrix Spike Duplicate

Daily Chemical Quality Control Report

Project/Delivery Order Number: _____ Date: _____

Project Name/Site Number: _____

Weather conditions: Temperature: _____ Barometric reading: _____
Wind speed and direction: _____
Significant wind changes: _____

General description of tasks completed: _____
_____
_____

Explain any departures from the SAP or deviations from approved procedures during the day's field activities: _____
_____
_____

Explain any technical problems encountered in the field or field equipment/field analytical instrument malfunction: _____
_____
_____

Corrective actions taken or instructions obtained from AFCEE/USACE personnel: No corrective actions necessary.
_____

Sampling shipment completed: √ Yes □ No Airbill #: …. …. ….

DCQCR Prepared by: _____ Date: _____

CQCC Signature: _____ Date:_____

ATTACHMENTS:

Checklist	Daily Chemical Quality Control Report Attachments
	✓ Field sampling forms
	✓ Equipment Calibration Log
	✓ Copies of COCs
	✓ SDG Table (See accompanying COCs).
	✓ Daily Health and Safety Meeting Form

Equipment Calibration Log

Instrument Name: _____

Model Number: _____

Date	First Standard Concentration	First Standard Reading	Second Standard Concentration	Second Standard Reading	Comments

MONITOR WELL / PIEZOMETER STATIC WATER LEVEL FORM

PROJECT NAME: _____ DATE: _____

WATER LEVEL INDICATOR ID # _____ FIELD BOOK # _____

LOCATION: _____ PAGE # _____

Monitor Well Number	Total Well Depth	Well Screen Length	Measuring Point Elev.	Time	Depth to Static Water Level	Explosimeter Reading (above background)	PID Reading (above background)

Note: Total well depth to be measured at time of gauging.

Comments: _____

_____

_____

Sampler _____ Observer _____

FORM WL.11

APPENDIX C
City of Rome Discharge Permit

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JAMES F. BROWN
MAYOR

WILLIAM BAYNES
CHIEF OPERATOR

DAVID MARINO
WORKING SUPERVISOR

CITY OF ROME
WATER POLLUTION CONTROL FACILITY
7180 EAST DOMINICK ST.
ROME, NEW YORK 13440-6255
(315) 339-7775 FAX (315) 339-7828
www.romenewyork.com

May 29, 2008

Mr. Daniel Hoffner
Parsons
40 La Riviere Drive
Buffalo, NY 14202

RE: Permission to discharge wastewater, from FRAC tank located near building 775 on the former Griffiss Air Force Base, Rome, NY

Dear Mr. Hoffner,

Enclosed is Special Permit number GAFB-775-1 for discharge of contaminated groundwater.

After a review of sampling data from groundwater testing wells near building 775 permission is herby granted to discharge this collected wastewater in FRAC tank under the following conditions:

1. Wastewater is pumped into frac tank located near groundwater site.

2. Prior to discharge sampling and analysis is done on wastewater in frac tank prior to discharge for the following: EPA Method 8260, Total Metals EPA Method 200.7, EPA 245.1 Mercury, EPA 335.4 Cyanide, EPA 1664 Oil & Grease.

3. Results from frac tank analysis are submitted prior to final permission to accept this discharge. If any pollutants are above limits in Rome's Sewer Use Ordinance wastewater may have to be filtered with carbon or other pretreatment before discharge to Rome's sanitary sewer.

4. Wastewater may be discharged to sanitary near your location in manhole designated for discharge.

5. Every effort is made to prevent any sludge from bottom of frac tank from entry into sanitary sewer.

6. The volume of discharge will be determined by measurement of Frac tank and liquid level.

7. You inform the City by phone (315-339-7775-ext 222) prior to start of discharge.

8. The City of Rome reserves the right to inspect this area.

9. The cost to discharge wastewater from tanks is 4 cents per gallon.

10. Permission may be rescinded at any time if the POTW determines discharge may affect treatment plant process, violates any sewer use ordinance, EPA or DEC regulations.

11. After discharge is completed you shall provide record of start and end time of discharge with approximate volume of discharge. The name and billing address or organization that will pay for this discharge will also be provided.

If you have any questions please or comments please call 315-339-7775 ext 222

Sincerely,

Bruce Clifford
IPP Coordinator

Cc: Special request/Hdrive

City of Rome
Water Pollution Control Authority

Special Permit for:

Discharge of Contaminated Groundwater

From

Area Near Former Building 775 Site, Southwest of Existing Building 775 and Southwest of Phoenix Drive

Permit Number: GAFB-775-1

Issued to: Parsons
40 LaRiviere Drive, Suite 350
Buffalo, NY 14202

Issued on: June 10, 2008

Expires on: June 10, 2013

Effective June 10, 2008 and in accordance with Section 74-254 of the City of Rome Code of Ordinance, permission is hereby granted to the following user:

Parsons
40 La Rivere Drive, Suite 350
Buffalo, New York 14202

To discharge treated groundwater to the City of Rome sanitary sewer at the following location: Phoenix Drive
Sanitary Manhole located SW of Bldg.
Griffiss Park

The terms of this permit shall be for a period of five years, to run effective from June 10, 2008 to June 10, 2013.

The user shall be subject to the following requirements:

1. The user shall sample discharge using EPA Method 624 and submit the results of the analytical data and chain of custody, every 90 days, during one of these sampling events EPA Method 8260 shall be used at least once a year. The following parameters shall not be exceeded:

PARAMETER	MAXIMUM DAILY LIMIT mg/l
Benzene	0.13
Ethyl Benzene	1.59
Toluene	1.35
Xylene	1.35
Total BETX	2.87
Total TTO	2.13

Lab must be NYDOH certified. The User shall also submit any data provided to other agencies such as EPA or DEC in regard to this contaminated groundwater site.

90 DAY SELF-MONITORING REPORT SUBMITTAL
The User shall submit all required reports within thirty (30) days after reporting period:

90-DAY REPORT PERIOD	REPORT DUE DATE
January-March	April 30
April-June	July 30
July-September	October 30
October-December	January 30

Submit to: City of Rome WPCF
7180 East Dominick Street
Rome, New York 13440-6255
Attn: Bruce Clifford, IPP Coordinator

2. If any of the above limits are exceeded the user shall inform the City of Rome within 24 hours of becoming aware of the violation.

3. The User shall remit, every 90 days with report submittal, the current cost to discharge required by Section 74-281 of the Rome Code of Ordinance. The current charge to discharge is $2.024 per one thousand gallons. The City will inform User of changes to this rate.

   Such remittance shall be made payable to the Rome City Treasurer within 30 days after 90 day reporting period to the following:

   City of Rome Water Pollution Control Facility
   7180 Lower East Dominick Street
   Rome, New York 13440-6255
   Attn: Bruce Clifford, IPP Coordinator

4. Right of Entry-The User shall allow the City of Rome or it's representative exhibiting credentials and/or identification to enter upon premises of the User, at reasonable hours, for the purpose of inspection and sampling. Reasonable hours include any time User is operating which results in process wastewater discharge to the City of Rome sanitary sewer.

5. CERTIFICATION REQUIREMENTS
   The User shall submit with all reports the following signed certification statements:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including possibilities of fines and imprisonment for knowing violation."

_____ _____
Signature Date

SIGNATORY REQUIREMENTS

All reports required by this permit shall be signed by a principal executive officer of the company, or his designee. The appointment of a designee to complete and sign reports, requires that the principal executive officer of the company submit to the City the following certification statement with the name and title of the designee prior to submittal of reports:

"I (Name and Title) designate (Name and Title) to sign reports and I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibilities of fines and imprisonment for knowing violation"

Signature: _____, Date: _____

6. No discharge, which violates Federal Pretreatment Standards or local limits, will be allowed under terms of this special permit.

7. This special permit shall not be binding and shall become void, at the sole discretion of the City of Rome, if it is subsequently shown that wastewater discharges cause violations contained within the City of Rome Sewer Use Ordinance, Federal Regulations, and/or causes pass through, interference, impacts the operation of the POTW.

8. The City of Rome shall retain sole discretion to approve or disapprove all proposals for a special permit. This permit shall be subject to periodic review and testing. The City of Rome may for reasonable cause modify and/or terminate at any time upon reasonable notice.

Issued by: Frank D. Tallarino
Frank D. Tallarino
Commissioner of Public Works

Issued this 28th day of May, 2008
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