DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND
HEADQUARTERS, UNITED STATES ARMY GARRISON
4551 LLEWELLYN AVENUE, SUITE 5000
FORT GEORGE G. MEADE, MARYLAND 20755-5000

June 29, 2016

Environmental Division

Elisabeth Green, Ph.D.
Federal Facilities Division
Maryland Department of the Environment
1800 Washington Boulevard, Suite 625
Baltimore, MD 21230

Dear Ms. Green:

Enclosed please find the *First Quarter Operation and Maintenance Report (January 1 through March 31, 2016)* (Report) for the Phoenix Military Reservation. Copies of the Report have also been furnished to Fran Coulters (U.S. Army Environmental Command), Robert Stroud (U.S. Environmental Protection Agency), and Kevin Koepernick (Baltimore County).

Please provide comments on the Report within 60 calendar days of receipt. Written comments should be addressed to Fort George G. Meade, Attention: IMME-PWE (George Knight), 4216 Roberts Ave., Suite 5115, Fort Meade, Maryland 20755-7068 or george.b.knight7.civ@mail.mil.

If you have any questions, please feel free to contact Denise Tegtmeyer at (301) 677-9559 or me at (301) 677-7999.

Sincerely,

George B. Knight, PG
Program Manager, Installation Restoration Program
Directorate of Public Works Environmental Division

Enclosure

Mr. Francis J. Coulters
Cleanup & Munitions Response Division
U.S. Army Environmental Command
2450 Connell Road, Building 2264
Fort Sam Houston, Texas 78234-7664

Arcadis U.S., Inc.
7550 Teague Road
Suite 210
Hanover
Maryland 21076
Tel 410 923 7846
Fax 410 799 2533
www.arcadis.com

ENVIRONMENT

Subject:
First Quarter Operation and Maintenance Report
(January 1 through March 31, 2016)
Phoenix Military Reservation
Jacksonville, Maryland

Date:
June 28, 2016

Contact:
John Cherry

Phone:
410.923.7763

Email:
John.Cherry@arcadis.com

Our ref:
10153005.0001

Dear Mr. Coulters:

This letter presents the results of quarterly groundwater sampling and operation and maintenance (O&M) activities completed at the Phoenix Military Reservation during the first quarter of 2016 (January 1 through March 31, 2016). The PIKA International, Inc. – Arcadis, Inc. Joint Venture LLC (the JV) conducted all work in accordance with Contract No. W91ZLK-13-D-0009: Task 0009. Performance monitoring and system O&M was conducted in accordance with the program outlined in the Remedial Design (Arcadis 2014). This letter and the documents enclosed serve as the formal submittal of the data collected under this task.

Performance monitoring and Monitored Natural Attenuation (MNA) sampling schedules are included as **Tables 1** and **2**, respectively. Groundwater elevation data and analytical results for the first quarter of 2016 are included as **Tables 3** and **4**, respectively. Analytical results from the samples collected during O&M activities conducted on the Directed Groundwater Recirculation (DGR) system are included in **Table 5**. The DGR layout including the location of extraction, injection, and monitoring wells is depicted on **Figure 1.** Completed O&M field forms and notes are included in **Attachment 1** and completed performance monitoring field logs are included in **Attachment 2.** Analytical laboratory reports are provided in **Attachment 3**.

All work was performed in accordance with the Remedial Action Operations and Long-term Management Accident Prevention Plan (Arcadis 2016). All performance monitoring data collected during the first quarter of 2016 were validated in accordance with the Final Quality Assurance Project Plan (Arcadis 2011). QAPP Addendum #4 is being prepared to guide work activities under Contract No. W91ZLK-13-D-0009: Task 0009 which will be submitted under separate cover. Data validation is conducted by a third party and includes a review of the laboratory report narrative for noted deficiencies and the potential impact to data usability; review of chain-of-custodies, sample preservation, and sample receipt logs and electronic data validation of select quality control parameters. No major deficiencies were identified during the data validation. The data validation report for analytical data collected during the first quarter of 2016 is provided in **Attachment 4**.

The quarterly performance monitoring sampling and gauging event was completed on February 18 and 19, 2016. Groundwater samples were collected from FCA-1, FCA-3, FCA-5, FCA-7, FCA-9, FCA-25, and FCA-26. Samples were submitted for analysis of volatile organic compounds (VOCs) via United States Environmental Protection Agency (USEPA) Method 8260B. The following summarizes groundwater analytical results for the constituents of concern identified at the Phoenix Military Reservation:

- Trichloroethene exceeded its Site Cleanup Level (SCL) of 5 micrograms per liter (µg/L) at three locations with concentrations ranging between 12.6 µg/L (FCA-1) and 136 µg/L (FCA-26).
- Cis-1,2-dichloroethene exceeded its SCL of 70 µg/L at one location (FCA-26) at a concentration of 93.2 µg/L.
- Vinyl chloride was not detected above its reporting limit (1.0 µg/L) in any of the seven monitoring wells sampled.

In addition to the detections of COCs summarized above, the following VOCs were detected above laboratory reporting limits: 1,1-dichloroethene, 2-Butanone (MEK), and methylcyclohexane. Many of these constituents have been detected historically at the Site; however, the primary risk driver identified in the Feasibility Study (Arcadis 2013) was trichloroethene (TCE).

Upon completion of groundwater sampling activities, all purge water generated during sampling activities was transferred to the DGR system equalization tank, pumped through the system, treated, and re-injected back into the formation.

The JVs monthly routine O&M site visit scheduled for January 2016 was postponed due to the large snowstorm that prevented access to the Site in late-January resulting in no site visit during the month of January 2016. O&M activities completed during the reporting period are summarized below:

- February 1, 2016 – The JV responded to a system shut-down (loss of power alarm) followed by a low pressure alarm received on January 24, 2016. The alarms were acknowledged and the system was restarted on February 1, 2016. Routine O&M was also completed during the February 1, 2016 site visit which included documenting system operational parameters, optimize settings, and recording volume of groundwater extracted, treated, and re-injected. In addition to routine O&M activities, a

replacement pressure gauge was installed on the air compressor. DGR system influent, mid-granular activated carbon, and effluent samples were also collected. The O&M samples were submitted for VOCs analysis via USEPA Method 8260B. The analytical Laboratory Report (2121509) is provided in **Attachment 3**.

- February 9, 2016 – The JV responded to a system shut-down (air compressor low alarm) received on February 5, 2016. The air compressor low alarm was caused by the electrical breaker tripping on the air compressor. The alarm was acknowledged, the electrical breaker was reset, and the system was restarted.

- February 19, 2016 – The JV responded to a system shut-down (air compressor low alarm) received on February 14, 2016. The air compressor low alarm was caused by the electrical breaker tripping on the air compressor. The alarm was acknowledged, the electrical breaker was reset, and the system was restarted following completion of the first quarter performance monitoring event.

- March 11, 2016 – The JV conducted a routine visit to document system operational parameters, optimize settings, and record volume of groundwater extracted, treated, and re-injected.

As of March 11, 2016, the DGR system has extracted, treated, and re-injected approximately 96,618 gallons since system startup/shakedown in June 2014. A summary of the approximate total number of gallons extracted and injected into each of the three injection wells associated with the DGR system during the reporting period is provided in **Table 6.**

Should you have any questions or comments, please contact the undersigned at your earliest convenience. The next sampling event is the second annual MNA sampling event tentatively scheduled for June 2016.

Sincerely,

Arcadis U.S., Inc.

John Cherry

Project Manager

Copies:
George Knight – 2 hard copies and 3 CDs
Francis Coulters – 1 CD

Enclosures:

Tables

1 Performance Monitoring Schedule
2 Monitored Natural Attenuation Schedule
3 Groundwater Elevations – February 2016
4 Analytical Results – February 2016
5 Analytical Results for Operation and Maintenance Samples – February 2016
6 Summary of System Volumes

Figures

1 Directed Groundwater Recirculation Layout

Attachments

1 O&M Field Forms and Notes
2 Groundwater Monitoring Logs
3 Laboratory Report (Provided on CD)
4 Data Validation Report (Provided on CD)

References

Arcadis. 2011. Final Quality Assurance Project Plan, Fort George G. Meade, Maryland. March 2011.

Arcadis. 2014. Remedial Design, Phoenix Military Reservation, Jacksonville, Maryland. Final. March 2014.

Arcadis. 2016. Remedial Action Operations and Long-term Management Accident Prevention Plan, Fort George G. Meade, Maryland. May 2016.

TABLES

Table 1
Performance Monitoring Schedule
Phoenix Military Reservation
Jacksonville, Maryland

Well ID	Monitoring Frequency	Sampling Parameters	
		Field Parameters[2]	VOCs
FCA-1	Quarterly[1]	X	X
FCA-3	Quarterly[1]	X	X
FCA-5	Quarterly[1]	X	X
FCA-7	Quarterly[1]	X	X
FCA-9	Quarterly[1]	X	X
FCA-25	Quarterly[1]	X	X
FCA-26	Quarterly[1]	X	X

Notes:

1. Quarterly performance monitoring is planned for the first two years of the directed groundwater recirculation system operation.

2. Field parameters include pH, dissolved oxygen, oxidation reduction potential, specific conductivity, turbidity, and temperature.

VOCs - volatile organic compounds

Table 2
Monitored Natural Attenuation Schedule
Phoenix Military Reservation
Jacksonville, Maryland

Well ID	Monitoring Frequency	Sampling Parameters				
		Field Parameters[2]	VOCs	Total Organic Carbon	Anions[3]	Dissolved Iron
FCA-1	Annually[1]	X	X	X	X	X
FCA-3	Annually[1]	X	X	X	X	X
FCA-5	Annually[1]	X	X	X	X	X
FCA-7	Annually[1]	X	X	X	X	X
FCA-9	Annually[1]	X	X	X	X	X
FCA-13	Annually[1]	X	X	X	X	X
FCA-15	Annually[1]	X	X	X	X	X
FCA-17	Annually[1]	X	X	X	X	X
FCA-19	Annually[1]	X	X	X	X	X
FCA-21	Annually[1]	X	X	X	X	X
FCA-25	Annually[1]	X	X	X	X	X
FCA-26	Annually[1]	X	X	X	X	X

Notes:
1. Annual monitored natural attenuation sampling began 1 year after directed groundwater recirculation system startup in the second quarter of 2015.
2. Field parameters include pH, dissolved oxygen, oxidation reduction potential, specific conductivity, turbidity, and temperature.
3. Anions include sulfate (SO_4) and nitrate (NO_3).

VOCs - volatile organic compounds

Table 3
2015 Groundwater Elevations - February 2016
Phoenix Military Reservation
Jacksonville, Maryland

Monitoring Well ID	Installation Date	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Top of Screen (ft amsl)	Bottom of screen (ft amsl)	Ground Elevation (ft amsl)	TOC Elevation (ft amsl)	February 18, 2016	
								Depth to Groundwater (ft bTOC)	Groundwater Elevation (ft amsl)
FCA-1	November 1982	62	72	498.8	488.8	560.8	559.92	55.95	503.97
FCA-3	October 1982 / May 2006	70	80	490.6	480.6	560.6	563.19	22.47	540.72
FCA-5	October 1982	65	75	512.13	502.13	577.13	577.85	37.74	540.11
FCA-7	October 1982 / May 2006	84	94	492.22	482.22	576.22	578.54	36.26	542.28
FCA-9	November 1982	71	81	480.58	470.58	551.58	554.22	7.17	547.05
FCA-13	May 2006	60	80	468.01	448.01	528.01	530.58	NG	--
FCA-15	May 2006	22	32	365.86	355.86	387.86	391	NG	--
FCA-17	May 2006	77	102	438.85	413.85	515.85	515.52	NG	--
FCA-19	May 2006	85	105	428.07	408.07	513.07	513.08	NG	--
FCA-21	May 2006	60	85	417.27	392.27	477.27	477.3	NG	--
FCA-25	May 2011	70	85	505.2	490.2	575.2	578.09	39.17	538.92
FCA-26	April 2014	62.5	72.5	503.4	493.4	565.9	568.44	26.95	541.49

Notes:
ft bgs - feet below ground surface
ft bTOC - feet below top of casing
amsl - above mean sea level
TOC - top of casing
NG - not gauged

Table 4
Analytical Results - February 2016
Phoenix Military Reservation
Jacksonville, Maryland

		Sample Location:	FCA-1	FCA-3	FCA-3	FCA-5	FCA-7	FCA-9	FCA-25	FCA-26
		Date:	2/19/2016	2/18/2016	2/18/2016	2/18/2016	2/19/2016	2/18/2016	2/18/2016	2/19/2016
		Sample ID:	PMR1-FCA-01 (021816)	PMR1-FCA-03 (021816)	DUP-01 (021816)	PMR1-FCA-05 (021816)	PMR1-FCA-07 (021816)	PMR1-FCA-09 (021816)	PMR1-FCA-25 (021816)	PMR1-FCA-26 (021816)
Analyte	**Unit**	**SCL[1]**								
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1,2,2-Tetrachloroethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1,2-trichloro-1,2,2-trifluoroethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1,2-Trichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1-Dichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1-Dichloroethene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**0.41 J**
1,2,3-Trichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2,4-Trichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2-Dibromo-3-chloropropane	µg/L	--	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
1,2-Dibromoethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2-Dichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2-Dichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2-Dichloropropane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,3-Dichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,4-Dichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
2-Butanone (MEK)	µg/L	--	< 5 U	**2.1 J**	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
4-Methyl-2-Pentanone	µg/L	--	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Acetone	µg/L	--	< 5 U	< 98.6 U	< 9 U	< 6.7 U	< 5 U	< 5 U	< 5 U	< 5 U
Benzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromochloromethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromodichloromethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromoform	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromomethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Carbon Disulfide	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Carbon Tetrachloride	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
CFC-11	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
CFC-12	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Chlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Chlorodibromomethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Chloroethane	µg/L	--	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ	< 1 UJ
Chloroform	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Chloromethane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
cis-1,2-Dichloroethene	µg/L	70	**1.8**	**3.8**	**4.9**	**0.42 J**	**0.89 J**	< 1 U	< 1 U	**93.2**
cis-1,3-Dichloropropene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Cyclohexane	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Dichloromethane	µg/L	--	< 1 U	< 5.7 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Ethylbenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Isopropylbenzene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
m,p-Xylene	µg/L	--	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
Methyl Acetate	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Methyl N-Butyl Ketone (2-Hexanone)	µg/L	--	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Methylcyclohexane	µg/L	--	< 1 U	**0.36 J**	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Methyl-tert-butylether	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Naphthalene	µg/L	--	< 1 U	< 1.3 U	< 1.5 U	< 1 U	< 1.7 U	< 1 U	< 1 U	< 1 U
o-Xylene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Styrene (Monomer)	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Tetrachloroethene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Toluene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
trans-1,2-Dichloroethene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**0.62 J**
trans-1,3-Dichloropropene	µg/L	--	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Trichloroethene	µg/L	5	**12.6**	**29.5 J**	**39.8**	2	**4.8**	< 1 U	< 1 U	**136**
Vinyl chloride	µg/L	2	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Field Parameters										
pH	S.U.	--	5.44	5.58	--	6.52	5.59	6.63	5.53	6.74
Specific Conductivity	µS/cm	--	0.160	0.148	--	0.145	0.158	0.168	0.398	0.243
Turbidity	NTU	--	0.33	23.2	--	1.05	4.05	3.19	0.74	27.6
Dissolved Oxygen	mg/L	--	1.86	0.34	--	9.66	0.63	5.62	8.72	0.44
Temperature	°C	--	11.17	8.86	--	5.28	10.74	7.66	5.54	7.57
Oxidation Reduction Potential	mV	--	153.9	102.2	--	12.2	32.8	21.2	97.3	-65.5

***Notes are provided on the last page of Table 4.**

Notes:
1. Site Cleanup Levels (SCLs) are presented for the constituents of concern as defined in the Record of Decision (Army 2013). Values exceeding the laboratory reporting limit are presented in bold font. Values exceeding the SCL are presented in bold font and highlighted in yellow.

--- - Not Applicable
°C - degrees Celsius
µg/L - microgram per liter
µS/cm - microsieman per centimeter
B - Compound was found in the blank and in the sample.
J - Indicates an estimated result.
mg/L - milligram per liter
mV - millivolt
NTU - Nephelometric Turbidity Unit
S.U. - standard units
U - Indicates the analyte was analyzed but not detected above the detection limit.

Table 5
Analytical Results for Operation and Maintenance Samples – February 2016
Phoenix Military Reservation
Jacksonville, Maryland

		Sample Location:	DGREFFLUENT	DGRINFLUENT	DGRMIDGAC
		Date:	2/1/2016	2/1/2016	2/1/2016
		Sample ID:	DGREFFLUENT(020116)	DGRINFLUENT(020116)	DGRMIDGAC(020116)
Analyte	**Unit**	**SCL[1]**			
Volatile Organic Compounds					
1,1,1-Trichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,1,2,2-Tetrachloroethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,1,2-trichloro-1,2,2-trifluoroethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,1,2-Trichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,1-Dichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,1-Dichloroethene	µg/L	--	< 1 U	< 1 U	< 1 U
1,2,3-Trichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U
1,2,4-Trichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U
1,2-Dibromo-3-chloropropane	µg/L	--	< 5 U	< 5 U	< 5 U
1,2-Dibromoethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,2-Dichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U
1,2-Dichloroethane	µg/L	--	< 1 U	< 1 U	< 1 U
1,2-Dichloropropane	µg/L	--	< 1 U	< 1 U	< 1 U
1,3-Dichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U
1,4-Dichlorobenzene	µg/L	--	< 1 U	< 1 U	< 1 U
2-Butanone (MEK)	µg/L	--	< 5 U	< 5 U	< 5 U
4-Methyl-2-Pentanone	µg/L	--	< 5 U	< 5 U	< 5 U
Acetone	µg/L	--	< 5 U	< 5 U	< 5 U
Benzene	µg/L	--	< 1 U	< 1 U	< 1 U
Bromochloromethane	µg/L	--	< 1 U	< 1 U	< 1 U
Bromodichloromethane	µg/L	--	< 1 U	< 1 U	< 1 U
Bromoform	µg/L	--	< 1 U	< 1 U	< 1 U
Bromomethane	µg/L	--	**0.42 J**	**0.72 J**	**0.6 J**
Carbon Disulfide	µg/L	--	< 1 U	< 1 U	**0.5 J**
Carbon Tetrachloride	µg/L	--	< 1 U	< 1 U	< 1 U
CFC-11	µg/L	--	< 1 U	< 1 U	< 1 U
CFC-12	µg/L	--	< 1 U	< 1 U	< 1 U
Chlorobenzene	µg/L	--	**0.56 J**	< 1 U	< 1 U
Chlorodibromomethane	µg/L	--	< 1 U	< 1 U	< 1 U
Chloroethane	µg/L	--	< 1 U	< 1 U	< 1 U
Chloroform	µg/L	--	< 1 U	< 1 U	< 1 U
Chloromethane	µg/L	--	< 1 U	**0.42 J**	< 1 U
cis-1,2-Dichloroethene	µg/L	70	< 1 U	**0.72 J**	< 1 U
cis-1,3-Dichloropropene	µg/L	--	< 1 U	< 1 U	< 1 U
Cyclohexane	µg/L	--	< 1 U	< 1 U	< 1 U
Dichloromethane	µg/L	--	< 1 U	< 1 U	< 1 U
Ethylbenzene	µg/L	--	< 1 U	< 1 U	< 1 U
Isopropylbenzene	µg/L	--	< 1 U	< 1 U	< 1 U
m&p-Xylenes	µg/L	--	< 2 U	< 2 U	< 2 U
Methyl Acetate	µg/L	--	< 1 U	< 1 U	< 1 U
Methyl N-Butyl Ketone (2-Hexanone)	µg/L	--	< 5 U	< 5 U	< 5 U
Methylcyclohexane	µg/L	--	< 1 U	< 1 U	< 1 U
Methyl-tert-butylether	µg/L	--	< 1 U	< 1 U	< 1 U
Naphthalene	µg/L	--	**0.53 J**	**0.34 J**	**0.44 J**
o-Xylene	µg/L	--	< 1 U	< 1 U	< 1 U
Styrene (Monomer)	µg/L	--	< 1 U	< 1 U	< 1 U
Tetrachloroethene	µg/L	--	< 1 U	< 1 U	< 1 U
Toluene	µg/L	--	< 1 U	< 1 U	< 1 U
trans-1,2-Dichloroethene	µg/L	--	< 1 U	< 1 U	< 1 U
trans-1,3-Dichloropropene	µg/L	--	< 1 U	< 1 U	< 1 U
Trichloroethene	µg/L	5	< 1 U	**6.2**	< 1 U
Vinyl chloride	µg/L	2	< 1 U	< 1 U	< 1 U

Notes:
1. Site Cleanup Levels (SCLs) are presented for the constituents of concern as defined in the Record of Decision (Army 2013). Values exceeding the laboratory reporting limit are presented in bold font. Values exceeding the SCL are presented in bold font and highlighted in yellow.
--- - Not Applicable
µg/L - microgram per liter
J - Indicates an estimated result.
U - Indicates the analyte was analyzed but not detected above the detection limit.

Table 6
Summary of System Volumes
Phoenix Military Reservation
Jacksonville, Maryland

Volumes (Gallons)[1]		
Date	**2/1/2016**	**3/11/2016**
Total Influent[2]	89,241	96,618
Injected Volumes		
IW-01	27,271	29,621
IW-02	25,251	27,481
IW-03	23,383	25,260

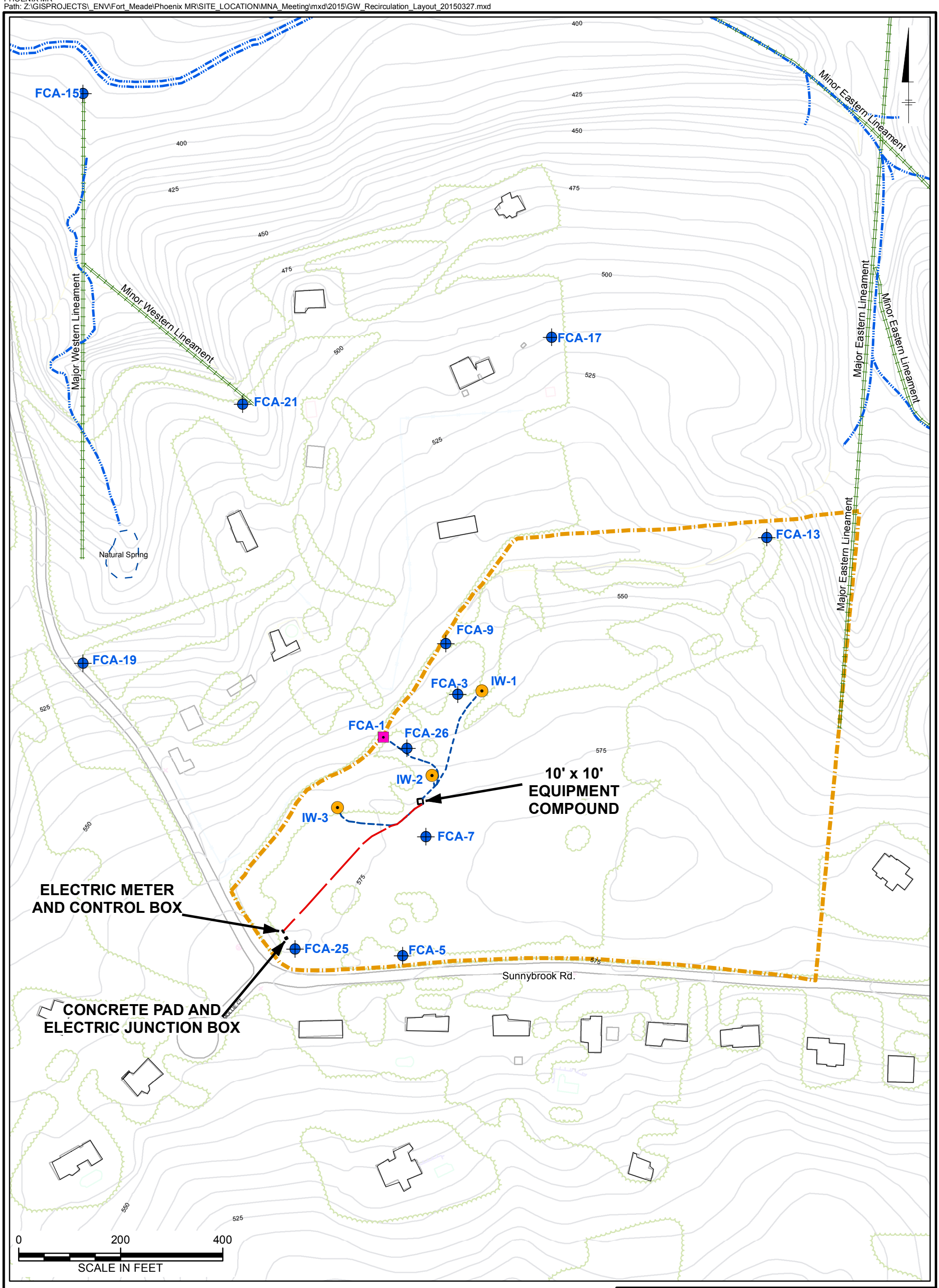
Notes:

1. Volumes are recorded during monthly operation and maintenance events.

2. Flow volume discrepancies between total influent and sum of injected volumes is attributed to well recharge at FCA-01 causing pulsed pumping cycles affecting flow meter accuracy.

FIGURES

CITY: MPLS DIV/GROUP: IM DB: MG LD: KS
PHOENIX MR
Path: Z:\GISPROJECTS_ENV\Fort_Meade\Phoenix MR\SITE_LOCATION\MNA_Meeting\mxd\2015\GW_Recirculation_Layout_20150327.mxd



Legend

- Deep Monitoring Well Location
- Extraction Well
- Recirculation Well
- Lineament
- Stream
- Electrical Feed
- Water Conveyance
- Natural Spring
- House
- Approximate Site Boundary

PHOENIX MILITARY RESERVATION
JACKSONVILLE, MARYLAND

DIRECTED GROUNDWATER RECIRCULATION LAYOUT

PIKA ARCADIS a joint venture

FIGURE
1

ATTACHMENT 1

O&M Field Forms and Notes

ATTACHMENT 2

Groundwater Monitoring Logs

ATTACHMENT 3

Laboratory Reports

(Provided on CD)

ATTACHMENT 4

Data Validation Report

(Provided on CD)