DEPARTMENT OF THE AIR FORCE
AIR FORCE CIVIL ENGINEER CENTER

November 6, 2014

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SUBJECT: Revised Final Site Clousure Report for Land use control/institutional control site DP015 Building 219 Area of Concern
October 2014
Former Griffiss Air Force Base (AFB) Rome, New York
Contract Number FA8903-10-D-8595 / Delivery Order 0014

Accompanying this letter please find the "Revised Final Site Clousure Report for Land use control/institutional control site DP015 Building 219 Area of Concern" in relation to work conducted at the Former Griffiss AFB in Rome, New York under the referenced Performance Based Remediation (PBR) contract.

This report has been prepared to present results from the July 2014 soil sampling event which was conducted based on a NYSDEC comment provided on June 9, 2014 for the Final Site Closure Report (April 2014).

We would appreciate review comments by December 10, 2014 so that project schedules and performance milestones can be maintained in accordance with this PBR Contract.

Should you have any questions or concerns please contact me at 518-563-2871.

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REVISED FINAL

SITE CLOSURE REPORT
LAND USE CONTROL/INSTITUTIONAL CONTROL SITE
DP015 BUILDING 219 AREA OF CONCERN

FORMER GRIFFISS AIR FORCE BASE SITE
ROME, NEW YORK

Prepared for:

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Contract Number FA8903-10-D-8595/
Delivery Order 0014

October 2014

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LIST OF ACRONYMS

AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AOC	Area of Concern
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	Below Ground Surface
CQCR	Chemical Quality Control Reports
EM	Electromagnetic
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FPM	FPM Remediations, Inc.
ft	Feet
GPR	Ground Penetrating Radar
LTM	Long Term Monitoring
LUC/IC	Land Use Control/Institutional Control
m	Meter
MAG	Magnetometer
MHz	Megahertz
NFA	No Further Action
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NW-SE	Northwest-Southeast
RI	Remedial Investigation
ROD	Record of Decision
SCO	Soil Cleanup Objective
S-N	South to North
SVOC	Semi-Volatile Organic Compound
UFP QAPP	Uniform Federal Policy Quality Assurance Project Plan
W-E	West to East
WSW-ENE	West-Southwest to East-Northeast

EXECUTIVE SUMMARY

This Revised Final Site Closure Report has been prepared to present the May 2014 soil sampling results. This sampling event was conducted based on a New York State Department of Environmental Conservation (NYSDEC) comment provided on June 9, 2014 for the Final Site Closure Report for Land use Control/Institutional Control Site DP015 Building 219 Area of Concern (AOC) (CAPE/FPM, April 2014). The comment is as follows:

- *The New York State Department of Environmental Conservation and the New York State Department of Health have reviewed the DP015-Building 219 and SD050-Building 214 Final Site Closure Report Land Use Control/Institutional Control Sites (Building 211, SD050 and DP015). Based on our review, we find that insufficient sampling data has been provided for both Building 214 and Building 219. Specifically, surface soil samples have not been adequately provided for these sites. This lack of data will prevent the removal of institutional controls. All previous sampling data should be included and resubmitted in the report(s). If insufficient data has been collected to date then additional sampling will be required. If site conditions did not warrant sample collection, a detailed discussion should be provided as well.*

Based on the comment, three additional soil samples were collected from 0-2 feet (ft) below ground surface (bgs) and analyzed for metals only on July 9, 2014. The sample locations are illustrated on the attached Figure 6. Sample analysis results indicated that all metals concentrations were below their respective residential use SCOs (Table 1).

All 2013 and 2014 soil sampling results meet the Title 6 - New York Codes, Rules, and Regulations (6-NYCRR) Part 375 Residential Use Soil Cleanup Objectives (SCOs) (NYSDEC, December 2006) at the DP015 Building 219 AOC. Therefore, it is requested that the site be closed and that New York State and USEPA grant permission to remove the remaining non-residential use deed restriction at the DP015 Building 219 AOC.

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1.0 INTRODUCTION

FPM Remediations, Inc. (FPM), in association with CAPE, Inc., under contract with the Air Force Civil Engineer Center (AFCEC), conducted site closure activities at the Land Use Control/Institutional Control (LUC/IC) Site DP015 Building 219 Area of Concern (AOC) at the former Griffiss Air Force Base (AFB) in Rome, New York.

1.1 Purpose

This Site Closure Report has been prepared to present soil sampling results from May 2013 and July 2014. Sampling was conducted at this site as a result of the Air Force's initiative to reduce its long-term environmental liabilities and life cycle costs through site closures. This site is subject to a deed restriction in the form of land use restrictions for non-residential use. An evaluation of the site, including soil sampling, was conducted to determine if residual soil contamination meets the 6-NYCRR Part 375 Residential use SCOs and to obtain site closure with unrestricted reuse at the site. The site closure activities were conducted in accordance with the Final Site Closure Plan for LUC/IC Sites (CAPE/FPM, March 2013). The Updated 2014 Uniform Federal Policy Quality Assurance Project Plan (UFP QAPP) for Performance Based-Remediation at the Former Griffiss AFB (CAPE/FPM, June 2014) and Health and Safety Plan for Performance Based-Remediation at the Former Griffiss AFB (CAPE/FPM, July 2012) were also adhered to.

2.0 RECORD OF DECISION

The Record of Decision (ROD) for the DP015 Building 219 AOC was signed by the Air Force and United States Environmental Protection Agency (EPA) in September 1999 (Air Force, September 1999). Based on the previous investigations and environmental conditions at the site the selected remedy for the DP015 Building 219 AOC is No Further Action (NFA) for soils with LUC/ICs for industrial land-use and groundwater use restrictions (groundwater use restrictions were removed in spring 2012). The ROD for DP015 Building 219 AOC, provided in Appendix A, states that:

- The property will be industrial use unless permission is obtained from the EPA, NYSDEC, and NYSDOH.

3.0 SITE BACKGROUND

Building 219, located in the west-central portion of the Griffiss AFB (Parcel F3A), was used as the Electrical Power Production Shop. Surface water run-off drains into the Mohawk River through the base storm drainage system. One drywell at the site was used for the disposal of liquid wastes (battery acid, glycol, floor wash-water) and was reportedly located south of the building. The drywell was not detected during surface geophysical surveys performed in 1993 and 1994 as part of the Remedial Investigation (RI).

Soil and groundwater samples were collected during the RI conducted in 1994 (Law, December 1996). Soil sampling results showed Semi-Volatile Organic Compound (SVOCs) and metals

above applicable RI criteria. A risk assessment was also conducted for the RI. For human health, contaminants in the soil and groundwater were within the lower end of the acceptable EPA target risk range for industrial and commercial users. A risk assessment based on residential or unrestricted reuse was not performed.

Long Term Monitoring (LTM) was conducted at the site from 2001 to 2002. Groundwater was deemed clean and monitoring ceased at the site in 2002 with regulatory approval. Based on the results from previous sampling and the ROD requirements for the DP015 Building 219 AOC, the Air Force submitted an Explanation of Significant Differences (ESD) in 2003 to the EPA. The document requested the deletion of ROD requirements for the groundwater investigations. The ESD was supported by groundwater monitoring data indicating groundwater Applicable or Relevant and Appropriate Requirements (ARARs) were met. The ESD was signed by the EPA on September 26, 2003. The remaining LTM wells at the site were decommissioned in the Round 3 Well Decommissioning event performed in summer/fall 2005.

A request to remove the groundwater restriction at the site was issued by the Air Force in March 2012. NYSDEC acceptance was provided on April 24, 2012 and EPA approval was provided on May 16, 2012. The NYSDEC acceptance email and EPA approval letter are provided in Appendix B.

4.0 SITE CLOSURE ACTIVITIES

Site Closure activities conducted at the DP015 Building 219 AOC included a geophysical investigation to confirm the absence/presence of the drywell at the site and a soil investigation to verify the presence of residual soil contamination exceeding the 6-NYCRR Part 375 Residential use SCOs. The following sections detail the results of both investigations.

4.1 Geophysical Investigation

The Geophysical Investigation was conducted in October 2012. A full description of the geophysical survey methodology and field procedures is provided in Appendix C.

A grid was established at the DP015 Building 219 AOC site over the approximate location of the suspected drywell. The grid dimensions were 15 meters (m) south to north (S-N) and 15 m west to east (W-E). Survey line spacings of 1 m were used in both the S-N and W-E directions. The grid (and suspected drywell) position was located near the southern wall of Building 219. The northern edge of the grid is ~1 m south of the building wall and directly adjacent to a reinforced concrete sidewalk. The location of the suspected drywell is near the north central edge of the grid at the present location of an access point to the steam lines. The steam line access point is a deep pit encased in reinforced concrete and capped by an iron grate. The southern portion of the gridded area (approximately 4 m) was covered with asphalt and used as a parking area. The remainder of the gridded area was covered with grass. The area currently covered with grass was formerly the location of a paved drive of unknown composition. A metal dumpster was located just off site near the southeastern corner of the grid. A steam line was marked-out in the W-E direction and intersecting the steam line access point. A northwest-southeast (NW-SE) trending communications utility line was also marked-out in the northeast quarter of the grid.

4.1.1 EM Data Results

The Electromagnetic (EM) data were collected along S-N lines at 1 m line spacing across the entire grid (Figure 1). High amplitude anomalies along the northern edge of the grid are due to the reinforced concrete sidewalk and steam line access point. The high amplitude anomaly near the southeast corner of the grid is attributed to the proximity of the metal dumpster near that location. A west-southwest to east-northeast (WSW-ENE) trending high amplitude anomaly in the southern half of the grid is interpreted as a possible buried pipe.

4.1.2 MAG Data Results

The Magnetometer (MAG) data were collected along S-N lines at 1 m line spacing across the entire grid in the same locations as the EM data (Figure 2). The anomalies evident in the MAG data are similar to those observed in the EM data.

Anomalies observed in the MAG data correspond well with the marked-out steam line and access point, the possible buried pipe and the dumpster locations. An S-N trending line of MAG anomalies intersecting with the steam line access point suggests another possible buried steam pipe along that line. The remaining MAG anomalies are interpreted to result from metal construction debris.

4.1.3 GPR Data Results

The investigation of the suspected drywell location at the DP015 Building 219 AOC consisted of 25 Ground Penetrating Radar (GPR) surveys conducted using the 200 Megahertz (MHz) antenna in the S-N and W-E directions (Figure 3) and 32 GPR surveys using the 400 MHz antenna in the S-N and W-E directions (Figure 4). A representative GPR profile cross-section from the Grid 301 GPR survey presented in Figure 5 shows the 200- and 400-MHz data for Line 9 East collected in the S-N direction.

The 200-MHz data shows anomalies in the location of the marked-out steam line along the northern edge of the grid (Figure 3). There are no obvious 200-MHz GPR anomalies along the marked-out communication line in the northeast quarter of the grid. GPR anomalies coincide with the WSW-ENE trending possible buried pipe observed in the EM/MAG data. GPR anomalies are also observed along the S-N trending line intersecting with the steam line access point and observed in the MAG data and are interpreted as representing the location of a steam line. A NW-SE trending line of GPR anomalies across the central portion of the grid is also interpreted as a possible buried pipe. A short WSW-ENE trending linear feature observed in the GPR data in the northeast corner of the grid and supported by the presence of EM and MAG anomalies is also interpreted to be a possible buried pipe. Another short NW-SE trending linear feature observed in the GPR data in the central portion of the grid is also interpreted to be a possible buried pipe.

The 400-MHz data show anomalies in locations similar to the 200-MHz data along the marked-out steam line, the interpreted steam line, the NW-SE trending and WSW-ENE trending possible

buried pipes (Figure 4). Two 400-MHz GPR anomalies also coincide with the marked-out communication line. Two N-S trending lines of anomalies are observed to either side of the interpreted steam line in the south central portion of the grid. These anomalies may be part of a utility corridor branching off from that location and are interpreted as possible pipe locations.

A representative GPR profile cross-section from the Grid 219 GPR survey depicts the 200- and 400-MHz data for Line 9 East collected in the S-N direction. The profiles show the anomalies associated with possible buried pipes/utilities at ~2.6 m, ~4.6 m, and ~6.5 m, a possible buried pipe/utility at~12.4 m and marked-out communication line at ~14.1 m.

4.1.4 Survey Conclusion

The geophysical survey did not identify any anomalies that could be interpreted as a drywell. Anomalies identified at the site have been attributed to underground utilities in the area.

4.2 Soil Investigation

2013 Soil Sampling Event:

The soil investigation included the collection of 18 soil samples from six soil borings (direct push) within the DP015 Building 219 AOC site boundary (Figure 6). Samples were collected from 0 to 4 ft bgs, 4 to 8 ft bgs, and 8 to 12 ft bgs from each boring. In preparation for this sampling, all historical soil sampling results were compared to the 6-NYCRR Part 375 Residential use SCOs. Only metals exceeded the residential use SCOs. Therefore, the site closure soil samples were analyzed for metals only via USEPA Method SW6010C. Field screening for visual and olfactory characteristics was conducted before sampling. Results from the soil sampling showed that metal concentrations in all samples were below their respective Residential use SCOs.

2014 Soil Sampling Event:

The 2014 sampling event was conducted on July 9, 2014 to collect surface soil samples at the site (0 to 2 ft bgs). The samples were collected at three borings (B219SCS-7, -8, -9, and -10) as shown in Figure 6. The samples were analyzed for metals using EPA Method SW6010C.

Sampling results for both events are presented in Table 1. Results from the soil sampling showed that metal concentrations in all samples were below their respective Residential use SCOs. All field sampling forms are attached in the daily CQCRs in Appendix D. The raw data are attached in Appendix E and the validated lab data are provided in Appendix F.

4.3 Recommendations

The 2013 and 2014 soil sampling results meet the 6-NYCRR Part 375 Residential use SCO. In addition, the geophysical investigation performed at the DP015 Building 219 AOC did not identify any underground anomalies that could be interpreted as a potential location for a former drywell. Therefore, it is requested that the site be closed and that New York State and USEPA grant permission to remove the remaining non-residential use deed restriction at the DP015 Building 219 AOC.

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5.0 REFERENCES

Air Force, Final Records of Decision for Areas of Concern at the Former Griffiss Air Force Base, Rome, NY, September 1999.

Air Force, Explanation of Significant Differences for the Tin City AOC at the Former Griffiss Air Force Base, September 2003.

CAPE/FPM, Updated 2014 Final Uniform Federal Policy Quality Assurance Project Plan for Performance Based-Remediation at the former Griffiss AFB, New York, June 2014.

CAPE/FPM, Final Site Closure Report for LUC/IC Site DP015 Building 219 AOC at the former Griffiss AFB, October 2013.

CAPE/FPM/AECOM, Final Addenda Health and Safety Plan for Performance Based-Remediation at the former Griffiss AFB, New York, July 2012.

CAPE/FPM, Final Site Closure Plan for Land use Control/Institutional Control Sites at the former Griffiss AFB, New York, March 2013.

Law, Draft Final Primary Report Remedial Investigation for Building 219 AOC at the former Griffiss Air Force Base, December 1996.

NYSDEC, 6-NYCRR Part 375 Environmental Remediation Programs, December 2006.

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Tables

Table 1
DP015 Building 219 AOC
Soil Sampling Results

Sample Location	NYCRR Part 375 Residential use Soil Cleanup Objectives (mg/kg)	B219SCS-1			B219SCS-2		
Sample ID		B219SCS0104AA	B219SCS0108AA	B219SCS0112AA	B219SCS0204AA	B219SCS0208AA	B219SCS0212AA
Date of Collection		5/7/2013	5/7/2013	5/7/2013	5/7/2013	5/7/2013	5/7/2013
Sample Depth (ft bgs)		0-4	4-8	8-12	0-4	4-8	8-12
Metals (mg/kg)							
aluminum	NA	6,100	8,400	7,700	7,300	8,200	8,600
antimony	NA	U	U	U	U	U	U
arsenic	16	3.6	3.5	3.5	4	4.3	4.6
barium	350	30	37	31	38	41	37
berylium	14	0.26 J	0.35 J	0.33 J	0.28 J	0.35 J	0.35 J
boron - total	NA	3.3 J	2.5 J	2.2 J	2.3 J	3.2 J	2.2 J
cadmium	2.5	0.35 J	0.18 J	0.13 J	0.42 J	0.35 J	0.45 J
calcium	NA	76,000	19,000	3,900	31,000	40,000	16,000
chromium	22	10.0	10.0	9.4	8.8	11.0	12.0
cobalt	NA	4.9	6	5.6	5	5.6	5.8
copper	270	39.0	22	31	26	28	36
iron	NA	13,000	18,000	19,000	15,000	18,000	30,000
lead	400	15	6.4	5	16	22	18
magnesium	NA	3,900	3,800	3,300	3,200	3,800	3,400
manganese	2,000	570	1000	1100	840	1000	1400
molybdenum	NA	0.32 J	0.36 J	0.31 J	0.45 J	0.55 J	0.77 J
nickel	140	13	13	13	11	13	14
potassium	NA	760	820	860	740	910	880
selenium	36	U	U	U	U	U	U
silver	36	U	0.23 J	0.26 J	0.23 J	0.17 J	0.27 J
sodium	NA	86 J	83 J	62 J	71 J	94 J	68 J
thallium	NA	U	U	U	U	U	U
vanadium	NA	21.0	16	13	13	16	15
zinc	2,200	54	44	47	59	68	200
mercury	0.81	U	U	U	U	U	U

Table 1
DP015 Building 219 AOC
Soil Sampling Results

Sample Location	NYCRR Part 375 Residential use Soil Cleanup Objectives (mg/kg)	B219SCS-3			B219SCS-4		
Sample ID		B219SCS0304AA	B219SCS0308AA	B219SCS0312AA	B219SCS0404AA	B219SCS0408AA	B219SCS0412AA
Date of Collection		5/7/2013	5/7/2013	5/7/2013	5/7/2013	5/7/2013	5/7/2013
Sample Depth (ft bgs)		0-4	4-8	8-12	0-4	4-8	8-12
Metals (mg/kg)							
aluminum	NA	6,300	6,300	7,600	10,000	7,800	7500 ♦
antimony	NA	U	U	U	U	U	U
arsenic	16	6.2	9.8	4.2	3.9	3.2	4.4 ♦
barium	350	26	27	29	32	27	33 ♦
berylium	14	0.21 J	0.25 J	0.33 J	0.46 J	0.34 J	0.32 J
boron - total	NA	2.1 J	1.8 J	1.9 J	2.3 J	1.7 J	2.1 J
cadmium	2.5	0.14 J	0.17 J	0.12 J	0.29 J	0.093 J	0.12 J
calcium	NA	23,000	14,000	1,900	7,900	1,000	3,300
chromium	22	7.4	8	9.4	14	10	8.8
cobalt	NA	4.7	4.1	5.1	6.6	5.8	5.6
copper	270	18	18	28	38	41	26 ♦
iron	NA	14,000	14,000	21,000	21,000	18,000	21000 ♦
lead	400	5.7	6.5	3.9	6.6	4.5	5
magnesium	NA	2,700	2,500	3,100	3,500	3,100	3200 ♦
manganese	2,000	810	680	900	870	890	1300 J ♦
molybdenum	NA	U	0.53 J	0.53 J	1.5 J	0.8 J	0.46 J ♦
nickel	140	9.8 J	8.8	13	15	13	13
potassium	NA	670	650	880	910	830	860
selenium	36	U	U	U	U	U	U
silver	36	U	U	U	U	0.19 J	0.25 J ♦
sodium	NA	69 J	70 J	U	310 J	160 J	82 J
thallium	NA	U	U	U	U	U	U
vanadium	NA	12	11	13	16	12	12 ♦
zinc	2,200	33 J	36	50	51	44	47 ♦
mercury	0.81	U	U	U	U	U	U

Table 1
DP015 Building 219 AOC
Soil Sampling Results

Sample Location	NYCRR Part 375 Residential use Soil Cleanup Objectives (mg/kg)	B219SCS-5			B219SCS-6		
Sample ID		B219SCS0504AA	B219SCS0508AA	B219SCS0512AA	B219SCS0604AA	B219SCS0608AA	B219SCS0612AA
Date of Collection		5/7/2013	5/7/2013	5/7/2013	5/7/2013	5/7/2013	5/7/2013
Sample Depth (ft bgs)		0-4	4-8	8-12	0-4	4-8	8-12
Metals (mg/kg)							
aluminum	NA	11,000	8,000	7,000	9,100	9,300	8,600
antimony	NA	U	U	U	1.1 J	U	U
arsenic	16	5	3.3	4	3.1	3.3	3.9
barium	350	50	32	36	28	26	35
berylium	14	0.52	0.32 J	0.41 J	0.36 J	0.4 J	0.39 J
boron - total	NA	2.1 J	1.9 J	2.3 J	3.4 J	2.1 J	2 J
cadmium	2.5	0.49 J	0.21 J	0.14 J	0.2 J	0.12 J	0.14 J
calcium	NA	11,000	2,900	3,700	83,000	1,000	2,200
chromium	22	12.0	8.5	8.7	11.0	11	9.4
cobalt	NA	8	5.1	5.5	5.2	6.1	6.2
copper	270	35	22	24	34	39	36
iron	NA	24,000	16,000	21,000	15,000	19,000	22,000
lead	400	25	8.6	4.7	13	5	5.2
magnesium	NA	4,000	2,700	2,800	5,300	3,500	3,500
manganese	2,000	1100	810	1300	510	870	1400
molybdenum	NA	U	0.38 J	0.32 J	0.29 J	0.72 J	0.28 J
nickel	140	17	11	13	15	14	15
potassium	NA	960	780	1,100	940	900	910
selenium	36	U	U	U	U	U	U
silver	36	0.25 J	0.19 J	0.22 J	U	0.19 J	U
sodium	NA	180 J	250 J	200 J	250 J	270 J	210 J
thallium	NA	U	U	U	U	U	U
vanadium	NA	19	13	13	15	14	13
zinc	2,200	97	49	110	52	44	63
mercury	0.81	U	U	U	U	U	U

Table 1
DP015 Building 219 AOC
Soil Sampling Results

Sample Location	NYCRR Part 375 Residential use Soil Cleanup Objectives (mg/kg)	B219SCS-7	B219SCS-8	B219SCS-9	B219SCS-10
Sample ID		B219SCS0702AA	B219SCS0802AA	B219SCS0902AA	B219SCS1002AA
Date of Collection		7/19/2014	7/19/2014	7/19/2014	7/19/2014
Sample Depth (ft bgs)		0-2	0-2	0-2	0-2
Metals (mg/kg)					
aluminum	NA	4,600	8,800	10,000	7,300
antimony	NA	U	U	U	U
arsenic	16	3.1	4.7	6.6	3.1 ♦
barium	350	20	38	42	28 ♦
berylium	14	0.23 J	0.43 J	0.45 J	0.31 J ♦
boron - total	NA	6.4 J	3.7 J	3.2 J	2.6 J ♦
cadmium	2.5	0.14 J	0.12 J	0.14 J	0.14 J
calcium	NA	190,000	48,000	27,000	12,000 ♦
chromium	22	10	11	13	8.1♦
cobalt	NA	3.9	6.6	6.6	4.8♦
copper	270	13	19	27	19
iron	NA	7,500	14,000	18,000	13,000
lead	400	6.8	11.0	15.0	9♦
magnesium	NA	6,200	3,800	3,700	2,400
manganese	2,000	360	570	670	510
molybdenum	NA	U	0.33 J	0.35 J	U
nickel	140	9.7	16	16	11
potassium	NA	1,100	1,300	1,200	920♦
selenium	36	U	U	U	U
silver	36	U	U	U	U
sodium	NA	150	77	64	91♦
thallium	NA	3.3 J	U	U	U
vanadium	NA	17	17	18	13
zinc	2,200	27	50	58	40
mercury	0.81	U	U	U	U

Notes and Data Qualifiers

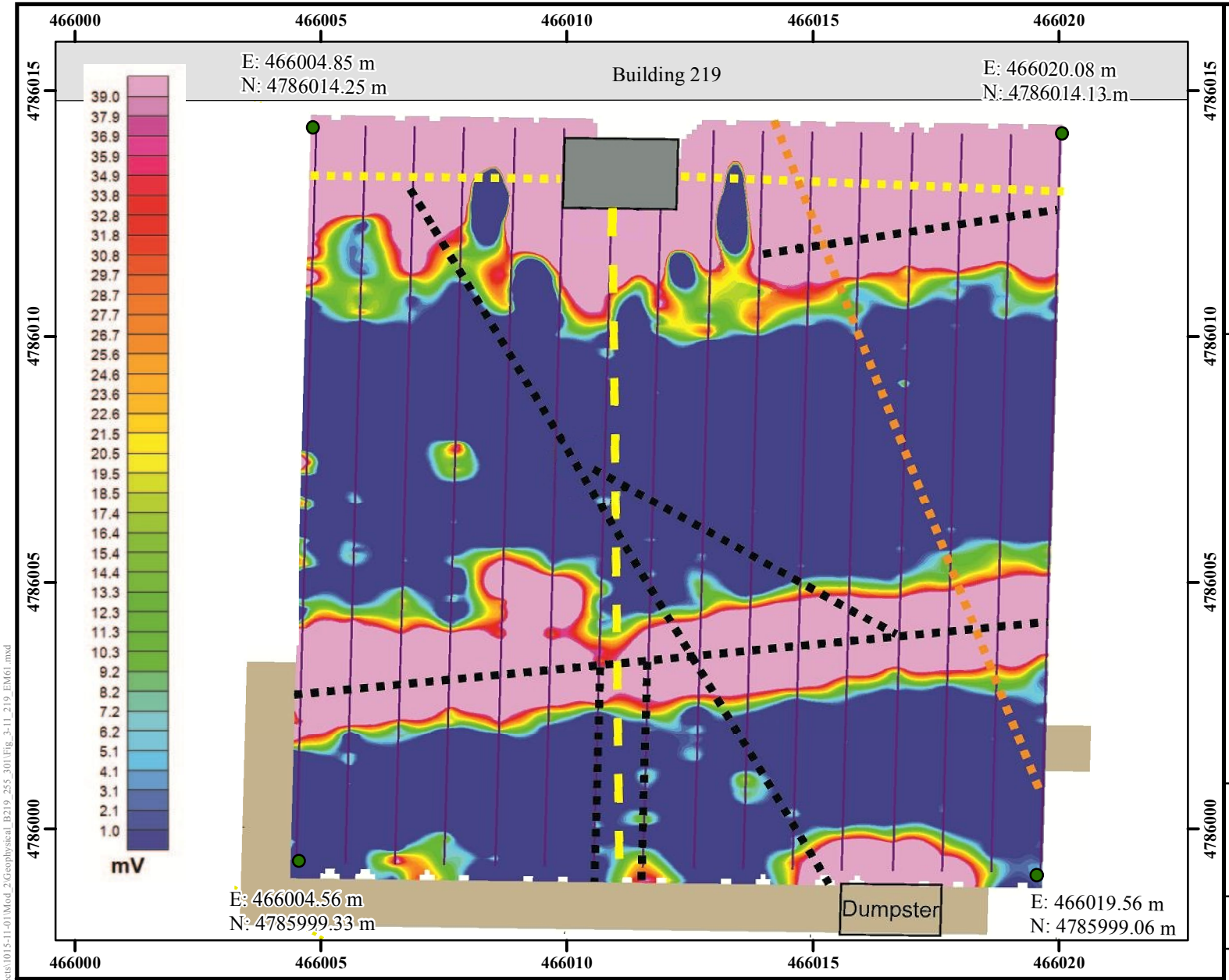
J = The analyte was positively identified above MDL, however the concentration is below the reporting limit (RL).

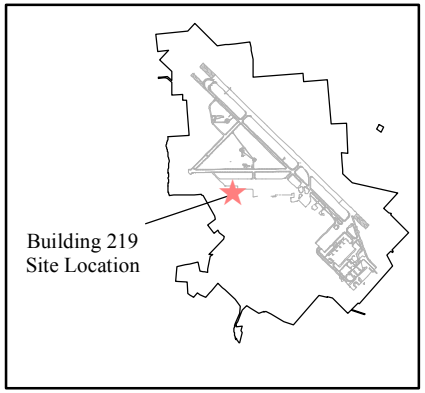
U = The analyte was analyzed for, but not detected. The associated numerical value is at or below the method detection limit.

NA = Not Available, no NYCRR Part 375 Soil Cleanup Objective.

♦ = Duplicate value was used.

Figures





Legend

- Grid Corner Location
- EM61 Sensor Position
- Marked Out Com Line
- Marked Out Steam Line
- Possible Buried Pipe
- Asphalt Parking Lot
- Metal Grate Over Steam Line Access

NOTES:

Coordinate System:WGS 1984 UTM Zone 18N
Projection: Transverse Mercator
False Easting: 500,000.0000
Central Meridian: -75.0000
Latitude Of Origin: 0.0000
Horizontal Datum: WGS 1984
False Northing: 0.0000
Scale Factor: 0.9996
Units: Meter

1 inch = 10 feet

0 2 4 Meters

0 10 20 Feet

N W E S

Former Griffiss Air Force Base
Rome, NY
AFCEC

FIGURE 1

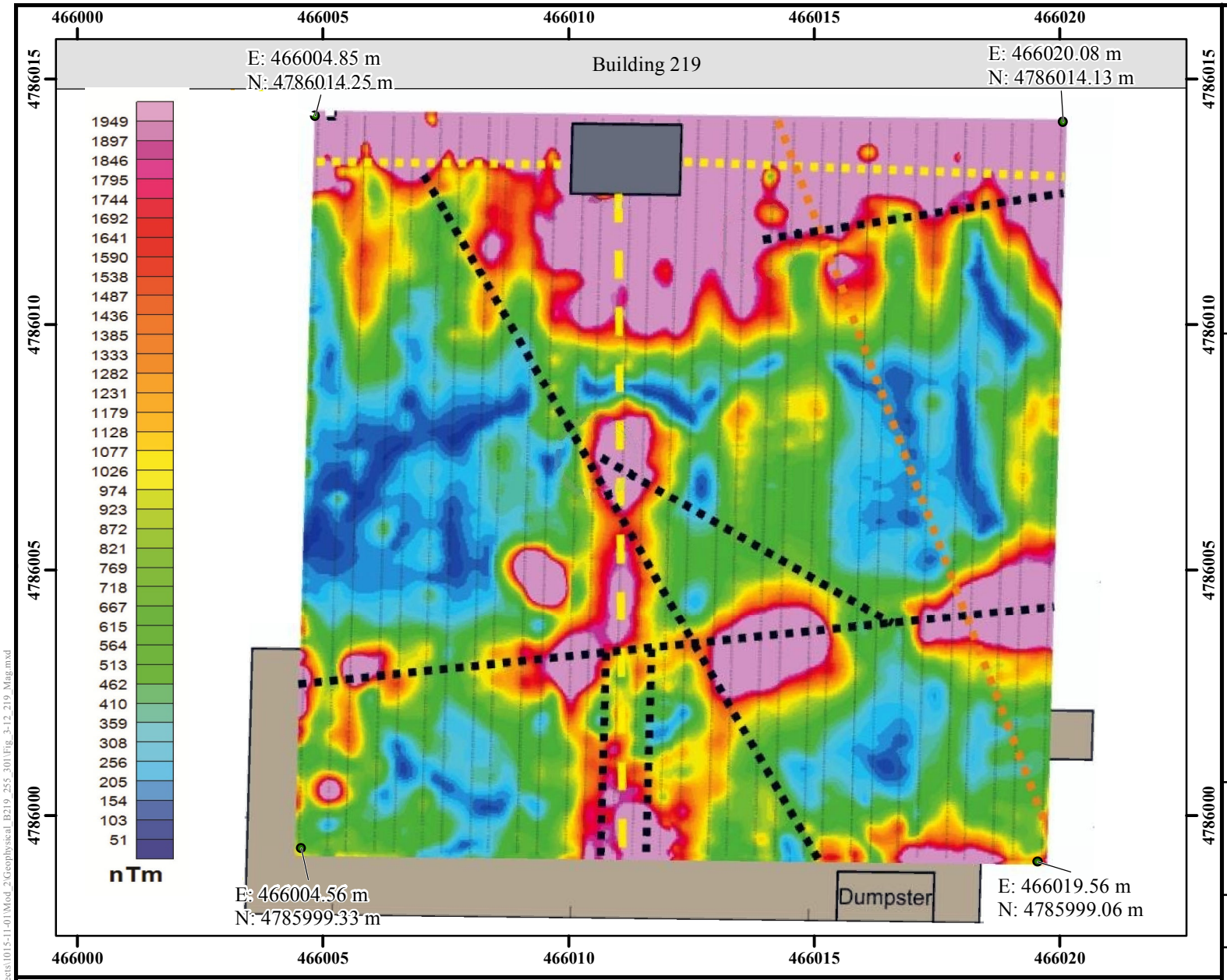
DP015 Building 219 AOC

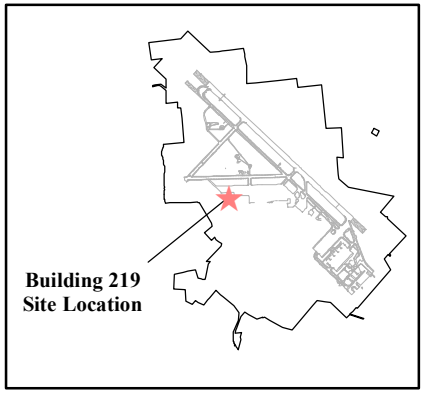
Grid 219 EM Data Interpretation
Channel 2 Demedian

FPM Remediations, Inc.

July 2013

Path: Y:\GIS_Projects\Griffiss\Projects\1015-11-01\Mod_2\Geophysical_B219_255_301\Fig_3-11_219_EM61.mxd





Legend

- Grid Corner Location
- G858 Sensor Position
- Marked Out Com Line
- Marked Out Steam Line
- Interpreted Steam Line
- Possible Buried Pipe
- Metal Grate Over Steam Line Adccess
- Asphalt Parking Lot
- Building 219 (Existing)

NOTES:

Coordinate System:WGS 1984 UTM Zone 18N
Projection: Transverse Mercator
False Easting: 500,000.0000
Central Meridian: -75.0000
Latitude Of Origin: 0.0000
Horizontal Datum: WGS 1984
False Northing: 0.0000
Scale Factor: 0.9996
Units: Meter

1 inch = 10 feet

0 2 4 Meters

0 10 20 Feet

N W E S

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Rome, NY
AFCEC

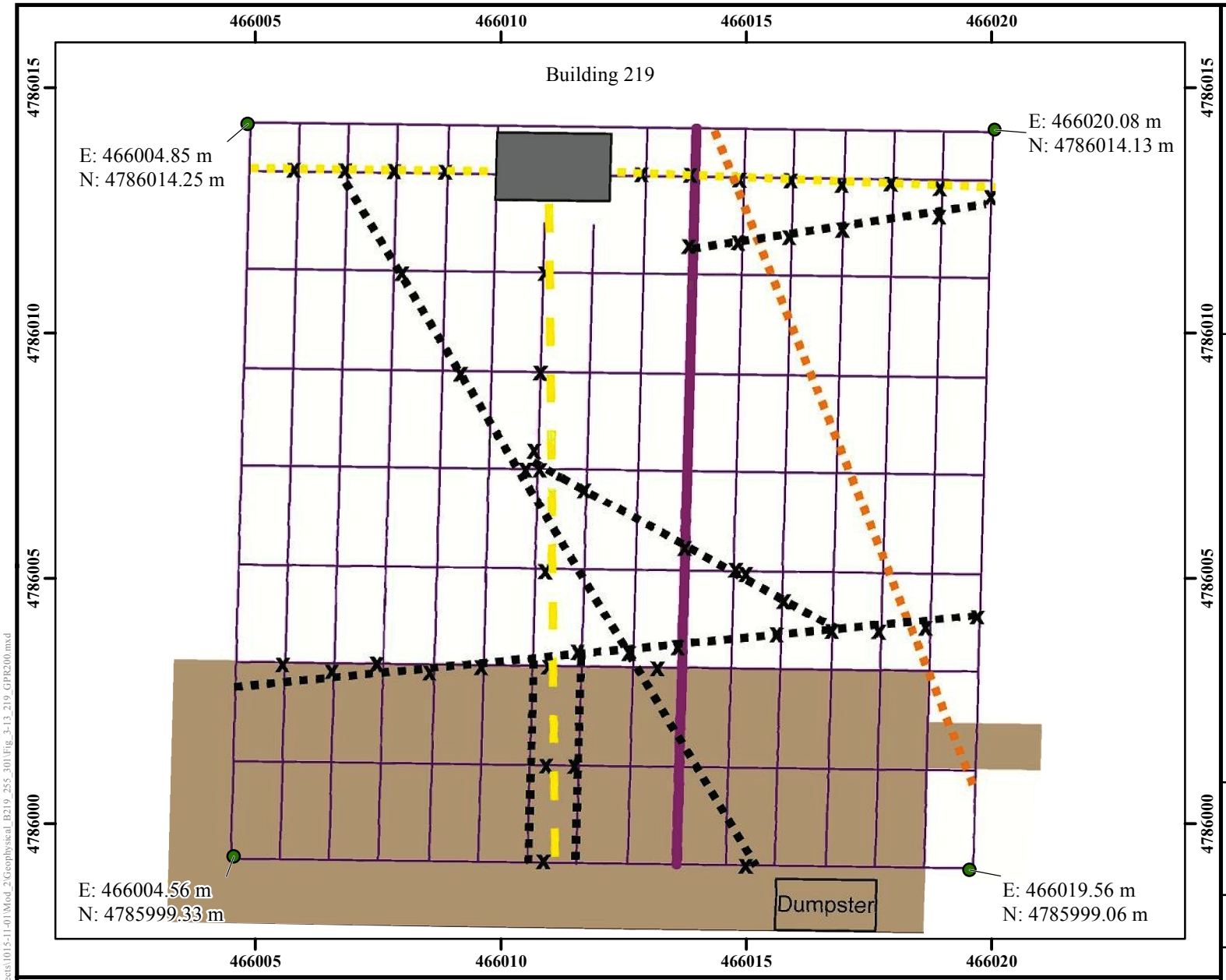
FIGURE 2

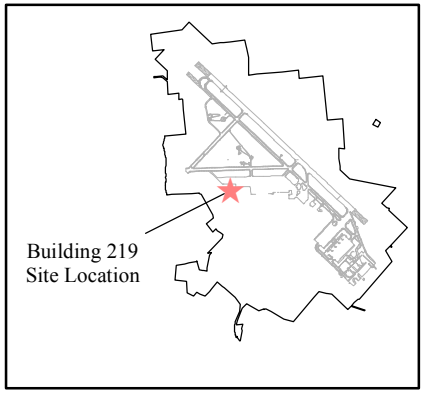
DP015 Building 219 AOC
Grid 219 MAG Data Interpretation
Analytic Signal

FPM Remediations, Inc.

July 2013

Path: Y:\GIS_Projects\Griffiss\Projects\1015-11-01\Mod 2\Geophysical_B219_255_301\Fig_3-12_219_Mag.mxd





Legend

- Grid Corner Location
- GPR Anomaly
- GPR Transect
- Marked Out Comm. Line
- Marked Out Steam Line
- Interpreted Steam Line
- Possible Buried Pipe
- GPR Profile Presented
- Metal Grate Over Steam Line Adccess
- Asphalt Parking Lot

NOTES:

Coordinate System:WGS 1984 UTM Zone 18N
Projection: Transverse Mercator
False Easting: 500,000.0000
Central Meridian: -75.0000
Latitude Of Origin: 0.0000
Horizontal Datum: WGS 1984
False Northing: 0.0000
Scale Factor: 0.9996
Units: Meter

1 inch = 10 feet

0 2 4 Meters

0 10 20 Feet

N W E S

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Rome, NY
AFCEC

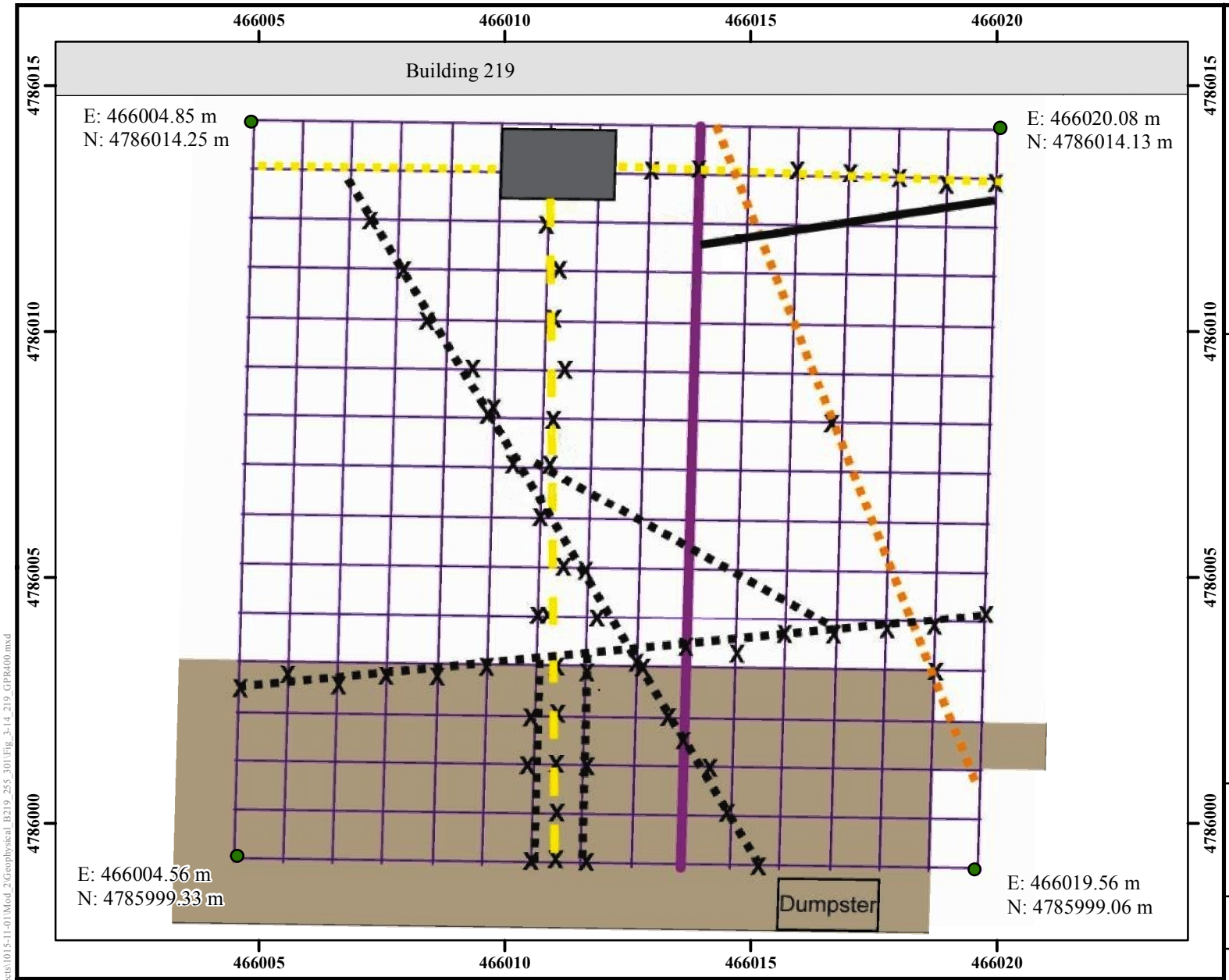
FIGURE 3

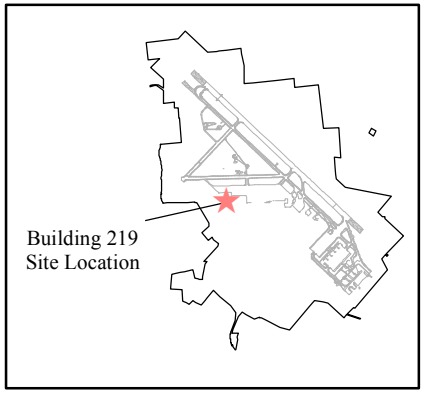
DP015 Building 219 AOC
Grid 219 GPR Data Interpretation
200-MHz Antenna

FPM Remediations, Inc.

July 2013

Path: Y:\GIS_Projects\Griffiss\Projects\1015-11-01\Mod_2\Geophysical_B219_255_301\Fig_3-13_219_GPR200.mxd





Legend

- Grid Corner Location
- GPR Anomaly
- GPR Transect
- Marked Out Com Line
- Marked Out Steam Line
- Interpreted Steam Line
- Possible Buried Pipe
- GPR Profile Presented
- Asphalt Parking Lot
- Building 219 (Existing)
- Metal Grate Over Steam Line Adccess

NOTES:

Coordinate System:WGS 1984 UTM Zone 18N
Projection: Transverse Mercator
False Easting: 500,000.0000
Central Meridian: -75.0000
Latitude Of Origin: 0.0000
Horizontal Datum: WGS 1984
False Northing: 0.0000
Scale Factor: 0.9996
Units: Meter

1 inch = 10 feet

0 2 4 Meters

0 10 20 Feet

N W E S

Former Griffiss Air Force Base
Rome, NY
AFCEC

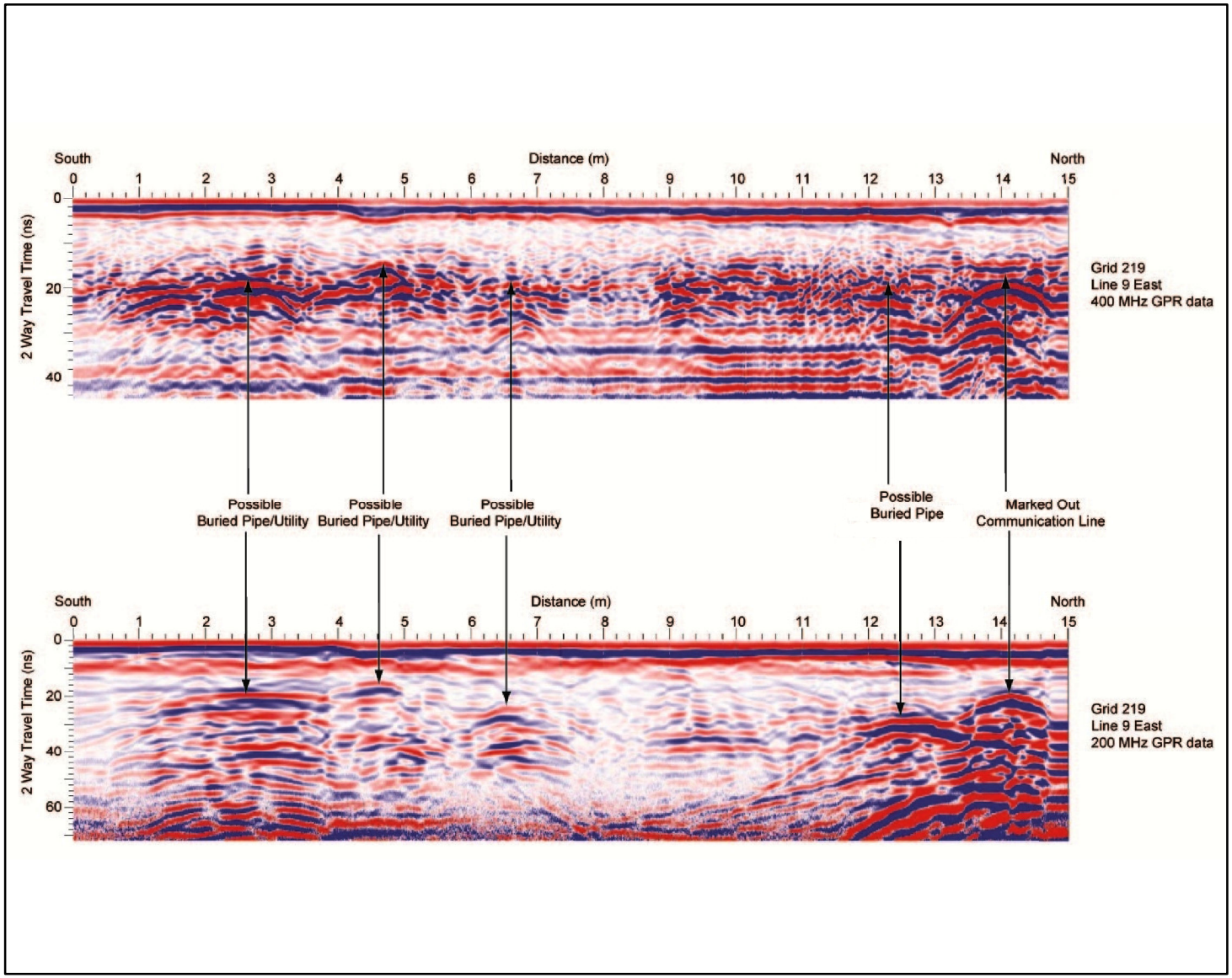
FIGURE 4

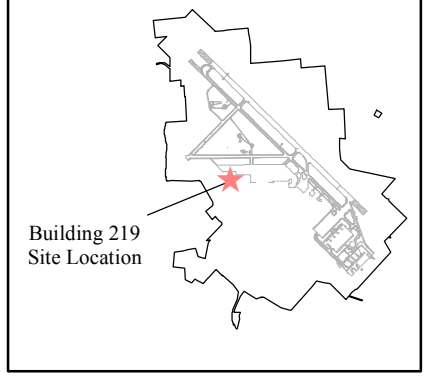
DP015 Building 219 AOC
Grid 219 GPR Data Interpretation
400-MHz Antenna

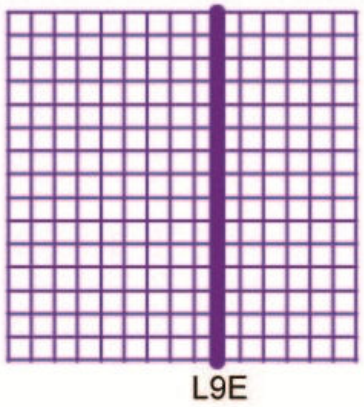
FPM Remediations, Inc.

July 2013

Path: Y:\GIS_Projects\Griffiss\Projects\1015-11-01\Mod_2\Geophysical_B219_255_301\Fig_3-14_219_GPR400.mxd







NOTES:

Coordinate System:WGS 1984 UTM Zone 18N
Projection: Transverse Mercator
False Easting: 500,000.0000
Central Meridian: -75.0000
Latitude Of Origin: 0.0000
Horizontal Datum: WGS 1984
False Northing: 0.0000
Scale Factor: 0.9996
Units: Meter

1 inch = 8 feet

0 2 4 Meters

0 8 16 Feet

N W E S

Former Griffiss Air Force Base
Rome, NY
AFCEC

FIGURE 5

DP015 Building 219 AOC
Representative GPR Profile Cross Sections
Line 9 East 200- and 400- MHz Antennas

FPM Remediations, Inc.

July 2013

Path: Y:\GIS_Projects\Griffiss\Projects\1015-11-01\Mod_2\Geophysical_B219_255_301\Fig_3-15_219_GPR_Profile.mxd

N

Site Location

Legend

- Soil Sample Location (2013)
- Soil Sample Location (2014)
- Building 219 AOC Site Boundary

* The background image does not reflect the current conditions on the ground.

15 10 5 0 15
Feet

United States Air Force
Former Griffiss Air Force Base
Rome, New York

Figure 6
DP015
Building 219 AOC
Sampling Locations

FPM Remediations, Inc.

Y:\GIS_Projects\Griffiss\Projects\1015-11-01\Mod_2\Building 219 - 2014 Sampling Locations.mxd

Appendix A
Final DP015 Building 219 AOC Record of Decision

1362 0

File: 17-C-10
M.M.

GRIFFISS AFB
NEW YORK

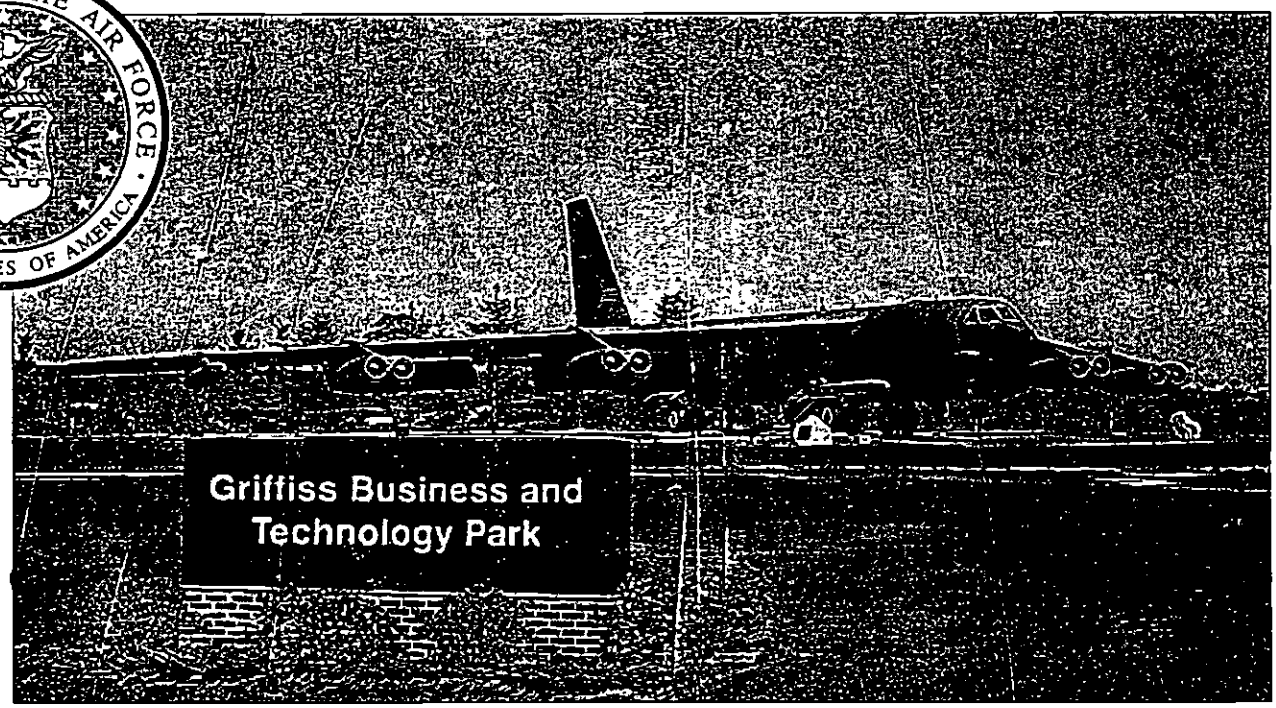
ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 1362

Final Records of Decision for Areas of Concern (AOCs)

Former Griffiss Air Force Base
Rome, New York

September 1999



- Building 301 Drywell AOC
- Building 219 Drywell AOC
- Building 214 AOC
- Fire Demonstration Area AOC
- Suspected Fire Training Area AOC

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

1362 2
94-7082
17-A-95
R1/FS
Mike W

SEP 30 1999

Mr. Albert F. Lowas
Director
AFBCA/DR
1700 North Moore Street, Suite 2300
Arlington, VA 22209-2802

Re: Record of Decision for Five Areas of Concern, Griffiss Air Force Base

Dear Mr. Lowas:

This is to inform you that after considering public comments on the Proposed Plans, Griffiss Air Force Base's responsiveness summary to those comments, the Draft Records of Decision and other supporting documents, the U.S. Environmental Protection Agency (EPA) concurs with the Records of Decision for the Suspected Fire Training Area, the Fire Demonstration Area, Building 301, Building 214 and Building 219. Enclosed is a copy of the signed Records of Decision, which I have co-signed on behalf of EPA.

These Records of Decision address only the above mentioned areas of concern. All other areas of Griffiss Air Force Base are being addressed under separate operable units. Please note that these Records of Decision require certain land use restrictions (e.g., deed restrictions) and are subject to EPA's 5-year review process (excluding the Suspected Fire Training Area which was found acceptable for unrestricted use).

If you have any questions regarding the subject of this letter, please contact me at (212) 637-5000 or have your staff contact Douglas Pocze at (212) 637-4432.

Sincerely,

Jeanne M. Fox
Regional Administrator

RECEIVED
19 OCT 1999
A.M.

cc: M. O'Toole, NYSDEC

New York State Department of Environmental Conservation
Division of Environmental Remediation, Room 260B
0 Wolf Road, Albany, New York 12233-7010
Phone: (518) 457-5861 • **FAX:** (518) 385-8404
Website: www.dec.state ny us

John P Cahill
Commissioner

SEP 16 1999

94-7082
17-A-95
R1/FS
SD-50 B/214
DP-12 B/301
SS-24 FDA
FT-48 SFTA
Mike W.

Mr. Richard L. Caspe, P.E.
Director
Emergency & Remedial Response Division
USEPA Region II
290 Broadway, 19th Floor
New York, NY 10007-1866

Dear Mr. Caspe:

Re: Draft Final Records of Decision for Bldgs. 214, 219, 301, FDA, SFTA;
Griffiss Air Force Base (ID No. 633006)

The New York State Department of Environmental Conservation (NYSDEC), in conjunction with the New York State Department of Health (NYSDOH), has reviewed the referenced Records of Decision (RODs) and find each to be acceptable.

If you have any questions or comments on this matter, please contact Mr. Sal Ervolina, of my staff, at (518) 457-4349.

Sincerely,

Michael J O'Toole, Jr.
Director
Division of Environmental Remediation

cc M McDermott
R. Wing/D Pocze, USEPA-Region II
H. Hamel, NYSDOH-Syracuse
D. Swedowski, Reg 6, Watertown
R. Joyner
L. Hansak
S Dimeo

DEPARTMENT OF THE AIR FORCE
AIR FORCE BASE CONVERSION AGENCY

1362 5

SEP 1 4 1999

1700 North Moore Street
Suite 2300
Arlington, VA 22209-2802

Mr. Richard L. Caspe
USEPA-Region II
290 Broadway, 18th Floor
New York, NY 10007-1866

Dear Mr. Caspe

Enclosed are four (4) copies of five (5) Final Records of Decision (RODs) for Building 301 Drywell Area of Concern (AOC), Building 219 Drywell AOC, Building 214 AOC, Fire Demonstration Area AOC, and Suspected Fire Training Area AOC for your review and concurrence. Once the RODs are signed, please retain one copy for your files, and forward three (3) copies to Air Force Base Conversion Agency (AFBCA) for distribution.

If you have any questions or need additonal information, please contact Ms. Lynn Hancsak at (703) 696-5244.

Sincerely

ALBERT F. LOWAS, JR.
Director

Attachment:
Final Records of Decision for Areas of Concern

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL | # of pages ►

To Mike McDermott | From Lynn

Dept./Agency | Phone #

Fax # | Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

KE6909

Final Records of Decision for Areas of Concern (AOCs) at the Former Griffiss Air Force Base Rome, New York

September 1999

Prepared for:

U.S. ARMY ENGINEER DISTRICT, KANSAS CITY
601 East 12th Street
Kansas City, MO 64106-2896

ecology and environment, inc.
International Specialists in the Environment
BUFFALO CORPORATE CENTER 368 Pleasant View Drive, Lancaster, New York 14086
Tel 716/684-8060, Fax 716/684-0844

TAB

Bldg 219 Drywell AOC

Record of Decision for Soils at the Building 219 Drywell Area of Concern at the Former Griffiss Air Force Base Rome, New York

September 1999

Prepared for:

U.S. ARMY ENGINEER DISTRICT, KANSAS CITY
601 East 12th Street
Kansas City, MO 64106-2896

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List of Acronyms

AFBCA	Air Force Base Conversion Agency
AFB	Air Force Base
AOC	Area of Concern
ATSDR	Agency for Toxic Substances and Disease Registry
BGS	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRP	Community Relations Plan
DoD	Department of Defense
EPA	United States Environmental Protection Agency
FFA	Federal Facility Agreement
FS	feasibility study
IRP	Installation Restoration Program
NCP	National Oil and Hazardous Substance Pollution Contingency Plan
NEADS	North East Air Defense Sector
NYANG	New York Air National Guard
NYSDEC	New York State Department of Environmental Conservation
PQL	Practical Quantitation Limit
QAPjP	Quality Assurance Project Plan
RI	remedial investigation
ROD	Record of Decision
SAC	Strategic Air Command
SAP	Sampling and Analysis Plan
SARA	Superfund Amendment and Reauthorization Act
SVOC	semivolatile organic compound
TBC	to be considered
USAF	United States Air Force
VOC	volatile organic compound

1 Declaration

1.1 Site Name and Location

The Building 219 Drywell Area of Concern (AOC) is located at the former Griffiss Air Force Base (AFB) in Rome, Oneida County, New York.

1.2 Statement of Basis and Purpose

This Record of Decision (ROD) presents the no further remedial action alternative with land use restricted to industrial land use as the selected remedial action for soils at the Building 219 Drywell AOC at the former Griffiss AFB. This alternative has been chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendment and Reauthorization Act (SARA), and, to the extent practicable, the National Oil and Hazardous Substance Pollution Contingency Plan (NCP). The Air Force Base Conversion Agency (AFBCA), the United States Environmental Protection Agency (EPA), and the New York State Department of Environmental Conservation (NYSDEC) have adopted this ROD through a joint agreement. This decision is based on the administrative record file for this site.

1.3 Description of Selected Remedy

The selected remedy for the Building 219 Drywell AOC is no further remedial action, with land use restrictions for industrial land use. The agencies will perform joint five-year reviews to ensure that future land use is in compliance with the transfer documents (deed) and consistent with the baseline risk assessment for industrial land use

1362 39

1.4 Declaration Statement

The AFBCA, EPA, and NYSDEC have determined that no further remedial action, with land use restrictions, is warranted for the Building 219 Drywell AOC because the baseline risk assessment for industrial land use demonstrates that contaminants in the site soil and groundwater pose no current or future threat to public health or the environment. Future landowners will be notified, through transfer documents (deed), that the land use is restricted to industrial use.

1.5 Signature of Adoption of the Remedy

On the basis of the remedial investigations (RIs) performed at the Building 219 Drywell AOC and the baseline risk assessment for industrial land use, there is no evidence that previous operations at this site have resulted in environmental contamination that poses a current or future potential threat to human health or the environment if the land is restricted to industrial use. Future landowners will be notified, through transfer documents (deed), that the land use is restricted to industrial use. The New York State Department of Environmental Conservation has concurred with the selected remedial action presented in this Record of Decision.

Albert F. Lowas, Jr.
Director
Air Force Base Conversion Agency

September 15, 1999
Date

Jeanne M. Fox
Regional Administrator
United States Environmental Protection Agency, Region 2

9/30/99
Date

2 Decision Summary

This section provides an overview of the site-specific factors and analysis that lead to the no further action with land use restrictions decision for soils at the Building 219 Drywell AOC.

2.1 Site Name, Location, and Description

Regional Site Description

The former Griffiss AFB covers approximately 3,552 contiguous acres in the lowlands of the Mohawk River Valley in Rome, Oneida County, New York. Topography within the valley is relatively flat, with elevations on the former Griffiss AFB ranging from 435 to 595 feet above mean sea level. Threemile Creek, Sixmile Creek (both of which drain into the New York State Barge Canal), and several state-designated wetlands are located on the former Griffiss AFB, which is bordered by the Mohawk River on the west. Because of its flat topography, sandy soil, and high average precipitation, the former Griffiss AFB is considered a groundwater recharge zone.

Building 219 Drywell Area of Concern

Building 219, the Electric Power Production Shop, is located in the west-central portion of the base (see Figure 2-1). Based on interviews with base personnel, a drywell was reportedly located south of Building 219 in what is now an asphalt parking lot (see Figure 2-2). The actual location of the drywell has not been determined. The drywell was reportedly a 4-foot-square by 10-foot-deep pit filled with stone and gravel.

Building 219 is not located near any natural surface water drainage features. Surface water runoff is channeled into the base storm drain system, which discharges to the Mohawk River. Groundwater flow in this area is southwesterly. Groundwater was encountered at a depth

of 14 feet below ground surface (BGS) in a soil boring southwest of the reported drywell location. The uppermost soils (to a depth of 2 feet below the asphalt pavement) have been described as fine to silty medium sand with some fine to coarse gravel. Subsurface soils from 2 feet BGS to 20 feet BGS have been described as brown to yellowish brown, fine- to coarse-grained silty sand with gravel and cobbles

2.2 Site History and Investigation Activities

The Former Griffiss AFB Operational History

The mission of the former Griffiss AFB varied during its operational history. The former Griffiss AFB was activated on February 1, 1942 as the Rome Air Depot, with the mission of storage, maintenance, and shipment of material for the U.S. Army Air Corps. Upon creation of the U.S. Air Force (USAF) in 1947, the depot was renamed Griffiss Air Force Base The base became an electronics center in 1950 with the transfer of the Watson Laboratory Complex (later Rome Laboratory). The 49th Fighter Interceptor Squadron was also added during that year. In June 1951, the Rome Air Development Center was established with the mission of accomplishing applied research, development, and testing of electronic air-ground systems. The Headquarters of the Ground Electronics Engineering Installations Agency was added in June 1958 to engineer and install ground communications equipment throughout the world. On July 1, 1970, the 416th Bombardment Wing of the Strategic Air Command (SAC) was activated with the mission of maintenance and implementation of both effective air refueling operations and long-range bombardment capability. The former Griffiss AFB was designated for realignment under the Base Realignment and Closure Acts of 1993 and 1995, resulting in deactivation of the 416th Bombardment Wing in September 1995. Rome Laboratory and the North East Air Defense Sector (NEADS) will continue to operate at their current locations. The New York Air National Guard (NYANG) operated the runway for the 10th Mountain Division deployments until October 1998, when they were relocated to Fort Drum and the Defense Finance and Accounting Services established an operating location at the former Griffiss AFB.

Environmental Background

As a result of the various national defense missions carried out at the former Griffiss AFB since 1942, hazardous substances and hazardous wastes were used, stored, or disposed of at various sites on the installation. The defense missions involved the storage, maintenance, and

shipping of war material; research and development, and aircraft operations and maintenance, among others.

Numerous studies and investigations under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP) have been carried out to detect, locate, and quantify contamination by these substances and wastes. These studies and investigations included a records search in 1981, which involved interviews with base personnel, a field inspection, compilation of an inventory of wastes, evaluation of disposal practices, and an assessment of the potential for site contamination; problem confirmation and quantification studies in 1982 and 1985; soil and groundwater analyses in 1986; a public health assessment in 1988 conducted by the U.S. Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR); base-specific hydrology investigations in 1989 and 1990; and a groundwater investigation in 1991 ATSDR issued a Public Health Assessment for Griffiss AFB dated October 23, 1995, and an addendum to the assessment report dated September 9, 1996.

Pursuant to Section 105 of CERCLA, the former Griffiss AFB was included on the National Priorities List (NPL) on July 15, 1987. On August 21, 1990, USAF, EPA, and NYSDEC entered into a Federal Facility Agreement (FFA) under Section 120 of CERCLA. Under the terms of the agreement, USAF is required to prepare and submit numerous reports to NYSDEC and EPA for review and comment. These reports include identification of environmental AOCs on base; a scope of work for an RI; a work plan for the RI, including a sampling and analysis plan (SAP) and a quality assurance project plan (QAPjP); a baseline risk assessment; a community relations plan (CRP); and the RI report. AFBCA delivered a draft-final RI report covering 31 AOCs to EPA and NYSDEC on December 20, 1996, that incorporated or addressed EPA and NYSDEC comments.

During the RI, a site-specific baseline risk assessment for industrial land was conducted (using appropriate toxicological and exposure assumptions to evaluate cancer risks and non-cancer health hazards) to evaluate the risks posed by site contaminants to the reasonable maximally exposed individual. In addition, the RI report compares detected site contaminants to available standards and guidance values using federal and state environmental and public health laws that were identified as potentially applicable or relevant and appropriate requirements (ARARs) at the site. Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies that result in a numerical value when applied to site-specific conditions. Currently, there are no chemical-specific ARARs for soil (other than for PCBs), sediments, or air. Therefore, other non-promulgated federal and state advisories and guidance values, referred to as to-be-considereds (TBCs), or background levels of the contaminants in the absence of TBCs, were considered. No further action with land use restrictions is proposed when the levels

of contaminants at the site, in comparison to the baseline risk assessment for industrial use and the applicable standards or guidance values indicate the site poses no threat to public health or the environment.

Proposed Remedy

Based on the results of the draft RI, AFBCA has proposed that no further remedial action, with land use restrictions for industrial use, be implemented at the Building 219 Drywell AOC. The land use restriction proposal was based on the contaminant levels found at the Building 219 Drywell AOC and the site-specific risk assessment for industrial use. The determination for industrial land use was based on the redevelopment plan for Griffiss AFB provided by the Griffiss Local Development Corporation (GLDC).

Summary of Site Activities

The Building 219 Drywell AOC was reportedly used to dispose of liquid wastes. Fuel spills have also been reported at this site. The drywell operated until the early 1970s, with the disposal of less than 1 gallon per day of neutralized battery acid, less than 1 gallon per day of ethylene glycol, and less than 1 gallon per month of shop floor washwater.

In the RI, the nature and extent of environmental contamination from historical releases at this AOC were investigated to determine whether any remedial action is necessary to prevent potential threats to human health and the environment that might result from exposure to site conditions. In 1993 and 1994, during the RI, a surface geophysical survey was performed, and one test pit was excavated in an attempt to locate the drywell. Neither the drywell nor any discharge points were detected by the survey, and they were not discovered during excavation.

In 1994, one soil boring was drilled in the anticipated downgradient direction from the reported drywell location. Seven soil samples were collected at 2-foot intervals from the surface to the depth of the groundwater; all samples were sent to a commercial laboratory for chemical analysis. Three volatile organic compounds (acetone, toluene, and trichloroethylene) were detected in several subsurface soil samples; all concentrations were below soil guidance values. Seven semivolatile organic compounds were also detected. Six of the SVOCs were polynuclear aromatic hydrocarbons (PAHs) (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, chrysene, fluoranthene, and pyrene). These SVOCs were detected only in the sample collected from the 0- to-2-foot depth interval, indicating that their presence may be related to asphalt at the site rather than prior disposal activities. The seventh SVOC, bis(2-ethylhexyl)phthalate, was detected in all seven soil samples and may be related to the gloves worn by field personnel or the

plastic containers used to ship deionized water to the site. The concentrations of all of the SVOCs were below soil guidance values with the exception of benzo(a)pyrene (see Table 2-1) Ten pesticides were detected in soil samples collected down to a depth of 12-feet BGS; none of their concentrations exceeded soil guidance values. Twenty-four metals were detected in the subsurface soil samples The concentrations of six metals exceeded soil guidance values (see Table 2-1).

Petroleum hydrocarbons were detected in six of the seven soil samples at concentrations ranging from 7 to 1,600 mg/kg. The highest concentrations were detected in the samples collected at depths less than 8 feet BGS, with the highest concentration occurring in the 0-to-2-foot depth interval. This finding is similar to the detection of PAHs at shallow depths and indicates that the presence of total petroleum hydrocarbons may be related to the asphalt rather than to previous disposal activities

In 1994, one grab groundwater sample was collected from the temporary monitoring well installed in the soil boring and sent to a commercial laboratory for chemical analysis. In 1995, a second grab groundwater sample was collected and analyzed for SVOCs (the laboratory had failed to analyze for SVOCs in the first sample). One VOC (trichloroethylene), three SVOCs (acenaphthylene, anthracene, and di-n-butylphthalate), five pesticides, sixteen metals, total glycols, and petroleum hydrocarbons were detected in the grab groundwater sample. None of the VOCs, SVOCs, or pesticide concentrations exceeded the screening levels. Five of the sixteen metals exceeded the standards or guidance values (aluminum, iron, manganese, sodium, thallium). Unfiltered grab groundwater samples, however, frequently yield elevated metals results due to the suspended particulate matter that contains naturally occurring metals. Therefore, grab groundwater samples are not necessarily representative of groundwater conditions.

The concentration of total glycols (0.44 mg/L) in the grab groundwater sample exceeded the New York State Groundwater Standard of 0.05 mg/L. However, glycols disposed of in the drywell in the 1970s should not be present in the environment in 1995 because glycols do not typically adsorb to either soils or sediments and rapidly biodegrade in groundwater. The physical half-life of glycols in the environment ranges from 4 to 24 days. Therefore, the presence of glycols does not appear to be related to drywell usage, but it was investigated under a separate RI AOC. Petroleum hydrocarbons were detected at a concentration of 0.3 mg/L which slightly exceeds the New York State Groundwater Standard for unspecified organic compounds (0.1 mg/L).

The groundwater is being evaluated for individual sites at the former Griffiss AFB on the basis of location and the direction of groundwater flow. Wells will be considered in groups

according to their location within given groundwater drainage areas and their relationship to individual sites or groups of sites. There are eight groundwater drainage areas on the former base; the Building 219 AOC falls within the Mohawk River drainage basin and will be discussed and evaluated in this context.

2.3 Highlights of Community Participation

A proposed plan for soils at the Building 219 Drywell AOC indicating no further action as the selected remedial action was released to the public on February 18, 1998. The document was made available to the public in both the administrative record and an information repository maintained at the Jervis Public Library. The notice announcing the availability of this document was published in the *Rome Sentinel* on February 18, 1998. In addition, a public meeting was held on March 10, 1998. At this meeting, representatives from AFBCA, EPA, and NYSDEC answered questions about issues at the AOC and the no further action proposal under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision (see Section 3).

The agencies have determined the land use restrictions that will be placed on the Building 219 Drywell AOC. This determination is based on the transfer and future reuse of the site indicated in the redevelopment plan for Griffiss AFB, which was provided by the GLDC.

This decision document presents the selected remedial action for the Building 219 Drywell AOC at the former Griffiss AFB, chosen in accordance with CERCLA, as amended by SARA and, to the extent practicable, the NPC. The decision for this AOC is based on the administrative record.

2.4 Scope and Role of Site Response Action

The scope of the no further remedial action with land use restrictions response for the Building 219 Drywell AOC addresses the soils at the site. Based on the baseline risk assessment for industrial land use, there is no evidence that the previous operations conducted at this site have resulted in environmental contamination that poses a current or potential threat to human health or the environment.

2.5 Summary of Site Risks

A baseline risk assessment for industrial land use was conducted to evaluate current and future potential risks to human health and the environment associated with contaminants found in

the soils during the RI at the Building 219 Drywell AOC. The results of this assessment were considered when formulating this no further action proposal for soils

Human Health Risk Assessment

A baseline human health risk assessment was conducted during the RI to determine whether chemicals detected at the Building 219 Drywell could pose health risks to individuals under current and proposed future land uses As part of the baseline risk assessment, the following four-step process was used for assessing site-related human health risks for a reasonable maximum exposure scenario:

- Hazard Identification--identifies the contaminants of concern at the site based on several factors such as toxicity, frequency of occurrence, and concentration;
- Exposure Assessment--estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathway (e.g., ingestion of contaminated soils) by which humans are potentially exposed,
- Toxicity Assessment--determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and
- Risk Characterization--summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of site-related risks.

The chemicals of potential concern were selected for use in the risk assessment based on the analytical results and data quality evaluation. All contaminants detected in the soil samples were considered chemicals of potential concern with the following exceptions. Detected compounds were excluded from the risk assessment if they were essential human nutrients or, for metals, if they were detected at a concentration less than twice the mean background concentration. Petroleum hydrocarbons were not included as a chemical of concern; rather the detected constituents (e.g., benzene, toluene, ethylbenzene) were evaluated.

The current and future land use designations for the Building 219 Drywell AOC are industrial The buildings adjacent to Building 219, which are also designated industrial, are primarily maintenance shops and offices occupied by base personnel. It is possible that Building 219 and the adjacent structures will be demolished and this area will become an easement next to the newly proposed parkway. In this case, there would be no complete exposure pathways, and exposure to contaminants would likely not occur. However, because of uncertainty regarding the

fate of this area, and for the purposes of the risk assessment, the future land use is assumed to be industrial. Under this scenario, the individuals most likely to be affected by subsurface soil are utility and construction workers. The exposure pathways evaluated for soil include incidental ingestion, dermal contact, and inhalation of fugitive dusts during excavation.

Quantitative estimates of carcinogenic and noncarcinogenic risks were calculated for the Building 219 AOC as part of a risk characterization. The risk characterization evaluates potential health risk based on estimated exposure intakes and toxicity values. For carcinogens, risks are estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. The risks of the individual chemicals are summed for each pathway to develop a total risk estimate. The range of acceptable risk is 1 in 10,000 (1×10^{-4}) to 1 in 1,000,000 (1×10^{-6}) of an individual developing cancer over a 70-year lifetime from exposure to the contaminant(s). A computed risk greater than 1 in 10,000 (1×10^{-4}) is considered unacceptable by EPA

To assess the overall noncarcinogenic effects posed by more than one contaminant, EPA has developed the Hazard Quotient (HQ) and Hazard Index (HI). The HQ is the ratio of the chronic daily intake of a chemical to the reference dose for the chemical. The reference dose is an estimate (with uncertainty spanning perhaps an order of magnitude or greater) of a daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during a portion of a lifetime. The HQs are summed for all contaminants within an exposure pathway (e.g., ingestion of soils) and pathways to determine the HI. When the HI exceeds 1, there may be concern for potential noncarcinogenic health effects if the contaminants in question are believed to cause a similar toxic effect.

EPA bases its decision to conduct site remediation on the risk to human health and the environment. Cleanup actions may be taken when EPA determines that risk at a site exceeds the cancer risk level of 1 in 10,000 or if the noncarcinogenic HI exceeds a level of 1. Once either of these thresholds have been exceeded, remedial action alternatives are evaluated to reduce the risk levels to within EPA's acceptable risk range of 1 in 10,000 to 1 in 1,000,000 and an HI of 1 or less.

Results of the risk assessment at the Building 219 AOC indicate that chemicals detected in the soil do not pose a current or potential threat to utility workers and construction workers. The cumulative carcinogenic risk for utility workers and construction workers were calculated as 2 in 1,000,000 (2×10^{-6}) and 1 in 1,000,000 (1×10^{-6}), respectively, which are within EPA's acceptable target risk range. For chemicals with concentrations greater than the most stringent soil guidance values, the contaminant-specific risk calculations were below the acceptable EPA risk levels. The chemical contributing most to the estimated cancer risks for utility workers and

construction workers was arsenic, which was detected at concentrations ranging from 4 to 10.7 mg/kg; the background screening concentration for arsenic in soils is 4.9 mg/kg.

The target risk level for noncarcinogenic effects, as specified by EPA, is a HI of 1. The total HI for this AOC for subsurface soils was calculated at 0.03 for the utility worker and 0.7 for the construction worker. The greatest potential noncarcinogenic hazard was from the incidental ingestion of soil. These results indicate that adverse noncarcinogenic health effects to these workers are not expected to occur from exposure to chemical concentrations in the soil.

A reference dose and cancer slope factor were not available for lead, and a quantitative risk assessment could not be performed; therefore, a qualitative assessment was performed. The concentrations of lead ranged from 1.5 to 50 mg/kg, with the highest concentration detected in the sample collected from the 0- to-2-foot depth interval. The maximum value slightly exceeds the background screening concentration (36 mg/kg) but is well below the soil guidance value of 400 mg/kg that is recommended by EPA and is based on incidental soil exposure for children. Therefore, lead concentrations in the soil at the Building 219 Drywell AOC are not expected to pose unacceptable risks to utility workers or construction workers.

Uncertainties exist in many areas of the human health assessment process. However, use of conservative variables in intake calculations and conservative assumptions throughout the entire risk assessment process results in an assessment that is protective of human health and the environment. Examples of uncertainties associated with the risk assessment for the Building 219 Drywell AOC include: (1) In quantifying exposure, it was assumed that chemicals are uniformly distributed over a defined area. At this AOC, every attempt was made to collect chemical samples from the suspected source(s) of contamination. However, because the exact location of the former drywell was never actually identified, it is possible that risk from soils was underestimated; (2) The risk assessment was quantified based on analysis of a relatively small number of soil samples from one soil boring, which can contribute to uncertainty in the risk calculations; (3) When assessing the dermal pathway, it was assumed that workers would come into contact with the soil, although the use of protective clothing is more likely. This assumption would result in potential overestimate of risk; (4) It was assumed that construction under the proposed future use scenario would occur over a one-year period, though it will probably require less time to complete due to the small size of this AOC. This assumption would result in potential overestimate of risk.

The property at the Building 219 Drywell AOC contains levels of contamination suitable for industrial/commercial usage but not necessarily suitable for residential or similar use. The transfer documents will contain the following restrictions to ensure that the reuse of the site is consistent with the risk assessment:

- The property will be industrial use unless permission is obtained from EPA, NYSDEC, and the New York State Department of Health; and

- The owner or occupant of the property shall not extract, utilize, consume, or permit to be extracted any water from the aquifer below the ground surface within the boundary of the property unless such owner or occupant obtains prior written approval from the New York State Department of Health.

Ecological Risk Assessment

A risk assessment for ecological receptors at the Building 219 Drywell was conducted during the RI. The current and one of the proposed future land uses for this AOC is industrial, which, by its very nature, minimizes the number of ecological receptors.

Although certain state endangered plants and animals have been observed on or in the vicinity of the base, no threatened or endangered plant or animal species have been identified at this site. Therefore, the ecological risk assessment was performed for terrestrial wildlife through the most likely routes of exposure, which are ingestion of soil and ingestion of native vegetation. The risk assessment was performed for the short-tailed shrew and the raccoon. The ecological HIs were calculated at much less than the target level of 1 for both animal species. The greatest values were 0.00074 for the short-tailed shrew for selenium and 0.00000044 for the raccoon for lead. Therefore, this AOC poses no threat to the terrestrial ecological receptors or the environment.

2.6 Description of the No Further Action With Land Use Restrictions Alternative

No further remedial action, with land use restrictions, is proposed for soils at the Building 219 Drywell AOC. The majority of the chemicals detected do not exceed screening levels, and there is no known source of these contaminants at the site. In addition, the baseline risk assessment for industrial use indicates that the levels of contaminants present in the soils are within or below EPA's acceptable carcinogenic risk range and pose no unacceptable noncarcinogenic risk to the occupational worker. Therefore, both the concentrations of contaminants in the soil and the baseline risk assessment demonstrate that soil contamination at the site poses no current or potential threat to public health or the environment.

2.7 Significant Changes

The proposed plan for soils at the Building 219 Drywell AOC was released for public comment on February 18, 1998. The proposed plan identified no further action as the preferred

alternative. The agencies have reviewed all written and verbal comments submitted during the public comment period Following the review of these comments, it was determined that the remedy should be amended to clarify no further remedial action, with land use restrictions, at the Building 219 Drywell AOC.

Table 2-1

COMPOUNDS EXCEEDING GUIDANCE VALUES
SUBSURFACE SOIL SAMPLES

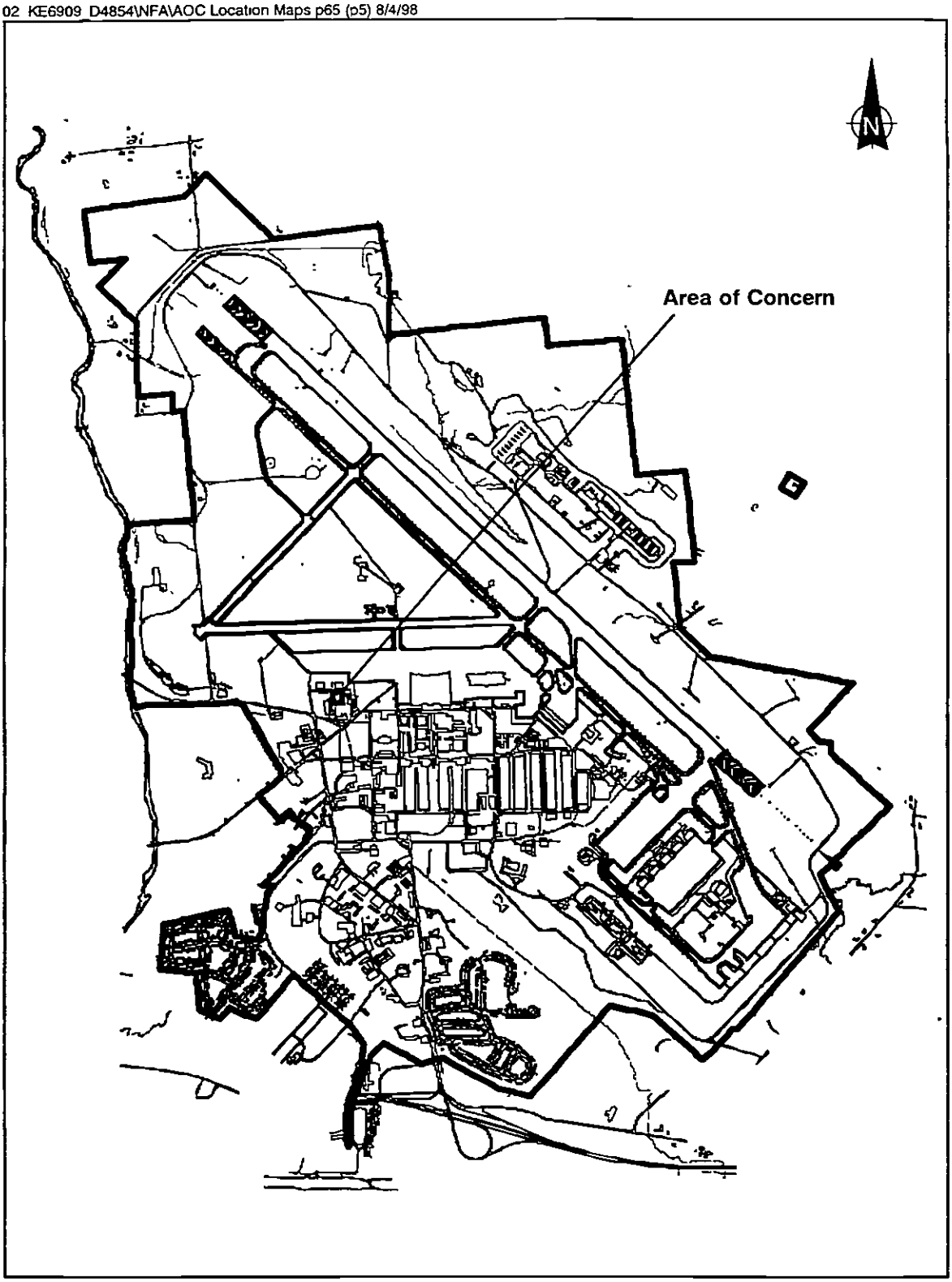
Compound	Range of Detected Concentrations	Frequency of Detection Above Most Stringent Criterion	Most Stringent Criterion
SVOCs (µg/L)			
Benzo(a)pyrene	68J	1/7	61[a]
Metals (mg/kg)			
Arsenic	4 - 10.7J	4/7	4.9[b]
Calcium	1,590 - 24,500	1/7	23,800[b]
Total chromium	9 3J - 28 9	2/7	22.6[b]
Copper	8 1 - 43.9	1/7	43[b]
Lead	1 5J - 50	1/7	36.2[b]
Manganese	283 - 2,360	1/7	2,110[b]

[a] NYS soil cleanup objective
[b] Background screening concentration

Key:

J = Estimated Concentration.

02 KE6909 D4854\NFA\AOC Location Maps p65 (p5) 8/4/98

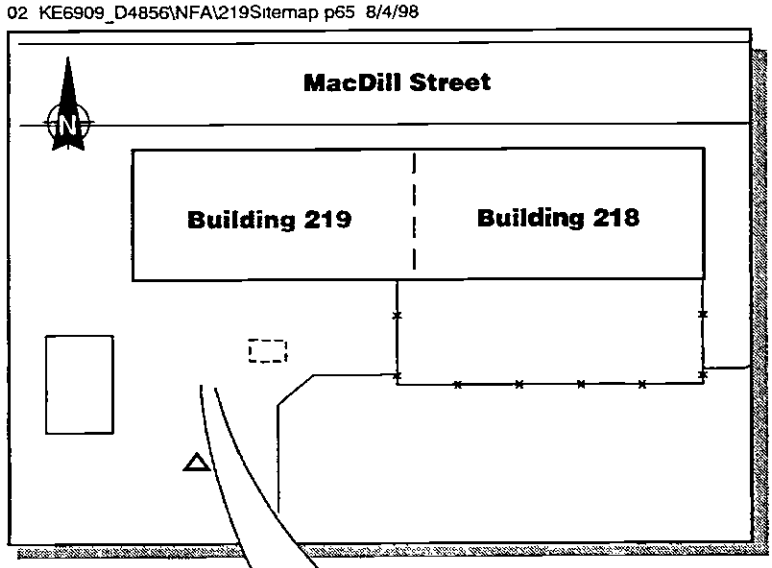


SOURCE: AFBCA 1996

SCALE
0 4,000 8,000 Feet

Figure 2-1 BUILDING 219 DRYWELL AOC FORMER GRIFFISS AIR FORCE BASE

02 KE6909_D4856\NFA\219Sitemap p65 8/4/98



KEY:
- Soil boring/grab groundwater sampling location
- Test pit location
- Fence

Building 219 Drywell was reportedly located to the south of Building 219 in an area that is now an asphalt parking lot. The parking lot is shown in the photo looking southwest from Building 219.

Figure 2-2 SITE MAP OF THE BUILDING 219 DRYWELL AOC

3 Responsiveness Summary

On Wednesday February 18, 1998, AFBCA, following consultation with and concurrence of the EPA and NYSDEC, released for public comment the no further action proposed plans at the Building 214, Building 219 Drywell, Building 301 Drywell, T-9 Storage Area, Fire Demonstration Area, and Suspected Fire Training Area Areas of Concern (AOCs) at the former Griffiss Air Force Base. The release of the proposed plans initiated the public comment period, which concluded on March 20, 1998.

During the public comment period, a public meeting was held on Tuesday March 10, 1998, at 5:00 p.m. at the former base chapel located at 525 Kirkland Drive. A court reporter recorded the proceedings of the public meeting. A copy of the transcript and attendance list are included in the Administrative Record. The public comment period and the public meeting were intended to elicit public comment on the proposal to take no further action at these sites.

This document summarizes the verbal comments and provides responses to the comments received at the March 10, 1998, public meeting. No written comments were received during the public comment period, which ran from February 18 through March 20, 1998.

Comment #1

One commentor referred to an article in the Sentinel that indicated that a certain firm involved in computer chips took the Griffiss Park off its list because it is considered a brownfield area. The same commentor also stated, "Last week a state consultant rejected the Griffiss Park's application to be one of the ten potential manufacturing sites around the state. Quoting from the Sentinel article, Dimeo said, 'The fact the park is considered a brownfield because of wastes dumped by the Air Force may have influenced that decision.' I'm wondering if any of these sites are part of that decision, are part of that brownfield?"

Response #1

No. These sites were not selected for consideration as brownfield sites. There is a brownfield site under consideration in Rome, NY; however, such evaluation is independent from the ongoing work at Griffiss.

Comment #2

Two commentors expressed concern that the contaminant levels shown in the tables of the proposed plans are above the stringent regulatory criteria shown in the tables. They requested an answer as to what rationale was used to justify no further action.

Response #2

It is assumed that this comment was directed at the T-9 Storage Area proposed plan since several compounds exceeded guidance values for surface soils at that site. Upon further review, it was decided to temporarily postpone the issuance of a ROD for the T-9 Storage Area until an interim removal action is completed. A revised proposed plan for the T-9 Storage Area will be issued. It will include the results of the confirmatory samples taken after the interim removal action is completed.

For this site, as explained in the Environmental Background section of the proposed plans:

The no further action proposal is based on an evaluation of two investigation criteria. First, a site-specific baseline risk assessment for industrial land use, using appropriate toxicological and exposure assumptions, was conducted to evaluate the risks posed by detected site contaminants. Second, the levels of contaminants found were compared to available standards and guidance values (e.g., industrial reuse) for each potential contaminant. The standards and guidance values were determined by using federal and state environmental and public health laws that were identified as potentially applicable or relevant and appropriate requirements (ARARs) at the site. Chemical-specific ARARs are usually health- or risk-based numerical values or methodologies which result in a numerical value when applied to site-specific conditions. Currently, there are no chemical-specific ARARs for soil, sediment, or air. In addition, groundwater and drinking water standards have not been promulgated for all potential contaminants. Therefore, other nonpromulgated federal and state advisories and guidance values, referred to as "TBCs," or background values of the contaminants in the absence of TBCs, were considered. Environmental sampling results were compared to the most stringent of these standards or guidance values during the remedial investigation for the AOC.

Although no further remedial action is proposed for this AOC, land use restrictions are required because the baseline risk assessment was limited to industrial/nonresidential reuse. However, the comparison of the levels of contamination to the applicable standards and guidance values (e.g., industrial reuse) indicate that this site poses no significant threat to public health or the environment if use is restricted.

Appendix B
Groundwater Restriction Removal Approval Documentation

MCDERMOTT, MICHAEL F GS-13 USAF DoD AFCEE/EXC

From: Heather Bishop <hlbishop@gw.dec.state.ny.us>
Sent: Tuesday, April 24, 2012 1:30 PM
To: Pocze.Doug@epamail.epa.gov; MCDERMOTT, MICHAEL F GS-13 USAF DoD AFCEE/EXC
Cc: John Swartwout
Subject: Re: Groundwater Deed Restriction Removal

Mike,
We (NYSDEC and NYSDOH) have reviewed the request for the deed restriction removal for Tin city and SS017 Lot 69. We have no comments or problems with the request and can go forward with it. Please let me know if you need more information.
Thanks -Heather

Heather Bishop
NYSDEC
Division of Environmental Remediation
Remedial Bureau A
625 Broadway, 11th Floor
Albany, NY 12233-7015
Phone: (518) 402-9692
Fax : (518) 402-9022>>> "MCDERMOTT, MICHAEL F GS-13 USAF DoD AFCEE/EXC" <michael.mcdermott.1@us.af.mil> 3/30/2012 11:11 AM >>> Doug, Heather, Any word on the groundwater deed restriction removal request for Tin city and SS017 Lot 69? I will be in San Antonio next Monday, Tuesday and Wednesday; just like to know where we stand.

"//SIGNED//"
Michael McDermott
Air Force Center for
Engineering and the Environment
Building 770
428 Phoenix Drive
Rome, New York 13441
Phone: 315-356-0810, ext. 202
FAX: 315-356-0816
email: michael.mcdermott.1@us.af.mil

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

JUN - 7 2012

Mr. Michael McDermott
BRAC Environmental Coordinator
Air Force Real Property Agency
428 Phoenix Drive
Rome, NY 13441-4105

Re: Removal of Groundwater Deed Restrictions
Building 301
Former Griffiss AFB, Rome NY

Dear Mr. McDermott:

The U.S. Environmental Protection Agency (EPA) has reviewed your request to remove the groundwater restrictions from the deed at Building 301, located at the former Griffiss AFB in Rome, New York.

As you are aware, groundwater restrictions and sampling were required as part of the selected remedy for Area of Concern – Building 301. These restrictions and continued monitoring were required as part of the remedy documented in the CERCLA Record of Decision (ROD), dated Sept. 30, 1999.

Since the selection of the remedy, the restrictions were incorporated into the appropriate deed. In addition, additional monitoring has been performed and the results have been below NYSDEC Groundwater Standards. Furthermore, annual land use and institutional control certifications were performed, as well as CERCLA-mandated Five-Year reviews. The information presented in these documents also indicates that the remedy remained protective of human health and the environment.

Therefore, based upon this information (i.e. the ROD, the Five-Year Reviews, annual land use and institutional control certification reports, and Long-Term Monitoring data), EPA concurs with your request to remove the groundwater restrictions from the applicable deed. Please note, this approval is only for this request and does not applied to any other requirements of the ROD.

Should you have any questions, please contact Douglas Pocze, of my staff, at (212) 637-4432.

Sincerely,

John S. Malleck, Chief
Federal Facilities Section

Appendix C
Geophysical Investigation Methodology and Field Procedures

GEOPHYSICAL SURVEY METHOLODY AND FIELD PROCEDURES

LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AGC	Automatic Gain Control
AOC	Area of Concern
BGS	Below Ground Surface
DGPS	Differential Global Positioning System
EM	Electromagnetic
EM61	Geonics EM61-Mk2 Time Domain Metal Detector
FPM	FPM Remediations, Inc.
G-858	Geometrics G-858G Cesium Vapor Magnetometer
GIS	Global Information System
GNSS	Global Navigation Satellite System
GPR	Ground Penetrating Radar
GSSI	Geophysical Survey Systems, Inc.
Hz	Hertz
m	Meter
MAG	Magnetometer
MHz	Megahertz
mV	Millivolt
nT	Nanotesla
PC	Personal Computer
QC	Quality Control
RI	Remedial Investigation
S-N	South to North
UTM	Universal Transverse Mercator
W-E	West to East
WGS	World Geodetic System

1.0 DESCRIPTION OF SURVEY METHODOLOGY

FPM used the following geophysical instrumentation to perform the geophysical surveys:

- Geophysical Survey Systems, Inc. (GSSI) SIR System-3000 Ground Penetrating Radar (GPR) coupled to 200- and 400-megaHertz (MHz) antennas;
- Geonics EM61-Mk2 Time Domain Electromagnetic metal detector (EM61);
- Geometrics, Inc. G-858G Cesium Vapor Magnetometer (G-858); and
- Trimble Pathfinder Pro XRT Global Navigation Satellite System (GNSS) Differential Global Positioning System (DGPS).

1.1 SURVEY EQUIPMENT AND METHOD DESCRIPTIONS

1.1.1 GPR Survey

The GPR data were collected using the GSSI SIR System-3000 coupled to 200- and 400-MHz antennas. The GPR system operates by introducing a short radar electromagnetic (EM) pulse into the ground. Propagation of the radar pulse is controlled by the dielectric constant (relative permittivity) and electrical conductivity of the materials being investigated. A contrast in the dielectric constant and/or electrical conductivity causes some of the radar energy to be reflected back to the receiver. Reflected radar energy is amplified, digitized and recorded on the SIR 3000's hard drive.

The effective depth of penetration of the radar pulse is controlled by the physical properties of the materials present and the frequency of the transmitted radar pulse. Lower frequency antennas have greater effective penetration depths than higher frequency antennas for all material types. The spatial resolution of the resulting data is dependent on both data density (measurement rate and line spacing) and the frequency of the transmitted radar pulse. Higher frequency antennas resolve smaller features than lower frequency antennas. The higher frequency antenna measurements also record data over a smaller effective area and require a tighter spacing between parallel lines of data to cover an area than a lower frequency antenna.

The detection capabilities of the two antennas were expected to provide complimentary data and present a more complete picture of subsurface conditions. Both antennas were used to collect GPR data over the same lines.

1.1.2 EM Survey

The Geonics EM61 metal detector generates a pulsed primary magnetic field that induces "secondary" eddy currents in the ground and in nearby metal objects. The receiver is timed to measure the induced secondary magnetic field in four time gates after the primary field generated within the ground has dissipated (i.e., measured response is caused only by currents induced in metal objects). The EM61 depth of exploration depends primarily on the size of the target, and to a lesser degree on the type of metal. The EM61 has an effective exploration depth in excess of 3 m for locating large conductive features, and would likely be able to detect an object the size of a metal drum buried at a depth greater than 2.0 to 2.5 meter (m) below ground surface (bgs).

The EM61 system used for the surveys consists of a 1.0-m x 0.5-m coil that was configured in the wheel or "cart" mode for this project. The single coil, which is both a transmitter and receiver, is located 17.5 inches above the ground surface. The nominal sampling width of the EM61 is 1.0 m. EM61 data were recorded on a Juniper Systems, Inc. Allegro data logger.

1.1.3 MAG Survey

The G-858 used for the geophysical surveys consisted of two optically pumped cesium vapor magnetometers that were configured in a horizontal gradiometer array and connected to the G-858 microprocessor console. The horizontal gradiometer array allows for sampling two lines of survey data in one pass. The G-858 total field magnetometer / gradiometer is used for detecting and mapping ferrous metallic objects by measuring the net strength of the total magnetic field simultaneously within the two magnetic sensors. The total magnetic field includes the earth's geomagnetic field [approximately 53,700 nanoTeslas (nT) in Rome, New York] and any anomaly generated from nearby ferromagnetic material. The G-858 depth of exploration depends primarily on the amount of ferromagnetic material present in the target, and would likely be able to detect a ferrous metal drum buried at a depth greater than 3.0 to 3.5 m bgs.

The G-858 system was operated in backpack mode where the two sensors were mounted on a low magnetic signature staff that was carried horizontally by the instrument operator at waist height. The sensors were mounted horizontally, with a nominal sensor separation of 0.6 m (23.6 inches), and carried approximately 0.25 m (10.0 inches) above the ground surface.

1.1.4 DGPS Survey

The Trimble Pathfinder Pro XRT is a 12-channel DGPS unit that utilizes multipath rejection technology and differential correction to provide sub-meter level accuracy. The DGPS was operated in backpack mode with the antenna mounted on a 2 m pole. The DGPS was used to locate the grid corners and to map the locations of known infrastructure such as marked out utilities, manhole covers, drains, utility stick-ups, and any other notable surface features that could affect the geophysical data including natural obstacles. The coordinate system used for the DGPS data was World Geodetic System (WGS) 1984 UTM Zone 18N and the units used were meters.

1.2 QUALITY CONTROL

1.2.1 GPR Survey

Initially, GPR system optimization testing was performed by varying depth range and signal amplitude gain and filter settings to determine system parameters best suited for site subsurface conditions. Once established, these parameters were used for the duration of the surveys. All GPR survey work was performed in accordance with professionally accepted practices and the manufacturer's instrument manual.

1.2.2 EM Survey

Prior to collecting EM61 survey data, a series of quality control (QC) tests were performed to verify the instrument was functioning properly. The tests included cable-shake, personnel, and static-standard. These tests, among others, are detailed in **Table 2-1** below. The EM61 survey work was performed in accordance with professionally accepted practices and the manufacturer's instrument manual.

1.2.3 MAG Survey

Prior to collecting G-858 survey data, a series of QC tests were performed to verify the instrument was functioning properly. The tests included cable-shake, personnel, and static-standard. These tests, among others, are detailed in **Table 2-1** below. The G-858 survey work was performed in accordance with professionally accepted practices and the manufacturer's instrument manual.

Table 1-1
EM61 and G-858 QC Tests

Test Description	Purpose	Acceptance Criteria
Warm-up test (beginning of day)	Warming up electronics (5-15min)	-
Null Instrument (beginning of day)	Performed in an area free of metal, instrument fully warmed up prior to nulling.	-
Personnel Test (beginning of day)	Determines the presence of metal on the operator.	EM - No change in the instrument response
		MAG - ≥ 3 nT change in the instrument response
Cable Shake Test (beginning of day)	Determines the presence of shorts or bad connections within the cables (5 seconds).	Both - data does not exhibit spikes
Static Test (beginning and end of day)	Demonstrates the stability of readings and repeatability of instrument response (3 minutes).	EM - 2.5 milliVolt (mV) peak to peak, < 20% deviation
		MAG - 1 nT peak to peak, < 20% deviation
Standard Test-Instrument Response (beginning and end of day)	Quantifies the response of the instrument to a standard test item (1 minute).	Both - < 20% deviation from test to test
Static Test-System Relaxation (beginning and end of day)	Demonstrates the ability to recover the system after electronic stress caused by standard item (1 minute).	EM - 2.5 mV peak to peak; MAG - 1 nT peak to peak; Both - mean value is approximately same as mean value from Static Test

1.3 FIELD PROCEDURES

1.3.1 Survey Grid Layout

A grid was established in each Area of Concern (AOC) centered over the approximate location of the suspected drywell using GIS. Each grid was set up orthogonally in the south to north (S-N) and west to east (W-E) directions with 15- by 15-m dimensions. The corners of the survey grids were located using the DGPS in the field.

First, the survey lines were laid out in the field with non-metallic tapes using a 1 m line interval in both directions. Then all corners, survey line ends, and intersections were identified with labeled non-metallic flags or using survey marking paint where flagging was not possible (asphalt). The naming convention for the grid based survey lines was that the west-east survey lines were labeled L1N, L2N, L3N, etc. and the south-north lines were labeled L1E, L2E, L3E, etc. The survey grids were established with the southwest corner of the survey area as the origin point (0,0) with X positive to the east and Y positive to the north. Known utilities were marked-out with paint and/or flags prior to the start of the geophysical fieldwork. **Photo 1** shows the grid set up at the Building 301 location, **Photo 2** shows the grid set up at the Building 255 location, and **Photo 3** shows the grid set up at the Building 219 location.

1.3.2 GPR Survey

GPR profile data were collected in the Building 219, 255, and 301 survey areas using 200- and 400-MHz antennas. For the Building 219 survey data using the 400-MHz antenna were collected along 32 survey lines in the S-N and W-E directions and along 25 survey lines using the 200-MHz antenna in the S-N and W-E directions. For the Building 255 survey data using the 400-MHz antenna were collected along 32 survey lines in the S-N and W-E directions and along 28 survey lines using the 200-MHz antenna in the S-N and W-E directions. For the Building 301 survey data using the 400-MHz antenna were collected along 32 survey lines in the S-N and W-E directions and along 16 survey lines using the 200-MHz antenna in the S-N direction. **Photo 4** shows the SIR 3000 system with 200-MHz antenna and **Photo 5** shows the SIR 3000 system with 400-MHz antenna.

GPR data were recorded semi-continuously at 32 scans per second as the antenna was pulled across the survey lines. The data were viewed in real-time on the GPR system color monitor and later processed with GSSI's RADAN® software and printed for data interpretation.

Data file names were recorded on the data file tracking form at the time of acquisition. At the end of each day the GPR data were downloaded to a personal computer (PC) and reviewed using GSSI's RADAN® software. At the end of the investigation the data were backed up in duplicate on a central server.

1.3.3 EM Survey

A Geonics EM61-Mk2 survey was performed at each 15- by 15-m grid location. EM data were collected along 16 parallel S-N lines spaced 1 m apart**.** The EM data were recorded at a rate of 10 Hertz (Hz) (~1 measurement per 0.1 m) along each line. **Photo 6** shows the EM61-MK2 EM system.

Data file names were recorded on the data file tracking form at the time of acquisition. The EM data were recorded in an Allegro data logger. At the end of each day the EM data were downloaded to a PC and reviewed using DAT61MK2 software by Geonics Limited. At the end of the investigation the data were backed up in duplicate on a central server.

1.3.4 MAG Survey

A Geometrics G-858 survey was performed at each 15- by 15-m grid location. MAG data were collected along 16 parallel S-N lines spaced 1 m apart. The MAG data were recorded at a rate of 10 Hertz (Hz) (~1 measurement per 0.1 m) along each line.

Data file names were recorded on the data file tracking form at the time of acquisition. The MAG data were recorded in an Allegro data logger. At the end of each day the MAG data were downloaded to a PC, and reviewed using MagMap2000 software by Geometrics. At the end of the investigation the data were backed up in duplicate on a central server

1.4 DATA PROCESSING AND ANALYSIS

1.4.1 GPR Data

GPR profile data were processed and analyzed using GSSI's RADAN® software. The GPR data were traced balanced and gained using an automatic gain control (AGC) function. A color amplitude function was chosen to enhance features of interest. Targets were manually picked and positional information was evaluated graphically. The results were imported into Adobe Illustrator for presentation as color enhanced profile cross-sections.

1.4.2 EM Data

The raw EM61-MK2 data were converted to Geosoft *.xyz files in Geonics Limited DAT61MK2. EM61-Mk2 data were processed using the Geosoft Oasis Montaj® geophysical data-analysis software to determine the presence or absence of metallic conductors at the site. The geophysical sensor data were evaluated for spikes, gaps, and sensor failure. The data from all four channels were analyzed to determine the most appropriate channel to use to meet the site-specific objectives. The channel 2 data were selected as the most appropriate channel to use for the interpretations. A demedian filter was applied to the geophysical data to remove sensor drift, regional trend, and level the data to a zero baseline. The demedian channel 2 data were gridded and color-enhanced to facilitate recognition of site anomalies. A color amplitude scale (0 – 40 mV) was applied to the gridded data to enhance features of interest. The results were imported into Adobe Illustrator for presentation as color enhanced plan view grid maps.

1.4.3 MAG Data

The Raw total field G-858 binary geophysical data were converted to Geosoft *.xyz files in Geometrics MagMap. The G-858 data were processed using the Geosoft Oasis Montaj® geophysical data-analysis software to determine the presence or absence of ferrous metal objects at the site. The geophysical sensor data were evaluated for spikes, gaps, and sensor failure. A demedian filter was applied to the geophysical data to remove sensor drift, regional trend, and level the data to a zero baseline. The demedian total field data were converted to analytic signal data, gridded, and color-enhanced to facilitate recognition of site anomalies. A color amplitude scale (0 – 2,000 nT/m) was applied to the gridded data to enhance features of interest. The results were imported into Adobe Illustrator for presentation as color enhanced plan view grid maps.

Appendix D
Daily Chemical Quality Control Reports

Daily Chemical Quality Control Report

Project/Delivery Order Number: 1015-11-01 Date: 5/6/2013

Project Name/Site Number: Site Closure Sampling at Building 301 AOC / DP012, Building 255 / DP013, Building 214 / SD050, and DP015 / Building 219

Weather conditions: Temperature: 76 F Barometric reading: 30.22
Wind speed and direction: 13 mph
Significant wind changes: none

General description of tasks completed: Soil Sampling with geoprobe.

Explain any departures from the SAP or deviations from approved procedures during the day's field activities: None

Explain any technical problems encountered in the field or field equipment/field analytical instrument malfunction: None

Corrective actions taken or instructions obtained from AFCEE/USACE personnel: No corrective actions necessary.
None

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

DCQCR Prepared by: Daniel Baldyga Date: 5/6/13

CQCC Signature: Daniel Baldyga Date: 5/6/13

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

SOIL / SEDIMENT SAMPLING FORM

Project: 214 SITE CLOSURE Sampled by: MG / JD

Site and Site Code (**SITEID**): 1015 - 11 - 01

Sampling Location ID. (**LOCID**): B214SCS6-2

Date (**LOGDATE**): 5/6/13 Time: 1355

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 2' REC	0.0' - 0.4' TOPSOIL: LT BROWN, MOIST, SILT, LITTLE GRAVEL. 0.4' - 2.0' BROWN, MOIST, F-C GRAVEL, LITTLE SILT, LITTLE SAND
4 - 8 1.5' REC	0.0' - 1.5' BROWN, MOIST, F-C GRAVEL, SOME SAND, LITTLE SILT.
8 - 12 2.5' REC	0.0' - 2.5' BROWN, MOIST TO WET, F-C GRAVEL, SOME SAND, TR. SILT

Comments/Observations:

Sample Time: 1406 Sample ID: B214SCS0204AA

Sample Time: 1408 Sample ID: B214SCS0208AA

Sample Time: 1411 Sample ID: B214SCS0212AA

SOIL / SEDIMENT SAMPLING FORM

Project: 214 SITE CLOSURE Sampled by: MG/JD

Site and Site Code (**SITEID**): 1015 - 11 - 01

Sampling Location ID. (**LOCID**): B214SCS-3

Date (**LOGDATE**): 5/6/13 Time: 1345

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 2.3' REC	0.0' - 0.3' TOPSOIL: D. BROWN, MOIST, SILT, SOME FINE SAND. 0.3' - 1.4' BROWN, MOIST, F-M SAND, SOME GRAVEL, TR. SILT 1.4 - 2.3' CRUSHED STONE. ~~1.4 - 2.3' [illegible]~~
4 - 8 1.5' REC	0.0' - 0.4' CRUSHED STONE 0.4' - 1.5' D. BROWN, MOIST, F-C GRAVEL, SOME SAND TR. SILT
8 - 12 1.1' REC	0.0' - 1.1' ~~[illegible]~~ D. BROWN, MOIST TO WET, F-C SAND, SOME GRAVEL, TR. SILT.

Comments/Observations:

Sample Time: 1357 Sample ID: B214SCS0304AA

Sample Time: 1359 Sample ID: B214SCS0308AA

Sample Time: 1403 Sample ID: B214SCS0312AA

SOIL / SEDIMENT SAMPLING FORM

Project: 214 SITE CLOSURE Sampled by: MG | JD

Site and Site Code (**SITEID**): 1015-11-01

Sampling Location ID. (**LOCID**): B214SCS-4

Date (**LOGDATE**): 5/6/13 Time: 1335

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 0.8' REC	0.0' - 0.6' TOPSOIL: BROWN, DRY, FINE SAND, SOME SILT. 0.6' - 0.8' LT. BROWN, MOIST, FINE SAND, TR. (B)
4 - 8 1.2' REC	0.0' - 0.3' S.A.A. 0.3' - 1.2' D. BROWN, MOIST, F-C GRAVEL, SOME SAND, TR. CLAY
8 - 12 2.4' REC	0.0' - 1.2' S.A.A. 1.2' - 2.4' D. BROWN, WET, F-C GRAVEL, SOME SAND, TR CLAY

Comments/Observations:

Sample Time: 1345 Sample ID: B214SCS0404AA

Sample Time: 1349 Sample ID: B214SCS0408AA

Sample Time: 1353 Sample ID: B214SCS0412AA/AC

(1355)

SOIL / SEDIMENT SAMPLING FORM

Project: B 219 CLOSURE Sampled by: MG/JD

Site and Site Code (**SITEID**): 1015 - 11-01

Sampling Location ID. (**LOCID**): B219 SCS - A 1

Date (**LOGDATE**): 5/6/03 Time: 1140

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 1.2' REC	0' - 0.4' TOPSOIL: LT. BROWN, DRY, SILT, LITTLE GRAVEL, TR SAND. 0.4' - 1.2' BROWN, F-C SAND, SOME GRAVEL, TR. CLAY
4 - 8 1.5' REC	0' - 1.5' BROWN, MOIST, F-C GRAVEL, SOME SAND, TR. CLAY
8 - 12 1.5' REC	0 - 1.5' BROWN, WET, S.A.A.

Comments/Observations:

Sample Time: ~~1153~~ 1153 Sample ID: B219SCS0104AA

Sample Time: ~~1156~~ 1156 Sample ID: B219SCS0108AA

Sample Time: ~~1200~~ 1200 Sample ID: B219 SCS 0112AA

SOIL / SEDIMENT SAMPLING FORM

Project: B 219 CLOSURE Sampled by: MG LOD

Site and Site Code (**SITEID**): 1015-11-01

Sampling Location ID. (**LOCID**): B219SCS - 2

Date (**LOGDATE**): 5/6/13 Time: 1149

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 1.4' REC	0' - 0.4' TOPSOIL; LT. BROWN, DRY, SILT, LITTLE SAND, TR. SAND. 0.4 - 1.4' BROWN, MOIST, F-C GRAVEL, LITTLE SAND, LITTLE SILT
4 - 8 0.7' REC	0.0 - 0.7' S.A.A. WET AT BOTTOM 0.1'.
8 - 12 1.7' REC	0.0' - 0.8' S.A.A. (MOIST) 0.8' - 1.7' BROWN, WET, F-C SAND, SOME GRAVEL, TR. SILT.

Comments/Observations:

Sample Time: 1208 Sample ID: B219SCS0204AA

Sample Time: 1211 Sample ID: B219SCS0208AA

Sample Time: 1215 Sample ID: B219SCS0212AA

SOIL / SEDIMENT SAMPLING FORM

Project: B219 CLOSURE Sampled by: MA / JD

Site and Site Code (**SITEID**): 1015-11-01

Sampling Location ID. (**LOCID**): B219SCS-3

Date (**LOGDATE**): 5/6/13 Time: 1200

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0-4 2.2' REC	0.0'-0.3' TOPSOIL: LT. BROWN, DRY, FINE SAND, SOME SILT, TR GRAVEL 0.3'-1.3' BROWN, DRY, F-C SAND, SOME GRAVEL, LITTLE SILT 1.3'-1.9' LT BROWN, FINE SAND. 1.9'-2.2' BROWN, MOIST, GRAVEL, SOME SAND, TR. CLAY
4-8 1.0' REC	0-0.4' LT. BROWN, MOIST, FINE SAND. 0.4'-1.0' GRAVEL (F-C), LITTLE CLAY, LITTLE SAND
8-12 1.8' REC	0.0-1.8' BROWN, MOIST TO WET, F-C GRAVEL, SOME SAND, TR SILT, TR CLAY

Comments/Observations:

Sample Time: 1217 Sample ID: B219SCS0304AA / AS / AD

Sample Time: 1221 Sample ID: B219SCS0508AA

Sample Time: 1225 Sample ID: B219SCS0312AA

SOIL / SEDIMENT SAMPLING FORM

Project: B219 CLOSURE Sampled by: MG / JD

Site and Site Code (**SITEID**): 1015-11-01

Sampling Location ID. (**LOCID**): B219SCS - 01

Date (**LOGDATE**): 5/6/13 Time: 1129

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 2' REC	0' - 0.3' TOPSOIL: BROWN, DRY SILT, LITTLE F SAND. 0.3' - 0.6' CRUSHED STONE 0.6' - 2.0' BROWN, DRY TO MOIST, F-C SAND, SOME GRAVEL, TRACE CLAY
4 - 8 1.8' REC	0' - 0.5' COBBLE, CRUSHED STONE. 0.5' - 1.8' BROWN, MOIST TO WET, F-C SAND, SOME GRAVEL, LITTLE TO TR. CLAY
8 - 12 2.5' REC	0' - 2.3' S.A.A. 2.3' - 2.5' SILT (BROWN, WET).

Comments/Observations:

Sample Time: 1140 Sample ID: B219SCS0401AA

Sample Time: 1143 Sample ID: B219SCS0408AA

Sample Time: 1145 Sample ID: B219SCS0412AA / AC (1146)

SOIL / SEDIMENT SAMPLING FORM

Project: B 219 Closure Sampled by: MA / SD

Site and Site Code (**SITEID**): 1015-11-01

Sampling Location ID. (**LOCID**): B219SCS-5

Date (**LOGDATE**): 5/6/13 Time: 1115

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 1.9' REC	0' - 0.8' TOPSOIL: BROWN, DRY, FINE SAND, SOME SILT, LITTLE GRAVEL. 0.8' - 1.9', BROWN, MOIST F-C SAND, SOME GRAVEL, LITTLE CLAY. WET AT 1.6 - 1.9'
4 - 8 1.3' REC	0.0 - 1.3' BROWN, WET, F-C GRAVEL, SOME SAND, TR CLAY.
8 - 12 1.5' REC	0.0 - 1.5' BROWN, WET, F-C GRAVEL, SOME SAND, LITTLE SILT, TR. CLAY.

Comments/Observations:

Sample Time: 1129 Sample ID: B219SCS0504AA

Sample Time: 1133 Sample ID: B219SCS0508AA

Sample Time: 1137 Sample ID: B219SCS0512AA

SOIL / SEDIMENT SAMPLING FORM

Project: B219 CLOSURE Sampled by: MG/JD

Site and Site Code (**SITEID**): 1015-11-01

Sampling Location ID. (**LOCID**): B219SCS-6

Date (**LOGDATE**): 5/6/13 Time: 1111

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0 - 4 2' REC	0'-0.5' TOPSOIL: BROWN, DRY, SILT, LITTLE F. SAND. 0.5'-2.0' BROWN, MOIST, SILTY CLAY, SOME F-C GRAVEL, LITTLE SAND.
4 - 8 1.7' REC	0'-1.3' BROWN, MOIST TO WET, F-C GRAVEL, SOME F-M SAND, TR. CLAY 1.3'-1.7' COBBLE FRAGMENTS.
8 - 12 2' REC	0'-2.0' BROWN, MOIST TO WET, F-C SAND, SOME GRAVEL, TR. SILT.

Comments/Observations:

UTILITIES EVERYWHERE, MOVE ~ 2' SOUTH.

Sample Time: 1119 Sample ID: B219SCS0604AA

Sample Time: 1124 Sample ID: B219SCS0608AA

Sample Time: 1127 Sample ID: B219SCS0612AA

CHAIN OF CUSTODY RECORD

COC#: _2_ SDG#: 1 2 (Open/Closed) Cooler ID#: _A_

Ship to:	Project Name: Griffiss AFB DP015 Building 219	Send Results to:
Elaine Walker Test America Laboratories, Inc. 4955 Yarrow Street Arvada, Colorado Tel: 303-736-0156	Sampler Name: Justin Damann	Daniel Baldyga FPM Remediations, Inc 584 Phoenix Drive Rome, NY 13441 Phone: (315) 336-7721 Ext. 207
Carrier: Test America courier.	Sampler Signature:	

Analyses requested

Field Sample ID	LocID	Date 2013	Time	MATRIX	SMCODE	SACODE	SBD/SED	# of Containers	Metals: note 4 4 oz glass jar	Comments
B219SCS0104AA	B219SCS-1	5/6	1153	SO	G	N	0/0	1	1	
B219SCS0108AA	B219SCS-1	5/6	1156	SO	G	N	0/0	1	1	
B219SCS0112AA	B219SCS-1	5/6	1200	SO	G	N	0/0	1	1	
B219SCS0204AA	B219SCS-2	5/6	1208	SO	G	N	0/0	1	1	
B219SCS0208AA	B219SCS-2	5/6	1211	SO	G	N	0/0	1	1	
B219SCS0212AA	B219SCS-2	5/6	1215	SO	G	N	0/0	1	1	
B219SCS0304AA	B219SCS-3	5/6	1217	SO	G	N	0/0	1	1	
B219SCS0308AA	B219SCS-3	5/6	1221	SO	G	N	0/0	1	1	
B219SCS0312AA	B219SCS-3	5/6	1225	SO	G	N	0/0	1	1	
B219SCS0404AA	B219SCS-4	5/6	1140	SO	G	N	0/0	1	1	
B219SCS0408AA	B219SCS-4	5/6	1143	SO	G	N	0/0	1	1	
B219SCS0412AA	B219SCS-4	5/6	1145	SO	G	N	0/0	1	1	
B219SCS0504AA	B219SCS-5	5/6	1129	SO	G	N	0/0	1	1	
B219SCS0508AA	B219SCS-5	5/6	1133	SO	G	N	0/0	1	1	
B219SCS0512AA	B219SCS-5	5/6	1137	SO	G	N	0/0	1	1	

B219SCS0604AA	B219SCS-6	5/6	1119	SO	G	N	0/0	1	1	
B219SCS0608AA	B219SCS-6	5/6	1124	SO	G	N	0/0	1	1	
B219SCS0612AA	B219SCS-6	5/6	1127	SO	G	N	0/0	1	1	
B219SCS0412AC	B219SCS-4	5/6	1146	SO	G	FD	0/0	1	1	
B219SCS0304AS	B219SCS-3	5/6	1217	SO	G	MS	0/0	1	1	
B219SCS0304AD	B219SCS-3	5/6	1217	SO	G	SD	0/0	1	1	

Sample Condition Upon Receipt at Laboratory: Cooler Temperature:
Special Instructions/Comments: Analyses to be conducted in compliance with AFCEE QAPP 4.0
Note 1: Total SVOCs: method SW8270D
Note 2: Total Pesticides: SW8081B
Note 3: Total VOCs: SW8260B
Note 4: Total Metals: SW6010C

#1 Released by: (Sig)	Date:	#2 Released by: (Sig)	Date: 1630	#3 Released by: (Sig)	Date:
Company Name:	Time:	Company Name: FPM	Time: 5-7-13	Company Name:	Time:
#1 Received by: (Sig) Daniel Baldyga	Date:	#2 Received by: (Sig) R English	Date: 05-07-13	#3 Received by: (Sig)	Date:
Company Name: FPM	Time:	Company Name: TA Sya	Time: 16:30	Company Name:	Time:

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

SMCODE
B = Bailer
G = Grab.
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 Health and Safety Meeting Form

Date: 5/6/13 *Time :* 830

Location: FPM office (sample room)

Weather Conditions: sunny / 70°s

Meeting Type: Daily Health and Safety

Personnel Present:

Dan Baldyga, Justin Damann, Mike Grifasi, Josh Wenzel

Visitors Present: None

Visitor Training: None

PPE Required: Modified D

Possible risks, injuries, concerns:

underground utilities (unmarked), slip/trip/fall, car traffic.

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

None

Property Damage:

None

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

None

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

None

Report made by (Name): Dan Baldyga

SSHP Organization Title: Site Safety and Health Officer

Daily Chemical Quality Control Report

Project/Delivery Order Number: 1015-11-01 Date: 7/09/14

Project Name/Site Number: Bldg 219

Weather conditions: Temperature: 69 F Barometric reading: 29.82
Wind speed and direction: SW @ 5mph
Significant wind changes: none

General description of tasks completed: Soil Sampling at Bldg 219

Explain any departures from the SAP or deviations from approved procedures during the day's field activities: None

Explain any technical problems encountered in the field or field equipment/field analytical instrument malfunction: None

Corrective actions taken or instructions obtained from AFCEC personnel: No corrective actions necessary.
None

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

DCQCR Prepared by: Josh Wenzel Date: 7/9/2014

CQCC Signature: Christie Rainford Date: 7/9/14

ATTACHMENTS:

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

SOIL / SEDIMENT SAMPLING FORM

Project: 1015-11-01 Sampled by: JW/MB

Site and Site Code (**SITEID**): Bldg 219

Sampling Location ID. (**LOCID**): B219SCS-7

Date (**LOGDATE**): 7/9/14 Time: 1125

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0-2ft.	Top 6 inches → sod + dark brown soil w/ small angular + subangular rocks. Remaining interval was brown soil w/ lots of angular rock fragments.

Comments/Observations:

Sample Time: 1130 Sample ID: B219SCS0702AA

SOIL / SEDIMENT SAMPLING FORM

Project: 1015-11-01 Sampled by: JW/MG

Site and Site Code (**SITEID**): Bldg 219

Sampling Location ID. (**LOCID**): B219SCS-8

Date (**LOGDATE**): 7/9/14 Time: 1135

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0-6 inches	sod + dark brown soil w/ angular rock fragments
6 inches → 2 ft.	Brown soil w/ lots of angular rock fragments

Comments/Observations:

Sample Time: 1140 Sample ID: B219SCS0802AA

SOIL / SEDIMENT SAMPLING FORM

Project: 1015-11-01 Sampled by: JW/MG

Site and Site Code (**SITEID**): Bldg 219

Sampling Location ID. (**LOCID**): B219SCS-9

Date (**LOGDATE**): 7/9/14 Time: 1145

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0-6 inches	Sod + dark brown soil w/ angular rock fragments
6 inches - 2ft.	Brown soil w/ lots of angular rock fragments.

Comments/Observations:

Sample Time: 1150 Sample ID: B219SCS0902AA

SOIL / SEDIMENT SAMPLING FORM

Project: 1015-11-01 Sampled by: JW/MB

Site and Site Code (**SITEID**): Bldg 219

Sampling Location ID. (**LOCID**): B219SCS-10

Date (**LOGDATE**): 7/9/14 Time: 1155

FIELD OBSERVATIONS:

Sample Depth or Interval	Material Description/ Color
0-2 ft.	~~0-6 inches~~ Top 6 inches sod + dark brown dirt w/ small angular + subangular rocks. 6 inches → 2 ft. brown sands w/ small angular + subangular rocks mixed in.

Comments/Observations:

Sample Time: 1200 Sample ID: B219SCS1002AA/AC

Daily Health and Safety Meeting Form

Date: 7/9/14 *Time:* 0845

Location: FPM office (sample room)

Weather Conditions: Overcast 69°F

Meeting Type: Daily Health and Safety

Personnel Present:

Josh Wenzel, Mark Grifasi

Visitors Present: NONE

Visitor Training: N/A

PPE Required: Modified D steel toe boots, latex gloves, safety glasses

Possible risks, injuries, concerns:

slip/trip/fall, biological (ticks, bees, wasps), traffic on roads and parking lots near Bldg 214 & Bldg. 219

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

NONE

Property Damage:

NONE

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

N/A

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

N/A

Report made by (Name): Josh Wenzel

SSHP Organization Title: Site Safety and Health Officer

CHAIN OF CUSTODY RECORD

COC#: _2_ SDG#: __304_ (Open/Closed) Cooler ID#: _A_

Ship to: Elaine Walker Test America Laboratories, Inc. 4955 Yarrow Street **Arvada, Colorado Tel: 303-736-0156**	Project Name: Griffiss AFB DP015 Building 219	Send Results to: Daniel Baldyga FPM Remediations, Inc 584 Phoenix Drive **Rome, NY 13441** Phone: (315) 336-7721 Ext. 207
	Sampler Name: Josh Wenzel	
Carrier: Test America courier.	Sampler Signature:	

Analyses requested

Field Sample ID	LocID	Date 2014	Time	MATRIX	SMCODE	SACODE	SBD/SED	# of Containers	Metals: note 4 4 oz glass jar	Metals note 4 250 ml poly (HNO_3)	Comments
B219SCS0702AA	B219SCS-7	7/9	1130	SO	G	N	0/0	1	1	--	
B219SCS0802AA	B219SCS-8	7/9	1140	SO	G	N	0/0	1	1	--	
B219SCS0902AA	B219SCS-9	7/9	1150	SO	G	N	0/0	1	1	--	
B219SCS1002AA	B219SCS-10	7/9	1200	SO	G	N	0/0	1	1	--	
B219SCS1002AC	B219SCS-10	7/9	1200	SO	G	FD	0/0	1	1	--	
070914AE	FIELDQC	7/9	1300	WQ	G	EB	0/0	1	--	1	

Sample Condition Upon Receipt at Laboratory: Cooler Temperature:
Special Instructions/Comments: Analyses to be conducted in compliance with AFCEE QAPP 4.0
Note 1: Total SVOCs: method SW8270D
Note 2: Total Pesticides: SW8081B
Note 3: Total VOCs: SW8260B
Note 4: Total Metals: SW6010C

#1 Released by: (Sig)	Date:	#2 Released by: (Sig)	Date: 7/9/14	#3 Released by: (Sig)	Date:
Company Name:	Time:	Company Name: FPM	Time: 1400	Company Name:	Time:
#1 Received by: (Sig) Daniel Baldyga	Date:	#2 Received by: (Sig)	Date:	#3 Received by: (Sig)	Date:
Company Name: FPM	Time:	Company Name:	Time:	Company Name:	Time:

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

SMCODE
B = Bailer
G = Grab.
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

Appendix E
Raw Laboratory Results
(provided as a separate file on CD)

Appendix F
Validated Laboratory Results

FPM Remediations, Inc.
Data Verification and Usability Report
Former Griffiss AFB
Building DP015 219
Contract No. FA8903-10-D-8595/0014, Delivery Order No. 0014

FPM Project No. 1015-11-01

TestAmerica Job # 280-42043-1

Laboratory:	TestAmerica Laboratories, Inc.
Sample Matrix:	Soil
Number of Samples:	19
Analytical Protocol:	DOD QSM version 4.2, as per project-specific UFP QAPP
Data Reviewer:	Connie van Hoesel
Sample Date:	May 6, 2013

LIST OF DATA VERIFICATION SAMPLES

This verification report pertains to the following environmental samples and corresponding QC samples:

Sample ID	Date	QC Samples	Date
B219SCS0104AA	5/6/13		
B219SCS0108AA	5/6/13		
B219SCS0112AA	5/6/13		
B219SCS0204AA	5/6/13		
B219SCS0208AA	5/6/13		
B219SCS0212AA	5/6/13		
B219SCS0304AA	5/6/13		
B219SCS0308AA	5/6/13		
B219SCS0312AA	5/6/13		
B219SCS0404AA	5/6/13		
B219SCS0408AA	5/6/13		
B219SCS0412AA	5/6/13	B219SCS0412AC	5/6/13
B219SCS0504AA	5/6/13		
B219SCS0508AA	5/6/13		
B219SCS0512AA	5/6/13		
B219SCS0604AA	5/6/13		
B219SCS0608AA	5/6/13		
B219SCS0612AA	5/6/13		

Notes:

Refer to attached chain-of-custody for detailed sampling information and sample specific analyses requested.
AA – Primary environmental samples
AC – Field duplicate sample

DELIVERABLES

The data deliverable report was per requirements of the DOD QSM, version 4.2, as specified in the project-specific QAPP. The report consisted of the following major sections: lab attachment letter, case narrative, chain-of-custody, lab qualifier definitions, analytical results (sheet 2) based on analytical batch, calibration summaries, method blank summaries, laboratory control sample summaries, matrix spike/matrix spike duplicate summaries, holding time forms, performance checks, surrogate and internal standard recoveries, as applicable.

ANALYTICAL METHODS

The analytical test methods and QA/QC requirements used for the sample analyses were per methods as specified in the DOD QSM, version 4.2, with project-specific modifications as listed in the project-specific QAPP. The analytical methods employed included SW-846 6010C, Metals.

VERIFICATION GUIDANCE

The analytical work was performed by TestAmerica Denver in accordance with the DOD QSM, version 4.2, and QC requirements of the respective analytical methods and of the project-specific QAPP. The data usability analysis was based on the reviewer's professional judgment and on an assessment of how this data would fare with respect to the DOD QSM, and the criteria as listed in the project-specific QAPP.

QA/QC CRITERIA

The following QA/QC criteria were reviewed for the metals analyses, as applicable:

- Method detection limits and limits of quantitation (DL, LOQ)
- Holding times
- Initial and Continuing calibration summaries
- Method blanks
- Field duplicate results
- Serial dilution results
- Matrix spike/matrix spike duplicate (MS/MSD) analysis
- Laboratory control samples (LCS)
- Results reported between DL and LOQ (J-flag)
- Sample storage and preservation
- Data system printouts
- Qualitative and quantitative compound identification
- Chain-of-custody (COC)
- Case narrative and deliverables compliance

The items listed above were in compliance with DOD QSM, version 4.2, and project-specific QAPP criteria and protocols with exceptions discussed in the text below. The data have been verified according to the procedures outlined above and qualified accordingly.

GENERAL NOTES:

SAMPLE LABELING/CHAIN-OF-CUSTODY

No errors in the chain-of-custody were noted. There were no discrepancies noted between the sample labels and the chain-of-custody, or the cooler contents and the chain-of-custody.

METALS

- According to the case narrative, the solution used as the interference check standard showed the result for copper at a level greater than the LOD for the analytical batch associated with the field samples. The solution is believed to contain trace impurities of these elements, consistent with those found by the manufacturer of the solution. Using professional judgment, the "Q" qualifiers assigned by the laboratory were removed since the sample results are not due to matrix interference; (the levels in the soil samples were also well above those levels observed in the ICS solution).

Metal	**Level in the ISCA solution 174938/14 (µg/L)**	**LOD (µg/L)**
Chromium	1.91	1.5
Copper	4.11	3.5
Vanadium	5.31	2.5
Metal	**Level in the ISCA solution 175407/14 (µg/L)**	**LOD (µg/L)**
Manganese	3.82	0.5

- An Inductively Coupled Plasma (ICP) Serial Dilution Test (1:5 dilution) is required to be run for each sample matrix that is analyzed for metals, and is applicable only for those analytes with concentrations greater than 50 times the limit of quantitation (LOQ). The dilution test was performed on sample B219SCS0304AA and indicated the percent difference (%D) between the original result and the five-times (5x) serial dilution result was greater than the QAPP limit of ±10%:

Analyte	**Initial Sample Result (mg/kg)**	**Serial Dilution Result (mg/kg)**	**% Difference**	**LOQ (mg/kg)**	**50 x LOQ**	**Post-Digestion Spike %Rec**
Nickel	9.8	10.9 J	***11***	4.3	215	85
Zinc	33	37.7 J	***15***	8.6	430	89

The QAPP also requires that a post-digestion spike addition be performed when at least one sample within the batch had a concentration of analyte less than 50x the LOD, and the recovery must be within 75-125% of the expected result. The QAPP requires that for all sample results for the specific analytes for all samples associated with the post-digestion spike addition that do not meet the acceptance criteria (i.e., 75-125%), that a "J" be applied to the results, and that they be considered estimated.

Corrective Action: Applying the data qualification approach for the serial dilution result exceedances per the QAPP, the dilution test results are only applicable if the analytes in the original, undiluted sample are reported greater than 50 times the LOQ. Hence, the dilution test results were not applicable.

- The following table summarizes QC exceedances of the matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and/or RPDs for parent sample B219SCS0304AA. The spike analytes, MS recoveries, MSD recoveries, spike recovery QC limits, and RPDs and their QC limit between the MS and MSD are listed.

Parent Sample: B219SCS0304AA

Spike Compounds	MS %Rec	MSD %Rec	QC Limits	RPD % (QC limit 20%)	Flag Applied	Rationale
Antimony	***64***	***61***	80-120	***23***	J	%Rec and RPD outside QC limits
Aluminum	***1096***	***1116***	80-120	4	None	Parent concentration > 4x spike
Calcium	***664***	***425***	80-120	***33***	None	Parent concentration > 4x spike
Iron	***-1,328***	***-2,144***	80-120	4	None	Parent concentration > 4x spike
Manganese	***-132***	***468***	80-120	***32***	None	Parent concentration > 4x spike
Nickel	81	***79***	80-120	16	J	%Rec outside QC limits
Zinc	***79***	***78***	80-120	10	J	%Rec outside QC limits

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices. Generally, these data alone cannot be used to evaluate the precision and accuracy of individual samples. A matrix spike and matrix spike duplicate analysis is an aliquot of sample spiked with known concentrations of all the analytes in the method. According to the QAPP, the MS/MSD result is used to assess whether the sample matrix may bias the results. The QAPP-recommended frequency of analysis is one MS/MSD per 20 samples. Exceedances of either percent recovery (%Rec) control limits of spike concentrations or relative percent difference (RPD) control limits between the MS and MSD results, according to the QAPP require a "J" (estimated) qualifier for the specific analyte in all samples collected from the same site matrix as the parent. However, due to the varied nature of environmental samples, such as locations, depths, physical characteristics (dissolved and suspended solids, turbidity, pH, organic content, etc.), it is difficult to assign one set of MS/MSD sample analysis as truly representative of an entire site matrix. Therefore, based on the definition of this type of QA/QC sample, using professional judgment it is deemed inappropriate to qualify more than the actual parent sample due to a percent recovery or RPD exceedance. This approach is in accordance with the EPA National Functional guidelines, which states that the MS/MSD results are not used alone to qualify the entire data package, however, can be used in conjunction with other QC criteria to determine the need for some qualification of the data. Using professional judgment, no corrective action and/or flagging is deemed required for minimal exceedances (i.e., within 1% of the control limits).

Corrective Action: As discussed above, "J" flags were applied to the associated results in parent samples B219SCS0304AA only. Note that no flags were applied to aluminum, calcium, iron, and manganese, since the parent sample concentrations were greater than 4x the spike concentrations.

- Field duplicate samples, which are collected at the same location and at the same time using identical collection, handling, and analytical procedures, are used to assess precision of the sample collection process. The UFP QAPP requires qualification of data for field duplicates

criterion if the duplicate samples contain detected compounds with concentrations above 5x the reporting limits (RL's) and the relative percent differences (RPD's) between the duplicate sample results exceed RPD control limits (20% for water samples, 30% for soil samples). If either the parent or the duplicate sample is less than 5x the RL, then the difference between the parent and duplicate sample must be less than 2x the RL. "J" flags for detects and "UJ" flags for non-detects are required per the QAPP for any exceedances. For these purposes the RL is considered equal to the LOQ.

The following table summarizes the relative percent differences (RPD's) of field duplicate sample set B219SCS0412AA/AC.

Sample ID, Normal	Sample ID, Field Duplicate	Analyte	Normal Result (mg/kg)	Field Dup Result (mg/kg)	LOQ (mg/kg)	RPD/ Total Difference	Flag Applied	Rationale
B219SCS0412AA	B219SCS0412AC	Aluminum	7,100	7,500	47, 53	5.5	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Arsenic	3.8	4.4	2.3, 2.6	0.6	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Barium	26	33	1.9, 2.1	24	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Beryllium	0.32 J	0.31 J	0.47, 0.53	0.010	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Boron	2.1 J	1.8 J	9.3, 11	0.30	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Cadmium	0.12 J	0.11 J	0.47, 0.53	0.010	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Calcium	3,300	3,200	93, 110	3.1	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Chromium	8.8	8.8	3.3, 3.7	0	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Cobalt	5.6	5.5	0.93, 1.1	1.8	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Copper	25	26	4.7, 5.3	1	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Iron	19,000	21,000	75, 84	10	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Lead	5.0	4.3	0.84, 0.95	0.7	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Magnesium	2,800	3,200	28, 32	13	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Manganese	900	1,300	4.2, 4.7	***36***	J	RPD > 30%
B219SCS0412AA	B219SCS0412AC	Molybdenum	0.40 J	0.46 J	2.3, 2.6	0.060	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Nickel	13	13	3.7, 4.2	0	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Potassium	860	850	280, 320	10	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Silver	0.19 J	0.25 J	1.4, 1.6	0.60	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Sodium	82 J	77 J	470, 530	5	None	Total difference < 2xRL
B219SCS0412AA	B219SCS0412AC	Vanadium	11	12	1.9, 2.1	8.7	None	RPD < 30%
B219SCS0412AA	B219SCS0412AC	Zinc	45	47	7.5, 8.4	4.3	None	RPD < 30%

Corrective Action: "J" qualifiers were applied to the manganese results, since the RPD's and/or total differences among the sample duplicate set B219SCS0412AA/AC were outside QAPP limits. All other RPD's and/or total differences were within QC limits.

DATA USABILITY RESULTS

METALS

Based on the evaluation of all information in the analytical data groups, the results for metals are usable with the data qualifiers as noted. Using the verification approach as presented above, the results for all above samples are 100% usable.

DATA USABILITY SUMMARY

All data in Job # 280-42043-1 are valid and usable with qualifications as noted in the data review.

Signed: Concordia van Hoesel Date: 7/5/13

ATTACHMENTS

- Chain-of-custody
- Laboratory case narrative
- Qualified final data verification results on annotated Lab Sheet 2s

SAMPLE SUMMARY

Client: FPM Remediations Inc

Job Number: 280-42043-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-42043-1	B219SCS0104AA	Solid	05/06/2013 1153	05/08/2013 0915
280-42043-2	B219SCS0108AA	Solid	05/06/2013 1156	05/08/2013 0915
280-42043-3	B219SCS0112AA	Solid	05/06/2013 1200	05/08/2013 0915
280-42043-4	B219SCS0204AA	Solid	05/06/2013 1208	05/08/2013 0915
280-42043-5	B219SCS0208AA	Solid	05/06/2013 1211	05/08/2013 0915
280-42043-6	B219SCS0212AA	Solid	05/06/2013 1215	05/08/2013 0915
280-42043-7	B219SCS0304AA	Solid	05/06/2013 1217	05/08/2013 0915
280-42043-7MS	B219SCS0304AA	Solid	05/06/2013 1217	05/08/2013 0915
280-42043-7MSD	B219SCS0304AA	Solid	05/06/2013 1217	05/08/2013 0915
280-42043-8	B219SCS0308AA	Solid	05/06/2013 1221	05/08/2013 0915
280-42043-9	B219SCS0312AA	Solid	05/06/2013 1225	05/08/2013 0915
280-42043-10	B219SCS0404AA	Solid	05/06/2013 1140	05/08/2013 0915
280-42043-11	B219SCS0408AA	Solid	05/06/2013 1143	05/08/2013 0915
280-42043-12	B219SCS0412AA	Solid	05/06/2013 1145	05/08/2013 0915
280-42043-13	B219SCS0504AA	Solid	05/06/2013 1129	05/08/2013 0915
280-42043-14	B219SCS0508AA	Solid	05/06/2013 1133	05/08/2013 0915
280-42043-15	B219SCS0512AA	Solid	05/06/2013 1137	05/08/2013 0915
280-42043-16	B219SCS0604AA	Solid	05/06/2013 1119	05/08/2013 0915
280-42043-17	B219SCS0608AA	Solid	05/06/2013 1124	05/08/2013 0915
280-42043-18	B219SCS0612AA	Solid	05/06/2013 1127	05/08/2013 0915
280-42043-19FD	B219SCS0412AC	Solid	05/06/2013 1146	05/08/2013 0915

All quality control parameters were within the acceptance limits.

CASE NARRATIVE
Client: FPM Remediations Inc
Project: Griffiss AFB DP015 Bldg 219
Report Number: 280-42043-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Nineteen samples were received on 05/08/2013; the samples arrived in good condition, properly preserved and on ice. The temperatures of the coolers at receipt were 0.1°C and 0.4°C.

MS/MSD analyses were requested and performed on sample B219SCS0304AA (280-42043-7).

TOTAL METALS (ICP)

Samples B219SCS0104AA (280-42043-1), B219SCS0108AA (280-42043-2), B219SCS0112AA (280-42043-3), B219SCS0204AA (280-42043-4), B219SCS0208AA (280-42043-5), B219SCS0212AA (280-42043-6), B219SCS0304AA (280-42043-7), B219SCS0308AA (280-42043-8), B219SCS0312AA (280-42043-9), B219SCS0404AA (280-42043-10), B219SCS0408AA (280-42043-11), B219SCS0412AA (280-42043-12), B219SCS0504AA (280-42043-13), B219SCS0508AA (280-42043-14), B219SCS0512AA (280-42043-15), B219SCS0604AA (280-42043-16), B219SCS0608AA (280-42043-17), B219SCS0612AA (280-42043-18), and B219SCS0412AC (280-42043-19) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/10/2013 and analyzed on 05/17/2013 and 05/21/2013.

Boron, Aluminum, Iron, and Manganese were detected in method blank MB 280-173665/1-A at levels that were above the method detection limits but below the reporting limits. The values should be considered estimates, and have been flagged "J". However, because the result concentrations were less than ½ the respective reporting limits, no corrective action was necessary.

Antimony, Iron, Manganese, and Zinc failed the recovery criteria low for the matrix spike (MS) of sample B219SCS0304AA (280-42043-7) in batch 280-175407. Aluminum and Calcium failed the recovery criteria high. For the matrix spike duplicate (MSD), Antimony, Iron, Nickel, and Zinc failed the recovery criteria low. Aluminum, Calcium, and Manganese failed the recovery criteria high. Also, Calcium and Manganese exceeded the RPD limit. The presence of the '4' qualifier in the report indicates where the analyte concentration in the unspiked sample exceeded four times the spiking amount. The associated laboratory control sample (LCS) recoveries met acceptance criteria, and the sample results have been flagged accordingly.

The interference check standard solution (ICSA) associated with batch 280-174938 showed results for one or more elements at a level greater than the limit of detection (LOD). The initial ICSA results were greater than the LOD for Chromium, Copper, and Vanadium. It is believed that the solution contains trace impurities of these elements and that the results are not due to matrix interference. These results are consistent with those found by the manufacturer of the ICSA solution. The associated sample results have been flagged "Q" for these elements.

The interference check standard solution (ICSA) associated with batch 280-175407 showed results for one or more elements at a level greater than the limit of detection (LOD). The initial ICSA result was greater than the LOD for Manganese. It is believed that the solution contains trace impurities of this element and that the results are not due to matrix interference. These results are consistent with those found by the manufacturer of the ICSA solution. The associated sample results have been flagged "Q" for Manganese.

No other difficulties were encountered during the metals analyses.

All other quality control parameters were within the acceptance limits.

PERCENT SOLIDS

Samples B219SCS0104AA (280-42043-1), B219SCS0108AA (280-42043-2), B219SCS0112AA (280-42043-3), B219SCS0204AA (280-42043-4), B219SCS0208AA (280-42043-5), B219SCS0212AA (280-42043-6), B219SCS0304AA (280-42043-7), B219SCS0308AA (280-42043-8), B219SCS0312AA (280-42043-9), B219SCS0404AA (280-42043-10), B219SCS0408AA (280-42043-11), B219SCS0412AA (280-42043-12), B219SCS0504AA (280-42043-13), B219SCS0508AA (280-42043-14), B219SCS0512AA (280-42043-15), B219SCS0604AA (280-42043-16), B219SCS0608AA (280-42043-17), B219SCS0612AA (280-42043-18), and B219SCS0412AC (280-42043-19) were analyzed for percent solids in accordance with EPA SW846 3550C. The samples were analyzed on 05/28/2013.

No difficulties were encountered during the % solids analyses.

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0104AA**

Lab Sample ID: 280-42043-1
Client Matrix: Solid
% Moisture: 3.8

Date Sampled: 05/06/2013 1153
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.12 g
Analysis Date:	05/17/2013 1712			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.56	U	0.35	1.9
Arsenic		3.6		0.61	2.3
Barium		30		0.071	1.9
Boron		3.3	J	0.91	9.3
Cadmium		0.35	J	0.038	0.46
Chromium		10	Q	0.054	3.2
Cobalt		4.9		0.093	0.93
Copper		39	Q	0.20	4.6
Lead		15		0.25	0.83
Molybdenum		0.32	J	0.24	2.3
Nickel		13		0.11	3.7
Silver		0.19	U	0.15	1.4
Thallium		1.1	U	0.60	2.8
Vanadium		21	Q	0.087	1.9

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.12 g
Analysis Date:	05/21/2013 1328			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		6100		1.4	46
Beryllium		0.26	J	0.031	0.46
Calcium		76000		13	93
Iron		13000		3.5	74
Magnesium		3900		3.4	28
Manganese		570	Q	0.093	4.2
Potassium		760		38	280
Selenium		1.1	U	0.80	2.8
Sodium		86	J	55	460
Zinc		54		0.37	7.4

METHOD / ANALYST SUMMARY

Client: FPM Remediations Inc

Job Number: 280-42043-1

Method	Analyst	Analyst ID
SW846 6010C	Bowen, Heidi E	HEB
EPA Moisture	Sullivan, Josh	JS

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: B219SCS0108AA

Lab Sample ID: 280-42043-2
Client Matrix: Solid

% Moisture: 7.5

Date Sampled: 05/06/2013 1156
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	05/17/2013 1715			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.55	U	0.35	1.8
Arsenic		3.5		0.61	2.3
Barium		37		0.070	1.8
Boron		2.5	J	0.91	9.2
Cadmium		0.18	J	0.038	0.46
Chromium		10		0.054	3.2
Cobalt		6.0		0.092	0.92
Copper		22		0.20	4.6
Lead		6.4		0.25	0.83
Molybdenum		0.36	J	0.24	2.3
Nickel		13		0.11	3.7
Silver		0.23	J	0.15	1.4
Thallium		1.1	U	0.60	2.8
Vanadium		16		0.087	1.8

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.17 g
Analysis Date:	05/21/2013 1331			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		8400		1.4	46
Beryllium		0.35	J	0.031	0.46
Calcium		19000		13	92
Iron		18000		3.5	74
Magnesium		3800		3.4	28
Manganese		1000		0.092	4.2
Potassium		820		38	280
Selenium		1.1	U	0.79	2.8
Sodium		83	J	55	460
Zinc		44		0.37	7.4

CM
7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0112AA**

Lab Sample ID: 280-42043-3
Client Matrix: Solid

% Moisture: 8.9

Date Sampled: 05/06/2013 1200
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	05/17/2013 1717			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.60	U	0.38	2.0
Arsenic		3.5		0.66	2.5
Barium		31		0.077	2.0
Boron		2.2	J	0.99	10
Cadmium		0.13	J	0.041	0.50
Chromium		9.4		0.058	3.5
Cobalt		5.6		0.10	1.0
Copper		31		0.22	5.0
Lead		5.0		0.27	0.91
Molybdenum		0.31	J	0.26	2.5
Nickel		13		0.12	4.0
Silver		0.26	J	0.16	1.5
Thallium		1.2	U	0.65	3.0
Vanadium		13		0.095	2.0

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.09 g
Analysis Date:	05/21/2013 1333			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7700		1.6	50
Beryllium		0.33	J	0.033	0.50
Calcium		3900		14	100
Iron		19000		3.8	81
Magnesium		3300		3.7	30
Manganese		1100		0.10	4.5
Potassium		860		41	300
Selenium		1.2	U	0.87	3.0
Sodium		62	J	59	500
Zinc		47		0.40	8.1

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7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0204AA**

Lab Sample ID: 280-42043-4
Client Matrix: Solid

% Moisture: 6.6

Date Sampled: 05/06/2013 1208
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	05/17/2013 1720			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.61	U	0.38	2.0
Arsenic		4.0		0.67	2.5
Barium		38		0.077	2.0
Boron		2.3	J	0.99	10
Cadmium		0.42	J	0.041	0.51
Chromium		8.8		0.059	3.5
Cobalt		5.0		0.10	1.0
Copper		26		0.22	5.1
Lead		16		0.27	0.91
Molybdenum		0.45	J	0.26	2.5
Nickel		11		0.12	4.0
Silver		0.23	J	0.16	1.5
Thallium		1.2	U	0.66	3.0
Vanadium		13		0.095	2.0

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.06 g
Analysis Date:	05/21/2013 1336			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7300		1.6	51
Beryllium		0.28	J	0.033	0.51
Calcium		31000		14	100
Iron		15000		3.8	81
Magnesium		3200		3.7	30
Manganese		840		0.10	4.5
Potassium		740		41	300
Selenium		1.2	U	0.87	3.0
Sodium		71	J	60	510
Zinc		59		0.40	8.1

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Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0208AA**

Lab Sample ID: 280-42043-5
Client Matrix: Solid

% Moisture: 7.5

Date Sampled: 05/06/2013 1211
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	05/17/2013 1722			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.65	U	0.41	2.2
Arsenic		4.3		0.71	2.7
Barium		41		0.082	2.2
Boron		3.2	J	1.1	11
Cadmium		0.35	J	0.044	0.54
Chromium		11	~~Q~~	0.063	3.8
Cobalt		5.6		0.11	1.1
Copper		28	~~Q~~	0.23	5.4
Lead		22		0.29	0.97
Molybdenum		0.55	J	0.28	2.7
Nickel		13		0.13	4.3
Silver		0.17	J	0.17	1.6
Thallium		1.3	U	0.70	3.2
Vanadium		16	~~Q~~	0.10	2.2

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.00 g
Analysis Date:	05/21/2013 1338			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		8200		1.7	54
Beryllium		0.35	J	0.036	0.54
Calcium		40000		15	110
Iron		18000		4.1	86
Magnesium		3800		4.0	32
Manganese		1000	~~Q~~	0.11	4.9
Potassium		910		44	320
Selenium		1.3	U	0.93	3.2
Sodium		94	J	64	540
Zinc		68		0.43	8.6

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7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0212AA**

Lab Sample ID: 280-42043-6
Client Matrix: Solid

% Moisture: 8.2

Date Sampled: 05/06/2013 1215
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.11 g
Analysis Date:	05/17/2013 1724			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.59	U	0.37	2.0
Arsenic		4.6		0.65	2.5
Barium		37		0.075	2.0
Boron		2.2	J	0.96	9.8
Cadmium		0.45	J	0.040	0.49
Chromium		12		0.057	3.4
Cobalt		5.8		0.098	0.98
Copper		36		0.21	4.9
Lead		18		0.27	0.88
Molybdenum		0.77	J	0.26	2.5
Nickel		14		0.12	3.9
Silver		0.27	J	0.16	1.5
Thallium		1.2	U	0.64	2.9
Vanadium		15		0.092	2.0

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.11 g
Analysis Date:	05/21/2013 1341			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		8600		1.5	49
Beryllium		0.35	J	0.032	0.49
Calcium		16000		14	98
Iron		30000		3.7	79
Magnesium		3400		3.6	29
Manganese		1400		0.098	4.4
Potassium		880		40	290
Selenium		1.2	U	0.84	2.9
Sodium		68	J	58	490
Zinc		200		0.39	7.9

CLK
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Client: FPM Remediations Inc | Job Number: 280-42043-1

Client Sample ID: B219SCS0304AA

Lab Sample ID: 280-42043-7 | Date Sampled: 05/06/2013 1217
Client Matrix: Solid | % Moisture: 8.3 | Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.01 g
Analysis Date:	05/17/2013 1736			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.65	U J	0.41	2.2
Arsenic		6.2		0.71	2.7
Barium		26		0.082	2.2
Boron		2.1	J	1.1	11
Cadmium		0.14	J	0.044	0.54
Chromium		7.4	~~J~~	0.063	3.8
Cobalt		4.7		0.11	1.1
Copper		18	~~J~~	0.23	5.4
Lead		5.7		0.29	0.97
Molybdenum		0.54	U	0.28	2.7
Nickel		9.8	J	0.13	4.3
Selenium		1.3	U	0.93	3.2
Silver		0.22	U	0.17	1.6
Thallium		1.3	U	0.70	3.2
Vanadium		12	~~J~~	0.10	2.2
Zinc		33	J	0.43	8.6

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.01 g
Analysis Date:	05/21/2013 1353			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		6300	~~J~~	1.7	54
Beryllium		0.21	J	0.036	0.54
Calcium		23000	~~J~~	15	110
Iron		14000	~~J~~	4.1	86
Magnesium		2700		4.0	32
Manganese		810	~~J~~	0.11	4.9
Potassium		670		44	320
Sodium		69	J	64	540

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Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0308AA**

Lab Sample ID: 280-42043-8
Client Matrix: Solid

% Moisture: 6.6

Date Sampled: 05/06/2013 1221
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	05/17/2013 1749			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.54	U	0.34	1.8
Arsenic		9.8		0.60	2.3
Barium		27		0.069	1.8
Boron		1.8	J	0.89	9.1
Cadmium		0.17	J	0.037	0.45
Chromium		8.0		0.053	3.2
Cobalt		4.1		0.091	0.91
Copper		18		0.20	4.5
Lead		6.5		0.25	0.82
Molybdenum		0.53	J	0.24	2.3
Nickel		8.8		0.11	3.6
Selenium		1.1	U	0.78	2.7
Silver		0.18	U	0.15	1.4
Thallium		1.1	U	0.59	2.7
Vanadium		11		0.085	1.8
Zinc		36		0.36	7.3

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	05/21/2013 1405			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		6300		1.4	45
Beryllium		0.25	J	0.030	0.45
Calcium		14000		13	91
Iron		14000		3.4	73
Magnesium		2500		3.4	27
Manganese		680		0.091	4.1
Potassium		650		37	270
Sodium		70	J	54	450

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7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0312AA**

Lab Sample ID: 280-42043-9
Client Matrix: Solid

% Moisture: 8.1

Date Sampled: 05/06/2013 1225
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	05/17/2013 1751			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.63	U	0.40	2.1
Arsenic		4.2		0.69	2.6
Barium		29		0.080	2.1
Boron		1.9	J	1.0	10
Cadmium		0.12	J	0.043	0.52
Chromium		9.4		0.061	3.7
Cobalt		5.1		0.10	1.0
Copper		28		0.23	5.2
Lead		3.9		0.28	0.94
Molybdenum		0.53	J	0.27	2.6
Nickel		13		0.13	4.2
Selenium		1.3	U	0.90	3.1
Silver		0.21	U	0.17	1.6
Thallium		1.3	U	0.68	3.1
Vanadium		13		0.098	2.1
Zinc		50		0.42	8.4

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	05/21/2013 1408			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7600		1.6	52
Beryllium		0.33	J	0.035	0.52
Calcium		1900		15	100
Iron		21000		4.0	84
Magnesium		3100		3.9	31
Manganese		900		0.10	4.7
Potassium		880		43	310
Sodium		100	U	62	520

CAA
7/5/13

Client: FPM Remediations Inc | Job Number: 280-42043-1

Client Sample ID: B219SCS0404AA

Lab Sample ID: 280-42043-10 | Date Sampled: 05/06/2013 1140
Client Matrix: Solid | % Moisture: 9.3 | Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	05/17/2013 1754			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.64	U	0.40	2.1
Arsenic		3.9		0.70	2.6
Barium		32		0.081	2.1
Boron		2.3	J	1.0	11
Cadmium		0.29	J	0.043	0.53
Chromium		14	~~Q~~	0.061	3.7
Cobalt		6.6		0.11	1.1
Copper		38	~~Q~~	0.23	5.3
Lead		6.6		0.29	0.95
Molybdenum		1.5	J	0.28	2.6
Nickel		15		0.13	4.2
Selenium		1.3	U	0.91	3.2
Silver		0.21	U	0.17	1.6
Thallium		1.3	U	0.69	3.2
Vanadium		16	~~Q~~	0.10	2.1
Zinc		51		0.42	8.5

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.04 g
Analysis Date:	05/21/2013 1410			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		10000		1.6	53
Beryllium		0.46	J	0.035	0.53
Calcium		7900		15	110
Iron		21000		4.0	85
Magnesium		3500		3.9	32
Manganese		870	~~Q~~	0.11	4.8
Potassium		910		43	320
Sodium		310	J	63	530

CLH
7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0408AA**

Lab Sample ID: 280-42043-11
Client Matrix: Solid

% Moisture: 9.0

Date Sampled: 05/06/2013 1143
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.20 g
Analysis Date:	05/17/2013 1756			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.55	U	0.35	1.8
Arsenic		3.2		0.60	2.3
Barium		27		0.070	1.8
Boron		1.7	J	0.90	9.2
Cadmium		0.093	J	0.038	0.46
Chromium		10	~~Q~~	0.053	3.2
Cobalt		5.8		0.092	0.92
Copper		41	~~Q~~	0.20	4.6
Lead		4.5		0.25	0.82
Molybdenum		0.80	J	0.24	2.3
Nickel		13		0.11	3.7
Selenium		1.1	U	0.79	2.7
Silver		0.19	J	0.15	1.4
Thallium		1.1	U	0.60	2.7
Vanadium		12	~~Q~~	0.086	1.8
Zinc		44		0.36	7.3

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.20 g
Analysis Date:	05/21/2013 1422			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7800		1.4	46
Beryllium		0.34	J	0.030	0.46
Calcium		1000		13	92
Iron		18000		3.5	73
Magnesium		3100		3.4	27
Manganese		890	~~Q~~	0.092	4.1
Potassium		830		38	270
Sodium		160	~~J~~	54	460

CMT
7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: B219SCS0412AA

Lab Sample ID: 280-42043-12
Client Matrix: Solid

% Moisture: 9.9

Date Sampled: 05/06/2013 1145
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.19 g
Analysis Date:	05/17/2013 1808			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.56	U	0.35	1.9
Arsenic		3.8		0.62	2.3
Barium		26		0.071	1.9
Boron		2.1	J	0.91	9.3
Cadmium		0.12	J	0.038	0.47
Chromium		8.8	~~Q~~	0.054	3.3
Cobalt		5.6		0.093	0.93
Copper		25	~~Q~~	0.20	4.7
Lead		5.0		0.25	0.84
Molybdenum		0.40	J	0.24	2.3
Nickel		13		0.11	3.7
Selenium		1.1	U	0.80	2.8
Silver		0.19	J	0.15	1.4
Thallium		1.1	U	0.61	2.8
Vanadium		11	~~Q~~	0.088	1.9
Zinc		45		0.37	7.5

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.19 g
Analysis Date:	05/21/2013 1424			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7100		1.4	47
Beryllium		0.32	J	0.031	0.47
Calcium		3300		13	93
Iron		19000		3.5	75
Magnesium		2800		3.5	28
Manganese		900	~~Q~~ J	0.093	4.2
Potassium		860		38	280
Sodium		82	J	55	470

CAH
7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0504AA**

Lab Sample ID: 280-42043-13
Client Matrix: Solid

% Moisture: 8.0

Date Sampled: 05/06/2013 1129
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	05/17/2013 1811			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.61	U	0.39	2.0
Arsenic		5.0		0.67	2.5
Barium		50		0.077	2.0
Boron		2.1	J	1.0	10
Cadmium		0.49	J	0.042	0.51
Chromium		12		0.059	3.6
Cobalt		8.0		0.10	1.0
Copper		35		0.22	5.1
Lead		25		0.27	0.91
Molybdenum		0.51	U	0.26	2.5
Nickel		17		0.12	4.1
Selenium		1.2	U	0.87	3.0
Silver		0.25	J	0.16	1.5
Thallium		1.2	U	0.66	3.0
Vanadium		19		0.096	2.0
Zinc		97		0.40	8.1

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	05/21/2013 1427			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		11000		1.6	51
Beryllium		0.52		0.034	0.51
Calcium		11000		14	100
Iron		24000		3.9	81
Magnesium		4000		3.8	30
Manganese		1100		0.10	4.6
Potassium		960		42	300
Sodium		180	J	60	510

cdt
7/5/13

Client: FPM Remediations Inc | Job Number: 280-42043-1

Client Sample ID: B219SCS0508AA

Lab Sample ID: 280-42043-14 | Date Sampled: 05/06/2013 1133
Client Matrix: Solid | % Moisture: 9.6 | Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	05/17/2013 1813			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.62	U	0.39	2.1
Arsenic		3.3		0.68	2.6
Barium		32		0.079	2.1
Boron		1.9	J	1.0	10
Cadmium		0.21	J	0.042	0.52
Chromium		8.5		0.060	3.6
Cobalt		5.1		0.10	1.0
Copper		22		0.22	5.2
Lead		8.6		0.28	0.93
Molybdenum		0.38	J	0.27	2.6
Nickel		11		0.13	4.1
Selenium		1.2	U	0.89	3.1
Silver		0.19	J	0.17	1.6
Thallium		1.2	U	0.67	3.1
Vanadium		13		0.097	2.1
Zinc		49		0.41	8.3

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.07 g
Analysis Date:	05/21/2013 1429			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		8000		1.6	52
Beryllium		0.32	J	0.034	0.52
Calcium		2900		15	100
Iron		16000		3.9	83
Magnesium		2700		3.8	31
Manganese		810		0.10	4.7
Potassium		780		42	310
Sodium		250	J	61	520

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: B219SCS0512AA

Lab Sample ID: 280-42043-15
Client Matrix: Solid

% Moisture: 11.8

Date Sampled: 05/06/2013 1137
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	05/17/2013 1815			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.67	U	0.42	2.2
Arsenic		4.0		0.73	2.8
Barium		36		0.084	2.2
Boron		2.3	J	1.1	11
Cadmium		0.14	J	0.046	0.56
Chromium		8.7	~~Q~~	0.064	3.9
Cobalt		5.5		0.11	1.1
Copper		24	~~Q~~	0.24	5.6
Lead		4.7		0.30	1.0
Molybdenum		0.32	J	0.29	2.8
Nickel		13		0.14	4.4
Selenium		1.3	U	0.96	3.3
Silver		0.22	J	0.18	1.7
Thallium		1.3	U	0.72	3.3
Vanadium		13	~~Q~~	0.10	2.2
Zinc		110		0.44	8.9

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.02 g
Analysis Date:	05/21/2013 1432			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7000		1.7	56
Beryllium		0.41	J	0.037	0.56
Calcium		3700		16	110
Iron		21000		4.2	89
Magnesium		2800		4.1	33
Manganese		1300	~~Q~~	0.11	5.0
Potassium		1100		46	330
Sodium		200	J	66	560

MA
7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0604AA**

Lab Sample ID: 280-42043-16
Client Matrix: Solid

% Moisture: 11.2

Date Sampled: 05/06/2013 1119
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	05/17/2013 1818			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		1.1	J	0.40	2.1
Arsenic		3.1		0.69	2.6
Barium		28		0.079	2.1
Boron		3.4	J	1.0	10
Cadmium		0.20	J	0.043	0.52
Chromium		11	~~Q~~	0.061	3.7
Cobalt		5.2		0.10	1.0
Copper		34	~~Q~~	0.23	5.2
Lead		13		0.28	0.94
Molybdenum		0.29	J	0.27	2.6
Nickel		15		0.13	4.2
Selenium		1.3	U	0.90	3.1
Silver		0.21	U	0.17	1.6
Thallium		1.3	U	0.68	3.1
Vanadium		15	~~Q~~	0.098	2.1
Zinc		52		0.42	8.3

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.08 g
Analysis Date:	05/21/2013 1434			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		9100		1.6	52
Beryllium		0.36	J	0.034	0.52
Calcium		83000		15	100
Iron		15000		4.0	83
Magnesium		5300		3.9	31
Manganese		510	~~Q~~	0.10	4.7
Potassium		940		43	310
Sodium		250	J	62	520

WA
7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: **B219SCS0608AA**

Lab Sample ID: 280-42043-17
Client Matrix: Solid

% Moisture: 9.3

Date Sampled: 05/06/2013 1124
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	05/17/2013 1821			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.56	U	0.36	1.9
Arsenic		3.3		0.62	2.3
Barium		26		0.071	1.9
Boron		2.1	J	0.92	9.3
Cadmium		0.12	J	0.038	0.47
Chromium		11	~~Q~~	0.054	3.3
Cobalt		6.1		0.093	0.93
Copper		39	~~Q~~	0.20	4.7
Lead		5.0		0.25	0.84
Molybdenum		0.72	J	0.24	2.3
Nickel		14		0.11	3.7
Selenium		1.1	U	0.80	2.8
Silver		0.19	J	0.15	1.4
Thallium		1.1	U	0.61	2.8
Vanadium		14	~~Q~~	0.088	1.9
Zinc		44		0.37	7.5

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.18 g
Analysis Date:	05/21/2013 1437			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		9300		1.4	47
Beryllium		0.40	J	0.031	0.47
Calcium		1000		13	93
Iron		19000		3.6	75
Magnesium		3500		3.5	28
Manganese		870	~~Q~~	0.093	4.2
Potassium		900		38	280
Sodium		270	J	55	470

CM
7/5/13

Client: FPM Remediations Inc | Job Number: 280-42043-1

Client Sample ID: **B219SCS0612AA**

Lab Sample ID: 280-42043-18 | Date Sampled: 05/06/2013 1127
Client Matrix: Solid | % Moisture: 8.2 | Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	05/17/2013 1823			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.62	U	0.39	2.1
Arsenic		3.9		0.68	2.6
Barium		35		0.079	2.1
Boron		2.0	J	1.0	10
Cadmium		0.14	J	0.043	0.52
Chromium		9.4	~~Q~~	0.060	3.6
Cobalt		6.2		0.10	1.0
Copper		36	~~Q~~	0.23	5.2
Lead		5.2		0.28	0.93
Molybdenum		0.28	J	0.27	2.6
Nickel		15		0.13	4.1
Selenium		1.2	U	0.89	3.1
Silver		0.21	U	0.17	1.6
Thallium		1.2	U	0.67	3.1
Vanadium		13	~~Q~~	0.098	2.1
Zinc		63		0.41	8.3

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	05/21/2013 1440			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		8600		1.6	52
Beryllium		0.39	J	0.034	0.52
Calcium		2200		15	100
Iron		22000		3.9	83
Magnesium		3500		3.8	31
Manganese		1400	~~Q~~	0.10	4.7
Potassium		910		43	310
Sodium		210	J	61	520

7/5/13

Client: FPM Remediations Inc

Job Number: 280-42043-1

Client Sample ID: B219SCS0412AC

Lab Sample ID: 280-42043-19FD
Client Matrix: Solid

% Moisture: 9.3

Date Sampled: 05/06/2013 1146
Date Received: 05/08/2013 0915

6010C Metals (ICP)

Analysis Method:	6010C	Analysis Batch:	280-174938	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26b051713.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	05/17/2013 1826			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Antimony		0.63	U	0.40	2.1
Arsenic		4.4		0.69	2.6
Barium		33		0.080	2.1
Boron		1.8	J	1.0	11
Cadmium		0.11	J	0.043	0.53
Chromium		8.8	~~J~~	0.061	3.7
Cobalt		5.5		0.11	1.1
Copper		26	~~J~~	0.23	5.3
Lead		4.3		0.28	0.95
Molybdenum		0.46	J	0.27	2.6
Nickel		13		0.13	4.2
Selenium		1.3	U	0.90	3.2
Silver		0.25	J	0.17	1.6
Thallium		1.3	U	0.68	3.2
Vanadium		12	~~J~~	0.099	2.1
Zinc		47		0.42	8.4

Analysis Method:	6010C	Analysis Batch:	280-175407	Instrument ID:	MT_026
Prep Method:	3050B	Prep Batch:	280-173665	Lab File ID:	26A052113.asc
Dilution:	1.0			Initial Weight/Volume:	1.05 g
Analysis Date:	05/21/2013 1442			Final Weight/Volume:	100 mL
Prep Date:	05/10/2013 1300				

Analyte	DryWt Corrected: Y	Result (mg/Kg)	Qualifier	DL	LOQ
Aluminum		7500		1.6	53
Beryllium		0.31	J	0.035	0.53
Calcium		3200		15	110
Iron		21000		4.0	84
Magnesium		3200		3.9	32
Manganese		1300	~~J~~ J	0.11	4.7
Potassium		850		43	320
Sodium		77	J	62	530

CCK
7/5/13