

APPENDIX C
WELL DEVELOPMENT LOGS

Groundwater Well Development Log

Fort McClellan, Alabama

Project Number: 774845 796887
 Form Completed by: N. M. M. / V
 Well Developed by (person/firm): N. M. M. / V

Parcel No.: HR-NOMA
 Well No.: 63
 Date started: 02/07/02

Monitoring Well Information

Development Method: Purge + Surge
 Development Equipment: Whisper Pump + tubing
Horiba U-10, ZMC Heron Water Indicator, 12V battery
 Casing Diameter: 2"

Beginning Measurements
 Depth to Water (ft): 11.85' LTO
 Total depth of Well (ft): 56.4' LTO

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments (Date if different from start date) (Purge Rate, Pump Position, Misc.)
11:30	0	11.85	—	—	—	—	—	Muddly brown	Pump rate = 0.2 gal/min Pump @ 52' bTDC
11:45	3	13.17	4.57	0.062	1024	8.25	15.3	"	Pump @ 52' bTDC
12:00	6	14.52	4.62	0.068	924	8.45	14.4	"	Pump @ 52' bTDC
12:15	9	15.84	4.69 6.69 ^{AK}	0.072	900	8.55	14.8	"	Raised pump to 50' bTDC
12:30	12	17.16	5.31	0.068	892	8.61	15.6	"	Pump @ 50' bTDC
12:45	17.5	18.48	5.72	0.069	861	8.53	15.6	"	Pump @ 50' bTDC
13:00	27.0	19.80	5.67	0.064	853	8.62	15.7	"	Raised pump to 45' bTDC

TD - DTW = WC x 2 1/4' well = One PV x 5 = Min PV + H2O to install well = Minimum H2O to remove

$$56.4 - 11.85 = 1.18 \times 0.163 = 118 \times 5 = 5.9 + 120 = 126 \text{ gal}$$

Parcel No.: NOM
 Well ID: HL - NOM - M403
 Date: 02/07/02

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
13:15	34.5	21.10	5.62	0.075	805	8.57	15.8	muddy brown	Pump @ 45' bTOC
13:30	42.0	22.43	5.63	0.072	720	8.63	15.7	"	Pump @ 45' bTOC
13:45	49.5	23.71	5.60	0.073	680	8.64	15.4	"	Pump @ 45' bTOC
14:00	57.0	25.05	5.58	0.078	501	8.62	15.4	"	Pump @ 45' bTOC
14:15	64.5	26.37	5.62	0.075	428	8.60	15.5	"	Pump @ 45' bTOC
14:30	72.0	27.64	5.68	-	-	-	-	"	Horiba Malfunction
14:45	82.5 77.5	28.88	5.72	0.072	382	8.60	15.4	clear brown	Horiba working fine now
15:00	82.5	30.14	5.70	0.075	341	8.67	15.3	"	raised pump to 36' bTOC
15:15	85.5	31.51	5.69	0.073	302	8.62	15.3	"	Pump @ 36' bTOC
15:30	88.5	32.86	5.65	0.074	298	8.64	15.1	"	Pump @ 36' bTOC
15:45	91.5	34.26	5.62	0.075	280	8.61	15.1	"	dropped pump to 50' bTOC
16:00	94.5	35.53	5.64	0.076	271	8.67	15.2	"	Pump @ 50' bTOC
16:15	97.5	36.83	5.57	0.078	269	8.70	15.3	"	above ^{NC} Pump @ 50' bTOC

Parcel No.: NOM
 Well ID: HR-NOM-mw03
 Date: 02/07/02

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
16:30	100.5	38.15	6.01	0.075	252	8.63	15.1	Clear- brown	Pump @ 50' bTOC
16:45	103.5	39.65	5.82	0.073	241	8.49	15.0	"	dewatered well
:		Continued on			02/08/02				
09:00	103.5	18.40	6.80	0.496	326	13.00	12.21	Cloudy	Pump set @ 45' bTOC pump rate = 0.10 gal/min
09:15	105.0	18.95	7.79	0.499	300	13.15	12.29	"	Pump @ 45' bTOC
09:30	106.5	19.02	10.75	0.530	273	13.25	12.96	"	Pump @ 45' bTOC
09:45	108.0	20.40	10.51	0.602	199	13.27	13.02	"	pump @ 45' bTOC
10:00	109.5	25.60	9.98	0.501	161	13.30	13.40	"	Pump @ 45' bTOC
10:15	111.0	26.23	9.48	0.259	87	12.59	13.92	"	Pump raised to 37' bTOC
10:30	112.5	27.62	9.52	0.300	80	12.45	14.83	Clear	Pump @ 37' bTOC
10:45	114.6	27.50	9.47	0.268	82	12.44	14.90	"	Pump @ 37' bTOC
11:00	115.5	28.21	10.21	0.270	54	12.39	15.01	"	pump rate increased to 0.15 gal/min
11:15	117.75	28.62	10.37	0.274	49	12.20	15.01	"	Pump @ 37' bTOC

Parcel No.: NOM
 Well ID: HR-NOM-nw03
 Date: 02/08/02

Time 24hr	Purge Volume (gal)	Water Level (ft) (TOC)	pH (std units)	Conductivity (mS/cm)	Turbidity (NTU)	Dissolved oxygen (mg/L)	Temperature (°C)	Clarity (color)	Comments
11 :30	120.0	29.06	9.05	0.275	39	12.42	12.42	Clear	pump @ 37' bTOC
11 :45	122.5	30.00	9.01	0.277	30	12.10	12.16	"	pump @ 37' sTOC
17 :50	124.5	30.02	9.02	0.276	25	12.07	12.07	"	pump @ 37' sTOC
11 :55	126.75	30.15	9.07	0.277	19	12.05	12.05	"	complete development.
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 02/08/02

APPENDIX D
SURVEY DATA

Appendix D

Survey Data Area North of MOUT Site Fort McClellan, Calhoun County, Alabama

Sample Location	Northing	Easting	Ground Elevation (ft amsl)	Top of Casing Elevation (ft amsl)
HR-NOM-DEP01	1180110.61	676386.98	809.82	NA
HR-NOM-DEP02	1180040.60	676150.39	827.91	NA
HR-NOM-GP01	1179254.98	676776.11	926.39	NA
HR-NOM-GP02	1179319.23	676679.34	912.68	NA
HR-NOM-GP03	1179407.07	676700.83	908.22	NA
HR-NOM-GP04	1179435.33	676590.67	896.07	NA
HR-NOM-GP05	1178868.92	676447.24	935.05	NA
HR-NOM-GP06	1179112.32	676444.63	924.71	NA
HR-NOM-GP07	1179092.06	676216.46	949.49	NA
HR-NOM-GP08	1179122.83	676315.50	926.43	NA
HR-NOM-GP09	1179378.22	676388.49	918.18	NA
HR-NOM-GP10	1179317.57	676096.91	954.57	NA
HR-NOM-GP11	1179466.08	676082.35	923.39	NA
HR-NOM-GP12	1179682.56	676276.00	867.47	NA
HR-NOM-GP13	1179825.99	676938.51	829.76	NA
HR-NOM-GP14	1179891.47	676747.75	851.86	NA
HR-NOM-GP15	1180476.96	676390.98	802.70	NA
HR-NOM-GP16	1180516.21	676232.70	798.12	NA
HR-NOM-GP17	1180436.70	676138.47	793.84	NA
HR-NOM-GP18	1180233.43	676124.70	786.00	NA
HR-NOM-GP19	1180129.41	675589.56	776.51	NA
HR-NOM-MW01	1179516.18	676618.53	909.57	NA
HR-NOM-MW02	1179463.08	676202.53	885.75	NA
HR-NOM-MW03	1180251.75	676186.50	787.13	789.13

Horizontal coordinates referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983.

Elevations referenced to the North American Vertical Datum of 1988.

ft amsl - Feet above mean sea level

NA - Not applicable.

APPENDIX E
VARIANCE REPORTS



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

Variance No: AREA NORTH OF MOUT JUNE02.VR1

Linked w/NC No: X

Date of Issue: 6-25-02

Page 1 of 1

Project Name: Fort McClellan – CK 10

Project Number: 796887.11020300

-Variance Report -

I. Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN, AREA NORTH OF MILITARY OPERATIONS IN URBAN TERRAIN (MOUT) SITE

The Final Site-Specific Field Sampling Plan (FSSFSP) proposed the collection of surface water samples and sediment samples at sample locations HR-NOM-SW\SD01 and HR-NOM-SW\SD02. Surface water and sediment were not present at these two proposed locations. Therefore, depositional soil samples HR-NOM-DEP01 and HR-NOM-DEP02 were collected.

Identified by: Jeffrey J. Tarr, PG – IT Site Manager

Date: 6-25-02

II. Justification for Variance:

The FSSFSP proposed a surface water sample and sediment sample at sample locations HR-NOM-SW\SD01 and HR-NOM-SW\SD02. Sample locations HR-NOM-SW\SD01 and HR-NOM-SW\SD02 were proposed in intermittent streambeds that flow north in the western and eastern-central portion of the area of investigation. However, surface water and sediment were not present in either of these intermittent streambeds. Several attempts were made to collect surface water and sediment samples, but all attempts were unsuccessful. Therefore, depositional soil samples HR-NOM-DEP01 and HR-NOM-DEP02 were collected at those locations to determine the presence or absence of contamination. This variance will not alter the scope or intent of the Site Investigation at the Area North of MOUT Site.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan and Site-Specific Unexploded Ordnance Safety Plan Attachments, Area North of Military Operations in Urban Terrain (MOUT) Site, Fort McClellan, Calhoun County, Alabama, December 2001.

Distribution List:

1. Jeanne Yacoub, IT Project Manager
2. Steve Moran, IT Technical Lead
3. Jeffrey Tarr, IT Site Manager
4. Randy McBride, IT QA Officer
5. Mr. Ellis Pope, US Army Corps of Engineers
6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager *6-25-02*
Jeffrey J. Tarr Date

Approved by: *COE Daryla H. Pope* *6/26/02*
 Date

Project Manager Approval: *Jeanne Yacoub* *7/8/02*
 Date

QA Approval: *Randy McBride* *07-01-02* Date



Variance No: AREA NORTH OF MOUT AUGUST02.VR1
 Linked w/NC No: X
 Date of Issue: 8-12-02

Page 1 of 1

Project Name: Fort McClellan – CK 10

Project Number: 796887.11020300

-Variance Report -

I. Description: (by the person identifying the change)

FINAL SITE-SPECIFIC FIELD SAMPLING PLAN, AREA NORTH OF MILITARY OPERATIONS IN URBAN TERRAIN (MOUT) SITE

The Final Site-Specific Field Sampling Plan proposed drilling residuum wells HR-NOM-MW01 and HR-NOM-MW02 using hollow-stem augers and collecting groundwater samples from each well. In addition to using hollow-stem augers, air rotary drilling techniques were used at proposed residuum well HR-NOM-MW01. However, neither monitoring well HR-NOM-MW01 or HR-NOM-MW02 was installed nor groundwater samples collected.

Identified by: Jeffrey J. Tarr, PG – IT Site Manager

Date: 8-12-02

II. Justification for Variance:

During hollow-stem auger (HSA) drilling at proposed residuum well location HR-NOM-MW02, competent bedrock was encountered at approximately 6 feet below ground surface (bgs) and groundwater was not present. Several attempts were made to drill deeper into the residuum for groundwater, but competent bedrock was encountered. Therefore, the boreholes were abandoned and proposed monitoring well HR-NOM-MW02 was not installed. During HSA drilling at proposed residuum well location HR-NOM-MW01, competent bedrock was encountered at approximately 63 feet bgs and groundwater was not present. A decision was made to use air rotary drilling technique to drill into bedrock for groundwater. However, after air rotary drilling to 100 feet bgs groundwater was not encountered. The IT Technical Lead and IT Site Manager made a decision after consultation with the Base Closure Team including the U.S. Army Corps of Engineers, Alabama Department of Environmental Management, U.S. Environmental Protection Agency and Fort McClellan to discontinue drilling operations if groundwater was not encountered within 100 feet bgs. The decision to stop drilling was based upon the fact that the likelihood of lead contamination being present in groundwater at depths greater than 100 feet bgs was extremely minimal. Therefore, drilling operations were stopped and groundwater samples were not collected.

III. Applicable Document/Work Plan: (by the person identifying the change)

Final Site-Specific Field Sampling Plan, Site-Specific Safety and Health Plan and Site-Specific Unexploded Ordnance Safety Plan Attachments, Area North of Military Operations in Urban Terrain (MOUT) Site, Fort McClellan, Calhoun County, Alabama, December 2001.

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6. Mr. Ross McCollum, US Army Corps of Engineers

- Signatures -

Requested by: Jeffrey Tarr, PG - IT Site Manager 8-12-2002
Date

Approved by: *COE [Signature]* 08/14/02
Date

Project Manager Approval: *Jeanne Yacoub* 8/26/02
Date

QA Approval: *Randy L. McBride* 8-16-02
Date