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TECHNICAL MEMORANDUM REGARDING SUMMARY OF DELINEATION ACTIVITIES FOR REMAINING NTCRA AREA SITE UNEXPLODED ORDNANCE 23 (UXO 23) MCB CAMP LEJEUNE NC

06/16/2014

CH2M HILL

Summary of Delineation Activities for Remaining NTCRA Area, Site UXO-23, Marine Corps Installations East – Marine Corps Base Camp Lejeune, North Carolina

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CONTRACT:	Comprehensive Long-term Environmental Action Navy Contract N62470-11-8012 Contract Task Order WE40

This technical memorandum summarizes the investigation activities and results of the additional soil sampling to assess the vertical extent of lead- and polycyclic aromatic hydrocarbon (PAH)-impacted soil within the remaining portion of the Non-time-critical Removal Action (NTCRA) area.

1 Site Background

Site Unexploded Ordnance (UXO)-23, the former D-9 Skeet Range, is located north of Parachute Tower Road and encompasses approximately 200 acres in the Mainside area of the MCIEAST-MCB CAMLEJ (**Figure 1**). The Skeet Range began operation in 1953 and was closed in July 2011 due to planned military construction projects within and adjacent to the site. The range was used for recreational shooting, and the weapons used included 12-, 16-, 20-, and 28-gauge and 410-bore shot guns, and the sizes of ammunition used included 7.5-millimeter (mm), 8-mm, 8.5-mm, and 9-mm lead shot. The types of clay pigeons used included White Flyer clays and biodegradable targets (White Flyer, 2007).

Environmental investigations conducted in 2007 through 2011 identified potentially unacceptable risks from lead and PAHs in soil within the theoretical shot fall zone (**Figure 2**). An NTCRA consisting of *in situ* stabilization with excavation and offsite disposal was the selected remedial action for lead- and PAH-impacted soil. The NTCRA was initiated in April 2012 and placed on hold prior to completion in December 2012. Approximately 36,211 cubic yards of soil have been removed over 16 acres. Lead- and PAH-impacted soil remained within the NTCRA boundaries to an unknown vertical extent within 18 grids (75-foot by 75-foot), encompassing approximately 2.3 acres, and was covered with geotextile fabric and backfilled with clean soil. The remaining lead and PAH concentrations were as follows:

- Lead
  - Concentrations of lead in soil from grids FF11 (1,160 milligrams per kilogram [mg/kg]) and JJ12 (59,200 mg/kg) exceed the lead project action limit (PAL) of 400 mg/kg (**Figure 3**).
- PAHs
  - Benzo(a)pyrene concentrations exceed the PAL of 0.15 mg/kg in all 18 grids. Concentrations range from 0.25 mg/kg to 15 mg/kg (**Figure 3**).
  - Benzo(a)anthracene, benzo(b)fluoranthene, indeno(1,2,3-cd)pyrene, and/or dibenzo(a,h)anthracene concentrations also exceed the respective PALs in 11 of the 18 the grids (**Figure 3**).

2 Investigation Activities

Delineation of the vertical extent of lead- and PAH-impacted soil within the remaining 2.3 acres of the NTCRA area was added to the scope of the UXO-23 Remedial Investigation. The investigation activities are described in the following subsections and were conducted in accordance with the Uniform Federal Policy-Sampling and Analysis Plan Addendum (CH2M HILL, 2013b) and Explosives Safety Submission (CH2M HILL, 2013a).

2.1 Site Preparation

During the NTCRA, several UXO items were found; therefore, munitions and explosives of concern (MEC) avoidance measures were implemented during this investigation. UXO technicians provided MEC escort and avoidance services to the environmental sampling team and the utility location and drilling subcontractors.

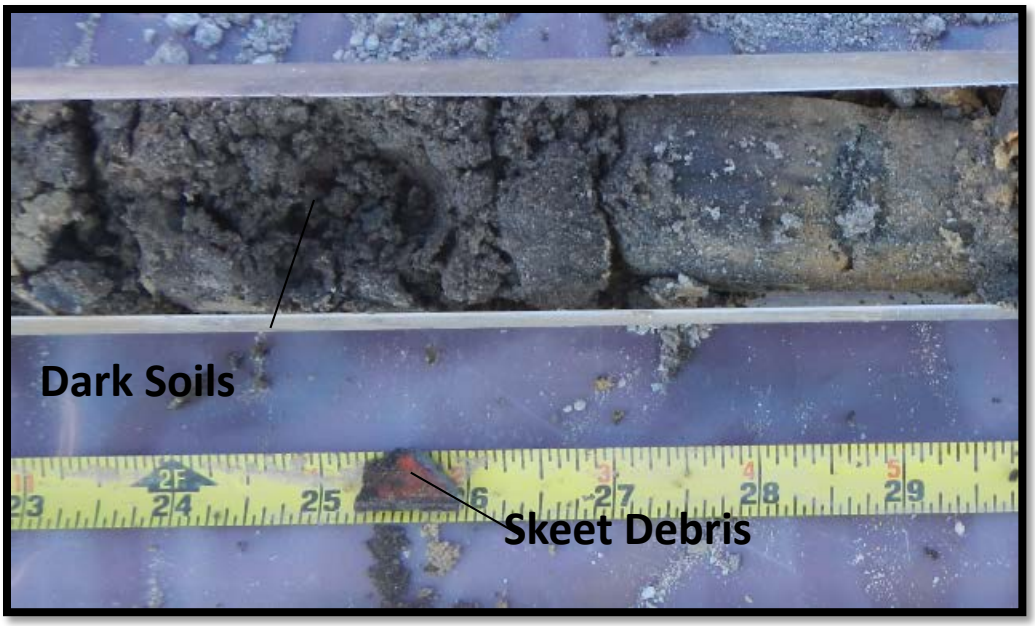
The North Carolina One-Call Center was contacted regarding the proposed subsurface sampling activities. ECLS, Inc., of Erwin, North Carolina, was subcontracted by CH2M HILL to locate and mark underground utilities at the soil boring locations.

2.2 Soil Sampling

Composite subsurface soil samples were collected from each of the 18 grids exhibiting PAL exceedances for select PAHs and from each of the two grids, JJ12 and FF11, exhibiting PAL exceedances for lead. Soil cores were collected from the four quadrants of each grid using direct-push technology (DPT) and the observed lithology was logged (**Attachment A**).

Previous confirmation samples collected during the NTCRA indicated an apparent correlation between dark soils, skeet debris (described as black flecks), and exceedances of the PALs for PAHs. In contrast, concentrations of PAHs were typically below the PALs in the underlying light tan sandy soils. Therefore, subsurface soil aliquots from each core were collected at 6-inch intervals, beginning within the light tan sandy soils that underlie the dark soil layer, until a maximum of six samples were collected per boring. However, if the dark soil layer was not present, soil aliquots were collected beginning six inches below the geotextile fabric. Furthermore, if skeet debris was encountered, soil aliquots were collected beginning six inches below their deepest occurrence. The subsurface soil aliquots representing the same depth intervals within each of the four DPT soil cores within a grid were homogenized within a disposable plastic bag, transferred to the sample container, and stored on ice in a cooler until shipped to the laboratory.

The field observations are provided in **Table 1**. In addition, the maximum depth of the dark soil, the maximum depth at which skeet fragments were observed, and the uppermost sampling depth are shown on **Figure 4**. As shown on **Figure 4**, two grids (JJ10 and JJ12) were further subdivided due to considerable differences in the observed depths of dark soils between soil cores within the same grid. Grid JJ10 was divided in half, such that the two northern quadrants were combined (JJ10-N) and the two southern quadrants were combined (JJ10-S). Grid JJ12 was divided such that the northwest and southeast quadrants were combined (JJ12-NWSE) and the northeast and southwest quadrants were combined (JJ12-NESW). In summary, dark soils were observed in all grids except GG14 and JJ10-S and skeet fragments were noted in at least one boring from each grid, except for JJ11. A photograph of observed dark soils and skeet debris is provided as follows:



Photograph of core collected from Grid FF12, southwest quadrant

Thirty-three subsurface soil samples (including duplicates) were sent to TriMatrix Laboratories for analysis of PAHs by United States Environmental Protection Agency (USEPA) SW846 Method 8270 SIM. In addition, the subsurface soil samples from JJ12 and FF11 were also analyzed for lead by USEPA SW846 Method 6020A. The shallowest soil sample was analyzed first, while the remaining soil samples were held for analysis, pending results. In cases where the results for the shallowest soil sample exceeded the PALs, the next deepest sample was analyzed until the PALs were met. The analytical data were validated by DataQual, Inc.

2.3 Decontamination

Field sampling equipment, such as hand augers, DPT tooling, and sampling equipment was decontaminated by physically removing residual soil with a brush, washing thoroughly with Alconox, and rinsing with distilled water, then isopropyl alcohol, and again with distilled water. The equipment was then wrapped in aluminum foil unless used immediately. Sampling equipment was decontaminated between borings, and new liners were used to retrieve each successive soil core.

2.4 Investigation-derived Waste Management

Investigation-derived waste (IDW) generated was managed in accordance with the current Investigation and Remediation Waste Management Plan (CH2M HILL, 2013c). IDW consisted of decontamination fluids, soil cuttings, and solid debris such as disposable sampling equipment and personal protective equipment. Solid and aqueous IDW were containerized by media in 55-gallon drums at a central staging location and then transferred at the end of the sampling event to the waste storage facility on Michael Road. The drums were transported offsite for disposal on January 14, 2014, by A&D Environmental Services. Gloves, paper towels, and similar refuse were placed in opaque, black garbage bags, and placed into on-Base trash receptacles.

3 Analytical Results

The subsurface soil validated analytical results and PALs are presented in **Table 2** and on **Figure 5**. Uppermost samples were collected from beneath dark soils and/or skeet debris, from soils described as brown fine-grained sand, brown clayey sand, and brown sandy clay. Uppermost sample depths ranged from 2.0 (JJ12-NWSE) to 6.5 feet below ground surface (bgs) (JJ12-NESW); however, most were collected between 2.5 and 3.5 feet bgs.

The sample results are summarized as follows:

- PAHs were detected in the uppermost samples of all but four grids (GG12, HH11, II13, and JJ11).
- PALs were exceeded within grid JJ10-N only. The concentrations of benzo(a)pyrene in the two uppermost samples of JJ10-N were higher than the benzo(a)pyrene PAL. The third sample (collected from 3.6 to 4.1 feet bgs [MR23-JJ10-NWNE-3.6-4.1-14A]) achieved the PALs.
- Lead was detected in the three samples submitted for lead analysis (uppermost samples from Grids FF11, JJ12-NWSE, and JJ12-NESW). Concentrations of lead ranged from 4.9 J to 7.2 mg/kg, well below the lead PAL of 400 mg/kg.

4 Conclusions

This investigation defined the maximum depth of contaminated soil lying beneath the geotextile fabric within each grid at concentrations below PALs. The maximum depth ranges from 2.0 to 6.5 feet bgs. Based on the investigation results, the estimated volume of lead- and/or PAH- impacted soils remaining in the NTCRA area beneath the geotextile fabric was calculated to be approximately 7,000 cubic yards (**Table 3**).

5 References

CH2M HILL. 2013a. *Explosives Safety Submission Munitions Response Activities Wallace Creek/UXO-23 Phase I (ESS-130)*, Marine Corps Installations East-Marine Corps Base Camp Lejeune, North Carolina. April.

CH2M HILL. 2013b. *Tier II Sampling and Analysis Plan Addendum, Remedial Investigation, UXO-23, D-9 Skeet Range, Archives Search Report 2.82*, Marine Corps Installations East-Marine Corps Base Camp Lejeune, North Carolina. November.

CH2M HILL. 2013c. *Investigation and Remediation Waste Management Plan*, Marine Corps Base Camp Lejeune, North Carolina. September.

White Flyer. 2007. http://www.whiteflyer.com

Tables

TABLE 1

Field Observations

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Grid	Quadrant	Vertical Extent of DS (in. bgs)	SF Depths (in. bgs)	Comments	Uppermost Sample Interval (in. bgs)	Uppermost Sample ID
FF11	NW	14	--	--	42 - 48	MR23-FF11-3.5-4-13D
	NE	24	12 - 24	--	42 - 48	
	SW	24	36 - 38	Dark brown staining also noted at 36 - 38"	42 - 48	
	SE	26	--	--	42 - 48	
FF12	NW	18	--	--	30 - 36	MR23-FF12-2.5-3-13D
	NE	--	--	--	30 - 36	
	SW	28	14 - 28	--	30 - 36	
	SE	--	--	--	30 - 36	
GG11	NW	30	24 - 30	--	36 - 42	MR23-GG11-3-3.5-13D*
	NE	36	20 - 36	--	36 - 42	
	SW	32	22 - 30	--	36 - 42	
	SE	30	16 - 32	--	36 - 42	
GG12	NW	28	18 - 28	--	36 - 42	MR23-GG12-3-3.5-13D*
	NE	16	14 - 16	--	36 - 42	
	SW	17	--	--	36 - 42	
	SE	22	--	Trace black staining noted at 12 - 22"	36 - 42	
GG14	NW	--	--	--	30 - 36	MR23-GG14-2.5-3-13D
	NE	--	--	--	30 - 36	
	SW	--	--	--	30 - 36	
	SE	--	--	--	30 - 36	
HH11	NW	24	--	--	42 - 48	MR23-HH11-3.5-4-13D
	NE	--	--	--	42 - 48	
	SW	33	31 - 33	--	42 - 48	
	SE	39	29 - 39	--	42 - 48	
HH13	NW	50	14 - 28	--	54 - 60	MR23-HH13-4.5-5-13D*
	NE	52	12 - 34 42 - 52	--	54 - 60	
	SW	52	14 - 28 46 - 52	--	54 - 60	
	SE	20	--	--	54 - 60	
HH14	NW	18	10 - 18	--	30 - 36	MR23-HH14-2.5-3-13D*
	NE	26	18 - 26	--	30 - 36	
	SW	26	--	--	30 - 36	
	SE	20	12 - 20	--	30 - 36	
II09	NW	12	12 - 16	--	26 - 32	MR23-II09-2.2-2.7-14A
	NE	30	60 - 63	Trace skeet debris noted at 60"	--[1]	
	SW	--	--	--	26 - 32	
	SE	--	--	--	26 - 32	
II10	NW	38	27 - 38 60 - 68		36 - 48	MR23-II10-3-4-13D*
	NE	35	28 - 35 63 - 68	Black staining noted on outside of core from 35 - 42"	36 - 48	
	SW	34	--		36 - 48	
	SE	--	28 - 36 60 - 65	Trace black staining noted at 27 - 34"	36 - 48	
II11	NW		28 - 36	--	36 - 42	MR23-II11-3-3.5-13D
	NE	23	19 - 23	--	36 - 42	
	SW	26	--	--	36 - 42	
	SE	--	--	--	36 - 42	
II12	NW	36	--	Limited to no recovery from approximately 42 - 48.5' on 3/4 of borings - no composite samples collected from these intervals	30 - 36	MR23-II12-2.5-3-13D*
	NE	24	12 - 24		30 - 36	
	SW	24	--		30 - 36	
	SE	16	14 - 16		30 - 36	

TABLE 1

Field Observations

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Grid	Quadrant	Vertical Extent of DS (in. bgs)	SF Depths (in. bgs)	Comments	Uppermost Sample Interval (in. bgs)	Uppermost Sample ID
II13	NW	36	19 - 36 50 - 51	dark staining also noted in intervals of skeet debris	54 - 60	MR23-II13-4.5-5-13D
	NE	43	36 - 43	Trace black staining at 11 - 21" and 36 - 43"	54 - 60	
	SW	30	--	Trace black staining noted at 26 - 30"	54 - 60	
	SE	--	--	--	54 - 60	
II14	NW	--	--	--	42 - 48	MR23-II14-3.5-4-13D*
	NE	--	--	--	42 - 48	
	SW	28	--	--	42 - 48	
	SE	23	20 - 23	Trace dark brown staining noted at 23 - 26"	42 - 48	
JJ09	NW	29	22 - 29	--	36 - 48	MR23-JJ09-3-4-13D
	NE	31	12 - 20 20 - 31 66 - 66	Trace black staining at 12 - 20" and 66"	36 - 48	
	SW	24	17 - 24 65 - 72	--	36 - 48	
	SE	28	20 - 28 65 - 67	Trace black skeet debris noted on outside of core at 28 - 47" likely from shallower zones	36 - 48	
JJ10	NW	30	--	--	31.2 - 37.2	MR23-JJ10-NENW-2.6-3.1-14
	NE	26	--	--	31.2 - 37.2	
	SW	--	--	--	30 - 36	MR23-JJ10-SESW-2.5-3-13D
	SE	--	--	--	30 - 36	
JJ11	NW	21	--	--	30 - 36	MR23-JJ11-2.5-3-13D
	NE	30	--	--	30 - 36	
	SW	--	--	Black staining noted on outside of core from 0 to 48", likely smeared from shallower zones	30 - 36	
	SE	--	--	--	30 - 36	
JJ12	NW	26	12 - 26	Trace black staining and possible skeet debris noted at 12-26"	24 - 30	MR23-JJ12-NWSE-2-2.5-13D
	SE	--	16 - 32	20 millimeter skeet fragment noted at 60"	24 - 30	
	NE	72	16 - 32 72 - 78	5 to 10 millimeter skeet fragments noted at 72"	78 - 84	MR23-JJ12-NESW-6.5-7-13D
	SW	36	18 - 36 68 - 76	Trace skeet debris noted at 68"	78 - 84	

Notes:

[1]This core was not included in the composite sample due to poor recovery

* indicates that a duplicate sample was collected at this location.

DS - dark soil

in. bgs - inches below ground surface

NE - northeast

NW - northwest

SE - southeast

SW - southwest

SF - skeet fragment

TABLE 2

Validated Analytical Results

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Station ID	**Project Action Limits (PAL)**	MR23-FF11	MR23-FF12	MR23-GG11						
Sample ID		MR23-FF11-3.5-4-13D	MR23-FF12-2.5-3-13D	MR23-GG11-3-3.5-13D	MR23-GG11D-3-3.5-13D	MR23-GG11-3.5-4-13D	MR23-GG11-4-4.5-13D	MR23-GG11-4.5-5-13D	MR23-GG11-5-5.5-13D	MR23-GG11-5.5-6-13D
Sample Date		11/15/13	11/15/13	11/14/13	11/14/13	11/14/13	11/14/13	11/14/13	11/14/13	11/14/13
Chemical Name										
Semivolatile Organic Compounds (UG/KG)										
Benzo(a)anthracene	1,500	**18 J**	9.7 U	**11 J**	**11 J**	**13 J**	**46**	9.7 U	**9.7 J**	**7.2 J**
Benzo(a)pyrene	150	**11 J**	9.7 U	**11 J**	**12 J**	**17 J**	**44**	9.7 U	**12 J**	**8.4 J**
Benzo(b)fluoranthene	1,500	**13 J**	**2.4 J**	**15 J**	**15 J**	**19**	**55**	9.7 U	**12 J**	**8.4 J**
Dibenz(a,h)anthracene	150	9.7 U	9.7 U	9.5 U	9.5 U	**2.9 J**	**7.3 J**	9.7 U	**2.2 J**	9.8 U
Indeno(1,2,3-cd)pyrene	1,500	**6.2 J**	3.9 U	**5.8 J**	**6.3 J**	**9.8 J**	**24**	3.9 U	**6.4 J**	**4.8 J**
Total Metals (MG/KG)										
Lead	400	**4.9 J**	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Exceeds PAL

Bold indicates detections

NA - Not analyzed

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

TABLE 2

Validated Analytical Results

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Station ID	**Project Action Limits (PAL)**	MR23-GG12	MR23-GG14	MR23-HH11	MR23-HH13		MR23-HH14		MR23-II09	
Sample ID		MR23-GG12-3-3.5-13D	MR23-GG14-2.5-3-13D	MR23-HH11-3.5-4-13D	MR23-HH13-4.5-5-13D	MR23-HH13D-4.5-5-13D	MR23-HH14-2.5-3-13D	MR23-HH14D-2.5-3-13D	MR23-II09-2.2-2.7-14A	MR23-II09D-2.2-2.7-14A
Sample Date		11/14/13	11/14/13	11/14/13	11/14/13	11/14/13	11/14/13	11/14/13	01/13/14	01/13/14
Chemical Name										
Semivolatile Organic Compounds (UG/KG)										
Benzo(a)anthracene	1,500	9.6 U	**7.3 J**	9.7 U	9.7 U	**3.2 J**	**18 J**	**110 J**	**12 J**	**10 J**
Benzo(a)pyrene	150	9.6 U	**9.3 J**	9.7 U	**4.2 J**	**3.6 J**	**16 J**	**140 J**	**15 J**	**15 J**
Benzo(b)fluoranthene	1,500	9.6 U	**10 J**	9.7 U	**4.9 J**	**4.4 J**	**22 J**	**170 J**	**12 J**	**11 J**
Dibenz(a,h)anthracene	150	9.6 U	9.6 U	9.7 U	9.7 U	9.6 U	**2.6 J**	**23 J**	9.5 U	9.5 U
Indeno(1,2,3-cd)pyrene	1,500	3.8 U	**6.1 J**	3.9 U	3.9 U	3.8 U	**9.5 J**	**92 J**	**9 J**	**7.4 J**
Total Metals (MG/KG)										
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Exceeds PAL

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UG/KG - Micrograms per kilogram

TABLE 2

Validated Analytical Results

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Station ID	**Project Action Limits (PAL)**	MR23-II10	MR23-II11	MR23-II12		MR23-II13	MR23-II14		MR23-JJ09
Sample ID		MR23-II10-3-4-13D	MR23-II11-3-3.5-13D	MR23-II12-2.5-3-13D	MR23-II12D-2.5-3-13D	MR23-II13-4.5-5-13D	MR23-II14-3.5-4-13D	MR23-II14D-3.5-4-13D	MR23-JJ09-3-4-13D
Sample Date		11/13/13	11/13/13	11/14/13	11/14/13	11/14/13	11/14/13	11/14/13	11/13/13
Chemical Name									
Semivolatile Organic Compounds (UG/KG)									
Benzo(a)anthracene	1,500	**10 J**	**67**	**8.6 J**	**15 J**	10 U	**5.4 J**	**6.2 J**	**77**
Benzo(a)pyrene	150	**12 J**	**70**	**9.9 J**	**17 J**	10 U	**6.9 J**	**7.3 J**	**89**
Benzo(b)fluoranthene	1,500	**10 J**	**86**	**11 J**	**16 J**	10 U	**8.4 J**	**7.7 J**	**87**
Dibenz(a,h)anthracene	150	9.1 U	**13 J**	10 U	**2.6 J**	10 U	9.6 U	9.6 U	**15 J**
Indeno(1,2,3-cd)pyrene	1,500	**5.1 J**	**42**	**5.3 J**	**7.2 J**	4 U	**4.2 J**	**3.9 J**	**42**
Total Metals (MG/KG)									
Lead	400	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

TABLE 2

Validated Analytical Results

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Station ID	**Project Action Limits (PAL)**	MR23-JJ10-NENW			MR23-JJ10-SESW	MR23-JJ11	MR23-JJ12	
Sample ID		MR23-JJ10-NENW-2.6-3.1-14A	MR23-JJ10-NENW-3.1-3.6-14A	MR23-JJ10-NENW-3.6-4.1-14A	MR23-JJ10-SESW-2.5-3-13D	MR23-JJ11-2.5-3-13D	MR23-JJ12-NWSE-2-2.5-13D	MR23-JJ12-NESW-6.5-7-13D
Sample Date		01/13/14	01/13/14	01/13/14	11/13/13	11/12/13	11/12/13	11/12/13
Chemical Name								
Semivolatile Organic Compounds (UG/KG)								
Benzo(a)anthracene	1,500	**240**	**190**	**46**	**61**	9.5 U	**45**	**47**
Benzo(a)pyrene	150	**280**	**190**	**62**	**78**	9.5 U	**52**	**59**
Benzo(b)fluoranthene	1,500	**310**	**250**	**71**	**81**	9.5 U	**76**	**76**
Dibenz(a,h)anthracene	150	**42**	**33**	**11 J**	**13 J**	9.5 U	**8.9 J**	**9.6 J**
Indeno(1,2,3-cd)pyrene	1,500	**140**	**110**	**37**	**35**	3.8 U	**33**	**33**
Total Metals (MG/KG)								
Lead	400	NA	NA	NA	NA	NA	**6.7**	**7.2**

Notes:

Exceeds PAL

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TABLE 3

Approximate Volume of Impacted Soil Calculation

UXO-23 NTCRA Area Technical Memorandum

MCIEAST-MCB CAMLEJ

North Carolina

Grid #	Depth of Geotextile Fabric (ft bgs)	Depth to below PALs[1] (ft bgs)	Area (Square Feet)	Volume of Clean Fill [2] (Cubic Feet)	Volume of Clean Fill [2] (Cubic Yards)	Tons of Clean Fill [2,3]	Volume of Contaminated Soil [4] (Cubic Feet)	Volume of Contaminated Soil [4] (Cubic Yards)	Tons of Contaminated Soil [3]
FF11	1.0	3.5	5,625	5,625	208	313	14,063	521	781
FF12	1.0	2.5	5,625	5,625	208	313	8,438	313	469
GG11	1.0	3.0	5,625	5,625	208	313	11,250	417	625
GG12	1.0	3.0	5,625	5,625	208	313	11,250	417	625
GG14	2.0	2.5	5,625	11,250	417	625	2,813	104	156
HH11	1.0	3.5	5,625	5,625	208	313	14,063	521	781
HH13	1.0	4.5	5,625	5,625	208	313	19,688	729	1,094
HH14	1.0	2.5	5,625	5,625	208	313	8,438	313	469
II09	1.0	2.2	5,625	5,625	208	313	6,750	250	375
II10	1.0	3.0	5,625	5,625	208	313	11,250	417	625
II11	1.5	3.0	5,625	8,438	313	469	8,438	313	469
II12	1.5	2.5	5,625	8,438	313	469	5,625	208	313
II13	1.5	4.5	5,625	8,438	313	469	16,875	625	938
II14	1.5	3.5	5,625	8,438	313	469	11,250	417	625
JJ09	1.0	3.0	5,625	5,625	208	313	11,250	417	625
JJ10 - N	1.0	3.5	2,813	2,813	104	156	7,031	260	391
JJ10 - S	1.0	2.5	2,813	2,813	104	156	4,219	156	234
JJ11	2.0	2.5	5,625	11,250	417	625	2,813	104	156
JJ12-NESW	2.0	2.0	2,813	5,625	208	313	0	0	0
JJ12 - NWSE	2.0	6.5	2,813	5,625	208	313	12,656	469	703
			101,250	**129,375**	**4,792**	**7,188**	**188,156**	**6,969**	**10,453**
Total Area (Acres) and Volume (Cubic yards):			**2.32**		**4,792 CY**			**6,969 CY**	
Totals for Cost Estimating:						**7,188 Tons**			**10,453 Tons**

Notes:

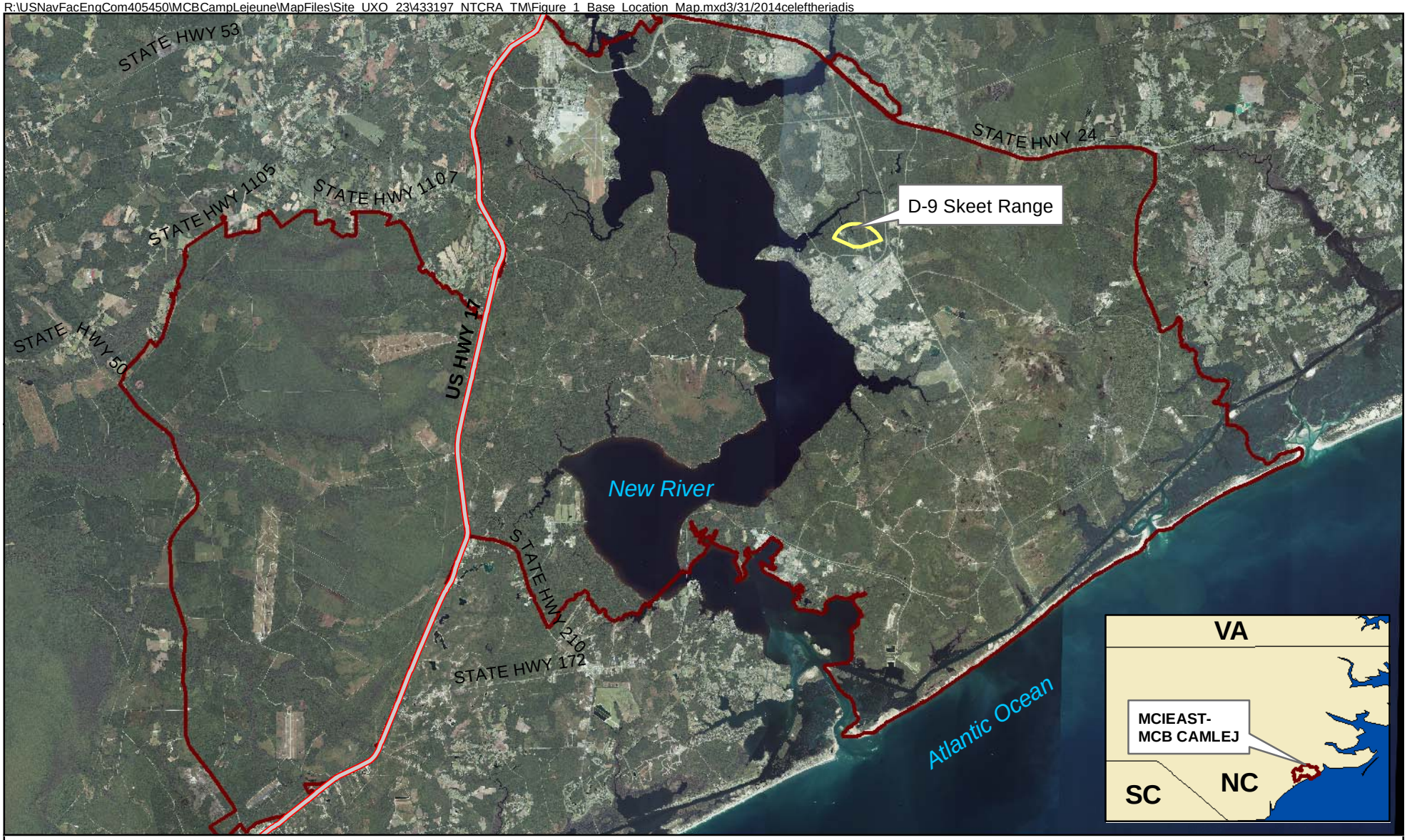
1. Depths are based on analytical results of composite samples collected within each grid.
2. The volume was calculated by multiplying the depth of geotextile fabric by the area.
3. The factor of 1.5 was used to convert cubic yards to tonnage, which was also used in Osage's tonnage estimation.
4. The volume was calculated by subtracting the depth of geotextile fabric from the depth to below PALs and multiplying by the area.

PAH: Polynuclear Aromatic Hydrocarbon

PAL: Project Action Limit

Figures

R:\USNavFacEngCom405450\MCBCampLejeune\MapFiles\Site_UXO_23\433197_NTCRA_TM\Figure_1_Base_Location_Map.mxd3/31/2014celeftheriadis



Legend

- Highways
- Skeet Range
- Installation Boundary

N

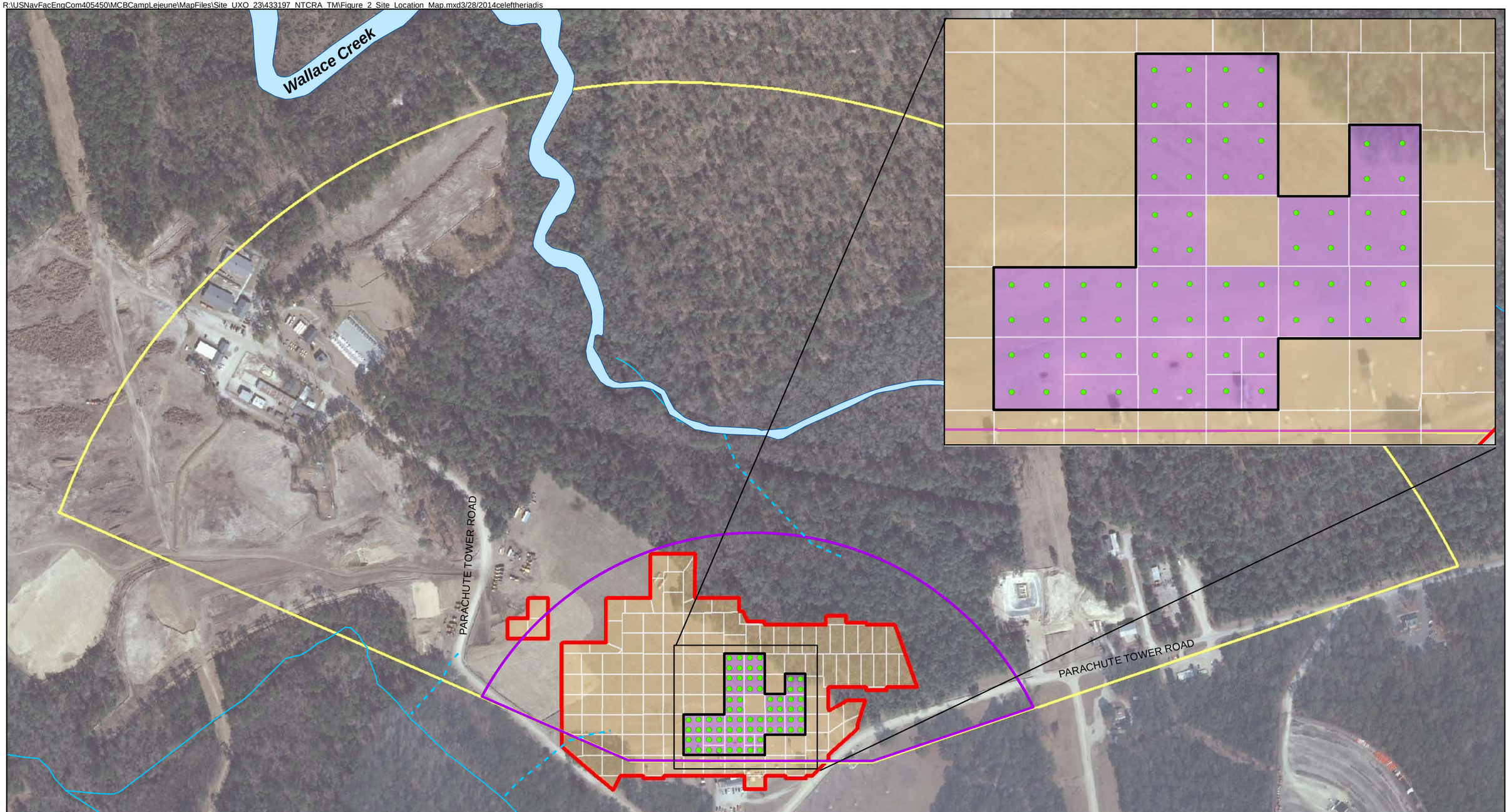
0 7,500 15,000 30,000 Feet

1 inch = 15,000 feet

Figure 1
Base Location Map
UXO-23 NTCRA Area Technical Memorandum
MCIEAST-MCB CAMLEJ
North Carolina

CH2MHILL

R:\USNavFacEngCom405450\MCBCampLejeune\MapFiles\Site_UXO_23\433197_NTCRA_TM\Figure_2_Site_Location_Map.mxd3/28/2014celeftheriadis



Legend

- DPT Locations
- Approximate Drainage Feature Location
- Surface Water
- Stream
- Geotextile Layer
- Theoretical Shot Fall Zone
- D-9 Skeet Range
- NTCRA Area
- Meets Project Action Limits
- Does Not Meet One or More Lead or Polycyclic Aromatic Hydrocarbons (PAHs) Project Action Limits (PALs), Under Geotextile Layer

N

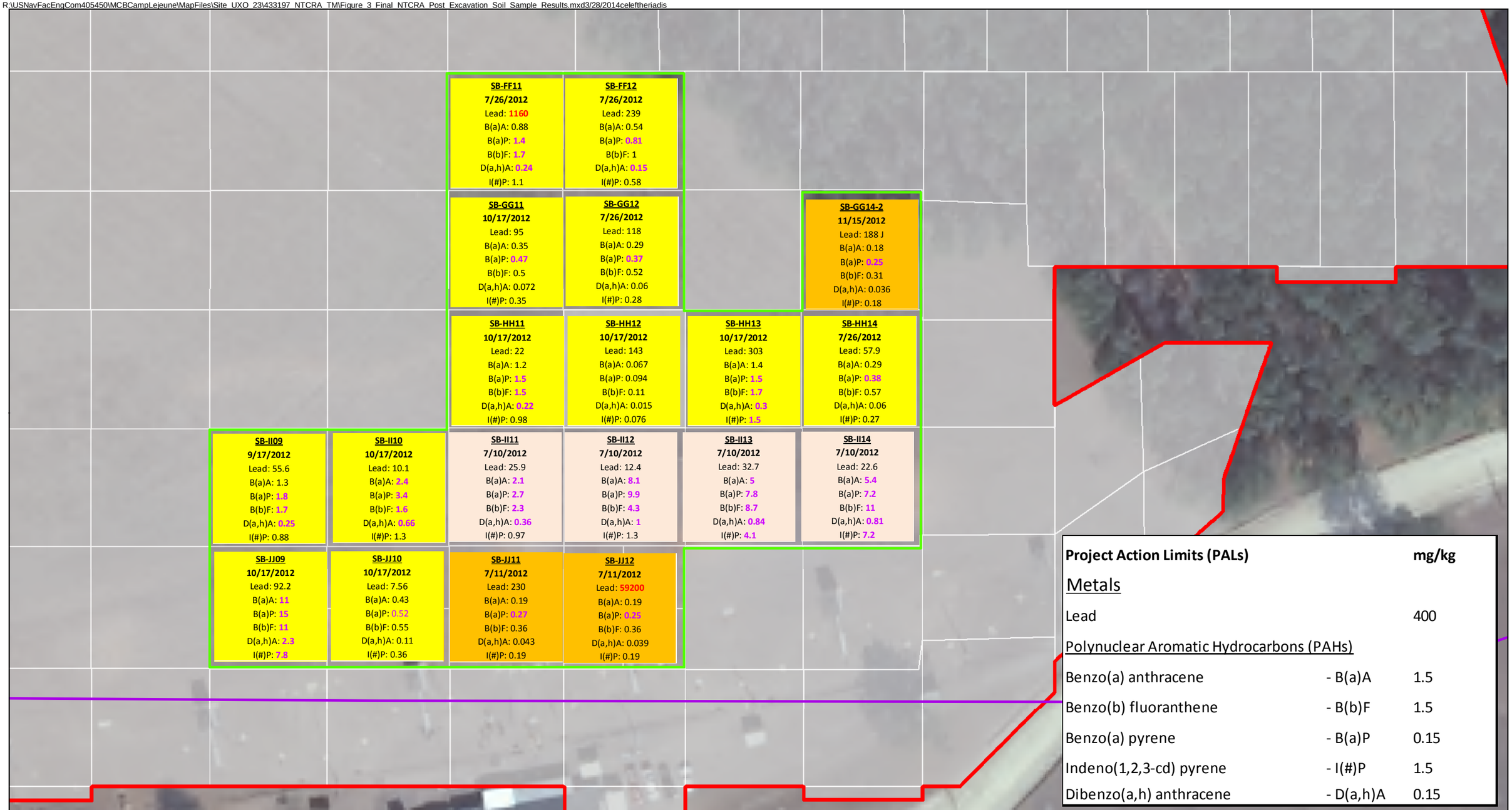
0 175 350 700 Feet

1 inch = 350 feet

Figure 2
Site Location Map
UXO-23 NTCRA Area Technical Memorandum
MCIEAST-MCB CAMLEJ
North Carolina

CH2MHILL

R:\USNavFacEngCom405450\MCBCampLejeune\MapFiles\Site_UXO_23\433197_NTCRA_TM\Figure_3_Final_NTCRA_Post_Excavation_Soil_Sample_Results.mxd3/28/2014celeftheriadis



Project Action Limits (PALs)		mg/kg
Metals		
Lead		400
Polynuclear Aromatic Hydrocarbons (PAHs)		
Benzo(a) anthracene	- B(a)A	1.5
Benzo(b) fluoranthene	- B(b)F	1.5
Benzo(a) pyrene	- B(a)P	0.15
Indeno(1,2,3-cd) pyrene	- I(#)P	1.5
Dibenzo(a,h) anthracene	- D(a,h)A	0.15

Legend
- Geotextile Layer
- Theoretical Shot Fall Zone
- NTCRA Area
- Grids outside Geotextile Area

Current NTCRA Excavation Depth (ft)
- 1
- 1.5
- 2

Notes:
1) Value = exceeds lead PAL
2) Value = exceeds PAH PALs.
3) Each sample result represents a composite soil sample comprised of four soil grabs.
4) Samples collected on multiple dates, results reflect most recent sample dates.
5) All results reported in milligrams per kilogram (mg/kg)

N

0 30 60 120 Feet

1 inch = 60 feet

Figure 3
Final NTCRA Post-Excavation Soil Sample Results
UXO-23 NTCRA Area Technical Memorandum
MCIEAST-MCB CAMLEJ
North Carolina

CH2MHILL

R:\USNavFacEngCom405450\MCBCampLejeune\MapFiles\Site_UXO_23\433197_NTCRA_TM\Figure_4_NTCRA_Vertical_Delineation_Field_Obs.mxd4/7/2014celeftheriadis

Legend
- Geotextile Layer
- Theoretical Shot Fall Zone
- NTCRA Area
- Grids outside Geotextile Area

Maximum Extent of Dark Soils	DS
Maximum Depth Interval With Skeet Fragments	SF
Uppermost Sampling Depth Interval	SD

All Depths are inches below ground surface

N

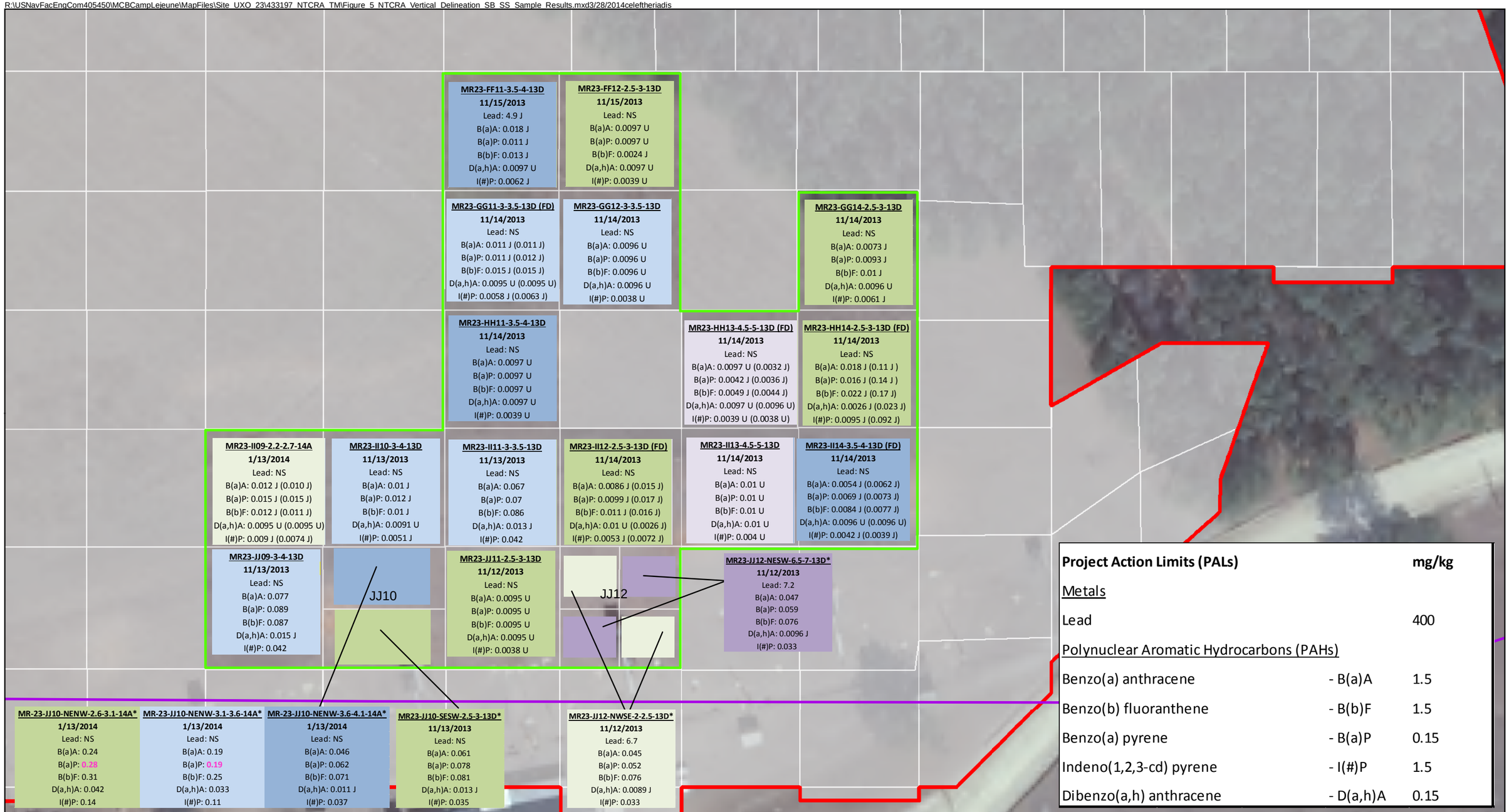
0 30 60 120 Feet

1 inch = 60 feet

Figure 4
Field Observations
UXO-23 NTCRA Area Technical Memorandum
MCIEAST-MCB CAMLEJ
North Carolina

CH2MHILL

R:\USNavFacEngCom405450\MCBCampLejeune\MapFiles\Site_UXO_23\433197_NTCRA_TM\Figure_5_NTCRA_Vertical_Delineation_SB_SS_Sample_Results.mxd3/28/2014celeftheriadis



Project Action Limits (PALs)		mg/kg
Metals		
Lead		400
Polynuclear Aromatic Hydrocarbons (PAHs)		
Benzo(a) anthracene	- B(a)A	1.5
Benzo(b) fluoranthene	- B(b)F	1.5
Benzo(a) pyrene	- B(a)P	0.15
Indeno(1,2,3-cd) pyrene	- I(#)P	1.5
Dibenzo(a,h) anthracene	- D(a,h)A	0.15

Legend
- Geotextile Layer
- Theoretical Shot Fall Zone
- NTCRA Area
- Grids outside Geotextile Area

Minimum Depth to Result below PALs
- 24 - 26 in (2.0 - 2.2 ft)
- 30 in. (2.5 ft)
- 36 in. (3.0 ft)
- 42 in. (3.5 ft)
- 54 in. (4.5 ft)
- 78 in. (6.5 ft)

Notes:
1) Value = exceeds PAH PALs
2) Each sample result represents a composite soil sample comprised of four soil grabs unless otherwise indicated
3) *Sample result represents a composite soil sample comprised of two soil grabs
4) Result for field duplicate sample are in parentheses
5) All results reported in miligrams per kilogram (mg/kg)

N

0 30 60 120 Feet

1 inch = 60 feet

Figure 5
NTCRA Area Vertical Delineation Soil Sample Results
UXO-23 NTCRA Area Technical Memorandum
MCIEAST-MCB CAMLEJ
North Carolina

CH2MHILL

Attachment A
Soil Boring Logs

UXO-23, ASR# 2.82 D-9 Skeet Range Remedial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/15/13
Sampling Team: D LUBELL
Driller: DROBE Technology
Weather: SUNNY, clear, 40°
GRID #: FF11

Sample IDs
MR23-FF11-3.5-4-13D
MR23-FF11-4-4.5-13D
MR23-FF11-4.5-5-13D
MR23-FF11-5-5.5-13D
MR23-FF11-5.5-6-13D
MR23-FF11-6-6.5-13D

CORE 3 FF11-SW

Photos:
TIME: 0845
Total Core Depth: 10'
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-18"	LT BROWN, FINE SAND w/SILT (SP-SM) MOIST, LOOSE
2	18-24"	DARK BROWN, FINE SAND (SP) TO FINE SILTY SAND (SM), TRACE LINER FRAGS
3	24-28" 28-36"	BROWN, FINE ~~SAND~~ SILTY SAND (SM) TAN FINE SAND (SP) TRACE SILT LOOSE
4	36-38"	SKEET RANGE DEBRIS AND DARK BROWN STAINED FINE SAND
5	38-44"	BROWN, SANDY SILT (ML), STIFF, MOIST
6	44-60"	NO RECOVERY
7	60-74"	BROWN, INTERBEDDED SANDY SILT (ML) AND SILTY SAND (SM)
8	74-84"	BROWN, CLAYEY SAND (SC), MED DENSE, MOIST
9	84-~~90~~ 105	BROWN, SANDY CLAY (CL), STIFF, MOIST
10	105-120"	BROWN/TAN, FINE SAND (SP) LOOSE MOIST

Northing: Easting:

CORE 4 FF11-NW

Photos:
TIME: 0900
Total Core Depth: 10'
Depth to liner: 12"
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	BROWN/LT TAN FINE SAND w/SILT (SP-SM)
2	12-14"	DARK BROWN, SILTY SAND (SM)
3	14-28" 28-40"	BROWN, SANDY SILT (ML) STIFF TAN, FINE SAND (SP) w/SILT, LOOSE, MOIST
4	40-50" 50-60"	BROWN, SANDY SILT (ML), STIFF, MOIST NO RECOVERY
5	60-72"	BROWN SANDY SILT (ML) + TAN SILTY SAND (SM) INTERBEDDED
6	72-94"	BROWN/ORANGE MOTTLED SANDY CLAY
7	94-102"	BROWN CLAYEY SAND (SC), MOIST DENSE
8	102-120"	TAN/WHITE, FINE GRAINED SAND (SP) TRACE SILT, MOIST, LOOSE
9		
10		

Northing: Easting:

Notes:
COLLECT (3.5-4) (4-4.5) (4.5-5) (5-5.5) (5.5-6) (6-6.5)

UXO-23, ASR# 2.82 D-9 Skeet Range Remedial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/15/13
Sampling Team: D. LUPEN
Driller: PROBE TECHNOLOGY
Weather: SUNNY, CLEAR, 40°
GRID #: FF11

Sample IDs
MR23-FF11-3.5-4-13D
MR23-FF11-4-4.5-13D
MR23-FF11-4.5-5-13D
MR23-FF11-5-5.5-13D
MR23-FF11-5.5-6-13D
MR23-FF11-6-6.5-13D

CORE 1 FF11-SE

Photos:
TIME: 0815
Total Core Depth: 10'
Depth to liner: 20"
Depth to darksoil: 20"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-20"	LT BROWN, FINE GRAINED SAND W/SILT TO SILTY SAND, MOIST, LOOSE
2	20-26"	DARK BROWN FINE SILTY SAND (SM), MED ~~STIFF~~ DENSE, MOIST, LINGR FRAG, LARGE GRAVEL
3	26-35"	LT BROWN, FINE GRAINED SAND W/SILT (SP SM)
4	35-49"	BROWN ~~SILTY SAND (SM)~~ 'SANDY' SILT (ML), DENSE, MOIST
	49-60"	NO RECOVERY
5	60-64"	SAME AS 35-49"
	64-76"	BROWN, FINE SILTY SAND, MOIST, SOFT
6	76-96"	BROWN, SANDY CLAY (CL), STIFF, MOIST
	96-105"	CLAYEY SAND (SC) - SILTY SAND (SM) ~~MED DENSE~~ MOIST
7	105-120"	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE MOIST
8		
9		
10		

Northing: Easting:

CORE 2 FF11-NE

Photos:
TIME: 0830
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	LT BROWN, FINE GRAINED SAND W/SILT MOIST, LOOSE
2	12-24"	DARK BROWN, SILTY SAND (SM), ~~TRACE~~ TRACE SAGGT DEBRIS FRAGS, DENSE
3	24-34"	BROWN, SANDY SILT (ML), STIFF
4	34-38"	BROWN/LT BROWN, FINE SILTY SAND (SM)
	38-60"	BROWN, SANDY SILT (ML), STIFF, MOIST
5	60-80"	BROWN/LT BROWN INTERBEDDED SILTY SAND/SANDY SILT, MOIST
6	80-96"	BROWN, SANDY SILT (ML) OR SANDY CLAY (CL) STIFF, MOIST
7	96-104"	BROWN, SILTY SAND (SM)
8	104-120"	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE, MOIST
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11-15-13
Sampling Team: Kevin Howell / David Seed
Driller: Probe Technologies
Weather: Sunny calm 40's
GRID #: FF 12

Sample IDs
MR23 FF12 - 2.5-3.0-13D
MR23 FF12 - 3.0-3.5-13D
MR23 FF12 - 3.5-4.0-13D
MR23 FF12 - 4.0-4.5-13D
MR23 FF12 - 4.5-5.0-13D
MR23 FF12 - 5.0-5.5-13D

CORE 3 FF12 SW

Photos:
TIME: 0810
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-14"	brown silty sand, moist, dense
2	14"-28"	d. brown sandy silt, moist, stiff liner debris @ 14" - skeet debris
3	28"-36"	brown sandy silt, moist, stiff
4	36"-46"	gray brown fine sand, moist, dense
5	46"-60"	brow sand silt, moist, stiff
6	60"-72"	gray brown fine sand, moist, dense
7		
8	72"-96"	brown sandy silt, moist, dence
9		
10	96-120"	brown gray fine sand, moist, dense

Northing: Easting:

CORE 4 FF12SE

Photos:
TIME: 0820
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-18"	brown to Lt gray silty sand, moist dense
2	18"-60"	brown sandy silt, moist, stiff
3		
4		
5	60"-80"	brown sandy silt, moist, stiff
6		
7	80"-90"	brown silty sand, moist, dense
8		
9	90"-120"	Lt. gray brown fine sand, moist, dense
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation

CLEAN 8012 - CTO-WE40

PAGE:

Date: 11-15-13

Sampling Team: Kevin Howell / David Seed

Driller: Probe Technology, Inc

Weather: Sunny cold calm 40's

GRID #: EF 12

Sample IDs

CORE 1 FF12 NE

Photos:

TIME: 0750

Total Core Depth: 10

Depth to liner:

Depth to darksoil:

Depth to tan soil:

Thickness of dark soil:

Thickness of tan soil:

1	0-12"	gray lt. brown fine sand with silt, moist dense liner debris @ 12"
2		
3		
4	12"-60"	brown sandy silt, moist, stiff
5	60"-78"	gray lt brown fine sand with silt, moist
6	78"-90"	brown sandy silt, moist, stiff
7		
8	90"-120"	lt. gray tan fine sand, moist, dense
9		
10		

Northing: Easting:

CORE 2 FF12 NW

Photos:

TIME: 0800

Total Core Depth: 10

Depth to liner:

Depth to darksoil:

Depth to tan soil:

Thickness of dark soil:

Thickness of tan soil:

1	0-10"	Lt brown sandy silt, moist, stiff
2	10"-18"	dbrown fine sand with silt, liner debris @ 10", moist, dense
3	18"-30"	brown silty sand, moist, dense
4	30"-60"	brown sandy silt, moist, ~~dense~~ stiff
5	60"-66"	brown sandy silt, moist, stiff
6	66"-84"	brown silty sand, moist, dense
7	84"-120"	Lt gray tan fine sand, moist, dense
8		
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Sample IDs

Date: 11-14-13
Sampling Team: Kevin Howell / David Seed
Driller: Probe Technologies Inc
Weather: Sunny mild calm 50's
GRID #: GG11

CORE 1 GG 11 SE

Photos:
TIME: 1410
Total Core Depth: 10
Depth to liner:
Depth to darksoil: 16"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-16"	brown silty clayey sand, moist, stiff
2	16"-32"	brown to d. brown sandy clay w. in skeet debris, liner debris @ 20"
3		
4		
5	32"-60"	brown silty sand/sandy silt, moist, stiff
6	60"-96"	brown to lt brown sandy silt, moist stiff
7		
8	96"-120"	lt gray fine sand with trace silt
9		
10		

Northing: Easting:

CORE 2 GG 11 SE

Photos:
TIME: 1420
Total Core Depth:
Depth to liner:
Depth to darksoil: 22"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-22"	brown silty clayey sand, moist, stiff
2	22"-30"	dark brown sandy clay with skeet debris, liner debris @ 22"
3	30"-60"	brown silty sand/sandy silt, stiff moist
4		
5	60-96"	brown sandy clay, moist, stiff
6		
7		
8	96-108	brown clayey sand, moist, dense
9		
10	108-120	lt. gray brown fine sand, moist

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Date: 11-14-13
Sampling Team: Kevin Howell / David Seed
Driller: Probe Technology Inc
Weather: Sunny mild calm 50's
GRID #: GG11

Sample IDs
MR23GG11-3.0-3.5-13D
MR23GG11-3.5-4.0-13D
MR23GG11-4.0-4.5-13D
MR23GG11-4.5-5.0-13D
MR23GG11-5.5-6.0-13D
MR23GG11-5.5-6.0-13D

CORE 3 GG11 NW

Photos:
TIME: 1435
Total Core Depth: 10
Depth to liner:
Depth to darksoil: 24
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-24"	brown silty sand moist dense
2	24"-30"	d brown sandy clay with skeet debris, liner debris @ 28"
3	30"-60"	brown sandy silty clay, moist, stiff
4		
5	60"-90"	brown silty clayey sand, moist, dense
6		
7	90"-108"	brown, sandy silty clay, moist, stiff
8		
9		
10	108"-120"	brown to light gray silty fine sand moist, dense

Northing: Easting:

CORE 4 GG11 NE

Photos:
TIME: 1445
Total Core Depth: 10
Depth to liner:
Depth to darksoil: 20
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-20"	lt brown silty sand, moist, dense
2	20"-36"	d brown sandy clay with skeet debris, liner debris @ 20"
3		
4	36"-60"	brown silty sand, moist, dense
5	60"-110"	brown silty sand/sandy clay moist, stiff
6		
7		
8		
9		
10	110"-120"	brown fine sand with silt moist - dense

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs

CORE 3 GG12-SW

Photos:
TIME: 1500
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 11"
Depth to tan soil: 17"
Thickness of dark soil:
Thickness of tan soil:

1	0-11"	LT BROWN, FINE SAND (SP) w/SILT (SP-SM) MOIST, LOOSE
2	11-17"	DARK BROWN FINE SAND (SP) TO FINE ~~SANDY CLAY (CL)~~ CLAYEY SAND (SC)
3	17-42"	BROWN, SANDY CLAY (CL), DRY-SL MOIST
4	42-60"	NO RECOVERY
	60-68"	BROWN, CLAYEY SAND (SC), FINE GRAIN, MOIST
5	68-110"	BROWN, SANDY CLAY (CL), FINE GRAINED MOIST, MED STIFF
6	110-116"	BROWN, CLAYEY SAND (SC), FINE GRAINED MOIST
7	116-120"	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE
8		
9		
10		

Northing: Easting:

CORE 4 GG12-SE

Photos:
TIME: 1515
Total Core Depth: 10'
Depth to liner: 12"
Depth to darksoil: 22"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	LT BROWN, FINE GRAINED SAND (SP) INTERBEDDED (SP-SM), LOOSE, MOIST
2	12-22"	DARK BROWN FINE GRAINED SAND, (SP) TRACE BLACK STAINING, UNDER PRACS
3	22-30"	TAN, FINE GRAINED SAND (SP), LOOSE
4	30-33"	BROWN, SANDY CLAY (CL), STIFF
	33-36"	TAN, FINE SAND (SP) LOOSE
5	~~33-36~~-60	BROWN, SANDY CLAY (CL), STIFF, SL MOIST
	60-62"	DARK BROWN, FINE GRAINED SAND w/SILT (SM)
6	62-~~60~~	BROWN, SANDY CLAY (CL)
	66-68"	SAME AS 60-62"
7	68-104"	BROWN/ORANGE MOTTLED SANDY CLAY (CL)
	104-105"	BROWN, CLAYEY SAND (SC)
8	105-120"	TAN/WHITE, FINE SAND (SP), LOOSE
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team: D. LUPELL + G. MOOR RITTER
Driller: PROBE TECHNOLOGY
Weather:
GRID #: GG12

Sample IDs	
MR23-GG12-3-3.5-13D	PROBE
MR23-GG12-3.5-4-13D	MS/MSD
MR23-GG12-4-4.5-13D	
MR23-GG12-4.5-5-13D	
MR23-GG12-5-5.5-13D	
MR23 GG12-5.5-6-13D	

CORE 1 GG12-NW

Photos:
TIME: 1430
Total Core Depth: 10'
Depth to liner: ND
Depth to darksoil: 18"
Depth to tan soil: 28"
Thickness of dark soil:
Thickness of tan soil:

1	0-18"	YELLOWISH BROWN, FINE SAND (SP) WITH CLAY NEAR 18", MOIST
2	18-28"	DARK BROWN SILTY SAND (SM), STIFF BLACK STAINING + SKEET DEBRIS FRAGS
3	28-42"	TAN FINE GRAINED SAND (SP) LOOSE TRACE SILT
4	42-60"	BROWN, SANDY CLAY (CL), SL MOIST STIFF
5	60-66"	BROWN, FINE SILTY SAND (SM) LOOSE MOIST
6	66-74	BROWN, CLAYEY SAND (SC)
7	74-102	BROWN/ORANGE MOTTLED SANDY CLAY (CL) MED STIFF
8	102-106"	BROWN, CLAYEY SAND (SC), MED DENSE MOIST
9	106-120	TAN/WHITE, FINE SANDS (SP)
10		

Northing: Easting:

CORE 2 GG12-NE

Photos:
TIME: 1445
Total Core Depth: 10'
Depth to liner: ND
Depth to darksoil: 14
Depth to tan soil: 16"
Thickness of dark soil:
Thickness of tan soil:

1	0-14"	LT BROWN, FINE GRAINED SAND (SP) V/SILT, LOOSE, MOIST
2	14-16"	DARK BROWN/BROWN, FINE SAND W/SILT (SP-SM) LOOSE, MOIST, TRACE SKEET FRAG + LINER
3	16-23"	TAN, FINE GRAINED SAND (SP), LOOSE
4	23-32"	BROWN, CLAYEY SAND (SC)/SANDY CLAY (CL) DRY, DENSE/STIFF
5	32-36"	TAN, FINE GRAINED SAND (SP), LOOSE
6	36-54"	BROWN, SANDY CLAY (CL), SL. MOIST, STIFF
7	54-60"	NO RECOVERY
8	60-67"	BROWN, FINE SILTY SAND (SM), LOOSE MOIST
9	67-85" 85-100"	BROWN, SANDY CLAY (CL)/SANDY SILT (ML) BROWN, CLAYEY SAND (SC).
10	100-120"	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE

Northing: Easting:

Notes:
COLLECT: (3-3.5)(3.5-4)(4-4.5)(4.5-5)(5-5.5)(5.5-6)

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11-14-13
Sampling Team: Kevin Howell
Driller: Probe Technology, inc
Weather: sunny, mild, 50's
GRID #: GG14

~~MR23GG14-2~~ Sample IDs
MR23GG14-2.5-3.0-13D
MR23GG14-3.0-3.5-13D
MR23GG14-3.5-4.0-13D
MR23GG14-4.0-4.5-13D
MR23GG14-4.5-5.0-13D
MR23GG14-5.0-5.5-13D

CORE 3 GG14NE

Photos:
TIME: 1625
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-16"	lt. brown silty sand, moist dense
2	16"-18"	gray sandy clay, moist stiff liner debris @ 16"
3	18"-60"	brown sandy silt, moist, stiff
4		
5	60"-90"	brown sandy silt, moist, stiff
6		
7		
8	90"-120"	lt brown to light gray fine sand with trace silt, moist, dense
9		
10		

Northing: Easting:

CORE 4 GG14NE

Photos:
TIME: 1630
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-20"	lt. brown silty sand moist, dense
2	20"-60"	brown sandy silt, moist, stiff liner debris @ 20"
3		
4		
5	60"-90"	brown sandy silt, moist, stiff
6		
7		
8	90"-120"	Lt brown to Lt gray fine sand moist, dense
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Sample IDs

Date: 11-14-13
Sampling Team: Kevin Howell
Driller: Probe Technologies, inc
Weather: Sunny, light breeze, 50's
GRID #: GG 14

CORE 1 GG14 SW

Photos:
TIME: 1605
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-24"	tan silty sand, moist, dense liner debris @ 18"
2	24"-48"	lt brown silty sand, moist, dens
3		
4		
5	48"-60"	no recovery
6	60"-78"	brown silty sand, moist dense
7	78"-92	brown silt with fine sand, moist stiff
8		
9	92"-120"	tan to light gray fine sand, moist dense
10		

Northing: Easting:

CORE 2

Photos:
TIME:
Total Core Depth:
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-36"	lt brown silty sand, moist, dense
2		
3	36"-60"	brown sandy silt, moist, stiff
4		
5	60"-96"	brown sandy silt, moist, stiff
6		
7		
8		
9	96"-120"	tan to L. gray fine sand, moist, dense
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team: D. LIBELL + G. MOORE
Driller: PROBE TECHNOLOGY
Weather:
GRID #: HH11

Sample IDs

CORE 1 HH11-NE

Photos:
TIME: 1330
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-10"	LT BROWN, FINE SANDS (SP), LOOSE - MED DENSE
	10-14"	LT BROWN, CLAYEY SAND, BROWN, MOIST
2	14-28"	INTERBEDDED SANDY CLAY / CLAYEY SAND BROWN MOIST
3	28-40"	BROWN, CLAYEY SAND (SC), DENSE F. GRAINED
4	40-48"	BROWN, SANDY CLAY (CL), STIFF FINE GRAINED
5	48-54"	BROWN, CLAYEY SAND (SC), SOFT FINE GRAINED
6	54-60"	BROWN, SANDY CLAY (CL), STIFF FINE GRAINED
7	60-69.5"	BROWN, CLAYEY SAND (SC), SOFT FINE GRAINED
8	69.5-94"	BROWN/ORANGE MOTTLED SANDY CLAY, (CL) / CLAY (CL), FINE GRAINED, MOIST, MED STIFF
9	94-103"	BROWN, CLAYEY SAND (SC), MOIST,
10	103-120"	TAN / WHITE, FINE GRAINED SAND (SP), LOOSE

Northing: Easting:

CORE 2 HH11-NW

Photos:
TIME: 1345
Total Core Depth: 10'
Depth to liner: ~~NA 23"~~ NA
Depth to darksoil: 21"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	LT BROWN, FINE SAND w/SILT (SP-SM) MOIST, LOOSE
2	12-15"	LT BROWN SANDY CLAY (CL), FINE GRAINED SOFT
3	15-21"	LT BROWN, FINE SAND w/SILT (SP-SM) MOIST, LOOSE
4	21-24"	DARK BROWN, FINE SAND w/CLAY
5	24-36"	BROWN, CLAYEY SAND (SC), MOIST, DENSE
6	36-47" 47-60"	BROWN, SANDY CLAY (CL), SL. MOIST, STIFF NO RECOVERY
7	60-68"	BROWN FINE SAND w/SILT (SP-SM)
8	68-72"	BROWN, CLAYEY SAND / SANDY CLAY
9	72-96"	BROWN / ORANGE MOTTLED CLAY + SANDY CLAY (CL)
10	~~96-102~~ 96-102 102-120"	BROWN CLAYEY SAND, (SC) FINE GRAINED TAN/WHITE FINE GRAINED SAND (SP), LOOSE

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs
MR23-HH11-3.5-4-13D - MS/SD
MR23-HH11-4-4.5-13D
MR23-HH11-4.5-5-13D
MR23-HH11-5-5.5-13D
MR23-HH11-5.5-6-13D
MR23-HH11-6-6.5-13D

CORE 3 HH11SW

Photos:
TIME: 1400
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 31"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-31"	~~BROWN~~ LT BROWN, FINE SAND w/CLAY TO CLAYEY SAND (SC) MOIST, LOOSE - MED DENSE
2	31-33"	BROWN/DK BROWN, FINE SAND (SP) SKEET DEBRIS FRAGS
3	33-39"	BROWN, CLAYEY SAND (SC), MED DENSE MOIST
4	39-60"	BROWN SANDY CLAY (CL), MED STIFF TO STIFF, MOIST
5	60-66"	BROWN, FINE-GRAINED SAND w/ CLAY
6	66-97"	BROWN/ORANGE MOTTLED SANDY CLAY (CL) STIFF/MED STIFF
7	97-104	BROWN CLAYEY SAND (SC), MED DENSE
8	104-120"	TAN/WHITE FINE GRAINED SAND (SP) LOOSE
9		
10		

Northing: Easting:

CORE 4 HH11-SE

Photos:
TIME: 1415
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 29"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-21"	LT BROWN, FINE SAND w/SILT (SP)
2	21-24"	LT BROWN/OLIVE, SANDY CLAY (CL)
3	24-29"	~~BROWN~~ LT BROWN, FINE SAND w/CLAY
4	29-39"	DARK BROWN, FINE SAND (SP), TRACE BLACK STAINING + SKEET DEBRIS FRAGS
5	39-50"	BROWN, SANDY CLAY (CL)
6	50-60"	BROWN, CLAYEY SAND (SC)
7	60-68"	BROWN, FINE GRAINED SAND w/ CLAY ~~(SP)~~ (SP-SC)
8	68-96"	BROWN/ORANGE MOTTLED SANDY CLAY (CL) SOFT
9	96-104	BROWN CLAYEY SAND (SC)
10	104-120	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE

Northing: Easting:

Notes:
COLLECT (3.5-4) (4-4.5) (4.5-5) (5-5.5) (5.5-6) (6-6.5)

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Date: 11-14-13
Sampling Team: Kevin Howell / David Seed
Driller: Probe Technologies, Inc
Weather: Sunny, mild, light breeze
GRID #: HH13

Sample IDs
MR23 HH13-4.5-5.0-13D
MR23 HH13-5.0-5.5-13D
MR23 HH13-5.5-6.0-13D
MR23 HH13-6.0-6.5-13D
MR23 HH13-6.5-7.0-13D
MR23 HH13-7.0-7.5-13D

CORE 3 HH13 NW

Photos:
TIME: 0950
Total Core Depth:
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-14"	Lt. brown silty fine sand, moist, m. dense
2	14"-28"	d. brown fine sandy clay, skeet debris liner fragments @ 16"
3	28"-42"	brown fine sandy clay, moist, stiff
4	42"-50"	brown to d brown fine sand with clay, m. dense, moist
5	50"-60"	brown fine sandy clay, moist, stiff
6	60"-102"	brown fine sandy clay, moist to wet stiff
7		
8		
9	102"-120"	tan to light gray fine sand with trace silt
10		

Northing: Easting:

CORE 4 HH13 NE

Photos:
TIME: 1000
Total Core Depth:
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	Lt brown silty fine sand, moist m. dense
2	12"-34"	d. brown clayey silt fine sand, skeet debris, liner debris @ 14"
3	34"-42"	brown fine sandy clay moist, stiff
4	42"-52"	brown to d. brown fine sand with clay, m. dense, moist, skeet debris
5	52"-60"	brown fine sandy clay, moist, stiff
6	60"-102"	brown fine sandy clay moist stiff
7		
8		
9	102"-120"	tan to light gray fine sand with trace silt
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Date: 11-14-13
Sampling Team: Kevin Howell / CLT
Driller: Probe Technologies, Inc
Weather: Sunny, 50s light breeze
GRID #: HH13

Sample IDs

CORE 1 HH13 SE

Photos:
TIME: 0930
Total Core Depth: 10
Depth to liner: -
Depth to darksoil: 12"
Depth to tan soil: 20"
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	Lt brown sandy silt, moist, stiff
2	12"-20"	d. brown fine sandy clay, liner debris @ 18"
3	20"-48"	brown fine sandy clay, moist, stiff
4	48"-60"	no recovery
5	60"-84"	brown fine sandy clay, wet, stiff
6		
7	84"-96"	light brown clayey fine sand, moist m. dense
8		
9	96"-120"	light gray tan fine sand with trace clay
10		

Northing: Easting:

CORE 2 HH13 SW

Photos:
TIME: 0940
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-14"	Lt brown sandy silt, moist, m. stiff
2	14"-28"	brown to d. brown fine sandy clay with skeet debris, liner frag @ 14"
3	28-46"	brown fine sandy clay, moist, stiff
4	46"-52"	brown to d. brown fine sandy clay with skeet debris
5	52"-96"	brown fine sandy clay, wet, stiff
6		
7		
8		
9	96"-120"	tan to light gray fine sand with trace clay, wet, dense
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Date: 11-14-13
Sampling Team: Kevin Howell
Driller: Probe Technologies, Inc
Weather: Sunny, 50°s, calm
GRID #: HH14

Sample IDs

CORE 3 HH14NE

Photos: 1115
TIME:
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-18"	brown sand with some silt, moist. m. dense
2	18"-26	d brown clayey sand with skeet debris liner debris @ 20"
3	26"-60	brown sandy clay, moist, stiff
4		
5	60"-96"	brown sandy clay, moist, stiff
6		
7		
8	96"-~~120~~ 108"	brown clayey sand, moist st. ff
9		
10	108"-120"	light brown gray fine sand, moist dense

Northing: Easting:

CORE 4 HH14NW

Photos: 1130
TIME:
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-10"	brown sand with some silt, moist m. dense
2	10"-18"	d. brown sandy clay with skeet debris, liner debris @ 14"
3	18"-26"	brown sandy clay, moist stiff
4	26"-28"	brown fine sand, wet, dense
5	~~28-32~~ 28"-30"	brown sandy clay, moist, stiff
6	30"-60"	brown silty sand, moist, m. dense
7	60"-96"	brown clayey sand, moist, stiff
8	96"-108	brown sandy clay, moist, stiff
9		
10	108"-120"	light brown gray fine sand, moist dense

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Date: 11-14-13
Sampling Team: Kevin Howell / David Seed
Driller: Probe Technologies, Inc
Weather: Sunny, calm, 50's
GRID #: HH14

Sample IDs
MR23 HH14-2.5-3.0-13D
MR23 HH14-3.0-3.5-13D
MR23 HH14-3.5-4.0-13D
MR23 HH14-4.0-4.5-13D
MR23 HH14-4.5-5.0-13D
MR23 HH14-5.0-5.5-13D

CORE 1 HH14SW

Photos:
TIME: 1045
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-16"	Lt brown silty sand, moist, m dense
2	16"-26"	d brown sandy clay, moist, stiff liner debris @ 18"
3	26"-42"	brown fine sandy clay, moist stiff
4	42"-50"	brown to d. brown clayey sand, moist m. dense
5	50"-60"	brown clayey sand with silt moist m dense
6	60"-90"	brown clayey sand with silt moist m. dense
7		
8	90"-120"	light gray to tan fine sand with trace clay/silt moist, dense
9		
10		

Northing: Easting:

CORE 2 HH14SE

Photos:
TIME: 1100
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	lt brown silty sand with some clay moist, m. dense
2	12"-20"	brown to d brown sandy clay with skeet debris, liner debris @ 14"
3	20"-40"	brown sandy clay, moist, stiff
4	40"-48"	brown to d brown clayey sand moist m dense
5	48"-60"	brown sandy clay moist, stiff
6	60"-90"	brown clayey sand with silt moist, m dense
7		
8	90"-120"	light gray to tan fine sand m. dense moist
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs

CORE 1 IID9-SW

Photos:
TIME: 1230
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 15"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-18"	LT BROWN, FINE GRAINED SAND (SP) WITH INTERBEDDED CLAYEY SAND
2	18-20"	BROWN, FINE GRAINED SAND, TRACE LINER
3	20-36"	BROWN CLAYEY SAND (SC)
4	36-43"	BROWN, FINE GRAINED SAND (SC)
5	43-60"	BROWN/ORANGE, SANDY CLAY (CL)
6	60-68"	BROWN, CLAYEY SAND (SC)
7	68-102"	BROWN/ORANGE MOTTLED SANDY CLAY / CLAY
8	102-105"	BROWN, CLAYEY SAND (SC)
9	105-120"	TAN/WHITE FINE GRAINED SAND (SP) LOOSE
10		

Northing: Easting:

CORE 2 IID9-SE

Photos:
TIME: 1245
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: NA
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-26"	LT BROWN, FINE GRAINED SAND (SP), LOOSE TO MEDIUM
2	26"-46"	BROWN, CLAYEY SAND (SC), DENSE
3	46-58" 58-60"	BROWN, SANDY CLAY (CL) STIFF NO RECOVERY
4	60-64"	BROWN, FINE SAND (SP), TRACE SILT
5	64-76"	BROWN, CLAYEY SAND (DENSE)
6	76-112"	BROWN/ORANGE MOTTLED SANDY CLAY (CL)
7	112-114"	BROWN/ORANGE CLAYEY SAND (SC)
8	114-120"	LT BROWN/TAN, FINE GRAINED SAND (SP) LOOSE
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #: II09

Sample IDs

CORE 3 II09-NE

Photos:
TIME: 1200
Total Core Depth: 10'
Depth to liner: 27"
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-27"	BROWN/LT BROWN, FINE SANDS (SP)
2	27-30"	DARK BROWN, FINE SANDS (SP), SOME BLACK STAINING
3	30-60"	NO RECOVERY
* 4	60-63"	BROWN/DARK BROWN, CLAYEY SAND (SC), TRACE BLACK SKEET DEBRIS TRACE
5	~~60-74"~~ 63-74"	BROWN CLAYEY SAND (SC)
6	74-115"	BROWN/ORANGE MOTTLED SANDY CLAY/CLAY MED STIFF, MOIST
7	115-119"	BROWN/ORANGE MOTTLED, CLAYEY SAND (SC)
8	119-120"	TAN/WHITE, FINE SAND (SP), LOOSE
9		
10		

Northing: Easting:

CORE 4 II09-NW

Photos:
TIME: 1215
Total Core Depth: 10'
Depth to liner: —
Depth to darksoil: 10"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-10"	LT BROWN, FINE SANDS (SP), MOD DENSE
2	10-12"	DARK BROWN, FINE SANDS, TRACE BLACK STAINING
3	12-16"	TAN, FINE GRAINED SAND (SP), TRACE BLACK STAINING OF SKEET DEBRIS
4	16-32"	BROWN, CLAYEY SAND (SC), DENSE
5	32-52"	BROWN/ORANGE MOTTLED SANDY CLAY (CL) STIFF
6	52-60"	NO RECOVERY
7	60-63" 63-70"	BROWN/DARK BROWN CLAYEY SAND (SC) DENSE * BROWN, ~~CL~~ SANDY CLAY (CL)
8	70-96" 96-99"	BROWN/ORANGE MOTTLED SANDY CLAY (CL) BROWN CLAYEY SAND (SC)
9	99-120"	TAN/WHITE, FINE GRAINED SAND (SP)
10		

Northing: Easting:

Notes:
COLLECT: 3-3.5, 3.5-4, ~~4-4.5~~ 4-4.5, 5-5.5, 5.5-6, 6-6.5'

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation

CLEAN 8012 - CTO-WE40

PAGE: 1

Date: 1/13/14

Sampling Team: G. Ritter, R. McComb

Driller: Probe

Weather: Sunny, warm

GRID #: IID9

Sample IDs	TIME
MR23-IID9-2.2-2.7-14A	1250
MR23-IID9-2.7-3.2-14A	1255
MR23-IID9-3.2-3.7-14A	1300
MR23-IID9-3.7-4.2-14A	1305
MR23-IID9-4.2-4.7-14A	1310
MR23-IID9-4.7-5.2-14A	1315
MR23-IID9-2.2-2.7-14A	1320

CORE 1 NE

Photos:

TIME: 1210

Total Core Depth: 10 — NO RECOVERY

Depth to liner: 2' — BELOW 2'

Depth to darksoil: 2' — ON NE CORE

Depth to tan soil: NA

Thickness of dark soil: 2' → END OF RECOVERY

Thickness of tan soil:

1	0-2' Brown light Brown sand
2	2' Liner
3	2'-2.2' - dark stained soil
4	
5	
6	
7	
8	
9	
10	

Northing: _____ Easting: _____

CORE 2 NW

Photos:

TIME: 1205

Total Core Depth: 10

Depth to liner: 1.4'

Depth to darksoil: 1.4'

Depth to tan soil: 0.5'

Thickness of dark soil: 2' - skeet debris in dark soil

Thickness of tan soil: NA

1	See log from 11/13/13
2	
3	
4	
5	
6	
7	
8	
9	
10	

Northing: _____ Easting: _____

Notes:

Generated by CamScanner

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE: 2

Date: 1/13/14
Sampling Team: R. McLemb/9 Ritter
Driller: Probe
Weather: Sunny warm
GRID #: TT09

Sample IDs
Reverse

CORE 3

Photos: SW
TIME: 1155
Total Core Depth: 10
Depth to liner: 1.4
Depth to darksoil: NA
Depth to tan soil: 9.5'
Thickness of dark soil:
Thickness of tan soil:

1		See log from 11/13/13
2		
3		
4		
5		
6		
7		
8		
9		
10		

Northing: Easting:

CORE 4 SE

Photos:
TIME: 1225
Total Core Depth: 10
Depth to liner: 2'
Depth to darksoil: 2'
Depth to tan soil: 9.4'
Thickness of dark soil: 2.5'
Thickness of tan soil: NA

1		See log from 11/13/13
2		
3		
4		
5		
6		
7		
8		
9		
10		

Northing: Easting:

Notes:

Generated by CamScanner

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs

CORE 1 ~~III~~ IID-NW

Photos:
TIME: 1130
Total Core Depth:
Depth to liner: NA
Depth to darksoil: 27"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-27"	LT BROWN FINE SAND + CLAYEY SAND?
2	27-33"	DARK BROWN, FINE SAND (SP) w/ SKEET DEBRIS + BLACK STAINING
3	33-38"	TAN, FINE GRAINED SAND (SP) TRACE BLACK STAINING + SKEET DEBRIS
4	38-56" 56-60"	BROWN, CLAYEY SAND (SC) NO RECOVERY
5 (60-68")	~~50-58"~~ ~~58-63"~~	BROWN, CLAYEY SAND (SC) DARK BROWN/BLACK FINE SANDS WITH SKEET DEBRIS FRAGS @ 63-65" + 67-68" (NO FRAGS) TRANSITIONS COLOR
6	68-114"	BROWN/ORANGE MOTTLED CLAY / SANDY CLAY
7	114-120"	BROWN/ORANGE CLAYEY SAND (SC)
8		
9		
10		

Northing: Easting:

CORE 2 IID-NE

Photos:
TIME: 1145
Total Core Depth:
Depth to liner:
Depth to darksoil: 28"
Depth to tan soil: 39"
Thickness of dark soil:
Thickness of tan soil:

1	0-28"	LT BROWN, FINE SAND + CLAYEY SAND
2	28-35"	DARK BROWN, FINE SANDS (SP) SKEET RANGE DEBRIS FRAGS / BLACK STAINING
3	35-42"	TAN / LIGHT BROWN FINE SANDS WITH SOME BLACK STAINING
4	42-53' 53-60"	BROWN, CLAYEY SAND (SC), DENSE NO RECOVERY
5	60-63"	BROWN CLAYEY SAND (SC), MOIST, SOFT
6	63-68"	DARK BROWN, FINE SANDS, SKEET DEBRIS FRAGS
7	68-80"	BROWN CLAYEY SAND (SC) DENSE
8	80-116"	BROWN/ORANGE MOTTLED SANDY CLAY (CL) MED STIFF
9	116-120'	BROWN/ORANGE, CLAYEY SAND (SC)
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #: III0

Sample IDs

CORE 3 III0-SE

Photos:
TIME: 1100
Total Core Depth: 10'
Depth to liner: 28"
Depth to darksoil: 28"
Depth to tan soil: 36"
Thickness of dark soil:
Thickness of tan soil:

1	0-28"	LT BROWN, SAND (SP) WITH CLAY
2	28-36"	TAN, FINE SANDS (SP), BLACK STAINING WITH SKEET DEBRIS
3	36-50" 50-60"	BROWN, CLAYEY SAND (SC), DENSE NO RECOVERY
4	60-65"	BROWN, FINE SAND (SP) W/ CLAY ~~WITH~~ BLACK FINE SAND W/NO SKEET DEBRIS
5	65-74"	BROWN, CLAYEY SAND (SC)
6	74-110"	BROWN/ORANGE MOTTLED SANDY CLAY (CL/CH)
7	110-~~115~~ 118	BROWN/ORANGE CLAYEY SAND
8	~~115~~-120 118-	TAN, FINE SAND (SP)
9		
10		

Northing: Easting:

CORE 4 III0-SW

Photos:
TIME: 1115
Total Core Depth: 10'
Depth to liner: ~~10'~~ NA
Depth to darksoil: 27.5"
Depth to tan soil: 34"
Thickness of dark soil:
Thickness of tan soil:

1	0-27"	LT BROWN FINE SAND + CLAYEY SAND
2	27-34"	DARK BROWN, FINE SAND W/CLAY, TRACE BLACK STAINING
3	34-44"	BROWN, CLAYEY SAND (SC), TRACE ORGANICS DENSE
4	44-60"	NO RECOVERY
5	60-63" 63-68"	BROWN, FINE GRAINED SAND W/CLAY DARK BROWN, FINE GRAINED SAND W/CLAY
6	68-85	BROWN, SANDY CLAY
7	85-120	BROWN ORANGE MOTTLED CLAY W/ INTERBEDDED CLAYEY SAND
8		
9		
10		

Northing: Easting:

Notes: 3.5-7.5ft in 6" intervals

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date:
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs

CORE 3 III-NE

Photos:
TIME: 1330
Total Core Depth: 10'
Depth to liner: 19"
Depth to darksoil: 19"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-19"	LT BROWN, FINE SAND (SP) W/CLAY
2	19-23"	DARK BROWN ~~FINE~~/BLACK FINE GRAINED SAND W/ SKEET DEBRIS FRAG
3	23-44"	BROWN, CLAYEY SAND, DENSE
4	44-53"	BROWN/ORANGE MOTTLED, SANDY CLAY/(CL) STIFF
5	53-60"	NO RECOVERY
6	60-67"	BROWN, CLAYEY SAND (SC), SE
7	67-98"	BROWN/ORANGE MOTTLED, SANDY CLAY/CLAY MED STIFF
8	98-110'	BROWN, CLAYEY SAND (SC)
9	110-120"	TAN/WHITE, FINE GRAINED SAND, LOOSE
10		

Northing: Easting:

CORE 4 III-NW

Photos:
TIME: 1445
Total Core Depth: 10'
Depth to liner: 28"
Depth to darksoil: 28"
Depth to tan soil: 36"
Thickness of dark soil:
Thickness of tan soil:

1	0-28"	LT BROWN FINE SAND W/CLAY
2	28-36"	DARK BROWN/BLACK FINE GRAINED SAND (SP), LINER FRAG + SKEET FRAG
3	36-46"	BROWN CLAYEY SAND (SC)
4	46-55"	BROWN, SANDY CLAY (CL), STIFF
5	55-60"	NO RECOVERY
6	60-68"	BROWN, CLAYEY SAND (SC)
7	68-110"	BROWN/ORANGE MOTTLED, SANDY CLAY/CLAY MED STIFF
8	110-114"	BROWN, CLAYEY SAND
9	114-120"	BROWN/TAN, FINE GRAINED SAND (SP)
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #: III

Sample IDs
MR23-III-SB-3-3.5-13D @ 1615
MR23-III-SB-3.5-4-13D @ 1620
MR23-III-SB-4-4.5-13D @ 1625
MR23-III-SB-4.5-5-13D @ 1630
MR23-III-SB-5-5.5-13D @ 1635
MR23-III-SB-5.5-6-13D @ 1640

CORE 1 III-SW

Photos:
TIME: 1300
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 26"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-26"	LT BROWN, FINE SANDS (SP)
2	26-30"	BROWN, FINE GRAINED SAND, TRACE SILT, LINER FRAGS
3	30-45" 45-60"	BROWN, CLAYEY SAND (SC). RENSE NO RECOVERY
4	60-66"	BROWN, FINE GRAINED SAND
5	66-76"	BROWN, CLAYEY SAND (SC)
6	76-111"	BROWN/ORANGE MOTTLED SANDY CLAY/CLAY
7	~~111~~ 111-120"	BROWN/ORANGE, CLAYEY SAND (SC) FINE GRAINED SAND @ 117'
8		
9		
10		

Northing: Easting:

CORE 2 III-SE

Photos:
TIME: 1315
Total Core Depth: 15'
Depth to liner: NA
Depth to darksoil: NA
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-24"	LT BROWN, FINE SANDS (SP)
2	24-43"	BROWN FINE SAND W/CLAY
3	43-60"	NO RECOVERY
4	60-63"	BROWN, FINE GRAINED SAND (SP) TRACE SILT
5	63-80"	BROWN CLAYEY SAND
6	80-105"	BROWN/ORANGE MOTTLED SANDY CLAY/CLAY
7	105-113"	~~GRA~~ BROWN/ORANGE BROWN MOTTLED CLAYEY SAND (SC)
8	113-120"	BROWN, FINE ~~SA~~ SAND, TRACE CLAY
9		
10		

Northing: Easting:

Notes:
COLLECT: (3-3.5), ~~(4-4.5)~~ (3.5-4), (4-4.5), (4.5-5), (5-5.5), (5.5-6)

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Sample IDs

Date: 11-14-13
Sampling Team: Kevin Howell / David Seed
Driller: Probe Technologies Inc
Weather: Sunny, cold, calm 40's
GRID #: II 12

CORE 3 II 12 NW

Photos:
TIME: 0745
Total Core Depth: 10
Depth to liner:
Depth to darksoil: 18"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-18"	Lt brown fine silty sand, moist
2	18"-36"	brown to d. brown fine sandy clay moist, m. stiff liner frag @ 18"
3	36"-54"	no recovery
4		
5	54"-96"	brown fine sandy clay, moist, stiff
6		
7		
8	96"-108"	brown clayey fine sand, moist, stiff
9	108"-120"	tan to light gray fine sand with trace clay
10		

Northing: Easting:

CORE 4 II 12 NE

Photos:
TIME: 0800
Total Core Depth: 10
Depth to liner:
Depth to darksoil: 18"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	lt brown fine silty sand, moist, m. dense
2	12"-24"	d. brown clayey fine sand, liner debris @ 18", skeet debris
3	24"-42"	brown fine sandy clay, stiff, moist
4	42"-54"	no recovery
5	54"-96"	brown fine sandy clay, moist, stiff
6		
7		
8	96"-108"	brown clayey fine sand, dense, moist
9	108"-120"	tan to lt. gray sand with trace clay
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

Date: 11-14-2013
Sampling Team: Kevin Howell
Driller: Probe Technologies, Inc
Weather: Sunny, cold, calm 45°
GRID #: II 12

Sample IDs
MR23 II12 - 2.5-3.0-13D
MR23-II12 - 3.0-3.5-13D
MR23 II12 - 4.5-5.0 -13D
MR23 II12 - 5.0 5.5 - 13D
Duplicate
MR23 II120-2.5-3.0 13D

CORE 1 II 12 SE

Photos:
TIME: 0820
Total Core Depth: 10
Depth to liner: 14"
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	Lt. brown fine sandy silt
2	12"-16"	d. brown fine sandy clay, liner debris @ 14", skeet debris 14"-16"
3	16"-28"	gray sandy gravel trace silt
4	28"-42"	brown fine sandy clay
5	42"-~~60~~ 54"	no recovery
6	60"-108"	brown fine sandy clay
7		
8		
9	108"-120"	tan fine sand with trace clay
10		

Northing: Easting:

CORE 2 II 12 SW

Photos:
TIME: 0825
Total Core Depth: 10
Depth to liner:
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	Lt brown fine sandy silt
2	12-20"	lt brown fine sandy silt trace clay
3	20"-24"	d. brown fine sandy clay - liner debris @ 20"
4	24"-60"	brown fine sandy clay
5	60"-108	brown fine sandy clay
6		
7		
8		
9	108"-120"	tan fine sand with trace clay
10		

Northing: Easting:

Notes: limited to no recovery from a 3.5-4.5 on 3 of 4 borings - no composite sample collected from these intervals

5D LEL
5P CU
0 16.5 O2
95.6 VOC
0.1 H2S

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team: D. LUBELL + G. MOORE
Driller: PROPE TECHNOLOGY
Weather:
GRID #: II13

Sample IDs

CORE 1 II13-SW

Photos:
TIME: 0835
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 26'
Depth to tan soil: 30"
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	LT BROWN FINE SAND w/SILT (SP-SM
	12-14"	DARK BROWN, FINE SAND (SP)
2	16-26"	GRAY, GRAVELLY SAND (SW), LOOSE
3	26-30'	DARK BROWN, CLAYEY SAND (SC), DENSE TRACE BLACK STAINING
4	30-46"	BROWN, CLAYEY SAND (SC), DENSE
5	46"-66"	BROWN SANDY CLAY (CL), MED STIFF-STIFF
6	60-63"	BROWN, FINE SAND (SP) w/SILT, LOOSE
7	63-68"	BROWN, CLAYEY SAND (SC), MED DENSE
8	68-105"	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) MED STIFF
9	105-109	BROWN CLAYEY SAND, MED DENSE TO LOOSE
10	109-120"	TAN/WHITE FINE GRAINED SAND (SP) LOOSE

Northing: Easting:

CORE 2 II13-SE

Photos:
TIME: 0905
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: NA
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	LT BROWN, FINE SAND w/SILT (SP-SM) LOOSE
2	12-28"	BROWN, CLAYEY SAND (SC), DENSE
3	28-38"	BROWN, SANDY CLAY (CL), MED STIFF-SOFT
4	38-60"	NO RECOVERY
5	60-71"	BROWN, CLAYEY SAND, FINE GRAINED INTERBEDDED FINE SAND (SP)
6	71-95"	BROWN/ORANGE MOTTLED SANDY CLAY MED STIFF
7	95-102"	BROWN CLAYEY SAND (SC), MED DENSE FINE GRAINED
8	102-120"	TAN/WHITE, FINE GRAINED SAND (SP)
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team: D. WABER + G. MOORE
Driller:
Weather:
GRID #: II13

Sample IDs	
MR23-II13-SB-4.5-5-13D	MS/MSD
MR23-II13-SB-5-5.5-13D	
MR23-II13-SB-5.5-6-13D	
MR23-II13-SB-6-6.5-13D	
MR23-II13-SB-6.5-7-13D	
MR23-II13-SB-7-7.5-13D	

CORE 3 II13 NW

Photos:
TIME: 0920
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 19"
Depth to tan soil: 36" + 45"
Thickness of dark soil:
Thickness of tan soil:

1	0-19"	LT BROWN, FINE SAND w/SILT + CLAY (SP-SM / SP-SC)
2	19-36"	DARK BROWN / BLACK FINE GRAINED SAND (SP) w/ SKEET DEBRIS STAINING + FRAGS
3	36-45"	BROWN CLAYEY SAND (SC), DENSE
4	45-53"	BROWN CLAYEY SAND (SC) w/ BLACK SKEET DEBRIS STAINING AND FRAGS @ 50-51"
5	53-60"	BROWN, SANDY CLAY (CL), STIFF, L. PLASTIC
6	60-67"	BROWN / DARK BROWN, FINE SAND w/ SILT
7	67-70.5"	BROWN, CLAYEY SAND (SC)
8	70.5-72"	BROWN, FINE SAND (SP)
9	72-88"	BROWN/ORANGE MOTTLED SANDY CLAY (CL)
10	88-91" 91-120"	BROWN CLAYEY SAND (SC) TAN / WHITE FINE GRAINED SAND (SP) LOOSE

Northing: Easting:

CORE 4

Photos:
TIME: 0930
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 21" + 36"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-11"	LT BROWN, FINE SAND w/SILT (SP-SM) SAND w/ CLAY (SP-SC)
2	11-21"	GRAY, GRAVELLY SAND / SAND w/ GRAVEL (SW) LOOSE, TRACE BLACK STAINING
3	21-36"	BROWN, CLAYEY SAND (SC), DENSE
4	36-43"	DARK BROWN, FINE SAND (SP), TAN SAND BLACK STAINING w/ SKEET DEBRIS FRAGS
5	43-60"	BROWN, CLAYEY SAND / SANDY CLAY
6	60-62"	BROWN / DARK BROWN FINE SAND w/ SILT
7	62-68"	BROWN, CLAYEY SAND (SC)
8	68-70"	BROWN, FINE SAND (SP)
9	70-~~101~~ 91	BROWN/ORANGE MOTTLED SANDY CLAY (CL) MED STIFF
10	91-98" 98-120	BROWN CLAYEY SAND (SC) TAN / WHITE, FINE SAND (SP) LOOSE

Northing: Easting:

Notes:

COLLECT: (4.5-5) (5-5.5) (5.5-6) (6-6.5) (6.5-7) (7-7.5)

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team: D. LUBELL + G MOORE
Driller: PROBE TECHNOLOGY
Weather:
GRID #: II14

Sample IDs

CORE 1 II14-SW

Photos:
TIME: 1030
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 24"
Depth to tan soil: 28"
Thickness of dark soil:
Thickness of tan soil:

1	0-24"	TAN/LT BROWN, FINE SAND w/SILT (SP-SM)
2	24-28"	DARK BROWN, FINE SAND w/CLAY ~~(SC)~~ (SP-SC) TRACE BLACK STAINING, LOOSE
3	28-38"	BROWN, CLAYEY SAND (SC), DENSE
4	38-58" 58-60"	BROWN, SANDY CLAY (CL), STIFF NO RECOVERY
5	60-67"	BROWN, FINE SAND W/CLAY
6	67-97"	BROWN/ORANGE MOTTLED SANDY CLAY/CLAY SOFT
7	97-100"	BROWN/TAN, CLAYEY SAND (SC)
8	100-119"	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE
9	119-120"	NO RECOVERY
10		

Northing: Easting:

CORE 2 II14-SE

Photos:
TIME: 1045
Total Core Depth: 10'
Depth to liner: 20"
Depth to darksoil: 20"
Depth to tan soil: 26"
Thickness of dark soil:
Thickness of tan soil:

1	0-20"	~~TAN~~ LT BROWN, FINE SAND w/SILT (SP-SM)
2	20-23"	DARK BROWN FINE SAND, TRACE LINEX FRAGS + SILCOT DEBRIS FRAGS
3	23-26"	BROWN, CLAYEY SAND, (SC), DENSE TRACE DARK BROWN STAINING
4	26-44"	BROWN CLAYEY SAND (SC)/SANDY CLAY (CL)
5	44-60"	NO RECOVERY
6	60-64"	BROWN, FINE SAND w/ ~~SILT~~ + CLAY (SP-SC/SP-SM)
7	64-90"	BROWN, SANDY CLAY (CL)/SANDY SILT (ML)
8	90-120"	TAN/WHITE, FINE SAND (SP), LOOSE TRACE SILT + CLAY
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/14/13
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs	
MR23-II14-SB-3.5-4-13D	DUPE
MR23-II14-SB-4-4.5-13D	DUPE
MR23-II14-SB-4.5-5-13D	
MR23-II14-SB-5-5.5-13D	
MR23-II14-SB-5.5-6-13D	
MR23-II14-SB-6-6.5-13D	

CORE 3 II14 NE

Photos:
TIME: 1100
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	TAN/LT BROWN, FINE SAND w/SILT
2	12-41"	GRAY, GRAVELLY SAND/SANDY GRAVEL FILL LIMESTONE PIECES, NO BLACK STAINING/SKEET DEBRIS
3	41-56"	BROWN, CLAYEY SAND, DENSE
4	56-60"	NO RECOVERY
5	60-68'	BROWN, FINE SAND (SP) LOOSE
6	68-98	BROWN/ORANGE MOTTLED SANDY CLAY
7	98-102"	BROWN, CLAYEY SAND (SC)
8	102-120"	TAN/WHITE, FINE SAND (SP) LOOSE
9		
10		

Northing: Easting:

CORE 4 II14-NW

Photos:
TIME: 1115
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil:
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-6"	BROWN, FINE SAND w/SILT
2	6-33"	GRAY, SANDY GRAVEL FILL
3	33-60'	BROWN, CLAYEY SAND, DENSE
4	60-64"	BROWN; FINE SAND w/CLAY/SILT TO CLAYEY SAND
5	64-94"	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) STIFF/MED STIFF
6	94-99"	BROWN CLAYEY SAND (SC)
7	99-116"	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE
8		
9		
10		

Northing: Easting:

Notes:
COLLECT: (3.5-4) (4-4.5) (4.5-5) (5-5.5) ~~(5-5)~~ (5.5-6) (6-6.5)

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #:

Sample IDs

CORE 1 JJ09-SW

Photos:
TIME: 0930
Total Core Depth: 10
Depth to liner: NA
Depth to darksoil: 17"
Depth to tan soil: 24"
Thickness of dark soil:
Thickness of tan soil:

1	0-17"	LT BROWN SAND (SP), FINE GRAINED TRACE CLAY
2	17-24"	TAN, FINE SAND (SP), BLACK STAINING TRACE SKEET DEBRIS FRAGS
3	24-42"	BROWN, CLAYEY SAND (SC)
4	42-56" 56-60"	BROWN/ORANGE MOTTLED CLAY (CL) NO RECOVERY
5	60-65" 65-72"	BROWN/ORANGE MOTTLED CLAY (CL) INTERBEDDED DARK BROWN SAND WITH SKEET DEBRIS FRAGS IN INTERIOR OF CORE
6	72-98"	BROWN/ORANGE MOTTLED CLAY (CL), STIFF & PLASTIC
7	98-104	BROWN, CLAYEY SAND (SC), DENSE
8	104-120	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE
9		
10		

Northing: Easting:

CORE 2 JJ09-NW

Photos:
TIME: 0945
Total Core Depth: 10
Depth to liner: 22"
Depth to darksoil: 22"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-8"	LT BROWN, FINE GRAINED SAND (SP), LOOSE
2	8-22"	BROWN/ORANGE MOTTLED, ~~SAN~~ CLAYEY SAND
3	22-29"	DARK BROWN FINE GRAINED SAND (SP) SKEET DEBRIS/BLACK STAINING
4	29-46"	BROWN/ORANGE SANDY CLAY (CL)
5	46-60"	BROWN/ORANGE, CLAYEY SAND (SC)
6	60-70"	BROWN/ORANGE, CLAYEY SAND (SC)
7	70-98"	BROWN/ORANGE, SANDY CLAY/CLAY (CL)
8	98-110"	BROWN/ORANGE, CLAYEY SAND (SC)
9	110-120	TAN/WHITE FINE GRAINED SAND (SP)
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team:
Driller:
Weather:
GRID #: JJ09

Sample IDs

CORE 3 JJ09-NE

Photos:
TIME: 0900
Total Core Depth: 10'
Depth to liner: ~12" BASED ON FIGURE, LINER @ 48' INSIDE THE CORE
Depth to darksoil: 20'
Depth to tan soil: 31"
Thickness of dark soil:
Thickness of tan soil:

1	0-12"	LT BROWN, FINE SAND WITH CLAY
2	12-20"	LT BROWN FINE SAND WITH SKEET DEBRIS AND BLACK STAINING
3	20-31"	DARK BROWN, FINE SAND (SP) SKEET DEBRIS
4	31-~~50~~ 42" / 42-50"	BROWN CLAYEY SAND (SC) / BROWN, SANDY CLAY (CL) — TRACE SKEET DEBRIS ON OUTSIDE OF CORES
5	50-60"	NO RECOVERY
6	60-72"	BROWN FINE GRAINED SANDS (SP), TRACE CLAY, TRACE BLACK STAINING + SKEET DEBRIS @ 66"
7	72-120	BROWN/ORANGE MOTTLED SANDY CLAY (CL) MOD STIFF, MOIST, L. PLASTICITY
8		
9		
10		

Northing: Easting:

CORE 4 JJ09-SE

Photos:
TIME: 0915
Total Core Depth: 10'
Depth to liner: 21"
Depth to darksoil: 21"
Depth to tan soil: 28"
Thickness of dark soil:
Thickness of tan soil:

1	0-20"	LT BROWN, FINE SAND W/CLAY (SP)
2	20-28"	TAN/BLACK FINE SAND (SP) SKEET DEBRIS + BLACK STAINING
3	28"-47" / 47-60"	BROWN, CLAYEY SAND (SC), DENSE, TRACE BLACK SKEET PIECES ON OUTSIDE OF CORE (SLOPE?) / NO RECOVERY
4	60-65" ~~65-70~~	BROWN CLAYEY SAND (SC)
5	65-107"	DARK BROWN, FINE SAND (SP) TRACE CLAY TRACE SKEET DEBRIS IN INTERIOR OF CORE
6	107-115	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) STIFF, MOIST, L. PLASTICITY
7	115-120	BROWN/ORANGE, CLAYEY SAND (SC)
8		
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Sample IDs

Date: 11/13/13
Sampling Team: D. LUBAL + G. MOORE
Driller: PROBE TECHNOLOGY
Weather:
GRID #: JJ1D

CORE 1 JJ10-SE

Photos:
TIME: 0800
Total Core Depth: 10'
Depth to liner: UNKNOWN
Depth to darksoil: NA
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-14"	BROWN, FINE GRAINED SAND (SP) WITH GRAVEL LOOSE, MOIST
2	14-36"	BROWN, CLAYEY SAND (SC), DENSE, MOIST
3	36-48"	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) STIFF, LOW PLASTIC, MOIST
4	48-60"	NO RECOVERY
5	60-98"	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) STIFF, LOW PLASTICITY, MOIST
6	98-105"	BROWN/ORANGE, CLAYEY SAND (SC) MED DENSE
7	105-120	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE
8		
9		
10		

Northing: Easting:

CORE 2 JJ10-SW

Photos:
TIME: 0815
Total Core Depth: 10'
Depth to liner: 14" PLASTIC
Depth to darksoil: NA
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-14"	BROWN, FINE GRAINED SAND (SP) WITH SMALL GRAVEL, LOOSE, MOIST
2	14-40"	BROWN, CLAYEY SAND (SC), DENSE, MOIST
3	40-54"	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) STIFF, LOW PLASTIC, MOIST
4	54-60"	NO RECOVERY
5	60-102"	BROWN/ORANGE MOTTLED, SANDY CLAY (CL) STIFF, LOW PLASTICITY, MOIST
6	102-106	BROWN/ORANGE, CLAYEY SAND (SC) MED DENSE
7	106-120	TAN/WHITE, FINE GRAINED SAND (SP) LOOSE
8		
9		
10		

Northing: Easting:

Notes:
COLLECT JJ10SW + JJ10SE 2.5-5.5

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/13/13
Sampling Team: DL/JR
Driller: PROBE
Weather: 30-40°F, SUNNY
GRID #: JJ10

Sample IDs

CORE 3 JJ10-NW

Photos:
TIME: 0830
Total Core Depth: 10'
Depth to liner: ~~[illegible]~~ 21"
Depth to darksoil: 21"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-21"	BROWN, FINE GRAINED SAND (SP), LOOSE MOIST
2	21-~~32~~ 36"	BROWN/DARK BROWN, F. GRAINED SAND TRACE SKEET RANGE DEBRIS/BLACK STAINING
3	36-40"	BROWN, F. GRAINED SAND (SP)
4	40-60"	BROWN CLAYEY SAND (SC), ORANGE MOTTLES
5	60-74"	SANDY CLAY/CLAYEY SAND INTERBEDDED SINGLE BLACK SKEET DEBRIS @ 64" (?) DK BROWN
6	74-116"	SANDY CLAY (CL) BROWN/ORANGE MOTTLED STIFF
7	116-120"	BROWNISH ORANGE/TAN, ~~[illegible]~~ SAND (SP)
8		
9		
10		

Northing: Easting:

CORE 4 JJ10-NE

Photos:
TIME: 0845
Total Core Depth: 10'
Depth to liner: 21"
Depth to darksoil: 21"
Depth to tan soil: 33" BROWN CLAYEY SAND
Thickness of dark soil:
Thickness of tan soil:

1	0-20'	LT BROWN/TAN, FINE GRAINED SAND TRACE ORGANICS
2	20-32"	DARK BROWN, F. GRAINED SAND (SP), TRACE SKEET RANGE DEBRIS + BLACK STAINING
3	32-~~60~~ 48"	BROWN, CLAYEY SAND (SC) DENSE
4	48-60'	BROWN, SANDY CLAY (CL), MED STIFF TRACE SKEET RANGE DEBRIS + BLACK STAIN
5	60-65'	INTERBEDDED SANDY CLAY + CLAYEY SAND TRACE SKEET RANGE DEBRIS @ 65", DK BROWN
6	65-~~90~~ 106"	BROWN/ORANGE MOTTLED SANDY CLAY (CL)
7	~~90-1~~ 106-110"	BROWN, CLAYEY SAND
8	110-120"	TAN/WHITE, FINE GRAINED SAND (SP) TRACE SILT
9		
10		

Northing: Easting:

Notes:
COLLECT JJ10NE + JJ10NW @ 5.5-8.5'

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 01/13/14
Sampling Team: McCook / Ritter
Driller: Probe
Weather: Sunny, warm
GRID #: JJ10

Sample IDs	Time
MR23-JJ10-NENW-2.6-3.1-14A	1415
MR23-JJ10-NENW-3.1-3.6-14A	1420
MR23-JJ10-NENW-3.6-4.1-14A	1425
MR23-JJ10-NENW-4.1-4.6-14A	1430
MR23-JJ10-NENW-4.6-5.1-14A	1435
MR23-JJ10-NENW-5.1-5.6-14A	1440

CORE 1 JJ10-NW (Redrill)

Photos:
TIME: 1315
Total Core Depth: 10'
Depth to liner: 18"
Depth to darksoil: 18"
Depth to tan soil: 9.5'
Thickness of dark soil: 12"
Thickness of tan soil: N/A

1	See previous log
2	* the interval from 21"-36" in previous log was found to
3	be from 18"-30" in boring on this date
4	
5	
6	
7	
8	
9	
10	

Northing: Easting:

CORE 2 JJ10-NE (Redrill)

Photos:
TIME: 1315
Total Core Depth: 10'
Depth to liner: 18"
Depth to darksoil: 18"
Depth to tan soil: 9'
Thickness of dark soil: 8"
Thickness of tan soil: N/A

1	See Previous log
2	* the interval from 20-32" in previous log was found
3	to be from 18-26" in boring on this date
4	
5	
6	
7	
8	
9	
10	

Northing: Easting:

Notes:

Generated by CamScanner

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation

CLEAN 8012 - CTO-WE40

PAGE:

Sample IDs	–

Date: 11/12/13

Sampling Team: D. LUBEL + G. MOORE

Driller: PROBE TECHNOLOGY

Weather:

GRID #: JJ11

CORE 1 JJ11-SE

Photos:

TIME: 1500

Total Core Depth: 10'

Depth to liner: ~ 14"?

Depth to darksoil: NA

Depth to tan soil:

Thickness of dark soil: NA

Thickness of tan soil:

0-5' 45" REC 45-60 NR

1	0-14"	TAN, FINE GRAINED SAND (SP), LOOSE, MOIST
	14-22"	BROWN/LT BROWN, F GRAINED SAND (SP), LOOSE MOIST
2	22-40"	BROWN, CLAYEY SAND (SC), DENSE, MOIST
3	40-45"	BROWN/ORANGE MOTTLED SANDY CLAY (CL) STIFF TO MED STIFF, MOIST
	45-60"	NO RECOVERY
4	60-68	TAN FINE GRAINED SAND (SP)
5	68-108	BROWN/ORANGE MOTTLED SANDY CLAY (CL) MED STIFF MOIST
6	108-120	BROWN/ORANGE MOTTLED CLAYEY SAND (SC) MED DENSE, SL. MOIST
7		
8		
9		
10		

Northing: Easting:

CORE 2 JJ11-SW

Photos: 1515

TIME: 1510

Total Core Depth: 10'

Depth to liner:

Depth to darksoil:

Depth to tan soil:

Thickness of dark soil:

Thickness of tan soil:

0-5' 0-54" REC 54-60" NR

1	0-28"	BROWN, FINE GRAINED SAND (SP), TRACE CLAY WITH CONCRETE DEBRIS, SKEET DEBRIS, BLACK/WHITE STAINING
2	28-48"	BROWN CLAYEY SAND (SC), DENSE, MOIST BLACK STAINING TO 52"
3	48-54	BROWN, SANDY CLAY (CL)
	54-60	NO RECOVERY
4	60-110"	SAME AS ABOVE
5	110-116"	BROWN TAN MED-FINE CLAYEY SAND (SC), MED DENSE
6	116-120	TAN FINE SAND (SP), LOOSE
7		
8		
9		
10		

Northing: Easting:

Notes:

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Sample IDs

Date: 11/12/13
Sampling Team: D. WRIGHT + C. MOORE
Driller: PROBE TECHNOLOGY
Weather:
GRID #:

CORE 3 JJ11-NE

Photos:
TIME: 1520
Total Core Depth: 10
Depth to liner: 24"
Depth to darksoil: 24"
Depth to tan soil: 30"
Thickness of dark soil: 6"
Thickness of tan soil:

0-60" 54-60" NR
60-120" REC 100%

1	0-24"	BROWN, CLAYEY SAND (SC), FIGRAINED MOIST, LOOSE TO MED DENSE
2	24-30"	DARK BROWN, FINE GRAINED SAND (SP) WITH TRACE SILT
3	30-54" 54-60	BROWN, CLAYEY SAND (SC), DENSE NO RECOVERY
4	60-66"	BROWN, SANDY CLAY (CL), STIFF
5	66-72"	BROWN, CLAYEY SAND (SC), LOOSE
6	72-~~120~~ 106"	BROWN/ORANGE MOTTLED SANDY CLAY STIFF (a)
7	106-120"	BROWN/TAN, FINE GRAINED SAND (SP)
8		
9		
10		

Northing: Easting:

CORE 4 JJ11-NW

Photos:
TIME: 1536
Total Core Depth: 10'
Depth to liner: 14"
Depth to darksoil: 14"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

0-5' NR 48-60"
5-10' 100% REC

1	0-14"	BROWN, CLAYEY SAND / SAND W/ CLAY
2	14-21"	DARK BROWN, FINE SANDS (SP)
3	21-27"	TAN, FINE SANDS (SP) LOOSE
4	27-48" 48-60"	BROWN CLAYEY SAND (SC) NO RECOVERY
5 (a)	~~48-60~~ 60-68	BROWN, CLAYEY SAND / SANDY CLAY INTERMIXED
6	~~60-108~~ 68-120	BROWN, SANDY CLAY
7	~~108~~-120 110	BROWN, CLAYEY SAND
8		
9		
10		

Northing: Easting:

Notes:
COMPOSITE ALL 4 FROM 2.5 - 5.5' (3FT)
ONLY FROM H-5.5 FROM JJ11-SW

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/12/13
Sampling Team: D. LOGAN + G. MOORE
Driller: PROBE TECHNOLOGY
Weather:
GRID #:

Sample IDs

CORE 3

Photos: JJ12-NW
TIME: 1430
Total Core Depth: 10'
Depth to liner: ~~[illegible]~~ 12" 0-12" NR
Depth to darksoil: 20"
Depth to tan soil: 24"
Thickness of dark soil: 20-24"
Thickness of tan soil:

12" 0-~~[illegible]~~ NR 1	~~[illegible]~~ ~~24"-30"~~ 0-12"	Brown, CLAYEY SAND (SC), moist geotextile liner @ 12"
30" REC. 0-5' 2	12"-26"	Brown, fine grained SAND (SP), moist med. dense, trace black staining (skeet?)
3	26"-48"	Brown, clayey SAND (SC) / SANDY CLAY (CL)
4	48"-102"	Brown, SANDY CLAY (CL), med stiff
5	102-120	Brown, CLAYEY SAND (SC)
6		
7		
8		collected 24"-~~[illegible]~~ 60" (2-5')
9		
10		

Northing: Easting:

CORE 4

Photos: JJ12-NE
TIME: 1445
Total Core Depth: 10'
Depth to liner: NA
Depth to darksoil: 19"
Depth to tan soil:
Thickness of dark soil:
Thickness of tan soil:

1	0-16"	Tan, fine grained SAND (SP), loose, moist
2	16-32"	DARK brown, SANDY CLAY (CL), stiff with black staining, trace skeet debris
3	32"-~~60"~~ 62"	Dark brown, SANDY CLAY (CL) stiff
4	~~60-72"~~ 62-~~[illegible]~~ 72"	Dark brown, SANDY CLAY (CL), stiff with black staining and 5-10mm skeet debris
5	72-78	Brown, CLAYEY SAND (SC), trace Black, skeet debris
6	78-100	Brown/tan, CLAY (CL) orange mottles stiff
7	100-120"	Brown/tan, clayey SAND (SC)
8		
9		COLLECTED ~~6-9'~~ 6.5-9.5'
10		

Northing: Easting:

Notes:
COMPOSITING JJ12-NW + JJ12-SE AND JJ12-NE + JJ12-SW

UXO-23, ASR# 2.82 D-9 Skeet Range Remdial Investigation
CLEAN 8012 - CTO-WE40

PAGE:

Date: 11/12/13
Sampling Team:
Driller:
Weather:
GRID #: JJ12

Sample IDs

CORE 1 JJ12 SE

Photos:
TIME: 1330
Total Core Depth: 10
Depth to liner: 23"
Depth to darksoil: -
Depth to tan soil:
Thickness of dark soil: NA
Thickness of tan soil: 10'

48" REC 0-5
60" REC 5-10'

1	32 0-32"	Lt brown, SAND (SP), fine grained moist, ~~no~~ liner debris @ 23"
2	32" -60" (32')	Brown, ~~CLAYEY SAND (SC)~~ SANDY CLAY (CL) MOIST, PLASTIC
3	60-62.5"	Brown, SANDY CLAY (CL) SAA SKEET DEBRIS FOUND (20mm), BLACK
4	62.5-72"	Lt brown, CLAYEY SAND, fine grained, moist
5	72-114"	Brown/orange mottled SANDY CLAY (CL), MED. STIFF
6	114-120"	Brown/orange, MED-FINE SAND, (SP), LOOSE, MOIST
7		
8		
9		COLLECTED 2-5'
10		

Northing: Easting:

CORE 2 JJ12 SW

Photos:
TIME: 1345
Total Core Depth: 10'
Depth to liner: 20"
Depth to darksoil: 20"
Depth to tan soil: 36"
Thickness of dark soil: 16"
Thickness of tan soil:

1	0-12"	TAN, FINE GRAINED SAND, LOOSE, MOIST
2	12-18"	Brown, CLAYEY SAND (SC), Moist
3	18-36"	BLACK FINE GRAINED SAND (SP) with some skeet debris, moist, loose
4	36"-60"	NO RECOVERY
5	60"-62"	Brown, fine grained SAND (SP)
6	62"-68"	DARK BROWN/BLACK, fine grained SAND (SP) trace skeet debris
	68-76"	~~SAA~~ Brown/orange mottled SANDY CLAY with BLACK staining
7	~~68"~~ 76"-116" (100')	Brown/orange mottled SANDY CLAY (CL), STIFF moist, plastic
8	116-120"	Lt brown/tan, fine grained SAND (SP)
9		Collect 6" intervals starting 6.5-9.5'
10		

Northing: Easting:

Notes: