MONTHLY PROGRESS REPORT #7
FOR OCTOBER 1997

EPA REGION I ADMINISTRATIVE ORDER SDWA I-97-1019
MASSACHUSETTS MILITARY RESERVATION
TRAINING RANGE AND IMPACT AREA

The following summary of progress is for the period from October 1 to October 31, 1997. Scheduled actions are for the six-week period ending December 12, 1997.

1. SUMMARY OF ACTIONS TAKEN

UXO Survey

CMS Environmental (the UXO contractor) remobilized to the site on October 14. Downhole UXO clearance was performed at MW-13, MW-19, and MW-26.

Surface clearance activities have also been completed at all of the 21 Barber Rig drilling locations in the Impact Area and Demo Areas. Downhole UXO clearance has been completed at 19 of the 21 locations including MW-1, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-19, MW- 25, MW-26, MW-27, MW-28, and MW-29, by advancing 10-foot deep boreholes at each drilling location. Downhole clearance will not be needed at MW-2 because this area was excavated to 12 feet in the course of performing UXO clearance. Downhole clearance remains to be performed at MW-3 after the roadway to this location has been completed.

UXO recovered during clearance activities are summarized in Table 1. UXO present at Spruce Swamp Road, Pocasset-Sandwich Road, and drilling locations MW-1, MW- 6, and MW-27 were destroyed on July 25. Remaining UXO in Table 1 were destroyed on September 12.

Plans and Reports

NGB submitted a Draft Field Sampling Plan (FSP) for Area 5 on October 13. NGB submitted a Final FSP for Area 4 on October 6, for Area 1 on October 17, for Background Areas on October 17, for Groundwater on October 28, and for Area 15 on October 30. These areas and the status of plans are summarized in Table 2.

Drilling

Ogden, D.L. Maher (the drilling contractor), and Valeri Construction (Maher's road building subcontractor) continued work on the site in September. TRC (EPA's oversight contractor) and the U.S. Geological Survey were present for oversight of drilling activities during the month.

Table 3 presents a summary of monitoring wells completed to date. Draft boring logs for these wells have been distributed to EPA, MADEP, USGS, and TRC during the weekly project review meetings.

Sampling and Analysis

Soil and groundwater samples have been analyzed or submitted for borings that have been drilled to date. Also, hand auger samples have been collected from 0-6 inches at future drilling locations in the Impact Area, and at the areas of potential concern identified in the Field Sampling Plans. The types of samples being analyzed, dates of submittal, and preliminary results are summarized in Table 4 and Table 5. Table 4 presents soil sampling and groundwater profiling results, and Table 5 provides results for samples from monitoring wells. All results in Table 4 and Table 5 are unvalidated. Concentrations of specific compounds will be presented in tabular form after the results for all samples in a sample data group are available and have been validated. Locations of monitoring wells are shown in Figure 1. Locations of soil sampling Areas are shown in the figures provided in the Field Sampling Plans.

Explosive Compounds --

Explosive compounds have been detected in soil samples collected from 0-6 inches at MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW- 7, MW-8, MW-9, MW-12, MW-15, MW-19, MW-25, MW-26, MW-27, MW-28, and MW-29, using the screening methods. Explosives were also detected using the screening method at 10 feet bgs in MW-1; at 20 feet bgs in MW-8; at 70, 80, 90, and 100 feet bgs in MW-25; at 10 and 20 feet bgs in MW-27; at 20 feet bgs in MW-2; at 20 feet in MW-9; and at 10 feet in MW-30. No explosives have been detected from the confirmatory Method 8330 analysis of 0-6 inch samples from MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-9, MW-12, MW-15, MW-26, MW-27, MW-28, and MW-29, of the 10 foot interval from MW-1, of the 70, 80, 90, and 100 foot intervals from MW-25, and of the 20 foot interval from MW-9. The results from the 8330 analysis of 0-6 inch samples from MW-8, MW-19, and MW-25 confirm that explosive compounds are present in surface soil at these locations. No explosive compounds have been detected in deeper soil samples analyzed to date by screening or confirmatory 8330 methods.

Explosive compounds have been detected using the screening method in composite surface soil samples from 0-6 inches in 8 grids from Area 1; 12 grids from Area 2; 11 grids from Area 3; 5 grids from Area 6; 4 grids from Area 7; 4 grids from Area 8; 4 grids from Area 9; 5 grids from Area 10; 4 grids from Area 11; 5 grids from Area 14; and 2 grids from Area 15. Method 8330 confirmatory analysis of these hits is complete for all samples from Area 1, 8 samples from Area 2, all samples from Area 3, no samples from Area 6, no samples from Area 7, no samples from Area 8, no samples from Area 9, 4 samples from Area 10, no samples from Area 11, no samples from Area 14, and no samples from Area 15, with no detected explosive compounds in any of

these samples. Method 8330 results from the remaining grids that had screening hits are not yet available.

RDX was reported at an estimated concentration below the detection limit by the screening method in a groundwater profiling sample collected from 160 feet bgs in MW-17. When this sample was analyzed using Method 8330 no explosive compounds were detected. Explosive compounds were detected using Method 8330 in a groundwater profiling sample collected from 44 feet bgs in MW-18. RDX was reported at an estimated concentration below the detection limit by the screening method in a groundwater profiling sample collected from 176 feet bgs in MW-18. When this sample was analyzed using Method 8330 no explosive compounds were detected. RDX was detected in groundwater profiling samples from 120, 130, 162, 202, 222, 232, and 252 feet bgs in MW-1 by screening methods. Explosive compounds were detected using Method 8330 in groundwater profiling samples collected at 120, 130, 140, 150, 162, 182, 202, 212, 222, 232, 252, 262, 272, and 282 feet bgs in MW-1. In MW-15, explosive compounds were detected in groundwater profiling samples from 110, 120, 130, 140, 150, 160, 280, and 300 feet bgs using Method 8330. In MW-21, explosive compounds were detected in groundwater profiling samples from 176, 186, 196, and 270 feet bgs using Method 8330. Explosives have been detected in groundwater profiling samples using Method 8330 at 125 feet in MW-9, 109 feet in MW-6, at 120 feet in MW-25, at 110 feet in MW-8, at 130 feet in MW-27, at 170 feet in MW-2, and at 212 feet in MW-16.

Explosives have been detected in groundwater samples from monitoring wells at locations MW-1S, MW-1M, CS19 MW0011E, CS19 MW0006E, CS19 MW0009E, and MW-25S.

Inorganic Compounds --

Inorganic compounds have been detected in all soil samples analyzed to date. There are a large number of detected compounds and many of these are expected to be naturally occurring. Compounds exceeding background concentrations will be identified after determination of background levels.

Other Analytes --

A number of "other" analytes have been detected in soil and groundwater profiling samples as indicated in Table 4, including VOC, SVOC, pesticides, and herbicides. Some of these compounds may have background concentrations; i.e., they may result from anthropogenic or natural sources which are not related to activities at the Impact Area and Training Ranges. Some of these compounds have been detected in laboratory blanks, which suggests that they may not be present in all of the samples indicated. Many of these compounds have been reported at estimated concentrations due to quality control issues. The quantity of data for these analytes does not allow a detailed description of the occurrence of each analyte for this progress update

report. Ogden is currently importing these data into a database to allow some summary information on the concentrations of each compound to be developed, to be presented in a future monthly report.

Water Level Measurements

A synoptic round of water level measurements was collected on October 3. The results are summarized in Table 6. The draft groundwater contour map from this synoptic measurement round is shown in Figure 2. Water level recording devices that were installed in LRWS-2, CS-19 (MW-7E), and CS-10 (AEHA- 11) continue to record water levels.

Meetings

A October 23 meeting of the Impact Area Groundwater Study Review Team was convened by EPA to discuss progress on the project. Weekly project review meetings continued during the month with EPA, MADEP, USGS, and TRC.

2. SUMMARY OF DATA RECEIVED

Daily reports of UXO survey results were received by Ogden during the survey operations and are summarized in section 1 above. Table 1 provides a summary of potential UXO discovered to date.

Laboratory results for soil and groundwater samples were received during the month and are summarized in Section 1 above. Concentrations for specific compounds will be presented in tabular form after the results for all samples in a sample data group are available and have been validated. The types of samples being analyzed, dates of submittal, and preliminary results are summarized in Tables 4 and 5. All results in Tables 4 and 5 are unvalidated.

Water table measurements performed on October 3 are summarized in Table 6.

3. DELIVERABLES SUBMITTED

Deliverables submitted during the reporting period included the following:

Weekly Progress Update (September 26 - October 2)	October 3, 1997
Final Field Sampling Plan for Area 4	October 6, 1997
Weekly Progress Update (October 3 - October 9)	October 10, 1997
Monthly Progress Report for September, 1997	October 10, 1997
Draft Field Sampling Plan for Area 5	October 13, 1997
Weekly Progress Update (October 10 - October 16)	October 17, 1997

Final Field Sampling Plan for Area 1	October 17, 1997
Weekly Progress Update (October 17 - October 23)	October 24, 1997
Final Field Sampling Plan for Background	October 27, 1997
Final Field Sampling Plan for Groundwater	October 28, 1997
Final Field Sampling Plan for Area 15	October 30, 1997
Weekly Progress Update (October 24 - October 30)	October 31, 1997

4. SCHEDULED ACTIONS

Actions for the next six weeks are indicated in Figure 3. This figure provides a Gantt chart based on the Final Action Plan, updated to reflect progress and proposed work.

Field Sampling Plans will continue to be completed and submitted to EPA during November. Drilling, sampling, and analysis will continue during October.

A meeting of the Impact Area Groundwater Study Review Team will be convened on November 20, 1997.

Table 1
Potential Explosive Ordnance Discovery
As of October 31, 1997

Location	Object Found	Depth (inches)	Disposition
Succonsette Pond, Area 8	2.36" rocket HEAT	surface	destroyed
	81mm mortar HE	4	destroyed
	60mm mortar HE	6	destroyed
	60mm mortar HE	5	destroyed
Turpentine Road	81mm mortar HE	18	destroyed
	105mm projectile HE	12	destroyed
MW-1 (Area 3)	105mm projectile HE	14	destroyed
Spruce Swamp Road	2" HE mortar	0.5	destroyed
	2" HE mortar	1.5	destroyed
	2“ HE mortar	2	destroyed
	2" HE mortar	8	destroyed
Sandwich Road	105mm projectile WP	6	destroyed
MW-26 (Area 2, east side)	105mm projectile HE		destroyed

Table 1
Potential Explosive Ordnance Discovery
As of October 31, 1997

Location	Object Found	Depth (inches)	Disposition
	155mm projectile HE		destroyed
	105mm projectile HE	surface	destroyed
	105mm projectile HE	surface	destroyed
Demo Area 1	30mm projectile HE	surface	destroyed
	30mm projectile HE	surface	destroyed
	30mm projectile HE	surface	destroyed
	3.5" rocket HEAT	surface	destroyed
MW-27	105mm projectile HEAT	20	destroyed
	105mm projectile HEAT	3	destroyed
	105mm projectile HEAT	surface	destroyed
MW-6	105mm projectile HEAT	6	destroyed
	105mm projectile HEAT	3	destroyed
	105mm projectile HE	4	destroyed
	81mm mortar HE	8	destroyed
	105mm projectile HEAT	3	destroyed
	105mm projectile HEAT	surface	destroyed
	60mm mortar HE	24	destroyed
	60mm mortar HE	24	destroyed
MW-29	60mm mortar HE		destroyed
MW-3	155mm ejection	surface	destroyed
MW-2	155mm ejection	surface	destroyed
	155mm ejection	8	destroyed
	155mm projectile HE	surface	destroyed
	81mm mortar HE	8	destroyed
	81mm mortar Illum.	18	destroyed

Table 1
Potential Explosive Ordnance Discovery
As of October 31, 1997

Location	Object Found	Depth (inches)	Disposition
Indian Trail Road	81mm mortar HE	6	destroyed
	81mm mortar HE	8	destroyed
	4.5" Hedge Hog rkt HE	16	destroyed
	4.5" Hedge Hog rkt HE	8	destroyed
Mortar Position 8	40mm M918 Training	surface	destroyed

Table 2
Summary of Sampling Areas and Field Sampling Plan Status
As of October 31, 1997

Area[a]	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
1	3 (S/I/D)	Area of Depression w/ Ground Scar	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 10/17 final 10/28
2	2 (S/I/D), 26 (S)	Site 3/Target Area/Burn Area	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 8/1 final 10/28
3	1(S/I/D)	Site 1 Target Area	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 8/1 final 10/28
4	27 (S)	Site 4 Mounds	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 10/6 final 10/28
5		Site 5	hand auger (soil)	draft 10/13
6	7 (S/I/D)	Burn Area (southeast of Turpentine)	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 9/26 final 10/28
7	8(S)	Burn Areas (southwest of Turpentine)	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 9/26 final 10/28

Table 2
Summary of Sampling Areas and Field Sampling Plan Status
As of October 31, 1997

Area[a]	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
8		Succonsette Pond	sediment/surface water hand auger (soil)	 final 9/26
9	4 (S)	(well on Pocasset Road north of Five Corners)	barber rig (soil) hand auger (soil: control area) groundwater	final 7/18 final 9/26 final 10/28
10	5 (S/I/D)	(well north of Wood Road)	barber rig (soil) hand auger (soil: control area) groundwater	final 7/18 final 9/26 final 10/28
11	25 (S)	(well southeast of CS-19)	barber rig (soil) hand auger (soil: control area) groundwater	final 7/18 final 9/26 final 10/28
	6 (S)	(well north of Area 5)	barber rig (soil) groundwater	final 7/18 final 10/28
12	19 (S/D)	Demo Area 1	barber rig (soil) hand auger (soil) groundwater	final 7/18 draft 9/4 final 10/28
13	16 (S/D)	Demo Area 2	barber rig (soil) hand auger (soil) groundwater	final 7/18 draft 9/4 final 10/28
14		(access road to MW-7)	hand auger (soil: control area)	final 9/26
	9 (S)	none (well southwest of CS-19)	barber rig (soil) groundwater	final 7/18 final 10/28
	10 (S/I/D)	none (well on west Jefferson Road)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	11 (S)	none (well midway along Jefferson)	barber rig (soil) groundwater	final 7/18 final 10/28
	12 (S)	none (well on Barlow south of Wood)	barber rig (soil) groundwater	final 7/18 final 10/28
	13 (S/D)	none (well near J-3 range south of Chadwick)	barber rig (soil) groundwater	final 7/18 final 10/28
	14 (S)	none (well at the corner of Wheelock and Turpentine)	barber rig (soil) groundwater	final 7/18 final 10/28

Table 2
Summary of Sampling Areas and Field Sampling Plan Status
As of October 31, 1997

Area[a]	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
	15 (S/D)	none (well at the corner of Spruce Swamp and Sandwich)	barber rig (soil) groundwater	final 7/18 final 10/28
15		Site 6	hand auger (soil)	draft 9/4
	28 (S)	none (well at corner of Wheelock and Chadwick)	barber rig (soil) groundwater	final 7/18 final 10/28
	29 (S)	none (well at the corner of Barlow and Chadwick)	barber rig (soil) groundwater	final 7/18 final 10/28
	17 (S/D)	none (well southeast of Demo-2)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	18 (S/I/D)	none (well on east end of Gibbs)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	20 (S)	none (well on west end of Pocasset Forestdale)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	21 (S/D)	none (well on south end of Burgoyne)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	22 (S)	none (well midway on Burgoyne)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	23 (S/I/D)	none (well north end of Burgoyne)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
	24 (S)	none (well near Rod & Gun Club)	rotosonic rig (soil) groundwater	final 7/18 final 10/28
16		GP-9 (High-use gun position)	hand auger (soil)	draft 9/19
17		Mixed-use gun position	hand auger (soil)	draft 9/19
18		Low-use gun position	hand auger (soil)	draft 9/19
19		High-use mortar position	hand auger (soil)	draft 9/19
20		Mixed-use mortar position	hand auger (soil)	draft 9/19
21		Low-use mortar position	hand auger (soil)	draft 9/19
22		Control area near mortar positions	hand auger (soil: control)	draft 9/19

Table 2
Summary of Sampling Areas and Field Sampling Plan Status
As of October 31, 1997

Area[a]	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
23		Drainage swale (N of Snake Pd.)	hand auger (soil)	
24		Drainage swale (NW of Snake Pd.)	hand auger (soil)	
25		Rod & Gun Club pond	sediment/surface water	
26		Deep Bottom Pond	sediment/surface water	
27		Round Swamp	sediment/surface water	
28		Grassy Pond	sediment/surface water	
29		Ox Pond	sediment/surface water	
30		Donnely Pond	sediment/surface water	
31		Little Halfway Pond	sediment/surface water	
32		Raccoon Swamp/Pond	sediment/surface water (control)	
33		Snake Pond	sediment/surface water	
34		Bailey's Pond	sediment/surface water	
35		Gibbs Pond	sediment/surface water	
36		Opening Pond	sediment/surface water	
37		Bypass Bog	sediment/surface water	
38		Control area near gun positions	hand auger (soil: control)	draft 9/19

Notes: (a) Boring sampling locations do not have unique area numbers

Table 3
Summary of Monitoring Wells Completed
As of October 31, 1997

Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
MW-14S	96.0-106.0	Water Table	7/28

Table 3
Summary of Monitoring Wells Completed
As of October 31, 1997

Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
MW-23S	122.5-132.5	Water Table	7/29
MW-23D	272.0-282.0	Bottom of Aquifer[1]	7/29
MW-28S	95.2-105.2	Water Table	7/30
MW-29S	98.5-108.5	Water Table	8/1
MW-12S	96.7-106.7	Water Table	8/7
MW-10S	145.0-155.0	Water Table	8/11
MW-10D	351.5-361.5	Bottom of Aquifer[2]	8/11
MW-11S	122.0-132.0	Water Table	8/12
MW-4S	137.0-147.0	Water Table	8/18
MW-7S	103.0-113.0	Water Table	8/27
MW-7D	332.0-342.0	Bottom of Aquifer[1]	8/27
MW-17S	120.0-130.0	Water Table	8/27
MW-17D	320.0-330.0	Bottom of Aquifer[1]	8/27
MW-18S	35.0-45.0	Water Table	9/9
MW-18D	265.0-275.0	Bottom of Aquifer[1]	9/9
MW-1D	290.0-300.0	Bottom of Aquifer[1]	9/15
MW-1I	160.0-165.0	45 feet Below Water Table	9/18
MW-1S	114.0-124.0	Water Table	9/18
MW-15S	105.0-115.0	Water Table	9/18
MW-15D	324.0-334.0	Bottom of Aquifer[1]	9/18
MW-21S	164.0-174.0	Water Table	9/22

Table 3
Summary of Monitoring Wells Completed
As of October 31, 1997

Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
MW-21D	302.0-312.0	Bottom of Aquifer[1]	9/22
MW-25S	108.0-118.0	Water Table	9/23
MW-22S	170.5-180.5	Water Table	9/24
MW-6S	106.0-116.0	Water Table	9/25
MW-9S	113.0-123.0	Water Table	9/25
MW-20S	92.0-102.0	Water Table	9/25
MW-23M1	225.0-235.0	100 feet Below Water Table	10/1
MW-23M2	189.0-194.0	70 feet Below Water Table	10/1
MW-23M3	156.0-161.0	30 feet Below Water Table	10/2
MW-8S	103.0-113.0	Water Table	10/2
MW-27S	117.0-127.0	Water Table	10/7
MW-16S	123.0-135.0	Water Table	10/15
MW-16D	355.0-360.0	Bottom of Aquifer[1]	10/15
MW-10I	280.0-285.0	130 feet Below Water Table	10/16
MW-2S	137.0-147.0	Water Table	10/28
MW-2D	355.0-360.0	Bottom of Aquifer[1]	10/28
MW-30S	26.0-36.0	Water Table	10/28

1 =Well constructed on top of till layer overlying bedrock.
2 =Well constructed on top of bedrock.