

**MONTHLY PROGRESS REPORT #11
FOR FEBRUARY 1998**

**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 February 1 to February 27, 1998. Scheduled actions are for the six-week period ending April 14, 1998.

1. SUMMARY OF ACTIONS TAKEN

UXO Survey

No UXO surveys were performed during the reporting period.

Plans and Reports

NGB completed final versions of the Storm Water FSP and the Gun and Mortar Positions FSP during February, and also submitted revision pages for the Surface Water/Sediment FSP. All Final FSPs are complete at this time. The FSP submittal and revision dates are summarized in Table 1.

Drilling

Ogden and D.L. Maher (the drilling contractor) continued work on the site in February. TRC (EPA's oversight contractor) and the US Geological Survey were present for observation of drilling activities during the month. The shallow and deep monitoring wells at MW-19 were installed at 38-48 feet bgs and 293-298 feet bgs. The shallow and deep monitoring wells at MW-3 were installed at 44-54 feet bgs and 262-267 feet bgs. Table 2 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

Soil sampling was performed on 10-foot intervals in the unsaturated zone at borings for MW-3 and MW-19; and at 18-24 inches bgs at Areas 8, 11, 12, 13, 15, 19, 20, 21, and 22. Surface water and sediment samples were collected from Areas 33, 37, 39, and 40. Groundwater samples were collected from monitoring wells MW-2S, MW-2M1, MW-2M2, MW-5S, MW-5M1, MW-5M2, MW-5D, MW-7M2, MW-26S, FS-12/90WT0003, FS-12/90WT0004, FS-12/90MW0070, FS-12/90MW0071, FS-12/90MW0080, LF-1/BB-703, CS-1/WT-711, CS-1/WT-712, 95-14, RW-1,

RW-2, SD-5/28MW0106, FS-14/MW -3, and USFW228040. Groundwater profiling samples were collected at 10 foot intervals in the saturated zone at borings for MW-3 and MW-19.

Analytical Results

Electronic Data Deliverables (EDDs) were received from ITS (the laboratory contractor) for Sample Delivery Groups (SDGs) 32-47 in February. Hardcopy data deliverables were received from ITS for SDGs 39-50 during the month. Results for SDGs 51-65 were being prepared by ITS as of the end of February.

Validation

Ogden continued validation of hardcopy deliverables during February. All data contained in SDGs 22, 23, 24, 25, and 27 had been validated by the end of the month, and VOC data for SDG 26 had also been validated. These data are attached to this report, and are summarized in Section 2. Validation is underway for SDGs 18-21 and 31-39.

Water Level Measurements

The next round of synoptic water level measurements around the Impact Area is scheduled for March 31, 1998.

Meetings

The Impact Area Groundwater Study Review Team did not meet during the month of February. Weekly project review meetings continued during the month with EPA, MADEP, USGS, TRC, and JPO.

2. SUMMARY OF DATA RECEIVED

The data validated during the month are presented in an attachment to this progress report. The attached results include field samples (having sample numbers that end in "A", or "D" for Duplicate) as well as quality control samples (ending in "E" for Equipment blank, "F" for Field blank, or "T" for Trip blank). The attachment includes a list of qualifier codes to explain the validation results.

The validated results include samples from 16 groundwater monitoring wells and three duplicate samples. The samples were collected from new wells MW-1S, -1M, -1D, -15S, and -15D, Bourne wells 95-6 and 95-15, Long Range Water Supply wells 2-6 and 3-1, and CS-19 wells 58MW0005E, 58MW0006E, 58MW0007C, 58MW0007E, 58MW0009E, 58MW0010A, and 58MW0011E. Detected compounds and concentration ranges for the monitoring well samples

are summarized in Table 3. The explosive compounds detected were RDX (or hexahydro-1,3,5-trinitro-1,3,5-triamine) in MW-1S, MW-1M, 58MW0006E, 58MW0009E, and 58MW0011E; HMX (or octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine) in MW-1S and 58MW0009E; and pentaerythritol tetranitrate (PETN) in 58MW0009E. Volatile organic compounds (VOCs) detected in groundwater samples include chloroform (MW-15S, -15D, 95-6, 95-15, 58MW0007C, 58MW0007E, LRWS2-6, and LRWS3-1), dibromochloromethane (MW-15D and an equipment blank), acetone (95-15 and several equipment blanks), and tert-butyl methyl ether (MTBE, in MW-1D). Bis (2-ethylhexyl) phthalate (BEHP) was the only semivolatile organic compound (SVOC) detected in groundwater samples (95-15, LRWS2-6, LRWS3-1, 58MW0006E, 58MW0009E, and 58MW0011E), although di-ethyl phthalate was detected in an equipment blank. The pesticides Alpha BHC (95-6 and 95-15) and Beta BHC (95-15) were detected. No polychlorinated biphenyls (PCBs) were detected. The herbicide MCPP was detected in well 95-6 and in the equipment blank for well 95-15.

The validated results include surface soil (0-6 inch bgs) samples from 6 grids in Area 4 (04A-04F), which is the portion of the J-1 Range surrounding the 2,000-meter target. Detected compounds and concentration ranges for these samples are summarized in Table 4. No explosive compounds were detected using EPA Method 8330. VOCs detected included trichloroethene (TCE) and chloroform at grid 04D. BEHP at grid 04B was the only SVOC detected. No pesticides or PCBs were detected. Four herbicides were detected, including 2,4,5-T and 3,5-dichlorobenzoic acid at grids 04B and 04E, 2,4,5-T at grid 04C, and MCPA and Bentazon at grid 04D. The inorganic analytes were detected in one or more samples except that cyanide, beryllium, selenium, sodium, thallium, and mercury were not detected.

The validated results include subsurface (>2 feet bgs) soil samples from 6 borings including MW-2, -8, -13, -16, -24, and -27. A total of 55 samples and one duplicate were collected from these borings. All samples were analyzed for inorganic compounds, 14 were analyzed for explosive compounds, and 8 were analyzed for other target analytes. Detected compounds and concentration ranges for these samples are summarized in Table 5. No explosive compounds or VOCs were detected. SVOCs detected include BEHP (MW-16, -24, -27 at 20, 10, and 10 feet), di-n-butyl phthalate (MW-16 at 20 feet), n-nitrosodiphenylamine (MW-16 at 20 feet), and naphthalene (MW-2 at 10 feet). Six pesticides were detected, including Alpha BHC in MW-27 at 10 feet, and heptachlor, Aldrin, Dieldrin, Endrin, and DDT in MW-16 at 20 feet. The herbicides Silvex and 2,4,5-T were detected in MW-13 at 10 feet. The inorganic analytes were detected in the majority of the 56 samples analyzed for these compounds except that cadmium and thallium were not detected, and antimony, selenium, silver, and mercury were detected only once.

3. DELIVERABLES SUBMITTED

Deliverables submitted during the reporting period included the following:

Final Storm Water FSP	February 5, 1998
Weekly Progress Update (January 30 - February 5)	February 6, 1998
Monthly Progress Report for January 1998	February 10, 1998
Final Gun and Mortar Position FSP	February 10, 1998
Weekly Progress Update (February 6 - February 12)	February 17, 1998
Weekly Progress Update (February 13 - February 19)	February 20, 1998
Interim Results Report	February 26, 1998
Replacement Pages for the Final Surface Water/Sediment FSP	February 27, 1998
Weekly Progress Update (February 20 - February 26)	February 27, 1998

4. SCHEDULED ACTIONS

Actions for the next six weeks are indicated in Figure 1. This figure provides a Gantt chart based on the Final Action Plan, updated to reflect progress and proposed work.

Drilling will be completed with the installation of MW-3M1 and MW-3M2, which are the final monitoring wells to be installed in this phase of work. Monitoring well sampling is expected to be completed with sampling of five wells around FS-12 (for the Response Plan to 90WT0013) and the six wells recently installed at MW-3 and MW-19. Soil sampling is expected to be completed with the collection of remaining samples from 18-24 inches bgs. Storm water sampling will be completed if a qualifying rain event (>1 inch/24 hours) occurs. Sample analysis will continue during March and April.

Meetings of the Impact Area Groundwater Study Review Team will be convened on March 2 and March 31, 1998.

Table 1 Summary of Sampling Areas and Field Sampling Plan Status As of February 28, 1998				
Area^a	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
1	3 (S, M2, M1, D)	Area of Depression w/ Ground Scar	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 10/17 final 11/13
2	2 (S, M2, M1, D), 26 (S)	Site 3/Target Area/Burn Area	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 8/1 final 11/13
3	1 (S, M2, M1, D)	Site 1 Target Area	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 8/1 final 11/13

Table 1 Summary of Sampling Areas and Field Sampling Plan Status As of February 28, 1998				
Area ^a	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
4	27 (S)	Site 4 Mounds	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 10/6 final 11/13
5		Site 5	hand auger (soil)	final 1/20
6	7 (S, M2, M1, D)	Burn Area (southeast of Turpentine)	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 9/26 final 11/13
7	8 (S)	Burn Areas (southwest of Turpentine)	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 9/26 final 11/13
8		Succonsette Pond	sediment/surface water hand auger (soil)	final 2/27 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 11/13
10	5 (S, M1, M2, D)	(well north of Wood Road)	barber rig (soil) hand auger (soil: control area) groundwater	final 7/18 final 9/26 final 11/13
11	25 (S)	(well southeast of CS-19)	barber rig (soil) hand auger (soil: control area) groundwater	final 7/18 final 9/26 final 11/13
	6 (S)	(well north of Area 5)	barber rig (soil) groundwater	final 7/18 final 11/13
12	19 (S, D)	Demo Area 1	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 11/25 final 11/13
13	16 (S, D)	Demo Area 2	barber rig (soil) hand auger (soil) groundwater	final 7/18 final 11/25 final 11/13
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 11/13

Table 1 Summary of Sampling Areas and Field Sampling Plan Status As of February 28, 1998				
Area ^a	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
	10 (S, M1, D)	none (well on west Jefferson Road)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	11 (S)	none (well midway along Jefferson)	barber rig (soil) groundwater	final 7/18 final 11/13
	12 (S)	none (well on Barlow south of Wood)	barber rig (soil) groundwater	final 7/18 final 11/13
	13 (S, D)	none (well near J-3 range south of Chadwick)	barber rig (soil) groundwater	final 7/18 final 11/13
	14 (S)	none (well at the corner of Wheelock and Turpentine)	barber rig (soil) groundwater	final 7/18 final 11/13
	15 (S, D)	none (well at the corner of Spruce Swamp and Sandwich)	barber rig (soil) groundwater	final 7/18 final 11/13
15		Site 6	hand auger (soil)	final 10/30
	28 (S)	none (well at corner of Wheelock and Chadwick)	barber rig (soil) groundwater	final 7/18 final 11/13
	29 (S)	none (well at the corner of Barlow and Chadwick)	barber rig (soil) groundwater	final 7/18 final 11/13
	17 (S, D)	none (well southeast of Demo-2)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	18 (S, M2, M1, D)	none (well on east end of Gibbs)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	20 (S)	none (well on west end of Pocasset Forestdale)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	21 (S, D)	none (well on south end of Burgoyne)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	22 (S)	none (well midway on Burgoyne)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	23 (S, M3, M2, M1, D)	none (well north end of Burgoyne)	rotosonic rig (soil) groundwater	final 7/18 final 11/13
	24 (S)	none (well near Rod & Gun Club)	rotosonic rig (soil) groundwater	final 7/18 final 11/13

Table 1 Summary of Sampling Areas and Field Sampling Plan Status As of February 28, 1998				
Area^a	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
	30 (S)	none (well on the J-3 Range)	barber rig (soil) groundwater	final 7/18 final 11/13
16		GP-16 (High-use gun position)	hand auger (soil)	final 2/10
17		GP-7 (Mixed-use gun position)	hand auger (soil)	final 2/10
18		GP-18 (Low-use gun position)	hand auger (soil)	final 2/10
19		MP-8 (High-use mortar position)	hand auger (soil)	final 2/10
20		MP-3, -6 (Mixed-use mortar postn.)	hand auger (soil)	final 2/10
21		MP-5 (Low-use mortar position)	hand auger (soil)	final 2/10
22		Control area near mortar positions	hand auger (soil: control)	final 2/10
23		J-3 Wetland Area (Drainage swale)	hand auger (soil)	final 1/28
24		Drainage swale (NW of Snake P.d.)	hand auger (soil)	see Area 37
25		Rod & Gun Club pond	sediment/surface water	final 2/27
26		Deep Bottom Pond	sediment/surface water	final 2/27
27		Round Swamp	sediment/surface water	final 2/27
28		Grassy Pond	sediment/surface water	final 2/27
29		Ox Pond	sediment/surface water	final 2/27
30		Donnelly Pond	sediment/surface water	final 2/27
31		Little Halfway Pond	sediment/surface water	final 2/27
32		Raccoon Swamp	sediment/surface water (control)	final 2/27
33		Snake Pond	sediment/surface water	final 2/27
34		Bailey's Pond	sediment/surface water	final 2/27
35		Gibbs Pond	sediment/surface water	final 2/27
36		Opening Pond	sediment/surface water	final 2/27
37		Bypass Bog	sediment/surface water	final 2/27
38		Control area near gun positions	hand auger (soil: control)	final 2/10

Table 1 Summary of Sampling Areas and Field Sampling Plan Status As of February 28, 1998				
Area ^a	Well No. (depth)	Location name/Description in Action Plan	Sample methods/media	FSP status
39		Great Pond	sediment/surface water (control)	final 2/27
40		Doughnut Pond	sediment/surface water (control)	final 2/27
41		Shawme-Crowell State Forest	hand auger (soil: control)	final 1/9
42		Four Ponds Conservation Area	hand auger (soil: control)	final 1/9
43		Upper Pond	sediment/surface water (control)	final 2/27

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

Table 2 Summary of Monitoring Wells Completed As of February 28, 1998			
Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
MW-14S	96.0-106.0	Water Table	7/28
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

Table 2 Summary of Monitoring Wells Completed As of February 28, 1998			
Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
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-1M	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
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

Table 2 Summary of Monitoring Wells Completed As of February 28, 1998			
Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
MW-16S	123.0-135.0	Water Table	10/15
MW-16D	355.0-360.0	Bottom of Aquifer ¹	10/15
MW-10M	280.0-285.0	130 feet Below Water Table	10/16
MW-24S	6.0-16.0	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
MW-13S	73.0-83.0	Water Table	11/4
MW-13D	220.0-225.0	Bottom of Aquifer ¹	11/4
MW-5S	119.0-129.0	Water Table	11/18
MW-5D	335.0-340.0	Bottom of Aquifer ¹	11/18
MW-7M1	240.0-245.0	135 feet Below Water Table	11/18
MW-7M2	170.0-175.0	65 feet Below Water Table	11/18
MW-18M1	171.0-176.0	128 feet Below Water Table	11/20
MW-18M2	107.0-112.0	64 feet Below Water Table	11/20
MW-1M1	220.0-225.0	104 feet Below Water Table	12/19
MW-2M1	212.0-217.0	73 feet Below Water Table	1/9
MW-2M2	170.0-175.0	31 feet Below Water Table	1/9
MW-26	129.0-139.0	Water Table	1/16
MW-5M1	210.0-215.0	89 feet Below Water Table	1/28
MW-5M2	170.0-175.0	49 feet Below Water Table	1/28
MW-3D	262.0-267.0	Bottom of Aquifer ¹	2/19

Table 2 Summary of Monitoring Wells Completed As of February 28, 1998			
Monitoring Well	Screen Interval (feet bgs)	Location	Date Completed
MW-3S	44.0-54.0	Water Table	2/19
MW-19D	293.0-298.0	Bottom of Aquifer ¹	2/23
MW-19S	38.0-48.0	Water Table	2/23
1 =Well constructed on top of till layer overlying bedrock. 2 =Well constructed on top of bedrock.			