

5.3 SWMU 3: DISPOSAL PIT (SOUTHEAST OF AREA 2)

5.3.1 Site Description and Waste Generation

SWMU 3 is located in the southeastern portion of TEAD-S. It consists of a partially backfilled disposal trench that remains open at the southern end (Figure 5.3-1). The trench is near an old asphalt or compacted soil and gravel pad and an empty wood and corrugated tin building. A sign that lies near the building reads "Groups (special hazard) ammunition or agent," "Contains agent." The remainder is illegible due to rusting. Stacks of metal grate are found to the west of the pavement. No fences exist at this site to indicate the exact area of any waste handling or disposal. The open trench contains drums and cans; some of the cans are marked "Decontaminating Agent, Non-Corrosive." These containers are believed to have contained DANC, a substance previously used widely throughout TEAD-S for decontamination of blister agents (Barnes 1992). A TEAD-S employee stated that past employees indicated that the site contained "a little bit of everything" and that people had been warned not to enter the area (USATHAMA 1979).

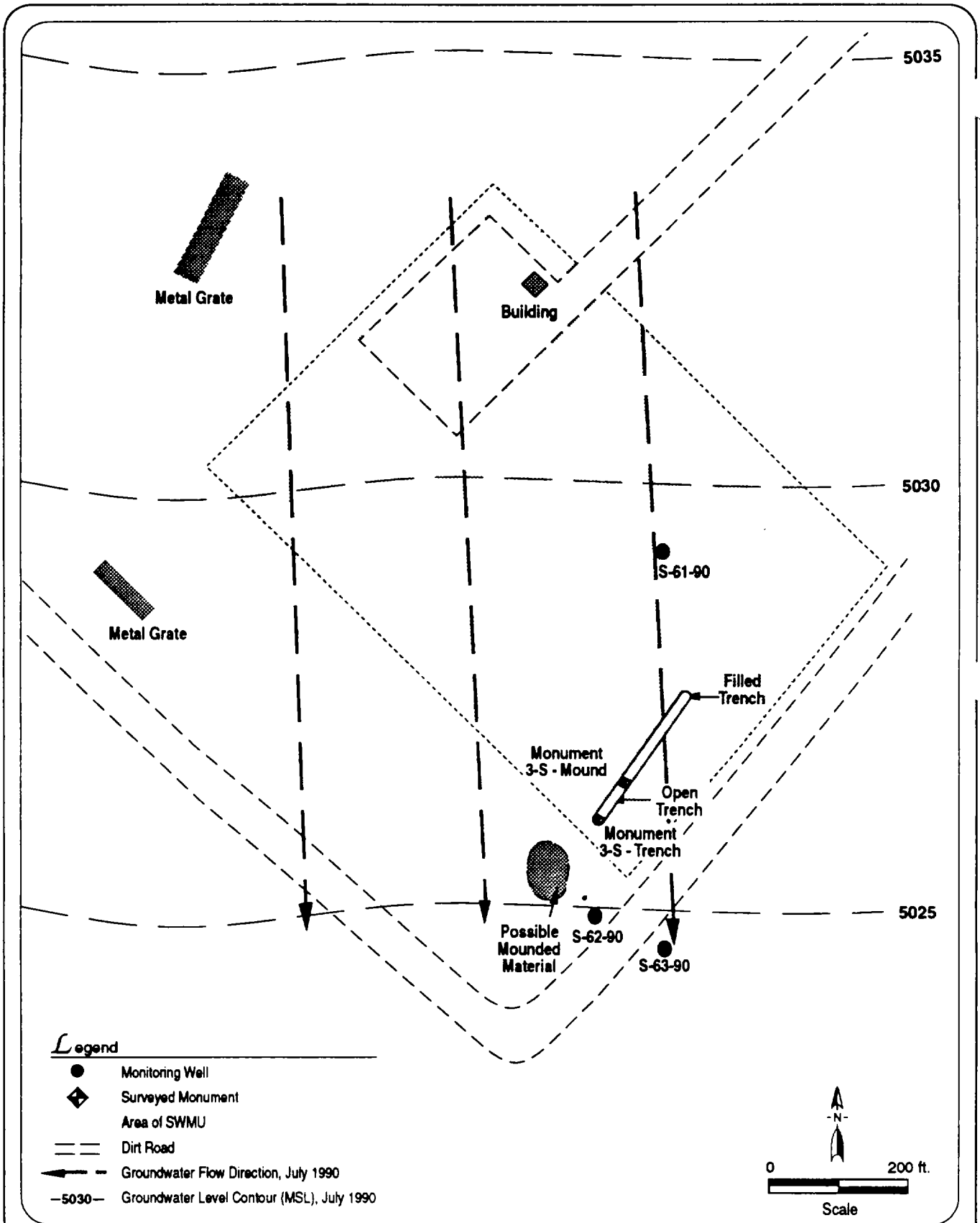
NUS (1987) noted that the open-trench area was approximately 80 ft long, 15 ft wide, and 6 ft deep and contained corroded 55-gallon drums with no evident warning labels. Construction debris and packing material were also observed in the trench. Charring of the trench contents indicated that an attempt was made to burn them (NUS 1987).

The general area of SWMU 3 was reportedly used for leaking chemical munitions and it was also identified as the site of a 1960s (nerve agent) spill. This information has not been confirmed; however, a report of a VX spill in the southeast corner of SWMU 9 (Old Area 2), an area where mustard spills also occurred (USATHAMA 1979), may have been misunderstood to indicate a spill at SWMU 3, which is farther southeast of SWMU 9.

5.3.2 Site Hydrogeology

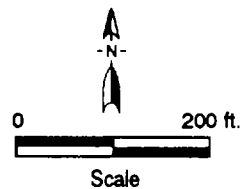
SWMU 3 is located on a gentle southwest-sloping topographic surface. Surface water may occur in the area as runoff after major storms. This runoff flows to the southwest in a broad system of shallow braided gullies that pass just to the east of the SWMU 3 trench. Other shallow gullies have eroded into an old roadbed leading directly to the site. Since surface water that once flowed on TEAD-S from Mercur Creek to the northeast has now been diverted around the east side of the site, the amount of flow in these channels may be small. However, the open pit creates the potential for local runoff to collect and leach contaminants into the subsurface at this site.

The site is underlain by Quaternary alluvial deposits. Details of the subsurface lithology are drawn from the field boring logs (Appendix A) constructed for each monitoring well in the SWMU (S-61-90, S-62-90, S-63-90), and from the sieve analyses from representative samples. The near-surface sediment, down to a depth of approximately 5 ft, is composed of moderately stiff, yellowish-brown, organic-rich (e.g., roots and rootlets), silty clay and clayey silt (CL, ML). The unsaturated zone is composed of approximately 25 ft of dense, yellowish brown to olive gray sand (SP, SM) interbedded with gravel (GP), and in a few places, with silt and clay (ML, CL).



Legend

- Monitoring Well
- ◆ Surveyed Monument
- Area of SWMU
- == Dirt Road
- ← Groundwater Flow Direction, July 1990
- 5030- Groundwater Level Contour (MSL), July 1990



Source:
 EBASCO Field Measurement
 Basic Information Maps 1985
 EPIC 1982

Figure 5.3-1
Site Map
SWMU 3 - Disposal Pit (Southeast of Area 2)
 Tooele Army Depot - South Area
 Prepared by: Ebasco Services Incorporated

Silt and clay content increases with depth at the expense of the sand. From approximately 30 ft to the water table at 88 to 89 ft, the alluvium is composed of dense, yellowish-brown, silty clay with some sand (CL). Beds of gravelly, silty, and clayey sand (SM) are also common, as shown in the sieve analysis.

Based on bore log descriptions, the saturated zone was characterized from about 88 to 104 ft and is composed of moist to wet, yellowish-brown, silty clay and silty sand with trace amounts of gravel (CL, SM). The screened interval was 10 ft in well S-61-90, from 87 to 97 ft, and is 20 ft in Wells S-62-90 and S-63-90, from 83 to 103 ft, and 84 to 104 ft, respectively. Three monitoring wells were installed at SWMU 3, one upgradient to the north of the disposal trench (S-61-90), and two downgradient to the south of the trench (S-62-90, S-63-90). The depth to groundwater in July 1990 at wells S-61-90, S-62-90, and S-63-90 was 89 to 88 ft below the ground surface, or 5,032, 5,027, and 5,028 ft msl, respectively. Groundwater flows south from the SWMU toward the southern boundary of TEAD-S.

5.3.3 Previous Sampling and RFI-Phase I Sampling Results

Previous investigations at TEAD-S did not include collection of soil or groundwater samples at SWMU 3. During the RFI-Phase I, four soil samples were originally to be collected from the open portion of the SWMU 3 trench (EBASCO 1991). Because of the potential for Army agent contamination in this trench, Army personnel from the Technical Escort Unit were required to collect these soil samples. These personnel were unavailable during the RFI-Phase I; therefore, the SWMU 3 soil samples were scheduled to be collected during the RFI-Phase II program.

During the RFI-Phase I, one monitoring well was installed upgradient and two monitoring wells were installed downgradient of the trench at SWMU 3 to detect possible contaminant releases from the trench contents. The groundwater samples were analyzed by the methods listed in Section 3.10.10, Table 3.10.3. Detections in groundwater samples are reported in Table 5.3-1. Well locations, compounds detected in groundwater, and their concentrations are illustrated in Figures 5.3-2 through 5.3-5.

5.3.4 Contamination Assessment

Methylene chloride was the only organic compound detected in groundwater at SWMU 3 and it was found in both the upgradient sample and one downgradient sample. Methylene chloride can be an incomplete combustion product (i.e., during a fire or explosion) of distilled mustard (HD) (Department of the Army 1988), a solvent used for degreasing and paint stripping (HSDB 1991), or a common laboratory contaminant and cleaning solvent (HSDB 1991; EPA 1989).

Munitions containing mustard or other contaminants may have been burned and disposed of at SWMU 3, and methylene chloride detections, therefore, may indicate a release of mustard decomposition products from the SWMU 3 trench. However, no other combustion products or degradation products of mustard, such as thiodiglycol, were detected. Therefore, the low concentrations of methylene chloride detected in both upgradient and downgradient wells are believed to have been caused by laboratory contamination of the samples.

TABLE 5.3-1

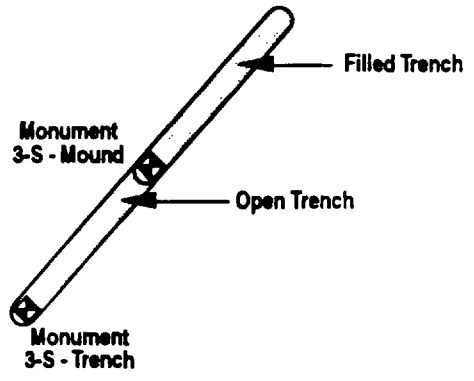
Summary of RFI-Phase I Investigations for
SWMU 3 : Disposal Pit (Southeast of Area 2)

GROUNDWATER ($\mu\text{g/l}$)

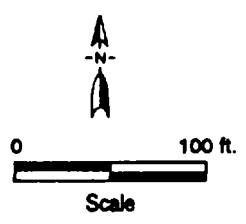
Analytical Groups and Analytes Detected	S-61-90	S-62-90	S-63-90
<i>Volatile Organics:</i>			
Methylene chloride(CH ₂ CL ₂)	5.9	6.2	LT 5.4
<i>Semivolatile Organics:</i>			
Unknowns		20	
<i>Metals:</i>			
Arsenic (As)	9.1	9.3	12
Chromium (Cr)	8.6	9.7	15
Sodium (Na)	37,000	27,000	33,000
<i>Anions:</i>			
Bromide (Br)	LT 50	LT 50	1500
Chloride (Cl)	18,000	13,000	LT 1,400,000
Fluoride (F)	340	440	LT 14,000
<i>Radionuclides (pCi/l):</i>			
Gross alpha (ALPHAG)	120	13	62
Gross beta (BETAG)	5.1	11	39
Uranium (U)	30	8.5	5.4

LT Less than
pCi/l Picocurie per liter
 $\mu\text{g/l}$ Microgram per liter

CH₂CL₂ 5.9
S-61-90



S-62-90
CH₂CL₂ 6.2
S-63-90

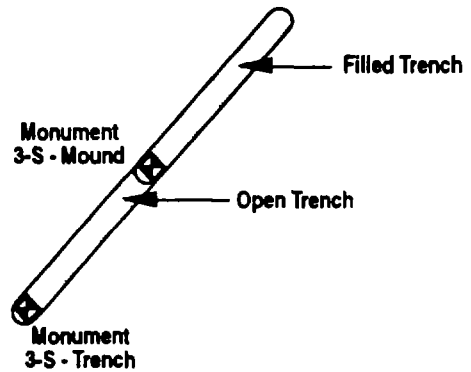


Legend
● Monitoring Well (results in µg/l)
1990 results are **bolded**

Figure 5.3-2
SWMU 3 - Disposal Pit (Southeast of Area 2)
Volatile Organics
Tooele Army Depot - South Area
Prepared by: Ebasco Services Incorporated

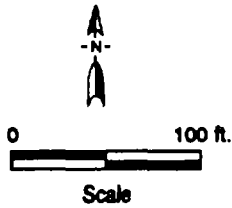
As	9.1
Cr	8.6
Na	37,000

S-61-90



S-62-90	
As	9.3
Cr	9.7
Na	27,000

S-63-90	
As	12
Cr	15
Na	33,000



Legend

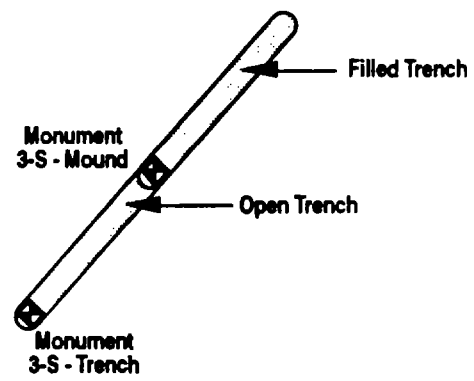
● Monitoring Well (results in µg/l)

1990 results are bolded

Figure 5.3-3
SWMU 3 - Disposal Pit (Southeast of Area 2)
Metals
 Tooele Army Depot - South Area
 Prepared by: Ebasco Services Incorporated

Cl	18,000
F	340

S-61-90

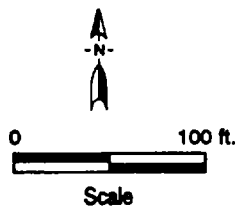


S-62-90

Cl	13,000
F	440

S-63-90

Br	1500
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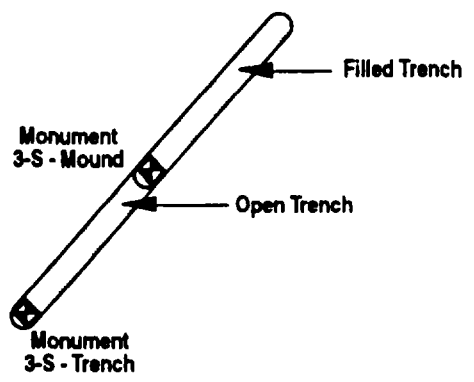
Legend

- Monitoring Well (results in µg/l)
- 1990 results are bolded

Figure 5.3-4
SWMU 3 - Disposal Pit (Southeast of Area 2)
Anions
 Tooele Army Depot - South Area
 Prepared by: Ebasco Services Incorporated

ALPHAG	120 ± 61
BETAG	5.1 ± 16
U	30 ± 2.2

S-61-90

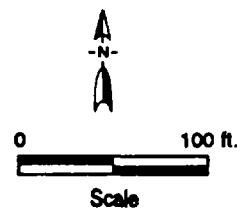


S-62-90

ALPHAG	13 ± 7
BETAG	11 ± 6.1
U	8.5 ± 1.3

S-63-90

ALPHAG	62 ± 27
BETAG	39 ± 23
U	5.4 ± 1.0



Legend

● Monitoring Well (results in pCi/l)

1990 results are bolded

Figure 5.3-5
SWMU 3 - Disposal Pit (Southeast of Area 2)
Radionuclides
 Tooele Army Depot - South Area
 Prepared by: Ebasco Services Incorporated

All wells at SWMU 3 are located in groundwater quality zone I. Zone I generally has lower concentrations of inorganic analytes and a smaller range of concentrations than zones II and III. No inorganic analytes were detected at elevated levels at SWMU 3 during the RFI-Phase I program.

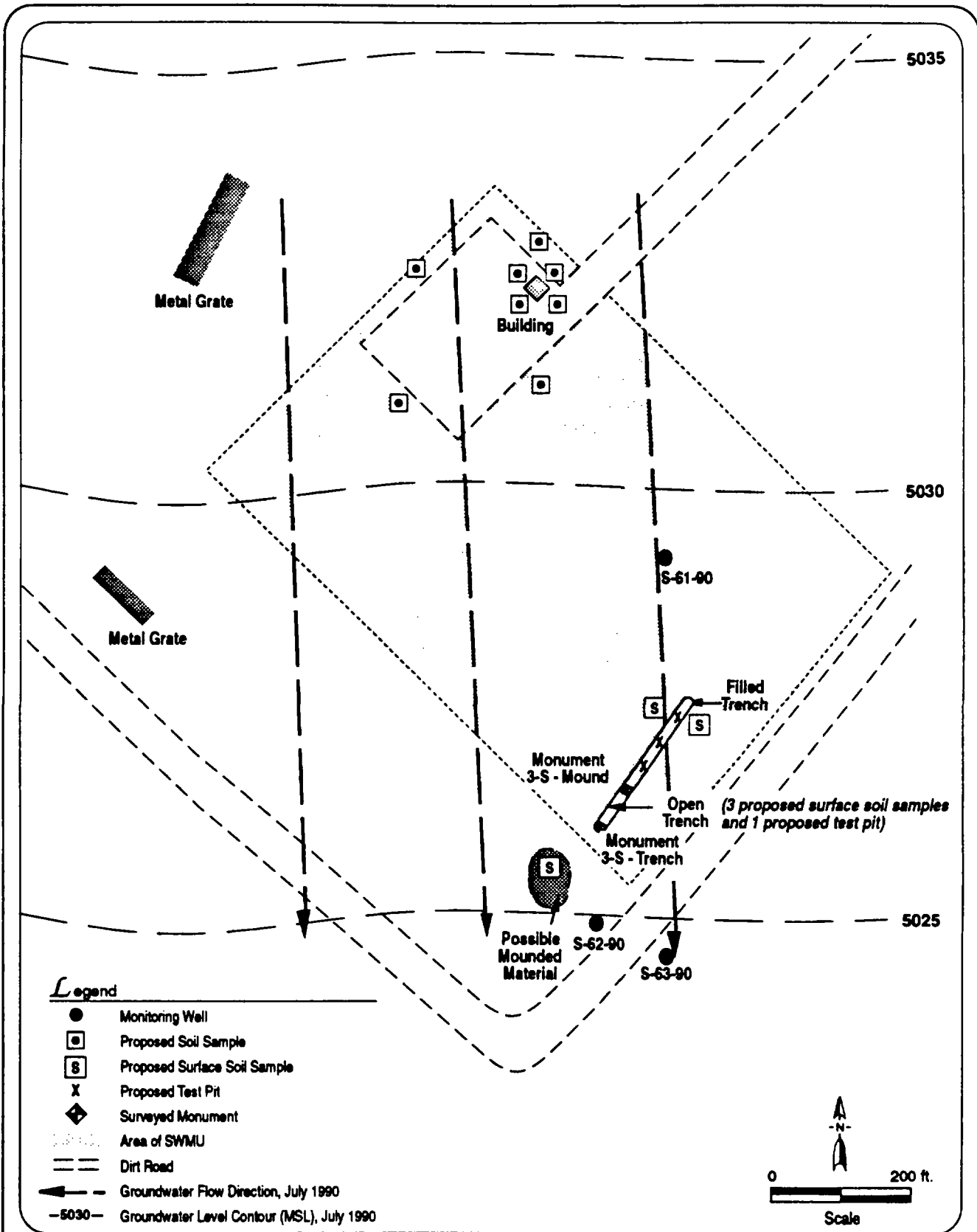
5.3.5 Recommendations

Since the RFI-Phase I groundwater samples for explosives analysis missed the holding time, these data should be replaced in Phase II. Annual groundwater monitoring for organics, explosives, agent breakdown products, anions, and metals is recommended at SWMU 3 while a potential for contaminant release remains. In addition, the four soil borings scheduled to be drilled in the trench during Phase I should be replaced by four test pits (Figures 5.3-6). These test pits should be excavated in the open and closed portions of the trench, with a total of 12 soil samples collected from the test pits. At least one soil sample should be collected per pit located according to evidence of contamination. Six surficial soil samples should also be collected in and around the open and closed portions of the trench with the sample locations selected based on evidence of contamination. The contents of the test pits should be inventoried during the excavation to identify potential contaminants.

In addition, a total of eight soil borings should be drilled around the building. These borings should be drilled to a depth of 3 ft and sampled from the 0- to 6-inch and 2- to 3-ft intervals. The test pit and building soil samples should be analyzed for organics, explosives, metals, and agent breakdown products. Also, a representative number of samples from each area should be analyzed for total organic carbon, pH, and electrical conductance.

No other potentially contaminated areas at this SWMU are evident. An in-depth review of the Installation Assessment (USATHAMA 1979) and other historical documents indicates that the reported VX spill at this site probably occurred in the southeast corner of SWMU 9 rather than at SWMU 3.

If the inventory of trench contents indicates a potential for exposure to hazardous wastes, or if soil sampling results indicate contamination, a vegetation survey should be conducted to identify habitats in and near the trench. Game species that could be consumed by humans should also be identified. Biota sampling in this area should be considered after review of the soil sampling results. An explosive risk determination will also be performed at this SWMU.



Source:
 EBASCO Field Measurement
 Basic Information Maps 1985
 EPIC 1982

Figure 5.3-6
SWMU 3 - Disposal Pit (Southeast of Area 2)
Proposed Sampling Locations

Tooele Army Depot - South Area
 Prepared by: Ebasco Services Incorporated