

5.20 SWMU 30: CAMDS LANDFILL

5.20.1 Site Description and Waste Generation

SWMU 30 is located in the southwestern portion of TEAD-S, south of known release SWMU 13 (CAMDS) (Figure 5.20-1). Three trenches were used from 1956 to the early 1970s for wood burning and dunnage disposal (USAEHA 1986). The landfill currently receives road renovation wastes such as soil, asphalt, and PVC pipe. The waste is placed in discrete piles 4 to 5 ft high that when combined cover an area approximately 500 by 500 ft.

SWMU 30 is visible in aerial photographs from 1959 and 1966 as a large linear ground scar containing three trenches. The ground scar was designated site 10 by EPIC (1986). Adjacent tracks forming a vehicle turnaround were also noted next to the site. By 1981, mounds of material, probably the road renovation wastes, had been dumped in a low area east of the SWMU 30 trenches (site 11) (EPIC 1986). CAMDS was constructed just to the north of SWMU 30 by 1979 (Weston 1991). Construction material and soil were the only visible wastes in this area during the initial RFI-Phase I visit.

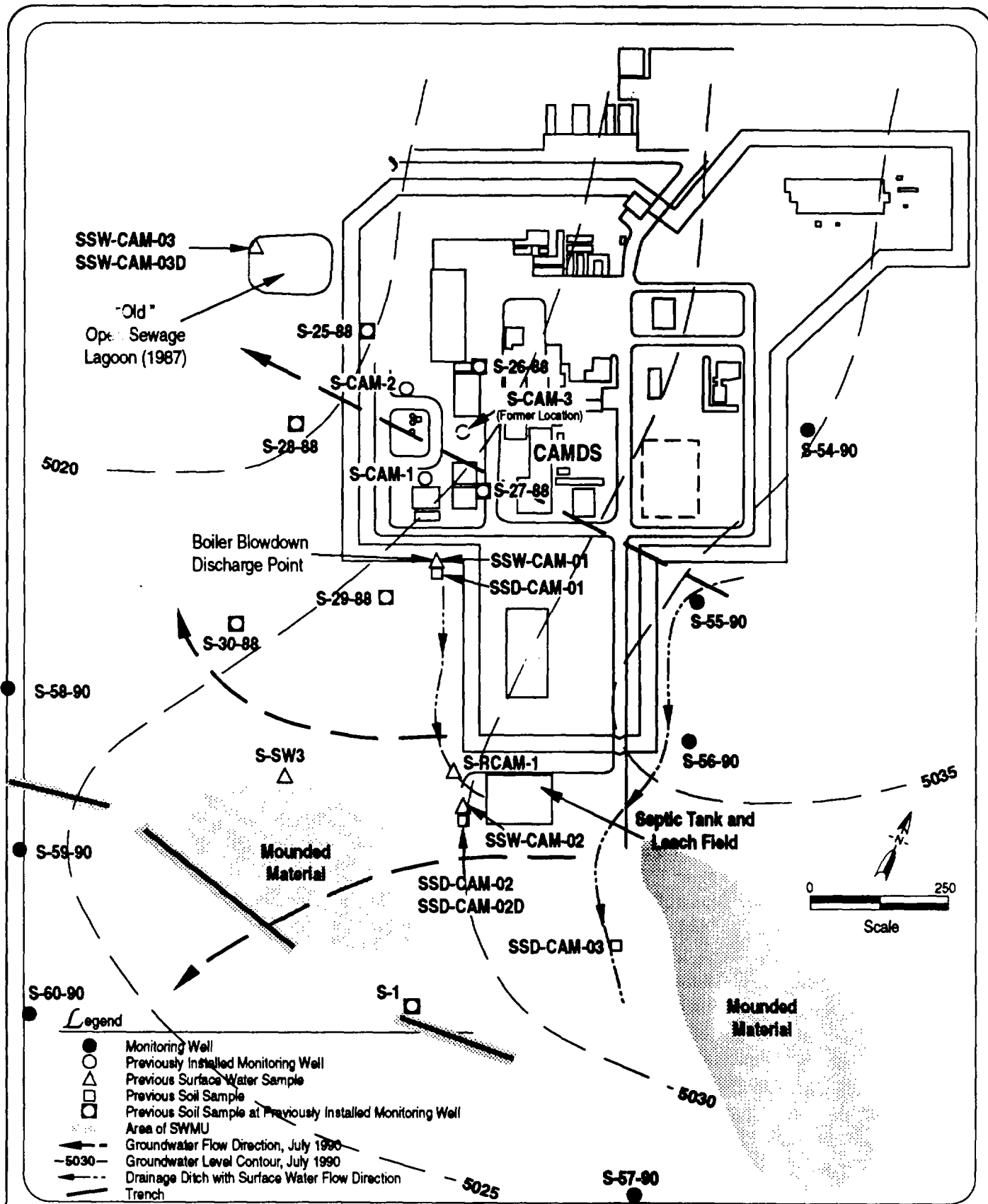
Contaminant sources related to CAMDS may overlap with the area of SWMU 30. Weston (1991) listed four sources of contamination at the CAMDS. The first was an open pit in the southwest corner of CAMDS that received sewage effluent from saturation of the leach field. Second was the boiler blowdown discharge and life-support compressor cooling water in the southwestern portion of the plant. The discharge water flows into a ditch that ends outside the southern perimeter of CAMDS. The third source was soil contaminated by a diesel fuel spill in January 1983. The fourth source was soil contaminated by miscellaneous spills (sodium hydroxide, potassium dichromate, and petroleum hydrocarbons).

5.20.2 Site Hydrogeology

The surface topography at SWMU 30 slopes very slightly to the southwest. This SWMU is near the valley center within 15 ft of the elevation of Faust Creek. To the east of the site, the ground abruptly rises about 25 ft. The area west and northwest of SWMU 30 has flooded when Faust Creek discharge was high because the stream is dammed by the railroad embankments that meet in the northwest part of TEAD-S (Weston 1991).

SWMU 30 is underlain by Quaternary alluvial deposits. Subsurface lithologic descriptions are from field boring logs (Appendix A) of each monitoring well in the area (S-CAM-1, S-CAM-2, S-1, S-25-88, S-26-88, S-27-88, S-28-88, S-29-88, S-30-88, S-54-90, S-55-90, S-56-90, S-57-90, S-58-90, S-59-90, S-60-90), and from sieve analyses of representative samples from these borings.

The surface soil at this SWMU is composed primarily of loose to stiff, light brownish gray to brown, organic rich (e.g., roots and rootlets), sandy silt and silty clay (ML, CL). Clayey gravels, silty gravels, and silty sands (GC, GM, SM) are found near the surface in the western part of



Legend

- Monitoring Well
- Previously Installed Monitoring Well
- △ Previous Surface Water Sample
- Previous Soil Sample
- ◻ Previous Soil Sample at Previously Installed Monitoring Well
- ⋯ Area of SWMU
- Groundwater Flow Direction, July 1990
- 5030- Groundwater Level Contour, July 1990
- - - Drainage Ditch with Surface Water Flow Direction
- Trench

Source:
 EA Engineering, Science, and Technology, Inc. 1988
 EPIC 1986
 Weston 1991
 Donohue 1990

Figure 5.20-1
Site Map
SWMU 13 - CAMDS
(Known Release SWMU) and
SWMU 30 - CAMDS Landfill
 Tooele Army Depot - South Area
 Prepared by: Ebasco Services Incorporated

CAMDS and southwest of the facility (S-28-88, S-29-88, S-30-88, S-59-90). Gravelly clays (CL) are common southeast of CAMDS (S-55-90, S-56-90).

The unsaturated zone in the southern part of CAMDS and at SWMU 30 (S-27-88, S-29-88, S-30-88, S-56-90, S-57-90, S-60-90) consists of interbedded sands and silts. To the north, the unsaturated zone consists of silts and clays. The thickness of this zone varies from 5 to 35 ft across the SWMU. Sands and silts are slightly moist, medium dense, light brownish-gray to dark gray with some gravel (SM, SP, ML). The sands are generally overlain by gravels. Silts and clays are hard, light olive-gray with some sand (ML, CL).

The saturated zone at SWMU 30, from about 10 to 49 ft, is composed of loose to dense, light gray to dark grayish brown, silty and gravelly sand (SM, SP). The screened interval was 10 ft in wells S-1 (10.3 to 20.3 ft), S-25-88 (9.5 to 19.5 ft), S-26-88 (9.4 to 19.4 ft), S-27-88 (approximately 10 to 20 ft), S-28-88 (5 to 15 ft), S-29-88 (6 to 16 ft), S-30-88 (6.4 to 16.4 ft), S-54-90 (17.5 to 27.5 ft), S-55-90 (8 to 18 ft), S-56-90 (39 to 49 ft), S-57-90 (7 to 17 ft), S-58-90 (4 to 14 ft), S-59-90 (5 to 15 ft), and S-60-90 (7 to 17 ft). Screened intervals of wells S-CAM-1 and S-CAM-2 are 5.6 to 21.6 ft and 5.5 to 23.5 ft, respectively. During the RFI-Phase I, seven monitoring wells were installed at SWMU 30; four on the east side in upgradient positions (S-54-90, S-55-90, S-56-90, S-57-90), and three on the west side in downgradient positions (S-58-90, S-59-90, S-60-90). All other monitoring wells in the area were installed prior to the RFI-Phase I.

The depth to groundwater in July 1990 ranged from 16 ft below ground surface at well S-56-90 southeast of the facility, to 5 ft below ground surface at wells S-59-90 and S-60-90 southwest of the facility. Groundwater elevations varied from 5,034 ft msl at wells S-54-90, S-5-90, and S-56-90 on the east side of the facility to 5,026 ft msl at well S-CAM-2 at CAMDS. The hydraulic gradient is fairly flat. Groundwater flows west toward wells S-58-90, S-59-90, and S-60-90 or south toward wells S-1 and S-57-90.

5.20.3 Previous Sampling and RFI-Phase I Sampling Results

Previous to the RFI-Phase I, sediment, surface water, and groundwater samples were collected near SWMU 30 to investigate known releases SWMU 13 - CAMDS. These samples were analyzed for volatile and semivolatile organics, explosives, agent breakdown products, total petroleum hydrocarbons, anions, and radionuclides. Sediment samples were collected from three locations along the drainage east of CAMDS. One surface water sample was collected from standing water southeast of CAMDS, and three surface water samples were collected along the drainage from the boiler blowdown discharge. Groundwater samples were collected from nine monitoring wells in the CAMDS area. One of these wells, S-1, is located in the vicinity of the CAMDS Landfill (SWMU 30).

During the RFI-Phase I, seven monitoring wells were installed to better evaluate possible groundwater contamination resulting from disposal and burning in the SWMU 30 CAMDS landfill. Monitoring wells S-54-90 and S-55-90 were intended to be upgradient of SWMU 30

but these wells appear to be upgradient of CAMDS, and may not reflect background conditions for SWMU 30.

Sixteen monitoring wells at SWMUs 13 and 30 were sampled during the RFI-Phase I for a full suite of analytes presented in Table 3.10-3, Section 3.10.10. Tables 5.20-1 and 5.20-2 illustrate previous and RFI-Phase I detections in SWMU 30 area wells. Monitoring well locations and detected compounds are shown in Figures 5.20-2 through 5.20-7 for those wells associated with the evaluation of SWMU 30 only. Results for wells associated with CAMDS SWMU 13 are presented with other data collected during the RFI-Phase I in Appendix F. No soil samples were collected from the SWMU 30 area during the RFI-Phase I.

5.20.4 Contamination Assessment

RFI-Phase I detections of organic compounds in groundwater included some low levels of chlorinated solvents and fuel related organics in one upgradient and two downgradient wells. An agent breakdown product, IMPA, was detected once in well S-1 but not during RFI-Phase I analysis, which used a more sensitive analytical method. These compounds may be related to disposal and burning in the SWMU 30 trenches, since waste burns may have been assisted by adding fuels and solvents. Chloroform is also a potential decontamination product of GB stabilizer DIPC, VX, VX stabilizer DIPC, and HD. These contaminants may also have migrated from CAMDS through groundwater or surface water into the SWMU 30 area. In this area of relatively flat water table, groundwater flow directions may vary with changes in local recharge. Ditches that bring surface water from CAMDS into SWMU 30 are other possible contaminant migration pathways, especially considering previous detections of petroleum hydrocarbons in surface water samples from the boiler blowdown ditch. Explosives have also been detected both in the CAMDS boiler blowdown ditch and in upgradient and downgradient SWMU 30 wells S-56-90 and S-1, although the detections in each sample were different explosives. A methylene chloride detection in well S-54-90 was a low concentration that probably represents laboratory contamination of the sample.

All wells at SWMU 30 are included in groundwater quality zone II. A wide range of concentrations for inorganic analytes is typical of zone II. Several inorganic analytes were detected at elevated concentrations in wells S-54-90, S-55-90, and S-56-90, which are upgradient of CAMDS and the SWMU 30 landfill. Inorganic analytes detected at elevated levels in this upgradient area include antimony, lead, mercury, selenium, sodium, zinc, bromide, chloride, gross alpha radioactivity, and uranium. A similar, but smaller suite of analytes was detected in downgradient wells S-57-90, S-58-90, S-59-90, and S-60-90 at comparable or lower concentrations. Arsenic was detected at elevated levels in the eastern part of the SWMU 30 area in wells S-1, S-56-90, and S-57-90.

TABLE 5.20-1

Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill

Analytical Groups and Analytes Detected	SOIL ($\mu\text{g/g}$)				SOIL ($\mu\text{g/l}$)			
	SSD CAM-01 1988	SSD CAM-02 1988	SSD CAM-02D 1988	SSD CAM-03 1988	S-1*			
					5-6.5 ft 1982	10-11.2 ft 1982	15-15.7 ft 1982	20.2-21.2 ft 1982
Volatile Organics:					NA	NA	NA	NA
Unknowns ^c	0.92							
Semivolatile Organics:								
Diethyl phthalate (DEP)	LT (0.30)	LT (0.30)	LT (0.30)	LT (0.30)	20 (25)	20 (25)	LT (25)	10 (25)
Unknowns ^c		130	18	84				
Metals:	NA	NA	NA	NA				
Arsenic (As)					30 (4.0)	30 (4.0)	40 (4.0)	100 (4.0)
Nickel (Ni)					9.0 (4.0)	LT (4.0)	LT (4.0)	LT (4.0)
Sodium (Na)					20,000 (1000)	50,000 (1000)	40,000 (1000)	50,000 (1000)
Zinc (Zn)					7.0 (3.0)	20 (3.0)	5.0 (3.0)	8.0 (3.0)

* Soil leach concentrations

c The identity of concentrations of these compounds cannot be conclusively determined and reporting limits have not been established.

() Detection limit

NA Not analyzed

LT Less than
 $\mu\text{g/g}$ microgram per gram
 $\mu\text{g/l}$ microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

TABLE 5.20-1

Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill

Analytical Groups and Analytes Detected	SOIL (µg/g)				SOIL (µg/l)			
	SSD CAM-01 1988	SSD CAM-02 1988	SSD CAM-02D 1988	SSD CAM-03 1988	S-1*			
					5-6.5 ft 1982	10-11.2 ft 1982	15-15.7 ft 1982	20.2-21.2 ft 1982
Anions:								
Bromide (Br)	LT (2500)	LT (2500)	LT (2500)	LT (2500)	NA	NA	NA	NA
Chloride (Cl)	LT (2500)	LT (2500)	LT (2500)	LT (2500)	GT 20,000 (1000)	GT 20,000 (1000)	GT 20,000 (1000)	GT 20,000 (1000)
Fluoride (F)	35 (5.0)	77 (5.0)	37 (5.0)	25 (5.0)	LT (1000)	LT (1000)	LT (1000)	1000 (1000)
Sulfate (SO ₄)	LT (13000)	LT (13000)	LT (13000)	LT (13000)	GT 20,000 (1000)	20,000 (1000)	20,000 (1000)	20,000 (1000)
Nitrite (NO ₂)					LT (u)	LT (u)	LT (u)	LT (u)
Nitrate (NO ₃)					LT (1000)	LT (1000)	LT (1000)	LT (1000)
Nitrate-nonspecific (NIT)	LT (9600)	LT (9600)	LT (9600)	LT (9600)				
Radionuclides (pCi/g):								
	LT (v)	LT (v)	LT (v)	LT (v)	LT (u)	LT (u)	LT (u)	LT (u)
Petroleum Hydrocarbons:								
	13000 (1000)	12000 (1000)	2100 (1000)	18 ^d (1000)	NA	NA	NA	NA

5-211

- * Soil leach concentrations
- d Value less than detection limit reported as found 1988 data - Weston 1989
- u Detection limit unavailable
- v Detection limit for radionuclides varies for each sample
- () Detection limit

- NA Not analyzed
- GT Greater than
- LT Less than
- pCi/g Picocurie per gram
- µg/g microgram per gram
- µg/l microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

GROUNDWATER (µg/l)

Analytical Groups and Analytes Detected	S-1		
	1982	1987	1988
Volatile Organics:			NA
Unknowns ^c	0.92		
Semivolatile Organics:			
Bis (2-ethylhexyl) phthalate (B2EHP)	NA	3.0 ^a (3.0)	LT (10)
Unknowns ^c			10
Agent Breakdown Products:			
Isopropylmethyl phosphonic Acid (IMPA)	NA	NA	16 (4.7)
Explosives:			
2,6-Dinitrotoluene (26DNT)	LT(u)	21 (5.7)	LT (0.55)
Metals:			
Arsenic (As)	100 (4.0)	260 (2.5)	330/320 (5.0)
Barium (Ba)	NA	32 (3.4)	NA

- a Probably due to laboratory contamination
- c The identity of concentrations of these compounds cannot be conclusively determined and reporting limits have not been established.
- u Detection limit unavailable
- () Detection limit

- NA Not analyzed
- LT Less than µg/l
- microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

S-212

GROUNDWATER (µg/l)

Analytical Groups and Analytes Detected	S-1		
	1982	1987	1988
<i>Metals (cont'd):</i>			
Beryllium (Be)	LT (0.40)	LT (0.83)	0.50/LT (0.10)
Cadmium (Cd)	LT(u)	12 (11)	LT (5.1)
Copper (Cu)	LT (6.0)	LT (21)	11/15 (1.8)
Cyanides-Total (TCYN)	12 (6.0)	LT(u)	NA
Lead (Pb)	LT (30)	47 (1.5)	12/LT (2.5)
Nickel (Ni)	LT (4.0)	LT (65)	12/LT (9.6)
Silver (Ag)	LT(u)	0.22 (.014)	LT (0.20)
Sodium (Na)	160,000 (1000)	380,000 (450)	NA
Zinc (Zn)	LT (3.0)	LT (14)	35/96 (17)
<i>Anions:</i>			
Bromide (Br)	NA	630 (240)	130 (50)
Chloride (Cl)	GT 17,000(100)	350,000 (5000)	380,000 (75)
Fluoride (F)	1,400(1000)	2,700 (360)	960 (50)

u Detection limit unavailable
 () Detection limit
 NA Not analyzed
 GT Greater than
 LT Less than
 µg/l Microgram per liter

References: 1982 data - Ertec 1982
 1987 data - EA Engineering 1988
 1988 data - Weston 1991

5-213

TABLE 5.20-1

Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill

GROUNDWATER (µg/l)

Analytical Groups and Analytes Detected	S-1		
	1982	1987	1988
Anions:			
Orthophosphate (PO ₄ ORT)	NA	190 (57)	NA
Sulfate (SO ₄)	GT 19,000(1000)	620,000 (4700)	140,000 (130000)
Nitrite (NO ₂)	LT (900)		
Nitrate (NO ₃)	3,100(1000)		
Nitrate-nonspecific (NIT)		190 (+24)	LT (5000)
Radionuclides (pCi/l):			
Gross alpha (ALPHAG)	LT (3.0)	20+11 (u)	15+9.0 (v)
Gross beta (BETAG)	28±4 (6.0)	25+11 (u)	26+7.0 (v)
Uranium (Total)	NA	NA	13 (v)
Petroleum Hydrocarbons:	NA	NA	1000

S-214

- u Detection limit unavailable
- v Detection limit for radionuclides varies for each sample
- () Detection limit
- NA Not analyzed
- GT Greater than
- LT Less than
- pCi/l Picocurie per liter
- µg/l Microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

TABLE 5.20-1

**Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill**

SURFACE WATER ($\mu\text{g/l}$)

Analytical Groups and Analytes Detected	S-RCAM-1 1987	S-SW3 1982	SSW-CAM-01 1988	SSW-CAM-02 1988
<i>Volatile Organics:</i>				
Benzene (C6H6)	LT (3.0)	LT (2.0)	LT (0.67)	LT (0.67)
Carbon tetrachloride (CCL4)	LT (0.80)	NA	LT (5.0)	LT (5.0)
Ethylbenzene (ETC6H5)	LT (3.0)	NA	LT (5.0)	LT (5.0)
Trichloroethene (TRCLE)	LT (1.9)	LT (3.0)	LT (0.71)	LT (0.71)
Unknowns			6.0	
<i>Semivolatile Organics:</i>				
Acenaphthene (ANAPNE)	LT (10)	NA	LT (10)	LT (10)
Anthracene (ANTRC)	LT (4.0)	NA	LT (10)	LT (10)
Bis (2-ethylhexyl) phthalate (B2EHP)	2.0 ^a (3.0)	NA	LT (10)	LT (10)
Dibenzofuran (DBZFUR)	LT (u)	NA	LT (10)	LT (10)
Diethyl phthalate (DEP)	LT (u)	LT (u)	LT (10)	LT (10)
Di-n-butyl phthalate (DNBP)	LT (u)	NA	LT (10)	LT (10)
Fluorene (FLRENE)	LT (10)	NA	LT (10)	LT (10)
Naphthalene (NAP)	LT (10)	LT (2.0)	LT (10)	LT (10)
Phenanthrene (PHANTR)	LT (3.0)	NA	LT (10)	LT (10)

- a Probably due to laboratory contamination
 c The identity of concentrations of these compounds cannot be conclusively determined and reporting limits have not been established.
 u Detection limit unavailable

() Detection limit
 NA Not analyzed
 LT Less than
 $\mu\text{g/l}$ Microgram per liter

References: 1982 data - Ertec 1982
 1987 data - EA Engineering 1988
 1988 data - Weston 1991

S-215

TABLE 5.20-1

Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill

SURFACE WATER (µg/l)

Analytical Groups and Analytes Detected	S-RCAM-1 1987	S-SW3 1982	SSW-CAM-01 1988	SSW-CAM-02 1988
Semivolatile Organics: (cont'd):				
2-Methylnaphthalene	LT (u)	NA	LT (10)	LT (10)
Unknowns ^c			10	220
Agent Breakdown Products:				
Isopropylmethyl phosphonic Acid (IMPA)	NA	NA	NA	NA
Explosives:				
Nitramine (TETRYL)	5.6 (4.4)	LT (2.0)	LT (0.66)	LT (0.66)
2,6-Dinitrotoluene (26DNT)	LT 5.7	LT (u)	LT (0.55)	LT (0.55)
2,4,6-Trinitrotoluene (246TNT)	LT (6.3)	LT (1.0)	LT (0.78)	LT (0.78)
2,4-Dinitrotoluene (24DNT)	LT (2.2)	LT (u)	LT (0.60)	LT (0.60)
1,3,5-Trinitrobenzene (135TNB)	LT (5.8)	NA	4.3 (0.56)	LT (2.7)
Metals:				
Antimony (Sb)	LT (7.0)	NA	NA	NA
Arsenic (As)	13 (2.5)	LT (4.0)		

5-216

- c The identity of concentrations of these compounds cannot be conclusively determined and reporting limits have not been established.
- u Detection limit unavailable

- NA Not analyzed
- LT Less than
- () Detection limit
- µg/l Microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

TABLE 5.20-1

Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill

SURFACE WATER (µg/l)

Analytical Groups and Analytes Detected	S-RCAM-1 1987	S-SW3 1982	SSW-CAM-01 1988	SSW-CAM-02 1988
Metals: (continued)			NA	NA
Barium (Ba)	49 (3.4)	NA		
Beryllium (Be)	LT (0.83)	LT (0.40)		
Cadmium (Cd)	LT (12)	LT (u)		
Chromium (Cr)	11 (11)	LT (20)		
Copper (Cu)	25 (21)	23 (6.0)		
Lead (Pb)	19 (1.5)	LT (30)		
Mercury (Hg)	LT (1.1)	LT (u)		
Nickel (Ni)	LT (65)	LT (4.0)		
Selenium (Se)	LT (u)	NA		
Silver (Ag)	0.22 (0.14)	LT (u)		
Sodium (Na)	120,000 (450)	220,000 (1000)		
Thallium (Tl)	LT (1.7)	NA		
Zinc (Zn)	47 (14)	60 (3.0)		

5-217

u Detection limit unavailable
() Detection limit
NA Not analyzed
LT Less than
µg/l Microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

TABLE 5.20-1

Summary of Previous Analytical Investigations for
SWMU 30: CAMDS Landfill

SURFACE WATER (µg/l)

Analytical Groups and Analytes Detected	S-RCAM-1 1987	S-SW3 1982	SSW-CAM-01 1988	SSW-CAM-02 1988
Anions:				
Bromide (Br)	LT (240)	NA	NA	NA
Chloride (Cl)	74,000 (5000)	GT 16700 (100)	NA	NA
Fluoride (F)	LT (360)	LT (10000)	NA	NA
Orthophosphate (PO ₄ ORT)	3300 (57)	NA	NA	NA
Phosphate (PO ₄)	NA	9000 (800)	NA	NA
Sulfate (SO ₄)	54,000 (4700)	GT 18500 (1000)	LT (130000)	LT (130000)
Nitrite (NO ₂)		LT (900)		
Nitrate (NO ₃)		11700 (1000)		
Nitrate-nonspecific (NIT)	840 (+24)		LT (5000)	LT (5000)
Radionuclides (pCi/l):				
Gross alpha (ALPHA)	LT (u)	25±7.0 (3.0)	LT (v)	LT (v)
Petroleum Hydrocarbons:				
	NA	NA	7000 (200)	3900 (200)

5-218

- u Detection limit unavailable
- v Detection limit for radionuclides varies for each sample
- () Detection limit
- NA Not analyzed
- LT Less than
- pCi/l Picocurie per liter per liter
- µg/l Microgram per liter

References: 1982 data - Ertec 1982
1987 data - EA Engineering 1988
1988 data - Weston 1991

TABLE 5.20-2

**Summary of RFI-Phase I Investigations for
SWMU 30: CAMDS Landfill**

GROUNDWATER (µg/l)

Analytical Groups and Analytes Detected	S-1	S-54-90	S-55-90	S-56-90	S-57-90	S-58-90	S-59-90	S-60-90
Volatile Organics:								
1,1-Dichloroethane (11DCLE)	LT 1.1	LT 1.1	LT 1.1	2.0	LT 1.1	LT 1.1	LT 1.1	2.8
1,2-Dichloroethen (12DCE)	LT 1.1	LT 1.1	LT 1.1	1.9	LT 1.1	LT 1.1	LT 1.1	2.9
Benzene (C6H6)	LT 2.4	LT 2.4	LT 2.4	LT 2.4	LT 2.4	LT 2.4	LT 2.4	2.9
Chloroform (CHCL3)	LT 0.83	LT 0.83	LT 0.83	1.3	LT 0.83	LT 0.83	LT 0.83	2.0
Methylene chloride(CH2CL2)	LT 5.4	8.4	LT 5.4	LT 5.4	LT 5.4	LT 5.4	LT 5.4	LT 5.4
Unknowns					7.0		1200	77
Semivolatile Organics:								
1-Methylnaphthalene (1MNAP)	NA	NA	NA	NA	7.0	NA	NA	NA
Unknowns	6.0	130	14	25*	65	50*	70*	80*
Explosives:								
Hexahydro-1,3,5-trinitro-1,3,4-triazine (RDX)	LT 0.62	LT 0.62	LT 0.62	1.9	LT 0.62	LT 0.62	LT 0.62	LT 0.62
Metals:								
Antimony (Sb)	LT 38	140	LT 38	LT 38	110	LT 38	LT 38	LT 38
Arsenic (As)	180	15	32	220	260	38	48	59
Chromium (Cr)	LT 6.0	LT 6.0	LT 6.0	LT 6.0	LT 6.0	LT 6.0	LT 6.0	LT 6.0
Copper (Cu)	9.8	13	LT 8.1	LT 8.1	LT 8.1	LT 8.1	LT 8.1	LT 8.1
Lead (Pb)	5.3	LT 2.5	13	15	LT 2.5	LT 1.3	LT 1.3	3.6
Mercury (Hg)	LT 0.24	0.93	LT 0.24	0.35	LT 0.24	LT 0.24	LT 0.24	LT 0.24
Selenium (Se)	LT 3.0	34	190	LT 15	LT 30	9.9	LT 3.0	LT 3.0
Sodium (Na)	500,000	5,700,000	8,200,000	8,000,000	5,700,000	4,200,000	1,300,000	1,400,000

* Detected in associated method blank

NA Not analyzed

LT Less than

µg/l Microgram per liter

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

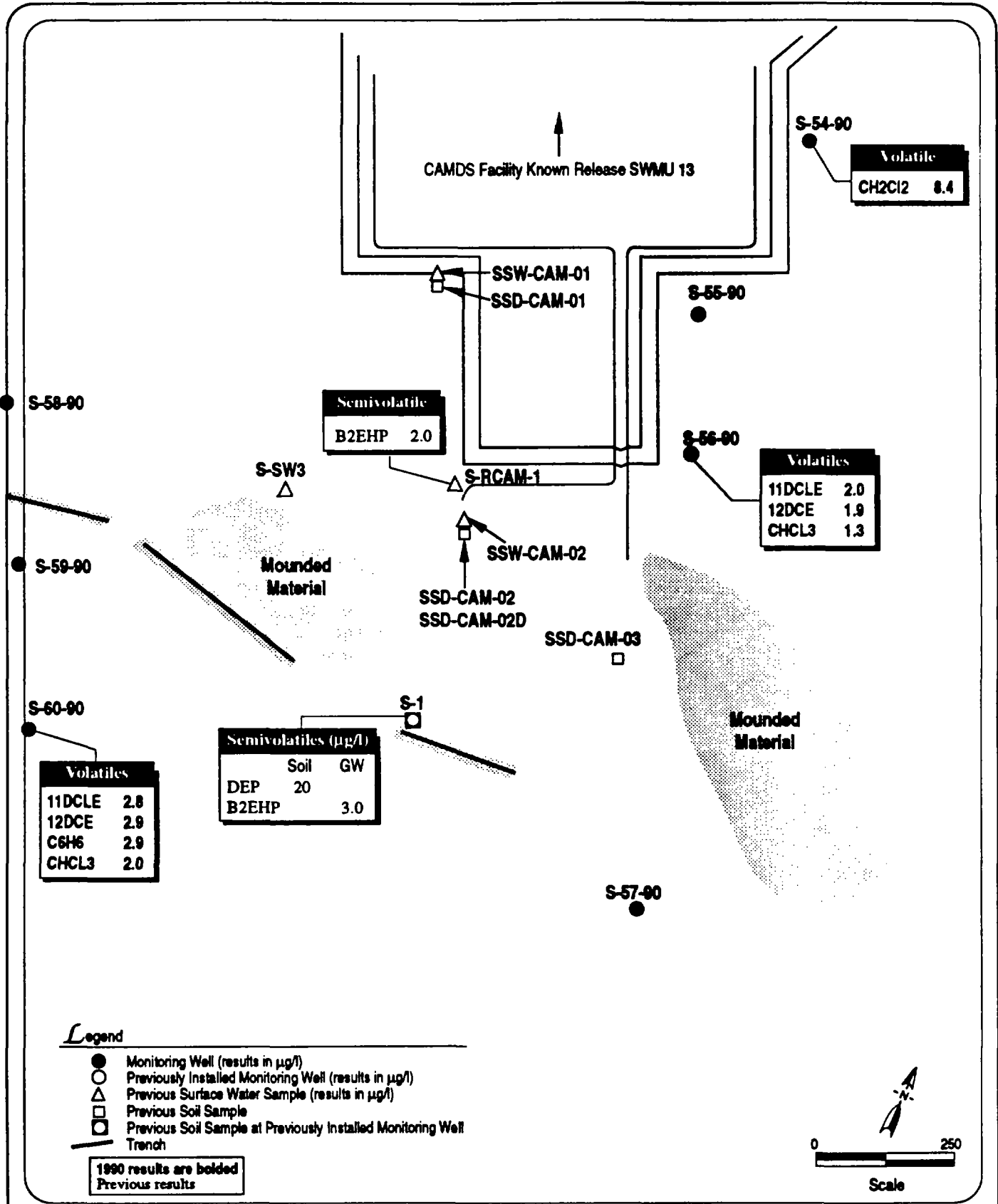
Analytical Groups and Analytes Detected	S-1	S-54-90	S-55-90	S-56-90	S-57-90	S-58-90	S-59-90	S-60-90
Anions:								
Bromide (Br)	200	8000	13000	18000	LT 10,000	4200	1700	1200
Chloride (Cl)	430,000	9,500,000	12,000,000	18,000,000	10,000,000	7,200,000	2,800,000	3,000,000
Fluoride (F)	3200	LT 360,000	LT 360,000	LT 360,000	LT 14,000	LT 14,000	LT 14,000	LT 14,000
Radionuclides (pCi/l):								
Gross Alpha (ALPHAG)	160	850	4700	1200	1500	650	160	310
Gross Beta (BETAG)	LT 0.30	LT 0.30	LT 0.30	LT 0.30	LT 0.30	220*	140*	0.5*
Uranium (U)	18	39	85	27	54	23	35	30

* Detected in associated method blank

LT Less than

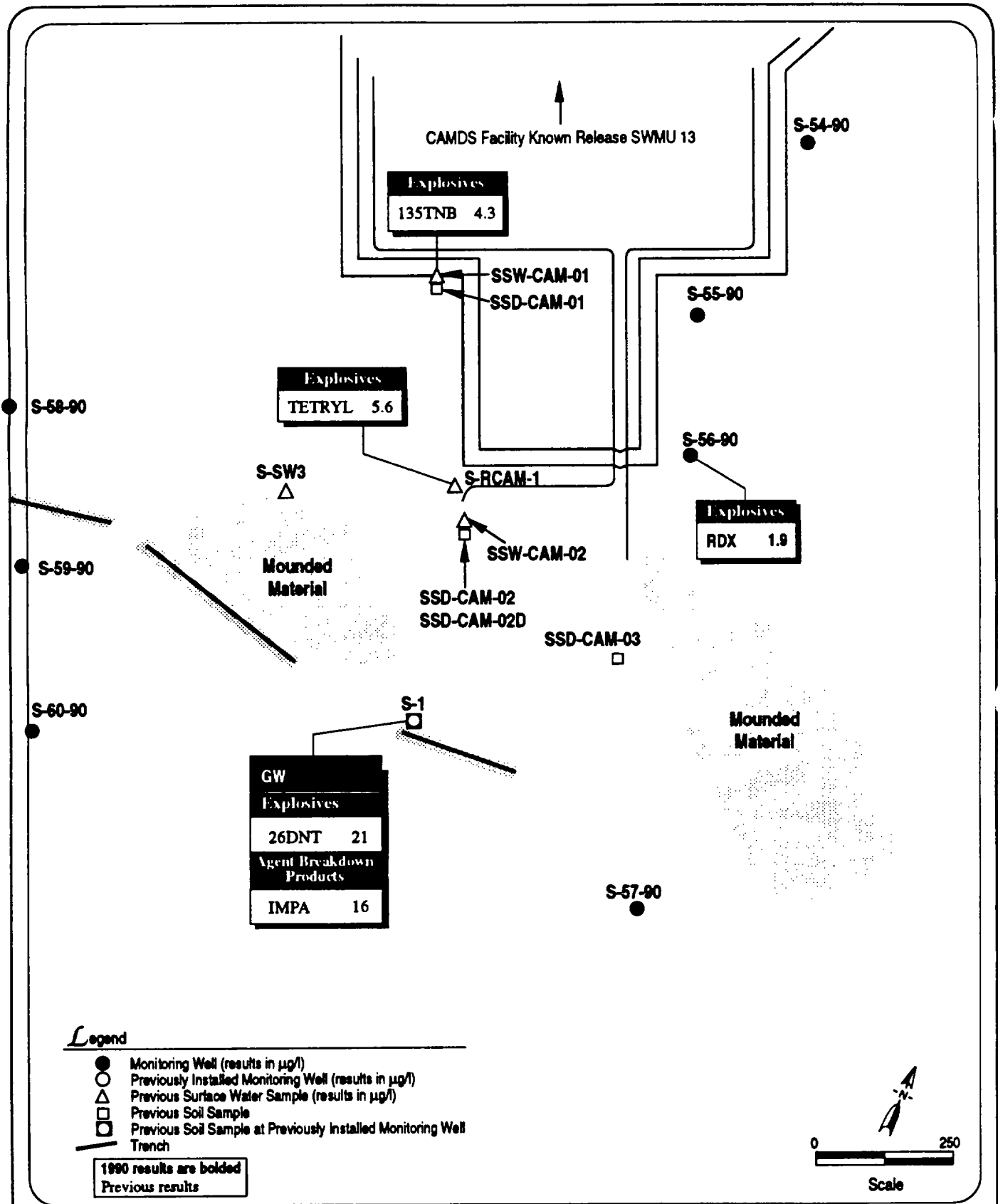
pCi/l Picocurie per liter

 $\mu\text{g/l}$ Microgram per liter



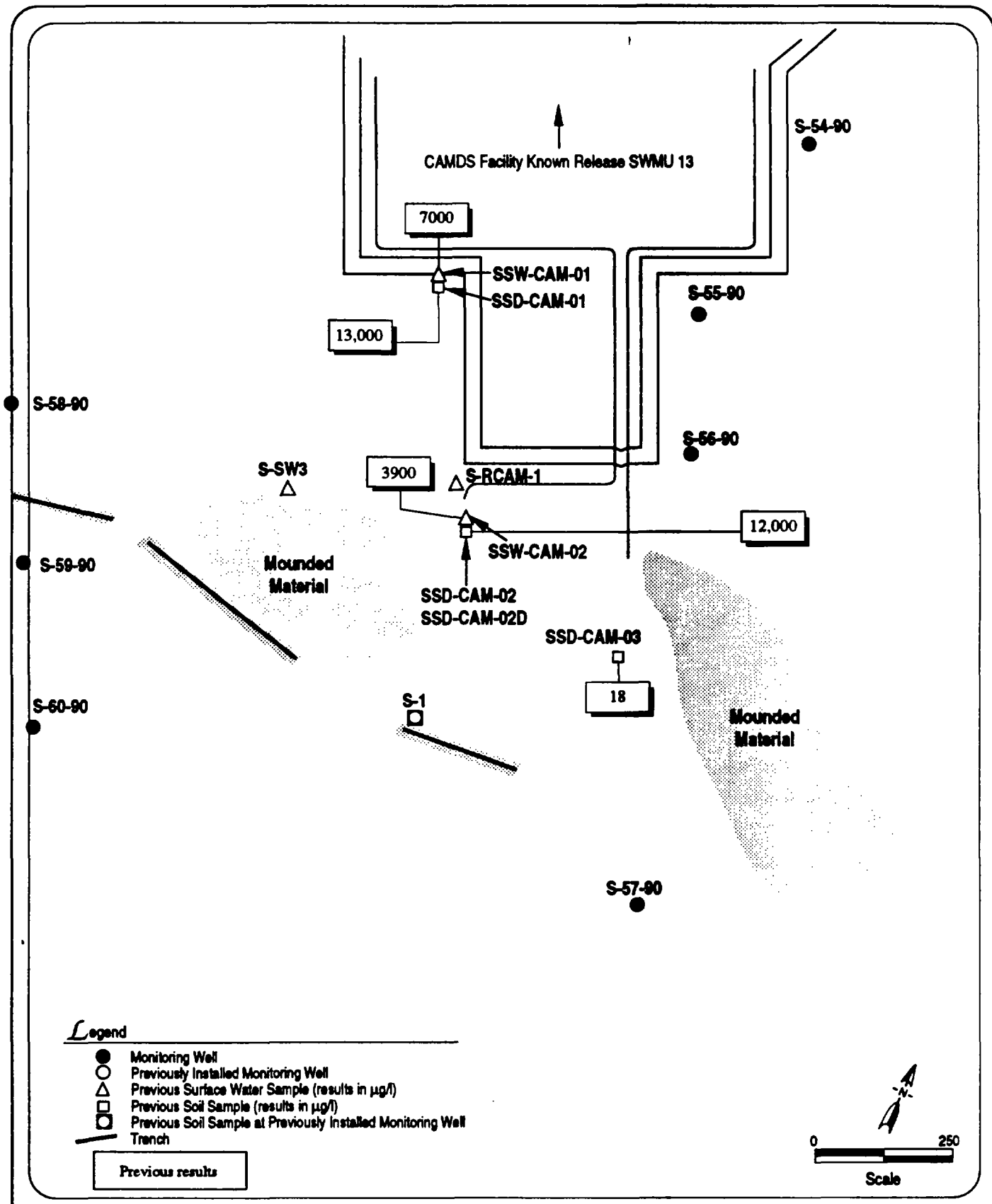
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Figure 5.20-2
SWMU 30 - CAMDS Landfill
Organics



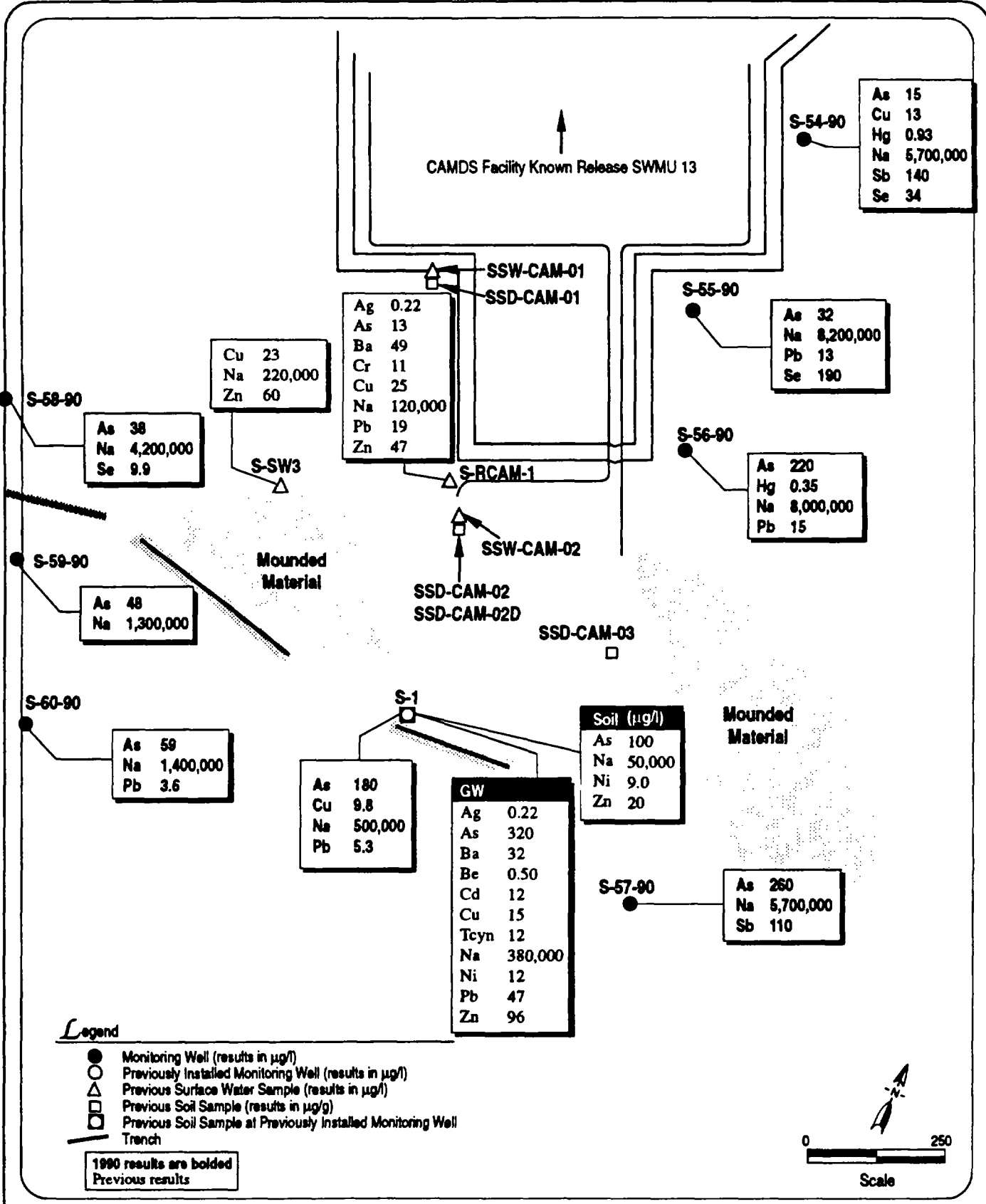
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Figure 5.20-3
SWMU 30 - CAMDS Landfill
Explosives and Agent Breakdown Products



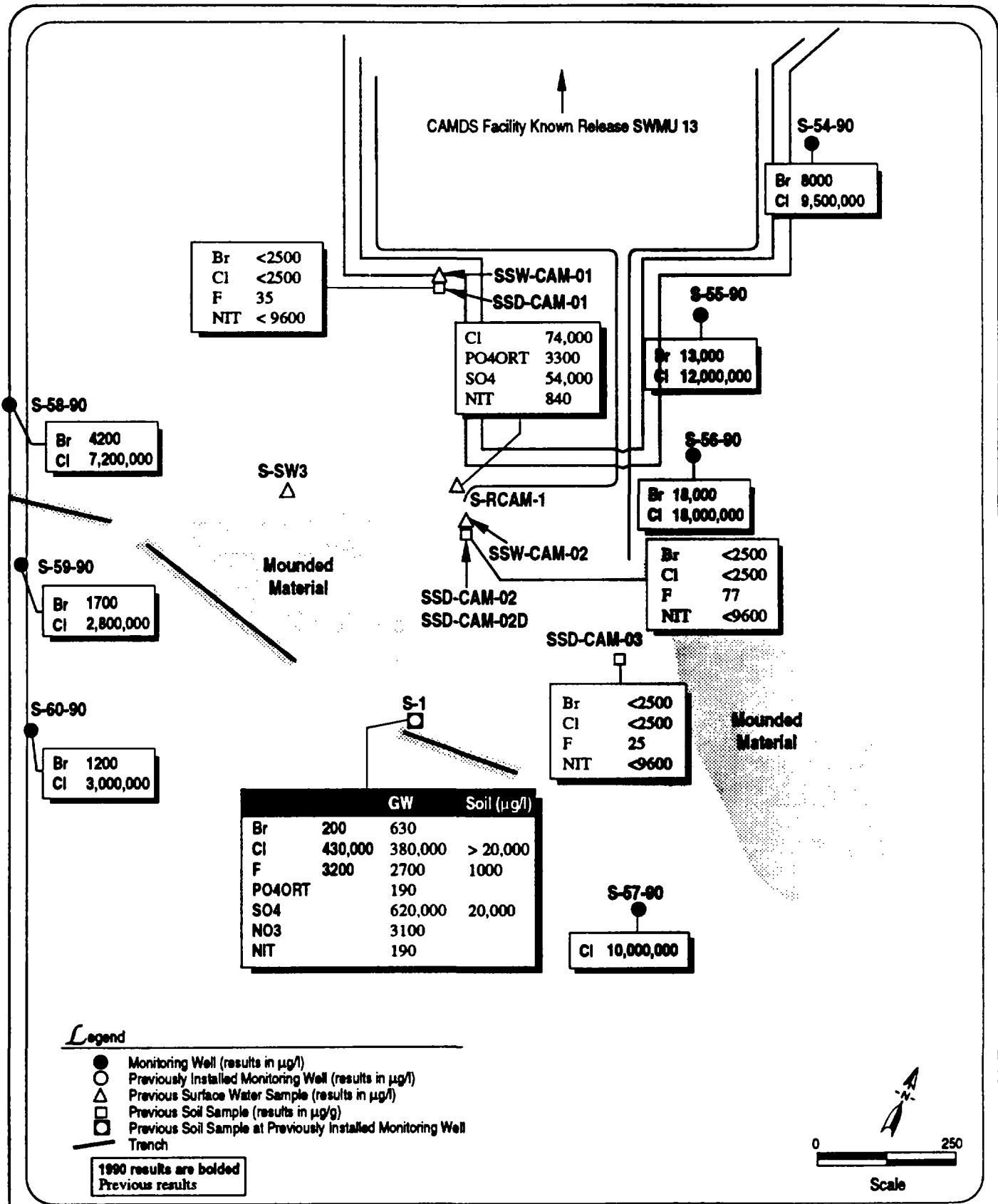
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Figure 5.20-4
SWMU 30 - CAMDS Landfill
Total Petroleum Hydrocarbons



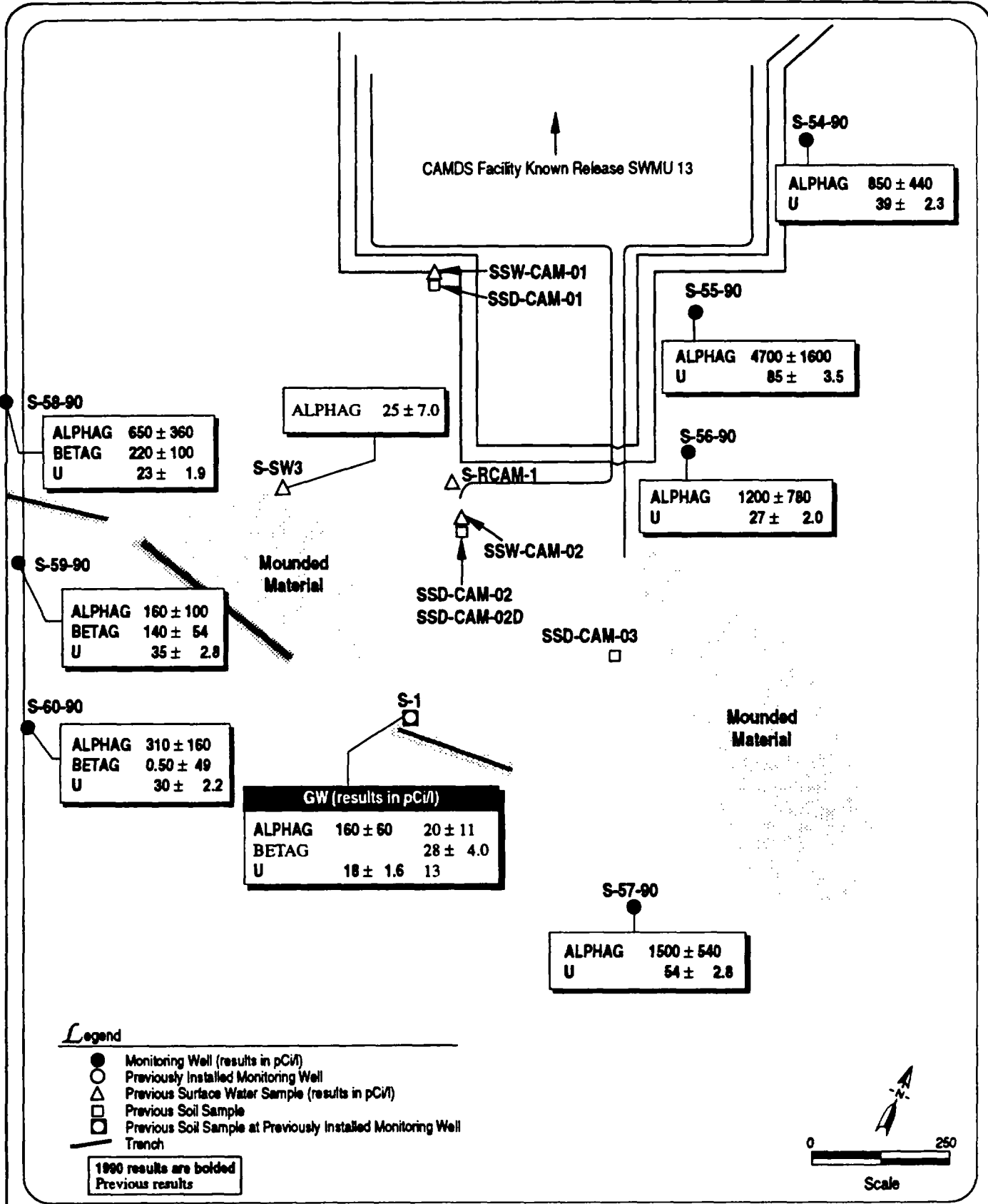
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Figure 5.20-5
SWMU 30 - CAMDS Landfill
Metals and Cyanide



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Figure 5.20-6
 SWMU 30 - CAMDS Landfill
 Anions



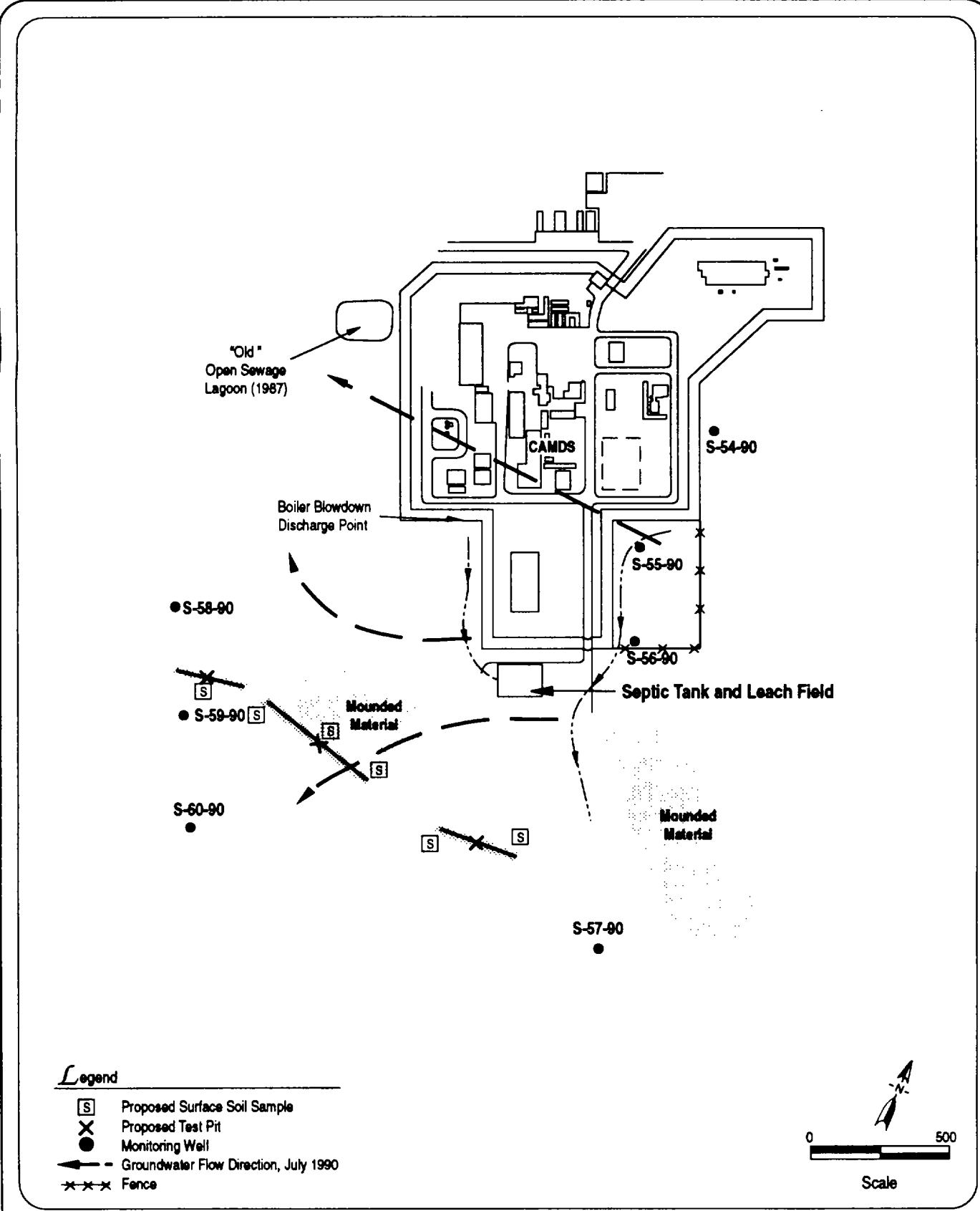
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Figure 5.20-7
SWMU 30 - CAMDS Landfill
Radionuclides

5.20.5 Recommendations

A Phase II program is recommended at SWMU 30. This program should include the use of geophysical techniques to locate the covered trenches. A test pit should then be excavated in each of the trenches to reveal the trench contents and allow sampling (Figure 5.20-8). Approximately three samples of the fill in each trench should be analyzed for volatile and semivolatile organics, PCBs, explosives, agent breakdown products, and metals. In addition, six surficial soil samples should be collected around the three trenches and analyzed for organics, PCBs, explosives, agent breakdown products, and metals. A representative number of the test pit and surficial soil samples should be analyzed for total organic carbon, pH, and electrical conductance. Until Phase II data can be evaluated, wells in this area should be resampled annually and analyzed for volatile organics to confirm whether the solvents detected in Phase I remain at very low concentrations. No deeper wells are recommended to delineate the vertical extent of contamination since detected levels of organic contaminants were too low to warrant deeper monitoring. Slug tests should also be performed in all the SWMU 30 Phase I wells.

An ecological survey should be conducted at SWMU 30 that, at a minimum, consists of vegetation and habitat mapping and identification of key species. If the results of soil sampling indicate contamination, biota sampling should be considered. An explosive risk determination should also be conducted at SWMU 30.



- Legend**
- S Proposed Surface Soil Sample
 - X Proposed Test Pit
 - Monitoring Well
 - Groundwater Flow Direction, July 1990
 - *** Fence

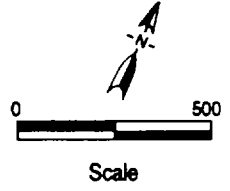


Figure 5.20-8
SWMU 30 - CAMDS Landfill
Proposed Sampling Locations
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