APPENDIX E

Summary of Previous Investigations

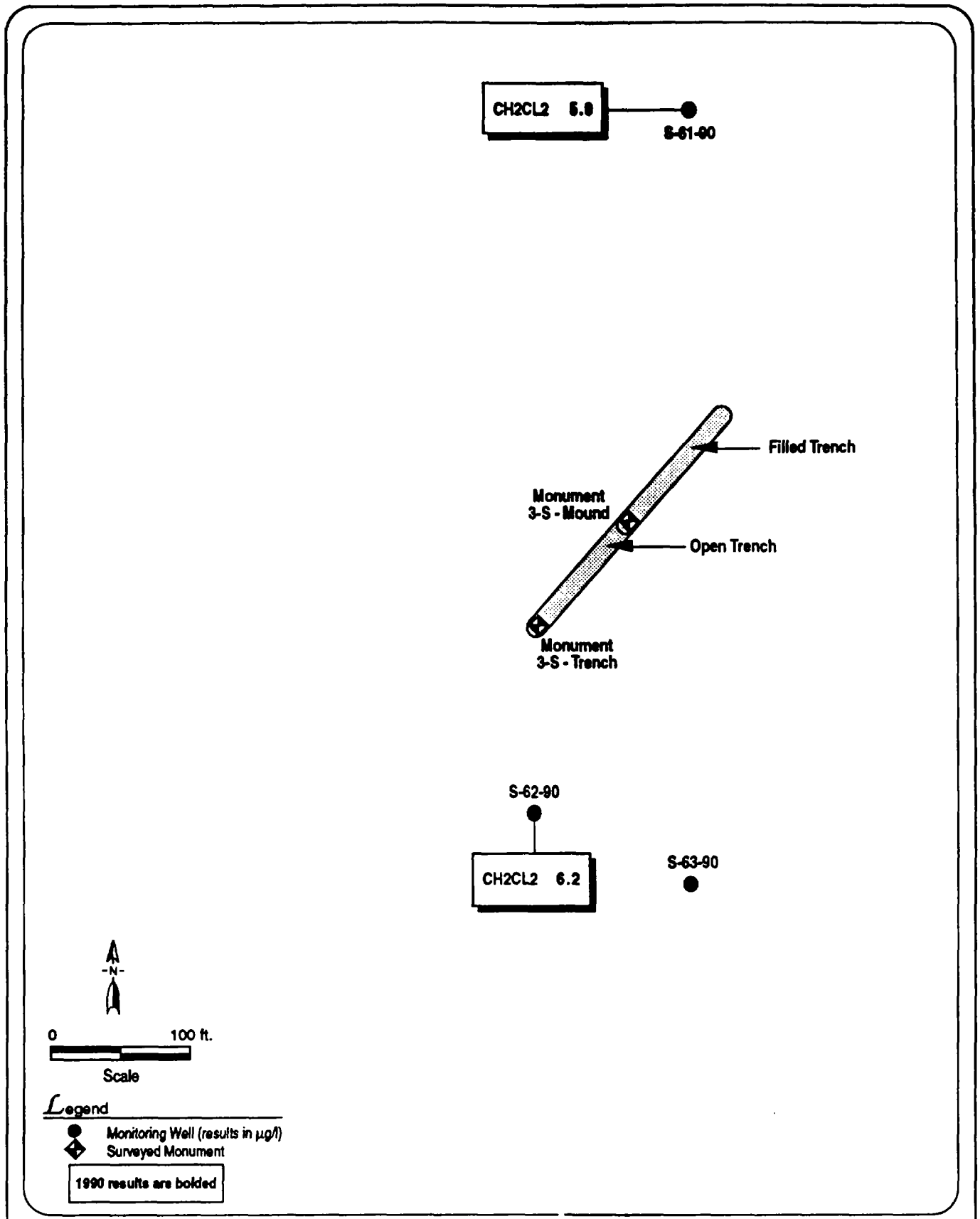
SUMMARY OF PREVIOUS INVESTIGATIONS

This summary of previous investigations is taken from the Tooele Task 2 DCQAP, Final Version, July 1993. For each SWMU the corresponding sampling histories and figures are presented from this text. All results of concern are illustrated in the figures presented for each SWMU.

Previous Sampling Results for SWMU 3

Before the RFI-Phase I, investigations at TEAD-S did not include collection of soil or groundwater samples at SWMU 3. 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 for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), explosives, agent breakdown products, metals, anions, and radiological parameters. Figures 3.3-2 through 3.3-5 show well locations, compounds detected in groundwater, and their concentrations.

During the RFI-Phase I, soil samples were originally to be collected from the open portion of the SWMU 3 trench. Because of the potential for agent contamination in this trench, Technical Escort Unit (TEU) personnel were required to collect these soil samples. These personnel were unavailable during the RFI-Phase I; therefore, the SWMU 3 soil samples were rescheduled to be collected during the RFI-Phase II program.



Tooele DCQAP 3.93.jb

Figure 3.3-2

SWMU 3 - Disposal Pit (Southeast of Area 2)
Volatile Organics

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

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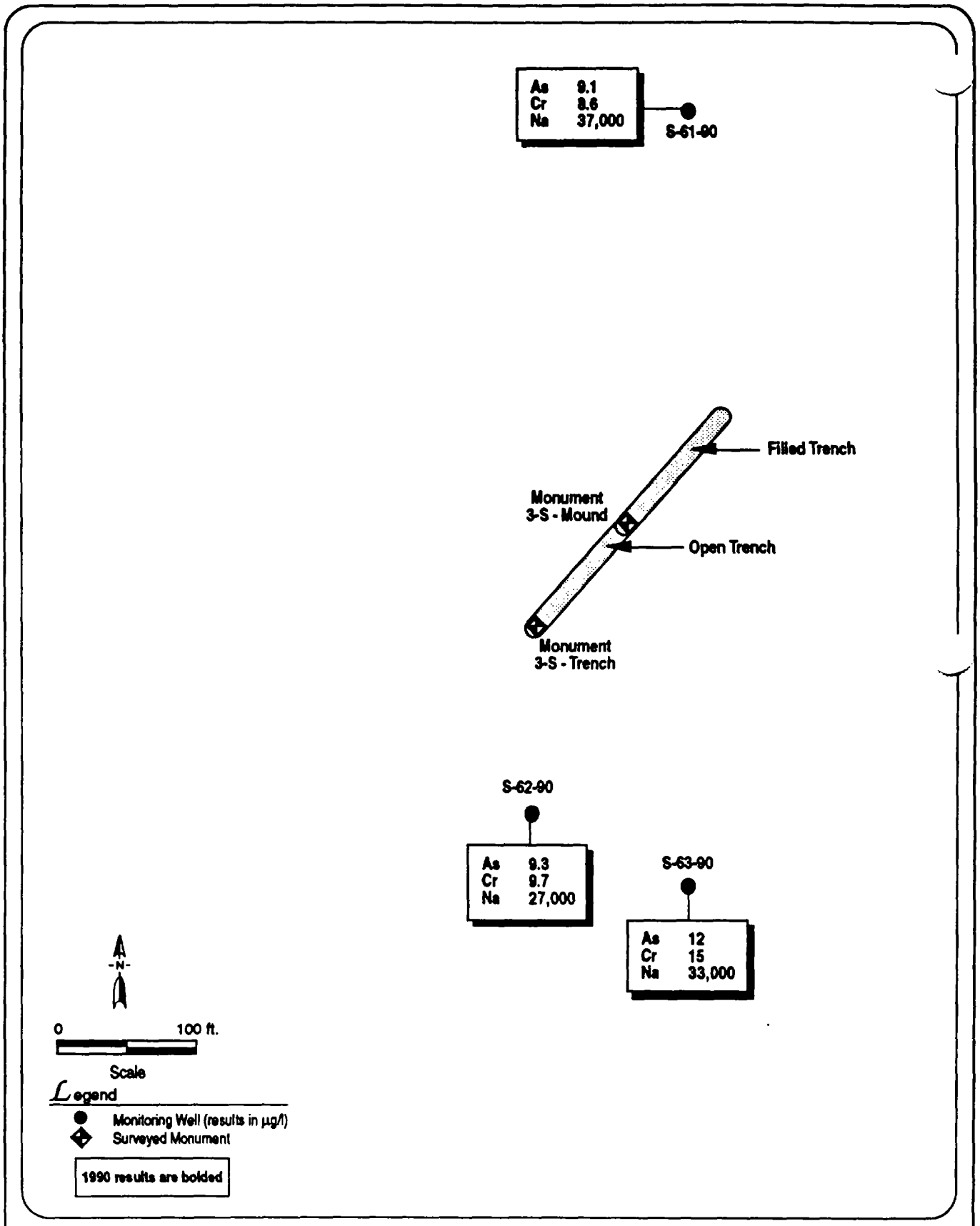
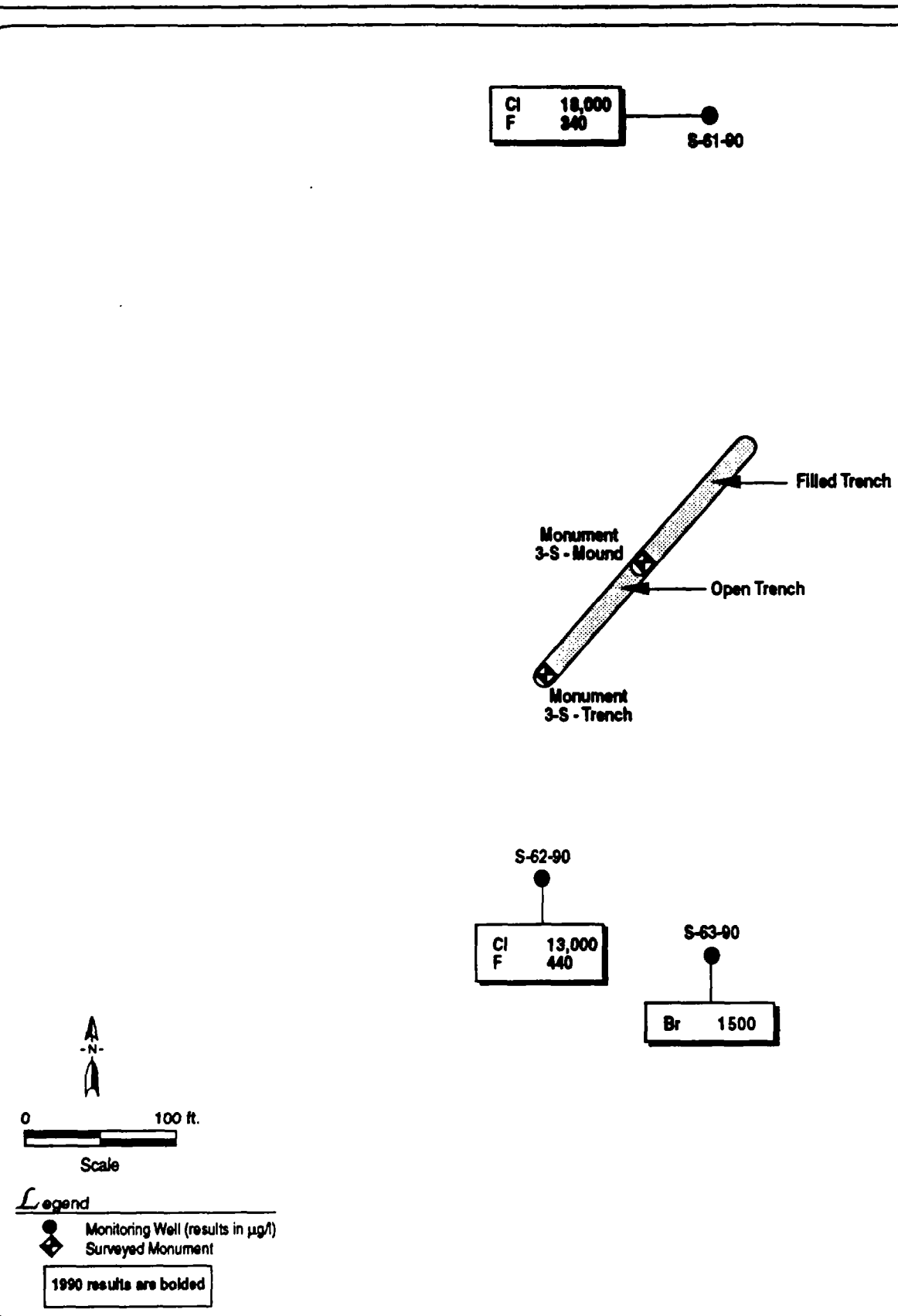


Tooele DCQAP 3.93.jb

Figure 3.3-3

SWMU 3 - Disposal Pit (Southeast of Area 2)
Metals

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



Tooele DCQAP 3.93.jb

Figure 3.3-4

SWMU 3 - Disposal Pit (Southeast of Area 2)

Anions

Tooele Army Depot - South Area
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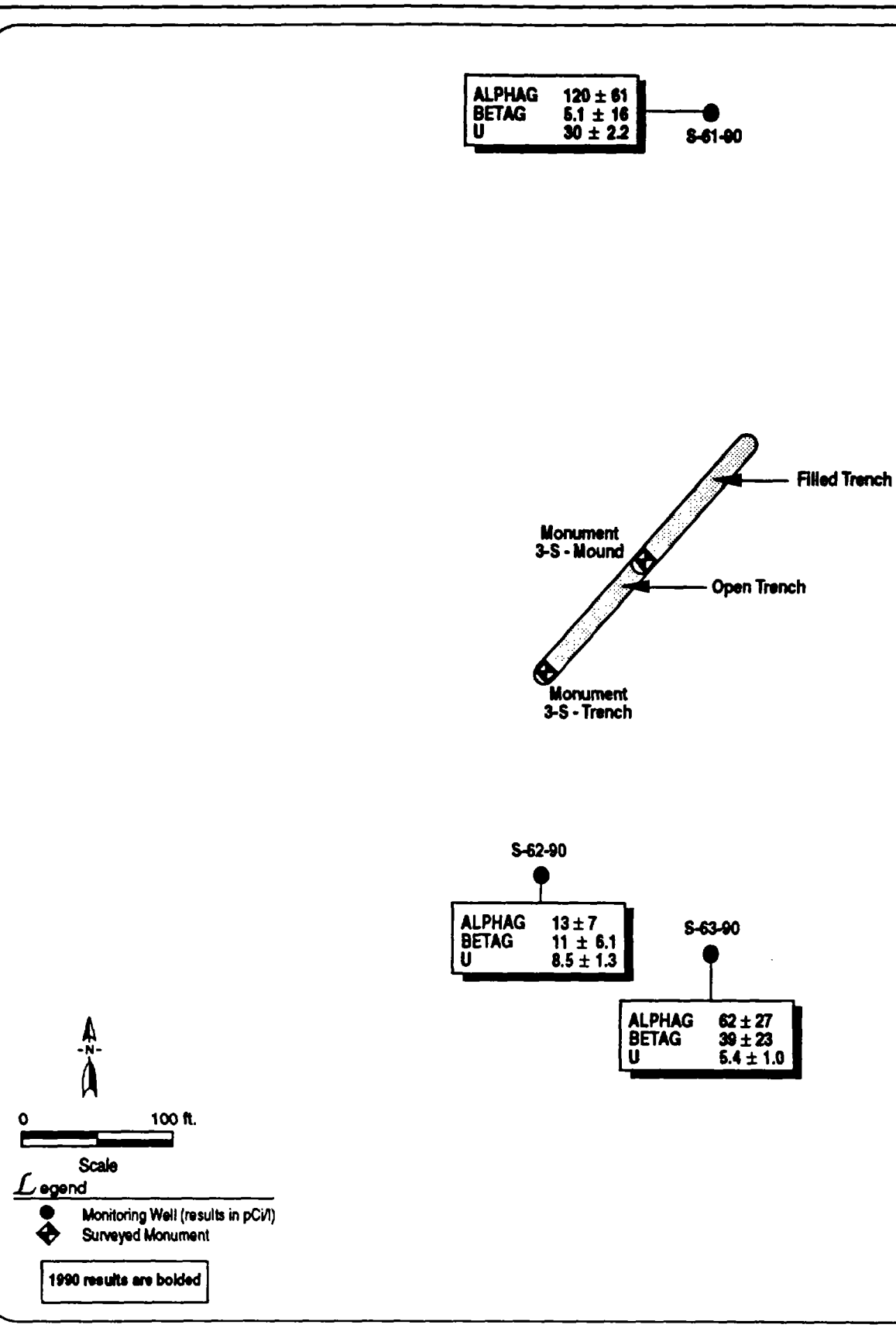

Tooele DCQAP 3.93.jb

Figure 3.3-5

SWMU 3 - Disposal Pit (Southeast of Area 2) Radionuclides

Tooele Army Depot - South Area
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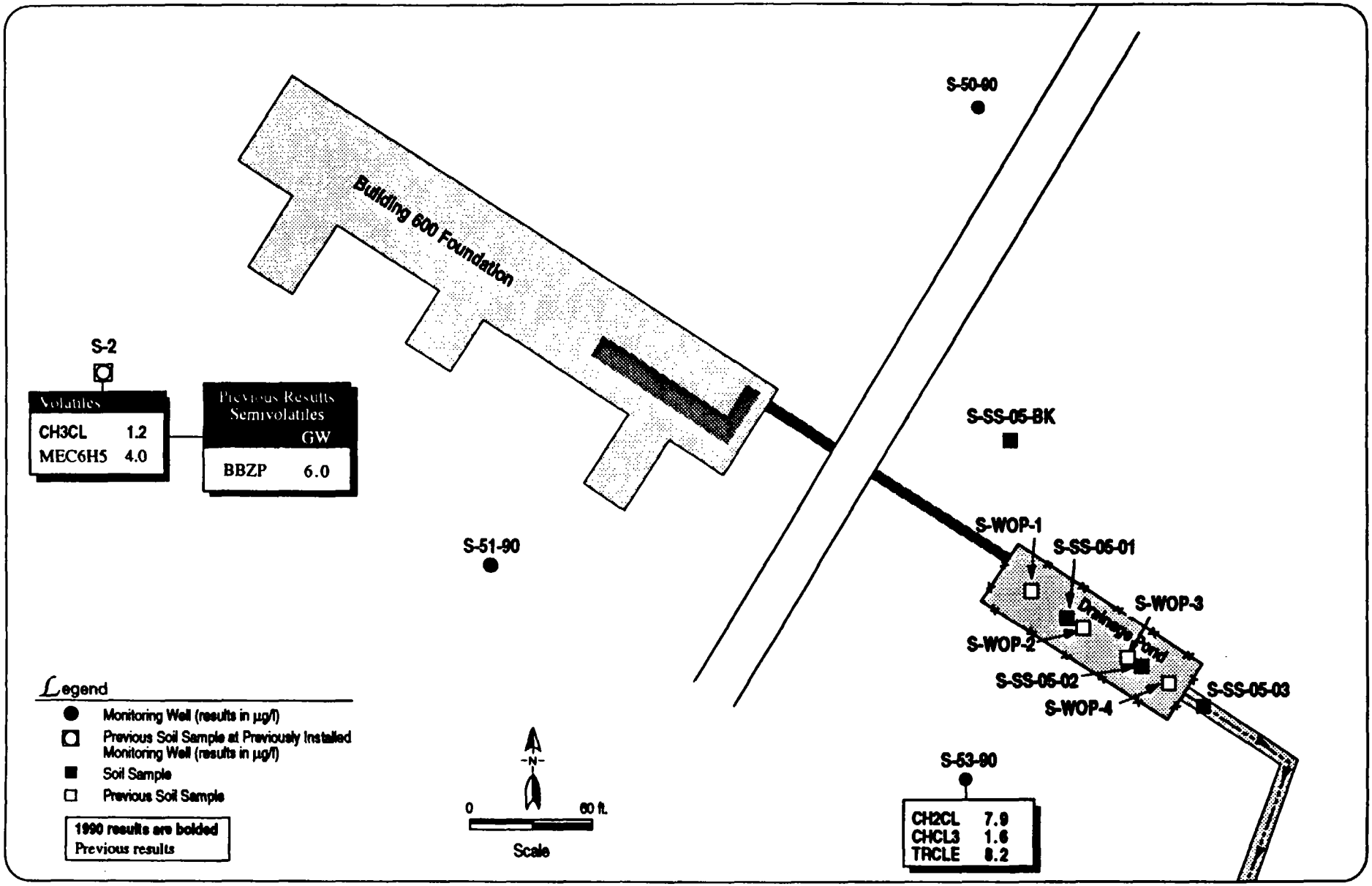
Previous Sampling Results for SWMU 5

Prior to the RFI, sampling at SWMU 5 consisted of groundwater sampling at well S-2, four soil samples collected from the drainage pond, and one soil sample collected during the installation of monitoring well S-2. Groundwater samples from monitoring well S-2 were analyzed for VOCs, SVOCs, agent breakdown products, explosives, metals, anions, and radiological parameters. Soil samples were analyzed for VOCs, SVOCs, metals, and anions.

The RFI-Phase I investigation of SWMU 5 included the collection of groundwater samples from well S-2 and the three new wells (S-50-90, S-51-90, and S-53-90). The close spacing (250 ft) of wells S-51-90 and S-53-90 eliminated the need for the originally planned well S-52-90. These groundwater samples were analyzed for VOCs, SVOCs, explosives, agent breakdown products, metals, anions, and radiological parameters. Four additional soil samples were also collected and analyzed for SVOCs, agent breakdown products, explosives, and metals to detect releases of chlorinated solvents, explosives, and thiodiglycol from the truck decontamination and munitions washout and painting activities. Two of the four soil samples were collected from the drainage pond, one was collected from the ditch, and one was collected from an area northwest of the drainage pond to provide background metal concentrations. Figures 3.3-8 through 3.3-11 illustrate the sampling locations and concentrations of analytes in the RFI-Phase I and previous investigations at SWMU 5.



Tooele DCQAP 3.93.jb

Figure 3.3-8

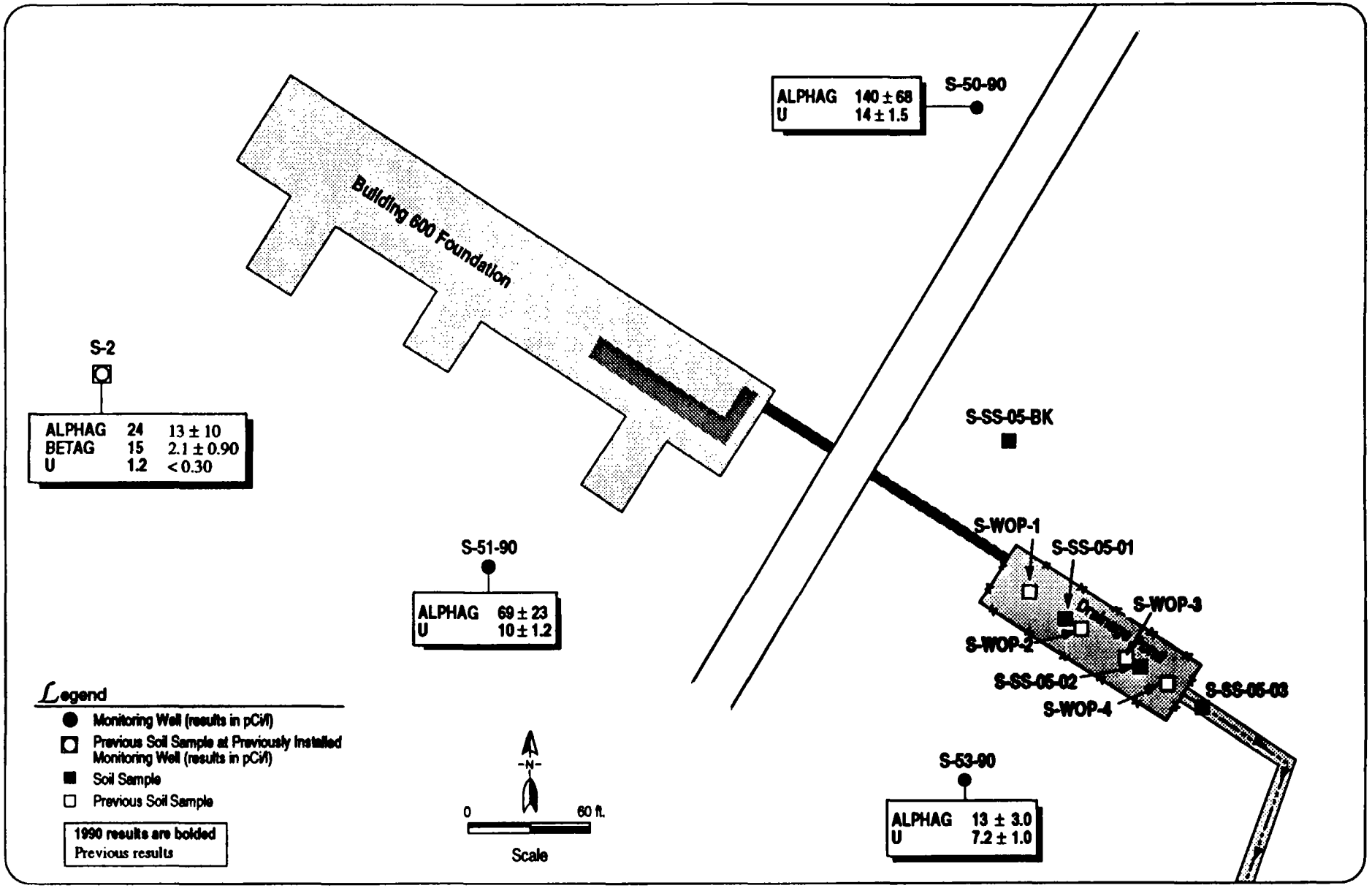
SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch

Organics

Tooele Army Depot - South Area

Prepared by: Ebasco Services Incorporated

EBASCO



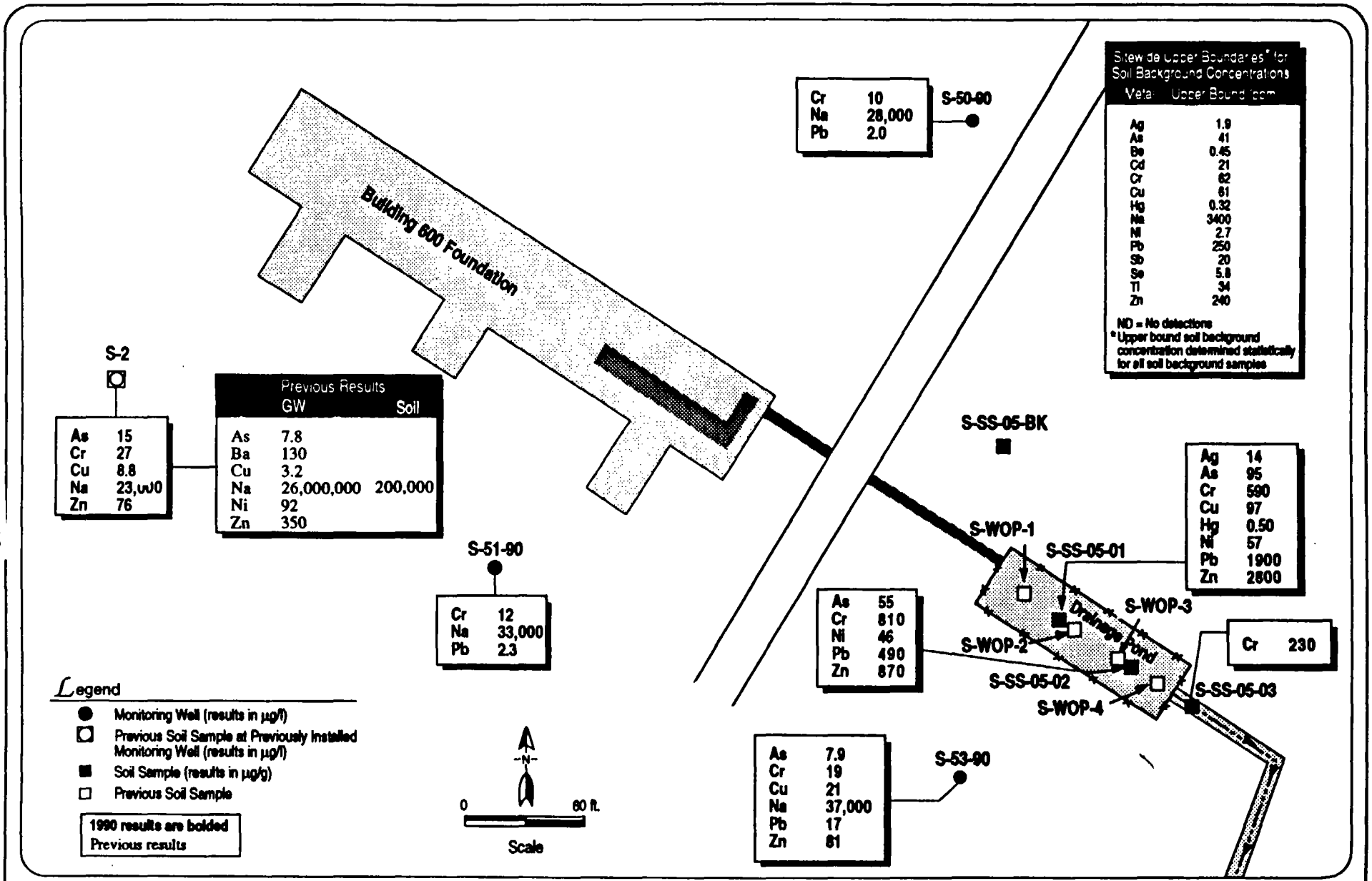
Tooele DCQAP 3.93.jb

Figure 3.3-9

SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch

Radionuclides

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



Tooele DCQAP 3.93.jb

Figure 3.3-10

SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch

Metals

Tooele Army Depot - South Ar
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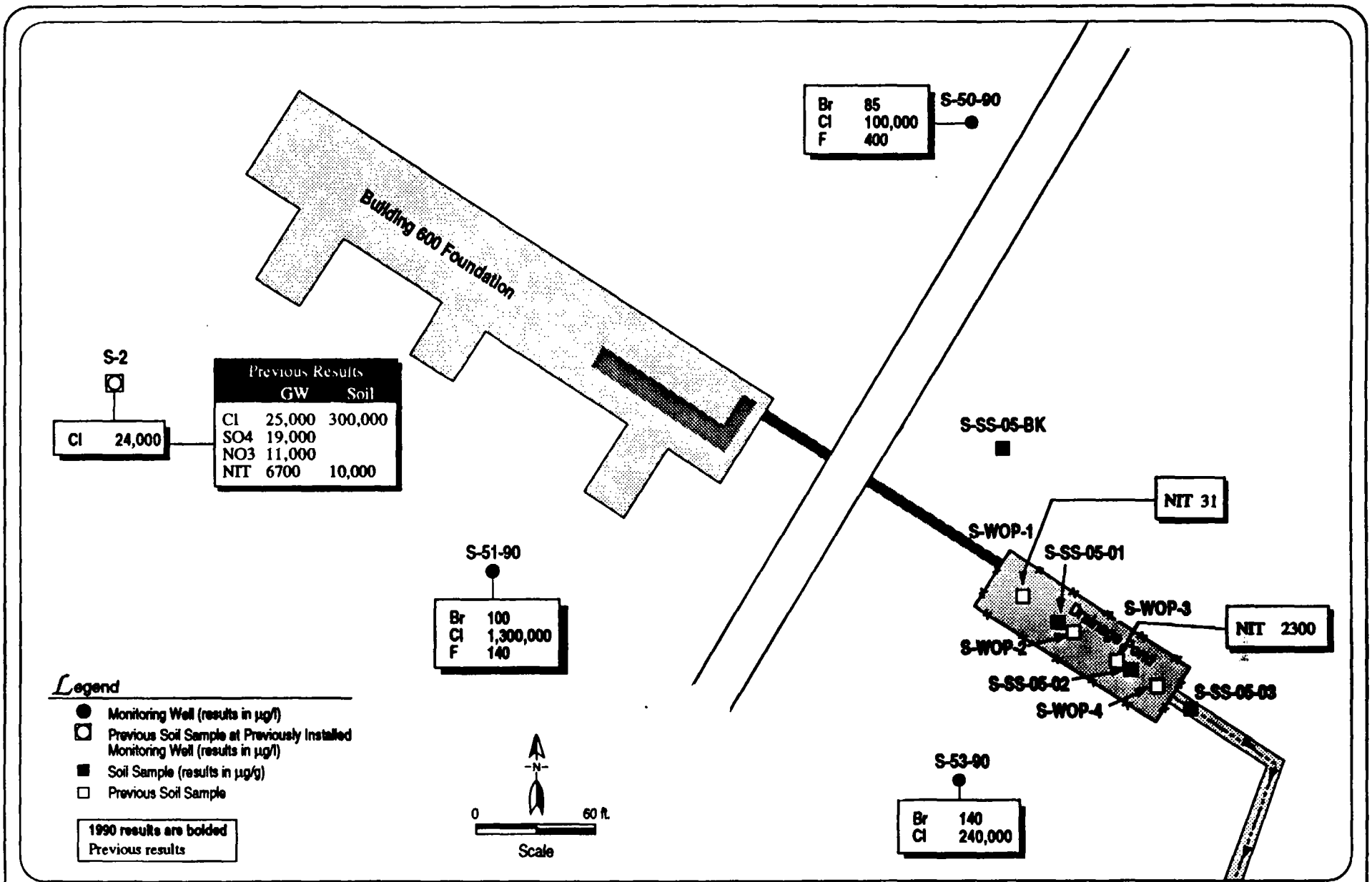


Tooele DCQAP 3.93.jb

Figure 3.3-11

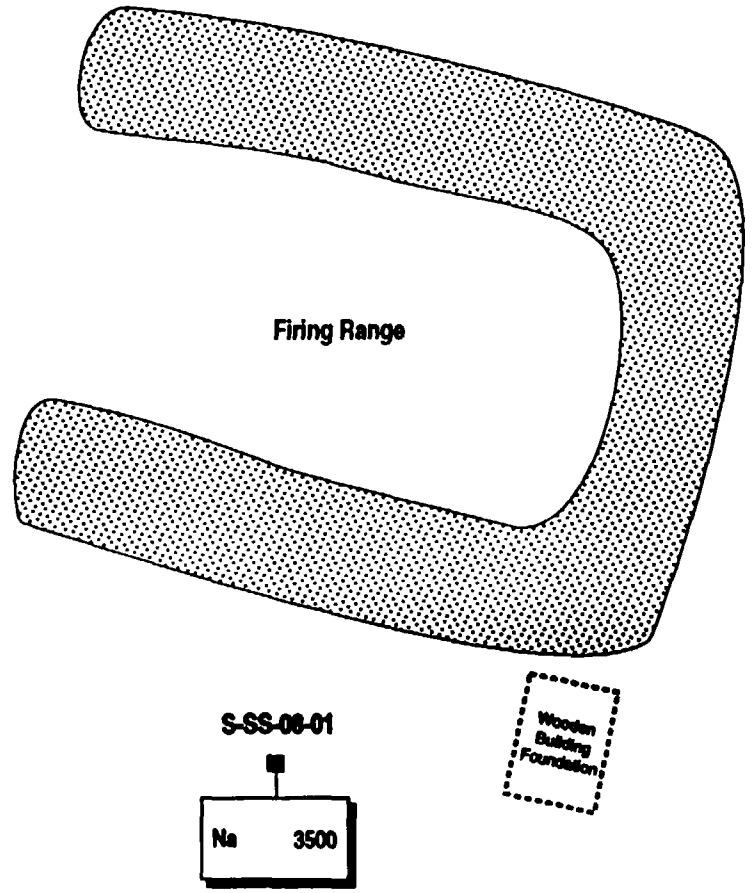
SWMU 5 - Building 600 Foundation, Drainage Pond, and Ditch

Anions

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

Previous Sampling Results for SWMU 8

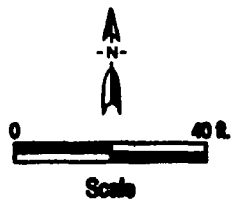
No soil or groundwater sampling was performed at SWMU 8 prior to the RFI-Phase I. During the RFI-Phase I, two soil samples were collected from the firing range area and one background soil sample was collected approximately 100 ft south of the western edge of the southern berm of the firing range. The two soil samples from the firing range were analyzed for SVOCs, total petroleum hydrocarbons, explosives, and metals. The samples analyzed for SVOCs exceeded their holding times, and poor Tetryl recoveries indicated inaccuracy in the explosives method. The background soil sample was analyzed for metals only. Figure 3.3-15 illustrates sampling locations, detected compounds, and concentrations.



Statewide Upper Boundaries* for Soil Background Concentrations

Metal	Upper Bound (ppm
Ag	1.9
As	41
Be	0.45
Cd	21
Cr	82
Cu	61
Hg	0.32
Na	3400
Ni	2.7
Pb	250
Sb	20
Se	5.8
Tl	34
Zn	240

ND = No detections
* Upper bound soil background concentration determined statistically for all soil background samples



Legend

■ Soil Sample (results in µg/g)

1990 results are bolded

Tooele DCQAP 3.93.jb

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

Figure 3.3-15
SWMU 8 - Surveillance Test Site
Soil Sample Results
Metals

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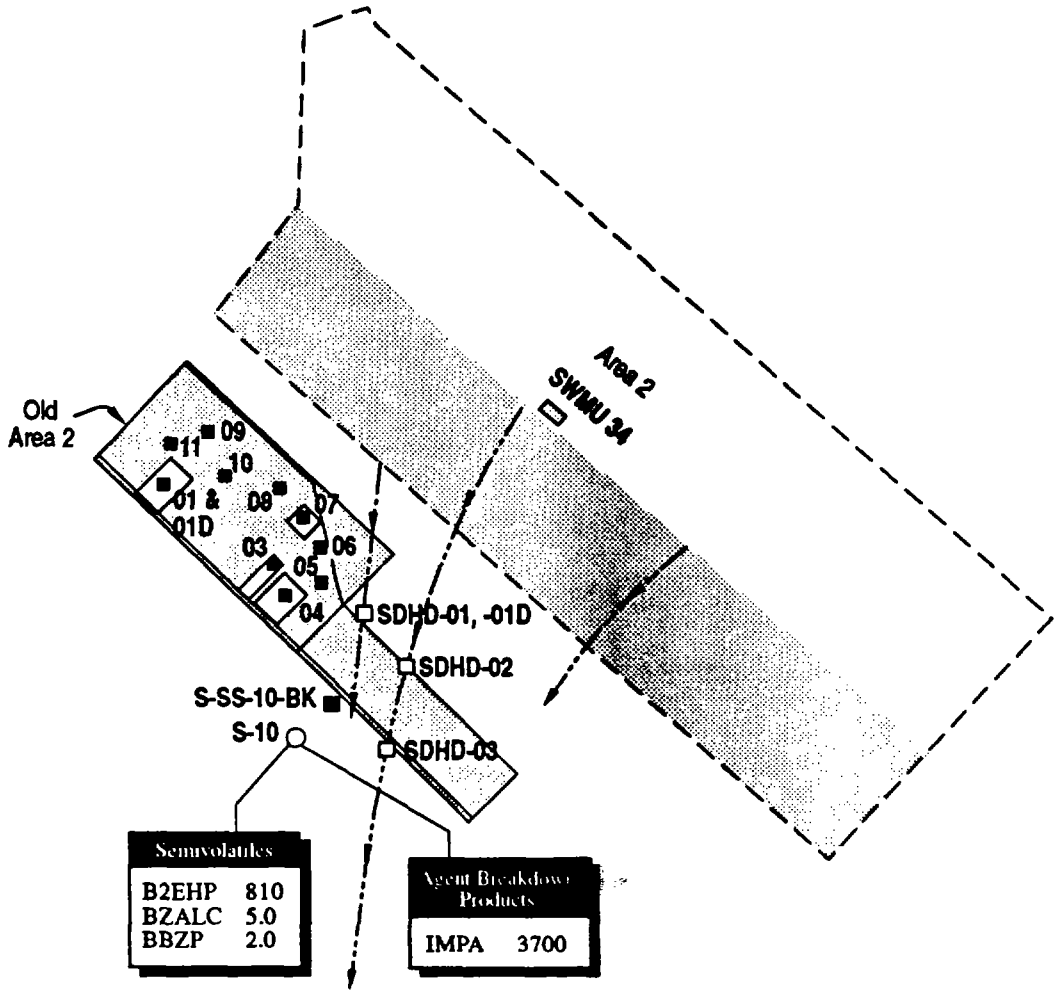
Previous Sampling Results for SWMU 9

Prior to the RFI-Phase I, sampling of SWMU 9 included the collection of soil samples from Old Area 2, sediment samples from drainages, and groundwater samples from monitoring well S-10.

Groundwater samples collected prior to the RFI-Phase I from well S-10 were analyzed for SVOCs, agent breakdown products, metals, anions, and radiological parameters. This well was resampled during the RFI-Phase I and analyzed for VOCs, SVOCs, explosives, agent breakdown products, metals, anions, and radiological parameters.

Soil and sediment samples collected prior to the RFI-Phase I from SWMU 9 included 11 from the area of the mustard spill in Old Area 2 and 3 from drainages southeast of Old Area 2. The spill area soil samples were collected from 1 to 3 ft below ground surface, and the stream sediment samples were collected at a depth of 1 to 1.5 ft. These samples were analyzed for metals, SVOCs, and agent breakdown products. During the RFI-Phase I, one background soil sample was collected near well S-10. Figures 3.3-18 through 3.3-21 present historical and RFI-Phase I sampling locations, detected compounds, and their concentrations.



Legend

- Previously Installed Monitoring Well (results in µg/l)
- Soil Sample
- Previous Soil Sample
- Previous Soil Sample (SSHD)
- Drainage Ditch with Surface Water Flow Direction

Previous results

Note: SSHD-02 not shown

N

0 1200 ft.

Scale

Tooele DCQAP 3.93.jb

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

Figure 3.3-18
SWMU 9 - Old Area 2
(Including Mustard Holding and Pit Areas)
Organics and Agent Breakdown Products

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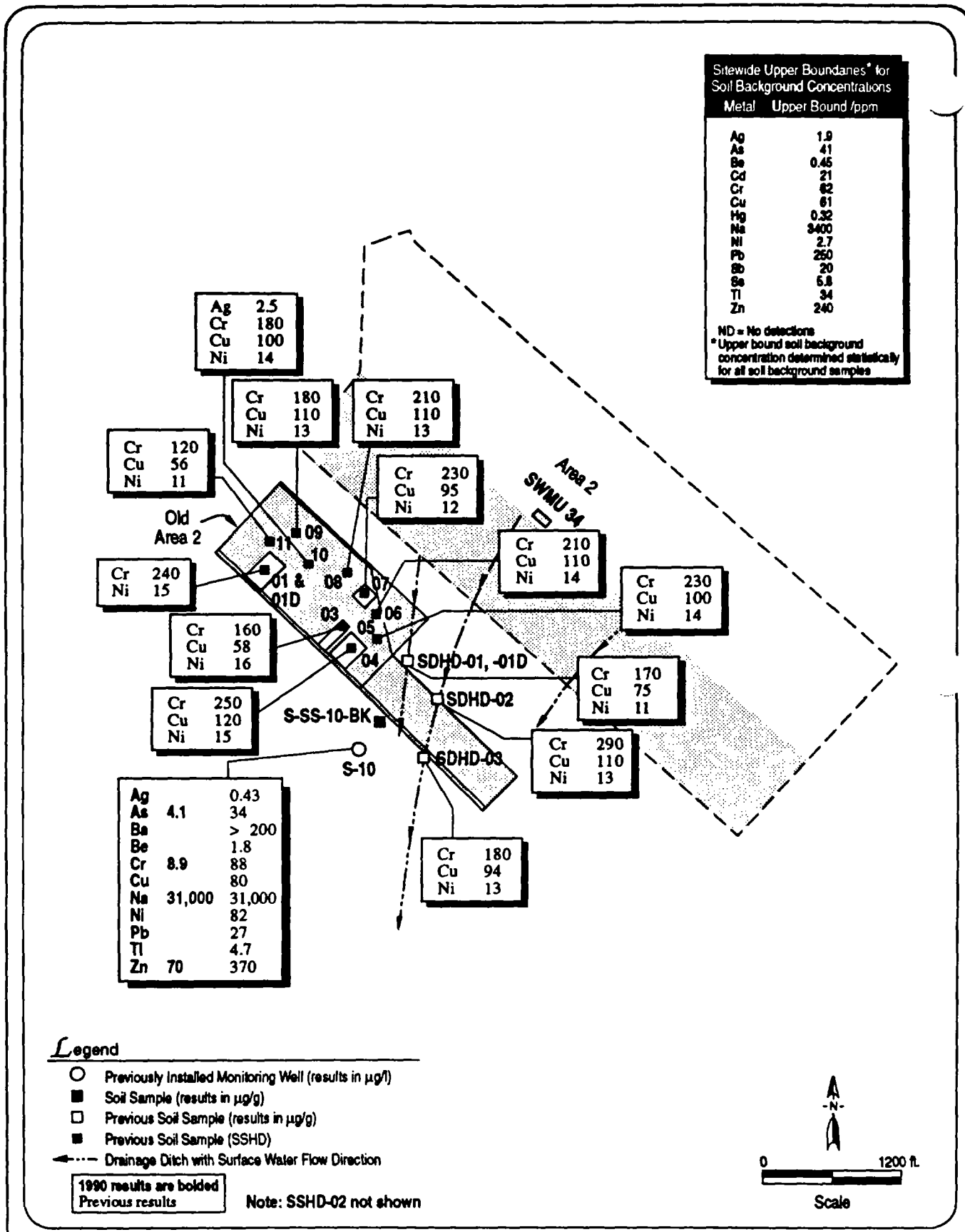
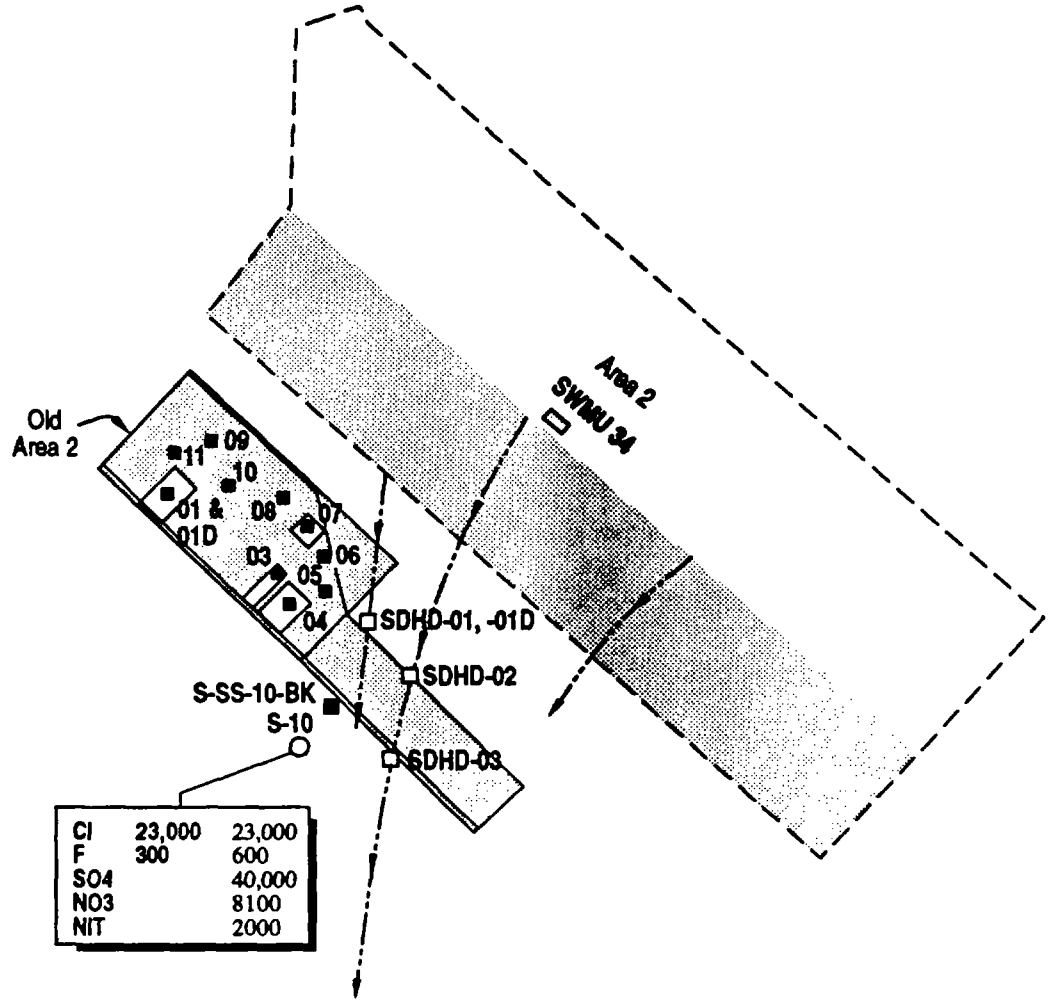


Tooele DCQAP 3.93.jb

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

Figure 3.3-19
SWMU 9 - Old Area 2
(including Mustard Holding and Pit Areas)
Metals



Legend

- Previously Installed Monitoring Well (results in µg/l)
- Soil Sample
- Previous Soil Sample
- Previous Soil Sample (SSHD)
- Drainage Ditch with Surface Water Flow Direction

1990 results are bolded
Previous results

Note: SSHD-02 not shown

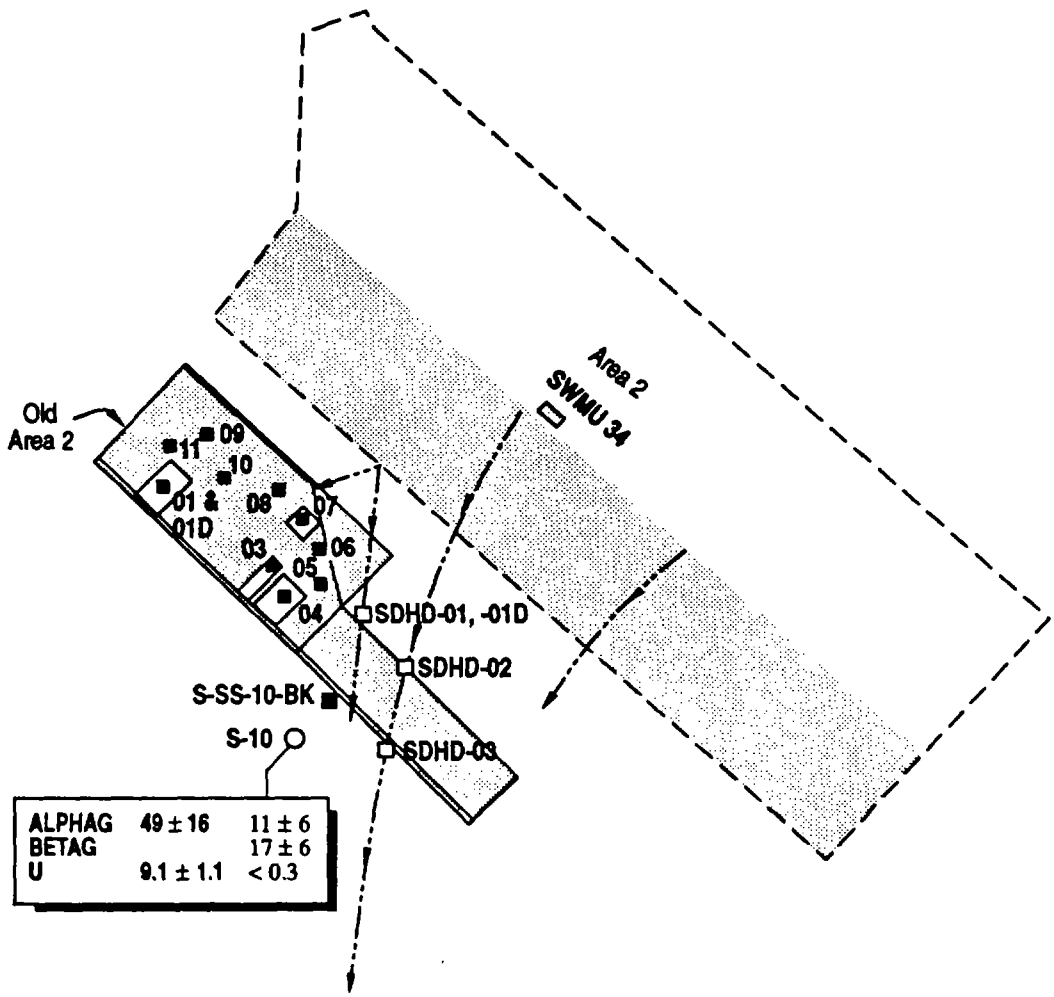
-N-

0 1200 ft.
Scale

Tooele DCQAP 3.93.jb

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

Figure 3.3-20
SWMU 9 - Old Area 2
(Including Mustard Holding and Pit Areas)
Anions



Legend

- Previous Installed Monitoring Well (results in pCi/l)
- Soil Sample
- Previous Soil Sample
- Previous Soil Sample (SSHD)
- Drainage Ditch with Surface Water Flow Direction

1990 results are bolded
Previous results

Note: SSHD-02 not shown

N

0 1200 ft.

Scale

Tooele DCQAP 3.93.jb

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

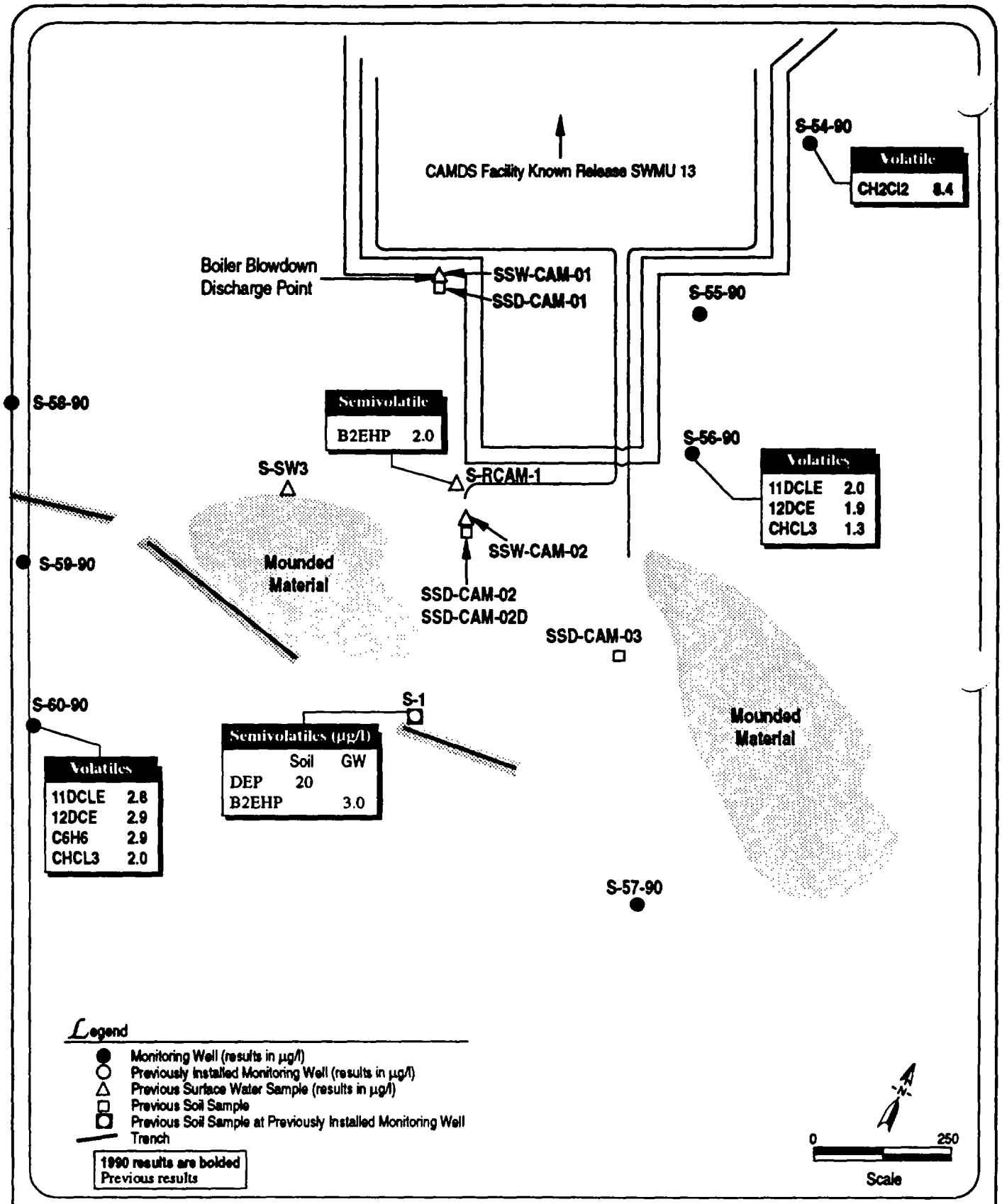
Figure 3.3-21
SWMU 9 - Old Area 2
(including Mustard Holding and Pit Areas)
Radionuclides

Previous Sampling Results for SWMU 30

Prior to the RFI-Phase I, sediment, surface water, and groundwater samples were collected near SWMU 30 to investigate SWMU 13 - CAMDS. These samples were analyzed for VOCs, SVOCs, 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 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 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.

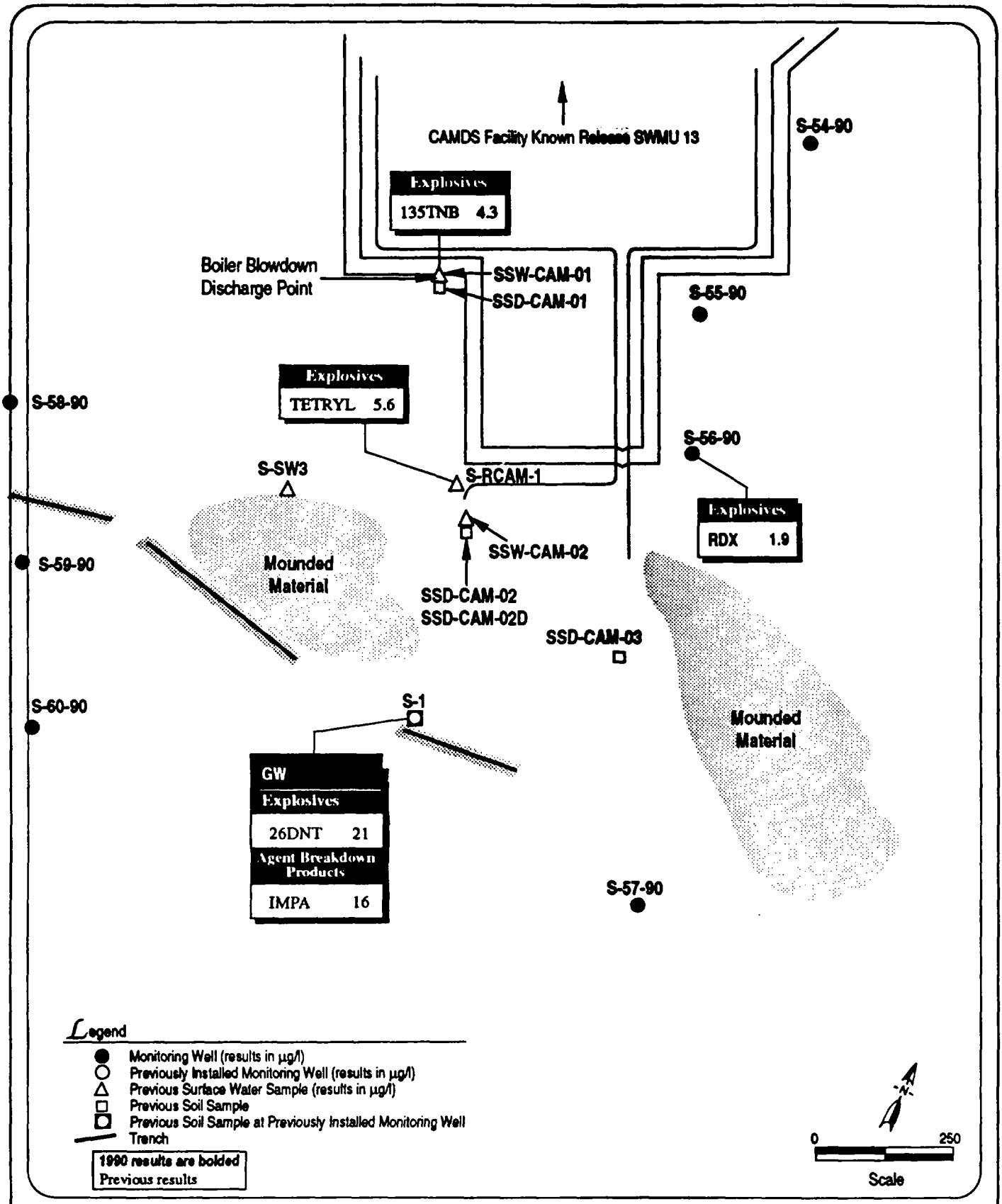
Sixteen monitoring wells at SWMUs 13 and 30 were sampled during the RFI-Phase I for VOCs, SVOCs, explosives, agent breakdown products, metals, anions, and radiological parameters. Figures 3.3-24 through 3.3-29 show monitoring well locations and detected compounds for those wells associated with the evaluation of SWMU 30 only. No soil samples were collected from the SWMU 30 area during the RFI-Phase I.



Tooele DCQAP 3.93.jb

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

Figure 3.3-24
SWMU 30 - CAMDS Landfill
Organics



Tooele DCQAP 3.93.jb

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

Figure 3.3-25
SWMU 30 - CAMDS Landfill
Explosives and Agent Breakdown Products

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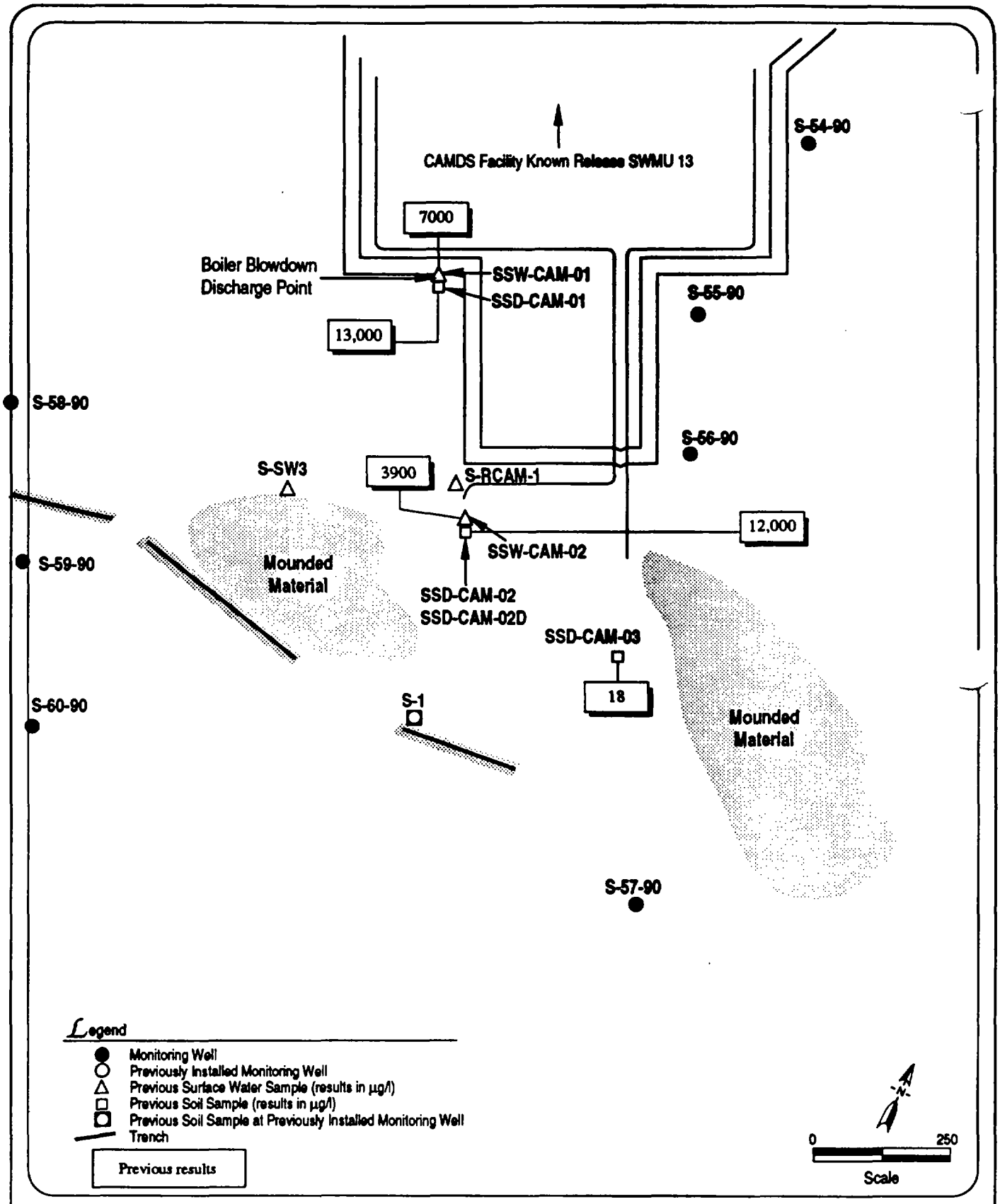
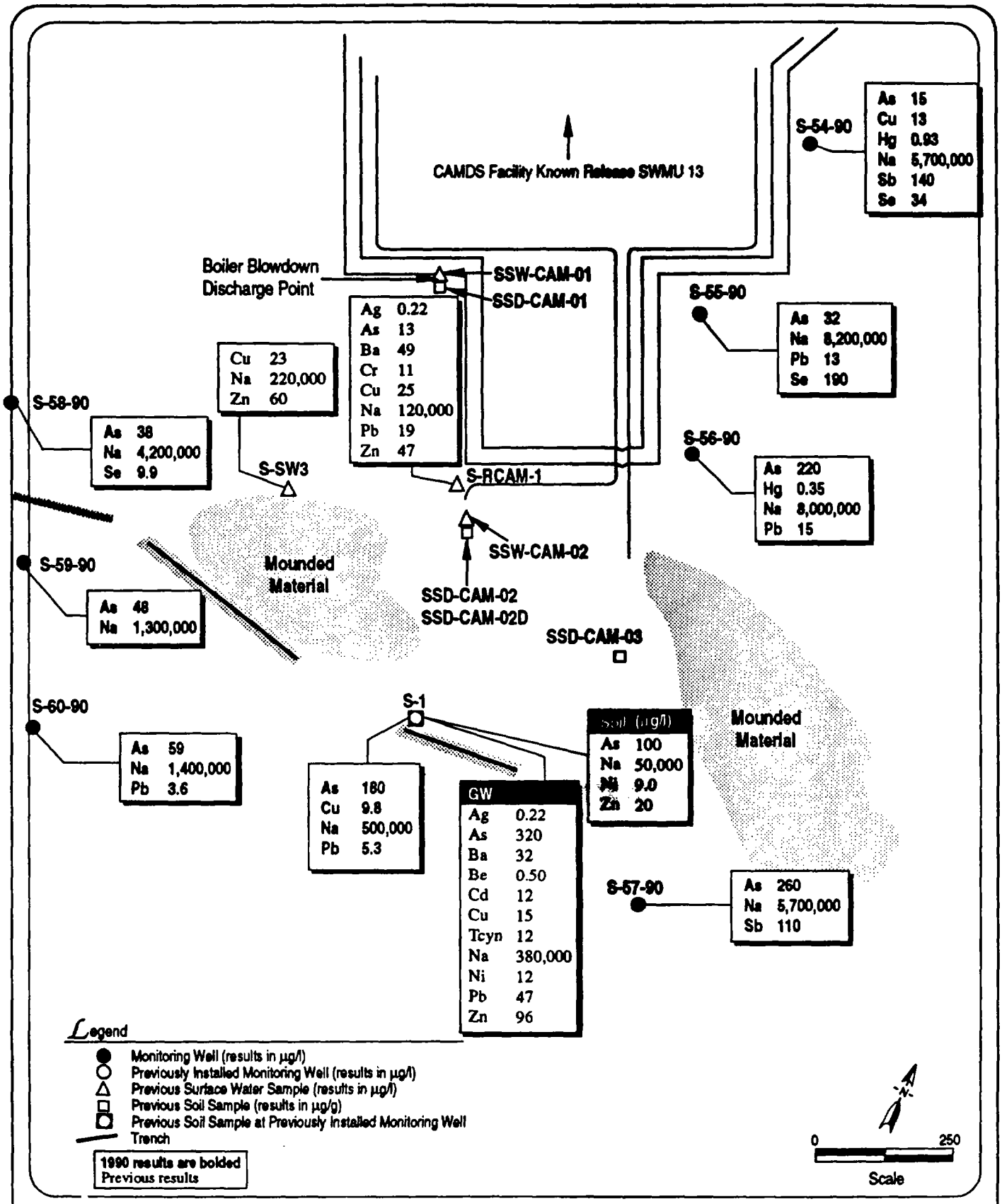


Tooele DCQAP 3.93.jb

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

Figure 3.3-26
SWMU 30 - CAMDS Landfill
Total Petroleum Hydrocarbons

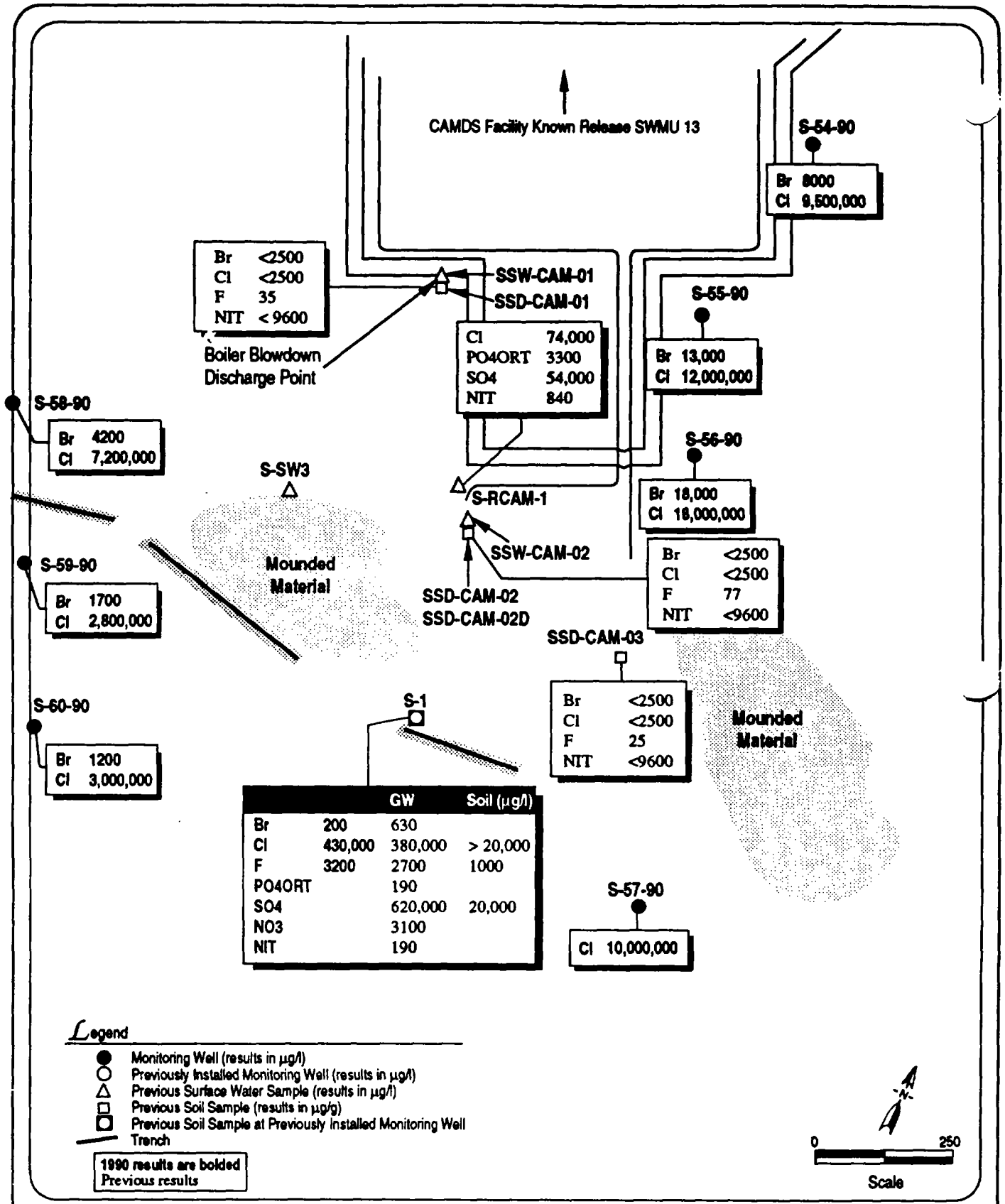
EBASCO



Tooele DCQAP 3.93.jb

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

Figure 3.3-27
SWMU 30 - CAMDS Landfill
Metals and Cyanide



Tooele DCQAP 3.93.jb

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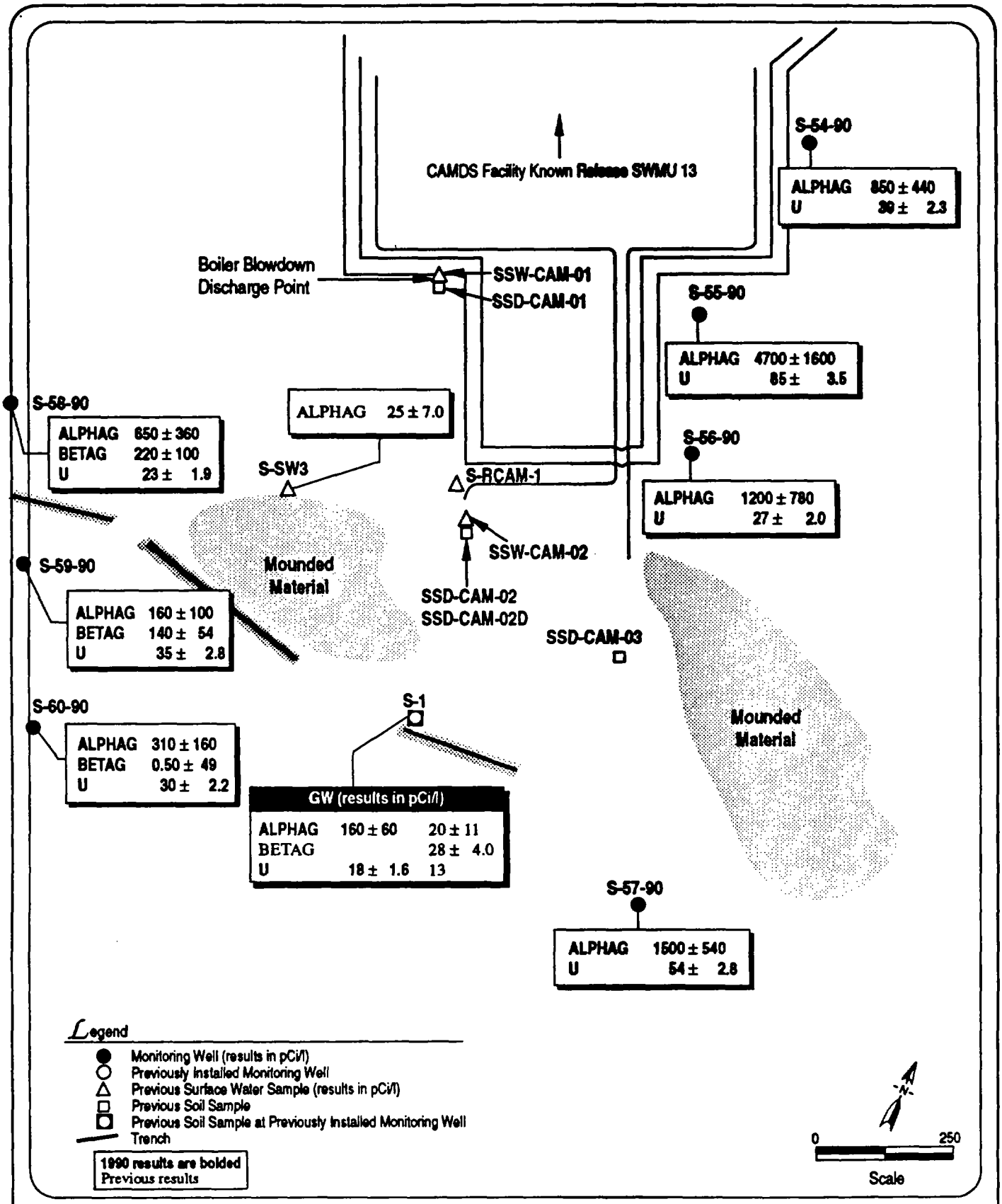
Figure 3.3-28
SWMU 30 - CAMDS Landfill
Anions



Tooele DCQAP 3.93.jb

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

Figure 3.3-29
SWMU 30 - CAMDS Landfill
Radionuclides

Previous Sampling Results for SWMU 31

No sampling of soil or groundwater has been performed at SWMU 31. Monitoring wells that were originally planned at this SWMU were canceled because open detonation taking place at SWMU 31 during the RFI-Phase I field program was believed to create sufficient force that PVC wells placed in the planned locations would be destroyed.

CHEMICAL ACRONYM LIST

13DNB	1,3-Dinitrobenzene
17PTCE	17-Pentatriacontene
1MNAP	1-Methylnaphthalene
246TNT	2,4,6-Trinitrotoluene
24DNT	2,4-Dinitrotoluene
2CHE1O	2-Cyclohexen-1-one
2MNAP	2-Methylnaphthalene
2PROL	2-Propanol
2TMPD	2,6,10,14-Tetramethylpentadecane
AC	Hydrogen cyanide
ACET	Acetone
Ag	Silver
Al	Aluminum
ALK	Alkalinity
ALKBIC	Bicarbonate alkalinity
As	Arsenic
B2EHP	Bis(2-ethylhexyl) phthalate
Ba	Barium
Be	Beryllium
Br	Bromide
BRDCLM	Bromodichloromethane
BZ	3-Quinudidinylbenzilate
C6H6	Benzene
C16A	Hexadecanoic Acid
C17	Heptadecane
C25	Pentacosane
C27	Heptacosane
C28	Octacosane
C29	Nonacosane
Ca	Calcium
CCL3F	Trichlorofluoromethane
Cd	Cadmium
CG	Phosgene
CH2CL2	Methylene chloride
CHCL3	Chloroform
CHOLA	Cholestane
CK	Cyanogen chloride
Cl	Chloride

CHEMICAL ACRONYM LIST (continued)

CL6BZ	Hexachlorobenzene
CN	Chloroacetophenone
Co	Cobalt
Cr	Chromium
CS	O-chlorobenzylidene malononitrile
CS2	Carbon disulfide
Cu	Copper
Cyn	Cyanide
DANC	Agent decontamination solution composed of 6.25% RH-195 (1,3-dichloro-5,5-dimethylhydantoin) in acetylene tetrachloride
DBZFUR	Dibenzofuran
DEGLYC	Diethylene glycol
DEP	Diethyl phthalate
DH2MN	Decahydro-2-methylnaphthalene
DM	Adamsite
DNBP	Di-n-butyl phthalate
DOAD	Dioctyl adipate
DS2	Agent decontamination solution composed of 70% diethylenetriamine, with ethylene glycol, monomethyl ether, and sodium hydroxide
ETOH	Ethanol
FANT	Fluoranthene
F	Fluoride
Fe	Iron
FS	Sulfur Trioxide-chlorosulfonic acid
GA	Tabun
GB	Sarin
GSITOS	γ-Sitosterol (gamma-Sitosterol)
H	Mustard
HD	Distilled mustard
HC	Smoke composed of zinc oxide, grained aluminum, and hexachloroethane
HCO3	Bicarbonate
Hg	Mercury
HMX	Cyclotetramethylenetetranitramine
HT	Mustard-T mixture
IMPA	Isopropyl methylphosphonic acid
K	Potassium

CHEMICAL ACRONYM LIST (continued)

L	Lewisite
MEC6H5	Toluene
MIBK	Methylisobutyl ketone
Mg	Magnesium
Mn	Manganese
MPA	Methylphosphonic acid
Na	Sodium
NAP	Naphthalene
NB	Nitrobenzene
Ni	Nickel
NIT	Nitrate, Nitrite - nonspecific
OMCTSX	Octamethylcyclotetrasiloxane
Pb	Lead
PCB248	PCB 1248 (Polychlorobiphenyl 1248)
PCB254	PCB 1254 (Polychlorobiphenyl 1254)
PCB260	PCB 1260 (Polychlorobiphenyl 1260)
PCE	Tetrachloroethylene
PETN	Pentaerythritol tetranitrate
PHANTR	Phenanthrene
PHTHAN	Phthalic anhydride
PO4	Phosphate
PYR	Pyrene
RDX	Cyclonite
Sb	Antimony
Se	Selenium
SO4	Sulfate
STB	Supertropical bleach
TCE	Trichloroethylene
TCDF	Tetrachlorodibenzofuran
TCLTFE	1,1,2-Trichloro-1,2,2-trifluoroethane
TCOS	Tetracosane
Tl	Thallium
TNB	Trinitrobenzene
TNT	Trinitrotoluene
TRCLE	Trichloroethene (or Trichloroethylene)
V	Vanadium
VX	O-ethyl-s-(2-diisopropylaminoethyl)methylphosphonothiolate
WP	White phosphorus
Zn	Zinc