

# Decision Document

Solid Waste Management Unit B-22a  
Building 101-44 West Catchment Pit  
Hawthorne Army Depot  
Hawthorne, Nevada



September 2000



Hawthorne Army  
Depot



# Decision Document SWMU B-22a

September 2000

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ENVIRONMENTAL PROTECTION

The selected remedy is protective of human health and the environment. It has been shown that a complete pathway to human health and the environment does not exist, and there is no potential for an exposure pathway to be completed in the future.

**U. S. Army**

18 OCT 2000

Anne L. Davis

Anne L. Davis  
Lieutenant Colonel, U.S. Army  
Commanding

**State of Nevada**

13 MARCH 2001

Paul Liebendorfer

Paul Liebendorfer  
Chief, Bureau of Federal Facilities

# Decision Document

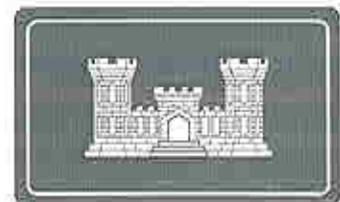
Solid Waste Management Unit B-22a  
Building 101-44 West Catchment Pit  
Hawthorne Army Depot  
Hawthorne, Nevada



September 2000



Hawthorne Army  
Depot



**Decision Document**  
**SWMU B-22a**  
**Building 101-44 West Catchment Pit**  
**HAWTHORNE ARMY DEPOT**  
**HAWTHORNE, NEVADA**

**1.0 Introduction:**

This decision document describes the rationale for the proposed closure of SWMU B-22a, building 101-44 West catchment pit, at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. This document was prepared by the U.S. Army Corps of Engineers, Sacramento District, with the help of HWAD for the Nevada Department of Environmental Protection (NDEP).

Tetra Tech, Inc. (Tt), and Ecology and Environment (E&E) were tasked by the US Army Corps of Engineers, Sacramento District (USACE), to perform remedial investigations and ground water monitoring at the Hawthorne Army Depot (HWAD), Hawthorne, Nevada. These tasks were conducted from 1993 through 1997, primarily at solid waste management units (SWMUs) designated by the Army and the Nevada Division of Environmental Protection (NDEP). The NDEP is the lead regulatory agency for environmental issues at HWAD. The purpose of the sampling was to determine the extent and degree of environmental impacts, if any, associated with activities performed at each SWMU. The primary goal of the investigation was to assess the environmental impacts and to report the findings, present conclusions, and recommend any remediation, if necessary.

With guidance from the NDEP, basewide proposed closure goals (PCGs) for soil were established as acceptable levels so that SWMU closure could be recommended and to assist in directing the investigative efforts toward those SWMUs where the target analytes were of greatest concern (Appendix A). These PCGs were used as action levels throughout this investigation and are used for comparison with the detected analytes in this report.

**2.0 Site History**

SWMU B22a is in the HWAD's central magazine area, on the southeast side of the 101 Production Area (Figure 1-1). SWMU B22a is an inactive unlined catchment pit located 280 feet northwest of Building 101-44 (Figure 1-2). The catchment pit measures 70 feet by 50 feet and is up to four feet deep.

The USACE, HWAD, and the NDEP agreed to define the boundaries of each SWMU using annotated monuments and survey pins. As part of E&E's 1997 field investigations, a survey monument was constructed and surveyed at SWMU B22a. A brass survey pin

on the monument designates the monument number HWAAP-94-1996 and the SWMU number B22a. Three corner pins were set and surveyed to define the SWMU boundary, with the monument as the northwest corner. The location of these corner markers and the SWMU boundary are shown on Figure 1-2. The survey data for this SWMU are presented in Appendix B.

### **3.0 Site Conditions**

Soils encountered during E&E's investigation of SWMU B22a were composed mostly of sands and silty sands.

The catchment pit at SWMU B22a reportedly was in operation from 1940 to the early 1970s and received wastewater containing TNT, cyclotrimethylenetrinitramine (RDX), and Yellow D.

Based on the past uses of the catchment pit at SWMU B22a and on the observations made during the previous site inspections, the target analytes at this SWMU are known to be explosives and metals.

### **4.0 INVESTIGATIONS**

Site inspections of SWMU B22a were conducted by the USAEHA (1988), Jacobs Engineering (1988), and RAI (1992). During these inspections, TNT-stained soil was noted in the catchment pit. No investigation activities were conducted during these inspections, and no soil samples were collected from the SWMU at that time.

In 1994, sampling activities proposed by E&E for the remedial investigation at SWMU B22a included collecting and analyzing both surface and subsurface soil samples. One surface soil sample and one near-surface soil sample were collected from sample location HA01 at SWMU B22a. Figure 3-1 illustrates the sampling locations. The subsurface investigation at SWMU B22a consisted of one CPT sounding with an adjacent sample boring, CPS01, drilled on the south side of the catchment pit, as shown on Figure 3-1. The sounding was advanced to a total depth of 46 feet below ground surface (bgs),

In 1999 the USACE took samples of the stained surface soil on the pit and had it analyzed for explosives. The concern was that the 1994 field screen tests were indicating very high levels of TNT and RDX contamination and laboratory analysis of the same samples indicated very low to non-detect levels of TNT and RDX. Later in 1999 DZHC took a soil sample at a depth of 5' in the center of the excavated area, and had a laboratory analysis run for explosives.

### **5.0 Investigation Results**

Both of the surface and near-surface samples collected from location HA01 were field screened for explosives and were found to contain RDX concentrations greater than 60,000 mg/kg or six

percent by weight. Because this value exceeds the safe shipping level of six percent, these samples were not sent to the laboratory for further analysis

Arsenic (1.6 mg/kg to 2.8 mg/kg), barium (74 mg/kg to 94 mg/kg), total chromium (4.4 mg/kg to 5.2 mg/kg), and lead (1.6 mg/kg to 2.0 mg/kg) were detected in both subsurface soil samples collected at location CPS01. No other metals were detected.

No explosives were detected in either of the subsurface soil samples collected from location CPS01 at this SWMU.

Based on the analytical results of E&E's remedial investigation at SWMU B22a, the surface, near-surface, and subsurface soils at this catchment pit contain detectable concentrations of arsenic, barium, total chromium, and lead that do not exceed their respective PCGs and are below their expected maximum background concentrations established during these remedial investigations (Tt 1997d). Therefore, at SWMU B22a, the detected metals arsenic, barium, total chromium, and lead, which are common metals in the Walker Lake Valley soils, are evaluated to be at naturally occurring concentrations near their background levels (appendix C).

The surface soil sample of the stained soil had no detection of explosive compounds. The two deeper soil samples by DZHC also did not detect any explosives contamination (appendix D). The SWMU has not been impacted by any COC.

## **6.0 Remediation**

No remediation action was required for this site.

## **7.0 Remediation Results**

N/A

## **8.0 Public Involvement:**

It is the U.S. Department of Defense and Army policy to involve the local community throughout the investigation process at an installation. To initiate this involvement, HWAD has established and maintains a repository library at the local public library. This repository includes final copies of all past studies and other documents regarding environmental issues at HWAD. As future environmental documents are made available to HWAD the repository shall be updated.

HWAD has solicited community participation in establishment of a restoration and advisory board (RAB). To date there has been insufficient response and HWAD has not formed a RAB. HWAD has held open houses to inform the public of on going environmental issues. HWAD shall continue to solicit community involvement, and will establish a RAB should sufficient community interest be obtained.

## **9.0 Conclusions**

SWMU B-22a was backfilled with clean soil and should be closed and documented on the depot site master plan with no restrictions.

## 10.0 REFERENCES

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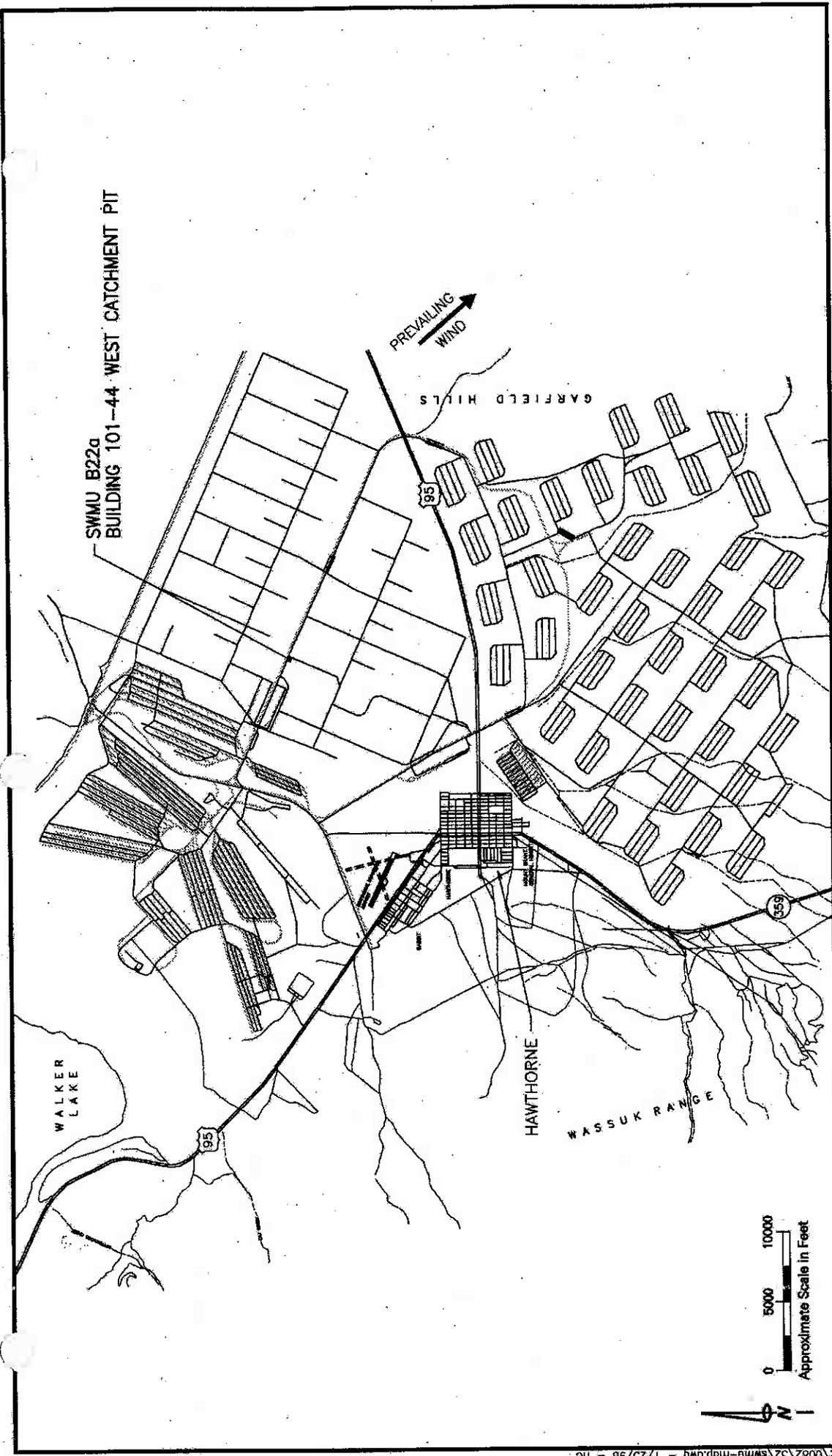
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USEPA. 1989. Risk Assessment Guidance for Superfund. Volume I Human Health Evaluation Manual (Part A). December 1989.

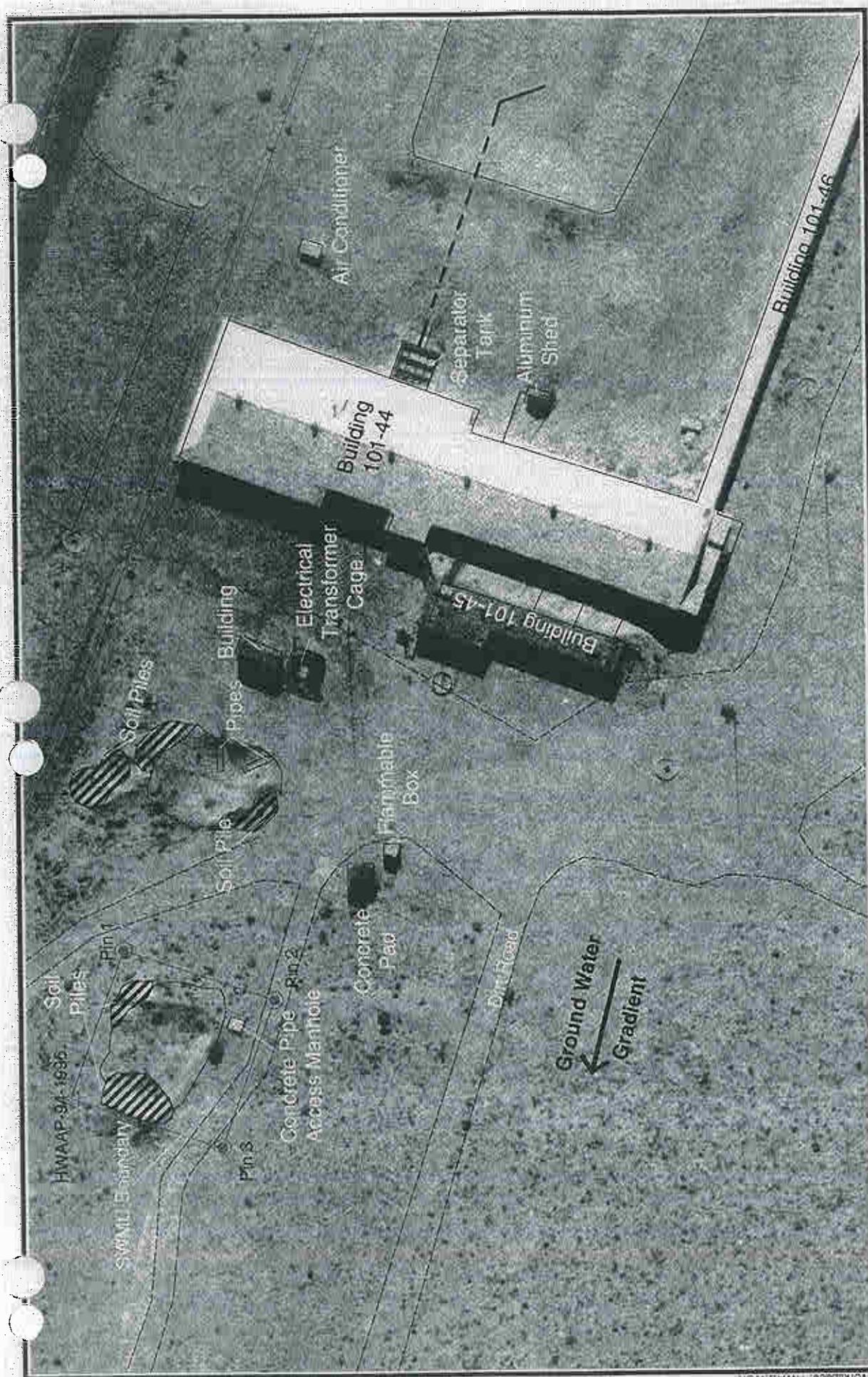
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WaterWork. 1990. Hawthorne Army Ammunition Plant, Area 101 Surface Impoundments, Field and Lab Data and Analysis, Attachment 1-8.



**Site Location Map**  
**SWMU B22a**  
**Building 101-44 West Catchment Pit**  
 Hawthorne Army Depot  
 Hawthorne, Nevada  
**Figure 1-1**

SOURCE: TETRA TECH FINAL DATA PACKAGE, 1996 (REV. 1997)



HWAAP-34-1886

SWMU Boundary

Pin 1

Soil Piles

Pipes

Concrete Pipe Access Manhole

Soil Pile

Electrical Transformer Cage

Building 101-44

Flammable Box

Concrete Pad

Separator Tank

Aluminum Shed

Driveway

Ground Water Gradient

Building 101-45

Building 101-46

Worksheet: HWAAP-34-1886

**Legend:**

- Boundary Corner Pin
- - - Drain Line
- - - - Railroad

- △ SWMU Monument



**Site Map**  
**SWMU B22a**  
**Building 101-44 West Catchment Pit**  
 Hawthorne Army Depot  
 Hawthorne, Nevada  
**Figure 1-2**



Workpiece: HWADWOP

**Legend:**

- Boundary Corner Pin
- Drain Line
- Hand Auger Location
- Soil Boring Location
- Monitoring Well
- Railroad
- SWMU Monument



**Investigation Activity Map**  
**SWMU B22a**  
**Building 101-44 West Catchment Pit**  
 Hawthorne Army Depot  
 Hawthorne, Nevada  
**Figure 3-1**

## **Appendix A**

Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-Carcinogenic (NC)	HVAD Proposed Closure Goals for Soil (mg/kg)	HVAD Proposed Closure Goal Source
Nitrate	Anion	NC	128,000	Calculated Subpart S <sup>a</sup>
2-Amino-dinitrotoluene	Explosive	NC	-	NA <sup>a</sup>
4-Amino-dinitrotoluene	Explosive	NC	8	NA
1,3-Dinitrobenzene	Explosive	NC	160	Calculated Subpart S
2,4-Dinitrotoluene	Explosive	NC	80	Calculated Subpart S
2,6-Dinitrotoluene	Explosive	NC	4,000	Calculated Subpart S
HMX	Explosive	NC	40	Calculated Subpart S
Nitrobenzene	Explosive	NC	800	Calculated Subpart S
Nitrotoluene (2-, 3-, 4-)	Explosive	NC	64	Calculated Subpart S
ROX	Explosive	NC	800	Calculated Subpart S
Tetryl	Explosive	NC	4	Calculated Subpart S
1,3,5-Trinitrobenzene	Explosive	NC	233	Calculated Subpart S
2,4,6-Trinitrotoluene	Explosive	C	80,000	Calculated Subpart S
Aluminum	Metal	NC	30	Background <sup>c</sup>
Arsenic (cancer endpoint)	Metal	C & NC	5,600	Calculated Subpart S
Barium and compounds	Metal	NC	1	Background
Beryllium and compounds	Metal	C	40	Calculated Subpart S
Cadmium and compounds	Metal	NC	80,000	Calculated Subpart S
Chromium III and compounds	Metal	NC	1000	PRG <sup>d</sup>
Lead	Metal	NC	24	Calculated Subpart S
Mercury and compounds (inorganic)	Metal	NC	400	Calculated Subpart S
Selenium	Metal	NC	400	Calculated Subpart S
Silver and compounds	Metal	NC	4,800	Calculated Subpart S
Acanaphthene	PAH	NC	0.96	Calculated Subpart S
Benzo[a]anthracene	PAH	C	0.10	Detection Limit <sup>e</sup>
Benzo[a]pyrene	PAH	C	0.96	Calculated Subpart S
Benzo[b]fluoranthene	PAH	C	10	Calculated Subpart S
Benzo[k]fluoranthene	PAH	C	96	Calculated Subpart S
Chrysene	PAH	C	0.96	Calculated Subpart S
Dibenz[ah]anthracene	PAH	NC	3,200	Calculated Subpart S
Fluoranthene	PAH	NC	3,200	Calculated Subpart S
Fluorene	PAH	C	-	NA
Indeno[1,2,3-cd]pyrene	PAH	NC	3,200	Calculated Subpart S
Naphthalene	PAH	NC	2,400	Calculated Subpart S
Pyrene	PAH	C	100	NDEP Level Clean-up <sup>f</sup>
Total Petroleum Hydrocarbons as Diesel (TPH-d)			25	TSCA <sup>g</sup>
Polychlorinated biphenyls (PCBs)	PCBs	C	1,600	Calculated Subpart S
Bis(2-ethylhexyl)phthalate (DEHP)	SVOC	C	89	Calculated Subpart S
Bromoform (tribromomethane)	SVOC	C		

**Proposed Closure Goals  
Hawthorne Army Depot  
Hawthorne, Nevada**

Constituent of Concern	Chemical Classification	Carcinogenic (C) or Non-carcinogenic (NC)	HWAD Proposed Closure Goals for Soil (mg/kg)	HWAD Proposed Closure Goal Source
Butyl benzyl phthalate	SVOC	NC	15,000	Calculated Subpart S
Dibromochloromethane	SVOC	C	83	Calculated Subpart S
Dibutyl-phthalate	SVOC	NC	8,000	Calculated Subpart S
Diethyl phthalate	SVOC	NC	64,000	Calculated Subpart S
Phenanthrene	SVOC	NC	-	NA
Phenol	SVOC	NC	48,000	Calculated Subpart S
Acetone	VOC	NC	800	Calculated Subpart S
Anthracene	VOC	NC	24,000	Calculated Subpart S
Benzene	VOC	C	24	Calculated Subpart S
Bis(2-chloroisopropyl)ether	VOC	C	3,200	Calculated Subpart S
Bromomethane	VOC	NC	112	Calculated Subpart S
Carbon tetrachloride	VOC	C	5	Calculated Subpart S
Chlorobenzene	VOC	NC	1,600	Calculated Subpart S
Chloroform	VOC	C	115	Calculated Subpart S
Chloromethane	VOC	C	538	Calculated Subpart S
Dibromomethane	VOC	C	0.008	Calculated Subpart S
1,2-Dichlorobenzene	VOC	NC	7,200	Calculated Subpart S
1,4-Dichlorobenzene	VOC	C	18,300	Calculated Subpart S
Dichlorodifluoromethane	VOC	C	15,000	Calculated Subpart S
Ethylbenzene	VOC	NC	8,000	Calculated Subpart S
Methylene bromide	VOC	NC	800	Calculated Subpart S
Methylene chloride	VOC	C	4,800	Calculated Subpart S
2-Methylnaphthalene	VOC	C	-	NA
1,1,2,2-Tetrachloroethane	VOC	C	35	Calculated Subpart S
Tetrachloroethylene (PCE)	VOC	C & NC	800	Calculated Subpart S
Toluene	VOC	NC	16,000	Calculated Subpart S
1,1,1-Trichloroethane	VOC	NC	7,200	Calculated Subpart S
Trichloroethylene (TCE)	VOC	C & NC	480	Calculated Subpart S
Trichlorofluoromethane	VOC	NC	24,000	Calculated Subpart S
1,2,3-Trichloropropane	VOC	C	480	Calculated Subpart S
Vinyl chloride	VOC	C	0.37	Calculated Subpart S
Xylene Total (m-, o-, p-)	VOC	NC	160,000	Calculated Subpart S
2,3,7,8-TCOD	Dioxin	C	0.000005	Calculated Subpart S

<sup>a</sup> RCRA 55 FR 30870

<sup>b</sup> Not available

<sup>c</sup> Highest background concentration detected in 50 background soil samples

<sup>d</sup> Smucker, Stanford J. USEPA Region IX, Preliminary Remedial Goals, Second Half, Sep. 1995

<sup>e</sup> Method detection limit for Volatile Organic Compounds by EPA Method 8260 or Semi-Volatile Organic Compounds analyzed by EPA Method 8270

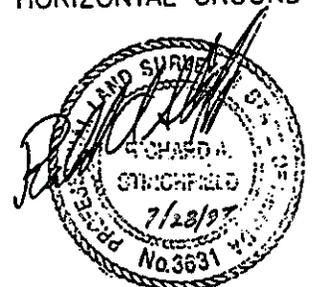
<sup>f</sup> Nevada Division of Environmental Protection

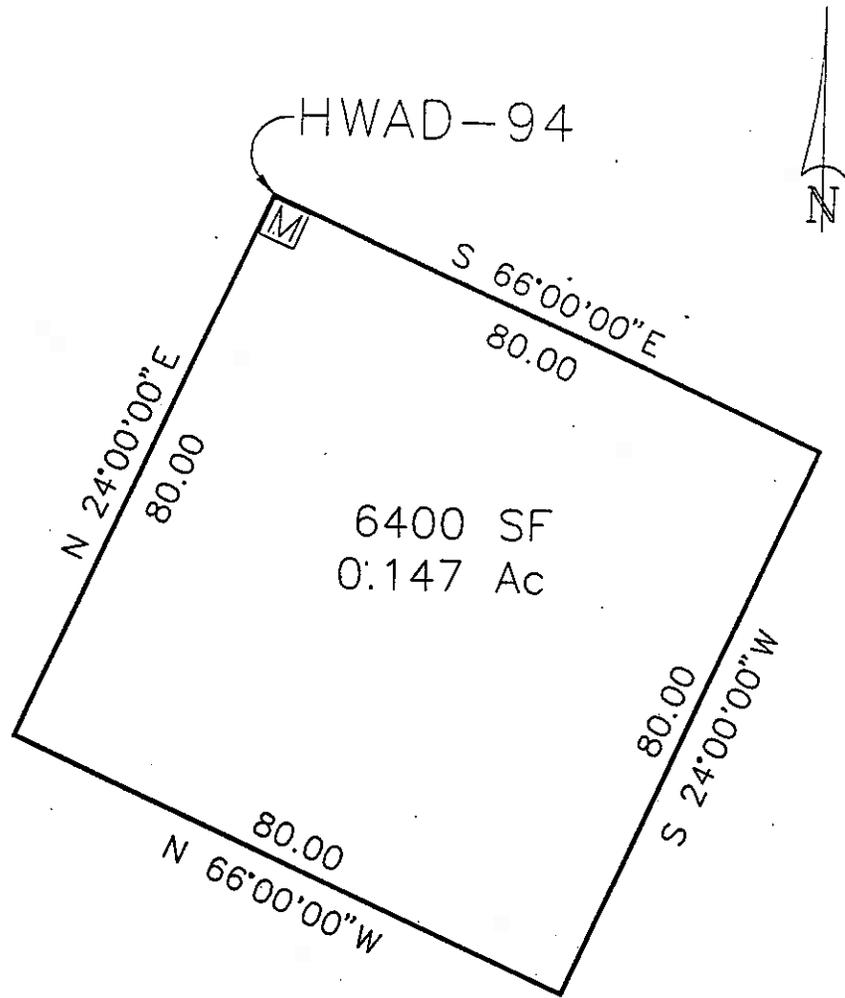
<sup>g</sup> Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 751

## **Appendix B**

## NOTES

1. FOR THE LOCATION OF THE FOLLOWING SWMU'S, REFER TO FIGURE 3-6 OF THE "FINAL R.C.R.A. FACILITY INVESTIGATION REPORT OF GROUP "A" SOLID WASTE MANAGEMENT UNITS A-04, B-16, B-21, B-24, B-26, AND H-01".
2. THE "HWAD" MONUMENTS AS SHOWN HEREIN AS "M", ARE A 1' X 1' X 2'+ CONCRETE MONUMENT WITH A BRASS CAP STAMPED AS PER SPECIFICATIONS. ALL OF THE OTHER CORNERS ARE MARKED BY A 5/8" RE-BAR WITH A PLASTIC CAP STAMPED "STINCHFIELD PLS 3631" UNLESS NOTED OTHERWISE ON THE MAPS.
3. HORIZONTAL DATUM IS BASED ON NAD 83(1994) AND MORE SPECIFICALLY, NGS STATION "W 2". "W 2" IS A FEDERAL BASE NETWORK CONTROL STATION AND IS LOCATED IN THE APPROXIMATE CENTER OF THIS PROJECT.
4. VERTICAL DATUM IS BASED ON NAVD 29. NAVD 88 ELEVATIONS HAVE BEEN SCALED AND THEREFORE ARE NOT ACCURATE. VERTICAL CONTROL USING GPS WAS USED TO ESTABLISH THE ELEVATIONS OF THE EXISTING CONTROL POINTS AND THE "HWAD" MONUMENTS. THE VALUE OF NGS STATION "W 2" WAS USED AS A BASIS FOR THE VERTICAL CONTROL.
5. COORDINATE VALUES OF EXISTING NGS CONTROL, TRAVERSE POINTS, AND HWAD MONUMENTS ARE STATE PLANE COORDINATES, WEST ZONE.
6. THE COMBINED FACTOR WAS CALCULATED USING THE FOLLOWING FIGURES. THE "MAP SCALE" AT POINT "W 2" IS 0.99990022, THE MEAN ELEVATION OF THE TOTAL PROJECT WAS TAKEN AS 4150.00 FEET ABOVE SEA LEVEL AND THE MEAN RADIUS OF THE EARTH WAS TAKEN AS 20,906,000 FEET. THE SEA LEVEL FACTOR WAS CALCULATED AS FOLLOWS:  $20,906,000 / 20,906,000 + 4150.00 = 0.999801532$ . THE COMBINED FACTOR (CF) WAS CALCULATED AS FOLLOWS:  $0.99990022 \times 0.999801532 = 0.999701772$ .
7. GROUND DISTANCE X CF (0.999801532) = GRID DISTANCE.
8. GRID DISTANCE X INVERSE CF (1.00298317) = GROUND DISTANCE.
9. COORDINATE VALUES OF ALL OTHER POINTS INCLUDING SWMU CORNERS OTHER THAN "HWAD" MONUMENTS, REFERENCE POINTS, TEST PIT OR HOLE LOCATIONS ETC., WERE CALCULATED USING GROUND DISTANCES AND ARE THEREFORE NOT TRUE STATE PLANE COORDINATES.
10. DISTANCES AS SHOWN ON THESE SWMU'S ARE HORIZONTAL GROUND DISTANCES.





6400 SF  
0.147 Ac

V COR	N	14511001.314	E	2626202.726	ELEV	4247.007
E COR	N	14510968.775	E	2626275.810	ELEV	4246.480
E COR	N	14510895.691	E	2626243.271	ELEV	4246.774
V COR	N	14510928.230	E	2626170.187	ELEV	4246.706



and environment, inc.  
Specialists in the Environment

SWMU B-22a



COMSTOCK  
LAND SURVEYING

777 LA RUE AVENUE, SUITE A  
RENO, NEVADA 89509  
PH. (702) 329-2072

SWMU B22a Survey Data  
Hawthorne Army Depot  
Hawthorne, Nevada

<b>SWMU</b>	<b>Point ID</b>	<b>Northing (feet)</b>	<b>Easting (feet)</b>	<b>Elevation</b>
B22a	HA01	1387599.00	501850.50	4242.157
B22a	CPS01	1387589.00	501819.30	4246.478
B22a	Pin 3	1387589.21	501779.51	4246.706
B22a	Pin 2	1387556.67	501852.59	4246.774
B22a	Pin 1	1387629.76	501885.13	4246.480
B22a	HWAAP-94-1996	1387662.29	501812.04	4247.007

Notes:

Coordinate data based on electronic map file using the NAD 1927 datum.  
Elevation data based on surveyors map using NGVD 1929 datum.

## **Appendix C**

**Metals**  
Method 6010A (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Chromium Total mg/kg	Silver mg/kg	Arsenic mg/kg	Lead mg/kg	Selenium mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	94	<0.5	<0.5	4.4	<1	NA	NA	NA
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	74	<0.51	<0.51	5.2	<1	2.8	2	<0.51
Analyses					2	2	2	2	2	1	1	1
Detections					2	0	0	2	0	1	1	0
Minimum Concentration					74	0	0	4.4	0	2.8	2	0
Maximum Concentration					94	0	0	5.2	0	2.8	2	0
HWAD - PCG					2000	1	20	20	100	100	100	20
HWAD - PCG Hits					0	0	0	0	0	0	0	0

Notes:  
 NA = Not analyzed  
 Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Arsenic  
Method 7060 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Arsenic
					mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	1.6
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	2.8
Analyses					2
Detections					2
Minimum Concentration					1.6
Maximum Concentration					2.8
HWAD - PCG					100
HWAD - PCG Hits					0

Lead  
Method 7421 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Lead mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	1.6
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	2
Analyses					2
Detections					2
Minimum Concentration					1.6
Maximum Concentration					2
HWAD - PCG					100
HWAD - PCG Hits					0

Mercury  
Method 7471 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Mercury
					mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	<0.1
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	<0.1

Analyses	2
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	24
HWAD - PCG Hits	0

**Note:**

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Selenium  
Method 7740 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Selenium mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	<0.5
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	<0.51

Analyses	2
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	20
HWAD - PCG Hits	0

Note:

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives  
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	2,4,6-TNT mg/kg	2,4-Dinitrotoluene mg/kg	2,6-Dinitrotoluene mg/kg	2-Amino-4,6-DNT mg/kg	2-Nitrotoluene mg/kg	3-Nitrotoluene mg/kg	4-Amino-2,6-DNT mg/kg	4-Nitrotoluene mg/kg	HMX mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Analyses</b>													
<b>Detections</b>					2	2	2	2	2	2	2	2	2
<b>Minimum Concentration</b>					0	0	0	0	0	0	0	0	0
<b>Maximum Concentration</b>					0	0	0	0	0	0	0	0	0
<b>HWAD - PCG</b>					233	2.6	80	NE	800	800	NE	800	4000
<b>HWAD - PCG Hits</b>					0	0	0	NE	0	0	NE	0	0

Notes:  
NE = Not established  
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Explosives  
Method 8330 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	m-Dinitrobenzene		Nitrobenzene		RDX		sym-Tritrobenzene		Tetryl	
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
<b>Analyses</b>														
<b>Detections</b>					2	2	2	2	2	2	2	2	2	2
<b>Minimum Concentration</b>					0	0	0	0	0	0	0	0	0	0
<b>Maximum Concentration</b>					0	0	0	0	0	0	0	0	0	0
<b>HWAD - PCG</b>					8	40	64	800	4	800	4	800	4	800
<b>HWAD - PCG Hits</b>					0	0	0	0	0	0	0	0	0	0

Notes:  
NE = Not established  
Zero values listed for maximum and minimum concentrations indicate a no

Picric Acid  
Method 8330M (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Picric Acid mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	<0.25
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	<0.25
Analyses					2
Detections					0
Minimum Concentration					0
Maximum Concentration					0
HWAD - PCG					NE
HWAD - PCG Hits					NE

Notes:

NE = Not established

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

pH  
Method 9045 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	pH
					S.U.
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	NA
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	NA

Analyses	0
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	NE
HWAD - PCG Hits	NE

Notes:

NA = Not analyzed

NE = Not established

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

Nitrate/Nitrite  
Method 9200 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Nitrate-Nitrogen mg/kg
B22A-CPS1-1-011	CPS01	4/4/91	11	ASC	<1
B22A-CPS1-1-007.5	CPS01	6/1/94	7.5	ASC	<1
Analyses					2
Detections					0
Minimum Concentration					0
Maximum Concentration					0
HWAD - PCG					128000
HWAD - PCG Hits					0

**Note:**

Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.

## **Appendix D**

# APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result	
				101@44-B22A-GF001-05-P 99-04595-1	101@44-B22A-GF002-05-P 99-04595-2
<b>NITROAROMATICS AND NITROAMINES</b>					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.24
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.24
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.25	<0.30
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.30
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.30
HMX	8330	mg/kg	0.25	<0.25	<0.30
NITROBENZENE	8330	mg/kg	0.25	<0.25	<0.30
3-NITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.30
RDX	8330	mg/kg	0.25	<0.25	<0.30
TETRYL	8330	mg/kg	0.25	<0.25	<0.30
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.25	<0.30
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.30
2-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.25	<0.30
4-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.25	<0.30

Component Analyzed	Method	Unit	PQL	Analysis Result	
				101@44-B22B-GF001-05-P 99-04595-3	101@44-B22B-GF002-05-P 99-04595-4
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	0.8	0.6
<b>NITROAROMATICS AND NITROAMINES</b>					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.20
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.20	<0.20
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.25	<0.25
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
HMX	8330	mg/kg	0.25	<0.25	<0.25
NITROBENZENE	8330	mg/kg	0.25	<0.25	<0.25
3-NITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
RDX	8330	mg/kg	0.25	<0.25	<0.25
TETRYL	8330	mg/kg	0.25	<0.25	0.06J
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.25	<0.25
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.25	<0.25
2-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.25	<0.25
4-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.25	<0.25

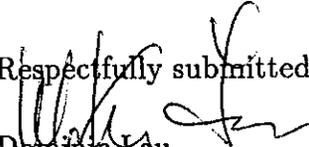
Component Analyzed	Method	Unit	PQL	Analysis Result	
				101@44-B22B-GF003-05-P 99-04595-5	A2-SMB06-S018-P 99-04595-6
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	1	1.7

# APCL Analytical Report

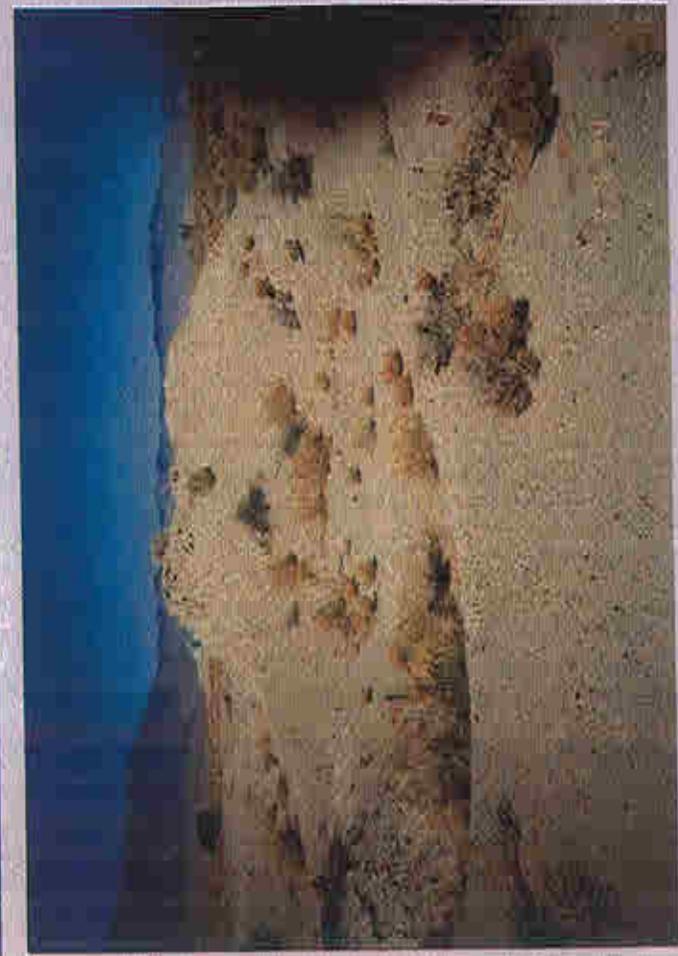
Component Analyzed	Method	Unit	PQL	Analysis Result		
				<del>CS30-SW-02</del> 99-02449-24	<del>CS30-SW-03</del> 99-02449-25	<del>CS30-SW-04</del> 99-02449-26
<b>NITROAROMATICS AND NITROAMINES (a)</b>						
Dilution Factor				1	1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.21	<0.21
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.21	<0.21
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
HMX	8330	mg/kg	0.25	0.32	<0.26	0.26
NITROBENZENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
3-NITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
RDX	8330	mg/kg	0.25	9.05	0.33	0.48
TETRYL	8330	mg/kg	0.25	<0.27	<0.26	<0.26
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.27	<0.26	<0.26

Component Analyzed	Method	Unit	PQL	Analysis Result		
				<del>CS30-SW-05</del> 99-02449-27	SS22-99-01 99-02449-28	SS22-99-02 99-02449-29
<b>MOISTURE</b>	ASTM-D2216	%Moisture	0.5	2.6	1.1	1.4
<b>NITROAROMATICS AND NITROAMINES</b>						
Dilution Factor				1	1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.20	<0.20
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.21	<0.20	<0.20
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
HMX	8330	mg/kg	0.25	<0.26	<0.25	<0.25
NITROBENZENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
3-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
RDX	8330	mg/kg	0.25	<0.26	<0.25	<0.25
TETRYL	8330	mg/kg	0.25	<0.26	<0.25	<0.25
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.26	<0.25	<0.25

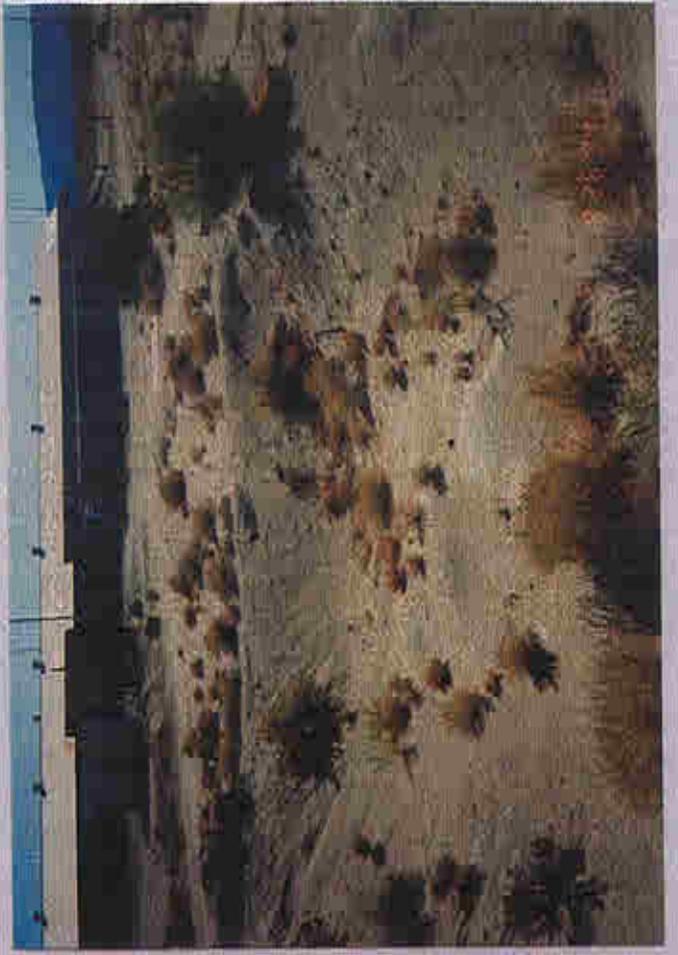
PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit  
 N.D.: Not Detected or less than the practical quantitation limit. " ": Analysis is not required.  
 J: Reported between PQL and MDL.  
 † All results are reported on dry basis for soil samples.  
 Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0  
 (a) Positive results had been confirmed by second column.

Respectfully submitted,  
  
 Dominic Lau  
 Laboratory Director  
 Applied P & Ch Laboratory

## **Appendix E**



SWMU B-22a. Facing northwest towards impoundment with large dredge pile at northwestern end. R1N5. 9/26/94.



SWMU B-22a. Facing southeast inside impoundment. A 3" galvanized steel pipe on southern slope and a 1" steel pipe protruding from base of impoundment. Buildings 101-44 and 101-45 in the background. R1N9. 9/26/94.



**SWMU B-22a FEBRUARY 2000**