Decision Document

Solid Waste Management Unit B-08
Building 101-1 Southwest Catchment Pit
Hawthorne Army Depot
Hawthorne, Nevada

April 2000

Hawthorne Army
Depot

Decision Document SWMU B-08

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ENVIRONMENTAL MANAGEMENT

April 2000

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

26 JUN 2000

James A. Piner
Lt. Colonel, U.S. Army Commanding

State of Nevada

04 August 2000

Paul Liebendorfer
Chief, Bureau of Federal Facilities

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SWMU B-08
Building 101-1 Southwest Catchment Pit
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

1.0 Introduction:

This decision document describes the rationale for the proposed closure of SWMU B-08, building 101-1 southwest 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), was 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 B08 is in the HWAD's central magazine area, on the southeast side of the 101 Production Area (Figure 1-1). SWMU B08 is an inactive, unlined surface catchment pit at the southwest corner of Building 101-1 (Figure 1-2). The catchment pit measures 45 feet wide by 72 feet long and six 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 B08. A brass survey pin on the monument designates the monument number HWAAP-75-1996 and the SWMU

number B08. Three corner pins were set and surveyed to define a 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. Survey data is presented in Appendix B.

3.0 Site Conditions

Soils encountered during E&E's remedial investigation of SWMU B08 were primarily silts, which graded to silty sands beneath the catchment pit. A dark reddish brown coloration was noted in the subsurface soils at this SWMU. However the coloration appeared to be natural, and no obvious evidence of bulk or concentrated explosive contamination (staining) was observed

The USAEHA estimated the depth to ground water in the vicinity of SWMU B08 at approximately 120 feet below ground surface (bgs). During the 1997 first and second quarter ground water monitoring, the depth to ground water (Tt 1997a, 1997b) was measured at 110 feet bgs at well DZB101-13MW8. This well is approximately 1,400 feet crossgradient to the north-northeast of SWMU B08.

Based on the past uses of the pit and observations made during the previous site inspections, the target analytes are explosives and metals.

4.0 Investigations

Site inspections of SWMU B08 were conducted by the USAEHA (1988), Jacobs Engineering (1988), and RAI (1992). During these inspections, evidence of TNT-stained soil was noted in the catchment pit. No investigation activities were conducted during these inspections, and no soil samples were collected at this SWMU. Sampling activities proposed by E&E for the remedial investigation at SWMU B08 included collecting and analyzing surface and subsurface soil samples.

One surface soil sample and one near-surface sample were collected at each hand auger location (HA01 through HA03) within the catchment pit, for a total of six samples. These locations were situated at low points in the pit to assess the potential impact from the explosives wastewater that would tend to accumulate in these areas. The subsurface investigation at SWMU B08 consisted of two CPT soundings with adjacent sample borings on the downgradient side of the catchment pit. Both a CPT sounding boring and a CPT sample boring were drilled at each location, CPS01 and CPS02, shown on Figure 3-1. The soundings at CPS01 and CPS02 were advanced to a total depth of 41 feet and 47 feet, respectively. Analytical results for these samples are included in appendix C.

5.0 Investigation Results

Arsenic (2.8 mg/kg to 6.7 mg/kg), barium (69 mg/kg to 160 mg/kg), total chromium (4.4 mg/kg to 12 mg/kg), and lead (14 mg/kg to 61 mg/kg) were detected in all six surface and near-surface soil samples collected at SWMU B08. Cadmium was detected in both samples at HA03 up to a concentration of 3 mg/kg and in the surface sample at HA01 at a concentration of 1.3 mg/kg. Selenium was detected in HA01 and HA03 at concentrations of 0.74 mg/kg and 0.54 mg/kg, respectively. Beryllium was detected only at HA02 at a

depth of five feet at a concentration of 0.58 mg/kg. No other metals were detected in the surface or near-surface samples collected at this SWMU.

RDX at concentrations ranging from 1.5 mg/kg to 2,500 mg/kg was detected in all six surface and near-surface samples. Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) was detected in all but one of these samples at concentrations ranging from 4.7 mg/kg to 1,500 mg/kg. TNT (1.4 mg/kg to 3.5mg/kg) was detected in two samples, B8-HA1-2-000 and B8-HA1-3-000. 2,4-Dinitrotoluene (DNT) (0.19 mg/kg), 4-amino-2,6-DNT (2.2 mg/kg), and sym-trinitrobenzene (TNB) (0.45 mg/kg) were detected only in sample B8-HA1-3-000. No other explosives were detected in the surface or near-surface samples collected at this SWMU.

Barium, chromium, arsenic, and lead were detected in both subsurface samples at concentrations up to 240 mg/kg, 25 mg/kg, 7.5 mg/kg, and 11 mg/kg, respectively. Beryllium was detected only in CPS01 at a concentration of 0.89 mg/kg. No other metals were detected in the subsurface samples collected at this SWMU.

RDX and sym-TNB were detected only in the sample collected from CPS01 at a depth of 10 feet bgs at concentrations of 4.1 mg/kg and 0.87 mg/kg, respectively. No other explosives were detected in the subsurface samples collected at this SWMU

All of the detected metals concentrations are below the HWAD PCGs for soil. With the exception of lead all metal detections are within the range of background concentrations observed in the Walker Valley. Lead concentrations in three samples exceeded the maximum expected background lead concentration of 16.7 mg/kg. Chromium was detected in one sample at a depth of 10 feet at boring location CPS01, at a concentration of 25 mg/kg, exceeding the PCG of 20 mg/kg and slightly exceeding the background concentration of 13.76 mg/kg. However, elevated chromium concentrations were not detected near the surface where potential releases could have occurred. Based on this data, it appears that the slightly elevated concentration of chromium in the one sample may be a naturally occurring anomaly above the maximum background level. Therefore, there does not appear to have been a release of chromium at SWMU B08 that has impacted the surface or subsurface soils.

RDX was detected in three surface and near-surface samples at concentrations above the PCG of 64 mg/kg. These concentrations ranged from 83 mg/kg to 2,500 mg/kg and were detected at the surface and at five feet below the bottom of the catchment pit. TNT, 2,4-DNT, HMX, and sym-TNB were detected at concentrations that did not exceed their respective PCGs With the exception of total chromium, metal concentrations detected in the two subsurface samples were below their respective PCGs.

All of the explosives detected in the subsurface samples were at concentrations that did not exceed their respective PCGs. However, the surface and near-surface explosives contamination required a remediation effort.

6.0 Remediation

Based on the composting pilot study in April 1998 it was determined that the explosives contaminated soil from SWMU B-08 would be treated by composting.. Composting is a natural process in which microorganisms biologically degrade organic material. For the destruction of the explosives contamination temperatures in the compost must reach between 120° F — 160° F and the system must remain in aerobic conditions. The windrow system of composting was selected as the most efficient and economical to be used at the site. Two hundred and fifty two (252) cubic yards of contaminated soil were removed from B-08 and placed in compost windrows 5B,6B and 8B. Confirmation samples, from the excavated area and finished compost were taken in accordance with the project work plan.

7.0 Remediation Results

Contaminated soil from B-08 was placed into three (3) different windrows at remedeation pad 1. The windrows and the excavated B-08 area were sampled for explosives and the test results are shown in appendix D; along with the windrow temperature graphs. The location of the conformation samples taken in the B-08 excavation area are shown on figure 4. All test results indicated explosives levels below excavation or clean up goals.

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-08 should be closed with the restrictions that no structure be constructed on the SWMU, that the site remain only for industrial use and this information documented on the depot site master plan.

10.0 REFERENCES

Ecology and Environment. 1995. RCRA Facility Assessment Report for 24 Solid Waste Management Units, Hawthorne Army Depot, Hawthorne, Nevada. April 1995.

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_____. 1996. Region IX Preliminary Remediation Goals. USEPA Region IX. August 1996.

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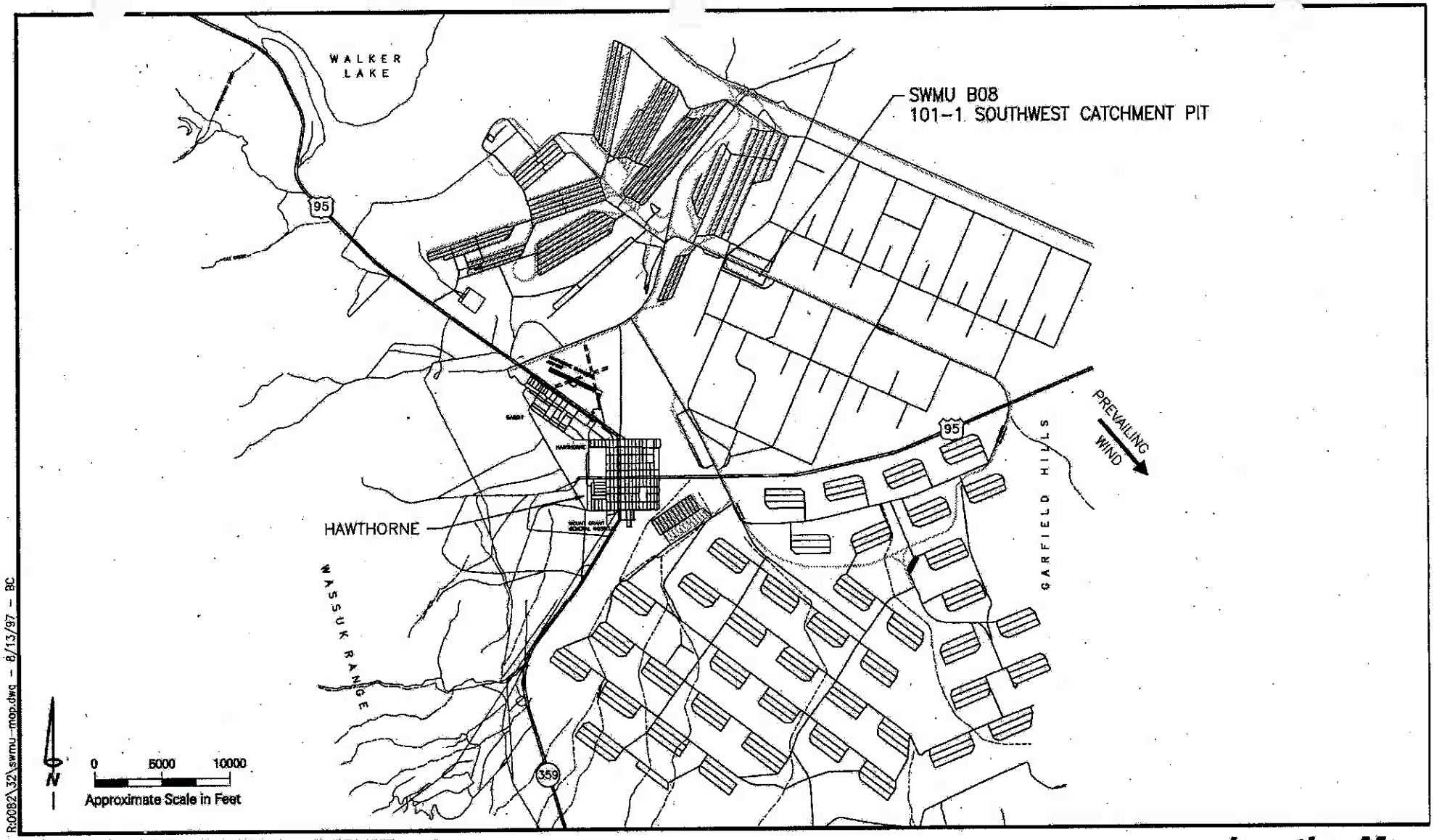


R:0082\32\swmu-map.dwg - 8/13/97 - BC

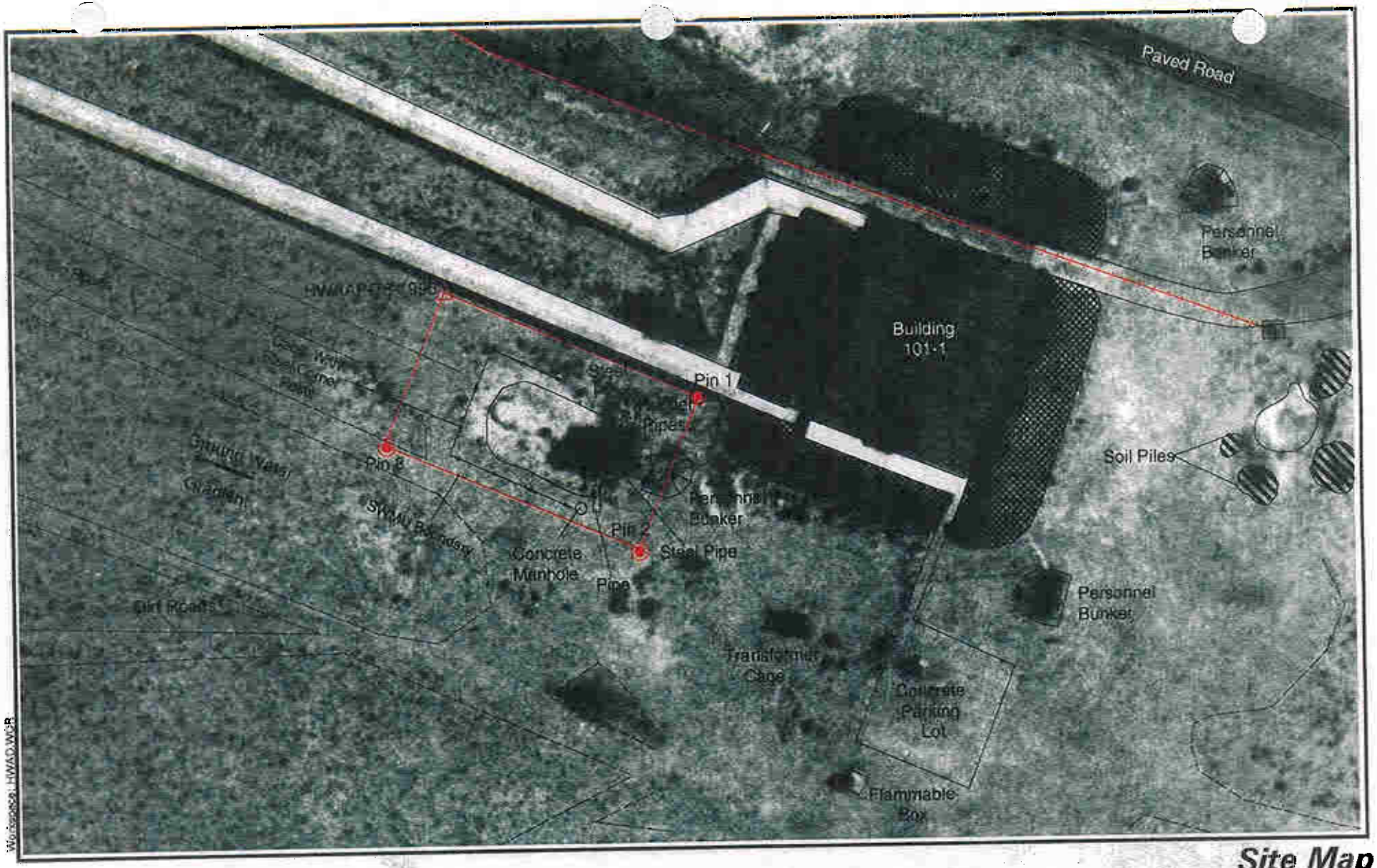
SOURCE: TETRA TECH FINAL DATA PACKAGE, 1996 (REV. 1997)

Location Map
SWMU B08
101-1 Southwest Catchment Pit

Hawthorne Army Depot
Hawthorne, Nevada

Tetra Tech, Inc.

Figure 1-1



Legend:

- Boundary Corner Pin
- Explosion Barrier
- Railroad
- SWMU Monument

N

0 35 70

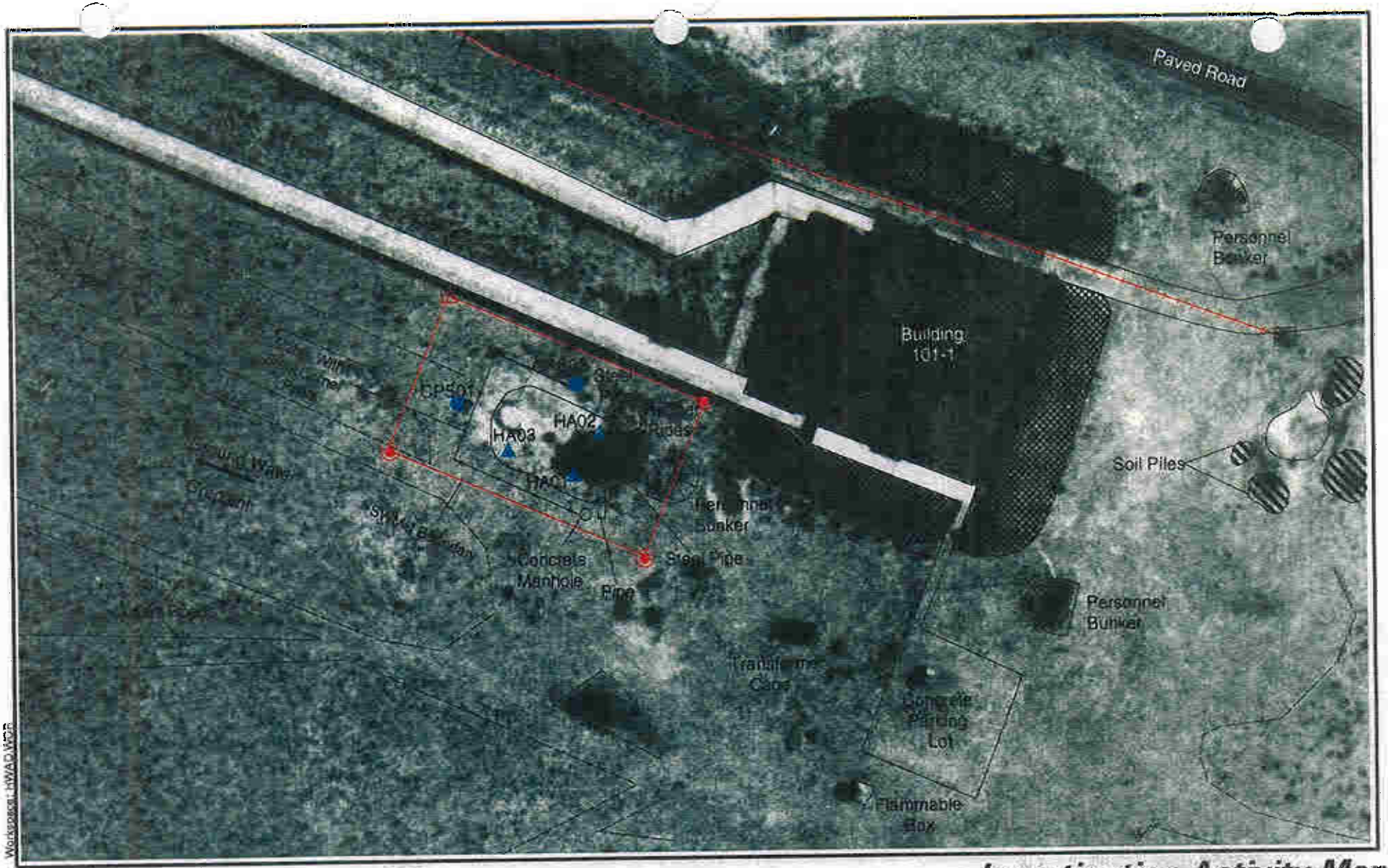
Approximate Scale in Feet

Tetra Tech, Inc.

Site Map
SWMU B08
101-1 Southwest Catchment Pit

Hawthorne Army Depot
Hawthorne, Nevada

Figure 1-2



Legend:

- Boundary Corner Pin
- Hand Auger Location
- Soil Boring Location
- Explosion Barrier
- Railroad
- SWMU Monument

N

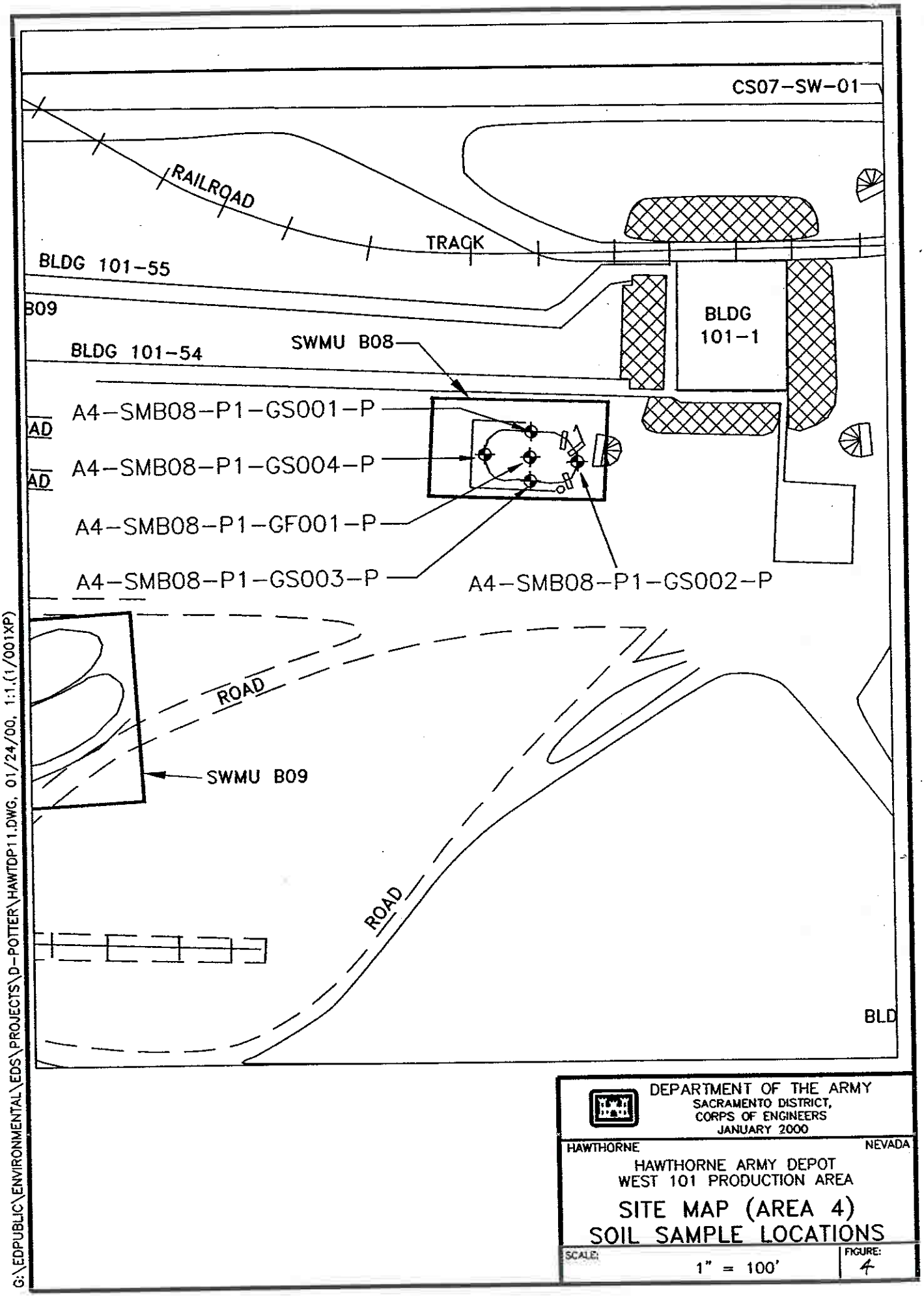
0 35 70
Approximate Scale in Feet

Tetra Tech, Inc.

Investigation Activity Map
SWMU B08
101-1 Southwest Catchment Pit

Hawthorne Army Depot
Hawthorne, Nevada

Figure 3-1


CS07-SW-01
RAILROAD
TRACK
BLDG 101-55
B09
BLDG 101-54
SWMU B08
BLDG 101-1
A4-SMB08-P1-GS001-P
A4-SMB08-P1-GS004-P
A4-SMB08-P1-GF001-P
A4-SMB08-P1-GS003-P
A4-SMB08-P1-GS002-P
ROAD
SWMU B09
ROAD
BLD
DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT,
CORPS OF ENGINEERS
JANUARY 2000
HAWTHORNE
NEVADA
HAWTHORNE ARMY DEPOT
WEST 101 PRODUCTION AREA
SITE MAP (AREA 4)
SOIL SAMPLE LOCATIONS
SCALE:
1" = 100'
FIGURE:
4
G:\EDPUBLIC\ENVIRONMENTAL\EDS\PROJECTS\D-POTTER\HAWTDP11.DWG, 01/24/00, 1:1,(1/001XP)

Appendix A

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

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	16,000	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		-	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	16,000	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		-	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-TCDD	Dioxin	C	0.000005	Calculated Subpart S

[a] RCRA 55 FR 30870

[b] Not available

[c] Highest background concentration detected in 50 background soil samples

[d] Smucker, Stanford J. USEPA Rgion IX, Preliminary Remedial Goals, Second Half, Sep. 1995

[e] Method detection limit for Volatile Organic Compounds by EPA Method 8260 or

Semi-Volatile Organic Compounds analyzed by EPA Method 8270

[f] Nevada Division of Environmental Protection

[g] Cleanup level for PCB spills in accordance with Toxic Substance and Control Act Spill Policy Guidelines 40 CFR 761

Proposed Excavation Goal (PEG's) by Definitive and Screening * Analysis-
Maximum Concentration of Contaminants
In Soil to Be Left in Place at Depth Below the Surface

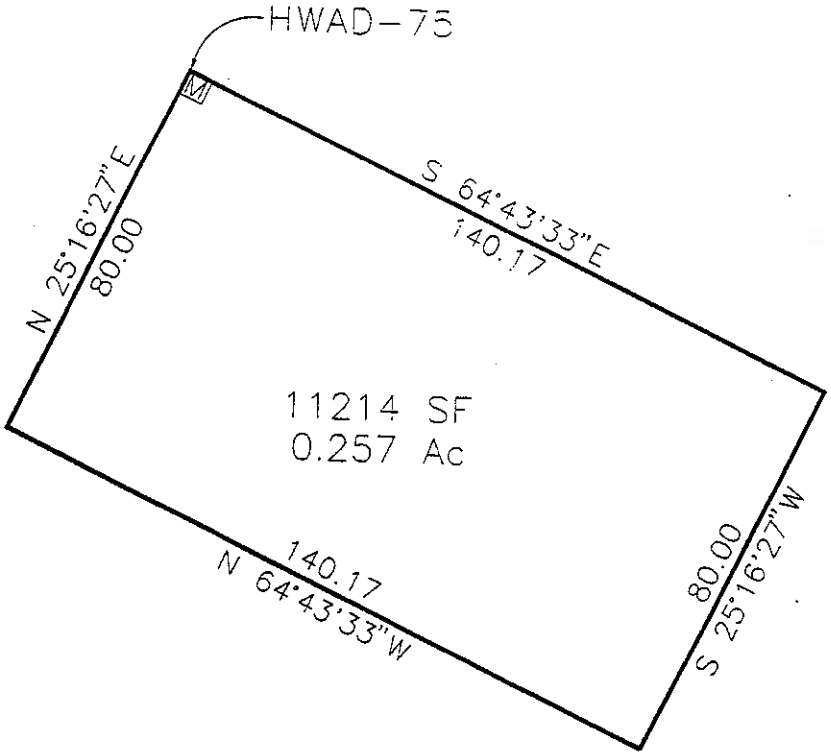
Contaminant	Concentration (mg/kg)
2,4,6,-trinitrotoluene (TNT)	800*
2,4-dinitrotoluene (2,4-DNT)	80
2,6-dinitrotoluene (2,6-DNT)	80
1,3,5-trinitrobenzene (1,3,5-TNB)	150
1,3,-drinitrobenzne (1,3-DNB)	NE
2-amino-4,6dinitrotoluene (2-Am-DNT)	NE
4-amino-2,6-dinitrotoluene (4-Am-DNT)	NE
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	4000
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	300
Picric acid	7.0
Pentachlorophenol	NE
Nitroaromatics/Nitroamines	<30

Clean-up Goals by Screening* and Definitive Analysis

Contaminant	Concentration (mg/kg)
2,4,6,-trinitrotoluene (TNT)	40*
2,4-dinitrotoluene (2,4-DNT)	2.6
2,6-dinitrotoluene (2,6-DNT)	2.6
1,3,5-trinitrobenzene (1,3,5-TNB)	4
1,3,-drinitrobenzne (1,3-DNB)	8
2-amino-4,6dinitrotoluene (2-Am-DNT)	NE
4-amino-2,6-dinitrotoluene (4-Am-DNT)	NE
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	100
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	64
Picric acid	7
Pentachlorophenol	None

NE - not established

Appendix B



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NE COR	N 14512163.413	E 2623455.025	ELEV 4202.530
SE COR	N 14512091.071	E 2623420.869	ELEV 4203.096
SW COR	N 14512150.917	E 2623294.117	ELEV 4201.749

PROFESSIONAL LAND SURVEYOR
STATE OF NEVADA
RICHARD A. STINGFIELD
7/21/97
No. 3631

30 15 0 30 60 90
SCALE IN FEET

ecology and environment, inc.
International Specialists in the Environment

SWMU B-08

COMSTOCK
LAND SURVEYING

SWMU B08 Survey Data
Hawthorne Army Depot
Hawthorne, Nevada

SWMU	Point ID	Northing (feet)	Easting (feet)	Elevation
B08	HA03	1388808.97	498963.49	NE
B08	HA02	1388813.97	499010.39	NE
B08	HA01	1388794.97	498996.09	NE
B08	CPS02	1388837.97	498999.99	NE
B08	CPS01	1388832.97	498938.99	NE
B08	Pin 3	1388811.9	498903.44	4201.749
B08	Pin 2	1388752.05	499030.19	4203.096
B08	Pin 1	1388824.39	499064.34	4202.530
B08	HWAAP-75-1996	1388884.24	498937.59	4202.531

Notes:

NE = Not establised

Coordinate data based on electronic map file using the NAD 1927 datum.

Elevation data based on surveyors plat using NGVD 1929 datum.

Appendix C

Nitrogen
Method 353.2 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Nitrogen Nitrate	Ammonia as Nitrogen
					mg/kg	mg/kg
B8-HA1-1-000	HA01	5/3/94	0.5	ASC	<1	NA
B8-HA1-1-005	HA01	5/3/94	5	ASC	<1.2	NA
B8-HA1-2-000	HA02	5/3/94	0.5	ASC	7.4	NA
B8-HA1-2-005	HA02	5/3/94	5	ASC	2.4	NA
B8-HA1-3-000	HA03	5/3/94	0.5	ASC	18	NA
B8-HA1-3-005	HA03	5/3/94	5	ASC	<1.1	NA
Analyses					6	0
Detections					3	0
Minimum Concentration					2.4	0
Maximum Concentration					18	0
HWAD - PCG					128000	NE
HWAD - PCG Hits					NE	NE

Notes:
NA = Not analyzed
NE = Not established
Zero values listed for maximum and minimum concentrations indicate that the sample was not analyzed for that analyte.

Metals
Method 6010A (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Barium	Beryllium	Cadmium	Chromium Total	Silver	Arsenic	Lead	Selenium
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
B8-HA1-1-000	HA01	5/3/94	0.5	ASC	78	<0.51	<0.51	7.4	<1	NA	30	NA
B8-HA1-1-005	HA01	5/3/94	5	ASC	110	<0.62	1.3	5.5	<1.2	6.4	16	0.74
B8-HA1-2-000	HA02	5/3/94	0.5	ASC	69	<0.51	<0.51	4.4	<1	5.8	14	<0.51
B8-HA1-2-005	HA02	5/3/94	5	ASC	160	0.58	<0.54	7.3	<1.1	2.8	22	<0.54
B8-HA1-3-000	HA03	5/3/94	0.5	ASC	110	<0.53	1.2	12	<1	6.7	61	0.54
B8-HA1-3-005	HA03	5/3/94	5	ASC	110	<0.53	3	5	<1.1	3.2	6.4	<0.53
B8-CPS1-1-010	CPS01	5/22/94	10	ASC	240	0.89	<0.67	25	<1.3	7	11	<0.67
B8-CPS1-2-009	CPS02	5/22/94	9	ASC	190	<0.57	<0.57	9.6	<1.1	7.5	4.6	<0.57
Analyses					8	8	8	8	8	7	8	7
Detections					8	2	3	8	0	7	8	2
Minimum Concentration					69	0.58	1.2	4.4	0	2.8	4.6	0.54
Maximum Concentration					240	0.89	3	25	0	7.5	61	0.74
HWAD - PCG					2000	1	20	20	100	100	100	20
HWAD - PCG Hits					0	0	0	1	0	0	0	0

Notes:

NA = Not analyzed

NE = Not established

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

Metals
Method 7060 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Arsenic
					mg/kg
B8-HA1-1-000	HA01	5/3/94	0.5	ASC	4.8
B8-HA1-1-005	HA01	5/3/94	5	ASC	6.4
B8-HA1-2-000	HA02	5/3/94	0.5	ASC	5.8
B8-HA1-2-005	HA02	5/3/94	5	ASC	2.8
B8-HA1-3-000	HA03	5/3/94	0.5	ASC	6.7
B8-HA1-3-005	HA03	5/3/94	5	ASC	3.2
B8-CPS1-1-010	CPS01	5/22/94	10	ASC	7
B8-CPS1-2-009	CPS02	5/22/94	9	ASC	7.5

Analyses	8
Detections	8
Minimum Concentration	2.8
Maximum Concentration	7.5
HWAD - PCG	100
HWAD - PCG Hits	0

Notes:

NA = Not analyzed

NE = Not established

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

Metals
Method 7421 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Lead
					mg/kg
B8-HA1-3-005	HA03	5/3/94	5	ASC	6.4
B8-CPS1-1-010	CPS01	5/22/94	10	ASC	11
B8-CPS1-2-009	CPS02	5/22/94	9	ASC	4.6

Analyses	3
Detections	3
Minimum Concentration	4.6
Maximum Concentration	11
HWAD - PCG	100
HWAD - PCG Hits	0

Notes:

NA = Not analyzed

NE = Not established

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

Mercury
Method 7471 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Mercury
					mg/kg
B8-HA1-1-000	HA01	5/3/94	0.5	ASC	<0.1
B8-HA1-1-005	HA01	5/3/94	5	ASC	<0.12
B8-HA1-2-000	HA02	5/3/94	0.5	ASC	<0.1
B8-HA1-2-005	HA02	5/3/94	5	ASC	<0.11
B8-HA1-3-000	HA03	5/3/94	0.5	ASC	<0.1
B8-HA1-3-005	HA03	5/3/94	5	ASC	<0.11
B8-CPS1-1-010	CPS01	5/22/94	10	ASC	<0.13
B8-CPS1-2-009	CPS02	5/22/94	9	ASC	<0.11

Analyses	8
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	24
HWAD - PCG Hits	0

Notes:

NA = Not analyzed

NE = Not established

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

Metals
Method 7740 (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Selenium
					mg/kg
B8-HA1-1-000	HA01	5/3/94	0.5	ASC	<0.51
B8-HA1-1-005	HA01	5/3/94	5	ASC	0.74
B8-HA1-2-000	HA02	5/3/94	0.5	ASC	<0.51
B8-HA1-2-005	HA02	5/3/94	5	ASC	<0.54
B8-HA1-3-000	HA03	5/3/94	0.5	ASC	0.54
B8-HA1-3-005	HA03	5/3/94	5	ASC	<0.53
B8-CPS1-1-010	CPS01	5/22/94	10	ASC	<0.67
B8-CPS1-2-009	CPS02	5/22/94	9	ASC	<0.57

Analyses	8
Detections	2
Minimum Concentration	0.54
Maximum Concentration	0.74
HWAD - PCG	20
HWAD - PCG Hits	0

Notes:

NA = Not analyzed

NE = Not established

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

Picric Acid
Method 8330M (ASC)

Sample ID	Location ID	Sample Date	Depth	Lab	Picric Acid
					mg/kg
B8-HA1-1-000	HA01	5/3/94	0.5	ASC	<0.25
B8-HA1-1-005	HA01	5/3/94	5	ASC	<0.25
B8-HA1-2-000	HA02	5/3/94	0.5	ASC	<0.25
B8-HA1-2-005	HA02	5/3/94	5	ASC	<0.25
B8-HA1-3-000	HA03	5/3/94	0.5	ASC	<0.25
B8-HA1-3-005	HA03	5/3/94	5	ASC	<0.25
B8-CPS1-1-010	CPS01	5/22/94	10	ASC	<0.25
B8-CPS1-2-009	CPS02	5/22/94	9	ASC	<0.25

Analyses	8
Detections	0
Minimum Concentration	0
Maximum Concentration	0
HWAD - PCG	7
HWAD - PCG Hits	0

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

Explosives
Method 8330 (CCAS)

Sample ID	Location ID	Sample Date	Depth	Aquifer	2,3-Dinitrotoluene	2,4,6-Trinitrotoluene	2,4-Dinitrotoluene	3,4- and 2,6-Dinitrotoluene	Picric Acid	RDX
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
DZB-101-13-MW4	DZB101-13MW04	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-13-MW4D	DZB101-13MW04	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-13-MW5	DZB101-13MW05	5/23/89	0		<1	<0.2	<0.5	<0.5	3.6	<1
DZB-101-13-MW5D	DZB101-13MW05	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-13-MW8	DZB101-13MW08	5/23/89	0		<1	<0.2	<0.5	<0.5	1.2	<1
DZB-101-13-MW8D	DZB101-13MW08	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-15-MW6	DZB101-15MW06	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-15-MW6D	DZB101-15MW06	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-15-MW7	DZB101-15MW07	5/23/89	0		<1	<0.2	<0.5	<0.5	<0.2	<1
DZB-101-15-MW7D	DZB101-15MW07	5/23/89	0		<1	<0.2	2	<0.5	<0.2	<1
Analyses					10	10	10	10	10	10
Detections					0	0	1	0	2	0
Minimum Concentration					0	0	2	3	1.2	0
Maximum Concentration					0	0	2	3	3.6	0
MCL					NE	NE	NE	NE	1	NE
MCL Hits					NE	NE	NE	NE	2	NE
PRG					NE	0.0022	0.073	NE	NE	0.00061
PRG Hits					NE	0	1	NE	NE	0

Notes:
NA = Not analyzed
NE = Not established
Zero values listed for maximum and minimum concentrations indicate a nondetect value for that analyte.
HWAD Action Level based on guidance from ASTDR and NDEP approval.

Appendix D

SWMU B-08

Confirmation Samples

Applied P & Ch Laboratory
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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR008A-C002-CC002-P 99-03985-7	Analysis Result A3-WR008A-C009-CC002-P 99-03985-8
NITROAROMATICS AND NITROAMINES [a]					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.28	<0.31
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.28	<0.31
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.35	<0.39
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.35	0.40
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.35	<0.39
HMX	8330	mg/kg	0.25	<0.35	<0.39
NITROBENZENE	8330	mg/kg	0.25	<0.35	<0.39
3-NITROTOLUENE	8330	mg/kg	0.25	<0.35	<0.39
RDX	8330	mg/kg	0.25	<0.35	<0.39
TETRYL	8330	mg/kg	0.25	<0.35	<0.39
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	0.2J	<0.39
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.35	<0.39
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.35	<0.39

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR008A-C004-CC002-P 99-03985-9	Analysis Result A4-SMB08-P1-GF001-P 99-03985-10
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	33.5	1.9
NITROAROMATICS AND NITROAMINES [a]					
Dilution Factor				1	5
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.30	<1.0
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.30	<1.0
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.38	<1.3
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.38	<1.3
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.38	<1.3
HMX	8330	mg/kg	0.25	<0.38	14
NITROBENZENE	8330	mg/kg	0.25	<0.38	<1.3
3-NITROTOLUENE	8330	mg/kg	0.25	<0.38	<1.3
RDX	8330	mg/kg	0.25	<0.38	89
TETRYL	8330	mg/kg	0.25	<0.38	<1.3
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.38	<1.3
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.38	1.9
2/4-NITROTOLUENE	8330	mg/kg	0.25	<0.38	<1.3

Component Analyzed	Method	Unit	PQL	Analysis Result A4-SMB08-P1-GS001-P 99-03985-11	Analysis Result A4-SMB08-P1-GS002-P 99-03985-12
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	1.5	1.4

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result A4-SMB08-P1-GS001-P 99-03985-11	Analysis Result A4-SMB08-P1-GS002-P 99-03985-12
NITROAROMATICS AND NITROAMINES [a]					
Dilution Factor				5	10
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<1.0	<2.0
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<1.0	<2.0
1,3-DINITROBENZENE	8330	mg/kg	0.25	<1.3	<2.5
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5
HMX	8330	mg/kg	0.25	10	22
NITROBENZENE	8330	mg/kg	0.25	<1.3	<2.5
3-NITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5
RDX	8330	mg/kg	0.25	56	178
TETRYL	8330	mg/kg	0.25	<1.3	<2.5
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<1.3	<2.5
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	1.4	46
2/4-NITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5

Component Analyzed	Method	Unit	PQL	Analysis Result A4-SMB08-P1-GS003-P 99-03985-13	Analysis Result A4-SMB08-P1-GS004-P 99-03985-14
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	1.5	0.8
NITROAROMATICS AND NITROAMINES [a]					
Dilution Factor				5	10
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<1.0	<2.0
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<1.0	<2.0
1,3-DINITROBENZENE	8330	mg/kg	0.25	<1.3	<2.5
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5
HMX	8330	mg/kg	0.25	10	55
NITROBENZENE	8330	mg/kg	0.25	<1.3	<2.5
3-NITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5
RDX	8330	mg/kg	0.25	98	134
TETRYL	8330	mg/kg	0.25	<1.3	<2.5
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<1.3	<2.5
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	1.4	1J
2/4-NITROTOLUENE	8330	mg/kg	0.25	<1.3	<2.5

Component Analyzed	Method	Unit	PQL	Analysis Result A4-SMB09-P1-GP001-P 99-03985-15	Analysis Result A4-SMB09-P1-GS001-P 99-03985-16
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	1.1	0.8

SWMU B-08

Windrow Compost Samples

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR005B-C001CC002P 99-04686-7	Analysis Result A3-WR005B-C002CC002P 99-04686-8
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	0.90	<0.26
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.26
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.32
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.32
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.32
HMX	8330	mg/kg	0.25	5.3	0.46
NITROBENZENE	8330	mg/kg	0.25	<0.31	<0.32
3-NITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.32
RDX	8330	mg/kg	0.25	<0.31	0.3J
TETRYL	8330	mg/kg	0.25	<0.31	<0.32
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.32
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.32
2-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.31	<0.32
4-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.31	<0.32

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR005B-C003CC002P 99-04686-9	Analysis Result A3-WR005B-C004CC002P 99-04686-10
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	20.1	18.3
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	0.4	<0.24
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	0.2J	<0.24
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
HMX	8330	mg/kg	0.25	2.0	0.2J
NITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
3-NITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
RDX	8330	mg/kg	0.25	0.2J	<0.31
TETRYL	8330	mg/kg	0.25	<0.31	<0.31
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	0.08J	<0.31
2-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.31	<0.31
4-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.31	<0.31

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR006B-C001CC002P 99-04686-11	Analysis Result A3-WR006B-C002CC002P 99-04686-12
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	17.4	17.8

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APCL Analytical Report

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR006B-C001CC002P 99-04686-11	Analysis Result A3-WR006B-C002CC002P 99-04686-12
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.24	<0.24
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.24	<0.24
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.30	<0.30
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.30	<0.30
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.30	<0.30
HMX	8330	mg/kg	0.25	<0.30	<0.30
NITROBENZENE	8330	mg/kg	0.25	<0.30	<0.30
3-NITROTOLUENE	8330	mg/kg	0.25	<0.30	<0.30
RDX	8330	mg/kg	0.25	<0.30	<0.30
TETRYL	8330	mg/kg	0.25	<0.30	<0.30
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	<0.30	<0.30
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.30	<0.30
2-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.30	<0.30
4-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.30	<0.30

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR006B-C003CC002P 99-04686-13	Analysis Result A3-WR006B-C004CC002P 99-04686-14
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	19.3	20.2
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.25
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.25
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
HMX	8330	mg/kg	0.25	0.84	<0.31
NITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
3-NITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
RDX	8330	mg/kg	0.25	<0.31	<0.31
TETRYL	8330	mg/kg	0.25	<0.31	<0.31
1,3,5 TRINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
2-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.31	<0.31
4-NITROTOLUENE (a)	8330	mg/kg	0.25	<0.31	<0.31

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR006B-C006CC002P 99-04686-15
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	22.0

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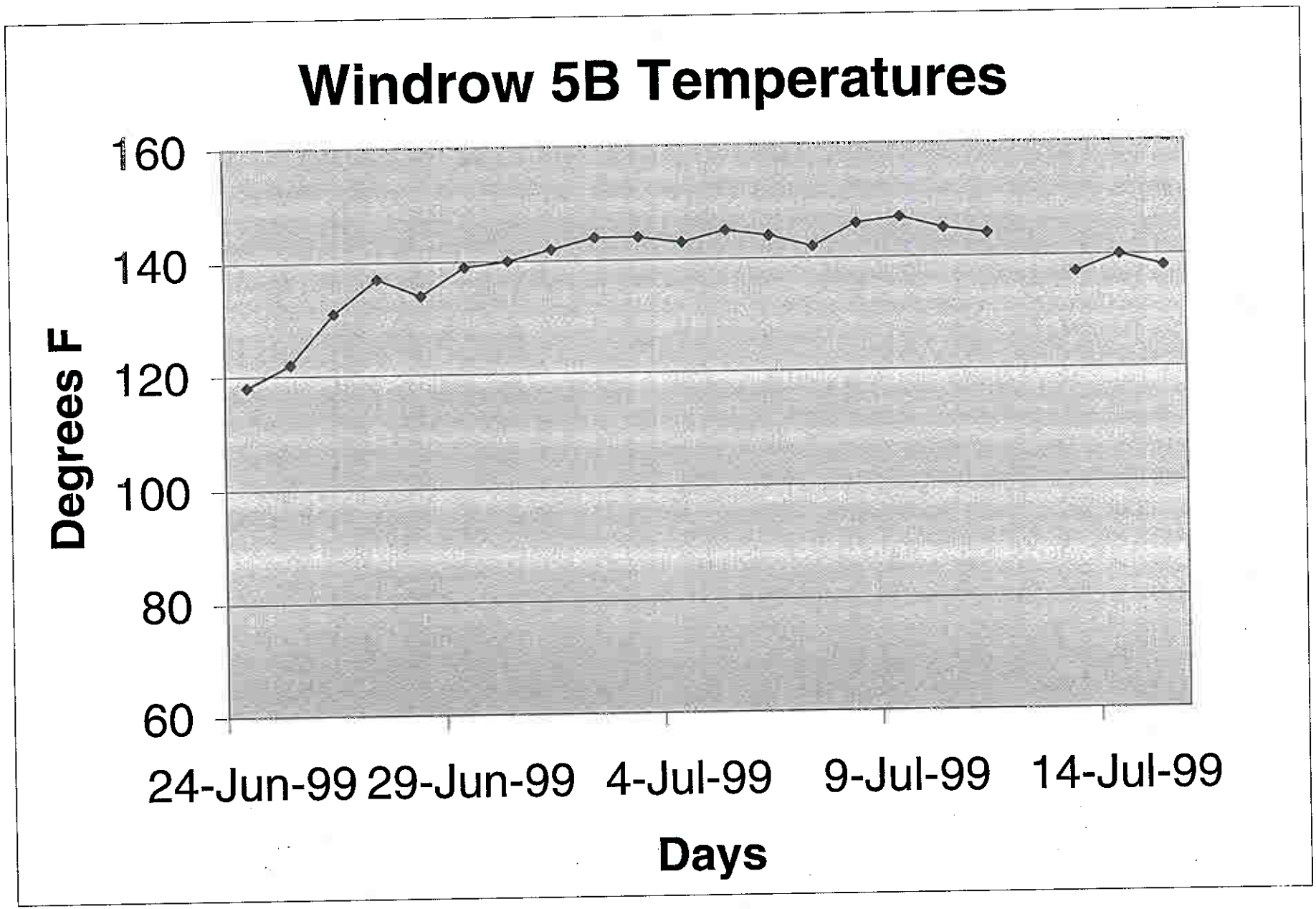
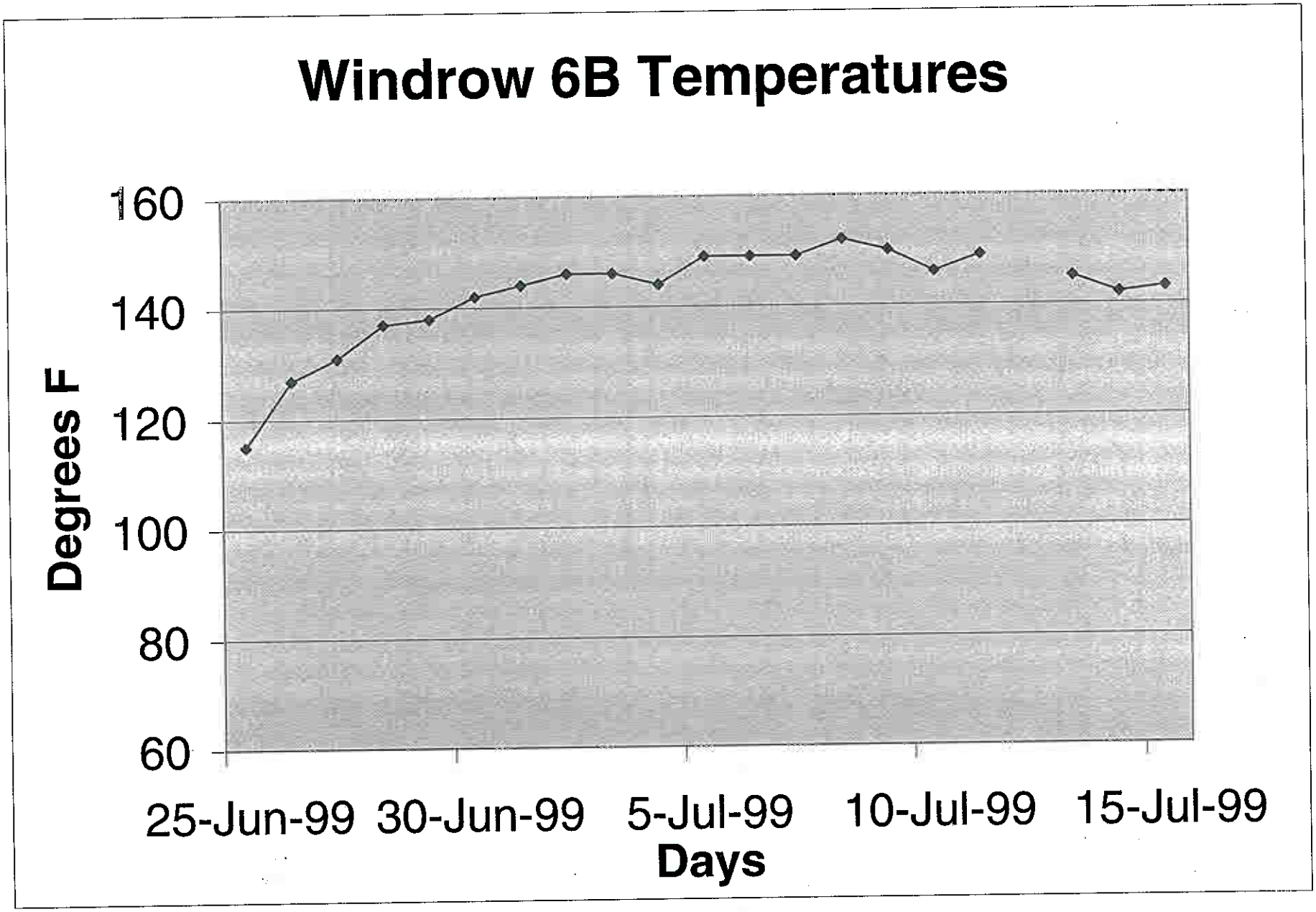
APCL Analytical Report

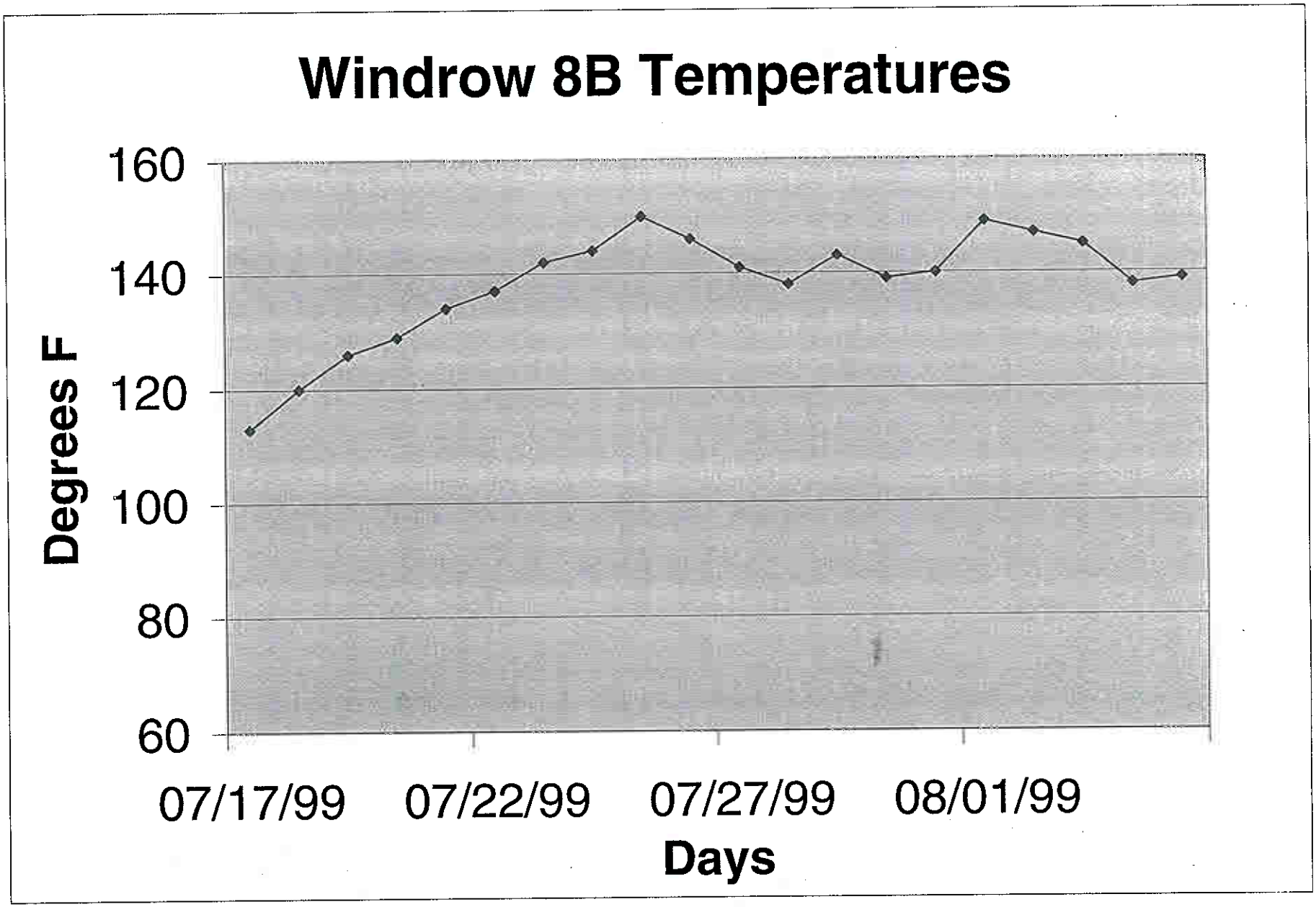
Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR008B-C001-CC002-P 99-05079-11	Analysis Result A3-WR008B-C002-CC002-P 99-05079-12
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.25
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.25
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
HMX	8330	mg/kg	0.25	0.62	<0.31
NITROBENZENE	8330	mg/kg	0.25	<0.31	<0.31
3-NITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.31
RDX	8330	mg/kg	0.25	<0.31	<0.31
TETRYL	8330	mg/kg	0.25	<0.31	<0.31
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	0.1J	<0.31
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	0.2J	0.2J
2-NITROTOLUENE	8330	mg/kg	0.25 [a]	<0.31	<0.31
4-NITROTOLUENE	8330	mg/kg	0.25 [a]	<0.31	<0.31

Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR008B-C003-CC002-P 99-05079-14	Analysis Result A3-WR008B-C004-CC002-P 99-05079-14
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	19.6	15.9
NITROAROMATICS AND NITROAMINES					
Dilution Factor				1	1
4-AMINO-2,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.24
2-AMINO-4,6-DINITROTOLUENE	8330	mg/kg	0.2	<0.25	<0.24
1,3-DINITROBENZENE	8330	mg/kg	0.25	<0.31	<0.30
2,4-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.30
2,6-DINITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.30
HMX	8330	mg/kg	0.25	<0.31	<0.30
NITROBENZENE	8330	mg/kg	0.25	<0.31	<0.30
3-NITROTOLUENE	8330	mg/kg	0.25	<0.31	<0.30
RDX	8330	mg/kg	0.25	<0.31	<0.30
TETRYL	8330	mg/kg	0.25	<0.31	<0.30
1,3,5-TRINITROBENZENE	8330	mg/kg	0.25	0.3J	<0.30
2,4,6-TRINITROTOLUENE	8330	mg/kg	0.25	0.46	0.54
2-NITROTOLUENE	8330	mg/kg	0.25 [a]	<0.31	<0.30
4-NITROTOLUENE	8330	mg/kg	0.25 [a]	<0.31	<0.30

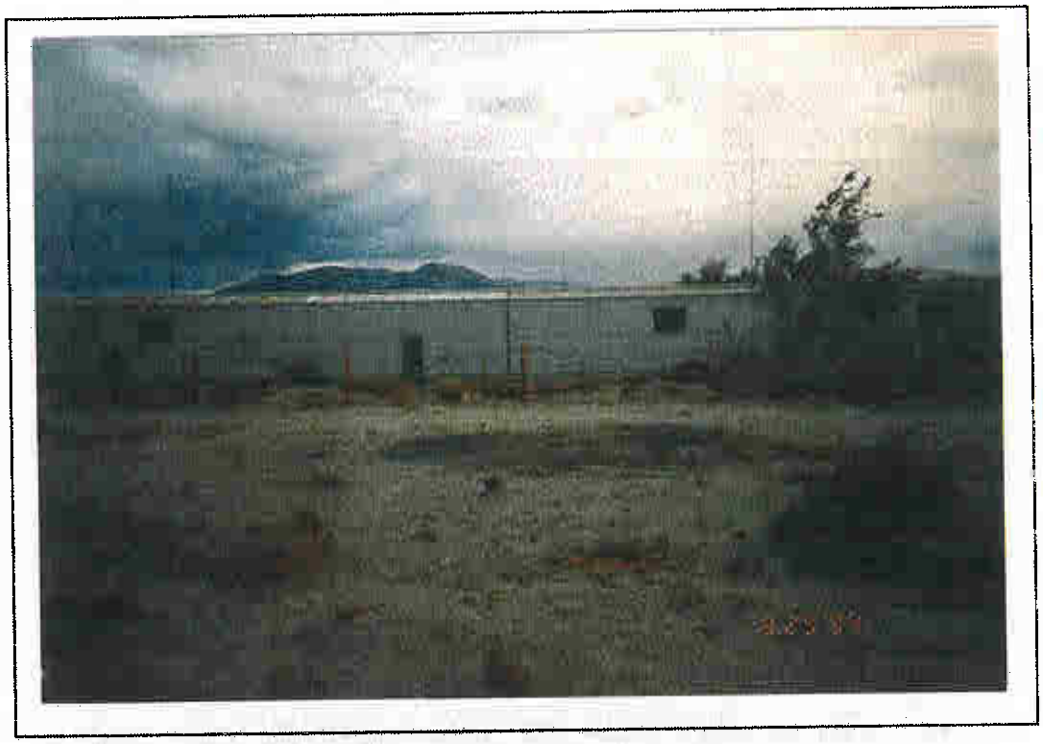
Component Analyzed	Method	Unit	PQL	Analysis Result A3-WR008B-C005-CC002-P 99-05079-15	Analysis Result A6-151099-CHUTE0003-2P 99-05079-16
MOISTURE, PERCENT IN SOIL	ASTM-D2216	%Moisture	0.5	18.0	1.9


Windrow 5B Temperatures
160
140
120
100
80
60
Degrees F
24-Jun-99
29-Jun-99
4-Jul-99
9-Jul-99
14-Jul-99
Days


Windrow 6B Temperatures
160
140
120
100
80
60
Degrees F
25-Jun-99
30-Jun-99
5-Jul-99
10-Jul-99
15-Jul-99
Days


Windrow 8B Temperatures
160
140
120
100
80
60
Degrees F
07/17/99
07/22/99
07/27/99
08/01/99
Days

Appendix E



B08, Facing northeast towards impoundment with Bldg. 101-54 in background. #R6-N13, 9/29/94

B08, Facing southeast towards impoundment. Building 101-54 to the west of impoundment. #R6-N14, 9/29/94

SWMU B-08 September 1999