# Decision Document

Solid Waste Management Unit B-16
Building 101-18 Catchment Pit
Hawthorne Army Depot
Hawthorne, Nevada

**August 2000**

Hawthorne Army Depot

# Decision Document SWMU B-16

August 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**

19 SEP 2000

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

**State of Nevada**

20 April 2001

Paul Liebendorfer
Chief, Bureau of Federal Facilities

# Decision Document

Solid Waste Management Unit B-16
Building 101-18 Catchment Pit
Hawthorne Army Depot
Hawthorne, Nevada

**August 2000**

Hawthorne Army
Depot

# Decision Document
# SWMU B-16
# Building 101-30 Production Area
## HAWTHORNE ARMY DEPOT
## HAWTHORNE, NEVADA

## 1.0 Introduction:

This decision document describes the rationale for the proposed closure of SWMU B-16, building 101-30 Production Area, 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).

Ecology and Environmental, Inc. (E&E), 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 B-16 is in the HWAD's central magazine area, on the northwest building 101-18 (Figures 1, 2). SWMU B-16 is an inactive, unlined surface catchment. The catchment pit measured 33 feet wide by 60 feet long and six feet deep, although it was partially filled with windblown sand and the side walls were eroded.

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 B-16. A brass survey pin on the monument designates the monument number HWAAP-86-1996 and the SWMU

number B-16. Three corner pins were set and surveyed to define a SWMU boundary, with the monument as the northwest corner. The coordinates for the monumnet are:

| | |
|---|---|
| Northing | 14,514,086.417 |
| Easting | 2,622,419.984 |

## 3.0 Site Conditions

The soils encountered during the investigation of SWMU B16 consisted of brown and tan sandy silts. US Army Environmental Hygiene Agency (USAEHA) estimated the depth to ground water in the vicinity of SWMU B16 at approximately 120 feet below ground surface (bgs) (USAEHA 1988). From the site inspections the contaminates of concern were explosives and metals.

## 4.0 Investigations

Site inspections of SWMU B16 were conducted by the USAEHA (1988), Jacobs Engineering (1988), and Resource Applications Incorporated (RAI 1992). During these inspections, evidence of TNT-stained soils was noted in the impoundment.No investigation activities were conducted during these inspections, and no soil samples were collected at this SWMU. In 1994 E&E conducted a Remedial Facilities Assessment (RFA)of B-16. The assessment included two surface samples, two hand auger borings to 5 feet, and one CPT boring. The samples generated from this investigation were analysied for explosives and metals. The 1997 sampling activities proposed by E&E for the Remedial Facilities Investigation (RFI) at SWMU B-16 included collecting and analyzing surface and subsurface soil samples. E&E collected eigth surface soil samples from eight different locations in the SWMU. In addtiton E&E completed three soil borings to a depth of 50 feet and collected a total of fifteen subsurface soil samples. Sample locations for the RFA and RFI are shown in figure 3-1.

per internal conversations spelling errors do not change meaning ok to leave. cords could not get it right on 2 figs.

## 5.0 Investigation Results

The metals detected in 1994 had maximum concentrations as follows:

| | |
|---|---|
| As | 3.8 ppm |
| Ba | 120 ppm |
| Ca | 0.58 ppm |
| Cr (total) | 4.7 ppm |
| Pb | 17 ppm |

These numbers indicated that all of the detected metal were below background levels and therefore, there appears to be no release of metals at the site .

Both the 1994 and 1997 investigation encountered high levels of explosives in the soil. Appendix C shows the results of the investigations. Surface soil concentrations of explosives from the 1997 remedial investigation were:

| | |
|---|---|
| 2,4,6 TNT | 5,600 ppm |
| RDX | 1,200 ppm |
| HMX | 310 ppm |

It was concluded in the RFI that there was a release of explosives in the SWMU that exceeded the action levels set by NDEP.

## 6.0 Remediation

The explosives contaminated soil from SWMU B-16 was treated by windrow 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. Six hundred and fifty-four (654) cubic yards of contaminated soil was removed from B-16 and placed in compost windrows. The RI report estimated that 5,800 cubic yards of contaminated soil were in the pit. However, the contamination was localized in only one area of the pit and not through out the area as was expected. 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-16 was placed into four (4) different windrows at remediation pad 1(windrows 7B, 8B, 2C and 5C). After the treatment process the windrows were sampled for explosives and the test results are shown in appendix D; along with the windrow temperature graphs. The location of the confirmation samples taken in the B-16 excavation area are shown in figure 4 with the analytical results of these tests also shown in appendix D.

## 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

The contaminated soil has been removed from SWMU B-16 and has been treated in the composting windrows to levels below clean up goals. SWMU B-16 should be closed with the restrictions that no structure be constructed on the SWMU, that the site remain only for industrial use and documented on the depot site master plan.

## 10.0 REFERENCES


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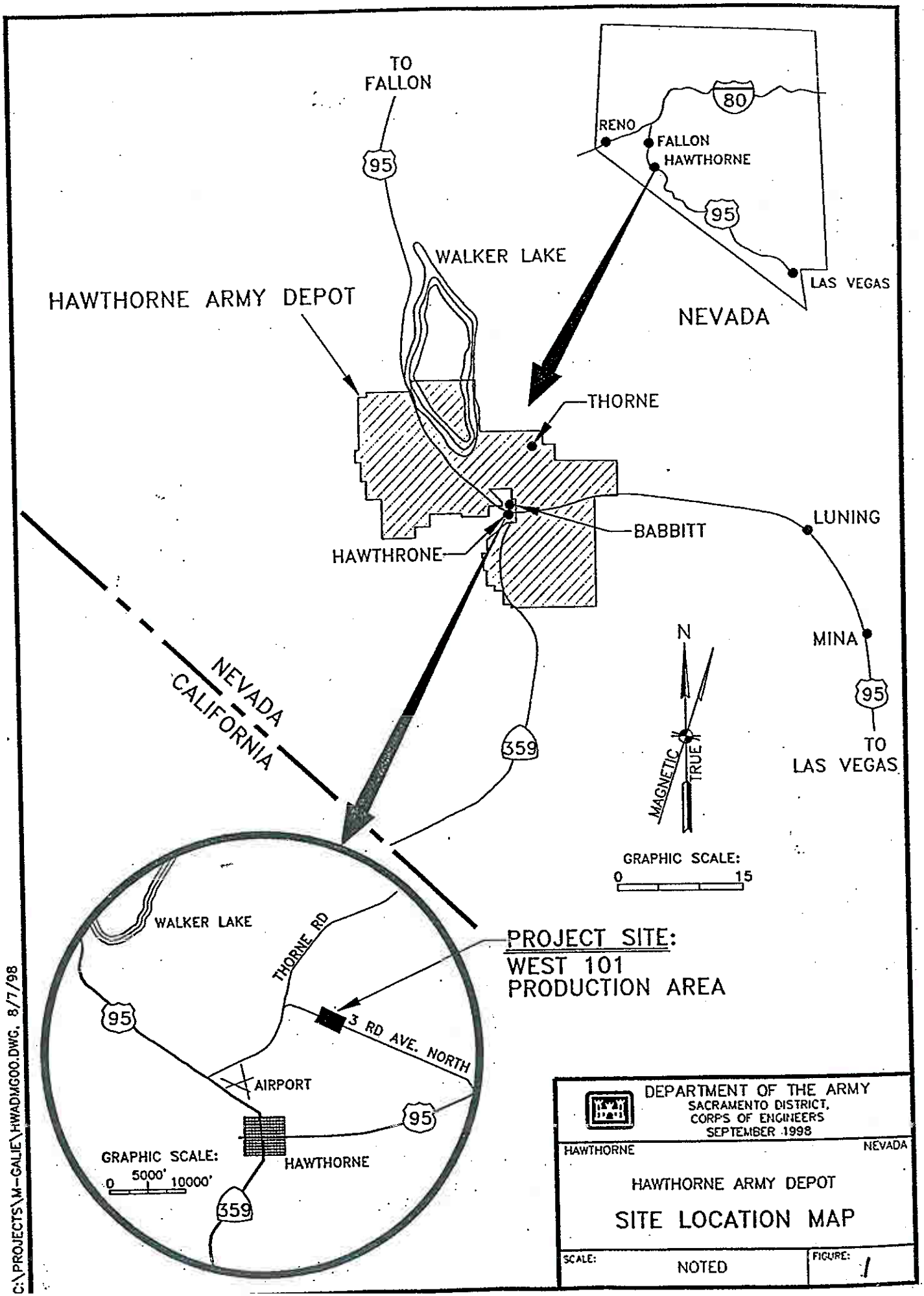
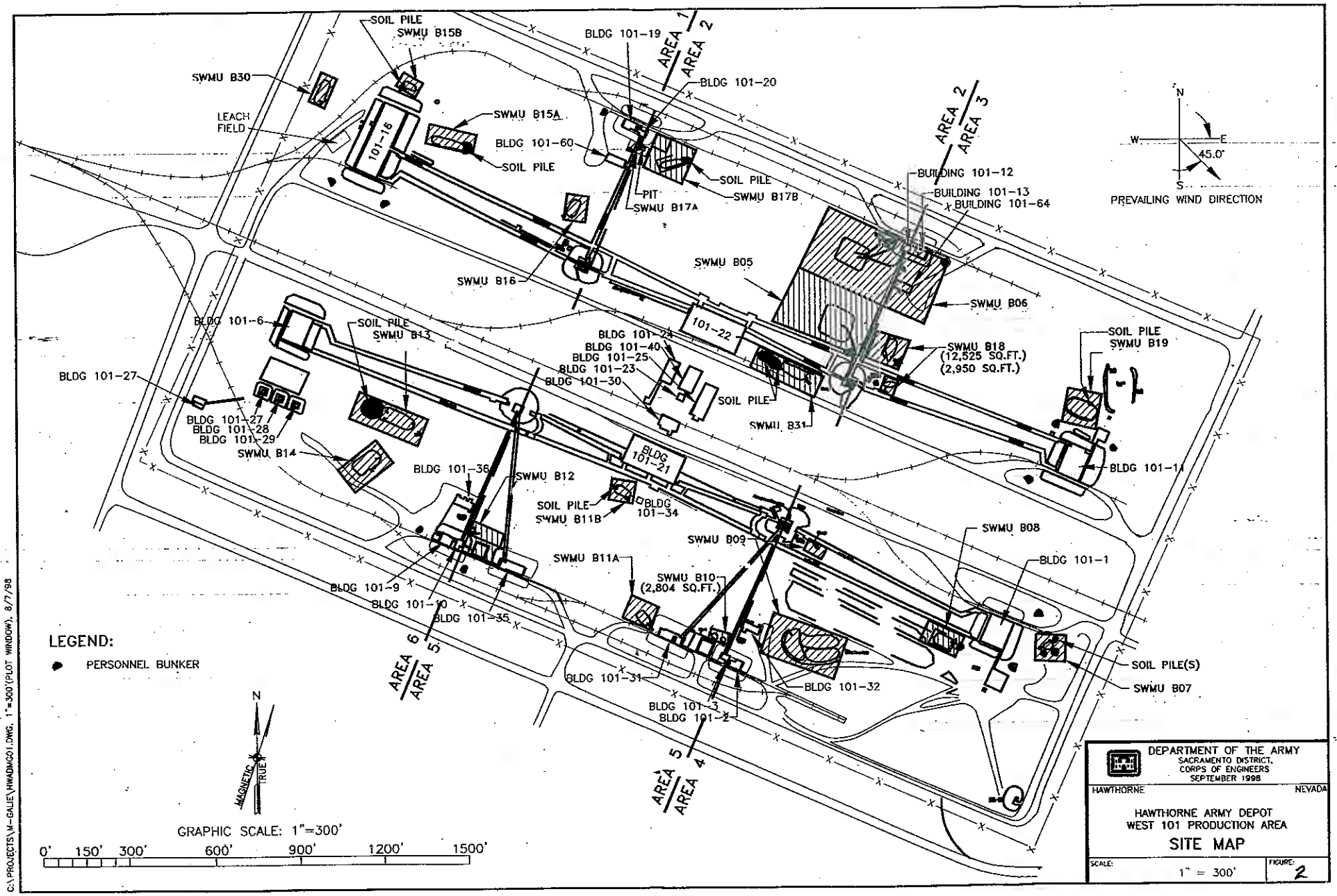

TO FALLON
95
WALKER LAKE
HAWTHORNE ARMY DEPOT
THORNE
BABBITT
HAWTHRONE
LUNING
MINA
95
TO LAS VEGAS
359
NEVADA
CALIFORNIA
N
MAGNETIC
TRUE
GRAPHIC SCALE:
0
15
80
RENO
FALLON
HAWTHORNE
95
LAS VEGAS
NEVADA
WALKER LAKE
THORNE RD
95
3 RD AVE. NORTH
AIRPORT
95
HAWTHORNE
GRAPHIC SCALE:
0
5000'
10000'
359
PROJECT SITE:
WEST 101
PRODUCTION AREA
DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT,
CORPS OF ENGINEERS
SEPTEMBER 1998
HAWTHORNE
NEVADA
HAWTHORNE ARMY DEPOT
SITE LOCATION MAP
SCALE:
NOTED
FIGURE:
1
C:\PROJECTS\M-GALIE\HWADMGOO.DWG, 8/7/98


SOIL PILE
SWMU B15B
SWMU B30
LEACH FIELD
101-16
SWMU B15A
BLDG 101-60
SOIL PILE
BLDG 101-19
AREA 1 / AREA 2
BLDG 101-20
PIT
SWMU B17A
SOIL PILE
SWMU B17B
SWMU B16
SWMU B05
AREA 2 / AREA 3
BUILDING 101-12
BUILDING 101-13
BUILDING 101-64
SWMU B06
N
W
E
S
45.0°
PREVAILING WIND DIRECTION
BLDG 101-6
SOIL PILE
SWMU B13
BLDG 101-27
BLDG 101-27
BLDG 101-28
BLDG 101-29
SWMU B14
101-22
BLDG 101-24
BLDG 101-40
BLDG 101-25
BLDG 101-23
BLDG 101-30
SOIL PILE
SWMU B31
SWMU B18
(12,525 SQ.FT.)
(2,950 SQ.FT.)
SOIL PILE
SWMU B19
BLDG 101-11
BLDG 101-36
SWMU B12
BLDG 101-21
SOIL PILE
SWMU B11B
BLDG 101-34
SWMU B09
SWMU B08
SWMU B11A
SWMU B10
(2,804 SQ.FT.)
BLDG 101-1
BLDG 101-9
BLDG 101-10
BLDG 101-35
AREA 5 / AREA 6
BLDG 101-31
BLDG 101-32
BLDG 101-3
BLDG 101-2
AREA 4 / AREA 5
SOIL PILE(S)
SWMU B07
LEGEND:
PERSONNEL BUNKER
N
MAGNETIC
TRUE
GRAPHIC SCALE: 1"=300'
0' 150' 300' 600' 900' 1200' 1500'
DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT,
CORPS OF ENGINEERS
SEPTEMBER 1998
HAWTHORNE
NEVADA
HAWTHORNE ARMY DEPOT
WEST 101 PRODUCTION AREA
SITE MAP
SCALE:
1" = 300'
FIGURE:
2
C:\PROJECTS\M-GALE\HWADMG01.DWG, 1"=300'(PLOT WINDOW), 8/7/98

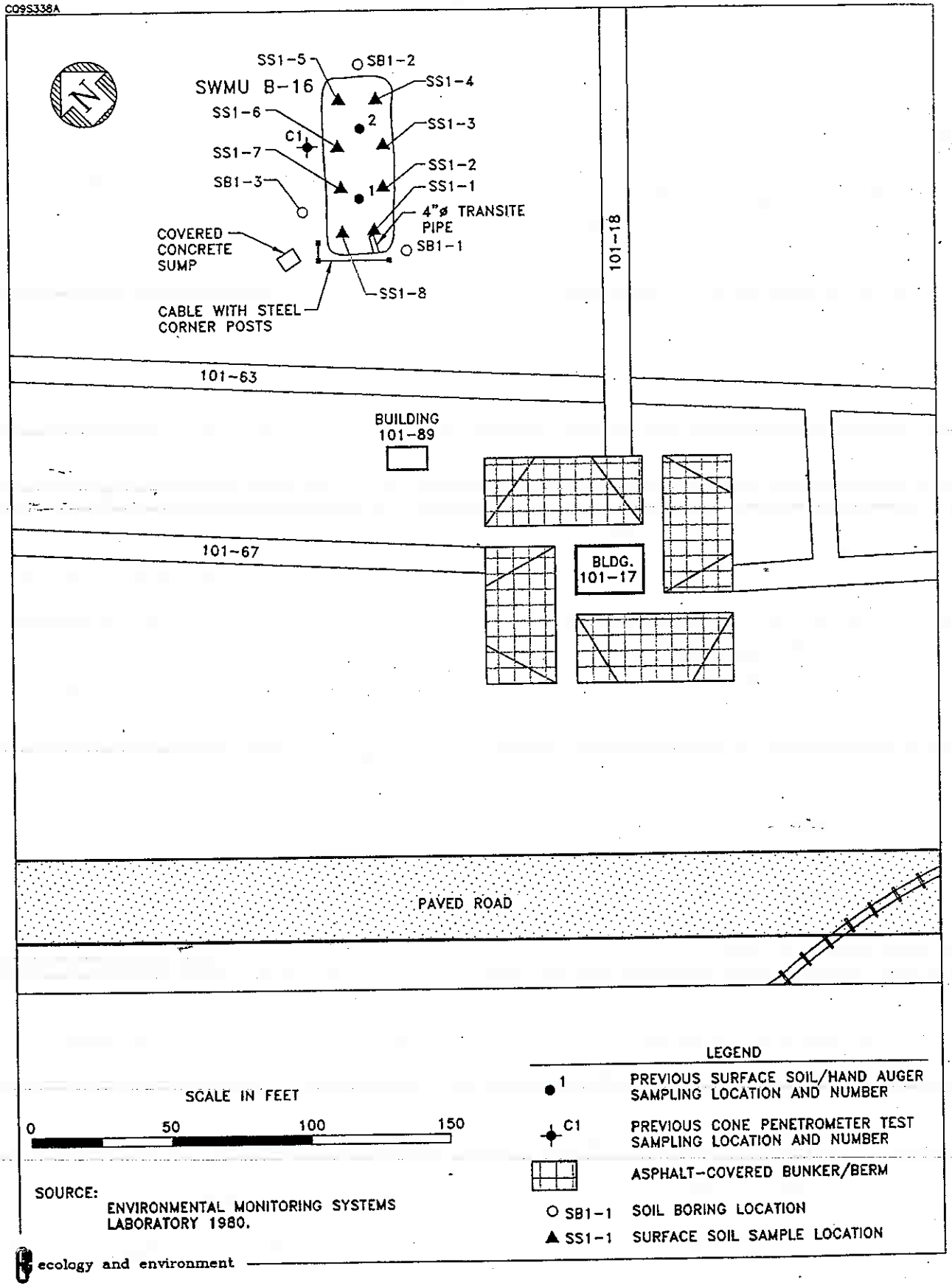
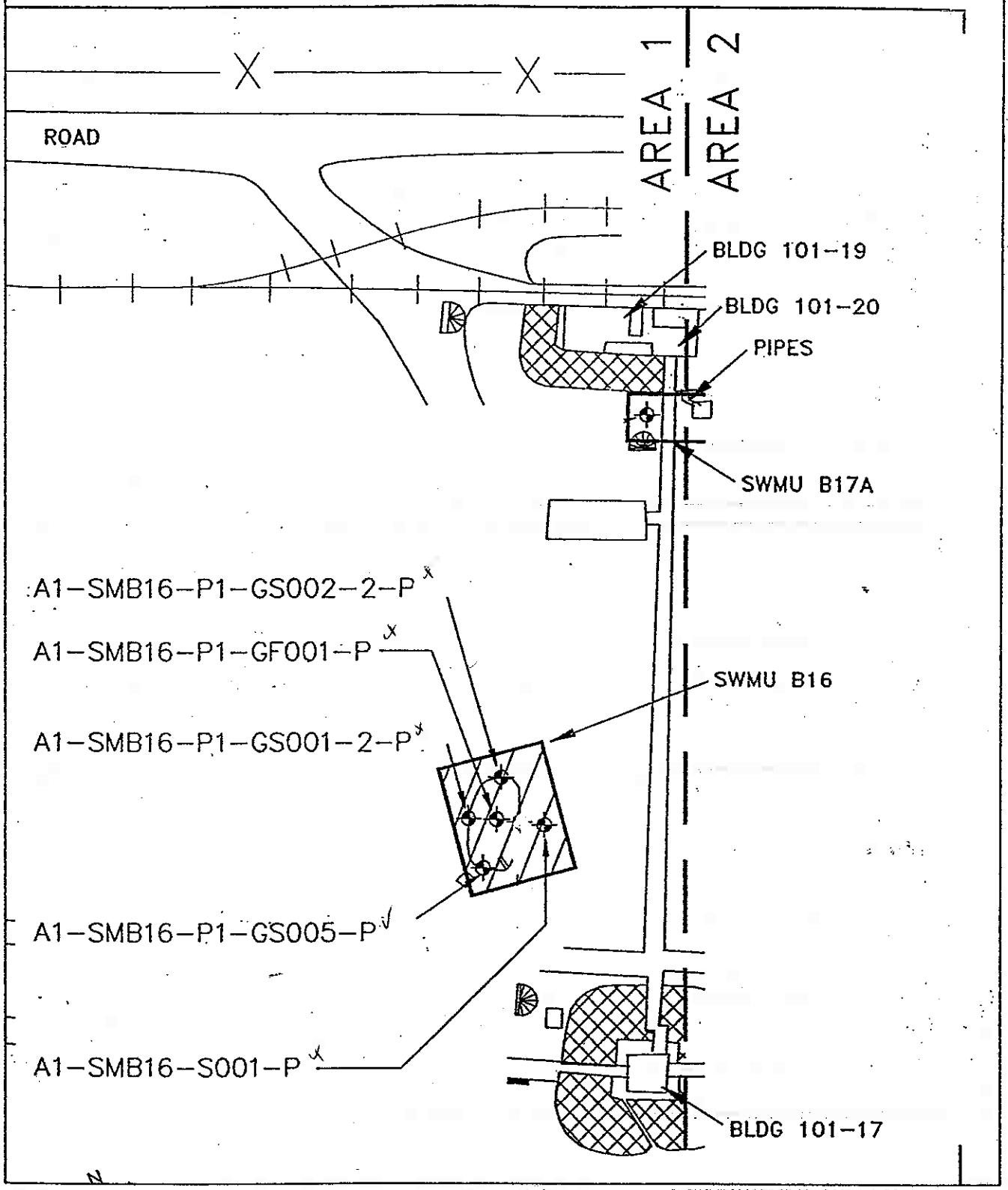



Figure 3-1 SAMPLE LOCATIONS AT SWMU B-16
101-18 CATCHMENT PIT
HAWTHORNE ARMY DEPOT

Plotted: 1/30/




DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT,
CORPS OF ENGINEERS
JANUARY 2000

HAWTHORNE NEVADA

HAWTHORNE ARMY DEPOT
WEST 101 PROJECTION AREA

SITE MAP (AREA 1)-
SOIL SAMPLE LOCATIONS

SCALE: 1" = 100'

FIGURE: 4

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# 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

This Appendix

Not

Used

# Appendix C

## Table 3-2

### SWMU B-16
### RFA ANALYTICAL RESULTS
### HAWTHORNE ARMY DEPOT
### HAWTHORNE, NEVADA
### mg/kg (ppm)

| Sample No./ Parameter | B-16 HA1-1-000 | B-16 HA1-1-005 | B-16 HA1-2-000 | B-16 CPS1-1-011 | B-16 CPS1-1-016 |
|---|---|---|---|---|---|
| Sample Depth (feet) | 0.5 - 1.0 | 5.0 - 5.5 | 0.5 - 1.0 | 10.5 - 11.5 | 16.0 - 17.0 |
| Nitrate-nitrogen | 18 | 7.3 | 9.7 | ND | 4.4 |
| **Metals** | | | | | |
| Arsenic (Method 7060) | 1.9 | 0.53 | 3.8 | 1.7 | 1.1 |
| Barium (Method 6010) | 42 | 41 | 99 | 120 | 69 |
| Cadmium (Method 6010) | 0.58 | ND | ND | ND | ND |
| Chromium (total) (Method 6010) | 3.7 | 2.8 | 4.7 | 4.4 | 3.8 |
| Lead (Method 7421) | 17 | 2.0 | 8.4 J | 2.5 | 1.3 |
| **Nitroaromatics (Method 8330)** | | | | | |
| HMX | 310 X | ND | ND | 2.4 | 7.8 |
| RDX | 1,200 | 35 X | 32 X | 5.2 | 30 X |
| 1,3,5-TNB | 9.9 J | 130 J | 52 XJ | 4.3 | 210 |
| 1,3-DNB | ND | 2.2 | 3.2 | ND | ND |
| Nitrobenzene | 1.8 | ND | ND | ND | ND |
| 2,4,6-TNT | 5,600 | 770 | 250 | 0.50 J | 790 |

## Table 3-2

**SWMU B-16**
**RFA ANALYTICAL RESULTS**
**HAWTHORNE ARMY DEPOT**
**HAWTHORNE, NEVADA**
**mg/kg (ppm)**

| Sample No./ Parameter | B-16 HA1-1-000 | B-16 HA1-1-005 | B-16 HA1-2-000 | B-16 CPS1-1-011 | B-16 CPS1-1-016 |
|---|---|---|---|---|---|
| 2-Amino-DNT | 29 X | ND | ND | 0.35 J | 6.9 |
| 2,4-DNT | 3.9 | 1.3 | ND | ND | 4.0 |
| Picric Acid | ND R | ND | ND | ND | 0.39 JC |

NOTE: Sample B-16-HA1-2-005 was not submitted for laboratory analyses because high levels of RDX were detected during screening.

Key:

C = Broad peak encompassing retention time window for picric acid is present in this sample. There is no confirmatory analysis for picric acid.
J = Estimated value.
ND = Not detected.
R = Analyte not confirmed, resampling and reanalysis needed to verify.
X = Exceeds calibration limit.
Shaded area = Value exceed remediation criteria listed on Table 3-1.

Table 3-3

SWMU B-16
101-18 CATCHMENT PIT
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

| | Surface Soil | | | | | Soil Remediation Criteria |
|---|---|---|---|---|---|---|
| Sample Number | 2-B16-SS1-1-000 | 2-B16-SS2-1-000 | 2-B16-SS1-2-000 | 2-B16-SS1-3-000 | 2-B16-SS1-4-000 | |
| Depth (feet) | 0.5 to 1.0 | 0.5 to 1.0 | 0.5 to 1.0 | 0.5 to 1.0 | 0.5 to 1.0 | |
| **Nitroaromatics (Method 8330) (mg/kg)** | | | | | | |
| 1,3,5-TNB | 4.9 | 5.2 | 9.3 | 2.6 | 12 | 4.0 |
| 2,4,6-TNT | 4,400 | 3,700 | 6,400 | 500 | 3,200 | 233.3 |
| 2,4-DNT | 3.9 NJ | 3.0 | 5.1 | 1.8 NJ | 2.0 NJ | 2.6 |
| 2-Amino-4,6-DNT | 64 | 47 | 88 | 66 | 54 | — |
| 2-Nitrotoluene | 1.5 | ND (1.0 U) | 2.0 | 1.4 | ND (1.0 U) | 800 |
| 4-Amino-2,6-DNT | 87 NJ | ND (1.0 U) | 82 NJ | 39 | 51 NJ | — |
| 4-Nitrotoluene | ND (1.0 U) | 9.7 | 14 NJ | 8.1 | 5.9 | 800 |
| HMX | 590 | 540 | 390 J | 310 | 480 | 4,000 |
| Nitrobenzene | 2.9 | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 40 |
| RDX | 900 | 840 | 1,100 | 280 | 710 | 63.6 |
| Picric Acid (Method 8330m) | 6.4 | 1.8 | 4.6 | 7.3 | 6.7 | — |

Key at end of table.

Table 3-3

SWMU B-16
101-18 CATCHMENT PIT
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

| | Surface Soil | | | | Soil Boring 1 | |
|---|---|---|---|---|---|---|
| Sample Number | 2-B16-SS1-5-000 | 2-B16-SS1-6-000 | 2-B16-SS1-7-000 | 2-B16-SS1-8-000 | 2-B16-SB1-1-010 | Soil Remediation Criteria |
| Depth (feet) | 0.5 to 1.0 | 0.5 to 1.0 | 0.5 to 1.0 | 0.5 to 1.0 | 10.0 to 12.5 | |
| **Nitroaromatics (Method 8330) (mg/kg)** | | | | | | |
| 1,3,5-TNB | 3.5 | 3.8 | ND (1.0 U) | 25 | 1.6 | 4.0 |
| 2,4,6-TNT | 330 | 1,000 | 27,000 | 15,000 J | 1.3 | 233.3 |
| 2,4-DNT | ND (1.0 U) | ND (1.0 U) | 17 | 9.7 | ND (1.0 U) | 2.6 |
| 2-Amino-4,6-DNT | 10 | 17 | 270 J | 89 | ND (1.0 U) | — |
| 2-Nitrotoluene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 800 |
| 4-Amino-2,6-DNT | 13 NJ | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | — |
| 4-Nitrotoluene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 12 | ND (1.0 U) | 800 |
| HMX | 43 | 130 | 640 J | 450 | ND (1.0 U) | 4,000 |
| Nitrobenzene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 4( |
| RDX | 83 | 280 | 1,100 | 990 | 0.91 J | 63.( |
| Picric Acid (Method 8330m) | 5.2 | 7.6 | 10 | 5.5 | ND (1.0 U) | — |

Key at end of table.

Table 3-3

SWMU B-16
101-18 CATCHMENT PIT
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

| Sample Number | Soil Boring 1 | | | | Soil Boring 2 | Soil Remediation Criteria |
|---|---|---|---|---|---|---|
| | 2-B16-SB1-1-020 | 2-B16-SB1-1-030 | 2-B16-SB1-1-040 | 2-B16-SB1-1-050 | 2-B16-SB1-2-010 | |
| Depth (feet) | 20.0 to 22.5 | 30.0 to 32.5 | 40.0 to 42.5 | 50.0 to 52.5 | 10.0 to 12.5 | |
| **Analyte** | | | | | | |
| **Nitroaromatics (Method 8330) (mg/kg)** | | | | | | |
| 1,3,5-TNB | 2.0 | 18 | 24 | ND (1.0 U) | 3.4 | 4.0 |
| 2,4,6-TNT | 1.2 | ND (1.0 U) | 0.97 J | ND (1.0 U) | ND (2.0 U) | 233.3 |
| 2,4-DNT | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 2.6 |
| 2-Amino-4,6-DNT | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | — |
| 2-Nitrotoluene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 800 |
| 4-Amino-2,6-DNT | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | — |
| 4-Nitrotoluene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 800 |
| HMX | ND (1.0 U) | 2.2 | 3.7 | ND (1.0 U) | 2.2 | 4,000 |
| Nitrobenzene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 40 |
| RDX | 8.8 | 20 | 30 | 11 | 6.1 | 63.6 |
| Picric Acid (Method 8330m) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | — |

Key at end of table.

Table 3-3

SWMU B-16
101-18 CATCHMENT PIT
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

| Sample Number | Soil Boring 2 | | | | | Soil Remediation Criteria |
|---|---|---|---|---|---|---|
| | 2-B16-SB1-2-020 | 2-B16-SB1-2-030 | 2-B16-SB1-2-040 | 2-B16-SB1-2-050 | 2-B16-SB2-2-050 | |
| Depth (feet) | 20.0 to 22.5 | 30.0 to 32.5 | 40.0 to 42.5 | 50.0 to 52.5 | 50.0 to 52.5 | |
| **Nitroaromatics (Method 8330) (mg/kg)** | | | | | | |
| 1,3,5-TNB | 9.0 | 18 | 13 | ND (1.0 U) | ND (1.0 U) | 4.0 |
| 2,4,6-TNT | 4.6 | 7.0 | (1.0 U) | ND (1.0 U) | ND (1.0 U) | 233.3 |
| 2,4-DNT | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 2.6 |
| 2-Amino-4,6-DNT | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | — |
| 2-Nitrotoluene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 800 |
| 4-Amino-2,6-DNT | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | — |
| 4-Nitrotoluene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 800 |
| HMX | 3.6 | 1.7 | 2.8 | 1.1 | 1.1 | 4,000 |
| Nitrobenzene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (2.0 U) | 40 |
| RDX | 7.8 | 26 | 16 | 21 | 21 | 63.6 |
| Picric Acid (Method 8330m) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | — |

Key at end of table.

Table 3-3

SWMU B-16
101-18 CATCHMENT PIT
RFI ANALYTICAL RESULTS
HAWTHORNE ARMY DEPOT
HAWTHORNE, NEVADA

| | Soil Boring 3 | | | | | Soil Remediation Criteria |
|---|---|---|---|---|---|---|
| Sample Number | 2-B16-SB1-3-010 | 2-B16-SB1-3-020 | 2-B16-SB1-3-030 | 2-B16-SB1-3-040 | 2-B16-SB1-3-050 | |
| Depth (feet) | 10.0 to 12.5 | 20.0 to 22.5 | 30.0 32.5 | 40.0 to 42.5 | 50.0 to 52.5 | |
| Analyte | | | | | | |
| **Nitroaromatics (Method 8330) (mg/kg)** | | | | | | |
| 1,3,5-TNB | 5.6 | 1.3 | 20 | 9.5 | ND (1.0 U) | 4.0 |
| 2,4,6-TNT | ND (1.0 U) | 1.5 | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 233.3 |
| 2,4-DNT | ND (2.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 2.6 |
| 2-Amino-4,6-DNT | ND (2.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | — |
| 2-Nitrotoluene | ND (2.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 800 |
| 4-Amino-2,6-DNT | ND (2.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | — |
| 4-Nitrotoluene | ND (2.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 800 |
| HMX | 3.3 | ND (1.0 U) | 4.6 | ND (1.0 U) | ND (1.0 U) | 4,000 |
| Nitrobenzene | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | 40 |
| RDX | 8.2 | ND (1.0 U) | 18 | 11 | ND (1.0 U) | 63.6 |
| Picric Acid (Method 8330m) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | ND (1.0 U) | — |

Key:

ND = The material was analyzed for, but was not detected. The associated numerical value in parentheses is a method quantitation limit adjusted for sample weight/sample volume, extraction volume, percent solids, and sample dilution.
U = Not detected.
J = Estimated value.
TNT = Trinitrotoluene.
mg/kg = Milligrams per kilogram.
TNB = Trinitrobenzene.
HMX = Cyclotetramethylenetetranitramin.
RDX = Cyclotrimethylenetrinitramine.
Shaded area = Value exceeds soil remediation criteria.

# Appendix D

# Windrow Confirmation Samples

# SWMU B-16

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# APCL Analytical Report

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR007B-C001-CC002-P 99-05079-7 | Analysis Result A3-WR007B-C002-CC002-P 99-05079-8 |
|---|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.4 | <0.27 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.2J | <0.27 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| HMX | 8330 | mg/kg | 0.25 | 1.2 | 0.2J |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| RDX | 8330 | mg/kg | 0.25 | 0.2J | <0.34 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 0.2J | <0.34 |
| 2-NITROTOLUENE | 8330 | mg/kg | 0.25 [a] | <0.31 | <0.34 |
| 4-NITROTOLUENE | 8330 | mg/kg | 0.25 [a] | <0.31 | <0.34 |

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR007B-C003-CC002-P 99-05079-9 | Analysis Result A3-WR007B-C004-CC002-P 99-05079-10 |
|---|---|---|---|---|---|
| MOISTURE, PERCENT IN SOIL | ASTM-D2216 | %Moisture | 0.5 | 15.9 | 20.0 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.57 | 0.3 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.3 | <0.25 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| HMX | 8330 | mg/kg | 0.25 | 1.2 | 0.38 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| RDX | 8330 | mg/kg | 0.25 | 0.67 | 0.3J |
| TETRYL | 8330 | mg/kg | 0.25 | <0.30 | <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 | <0.31 |
| 2-NITROTOLUENE | 8330 | mg/kg | 0.25 [a] | <0.30 | <0.31 |
| 4-NITROTOLUENE | 8330 | mg/kg | 0.25 [a] | <0.30 | <0.31 |

| 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 |
|---|---|---|---|---|---|
| MOISTURE, PERCENT IN SOIL | ASTM-D2216 | %Moisture | 0.5 | 19.1 | 18.6 |

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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 99-05079-13 | 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 A6-101@9-CHUTE003-2P 99-05079-16 |
|---|---|---|---|---|---|
| **MOISTURE, PERCENT IN SOIL** | ASTM-D2216 | %Moisture | 0.5 | 18.0 | 1.9 |

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# APCL Analytical Report

Submitted to:
Tetra Tech, Inc. (San Francisco)
Attention: Roy Roenbeck
180 Howard St. Ste. 250
San Francisco CA 94105
Tel: (415)974-1221 Fax: (415)974-5914

Service ID #: 801-995332
Collected by: D. Gonzales
Collected on: 08/11-12/99

Received: 08/14/99
Extracted: 08/17-23/99
Tested: 08/16-25/99
Reported: 08/26/99

Sample Description: Compost, Soil and Water
Project Description: W 101 Bioremediation

## Analysis of Water and Soil Samples

### I. Analysis of Water Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~ER-081199-0805-1~~ 99-05332-20 |
|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES | | | | |
| Dilution Factor | | | | 2.2 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | μg/L | 10 | <22 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | μg/L | 10 | <22 |
| 1,3-DINITROBENZENE | 8330 | μg/L | 4 | <8.8 |
| 2,4-DINITROTOLUENE | 8330 | μg/L | 5.7 | <13 |
| 2,6-DINITROTOLUENE | 8330 | μg/L | 9.4 | <21 |
| HMX | 8330 | μg/L | 13 | <29 |
| NITROBENZENE | 8330 | μg/L | 6.4 | <14 |
| 3-NITROTOLUENE | 8330 | μg/L | 7.9 | <17 |
| RDX | 8330 | μg/L | 14 | <31 |
| TETRYL | 8330 | μg/L | 4 | <8.8 |
| 1,3,5-TRINITROBENZENE | 8330 | μg/L | 7.3 | <16 |
| 2,4,6-TRINITROTOLUENE | 8330 | μg/L | 6.9 | <15 |
| 2-NITROTOLUENE [a] | 8330 | μg/L | 8.5 | <19 |
| 4-NITROTOLUENE [a] | 8330 | μg/L | 8.5 | <19 |

### II. Analysis of Soil Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~A2-9M17D-S003-1-P~~ 99-05332-1 | A3-WR002C-C001-CC002-P 99-05332-2 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 1.7 | 16.9 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| 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 | 3.0 | 0.41 |
| 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 | 22.0 | 0.2J |
| TETRYL | 8330 | mg/kg | 0.25 | <0.25 | <0.30 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 13.4 | <0.30 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 5.50 | <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 |

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# APCL Analytical Report

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR002C-C002-CC002-P 99-05332-3 | Analysis Result A3-WR002C-C003-CC002-P 99-05332-4 |
|---|---|---|---|---|---|
| **MOISTURE** | ASTM-D2216 | %Moisture | 0.5 | 19.0 | 25.7 |
| **NITROAROMATICS AND NITROAMINES** | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.5 | <0.27 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.25 | <0.27 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| HMX | 8330 | mg/kg | 0.25 | 0.49 | <0.34 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| RDX | 8330 | mg/kg | 0.25 | 5.1 | 0.61 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 0.1J | <0.34 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | 0.2J |
| 2-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 4-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR002C-C004-CC002-P 99-05332-5 | Analysis Result A3-WR002C-C005-CC002-P 99-05332-6 |
|---|---|---|---|---|---|
| **MOISTURE** | ASTM-D2216 | %Moisture | 0.5 | 17.2 | 19.6 |
| **NITROAROMATICS AND NITROAMINES** | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.24 | <0.25 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.24 | <0.25 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| HMX | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| RDX | 8330 | mg/kg | 0.25 | <0.30 | 3.8 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 0.2J | 0.1J |
| 2-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 4-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR003C-C001-CC002-P 99-05332-7 | Analysis Result A3-WR003C-C002-CC002-P 99-05332-8 |
|---|---|---|---|---|---|
| **MOISTURE** | ASTM-D2216 | %Moisture | 0.5 | 16.4 | 14.5 |

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# APCL Analytical Report

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~[illegible]~~ 99-05567-1 | Analysis Result A3-WR005-CC001-CC0002-P 99-05567-2 |
|---|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES (b) | | | | | |
| Dilution Factor | | | | 10 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <2.1 | <0.25 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <2.1 | 0.4 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| HMX | 8330 | mg/kg | 0.25 | 14 | 0.2J |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| RDX | 8330 | mg/kg | 0.25 | 104 | 0.44 |
| TETRYL | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 8.5 | 0.1J |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 31 | 0.32 |
| 2-NITROTOLUENE (a) | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| 4-NITROTOLUENE (a) | 8330 | mg/kg | 0.25 | <2.6 | <0.31 |
| Dilution Factor | | | | 1 | 1 |
| PICRIC ACID | M8330 | mg/kg | 2.5 | - | <3.1 |

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR005-CC002-CC0002-P 99-05567-3 | Analysis Result A3-WR005-CC003-CC0002-P 99-05567-4 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 17.5 | 21.8 |
| NITROAROMATICS AND NITROAMINES (b) | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.24 | <0.26 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.24 | <0.26 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| HMX | 8330 | mg/kg | 0.25 | 0.95 | <0.32 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| RDX | 8330 | mg/kg | 0.25 | 14.1 | <0.32 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 2-NITROTOLUENE (a) | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| 4-NITROTOLUENE (a) | 8330 | mg/kg | 0.25 | <0.30 | <0.32 |
| Dilution Factor | | | | 1 | 1 |
| PICRIC ACID | M8330 | mg/kg | 2.5 | <3.0 | <3.2 |

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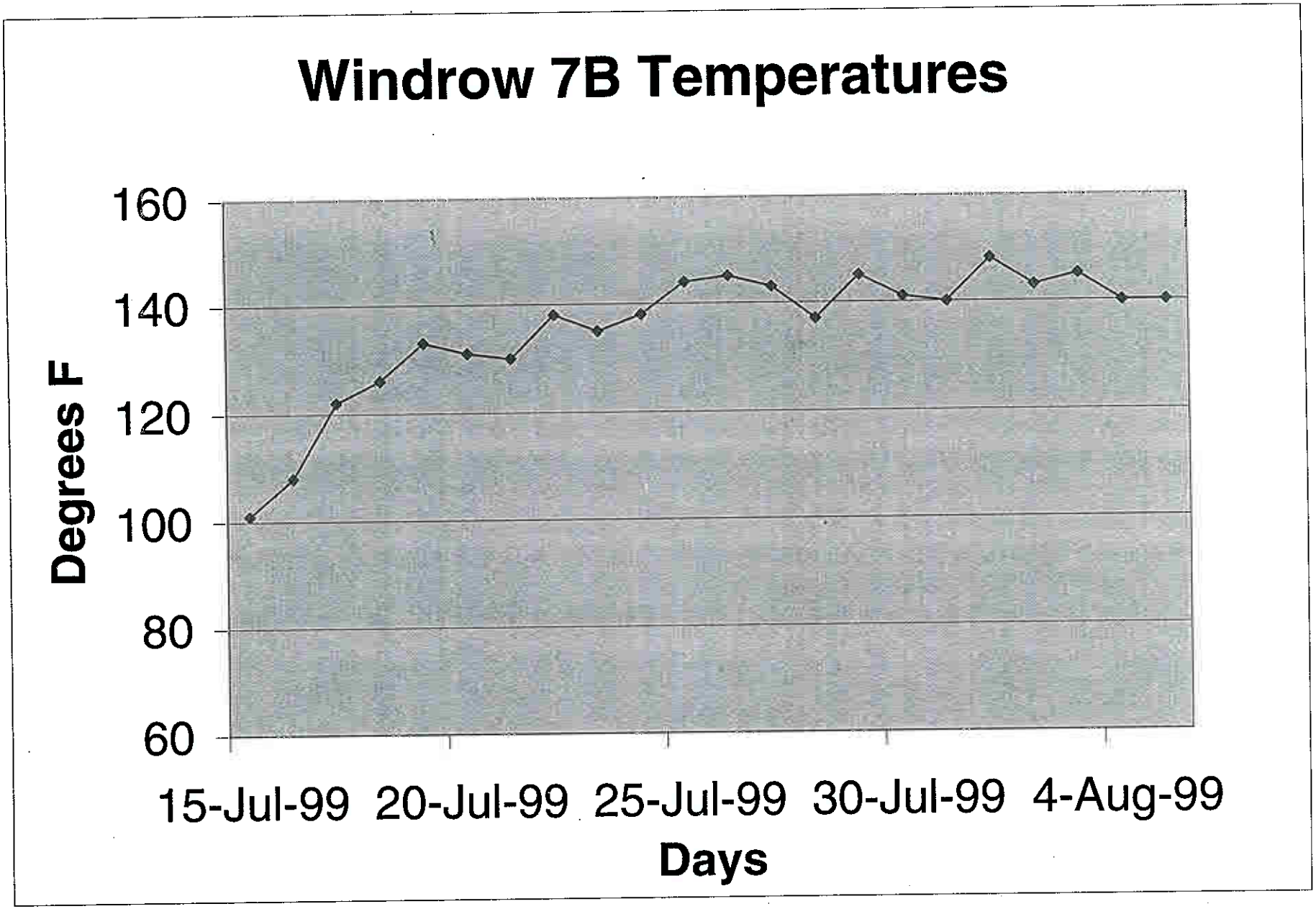
# APCL Analytical Report

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR005-CC004-CC0002-P 99-05567-5 | ~~A3-WR006-CC001-CC0002-P~~ 99-05567-6 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 21.9 | 16.0 |
| NITROAROMATICS AND NITROAMINES [b] | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.97 | <0.24 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.93 | <0.24 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| HMX | 8330 | mg/kg | 0.25 | 0.2J | <0.30 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| RDX | 8330 | mg/kg | 0.25 | 0.2J | <0.30 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 1.6 | <0.30 |
| 2-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| 4-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.32 | <0.30 |
| Dilution Factor | | | | 1 | 1 |
| PICRIC ACID | M8330 | mg/kg | 2.5 | <3.2 | <3.0 |

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~A3-WR005-CC003-CC0003-P~~ 99-05567-7 | ~~A3-WR006-CC002-CC0002-P~~ 99-05567-8 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 17.6 | 19.5 |
| NITROAROMATICS AND NITROAMINES [b] | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.24 | <0.25 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.24 | <0.25 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| HMX | 8330 | mg/kg | 0.25 | 0.3J | <0.31 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| RDX | 8330 | mg/kg | 0.25 | 1.9 | <0.31 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 2-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| 4-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.30 | <0.31 |
| Dilution Factor | | | | 1 | 1 |
| PICRIC ACID | M8330 | mg/kg | 2.5 | ~~<3.0~~ | ~~<3.1~~ |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Degrees F
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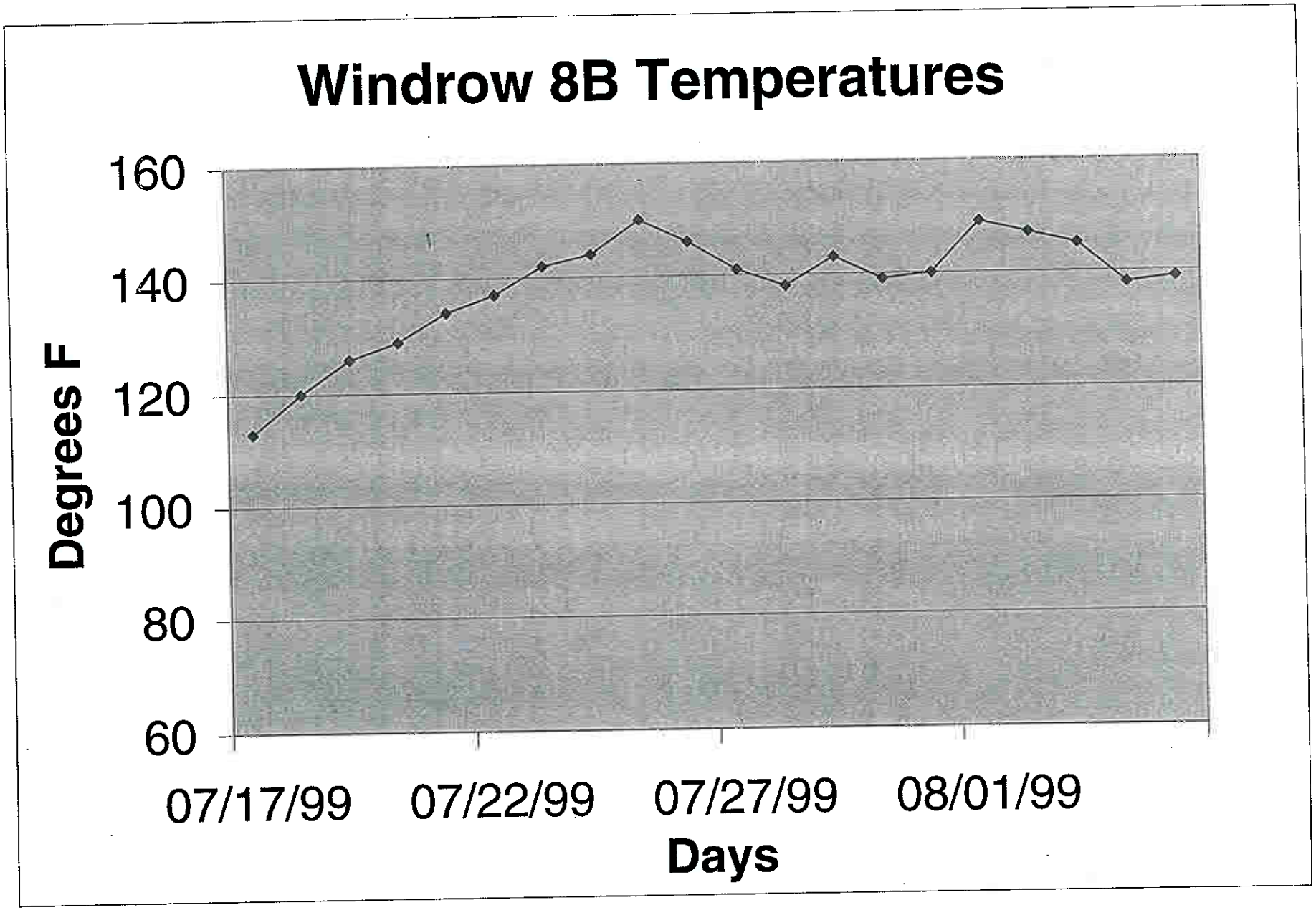
25-Jul-99
30-Jul-99
4-Aug-99
Days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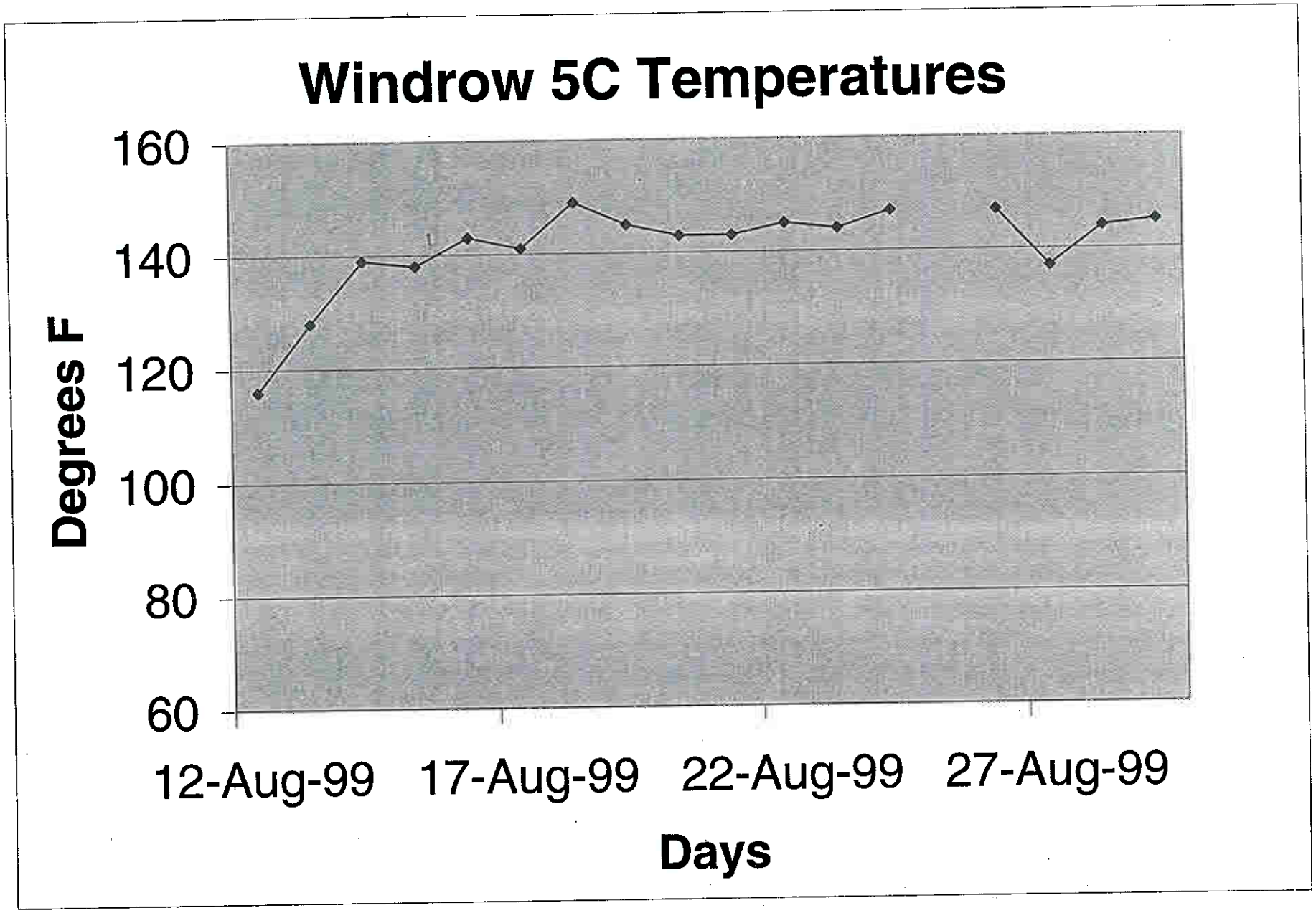
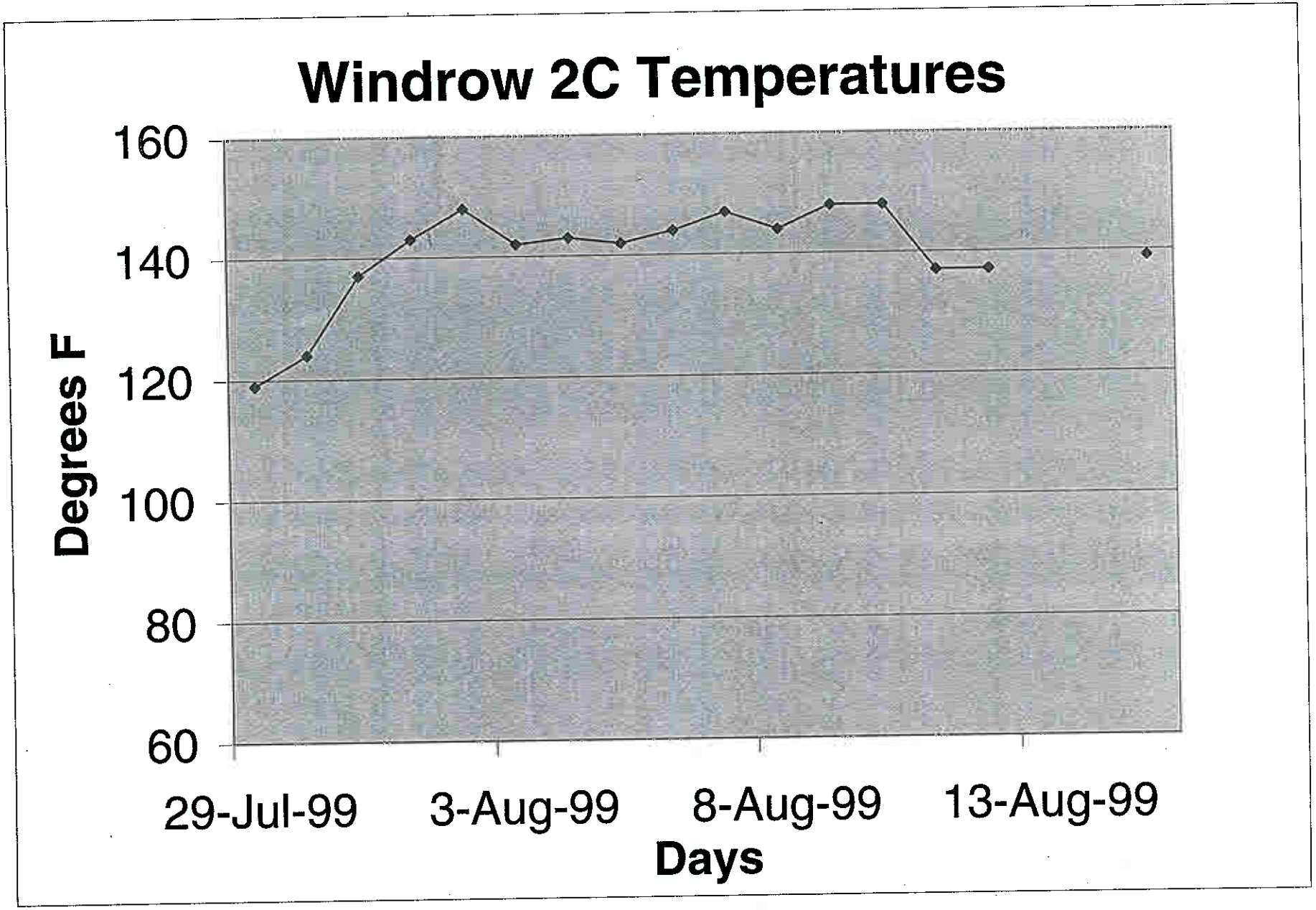
160
140
120
100
80
60
Degrees F
07/17/99
07/22/99
07/27/99
08/01/99
Days


Windrow 5C Temperatures
160
140
120
100
80
60
Degrees F
12-Aug-99
17-Aug-99
22-Aug-99
27-Aug-99
Days


Windrow 2C Temperatures
160
140
120
100
80
60
Degrees F
29-Jul-99
3-Aug-99
8-Aug-99
13-Aug-99
Days

# Confirmation Soil Samples

# SWMU B-16

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# APCL Analytical Report

Submitted to:
Tetra Tech, Inc. (San Francisco)
Attention: Roy Hoenbeck
180 Howard St. Ste. 250
San Francisco CA 94105
Tel: (415)974-1221 Fax: (415)974-5914

Service ID #: 801-995190
Collected by: D. Gonzales
Collected on: 08/03-04/99

Received: 08/06/99
Extracted: 08/10/99
Tested: 08/09-11/99
Reported: 08/13/99

Sample Description: Compost, Soil and Water
Project Description: W 101 Bioremediation

## Analysis of Water and Soil Samples(b)

### I . Analysis of Water Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~[illegible]~~ 99-05190-15 |
|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES | | | | |
| Dilution Factor | | | | 2.26 |
| 4-AMINO 2,6-DINITROTOLUENE | 8330 | µg/L | 10 | <23 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | µg/L | 10 | <23 |
| 1,3-DINITROBENZENE | 8330 | µg/L | 4 | <9 |
| 2,4-DINITROTOLUENE | 8330 | µg/L | 5.7 | <13 |
| 2,6-DINITROTOLUENE | 8330 | µg/L | 9.4 | <21 |
| HMX | 8330 | µg/L | 13 | <29 |
| NITROBENZENE | 8330 | µg/L | 6.4 | <14 |
| 3-NITROTOLUENE | 8330 | µg/L | 7.9 | <18 |
| RDX | 8330 | µg/L | 14 | <32 |
| TETRYL | 8330 | µg/L | 4 | <9 |
| 1,3,5-TRINITROBENZENE | 8330 | µg/L | 7.3 | <16 |
| 2,4,6-TRINITROTOLUENE | 8330 | µg/L | 6.9 | <16 |
| 2-NITROTOLUENE | 8330 | µg/L | 8.5 (b) | <19 |
| 4-NITROTOLUENE | 8330 | µg/L | 8.5 (b) | <19 |

### II . Analysis of Soil Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result A1-SMB16-P1-GS001-2-P 99-05190-1 | A1-SMB16-P1-GS002-2-P 99-05190-2 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 0.4J | 0.6 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 1 | 5 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.20 | <1.0 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.2 | <1.0 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.25 | <1.3 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.25 | <1.3 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.25 | <1.3 |
| HMX | 8330 | mg/kg | 0.25 | 0.61 | 1J |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.25 | <1.3 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.25 | <1.3 |
| RDX | 8330 | mg/kg | 0.25 | 2.9 | 4.7 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.25 | <1.3 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 0.60 | 1J |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 7.88 | 13 |
| 2-NITROTOLUENE | 8330 | mg/kg | 0.25 (b) | <0.25 | <1.3 |
| 4-NITROTOLUENE | 8330 | mg/kg | 0.25 (b) | <0.25 | <1.3 |

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# APCL Analytical Report

| Component Analyzed | Method | Unit | PQL | Analysis Result A1-SMR16-S001-P 99-05190-3 | Analysis Result ~~A2-SMR06-Tunnel-001-2-P~~ 99-05190-4 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 1 | 1.0 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 5 | 10 |
| 4-AMINO-2,6 DINITROTOLUENE | 8330 | mg/kg | 0.2 | 1 | <2.0 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 2 | 2J |
| 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 | 5.2 | 7.2 |
| 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 | 7.5 | 33 |
| TETRYL | 8330 | mg/kg | 0.25 | <1.3 | <2.5 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 1J | 5.5 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 39 | 5.5 |
| 2-NITROTOLUENE | 8330 | mg/kg | 0.25 (b) | <1.3 | <2.5 |
| 4-NITROTOLUENE | 8330 | mg/kg | 0.25 (b) | <1.3 | <2.5 |

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~A3-WR001C-C001-CC002-P~~ 99-05190-5 | Analysis Result ~~A3-WR001C-C002-CC002-P~~ 99-05190-6 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 18.4 | 26.3 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.2J | <0.27 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.4 | <0.27 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,4 DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| HMX | 8330 | mg/kg | 0.25 | 0.95 | 0.37 |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| RDX | 8330 | mg/kg | 0.25 | 3.3 | 1.8 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.31 | <0.34 |
| 2-NITROTOLUENE | 8330 | mg/kg | 0.25 (b) | <0.31 | <0.34 |
| 4-NITROTOLUENE | 8330 | mg/kg | 0.25 (b) | <0.31 | <0.34 |

| Component Analyzed | Method | Unit | PQL | Analysis Result A3-WR001C-C003-CC002-P 99-05190-7 | Analysis Result A3-WR001C-C004-CC002-P 99-05190-8 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 29.7 | 27.2 |

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# APCL Analytical Report

Submitted to:
Tetra Tech, Inc. (San Francisco)
Attention: Roy Roenbeck
180 Howard St. Ste. 250
San Francisco CA 94105
Tel: (415)974-1221 Fax: (415)974-5914

Service ID #: 801-994686
Collected by: D. Gonzales
Collected on: 07/06-07/99

Received: 07/09/99
Extracted: 07/13/99
Tested: 07/12-14/99
Reported: 07/19/99

Sample Description: Compost, Soil and Water
Project Description: W 101 Bioremediation

## Analysis of Water and Soil Samples

### I. Analysis of Water Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~RP-072699-1100-1~~ 99-04686-16 |
|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES | | | | |
| Dilution Factor | | | | 2.56 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | µg/L | 10 | <26 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | µg/L | 10 | <26 |
| 1,3-DINITROBENZENE | 8330 | µg/L | 4 | <10 |
| 2,4-DINITROTOLUENE | 8330 | µg/L | 5.7 | <15 |
| 2,6-DINITROTOLUENE | 8330 | µg/L | 9.4 | <24 |
| HMX | 8330 | µg/L | 13 | <34 |
| NITROBENZENE | 8330 | µg/L | 6.4 | <17 |
| 3-NITROTOLUENE | 8330 | µg/L | 7.9 | <21 |
| RDX | 8330 | µg/L | 14 | 3J |
| TETRYL | 8330 | µg/L | 4 | <10 |
| 1,3,5-TRINITROBENZENE | 8330 | µg/L | 7.3 | <19 |
| 2,4,6-TRINITROTOLUENE | 8330 | µg/L | 6.9 | 12J |
| 2-NITROTOLUENE | 8330 | µg/L | 8.5 | <22 |
| 4-NITROTOLUENE | 8330 | µg/L | 8.5 | <22 |

### II. Analysis of Soil Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result A1-SMB16-P1-GP001P 99-04686-1 | ~~A1-SMB16-P1-GS001P~~ 99-04686-2 |
|---|---|---|---|---|---|
| MOISTURE, PERCENT IN SOIL | ASTM-D2216 | %Moisture | 0.5 | 1.1 | 0.9 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 10 | 50 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <2.0 | <10 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 2 | <10 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| HMX | 8330 | mg/kg | 0.25 | 9.5 | 5J |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| RDX | 8330 | mg/kg | 0.25 | 40 | 29 |
| TETRYL | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 3.1 | 8J |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 110 | 49J |
| 2-NITROTOLUENE (c) | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 4-NITROTOLUENE (c) | 8330 | mg/kg | 0.25 | <2.5 | <13 |



7-23-01

Applied P & Ch Laboratory
13760 Magnolia Ave. Chino CA 91710
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# APCL Analytical Report

Submitted to:
Tetra Tech, Inc. (San Francisco)
Attention: Roy Roenbeck
180 Howard St. Ste. 250
San Francisco CA 94105
Tel: (415)974-1221 Fax: (415)974-5914

Service ID #: 801-994686
Collected by: D. Gonzales
Collected on: 07/06-07/99

Received: 07/09/99
Extracted: 07/13/99
Tested: 07/12-14/99
Reported: 07/19/99

Sample Description: Compost, Soil and Water
Project Description: W 101 Bioremediation

## Analysis of Water and Soil Samples

### I . Analysis of Water Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~99-04686-1~~ 99-04686-16 |
|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES | | | | |
| Dilution Factor | | | | 2.56 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | µg/L | 10 | <26 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | µg/L | 10 | <26 |
| 1,3-DINITROBENZENE | 8330 | µg/L | 4 | <10 |
| 2,4-DINITROTOLUENE | 8330 | µg/L | 5.7 | <15 |
| 2,6-DINITROTOLUENE | 8330 | µg/L | 9.4 | <24 |
| HMX | 8330 | µg/L | 13 | <34 |
| NITROBENZENE | 8330 | µg/L | 6.4 | <17 |
| 3-NITROTOLUENE | 8330 | µg/L | 7.9 | <21 |
| RDX | 8330 | µg/L | 14 | 3J |
| TETRYL | 8330 | µg/L | 4 | <10 |
| 1,3,5-TRINITROBENZENE | 8330 | µg/L | 7.3 | <19 |
| 2,4,6-TRINITROTOLUENE | 8330 | µg/L | 6.9 | 17J |
| 2-NITROTOLUENE | 8330 | µg/L | 8.5 | <22 |
| 4-NITROTOLUENE | 8330 | µg/L | 8.5 | <22 |

### II . Analysis of Soil Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result A1-SMB16-P1-GF001P 99-04686-1 | A1-SMB16-P1-GS001P 99-04686-2 |
|---|---|---|---|---|---|
| MOISTURE, PERCENT IN SOIL | ASTM-D2216 | %Moisture | 0.5 | 1.1 | 0.9 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 10 | 50 |
| 4-AMINO-2,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | <2.0 | <10 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 2 | <10 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| HMX | 8330 | mg/kg | 0.25 | 9.5 | 5J |
| NITROBENZENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 3-NITROTOLUENE | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| RDX | 8330 | mg/kg | 0.25 | 40 | 29 |
| TETRYL | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 3.1 | 8J |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 110 | 491 |
| 2-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <2.5 | <13 |
| 4-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <2.5 | <13 |

Applied P & Ch Laboratory
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# APCL Analytical Report

Submitted to:
Tetra Tech, Inc. (San Francisco)
Attention: Roy Roenbeck
180 Howard St. Ste. 250
San Francisco CA 94105
Tel: (415)974-1221 Fax. (415)974-5914

Service ID #: 801-994850
Collected by: D.Gonzalez
Collected on: 07/15/99

Received: 07/17/99
Extracted: 07/20/99
Tested: 07/19 21/99
Reported: 07/26/99

Sample Description: Compost, Soil and Water
Project Description: W 101 Bioremediation

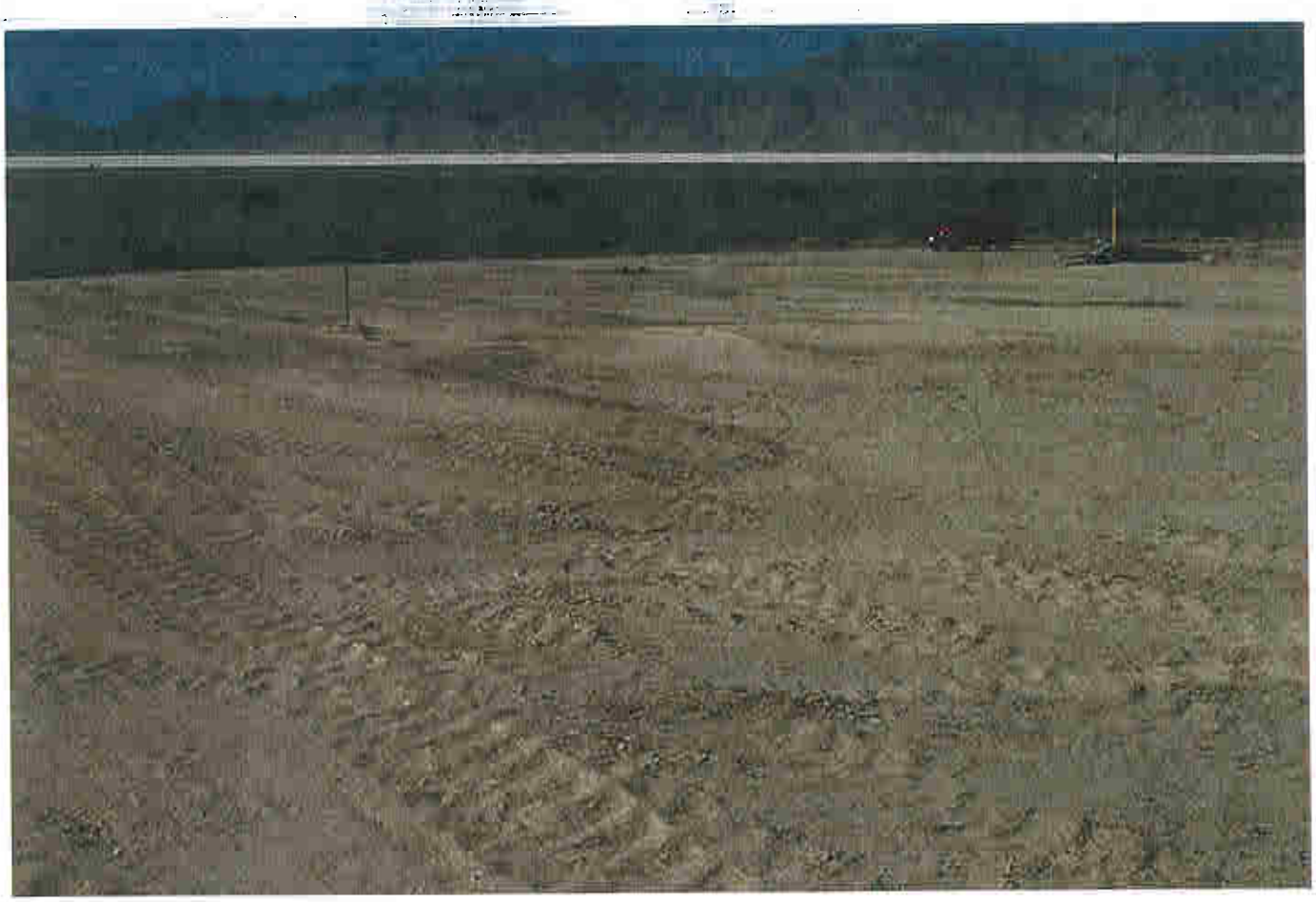
## Analysis of Water, Compost and Soil Samples

### I . Analysis of Water Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result ~~[illegible]~~ 99-04850-11 |
|---|---|---|---|---|
| NITROAROMATICS AND NITROAMINES | | | | |
| Dilution Factor | | | | 2.08 |
| 4-AMINO-2,6 DINITROTOLUENE | 8330 | µg/L | 10 | <21 |
| 2-AMINO 4,6-DINITROTOLUENE | 8330 | µg/L | 10 | <21 |
| 1,3-DINITROBENZENE | 8330 | µg/L | 4 | <8.4 |
| 2,4-DINITROTOLUENE | 8330 | µg/L | 5.7 | <12 |
| 2,6-DINITROTOLUENE | 8330 | µg/L | 9.4 | <20 |
| HMX | 8330 | µg/L | 13 | <27 |
| NITROBENZENE | 8330 | µg/L | 6.4 | <14 |
| 3-NITROTOLUENE | 8330 | µg/L | 7.9 | <17 |
| RDX | 8330 | µg/L | 14 | <30 |
| TETRYL | 8330 | µg/L | 4 | <8.4 |
| 1,3,5-TRINITROBENZENE | 8330 | µg/L | 7.3 | <15 |
| 2,4,6-TRINITROTOLUENE | 8330 | µg/L | 8.9 | 0.5J |
| 2-NITROTOLUENE [a] | 8330 | µg/L | 8.5 | <18 |
| 4-NITROTOLUENE [a] | 8330 | µg/L | 8.5 | <18 |

### II . Analysis of Soil Samples

| Component Analyzed | Method | Unit | PQL | Analysis Result A1-SMB16-P1-GS005-P 99-04850-1 | ~~A1-SMB16-P1-GS005-P~~ 99 04850-2 |
|---|---|---|---|---|---|
| MOISTURE | ASTM-D2216 | %Moisture | 0.5 | 1.0 | 1.1 |
| NITROAROMATICS AND NITROAMINES | | | | | |
| Dilution Factor | | | | 1 | 1 |
| 4-AMINO-2,6 DINITROTOLUENE | 8330 | mg/kg | 0.2 | <0.20 | 0.2 |
| 2-AMINO-4,6-DINITROTOLUENE | 8330 | mg/kg | 0.2 | 0.3 | 0.3 |
| 1,3-DINITROBENZENE | 8330 | mg/kg | 0.25 | <0.25 | <0.25 |
| 2,4-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.25 | 0.2J |
| 2,6-DINITROTOLUENE | 8330 | mg/kg | 0.25 | <0.25 | <0.25 |
| HMX | 8330 | mg/kg | 0.25 | 0.92 | 1.0 |
| 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 | 1.8 | 2.1 |
| TETRYL | 8330 | mg/kg | 0.25 | <0.25 | <0.25 |
| 1,3,5-TRINITROBENZENE | 8330 | mg/kg | 0.25 | 0.70 | 0.74 |
| 2,4,6-TRINITROTOLUENE | 8330 | mg/kg | 0.25 | 2.0 | 2.4 |
| 2-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.25 | <0.25 |
| 4-NITROTOLUENE [a] | 8330 | mg/kg | 0.25 | <0.25 | <0.25 |

# Appendix E

# SWMU B-16 September 1999