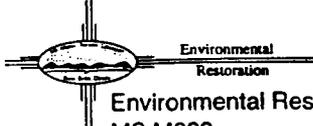


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TR/16

Los Alamos National Laboratory

UNIVERSITY OF CALIFORNIA



Environmental Restoration Project
MS M992
Los Alamos, New Mexico 87545
505-667-0908/FAX 505-665-4747

Date: September 30, 1996
Refer to: EM/ER:96-527

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Mr. Ted Taylor
Los Alamos Area Office
US Department of Energy, MS A316
Los Alamos, NM 87544

SUBJECT: VCA COMPLETION REPORTS FOR TAs -11, -16, -33, AND -46, PRSs 11-001(c), 16-026(m-p), 16-029(k,l,q,s,t,u), C-16-064, C-16-067, 33-007(c), 33-010(b), AND 46-003(h) ACTIVITIES

Dear Ted:

Enclosed for your review and approval please find a copy of the Voluntary Corrective Action (VCA) Completion Reports for Technical Areas (TAs) -11, -16, -33, and -46, Potential Release Sites (PRSs) 11-001(c), 16-026(m-p), 16-029(k,l,q,s,t,u), C-16-064, C-16-067, 33-007(c), 33-010(b), and 46-003(h) for cleanup activities completed in Fiscal Year 1996. Also enclosed are the VCA Approval/Disapproval Forms for your signature indicating your approval or disapproval of the reports. If you do not approve these reports, please include a brief description of the reason(s) for disapproval.

Please note that the VCA Completion Reports for TA-16 include Resource Conservation and Recovery Act Facility Investigation (RFI) information. The following PRSs have RFI results in the VCA Completion Reports: TA-16 90's Line, PRSs 16-026(m-p), 16-029(k,l,q,s,t,u), C-16-064, and C-16-067. We would like to propose that the VCA reports covering RFI results be counted as both RFI reports and VCA reports.

Once we have received your approval of these reports, we will submit them to the regulators for their review/approval.

Your Field Project Coordinator participated in developing and reviewing these reports. The Certifications of Completion have been signed and are included in the enclosed reports.

Attachment 4



6016

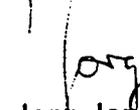
Mr. Ted Taylor
EM/ER:96-527

-2

September 30, 1996

If you have any questions, please call Roy Michelotti at (505) 665-7444 or Joe Mose at (505) 667-5808. Thank you for your cooperation in this matter.

Sincerely,



Jorg Jansen
Program Manager

JJ/el

- Enclosures:
- (1) VCA Completion Reports for TAs -11, -16, -33, and -46, PRS(s) 11-001(c), 16-026(m-p), 16-029(k,l,q,s,t,u), C-16-064, C-16-067, 33-007(c), 33-010(b), and 46-003(h)
 - (2) Certifications of Completion
 - (3) VCA Approval/Disapproval Forms
 - (4) VCA Reports with RFI Report Results

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Voluntary Corrective Action Completion Report for Potential Release Sites at TA-16, 90s-Line

**16-026(m-p)
16-029(k,l,q,s,t,u)
C-16-064
C-16-067**

Field Unit 3

**Environmental
Restoration
Project**

September 1996

**A Department of Energy
Environmental Cleanup Program**

Los Alamos
NATIONAL LABORATORY

LA-UR-96-3285

ACRONYMS

AOC	Area of concern
COPC	Chemical of potential concern
CSF	Characterization strategy form
D&D	Decontamination and decommissioning
DNB	Dinitrobenzene
DNT	2,4 Dinitrotoluene; 2,6 Dinitrotoluene
2-aDNT	2-amino-4,6-DNT
4-aDNT	4-amino-2,6-DNT
DOE	US Department of Energy
EQL	Estimated quantitation limit
EPA	US Environmental Protection Agency
ER	Environmental Restoration
FIMAD	Facility for information management & display
HE	High explosive
HMX	Cyclotetramethylenetetranitramine
HSWA	Hazardous and Solid Waste Amendments
LANL	Los Alamos National Laboratory
MCE	Multiple chemical evaluation
NFA	No further action
NT	Nitrotoluene
OU	Operable unit
PAH	Polycyclic aromatic hydrocarbons
PID	Photo-ionization detector
PRS	Potential release site
QA	Quality assurance
RCRA	Resource Conservation and Recovery Act

RDX	Cyclotrimethylenetrinitramine
RFI	RCRA facility Investigation
SAL	Screening action level
SVOC	Semivolatile organic compound
SWMU	Solid waste management unit
TA	Technical area
TCLP	Toxicity characteristic leaching procedure
TNB	1,3,5 Trinitrobenzene
TNT	2,4,6 Trinitrotoluene
UCL	Upper confidence limit
UTL	Upper tolerance limit
VCA	Voluntary corrective action
VOC	Volatile organic compound
XRF	X-ray fluorescence

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Appendix B.	CHARACTERIZATION DATA

Appendix C.	BEFORE AND AFTER COST COMPARISON
Appendix D.	CONFIRMATORY SAMPLING RESULTS TABLES
Appendix E.	CERTIFICATION OF COMPLETION

1.0 INTRODUCTION

1.1 General

This voluntary corrective action (VCA) report documents the corrective action performed at potential release sites (PRSs) at the 90s-Line. All of these PRSs are located at Technical Area (TA) 16, S-Site. These sites are south of Cañon de Valle, within the southwestern portion of Los Alamos National Laboratory (LANL), Los Alamos, New Mexico (Fig. 1.0-1). The 90s-Line consisted of sumps, drain lines, drum storage areas, and buildings numbered as TA-16-89, -90, -91, -92, -93, and -99 (Fig. 1.0-2). TA-16-99 was part of the high explosives (HE) processing operations at the 20s-Line, but for the purposes of this VCA report, all of the buildings will be referred to as the 90s-Line. Operations in these buildings were initially part of HE processing activities in the post-World War II era S-Site complex. Five of these six buildings were used for machining HE charges and TA-16-93 was used for electroplating HE. These processes involved large quantities of HE and contaminated several of the 90s-Line buildings and their associated sumps, drain lines, and outfalls. HE production operations at the post-World War II era S-Site are discussed in greater detail in Subsections 5.18 and 5.23 of Addendum I to the Operable Unit (OU) 1082 work plan (LANL 1994, 1160). Additional historical information is available in the 90s-Line VCA plan (LANL 1996, 0623).

The 90's-Line PRSs are in Table C of LANL's Hazardous and Solid Waste Amendments (HSWA) permit and listed below in Table 1.1-1. Four of the 90s-Line structures have one PRS for the sumps and one PRS for the drain line/outfall; in contrast two structures have a single PRS that includes sumps, drain lines, and outfalls.

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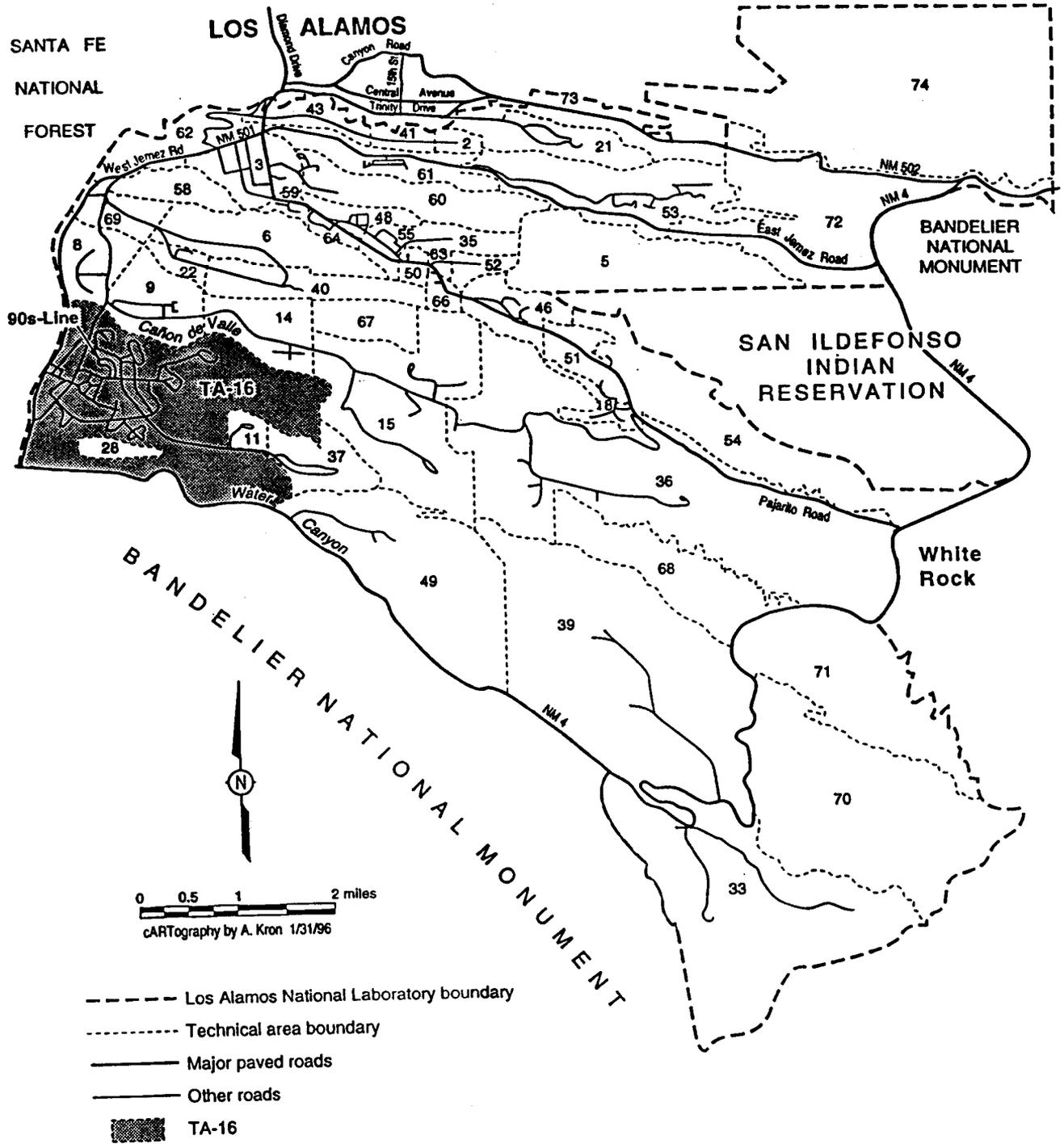


Fig. 1.0-1 Location of Technical Area 16 with respect to Laboratory technical areas and surrounding landholdings.

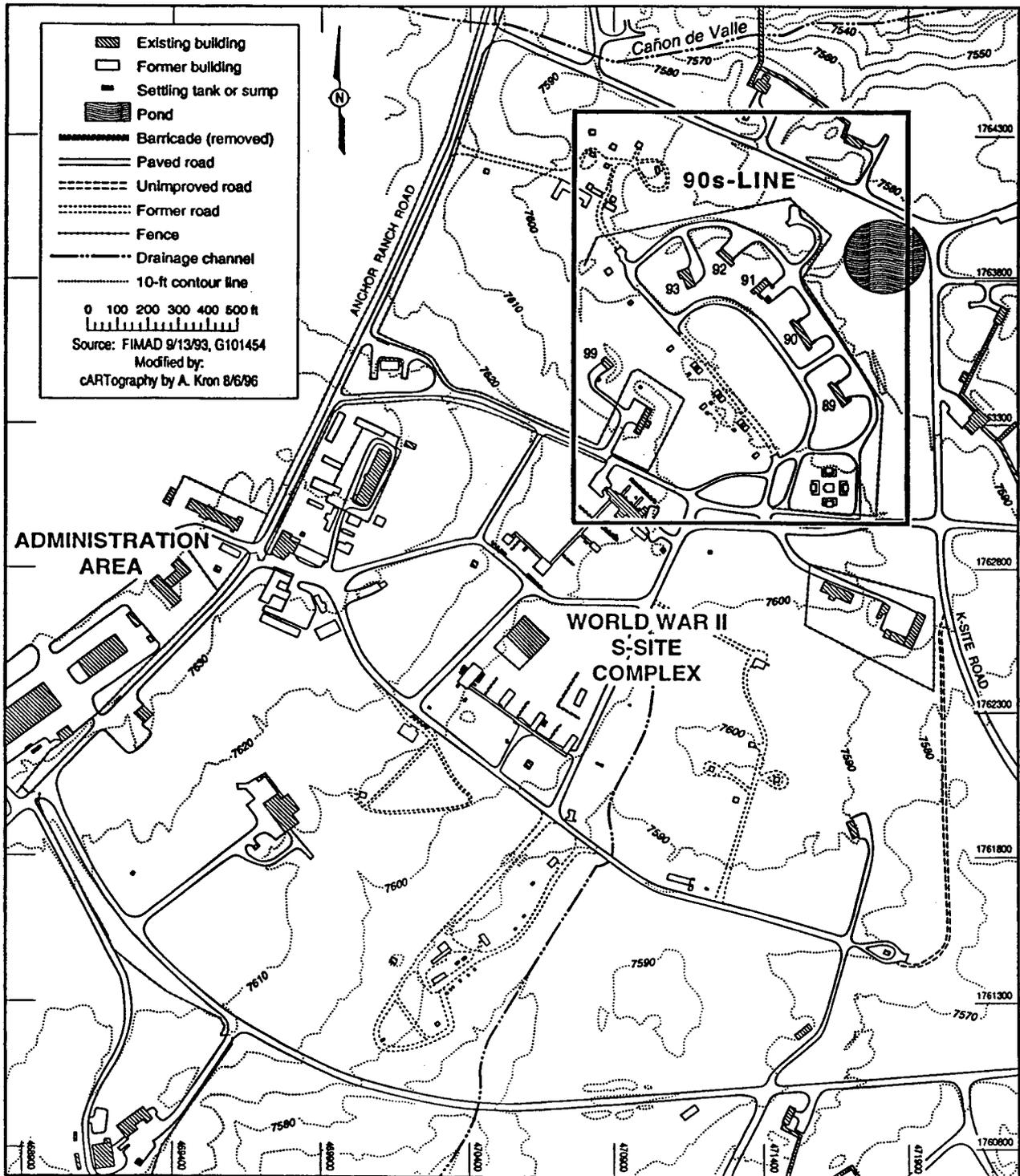


Fig. 1.0-2 Location of the 90s-Line in the World War II S-Site complex.

TABLE 1.1-1

90s-LINE POTENTIAL RELEASE SITES

STRUCTURE	SUMP PRS	DRAIN LINE/ OUTFALL PRS	ASSOCIATED DRUM STORAGE AREA
TA-16-89	16-029(u)	16-026(p)	N/A ^a
TA-16-90	16-029(t)	16-026(o)	C-16-067
TA-16-91	16-029(s)	16-026(n)	N/A
TA-16-92	16-029(l)	16-026(m)	N/A
TA-16-93	16-029(k)	16-029(k)	N/A
TA-16-99	16-029(q)	16-029(q)	C-16-064

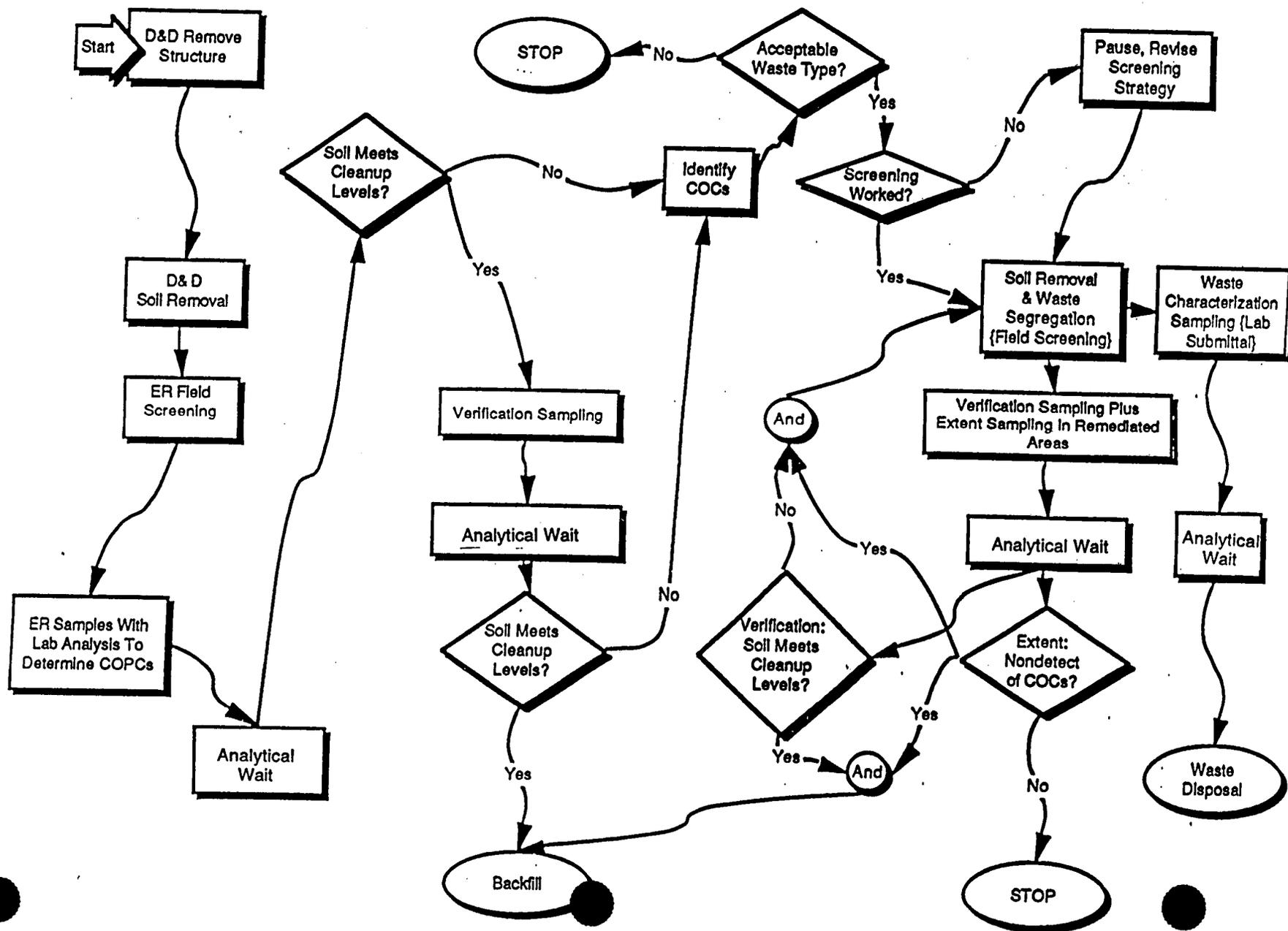
^a N/A= Not applicable.

1.2 Scope of VCA

Because this VCA involved coordination with Demolition and Decommission (D&D) activity and, consequently was more complex than many others, the VCA process, described in the VCA plan is summarized below and in Fig. 1.2-1 (LANL 1996, 0623).

- 1) The decontamination and decommissioning (D&D) contractor removed all buildings, paved parking lots and roads, berms, sumps, and drain lines.
- 2) The D&D contractor removed all contaminated soil within 2 ft of sumps and drain lines, using the HE spot test to guide soil removal.
- 3) Field Unit 3 personnel used visual inspection and quantitative field screening methods to locate additional areas potentially requiring cleanup.
- 4) Based on quantitative field screening, the location showing the highest level of each constituent was submitted for laboratory analysis. These laboratory samples are referred to as chemical of potential concern (COPC) throughout this VCA report. Each building has a specific number of COPC samples based on field screening results. COPC samples are akin to those normally

Fig. 1.2-1. Flow diagram for decision making at the 90s-Line TA-16



taken in a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Phase I investigation. Results of COPC samples are presented in Subsections 2.X.

- 5) Field Unit 3 soil cleanup and vertical and lateral cleanup boundaries were based on quantitative field screening results. The initial cleanup target was one-half the industrial soil preliminary remediation goal (PRG) to ensure that cleanup criteria would be met.
- 6) Vertical bounding laboratory samples were taken at a depth of 2–3 ft beneath each soil location that required cleanup.
- 7) Following receipt of COPC sample results, additional cleanups occurred if the analytes exceeded PRGs.
- 8) Verification samples were collected at locations where cleanups had occurred, and at locations that had not been sampled for laboratory analysis during COPC sampling. COPC samples from locations where no cleanup was required and bounding samples beneath excavated areas were used with verification samples in the calculation of residual contaminant concentrations remaining after cleanup. An appropriate number of verification samples were taken for laboratory analysis to characterize soil that remained within each exposure unit. These results are reported in Subsections 3.X.2.
- 9) If verification samples showed that cleanup levels had not been achieved, for constituents without quantitative screening results then additional soil removal, verification samples, and bounding sampling occurred.
- 10) Toxicity characteristic leaching procedure (TCLP) waste samples were taken from removed material.
- 11) Verification sampling data were compared with cleanup levels. If any COPC concentration was at a level approaching its PRG, a 95% upper confidence

level (UCL) on the mean was calculated and compared with the cleanup levels. In most cases, the data were far below cleanup levels.

- 12) Sump and drain line excavations were backfilled and the soil was reseeded by the D&D contractor.

Based on the results of COPC laboratory sampling and field screening, soils associated with 90s-Line sumps, drain lines, outfalls, and drainages were moderately contaminated with HE, barium, volatile organic compounds (VOCs), polyaromatic hydrocarbons (PAHs), and metals. The principal HE found were TNT and RDX, used in the explosives Composition B and baratol. Barium nitrate is also a component of baratol. Another HE, HMX, and the HE breakdown products DNT, NT, TNB, and amino-DNT were also present in the 90s-Line soils. Nickel and other metals used in HE-plating operations in TA-16-93 were also present (Martin and Hickmott 1993, 15-16-498). Cyanides and VOCs were also thought to be used in the plating operation and were found in trace amounts. Weapons disassembly operations contaminated the building TA-16-92 with low levels of uranium (Martin and Hickmott 1993, 15-16-497).

As noted above, three different types of laboratory samples were taken during the VCA.

- 1) Chemical of potential concern (COPC) samples are akin to those normally taken in a Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) Phase I investigation. These samples were biased to positive field screening results to ensure that all COPCs were identified. Positive results for these samples and for field screening samples guided soil removal activities. Results for COPC samples are provided in Subsections 2.X.
- 2) Bounding samples were used to determine the vertical and horizontal extent of contamination.
- 3) Verification samples were taken to ensure that cleanup levels were achieved. Verification sampling results are provided in Subsections

3.X. Toxicity characteristic leaching procedure (TCLP) waste samples were taken of removed material.

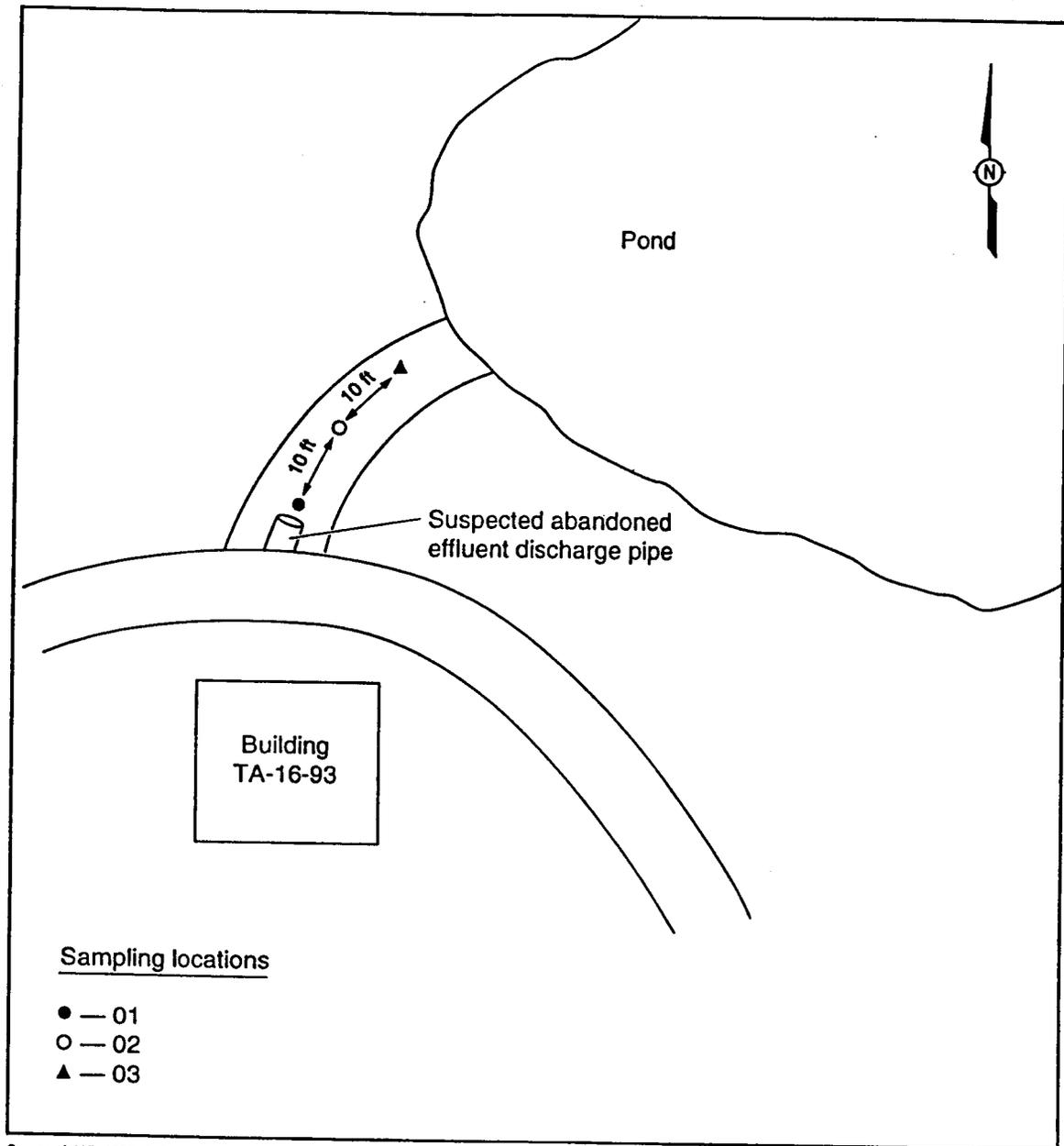
1.3 Deviations

There were three deviations from the VCA plan. The two AOCs (C-16-064 and C-16-067) were investigated during the 90s-Line campaign. AOC C-16-064 was not originally included in the VCA plan because contamination was not expected. Upon review of the analytical data, the decision to perform a soil removal was made while the crews and equipment were available and on site. During the sampling activities of C-16-067, all soil associated with the PRS was removed. There was one deviation in the sampling of the buildings at the 90s-Line. One location was not bounded (Sections 2.3.8 and 2.3.9).

2.0 SITE CHARACTERIZATION PRIOR TO CLEANUP ACTIVITY

2.0.1 Activities Prior to Environmental Restoration Investigation

The Department of Energy (DOE) sampled potentially contaminated sites at the 90s-Line during the late 1980s. Their Environmental Problem #24 document reports surface soil data for the plating outfall draining TA-16-93 (LANL 1989, 0425). These data are summarized in Table 2.0-1 and the sampling locations are shown in Fig. 2.0-1. The authors of the report state that the outfall could not be located with certainty and that the sample locations were based on utility drawings. Field measurements, used to determine sample locations, were made for HE, radionuclides, and organic vapors. All samples were analyzed for HE, cyanide, metals, and VOCs. Metals detected above LANL background upper tolerance limits (UTLs) in these samples included barium (420–1 590 mg/kg), cadmium (1.7–5.6 mg/kg), lead (332 mg/kg), and zinc (130–234 mg/kg). Cyanide was found in two samples at 0.4 mg/kg. None of these values exceed screening action levels (SALs). Unexpectedly, no HE were detected in these samples.



Source: LANL 1989, 0425
 Modified by: cARTography by A. Kron 8/6/96

Fig. 2.0-1 Sampling locations at TA-16-93 outfall from Environmental Problem #24 (LANL 1989, 0425).

TABLE 2.0-1

**INORGANICS WITH CONCENTRATIONS GREATER THAN BACKGROUND
UPPER TOLERANCE LIMITS FOR PRS 16-029(k)^{a,b}**

SAMPLE ID	BARIUM mg/kg	CADMIUM mg/kg	CYANIDE mg/kg	LEAD mg/kg	ZINC mg/kg
LANL UTL	315	2.6	na ^c	23.3	50.8
SAL	5 300	38	1 300	400	23 000
824-1	420	1.8	0.39	nd ^d	130
824-2	1 120	1.7	nd	332	206
824-3	1 590	5.6	0.40	nd	234

^a Environmental Problem #24, (LANL 1989, 0425).

^b Double bordered cells contain concentrations greater than UTL.

^c na = Not applicable.

^d nd = Not detected.

No previous analyses were conducted for samples within the boundaries of PRSs associated with TA-16-99, -89, -90, -91, and -92. However, historic samples from the pond [PRS 16-008(a)] into which the drain lines from TA-16-89, -90, and -91 discharged may be representative of COPCs from those buildings. To summarize those data, barium, nickel, cadmium, and acetone were at levels above background but below SALs in soils. Within the pond, barium in water and HE in soils exceeded SALs. These data are reported in Subsection 5.12.1.2.1 of the RFI Work Plan for OU 1082 (LANL 1993, 1094).

2.1 Building TA-16-89, PRSs 16-029(u) and 16-026(p)

PRS 16-029(u) is the sumps associated with TA-16-89, an HE machining building, and PRS 16-026(p) is the associated drain lines and outfall. Metals and HE were detected at levels above SAL and PRG. Contaminated soils were cleaned up to below PRG. These two PRSs are therefore proposed for no further action (NFA).

2.1.1 History

TA-16-89 and its associated PRSs are discussed in Subsection 1.1.1 of the VCA plan (LANL 1996, 0623) and Subsection 5.23.1.1 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). TA-16-89 was completed in 1950 and machining activities were at maximum levels until mid-1951 when the modern HE machining building, TA-16-260, was finished. Low levels of HE machining continued from the early-1950s to the late-1950s. At some time during the late 1950s or early 1960s, TA-16-89 was converted to a storage facility. In the mid- to late-1960s the HE sump was filled with gravel. TA-16-89 was totally abandoned by 1991.

2.1.2 Description

TA-16-89 was constructed of wood on a concrete slab and was 1 684 ft² in floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings. PRS 16-029(u) consisted of two sumps, each roughly 15 ft long x 5 ft wide x 5 ft deep. PRS 16-026(p) consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes daylighted, additional vitrified-clay pipe beneath the road leading to the north of the road, and an open-air drainage channel. The building, sumps, drain lines, and berms were removed during D&D operations in 1996 (Fig. 2.1.2-1).

2.1.3 Previous Investigations

No investigations were conducted prior to 1996.

2.1.4 Field Investigation

Following D&D removal of all surface and subsurface structures, 28 field screening samples were taken. Several screening points were located within the building footprints.

Ten of these were lateral bounding, quantitative field screening samples and two were

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PRSs 16-026(m-p), 16-029(k,l,q,s,t,u),
C-16-064, C-16-067

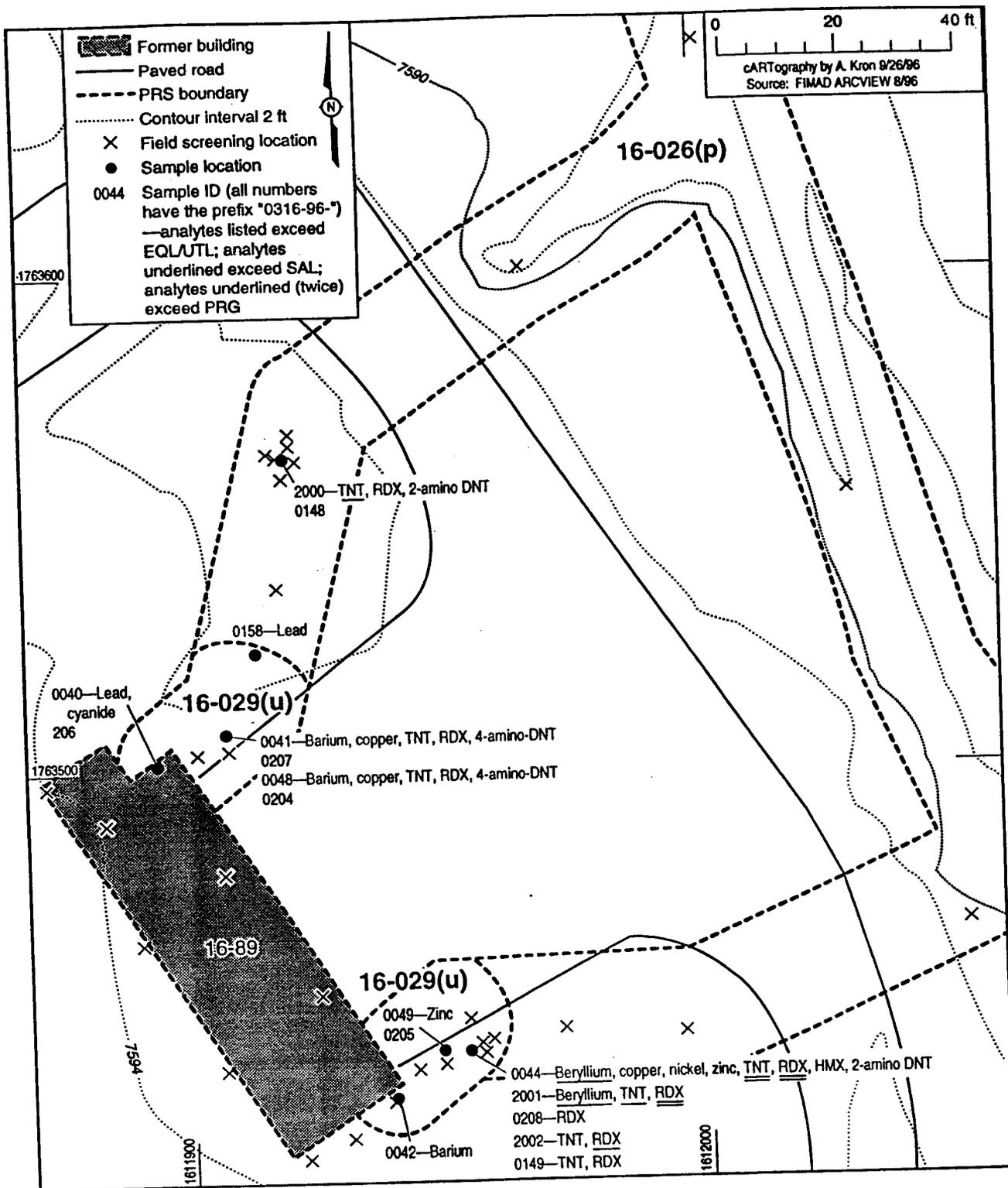


Fig. 2.1.2-1 Field screening, COPC, and bounding sampling for Building TA-16-89.

vertical bounding samples. Locations of field screening samples are shown in Fig. 2.1.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by x-ray fluorescence (XRF), volatiles by photoionization detector (PID), radionuclides by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Eighteen screening locations were above background for barium, four locations were above background for zinc, one location was above background for silver, and one location was above SAL for uranium. All locations where cleanup did not occur were well below one-half of the HE PRGs. Bounding samples were taken at locations where soil cleanup occurred and beneath each sump. The soil containing the highest level of each COPC at a level above background based on the screening methods was submitted for laboratory analysis.

Soil was excavated from around location 16-2372 (laboratory sample 0316-96-0148) and location 16-2373 (laboratory sample 0316-96-0044) by Field Unit 3 and from location 16-2370 (laboratory sample 0316-96-0158) by D&D. The limits of the excavation were determined by the four lateral and one vertical quantitative field screening samples. All these field screening samples yielded results less than one-half PRG.

Seventeen laboratory COPC and bounding laboratory samples were taken; 13 were analyzed for inorganics and HE (Table 2.1.4-1). Eleven were analyzed for semivolatile organic compounds (SVOCs) and VOCs. Samples 0316-96-0040, -0041, -0048, -0044, -0049, and -2001 were handled improperly at the analytical laboratory during the analysis, so they were resampled and analyzed for SVOCs and VOCs as 0316-96-0206, -0207, -0204, -0208, -0205, and -2002 for SVOCs and VOCs. Six samples were taken beneath the northwest sump and nine under the southeast sump. The remaining samples were

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taken within the drainage. More than the minimum number of samples required in the VCA plan were taken. Samples were biased within the sumps and drain lines with field screening (Fig. 2.1.2-1).

TABLE 2.1.4-1
SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT
PRs 16-029(u) and 16-026(p)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRs	TYPE OF SAMPLE	INORGANIC	HE	SVOC	VOC
0316-96-0040	16-2431	4-4.5	16-029(u)	COPC	2013	2014	na ^a	na
0316-96-0206	16-2431	4-4.5	16-029(u)	COPC	na	na	2128	2128
0316-96-0041	16-2433	4-4.5	16-029(u)	COPC	2013	2014	na	na
0316-96-0207	16-2433	4-4.5	16-029(u)	COPC	na	na	2128	2128
0316-96-0048	16-2433	7-8	16-029(u)	Bounding	2013	2014	na	na
0316-96-0204	16-2433	7-8	16-029(u)	Bounding	na	na	2090	2090
0316-96-0042	16-2434	4-4.5	16-029(u)	COPC	2132	2133	2131	2131
0316-96-0044	16-2373	3.5-4	16-026(p)	COPC	2132	2133	na	na
0316-96-0208	16-2373	4-4.5	16-026(p)	COPC	2170	2171	2169	2169
0316-96-0149	16-2373	5.5-6	16-026(p)	Bounding	2170	2171	2169	2169
0316-96-0049	16-2436	6.5-7	16-029(u)	Bounding	2013	2014	na	na
0316-96-0205	16-2436	7-8	16-029(u)	Bounding	na	na	2090	2090
0316-96-0043	16-2372	0-0.5	16-026(p)	COPC	2170	2171	2169	2169
0316-96-0148	16-2372	2-3	16-026(p)	Bounding	2170	2171	2169	2169
0316-96-2000	16-2372	0-0.5	16-026(p)	COPC	2170	2171	2169	2169
0316-96-0158	16-2370	4-5	16-026(p)	Bounding	2197	2198	2196	2196
0316-96-2001	16-2373	3.5-4	16-026(p)	COPC	2129	2130	na	na
0316-96-2002	16-2373	3.5-4	16-026(p)	COPC	2170	2171	2169	2169

^a na = Not analyzed.

2.1.5 Background Comparison

Barium was found above the LANL UTL in four COPC samples (Table 2.1.5-1). Beryllium was slightly above background/SAL for two samples. Three samples were above UTL for copper. Two samples were above UTL for lead. Nickel was above UTL for one sample. Zinc was above UTL for two samples. Traces of cyanide were detected in one sample. Cyanide was not detected at or above the detection limit for the rest of the samples.

TABLE 2.1.5-1

INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES FOR PRSs

16-029(u) and 16-026(p)^a

SAMPLE ID	Ba (mg/kg)	Be (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)	Cyanide (mg/kg)
UTL	315	1.95	15.5	23.3	15.2	50.8	nc ^b
SAL	5 300	1.95	2 800	400	1 500	23 000	1 300
PRG	10 000	11 ^c	6 300	1 000	3 400	nc	1 400
0316-96-0040	164	1.3	10.4	109	10.7	41.6	1.6
0316-96-0041	611	1.3	20.0	12.7	13.6	42.1	0.58 (U) ^d
0316-96-0042	589	1.4	11.3	10.1	11.7	37.8	0.54 (U)
0316-96-0043	478	1.4	9.6	16.2	10.5	25.2	0.59 (U)
0316-96-0044	131	2.0	23.7	17.5	19.1	61.1	0.55 (U)
0316-96-0048	1 320	1.3	20.6	13.6	10.2	36.3	0.59 (U)
0316-96-0049	309	1.6	9.4	10.1	12.7	69.1	0.60 (U)
0316-96-0148	71.5	1.0	11.2	10.0	7.6	23.5	0.60 (U)
0316-96-0149	107	1.4	10.0	10.2	11.6	25.0	0.62 (U)
0316-96-0158	84.4	1.6	14.4	30.6	14.5	36.8	0.60 (U)
0316-96-0208	56.0	1.8	8.1	10.1	12.5	21.1	0.58 (U)
0316-96-2000	308	1.4	10.5	21.1	10.3	26.7	0.59 (U)
0316-96-2001	117	2.0	13.8	18.3	14.2	33.5	0.59 (U)
0316-96-2002	81.1	1.6	6.2	9.7	10.1	17.8	0.58 (U)

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c The industrial PRG used for beryllium is at the 10⁻⁵ risk level.

^d U = Reported detection limit. Analyte was not detected at or above this level.

2.1.6 Evaluation of Organics

Numerous types of HE were found above detection limits. Three samples were above SAL for TNT (Table 2.1.6-1). Three samples were above SAL for RDX. TNT and RDX were above industrial PRGs at several locations. HE compounds detected at levels below SAL were HMX, tetryl, 2-NT, TNB, 2-aDNT, and 4-aDNT. All other organics detected were estimated (J), blank contamination (B), or estimated and blank contamination (JB) qualified (Table 2.1.6-2). A J-qualifier is used when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when a concentration is calculated that is less than the detection limit. DNT was detected as J-qualified in the

SVOC analysis, but was not found in the HE analysis of the same sample. Benzoic acid was also J-qualified and is well below the estimated quantitation limit (EQL).

TABLE 2.1.6-1
DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES FOR
PRs 16-029(u) and 16-026(p)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	2-NT (mg/kg)	TETRYL (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.25	0.65	0.25	0.26	nc ^b
SAL	15	4	3 300	650	650	3.3	nc	nc
PRG	64	17	3 400	nc	nc	3.4	nc	nc
0316-96-0041	0.654	2.05	0.218	0.161 (U)	0.103 (U) ^c	0.090 (U)	0.084 (U)	0.094
0316-96-0042	0.091	0.165 (U)	0.185 (U)	0.160 (U)	0.102 (U)	0.080 (U)	0.084 (U)	0.086 (U)
0316-96-0043	14.7	2.33	0.207	0.203	0.103 (U)	0.091 (U)	0.263	0.400
0316-96-0044	86.4	186	10.8	0.160 (U)	0.207	0.169	0.42	0.088 (U)
0316-96-0048	1.14	1.28	0.253	0.160 (U)	0.102 (U)	0.090 (U)	0.185	0.222
0316-96-0049	0.135	0.326	0.185 (U)	0.160 (U)	0.102 (U)	0.135	0.084 (U)	0.087 (U)
0316-96-0148	0.174	0.180 (U)	0.186 (U)	0.160 (U)	0.102 (U)	0.090 (U)	0.084 (U)	0.087 (U)
0316-96-0149	0.294	1.01	0.272	0.160 (U)	0.102 (U)	0.090 (U)	0.203	0.199
0316-96-0158	0.092 (U)	0.341	0.189 (U)	0.163 (U)	0.104 (U)	0.092 (U)	0.086 (U)	0.088 (U)
0316-96-0208	0.184	2.38	0.285	0.167 (U)	0.107 (U)	0.094 (U)	0.182	0.099
0316-96-2000	23.7	2.2	0.301	0.163 (U)	0.104 (U)	0.091 (U)	0.31	0.454
0316-96-2001	16.5	17.7	1.62	0.164 (U)	0.105 (U)	0.082 (U)	0.093	0.089 (U)
0316-96-2002	2.07	4.33	0.568	0.163 (U)	0.104 (U)	0.091 (U)	0.182	0.125

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.
^b nc = Not calculated.
^c U = Reported detection limit. Analyte was not detected at or above this level.

TABLE 2.1.6-2
DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR PRs 16-
029(u) and 16-026(p)

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0042	Acetone	0.009(JB) ^a	2 000	0.02
	Methylene chloride	0.011(B) ^b	11	0.005
0316-96-0043	Acetone	0.008(JB)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
0316-96-0148	Acetone	0.007(JB)	2 000	0.02
	Methylene chloride	0.007(B)	11	0.005

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0149	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.008(B)	11	0.005
0316-96-0158	Acetone	0.010(JB)	2 000	0.02
	Methylene chloride	0.023(B)	11	0.005
0316-96-0204	Methylene chloride	0.040(B)	11	0.005
0316-96-0205	Acetone	0.008(JB)	2 000	0.02
	Benzoic acid	0.140(J) ^c	100 000	3.3
	2,4-Dinitrotoluene	0.084(J)	130	0.33
	Methylene chloride	0.036(B)	11	0.005
0316-96-0206	Methylene chloride	0.013(B)	11	0.005
0316-96-0207	Methylene chloride	0.016(B)	11	0.005
	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
0316-96-2000	Acetone	0.005(JB)	2 000	0.02
	Methylene chloride	0.006(B)	11	0.005
0316-96-2002	Acetone	0.012(JB)	2 000	0.02
	Methylene chloride	0.010(B)	11	0.005

^a JB = Estimated quantity and blank contamination.

^b B = Blank contamination.

^c J = Estimated quantity.

2.1.7 Screening Assessment

As anticipated in the VCA plan, the HE, TNT, and RDX were COPCs at TA-16-89 PRSs. They were present at levels above both SALs and industrial cleanup levels. Beryllium was slightly above background/SAL at the same location where HE was detected above PRGs. These COPCs were excavated during cleanup activities (Section 3.1.1). Locations 16-2373 and 16-2372 required Field Unit 3 soil removal.

Benzoic acid was not submitted for a multiple chemical evaluation (MCE) since its toxicity is not based on cancer or noncancer concerns, but is based on ceiling limits.

Other identified analytes greater than LANL UTLs were submitted for a MCE for the noncarcinogenic group. The sum of the maxima for the noncarcinogenic group of analytes is 0.6. This result is well below the target value of 1, which indicates a very low potential for adverse human health effects due to exposure to these analytes. If a value of

1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCE are summarized in Table 2.1.7-1. Only one constituent, beryllium, was detected in the carcinogenic group; therefore, no MCE has been performed for this group. No other COPCs were identified because the MCE was below unity.

TABLE 2.1.7-1
MCE FOR NONCARCINOGENIC EFFECTS AT PRSs 16-029(u) and 16-026(p)

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	1 320	5 300	0.2
Copper	23.7	2 800	0.008
Cyanide	1.6	1300	0.001
Lead	109	400	0.3
Nickel	19.1	1 500	0.01
Zinc	69.1	23 000	0.003
2,4- DNT	0.08	130	0.0006
HMX	10.8	3 300	0.003
Tetryl	0.207	650	0.0003
TNB	0.169	3.3	0.05
Total			0.6

2.1.8 Nature and Extent of Contamination

Sampling was biased at these PRSs to the areas most likely to be contaminated. TNT, RDX, and beryllium were all detected above SAL in soils and the soils were removed (Section 3.1.1). The high level of TNT and RDX at location 16-2373, which was removed, is bounded by sample 0316-96-0149 taken at 5.5–6.0 ft. The high level of TNT at location 16-2372, which was removed was bounded by sample 0316-96-0148 taken at 2–3 ft. All the remaining HE detects in bounding samples were barely above the EQLs.

2.1.9 Conclusions

The COPCs expected in the VCA plan were the HE RDX and TNT and barium (LANL 1996, 0623). Based on COPC and bounding sampling, TNT and RDX were the COPCs identified during cleanup activities. The soils that contained these COPCs were excavated as detailed in Section 3.1. After cleanup activities, all soils were below PRGs. Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use. These two PRSs are proposed for NFA (see Section 3.1.2).

2.2 Building TA-16-90, PRSs 16-029(t) and 16-026(o)

PRS 16-029(t) is the sumps associated with TA-16-90, an HE machining building, and PRS 16-026(o) is the associated drain lines and outfall. HE was detected at levels above SAL and industrial cleanup levels. Contaminated soil was cleaned up to below industrial cleanup levels. These two PRSs are therefore proposed for NFA.

2.2.1 History

TA-16-90 and its associated PRSs are discussed in Subsection 1.1.1 of the VCA plan (LANL 1996, 0623) and in Subsection 5.23.1.1 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). TA-16-90 was completed in 1950 and machining activities were at maximum levels until mid-1951, when the modern HE machining building,

TA-16-260, was finished. Low levels of HE machining continued from the early-1950s to the late-1950s. At some time during the late 1950s or early 1960s, TA-16-90 was converted to a storage facility. In the mid- to late-1960s, the HE sump was filled with gravel. The building was totally abandoned by 1991.

2.2.2 Description

TA-16-90 was constructed of wood on a concrete slab and was 2 165 ft² in floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings. PRS 16-029(t) consisted of two sumps, roughly 15 ft long x 5 ft wide x 5 ft deep. PRS 16-026(o) consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes daylighted, additional vitrified-clay pipe beneath the road to the north of the road, and an open-air drainage channel. The building, sumps, drain lines, and berms were removed during D&D operations in 1996 (Fig. 2.2.2-1).

2.2.3 Previous Investigations

No previous investigations were conducted at these PRSs.

2.2.4 Field Investigation

Following D&D removal of all surface and subsurface structures, 41 field screening samples were taken. Several screening points were located within the building footprints. Eighteen of these were lateral bounding, quantitative field screening samples and seven were vertical bounding samples. Locations of field screening samples are shown in Fig. 2.2.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by XRF, volatiles by PID, radionuclides by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Thirty screening

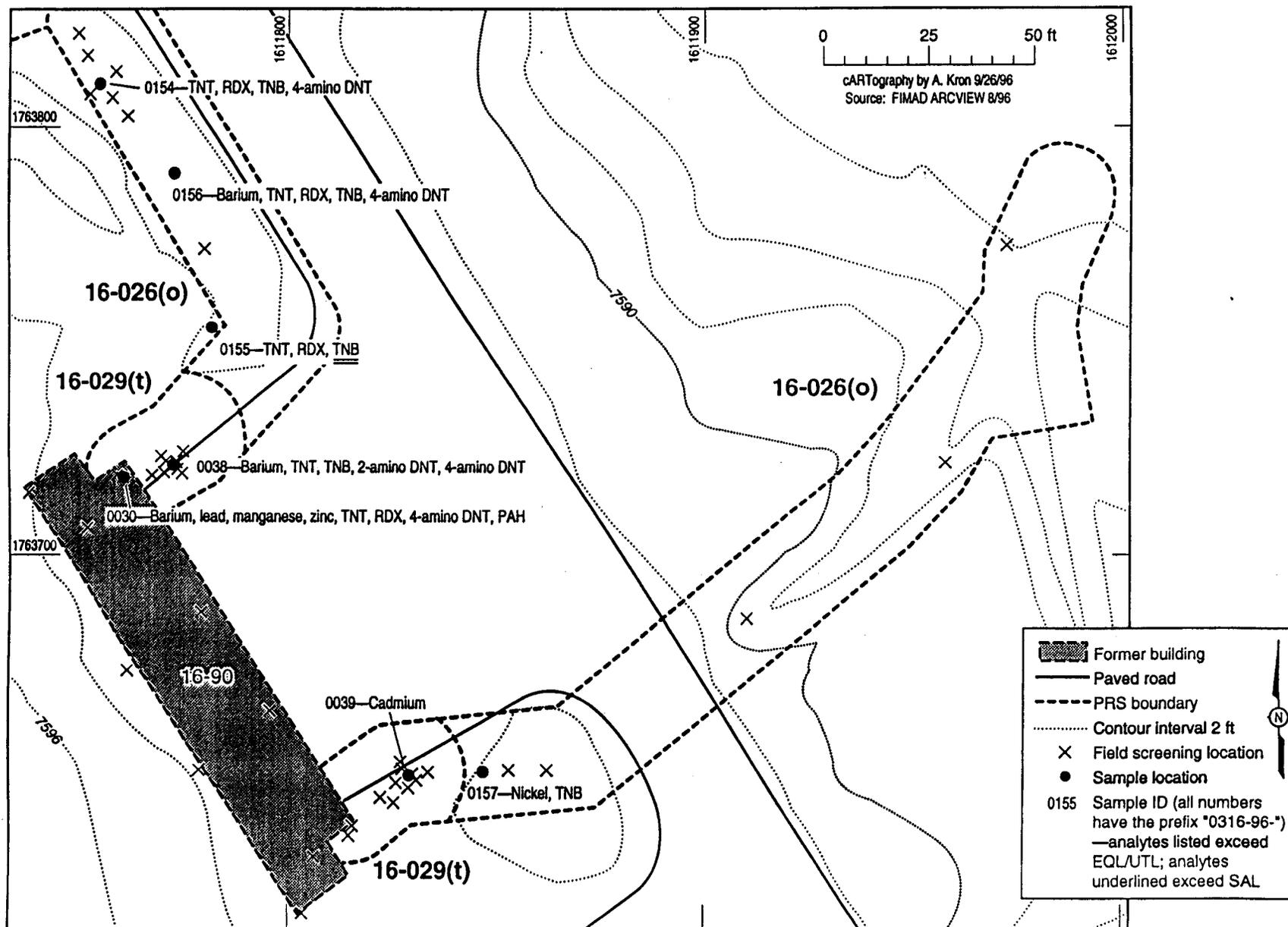


Fig. 2.2.2-1 Field screening, COPC, and bounding sampling for Building TA-16-90.

locations were above background for barium, four locations were above background for zinc, one location was above background for silver, and two locations were above background for thorium. Bounding samples were taken at sumps and at locations where soil cleanup occurred. The soil containing the highest level of each COPC at a level above background based on the screening methods was submitted for laboratory analysis.

Soil was excavated from around location 16-2363 (laboratory sample 0316-96-0154), location 16-2427 (laboratory sample 0316-96-0038), location 16-2430 (laboratory sample 0316-96-0039), and from location 16-2360 (laboratory sample 0316-96-0155) to location 16-2362 (laboratory sample 0316-96-0156). The limits of the excavations were determined by four lateral and one vertical quantitative field screening samples for each excavated area. All these field screening samples yielded results less than one-half PRG.

Seven COPC and bounding laboratory samples were taken; all were analyzed for inorganics, HE, SVOCs, and VOCs (Table 2.2.4-1). Two of these samples were taken beneath the northwest sump and one was taken under the southeast sump. The remaining samples were taken in the drainages, three in the northwest drain line, and one in the southeast. Samples were biased within the sumps and drain lines with field screening (Fig. 2.2.2-1).

TABLE 2.2.4-1
SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT
PRSS 16-029(t) and 16-026(o)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0030	16-2425	4-4.5	16-029(t)	COPC	1998	1999	1997	1997
0316-96-0038	16-2427	7-8	16-029(t)	Bounding	2092	2093	2090	2090
0316-96-0039	16-2430	7-8	16-029(t)	Bounding	2092	2093	2090	2090

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0154	16-2363	6.5-7.5	16-026(o)	Bounding	2158	2159	2157	2157
0316-96-0155	16-2360	4.5-5	16-026(o)	Bounding	2197	2198	2196	2196
0316-96-0156	16-2362	5-6	16-026(o)	Bounding	2197	2198	2196	2196
0316-96-0157	16-2364	5-6	16-026(o)	Bounding	2197	2198	2196	2196

2.2.5 Background Comparison

Barium was above UTL for three samples. Cadmium, lead, and zinc were above UTL for one sample each (Table 2.2.5-1). Manganese was above UTL for one sample. Nickel was at UTL for one sample and above it for one other.

TABLE 2.2.5-1
INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES FOR PRSs
16-029(t) and 16-026(o)^a

SAMPLE ID	Ba (mg/kg)	Cd (mg/kg)	Pb (mg/kg)	Mn (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
UTL	315	2.6	23.3	714	15.2	50.8
SAL	5 300	38	400	3 200	1 500	23 000
PRG	10 000	85	1 000	7 800	3 400	nc ^b
0316-96-0030	613	1.4	40.1	954	15.2	110
0316-96-0038	1 710	0.89	3.3	91.3	4.8	10.9
0316-96-0039	185	4.4	8.1	311	9.7	19.7
0316-96-0154	159	0.75 (U) ^c	3.3	206	4.8	17.0
0316-96-0155	104	0.95	5.7	163	9.0	16.8
0316-96-0156	1 550	0.86 (U)	3.9	196	3.8	21.5
0316-96-0157	177	0.83 (U)	7.6	644	15.5	38.3

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

2.2.6 Evaluation of Organics

Numerous types of HE were found above detection limits. Most of these results were well below SALs. TNB was detected above SAL for one sample (Table 2.2.6-1). Low levels of PAHs were found in two samples (Table 2.2.6-2). These are attributed to non-release

sources (asphalt paving and roofing tar). All other organics were B, J, or JB-qualified. Tetrachloroethene, trichloroethane, and trichlorofluoromethane were detected as J-qualified and are well below their respective EQLs.

TABLE 2.2.6-1
DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES FOR
PRs 16-029(t) and 16-026(o)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	NT (mg/kg)	NB (mg/kg)	TETRYL (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.25	0.26	0.65	0.25	0.26	nc ^b
SAL	15	4	3 300	650	3.3	650	3.3	nc	nc
PRG	64	17	3 400	nc	nc	nc	3.4	nc	nc
0316-96-0030	0.382	1.20	0.182 (U) ^c	0.157 (U)	0.091 (U)	0.100 (U)	0.088 (U)	0.083 (U)	0.128
0316-96-0038	0.472	0.671	0.182 (U)	0.157 (U)	0.091 (U)	0.100 (U)	1.09	0.282	0.161
0316-96-0039	0.089 (U)	0.814	0.182 (U)	0.157 (U)	0.091 (U)	0.100 (U)	0.089 (U)	0.083 (U)	0.085 (U)
0316-96-0154	2.790	3.59	0.548	0.124	0.189	0.100 (U)	0.275	0.140	0.088
0316-96-0155	0.499	2.77	0.722	0.068	0.087 (U)	0.255	16.3	0.084 (U)	0.086 (U)
0316-96-0156	1.820	3.40	0.305	0.157 (U)	0.091 (U)	0.184	2.06	0.180	0.136
0316-96-0157	0.098	0.974	0.184 (U)	0.159 (U)	0.092 (U)	0.133	0.373	0.084 (U)	0.086 (U)

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

TABLE 2.2.6-2
DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR PRs
16-029(t) and 16-026(o)

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0030	Acetone	0.069(B) ^a	2 000	0.02
	Anthracene	0.140(J) ^b	19	0.33
	Benzo(a)anthracene	0.300(J)	0.61	0.33
	Benzo(a)pyrene	0.210(J)	0.061	0.33
	Benzo(b)fluoranthene	0.200(J)	0.61	0.33
	Benzo(g,h,i)perylene	0.097(J)	nc ^c	0.33
	Benzo(k)fluoranthene	0.160(J)	6.1	0.33
	Chrysene	0.360(J)	24	0.33
	Flouranthene	0.53	2 600	0.33
	Fluorene	0.048(J)	300	0.33
	Indeno(1,2,3-cd)pyrene	0.082(J)	0.61	0.33
	Methylene chloride	0.006(B)	11	0.005

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0030	Phenanthrene	0.58	nc	0.33
	Pyrene	0.75	2 000	0.33
	Tetrachloroethene	0.001(J)	7	0.005
	Trichloroethane	0.002(J)	3 000	0.005
0316-96-0038	Methylene chloride	0.014(B)	11	0.005
0316-96-0039	Anthracene	0.058(J)	19	0.33
	Benzo(a)anthracene	0.037(J)	0.61	0.33
	Chrysene	0.069(J)	24	0.33
	Methylene chloride	0.012(B)	11	0.005
	Phenanthrene	0.110(J)	nc	0.33
	Pyrene	0.100(J)	2 000	0.33
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0154	Acetone	0.006(JB) ^d	2 000	0.02
	Methylene chloride	0.006(B)	11	0.005
0316-96-0155	Acetone	0.011(JB)	2 000	0.02
	Methylene chloride	0.021(B)	11	0.005
0316-96-0156	Acetone	0.013(JB)	2 000	0.02
	Methylene chloride	0.023(B)	11	0.005
0316-96-0157	Acetone	0.006(JB)	2 000	0.02
	Methylene chloride	0.018(B)	11	0.005

^a B = Blank contamination.

^b J = Estimated (below detection limit).

^c nc = not calculated.

^d JB = Estimated and blank contamination.

2.2.7 Screening Assessment

The VCA plan anticipated the HE TNT and RDX and barium as COPCs at TA-16-90 PRSs. Based on positive HE spot tests and quantitative field screening results, RDX and TNT were COPCs at these PRSs. TNB, present at levels above SAL and cleanup levels, was added to the COPC list. Soil containing COPCs above cleanup level was removed by D&D and Field Unit 3 personnel as detailed in Section 3.2.1

Analytes greater than LANL UTLs were submitted for a MCE for the noncarcinogenic group. Organics that were B-qualified were excluded. The sum of the maxima for the noncarcinogenic group of analytes is 0.8. This result is below the target value of 1, which indicates a very low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more

would be added to the COPC list. The results of the MCE are summarized in Table 2.2.7-1. PAHs were not included in the MCE. PAHs at this site are attributed to non-point-source runoff from surrounding asphalt parking lots, roads, and roof drains. These sources have been removed. No other COPCs were identified because the MCE was below unity.

TABLE 2.2.7-1
MCE FOR NONCARCINOGENIC EFFECTS AT PRSs 16-029(t) and
16-026(o)

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	1 710	5 300	0.3
Cadmium	4.4	38	0.1
Lead	40.1	400	0.1
Manganese	954	3 200	0.3
Nickel	15.5	1 500	0.01
Zinc	110	23 000	0.005
Trichlorofluoromethane	0.002	710	3×10^{-6}
Trichloroethane	0.002	3 000	7×10^{-7}
Tetrachloroethene	0.001	7	1×10^{-4}
Total			0.8

2.2.8 Nature and Extent of Contamination

Sampling was biased at this PRS to the areas most likely to be contaminated. TNB was detected above PRGs and was excavated (Section 3.2.1). Bounding samples were well below SAL and PRGs except for three locations where the soil was later excavated (See Section 3.2.1). The vertical extent of contamination was defined by bounding samples at locations that were cleaned up.

2.2.9 Conclusions

The COPCs expected in the VCA plan were the HE RDX and TNT and barium (LANL 1996, 0623). Based on COPC and bounding sampling, TNB was an additional COPC

identified during cleanup activities. TNT and RDX were COPCs identified by field screen during cleanup efforts. The soils that contained COPCs above PRG were excavated as detailed in Section 3.1. After cleanup activities, all soils were below PRGs, therefore these PRSs are proposed for NFA (see Section 3.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

2.3 Building TA-16-91, PRSs 16-029(s) and 16-026(n)

PRS 16-029(s) is the sumps associated with TA-16-91, an HE machining building, and PRS 16-026(n) is the associated drain line and outfall. HE were detected at levels above SALs and PRGs and the contaminated soil was cleaned up. These two PRSs are proposed for NFA.

2.3.1 History

TA-16-91 and its associated PRSs are discussed in Subsection 1.1.1 of the VCA plan (LANL 1996, 0623) and in Subsection 5.23.1.1 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). TA-16-91 was completed in 1950 and machining activities were at maximum levels until mid-1951, when the modern HE machining building, TA-16-260, was finished. Low levels of HE machining continued from the early-1950s to the late-1950s. At some time during the late 1950s or early 1960s, TA-16-91 was converted to a facility for cleaning and refurbishing HE-contaminated equipment. In the mid- to late-1960s, the HE sump was filled with gravel. By 1970 all the buildings in the 90s-Line were used for storage. The building was totally abandoned by 1991.

2.3.2 Description

TA-16-91 was constructed of wood on a concrete slab and was 1 332 ft² in floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings. PRS 16-029(s) consisted of two sumps, roughly 15 ft long x 5 ft wide x 5 ft deep. PRS 16-026(n) consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes daylighted, additional vitrified-clay pipe beneath to the north of the road, and an open-air drainage channel. The building, sumps, drain lines, and berms were removed during D&D operations in 1996 (Fig. 2.3.2-1).

2.3.3 Previous Investigations

No previous investigations were conducted at these PRSs.

2.3.4 Field Investigation

Following D&D removal of all surface and subsurface structures, 41 field screening samples were taken. Several screening points were located within the building footprints. Sixteen of these were lateral bounding, quantitative field screening samples, two were vertical delineation samples, and four were vertical bounding samples. Locations of field screening samples are shown in Fig. 2.3.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by XRF, volatiles by PID, radionuclides by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Thirty-one locations were above background for barium and seven locations were above background for silver. All locations where cleanup did not occur were well below one-half HE PRGs. Bounding samples were taken at sumps and at locations where soil cleanup occurred. The soil containing the highest level of each

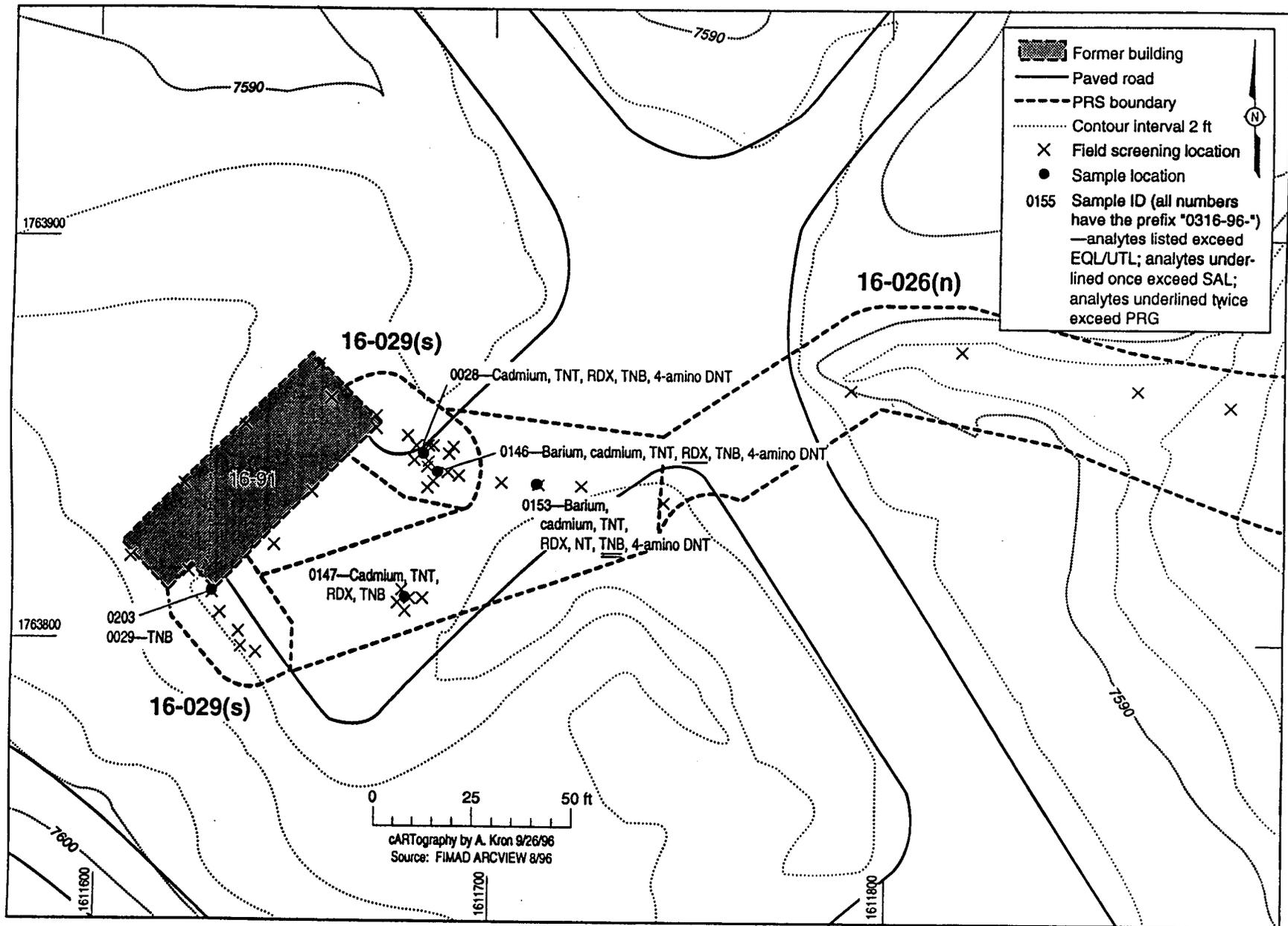


Fig. 2.3.2-1 Field screening, COPC, and bounding sampling for Building TA-16-91.

COPC at a level above background based on the screening methods was submitted for laboratory analysis.

Soil was excavated from around location 16-2240 (laboratory sample 0316-96-0153), location 16-2350 (laboratory sample 0316-96-0146), location 16-2354 (laboratory sample 0316-96-0147), and location 16-2421 (0316-96-0028). The limits of the excavation were determined by the four lateral and one vertical quantitative field screening samples. All these field screening samples yielded results less than one-half PRG.

Six COPC and bounding laboratory samples were taken and analyzed for inorganics, HE, SVOCs, and VOCs (Table 2.3.4-1). Sample 0316-96-0203 is a resample of 0316-96-0029 for SVOCs and VOCs that was taken because the original samples were handled improperly at the analytical laboratory. Two of the six samples were taken in the southwest sump; one sample was taken in the northeast sump. Two samples were taken in the northern drainage, and the remaining sample was in the southern drainage. Samples were biased within the sumps and drain lines with field screening (Fig. 2.3.2-1).

TABLE 2.3.4-1
SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT

PRs 16-029(s) and 16-026(n)								
SAMPLE ID	Location ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0028	16-2421	7-8	16-029(s)	Bounding	2092	2093	2090	2090
0316-96-0029	16-2422	7-8	16-029(s)	Bounding	2013	2014	na ^a	na
0316-96-0203	16-2422	6.5-7	16-029(s)	Bounding	na	na	2090	2090
0316-96-0146	16-2350	6.5-7.5	16-026(n)	Bounding	2092	2093	2090	2090
0316-96-0147	16-2354	6-7	16-026(n)	Bounding	2092	2093	2090	2090
0316-96-0153	16-2240	4.5-5.5	16-026(n)	Bounding	2158	2159	2157	2157

^a na = Not analyzed.

2.3.5 Background Comparison

Two samples were above UTL for barium (Table 2.3.5-1). Cadmium was above UTL for four samples. Silver was not detected in the laboratory samples, although the XRF screening suggested that it was present at seven locations.

TABLE 2.3.5-1

INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES FOR PRSs

16-029(s) and 16-026(n)^a

SAMPLE ID	Ba (mg/kg)	Cd (mg/kg)
UTL	315	2.6
SAL	5 300	38
PRG	10 000	85
0316-96-0028	276	9.4
0316-96-0029	60.2	0.85 (U) ^b
0316-96-0146	469	9.9
0316-96-0147	104	5.3
0316-96-0153	443	8.2

^a Double bordered cells contain concentrations greater than UTL.

^b U = Reported detection limit. Analyte was not detected at or above this level.

2.3.6 Evaluation of Organics

Numerous types of HE were found above detection limits using both quantitative field screening and laboratory analysis. RDX was above SAL in one sample; (Table 2.3.6-1) TNB was at SAL in one sample; TNB was above both SAL and PRG in one sample. PAHs at this site are attributed to non-point-source runoff from surrounding parking lots and roads. All other organics were qualified with a B, J, or JB (Table 2.3.6-2). Benzoic acid, trichlorofluoromethane, and 2,4-DNT were detected below EQL and J-qualified. 2,4-DNT was detected in the organics, but was not detected in the HE analysis.

TABLE 2.3.6-1

DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES FOR
PRs 16-029(s) and 16-026(n)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.25	0.25	0.26	nc ^b
SAL	15	4	3 300	650	3.3	nc	nc
PRG	64	17	3 400	nc	3.4	nc	nc
0316-96-0028	1.53	2.35	0.379	0.158 (U) ^c	0.323	0.224	0.112
0316-96-0029	0.088 (U)	0.358	0.180 (U)	0.156 (U)	2.700	0.082 (U)	0.084 (U)
0316-96-0146	3.62	8.4	0.823	0.161 (U)	0.729	0.216	0.167
0316-96-0147	0.28	1.75	0.183 (U)	0.159 (U)	3.3	0.089	0.086 (U)
0316-96-0153	0.276	3.12	1	0.265	10.4	0.138	0.157

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

TABLE 2.3.6-2

DETECTED ORGANICS FOR IN PRE-VERIFICATION SAMPLES PRs
16-029(s) and 16-026(n)

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0028	Benzo(a)pyrene	0.039(J) ^a	0.061	0.33
	bis(2-Ethylhexyl) phthalate	0.058(J)	32	0.33
	Methylene chloride	0.009(B) ^b	11	0.005
0316-96-0146	Methylene chloride	0.012(B)	11	0.005
0316-96-0147	Acetone	0.013(JB) ^c	2 000	0.02
	Benzoic acid	0.092(J)	100 000	3.3
	Methylene chloride	0.041(B)	11	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0147R	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.038(B)	11	0.005
	Trichlorofluoromethane	0.001(J)	710	0.005
0316-96-0153	Acetone	0.008(JB)	2 000	0.02
	Dinitrotoluene(2,4-)	0.084(J)	130	0.33
	Methylene chloride	0.008(B)	11	0.005
0316-96-0203	Acetone	0.008(JB)	2 000	0.02
	Benzoic acid	0.087(J)	100 000	3.3
	Methylene chloride	0.036(B)	11	0.005

^a J = Estimated.

^b B = Blank contamination.

^c JB = Estimated and blank contamination.

2.3.7 Screening Assessment

The HE TNT and RDX and barium were the anticipated COPCs at TA-16-91. RDX and TNB are COPCs at these PRSs because they were present at levels greater than SALs. TNB was added as a COPC during COPC and bounding sampling. All sites where COPC levels were above PRGs were excavated as detailed in Section 3.3.1.

Analytes greater than LANL UTLs were submitted for an MCE for noncarcinogenic and carcinogenic groups. PAHs were not included in the MCE. PAHs at this site are attributed to historical runoff from surrounding asphalt parking lots, roads, and roof drains. These sources have been removed. Organics that were B-qualified were also excluded. Benzoic acid was not submitted for a multiple chemical evaluation (MCE) since its toxicity is not based on cancer or noncancer concerns, but is based on ceiling limits. The sum of the maxima for the noncarcinogenic group of analytes is 0.4 and the maxima for the carcinogenic group is 0.2. Both results are well below the target value of 1, which indicates a very low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCEs are summarized in Tables 2.3.7-1 and 2.3.7-2. No other COPCs were identified because the MCE was below unity.

TABLE 2.3.7-1

MCE FOR NONCARCINOGENIC EFFECTS FOR PRSs 16-029(s) and
16-026(n)

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	469	5 300	0.09
Cadmium	9.9	38	0.3

ANALYTE	MAXIMUM SOIL CONCENTRATION	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
NT	0.265	650	0.0004
2,4-Dinitrotoluene	0.084	130	6×10^{-4}
Trichlorofluoromethane	0.002	710	3×10^{-6}
Total			0.4

TABLE 2.3.7-2

MCE FOR CARCINOGENIC EFFECTS FOR PRSs 16-029(s) and 16-026(n)

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
TNT	3.62	15	0.2
bis(2-Ethylhexyl)phthalate	0.058	32	0.001
Total			0.2

2.3.8 Nature and Extent of Contamination

Sampling was biased at this PRS to the areas most likely to be contaminated. RDX was detected above SAL and TNB was detected above PRG. Contamination was bounded at all locations during COPC sampling except one (sample 0316-96-0153). This is a deviation from the VCA plan. All other locations were below PRGs (Section 3.3.1).

2.3.9 Conclusions

The COPCs expected in the VCA plan were the HE RDX and TNT and barium (LANL 1996, 0623). RDX and TNT were identified as COPCs during field screening. Based on COPC and bounding sampling, TNB was the only additional COPC identified during cleanup activities. The soils that contained these COPCs at levels above PRG were excavated as detailed in Section 3.3.1. After cleanup activities, all soils were below PRGs except for one location (bounding sample 0316-96-0153). The PRGs are highly conservative and based on a hazard index of 0.1 (Section 3.0.1). Because there are no multiple constituent problems at this PRS, the one location where TNB was above PRG

would be below a PRG based on a hazard index of 1. These PRSs are therefore proposed for NFA (see Section 3.3.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

2.4 Building TA-16-92, PRSs 16-029(l) and 16-026(m)

PRS 16-029(l) is the sumps associated with Building TA-16-92, an HE machining building, and PRS 16-026(m) is the associated drain lines and outfall. No analytes were detected above PRG, and were additionally below SAL. These two PRSs are proposed for NFA.

2.4.1 History

TA-16-92 and its associated PRSs are discussed in Subsection 1.1.1 of the VCA plan (LANL 1996, 0623) and in Subsection 5.23.1.1 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). TA-16-92 was completed in 1950 and machining activities were at maximum levels until mid-1951 when the modern HE machining building, TA-16-260, was finished. Low levels of HE machining continued from the early-1950s to the late-1950s. At some time during the late 1950s or early 1960s, TA-16-92 was converted to a machine tool and disassembly building. In the mid- to late-1960s the HE sump was filled with gravel. By 1970, TA-16-92 was devoted entirely to storage. TA-16-92 was totally abandoned by 1991.

2.4.2 Description

TA-16-92 was constructed of wood on a concrete slab and was 1 332 ft² in floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings. PRS 16-029(l) consisted of two sumps, roughly 15 ft long x 5 ft wide x 5 ft deep. PRS 16-026(m) consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes daylighted, additional vitrified-clay pipe to the north of the road, and an open-air drainage channel. The building, sumps, drain lines, and berms were removed during D&D operations in 1996 (Fig. 2.4.2-1).

2.4.3 Previous Investigations

No previous investigations were conducted at these PRSs.

2.4.4 Field Investigation

Following D&D removal of all surface and subsurface structures, 20 quantitative field screening samples were taken. Several screening points were located within the building footprints. Four of these were lateral bounding, quantitative field screening samples. Locations of field screening samples are shown in Fig. 2.4.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by XRF, volatiles by PID, radionuclides by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Twenty screening locations were above background for barium, one location was above background for zinc, five locations were above background for nickel, six locations were above background for copper, and six locations were above SAL for uranium. All locations where cleanup did not occur were

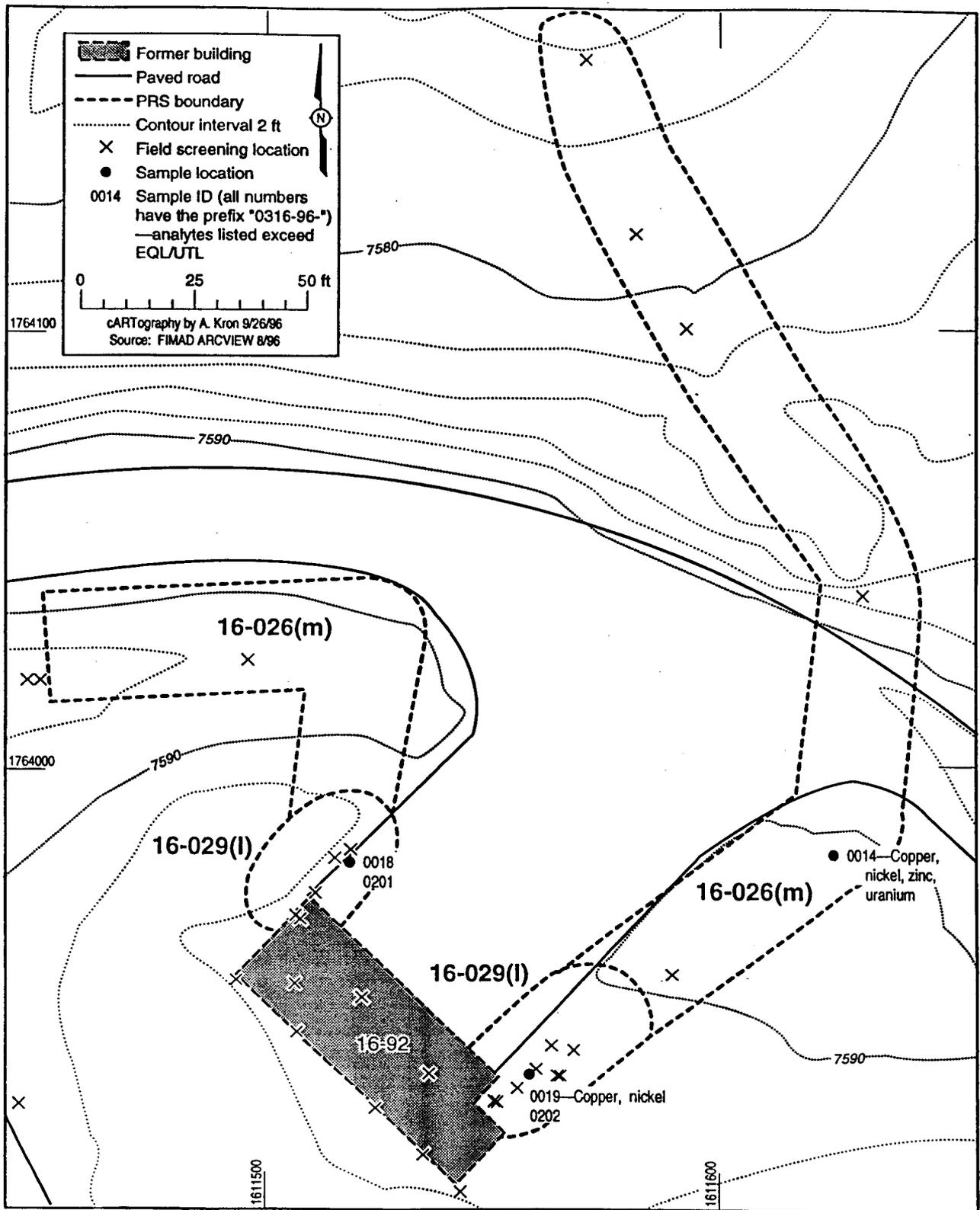


Fig. 2.4.2-1 Field screening, COPC, and bounding sampling for Building TA-16-92.

well below one-half PRGs. Bounding samples were taken at sumps. The soil containing the highest level of each COPC at a level above background based on the screening methods was submitted for laboratory analysis.

Four bounding samples and one COPC sample were taken and analyzed for inorganics, HE, total uranium, SVOCs, and VOCs (Table 2.4.4-1). Samples 0316-96-0018 and 0316-96-0019 had to be resampled for SVOCs and VOCs (samples 0316-96-0201 and 0316-96-0202) because of mishandling at the analytical laboratory. Two samples were taken under both the northwest and southeast sumps (Fig. 2.4.2-1). The remaining sample was taken within the northeastern drainage. Samples were biased within the sumps and drain lines with field screening.

TABLE 2.4.4-1
SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT
PRs 16-029(l) and 16-026(m)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	RAD	SVOC	VOC
0316-96-0014	16-2345	0-0.5	16-026(m)	COPC	1968	1969	1970	1967	1967
0316-96-0018	16-2415	6-6.5	16-029(l)	Bounding	2013	2014	2015	na ^a	na
0316-96-0019	16-2418	6.5-7	16-029(l)	Bounding	2013	2014	2015	na	na
0316-96-0201	16-2415	7.5-8	16-029(l)	Bounding	na	na	na	2090	2090
0316-96-0202	16-2418	7-7.5	16-029(l)	Bounding	na	na	na	2090	2090

^a na = Not analyzed.

2.4.5 Background Comparison

Copper was above UTL for two samples, but well below SAL (Table 2.4.5-1). Nickel was also detected above UTL in two samples. One sample was above UTL for zinc. One sample was above UTL for uranium (Table 2.4.5-2).

TABLE 2.4.5-1

INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES FOR PRSs

16-029(l) and 16-026(m)^a

SAMPLE ID	Cu (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
UTL	15.5	15.2	50.8
SAL	2 800	1 500	23 000
PRG	6 300	3 400	nc ^b
0316-96-0014	104.0	179	54.5
0316-96-0018	5.1	9.5	19.7
0316-96-0019	166.0	404	29.1

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

TABLE 2.4.5-2

DETECTED URANIUM IN PRE-VERIFICATION SAMPLES FOR PRSs

16-029(l) and 16-026(m)^a

SAMPLE ID	U (mg/kg)
UTL	5.45
SAL	29
PRG	284
0316-96-0014	7.19
0316-96-0018	2.4
0316-96-0019	4.25

^a Double bordered cells contain concentrations greater than UTL.

2.4.6 Evaluation of Organics

No high explosives were detected. All other organics were qualified with a B, J, or JB

(Table 2.4.6-1). Benzoic acid was detected as J-qualified and was far below EQL.

TABLE 2.4.6-1

**DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR PRSs
16-029(l) and 16-026(m)**

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0014	Methylene chloride	.014(B) ^a	11	0.005
0316-96-0201	Acetone	.009(JB) ^b	2 000	0.02
	Benzoic acid	.085(J) ^c	100 000	3.3
	Methylene chloride	.041(B)	11	0.005
0316-96-0202	Acetone	.009(JB)	2 000	0.02
	Benzoic acid	.100(J)	100 000	3.3
	Methylene chloride	.037(B)	11	0.005

^a B = Blank contamination

^b JB = Estimated quantity and blank contamination

^c J = Estimated quantity

2.4.7 Screening Assessment

The COPCs expected at these PRSs were the HE TNT and RDX, barium, and uranium. No analyte was detected above SAL or PRG at this PRS. No COPCs were present.

Analytes greater than LANL UTLs were submitted for an MCE for the noncarcinogenic grouping. Benzoic acid was not submitted for a multiple chemical evaluation (MCE) since its toxicity is not based on cancer or noncancer concerns, but is based on ceiling limits. The sum of the maxima for the noncarcinogenic group of analytes is 0.4. This result is well below the target value of 1, which indicates a very low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCE are summarized in Table 2.4.7-1. No COPCs were added because the MCE was below unity.

Uranium was the only analyte in the radionuclide group, therefore no MCE calculation was performed.

TABLE 2.4.7-1

**MCE FOR NONCARCINOGENIC EFFECTS FOR PRSs 16-029(l) and
16-026(m)**

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Copper	166	2 800	0.06
Nickel	404	1 500	0.3
Zinc	54.5	23 000	0.002
Total			0.4

2.4.8 Nature and Extent of Contamination

Sampling was biased at these PRSs to the areas mostly likely to be contaminated. No analytes were detected above SAL. All bounding samples were well below SALs.

2.4.9 Conclusions

The COPCs expected in the VCA plan were the HE RDX and TNT, barium, and uranium (LANL 1996, 0623). Based on COPC and bounding sampling, no COPCs were present. All soils were below PRGs, therefore these PRSs are proposed for NFA (see Section 3.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

2.5 Building TA-16-93, PRS 16-029(k)

PRS 16-029(k) is the sumps, drain lines, and outfall associated with Building TA-16-93, an electroplating building. Several inorganics and HE were detected at levels above SAL. Chromium (VI) was detected above PRG. The soil was cleaned up to below industrial cleanup levels. This PRS is proposed for NFA.

2.5.1 History

TA-16-93 and its associated SWMU are discussed in Subsection 1.1.1 of the VCA plan (LANL 1996, 0623) and in Subsection 5.23.1.1 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). The building was completed in 1950. It is not known how long electroplating activities continued in TA-16-93. In the mid- to late-1960s the HE sump was filled with gravel. By the 1970s, TA-16-93 was devoted to storage. The building was totally abandoned by 1991.

2.5.2 Description

TA-16-93 was constructed of wood on a concrete slab and was 1 627 ft² in floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings. PRS 16-029(k) consisted of two sumps, roughly 15 ft long x 5 ft wide x 5 ft deep. This PRS also contained buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes daylighted, additional vitrified-clay pipe beneath the road to the north of the road, and an open-air drainage channel. The building, sumps, drain lines, and berms were removed during D&D operations in 1996 (Fig. 2.5.2-1).

2.5.3 Previous Investigations

Previous investigations for this PRS were reported in Section 2.0 of this report.

2.5.4 Field Investigation for Building TA-16-93, PRS 16-029(k)

Following D&D removal of all surface and subsurface structures, 31 field screening samples were taken. Several screening points were located within the building footprints. Eight of these were lateral bounding, quantitative field screening samples and two were vertical bounding samples. Locations of field screening samples are shown in Fig. 2.5.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by XRF, volatiles by PID, radionuclides by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Twenty-nine locations were above background for barium, two locations were above SAL for chromium, one location was above background for nickel, one location was above background for silver, one location was above background for lead, and one location was above SAL for uranium. All locations where cleanup did not occur were well below one-half PRGs. Bounding samples were taken at locations where soil cleanup occurred. The soil containing the highest level above background for each COPC based on the screening methods was submitted for laboratory analysis.

Soil was excavated from around location 16-2393 (laboratory sample 0316-96-0058). The limits of the excavation were determined by the four lateral and one vertical quantitative field screening samples. All these field screening samples yielded results less than one-half PRG.

Five COPC and bounding laboratory samples were taken and analyzed for inorganics, HE, SVOCs, and VOCs (Table 2.5.4-1). One sample was also tested for chromium (VI) due to a high chromium screening value. Two samples were taken under both the northwest and

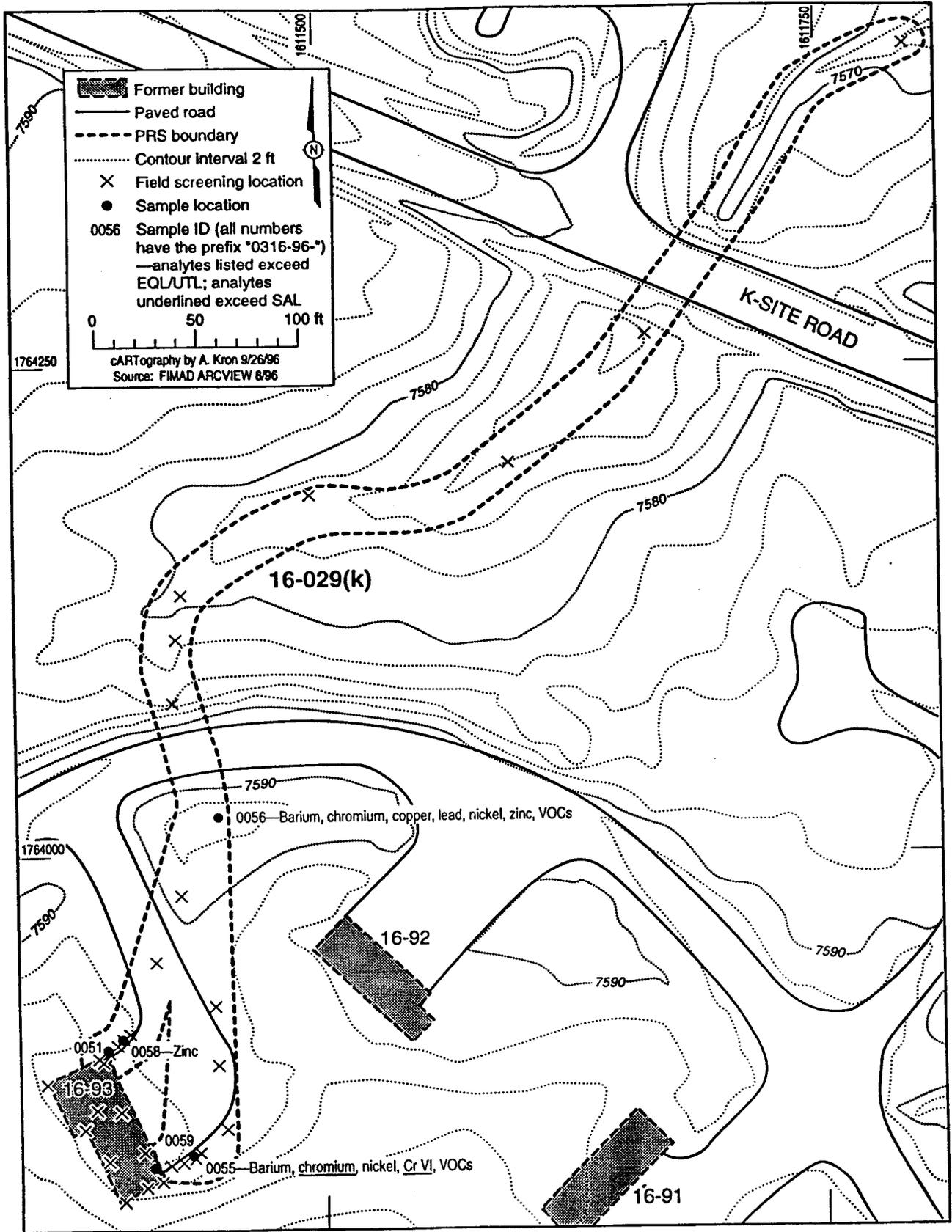


Fig. 2.5.2-1 Field screening, COPC, and bounding sampling for Building TA-16-93.

southeast sumps. The remaining sample was taken at the intersection of the two drain lines. Samples were biased within the sumps and drain lines with field screening.

TABLE 2.5.4-1
SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT
PRS 16-029(k)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	CR (VI)	HE	SVOC	VOC
0316-96-0051	16-2392	4-4.5	16-029(k)	COPC	1935	na ^a	1936	1934	1934
0316-96-0055	16-2384	3.5-4	16-029(k)	COPC	1935	1935	1936	1934	1934
0316-96-0056	16-2386	1.5-2	16-029(k)	COPC	1935	na	1936	1934	1934
0316-96-0058	16-2393	7.0-8	16-029(k)	Bounding	2092	na	2093	2090	2090
0316-96-0059	16-2394	7.5-8	16-029(k)	Bounding	2030	na	2028	2029	2029

^a na = Not analyzed.

2.5.5 Background Comparison

Two samples are above UTL for barium (Table 2.5.5-1). One sample is above UTL for chromium, and one sample was above SAL for chromium (VI) and chromium. Copper and lead are above UTL for one sample. Two samples are above UTL for nickel. Two samples were barely above background levels for zinc.

TABLE 2.5.5-1
INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES FOR PRS
16-029(k)^a

SAMPLE ID	Ba (mg/kg)	Cr (mg/kg)	Cr (VI) (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
UTL	315	19.3	nc ^b	15.5	23.3	15.2	50.8
SAL	5 300	210	30	2 800	400	1 500	23 000
PRG	10 000	450	64	6 300	1 000	3 400	nc
0316-96-0051	188	8.4	na ^c	13.1	11.3	12.1	33.5
0316-96-0055	2 710	226	67.7	14.3	12.2	19.1	26.4
0316-96-0056	439	52.9	na	37.2	45.2	135	69.8
0316-96-0058	79.1	5.7	na	5.0	5	10.3	60.3

SAMPLE ID	Ba (mg/kg)	Cr (mg/kg)	Cr (VI) (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
0316-96-0059	98.4	2.7	na	4.0	5.2	5.8	14.7

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c na = Not analyzed.

2.5.6 Evaluation of Organics

No high explosives were detected above SAL (Table 2.5.6-1). Several VOCs were detected, all well below SAL. Non-qualified data was from location where no removal of soil occurred. Location 16-2393 contained a small amount of J-qualified organics at a depth of 7–8 ft (sample 0316-96-0058). However, a shallower sample taken at a depth of 4–5 ft contained no organics (confirmatory sample 0316-96-0052; section 3.5.2). All other organics were qualified with a B, J, or JB (Table 2.5.6-2). Butylbenzylphthalate, bis(2-ethylhexyl)phthalate, trichloroethene, trichlorotrifluoromethane, and tetrachloroethene were all J-qualified and are well below EQL.

TABLE 2.5.6-1
DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES AT
PRS 16-029(k)

SAMPLE ID	4-aDNT (mg/kg)
EQL	nc ^a
SAL	nc
PRG	nc
0316-96-0056	0.147

^a nc = Not calculated.

TABLE 2.5.6-2

DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR PRS 16-029(k)^a

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0055	Trichloroethene	0.011	7.1	0.005
	Tetrachloroethene	0.009	7	0.005
0316-96-0056	cis-1,2-Dichloroethene	0.011	59	0.01
	Trichloroethene	0.12	7.1	0.005
	Tetrachloroethene	0.16	7	0.005
	Butylbenzophthalate	0.083(J) ^b	13 000	0.33
	Bis(2-ethylhexyl)phthalate	0.110(J)	32	0.33
0316-96-0058	Methylene chloride	0.008(B) ^c	11	0.005
	Trichloroethene	0.003(J)	7.1	0.005
	Trichlorotrifluoroethane	0.001(J)	4 100	0.005
	Tetrachloroethene	0.002(J)	7	0.005
0316-96-0059	Methylene chloride	0.01	11	0.005
	Acetone	0.013(JB) ^d	2 000	0.02
	Trichloroethene	0.016	7.1	0.005
	Tetrachloroethene	0.013	7	0.005

^a Double bordered cells contain concentrations greater than EQL.

^b J = Estimated quantity

^c B = Blank contamination

^d JB = Estimated quantity and blank contamination

2.5.7 Screening Assessment

The HE TNT and RDX, barium, plating metals, beryllium, cadmium, lead, and zinc. were the COPCs anticipated in the VCA plan, however, no COPCs were identified during COPC and bounding sampling. RDX was identified as a COPC based on quantitative field screening. Chromium and chromium (VI) were added as COPCs based on laboratory results. These locations were excavated as detailed in Section 3.5.1.

Analytes greater than LANL UTLs were submitted for an MCE for the noncarcinogenic and carcinogenic groupings. Organics that were B-qualified were excluded. The sum of the maxima for the noncarcinogenic group of analytes is 0.7 and the sum of the maxima for the carcinogenic group is 0.04. These results are below the target value of 1, which indicates a low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCE are summarized in Tables 2.5.7-1 and 2.5.7-2. No COPCs were identified because the MCE was below unity.

TABLE 2.5.7-1
MCE FOR NONCARCINOGENIC EFFECTS AT PRS 16-029(k)

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	2 710	5 300	0.5
Copper	37.2	2 800	0.01
Lead	45.2	400	0.1
Nickel	135	1 500	0.09
Zinc	69.8	23 000	0.003
Butylbenzolphthalate	0.083	13 000	6 x 10 ⁻⁶
cis-(1,2-)Dichloroethene	0.011	59	2 x 10 ⁻⁴
Total			0.7

TABLE 2.5.7-2
MCE FOR CARCINOGENIC EFFECTS AT PRS 16-029(k)

ANALYTE	MAXIMUM SOIL CONCENTRATION	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Trichloroethene	0.12	7.1	0.02
Tetrachloroethene	0.16	7	0.02
Bis (2-ethylhexyl)phthalate	0.11	32	0.003
Total			0.04

2.5.8 Nature and Extent of Contamination

Sampling was biased at this PRS to the areas most likely to be contaminated. One location that was above PRG for RDX based on field screening was excavated (Section 3.5.1). Chromium was detected well below PRG so it was not excavated. Chromium (VI) was detected slightly above PRG . Upon review of all of the chromium data from the SE drainage, the decision was made not to excavate (Section 3.5.1). Bounding samples were below SALs for all analytes.

2.5.9 Conclusions

The COPCs expected in the VCA plan were the HE RDX and TNT, barium, plating metals, beryllium, cadmium, lead, and zinc (LANL 1996, 0623). No COPCs were identified during COPC and bounding sampling. One location that was above PRG for RDX based on field screening was excavated (Section 3.5.1). Bounding samples were below SALs for all analytes. After cleanup activities, all soils were below PRGs, therefore this PRS is proposed for NFA (see Section 3.5.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

2.6 Building TA-16-99, PRS 16-029(q)

PRS 16-029(q) is the sump, drain lines, and outfall associated with TA-16-99, an HE machining building. HE and lead were detected above cleanup levels and the soil was excavated. This PRS is therefore proposed for NFA.

2.6.1 History

TA-16-99 and its associated SWMU are discussed in Subsection 1.1.1 of the VCA plan (LANL 1996, 0623) and in Subsections 5.23.1.1 and 5.18.1.1 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). The building was completed in 1948 and riser cutting activities were at maximum levels until mid-1951 when the modern HE machining building, TA-16-260, was finished. At some time during the late 1950s or early 1960s, TA-16-99 was converted to a storage facility. In the mid- to late-1960s the HE sump was filled with gravel. The building was totally abandoned by 1991.

2.6.2 Description

TA-16-99 was constructed of wood on a concrete slab and was 892 ft² in floor area. It was surrounded on three sides by an earthen berm that was packed against steel pilings. PRS 16-029(q) consisted of two sumps, roughly 15 ft long x 5 ft wide x 5 ft deep. It also consisted of buried vitrified-clay pipe from the sumps to the road, depressions next to the road where the pipes daylighted, and an open-air drainage channel. The building, sumps, drain lines, and berms were removed during D&D operations in 1996 (Fig. 2.6.2-1).

2.6.3 Previous Investigations

No previous investigations were conducted at this PRS.

2.6.4 Field Investigation

Following D&D removal of all surface and subsurface structures, 35 field screening samples were taken. Several screening points were located within the building footprints. Six of these were lateral bounding, quantitative field screening samples and six were vertical bounding samples. Locations of field screening samples are shown in Fig. 2.6.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by XRF, volatiles by PID, radionuclides

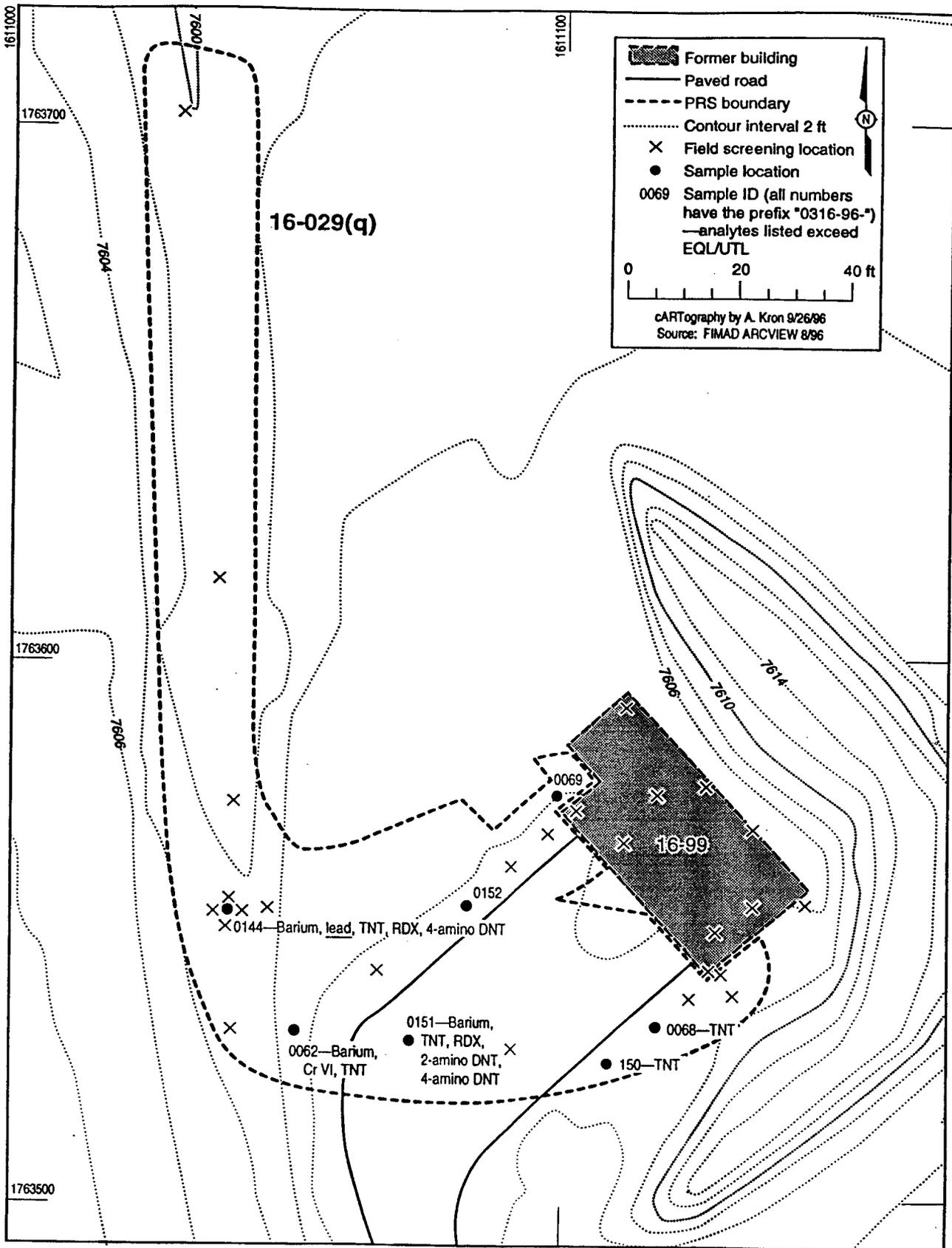


Fig. 2.6.2-1 Field screening, COPC, and bounding sampling for Building TA-16-99.

by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Twenty-six locations were above background for barium, one location was above background for zinc, two locations were above background for chromium, and one location was above SAL for uranium. All locations where cleanup did not occur were well below one-half HE PRGs. Bounding samples were taken at sumps and at locations where soil cleanup occurred. The soil containing the highest level of each COPC at a level above background based on the screening methods was submitted for laboratory analysis. Based upon visible HE residue and positive HE spot tests, soil was excavated from both trenches by D&D. Based upon positive D-Tech™ results for RDX and TNT, soil was excavated from around location 16-2404 (laboratory sample 0316-96-0144) by Field Unit 3. The limits of the excavation were determined by the four lateral and one vertical quantitation field screening samples. The initial vertical bounding sample at 16-2404 was screened and revealed remaining contamination. A second removal was performed and additional bounding samples collected. The second bounding samples yielded results less than one-half PRGs.

Seven COPC and bounding laboratory samples were taken for this PRS and all were analyzed for inorganics, HE, SVOCs, and VOCs (Table 2.6.4-1). One sample was taken at the southwestern end of the southeast sump. Two samples were collected along the drain line from this sump. One sample was at the intersection of the two drain lines. One sample was taken under the northwest sump, one along the drain line, and one down drainage. Samples were biased within the sumps and drain lines with field screening (Fig. 2.6.2-1).

TABLE 2.6.4-1

SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT
 PRS 16-029(q)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	CR (VI)	HE	SVOC	VOC
0316-96-0062	16-2399	4.5-5	16-029(q)	COPC	2033	2033	2034	2032	2032
0316-96-0068	16-2412	7.0-8	16-029(q)	Bounding	1911	na	1912	1910	1910
0316-96-0069	16-2407	7.0-8	16-029(q)	Bounding	1911	na	1912	1910	1910
0316-96-0144	16-2404	7.0-8	16-029(q)	Bounding	2158	na	2159	2157	2157
0316-96-0150	16-2400	5.0-6	16-029(q)	Bounding	2158	na	2159	2157	2157
0316-96-0151	16-2402	5.0-6	16-029(q)	Bounding	2158	na	2159	2157	2157
0316-96-0152	16-2397	6.0-7	16-029(q)	Bounding	2158	na	2159	2157	2157

2.6.5 Background Comparison

Barium was above UTL for three samples (Table 2.6.5-1). Lead was above SAL for one sample. Low levels of chromium (VI) were detected in one sample.

TABLE 2.6.5-1

INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES FOR PRS
 16-029(q)^a

SAMPLE ID	Ba (mg/kg)	Cr (VI) (mg/kg)	Pb (mg/kg)
UTL	315	nc ^b	23.3
SAL	5 300	30	400
PRG	10 000	nc	1 000
0316-96-0062	1 600	1.2	1.4
0316-96-0068	70.3	na ^c	3.8
0316-96-0069	34.3	na	1.6
0316-96-0144	702	na	404
0316-96-0150	69.4	na	2.6
0316-96-0151	2 720	na	2.7
0316-96-0152	69.1	na	2.6

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c na = Not analyzed.

2.6.6 Evaluation of Organics

No high explosives were detected above SAL in laboratory samples (Table 2.6.6-1). All other organics were qualified with a B, J, or JB (Table 2.6.6-2). Carbon disulfide, dichlorodifluoromethane, methylene chloride, bis (2-ethylhexyl)phthalate, and trichlorofluoromethane were detected at or well below EQL and were J-qualified.

TABLE 2.6.6-1
DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES FOR
PRS 16-029(q)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.25	0.26	nc ^b
SAL	15	4	3 300	3.3	nc	nc
PRG	64	17	3 400	3.4	nc	nc
0316-96-0062	0.328	0.324	0.181 (U) ^c	0.091	0.082 (U)	0.085 (U)
0316-96-0068	0.61	0.698	0.185 (U)	0.097	0.084 (U)	0.086 (U)
0316-96-0144	1.05	2.03	0.524	0.088 (U)	0.082 (U)	0.148
0316-96-0150	0.311	0.285	0.180 (U)	0.088 (U)	0.082 (U)	0.084 (U)
0316-96-0151	1.94	1.69	0.180 (U)	0.088 (U)	0.265	0.292
0316-96-0152	0.238	0.208	0.181 (U)	0.088 (U)	0.082 (U)	0.085 (U)

^a Double bordered cells contain concentrations greater than EQL.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

TABLE 2.6.6-2
DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR PRS
16-029(q)

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0062	Acetone	0.003(JB) ^a	2 000	0.02
	Carbon disulfide	0.001(J) ^b	16	0.005
	Dichlorodifluoromethane	0.002(J)	110	0.01
	Methylene chloride	0.010(B) ^c	11	0.005
0316-96-0068	Acetone	0.009(JB)	2 000	0.02

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0068	Methylene chloride	0.005(J)	11	0.005
0316-96-0069	Bis(2-Ethylhexyl)phthalate	0.040(J)	32	0.33
	Methylene chloride	0.001(J)	11	0.005
0316-96-0144	Acetone	0.002(JB)	2 000	0.02
	Methylene chloride	0.006(B)	11	0.005
0316-96-0150	Acetone	0.007(JB)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0151	Methylene chloride	0.010(B)	11	0.005
0316-96-0152	Acetone	0.005(JB)	2 000	0.02
	Methylene chloride	0.008(B)	11	0.005
	Trichlorofluoromethane	0.001(J)	710	0.005

^a JB = Estimated quantity and blank contamination.

^b J = Estimated quantity.

^c B = Blank contamination.

2.6.7 Screening Assessment

The HE TNT and RDX and barium were the COPCs anticipated in the VCA plan. Lead, at a level above SAL, was identified as a COPC during laboratory sampling. TNT and RDX were COPCs at this PRS because they were present at levels greater than SALs and cleanup levels based on quantitative field screening analysis. These locations, where HE was above PRGs, were excavated as detailed in Section 3.6.1.

Additional analytes greater than LANL UTLs were submitted for an MCE for noncarcinogenic and carcinogenic groupings. Organics that were B-qualified were excluded. The sum of the maxima for the noncarcinogenic group of analytes is 0.5 and the sum of the maxima for the carcinogenic group is 0.04. These results are well below the target value of 1, which indicates a low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCE are summarized in Table 2.6.7-1 and Table 2.6.7-2. No additional COPCs were identified because the MCE was below unity.

TABLE 2.6.7-1**MCE FOR NONCARCINOGENIC EFFECTS AT PRS 16-029(q)**

ANALYTE	MAXIMUM SOIL CONCENTRATION	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	2 720	5 300	0.5
Carbon disulfide	0.001	16	6 x 10 ⁻⁵
Dichlorodifluoromethane	0.002	110	2x 10 ⁻⁵
Trichlorofluoromethane	0.002	710	3 x 10 ⁻⁶
Total			0.5

TABLE 2.6.7-2**MCE FOR CARCINOGENIC EFFECTS AT PRS 16-029(q)**

ANALYTE	MAXIMUM SOIL CONCENTRATION	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Bis(2-ethylhexyl)phthalate	0.04	32	0.001
Chromium (VI)	1.2	30	0.04
Methylene chloride	0.005	11	0.0005
Total			0.04

2.6.8 Nature and Extent of Contamination

Sampling was biased at this PRS to the areas most likely to be contaminated. Lead was detected at one location above SAL, but was well below PRG and was not excavated. The locations where TNT and RDX were above PRG were excavated (Section 3.6.1). All bounding samples were well below SAL, except for the initial bounding sample at 16-2404 and one that contained lead which was far below PRG.

2.6.9 Conclusions

The COPCs expected in the VCA plan were the HE RDX and TNT and barium (LANL 1996, 0623). Lead was identified as a COPC during COPC and bounding sampling. Locations where TNT and RDX were above PRG based on quantitative field screening were excavated (Section 3.6.1). Bounding samples were below PRG for all analytes. After

cleanup activities, all soils were below PRGs, therefore this PRS is proposed for NFA (see Section 3.6.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

2.7 Area of Concern C-16-064

C-16-064 is the drum storage site located near building TA-16-99. HE was detected above SAL and industrial PRGs and the soil was cleaned up. This area of concern (AOC) is proposed for NFA.

2.7.1 History

C-16-064 is discussed in Subsection 5.19.1.1.5 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160) and is a drum storage area located roughly 50 ft southwest of TA-16-99. A drum storage platform, TA-16-183, was constructed in April 1945 and was a wooden structure on steel legs. The platform was used for storage of garbage cans that contained HE scrap from the riser cutting building (Martin 1993, 15-16-477). The platform was decommissioned and flashed at the burning ground in 1968.

2.7.2 Description

This AOC consisted of a wooden storage area a few feet off the ground on steel legs. The platform was 8 ft long x 8 ft wide (Fig. 2.7.2-1).

2.7.3 Previous Investigations

No previous investigations were conducted at this PRS.

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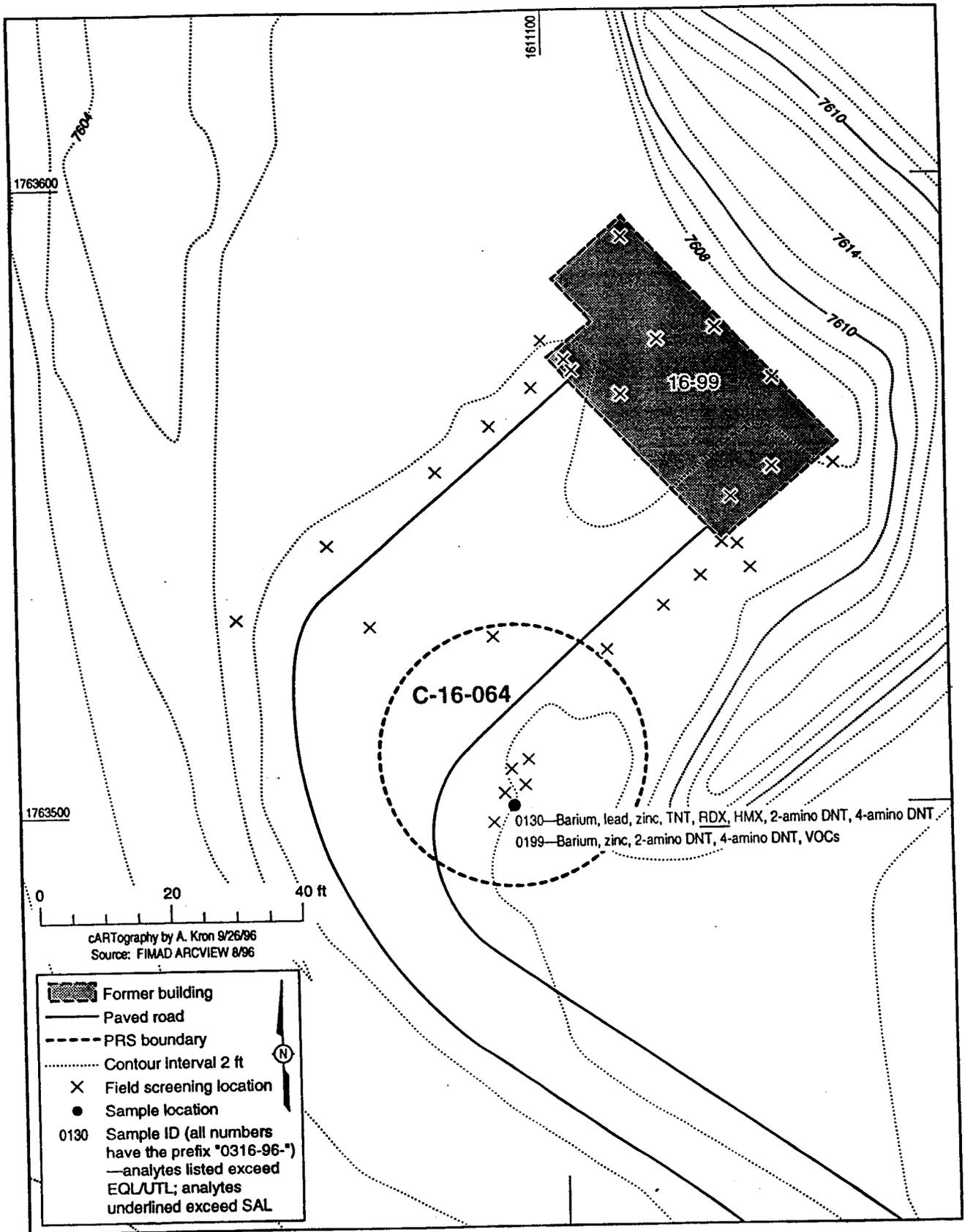


Fig. 2.7.2-1 Field screening, COPC, and bounding sampling for C-16-064.

2.7.4 Field Investigation

Eight field screening samples were taken. Several screening points were located within the building footprints. Two of these were vertical bounding, quantitative field screening samples. Locations of field screening samples are shown in Fig. 2.7.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), volatiles by PID, radionuclides by hand-held sodium iodide detector, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. All locations where cleanup did not occur were well below one-half HE PRGs. Bounding samples were taken at locations where soil cleanup occurred.

Soil was excavated from around location 16-2541 (laboratory sample 0316-96-0130) within the sample points that defined the lateral extent of the PRS. The limits of the excavation were determined by the four lateral and one vertical quantitative field screening samples. All these surrounding field screening samples yielded results less than one-half PRG.

Two laboratory samples were taken and analyzed for metals, HE, and SVOCs (Table 2.7.4-1). One of the samples was additionally analyzed for VOCs.

TABLE 2.7.4-1
SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT
C-16-064

SAMPLE ID	LOCATION ID	DEPTH (in.)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0130	16-2541	0-6	C-16-064	COPC	1885	1886	1884	na ^a
0316-96-0199	16-2541	6-12	C-16-064	Bounding	1885	1886	1884	1884

^a na = Not analyzed.

2.7.5 Background Comparison

Barium was above UTL, but well below SAL for two samples (Table 2.7.5-1). Lead was above UTL for one sample, but well below SAL. Zinc was above UTL for two samples, but well below SAL.

TABLE 2.7.5-1
INORGANICS ABOVE BACKGROUND IN PRE-VERIFICATION SAMPLES
FOR C-16-064^a

SAMPLE ID	Ba (mg/kg)	Pb (mg/kg)	Zn (mg/kg)
UTL	315	23.3	50.8
SAL	5 300	400	23 000
PRG	10 000	1 000	nc ^b
0316-96-0130	999	41.7	54
0316-96-0199	387	21.9	63.9

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

2.7.6 Evaluation of Organics

Several HE were above detection limits (Table 2.7.6-1). One sample was above SAL and PRG for RDX. This soil was later removed (see Section 3.7). Methylene chloride was found in the blank, and was detected in one sample at level less than 5x the level in the blank (Table 2.7.6-2). This result is attributed to blank contamination.

TABLE 2.7.6-1

**DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES FOR
C-16-064^a**

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.26	nc ^b
SAL	15	4	3 300	nc	nc
PRG	64	17	3 400	nc	nc
0316-96-0130	0.3	164	25.9	0.401	0.584
0316-96-0199	0.090 (U) ^c	0.229	0.184 (U)	0.272	0.296

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

TABLE 2.7.6-2

DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR C-16-064^a

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0199	Methylene chloride	0.011	11	0.005

^a Double bordered cells contain concentrations greater than EQL.

2.7.7 Screening Assessment

The primary COPC at C-16-064 was HE. RDX was identified as a COPC because it was detected above SAL. This one location was excavated as detailed in Section 3.7.1.

Analytes greater than LANL UTLs were submitted for an MCE for noncarcinogenic and carcinogenic groups. The sum of the maxima for the noncarcinogenic group of analytes is 0.3 and the sum of the maxima for the carcinogenic group is 0.02. These results are below the target value of 1, which indicates a low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCE

are summarized in Tables 2.7.7-1 and 2.7.7-2. No COPCs were added because the MCE was below unity.

TABLE 2.7.7-1

MCE FOR NONCARCINOGENIC EFFECT FOR C-16-064

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	999	5 300	0.2
Lead	41.7	400	0.1
Zinc	63.9	23 000	0.003
Total			0.3

TABLE 2.7.7-2

MCE FOR CARCINOGENIC EFFECT FOR C-16-064

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Methylene chloride	0.011	11	0.001
TNT	0.3	15	0.02
Total			0.02

2.7.8 Nature and Extent of Contamination

Inorganics were detected above background screening levels, but were well below SAL in the bounding sample. Methylene chloride was detected slightly above the detection limit. RDX was detected above SAL in the near-surface sample and the contaminated soil was excavated (Section 3.7.1).

2.7.9 Conclusions

The COPC expected in Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160) was HE. One location was above PRG for RDX and was excavated. The bounding sample was below PRG. After cleanup activities, all soils were below PRGs, therefore this PRS is proposed for NFA (see Section 3.7.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

2.8 Area of Concern C-16-067

C-16-067 is a drum storage area near building TA-16-90. HE was detected above cleanup levels and the contaminated soil was excavated. This AOC is proposed for NFA.

2.8.1 History

C-16-067 is discussed in Subsection 5.19.1.1.5 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). It is a drum storage area east of machining building TA-16-90. It was likely constructed concurrently with the 90s-Line in 1950 and was used to store barrels of volatile organics and possibly HE that were laid on their sides (Martin 1993, 15-16-477). The drums were equipped with spigots, which may have allowed the barrels to drip on the ground. The platform is decommissioned.

2.8.2 Description

This AOC contained a wooden storage area a few feet off the ground on steel legs. The platform was 8.33 ft long x 8.33 ft wide x 4.5 ft high (Fig. 2.8.2-1). The drain line for TA-16-90 extended through the boundaries of C-16-067.

2.8.3 Previous Investigations

No previous investigations were conducted at C-16-067.

2.8.4 Field Investigation

Following D&D removal of all surface and subsurface structures, 16 field screening samples were taken. Several screening points were located within the building footprints. Locations of field screening samples are shown in Fig. 2.8.2-1. All field screening samples were analyzed for RDX and TNT by D-Tech™ immunoassay kit (Draft SW846 Methods 4051 and 4050), metals by XRF, volatiles by PID, radionuclides by hand-held sodium iodide detector, petrochemicals by Handby™ BTEX, and HE by spot test. COPC and bounding laboratory samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. One location had 500-1 000 ppm of diesel fuel. Most of the readings were around 10 ppm.

Two samples were taken and analyzed for inorganics, SVOCs, VOCs, and HE (Table 2.8.4-1). These two samples were within the area excavated for removal of TA-16-90 drain lines. Field Unit 3 excavated all soil at this PRS.

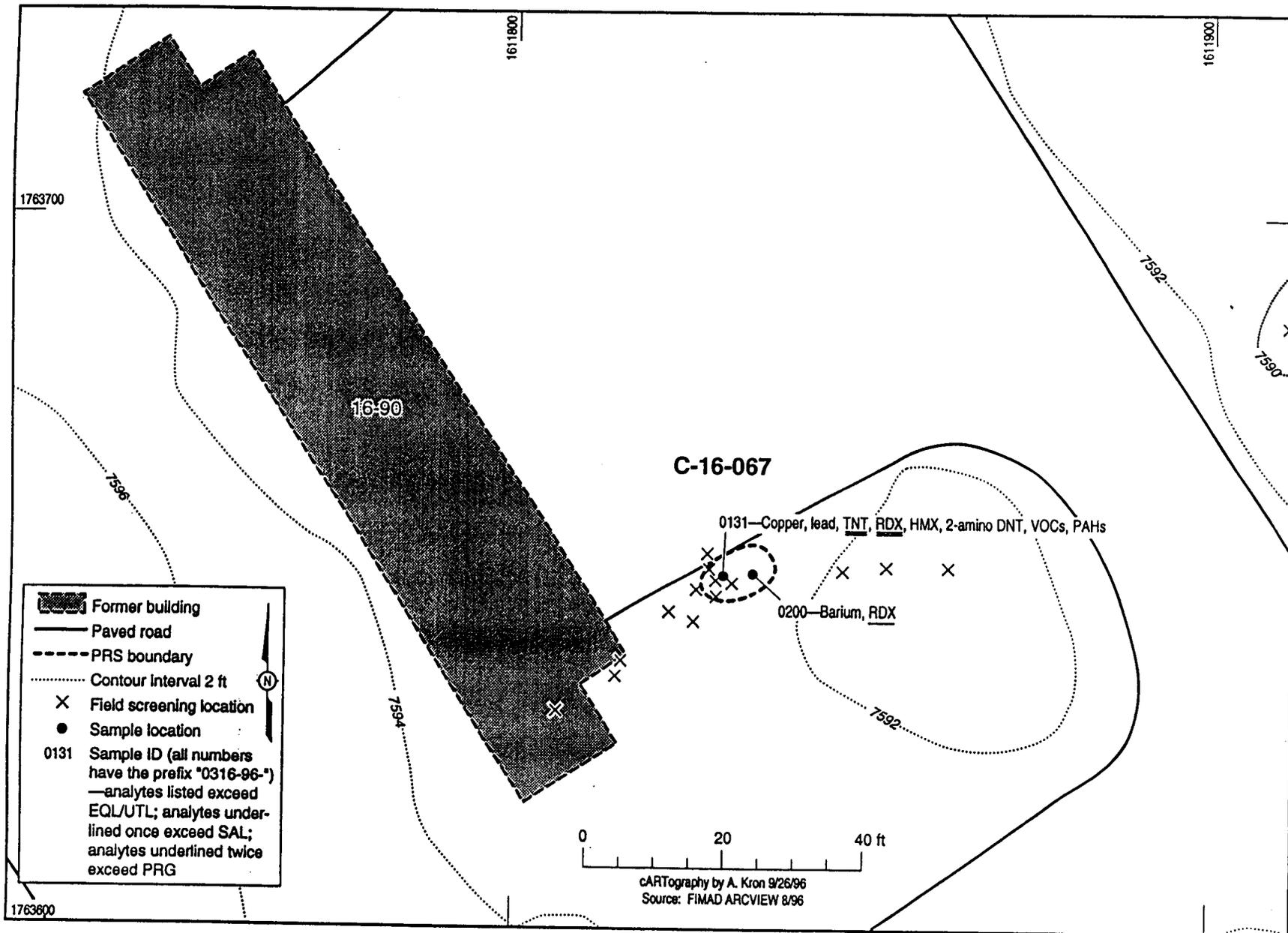


Fig. 2.8.2-1 Field screening, COPC, and bounding sampling for C-16-067.

TABLE 2.8.4-1

SUMMARY OF REQUEST NUMBERS FOR SAMPLES COLLECTED AT

C-16-067

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0131	12-2542	0-1	16-067	COPC	1998	1999	1997	1997
0316-96-0200	16-2543	7-7.5	16-067	Bounding	1998	1999	1997	1997

2.8.5 Background Comparison

Barium was detected above UTL in one sample (Table 2.8.5-1). Copper is above UTL in one sample, but is well below SAL. One sample is above UTL for lead.

TABLE 2.8.5-1

INORGANICS ABOVE UTL IN PRE-VERIFICATION SAMPLES UTL FOR

C-16-067^a

SAMPLE ID	Ba (mg/kg)	Cu (mg/kg)	Pb (mg/kg)
UTL	315	15.5	23.3
SAL	5 300	2 800	400
PRG	10 000	6 300	1 000
0316-96-0131	88.5	46.8	83.5
0316-96-0200	387	8.6	19.6

^a Double bordered cells contain concentrations greater than UTL.

2.8.6 Evaluation of Organics

One sample has TNT above SAL and PRG, and both samples are above SAL for RDX with one above PRG (Table 2.8.6-1). Trichloroethane was detected in one sample (Table 2.8.6-2) probably due to leakage from storage drums. Low levels of PAHs were found in one sample. These are attributed to non-point-source runoff from surrounding parking lots, roads, and roof drains. All other organics were B or J-qualified.

TABLE 2.8.6-1

DETECTED HIGH EXPLOSIVES IN PRE-VERIFICATION SAMPLES FOR
C-16-067^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.26	nc ^b
SAL	15	4	3 300	nc	nc
PRG	64	17	3 400	nc	nc
0316-96-0131	121	173	12.5	1.83	1.19
0316-96-0200	0.139	5.84	0.191	0.084 (U) ^c	0.086 (U)

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

TABLE 2.8.6-2

DETECTED ORGANICS IN PRE-VERIFICATION SAMPLES FOR C-16-067

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0131	Methylene chloride	0.010(B) ^a	11	0.005
	Trichloroethane	0.005	3 000	0.005
	Benzoic acid	0.089(J) ^b	100 000	3.3
	Di-n-butylphthalate	0.250(J)	6 500	nc ^c
	Fluoranthene	0.038(J)	2 600	0.33
	Pyrene	0.043(J)	2 000	0.33
	Chrysene	0.054(J)	24	0.33
	Bis(2-ethylhexyl) phthalate	0.120(J)	32	0.33
	Benzo(b)fluoranthene	0.085(J)	0.61	0.33
	Benzo(k)fluoranthene	0.078(J)	6.1	0.33
	Benzo(a)pyrene	0.089(J)	0.061	0.33
	Indeno(1,2,3-cd)pyrene	0.130(J)	0.61	0.33
Benzo(g,h,i)perylene	0.180(J)	nc	0.33	
0316-96-0200	Methylene chloride	0.009(B)	11	0.005

^a B = Blank contamination.

^b J = Estimated quantity.

^c nc = Not calculated.

2.8.7 Screening Assessment

The primary COPC anticipated here was residual petrochemicals. The two HE, TNT and RDX, were found to be above SALs and PRGs in the COPC sample. They were COPCs for this AOC. The contaminated soil was excavated.

Only one analyte (Trichloroethane) for the carcinogenic group was detected, therefore no MCE was calculated. Benzoic acid was not submitted for a multiple chemical evaluation (MCE) since its toxicity is not based on cancer or noncancer concerns, but is based on ceiling limits.

Analytes greater than LANL UTLs were submitted for an MCE for a noncarcinogenic group. The sum of the maxima for the noncarcinogenic group of analytes is 0.3. This result is below the target value of 1, which indicates a low potential for adverse human health effects due to exposure to these analytes. If a value of 1 was reached, then each analyte that contributed 10% or more would be added to the COPC list. The results of the MCE are summarized in Table 2.8.7-1. PAHs were not included in the MCE. PAHs at this site are attributed to non-point-source runoff from surrounding asphalt parking lots, road, and roof drains. These sources have been removed.

TABLE 2.8.7-1
MCE FOR NONCARCINOGENIC EFFECTS AT C-16-067

ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
Barium	387	5 300	0.07
Copper	46.8	2 800	0.02
Lead	83.5	400	0.2
Di-n-butylphthalate	0.25	6 500	4×10^{-5}

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ANALYTE	MAXIMUM SOIL CONCENTRATION (mg/kg)	SOIL SAL (mg/kg)	CONCENTRATION NORMALIZED TO SAL
HMX	12.5	3 300	0.004
Total			0.3

2.8.8 Nature and Extent of Contamination

Inorganics and trichloroethane were above background, but were well below SAL. High explosives were detected above SAL and were excavated (Section 3.8.1). The bounding sample was well below PRGs. After cleanup activities, all soils were below PRGs, therefore this AOC is proposed for NFA (see Section 3.8.2).

2.8.9 Conclusions

The COPCs expected in Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160) were petrochemicals. One location was above PRG for RDX and TNT and was excavated. The bounding sample was below PRG. After cleanup activities, all soils were below PRGs, therefore this PRS is proposed for NFA (see Section 3.8.2). Five criteria have been agreed upon under which a PRS may be proposed for NFA (New Mexico Environment Department et al 1995, 1328). The appropriate NFA criterion for PRSs 16-026(p) and 16-029(u) is Criterion 5: the PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants of concern are either not present or are present in concentrations that would pose an acceptable level of risk under the projected future land use.

3.0 REMEDIAL ACTIVITIES AND RESULTS OF CONFIRMATORY SAMPLING

3.0.1 Risk Calculation and/or Cleanup Level Derivation

The 90s-Line PRSs lie entirely on DOE-owned land and are not accessible by public roads. Access to the area is limited to Q- and L-cleared personnel who have had site-specific HE training or to visitors escorted by cleared individuals with such training. In the future, the land will be used exclusively for LANL (industrial) operations, as stated in the Site Development Plan Annual Update (LANL 1994, 1171).

Exposure scenarios describe the circumstances by which an individual may come into contact with residual contaminants in the environment. Because TA-16 will remain dedicated to continued Laboratory operations into the future, only a continued laboratory exposure scenario (in which the receptor is a generic, long-term industrial worker) were evaluated to derive cleanup levels.

Cleanup levels were calculated in the VCA Plan (LANL 1996, 0623) for constituents deemed likely to be found at the 90s-Line based on existing data and knowledge of process (Table 3.0.1-1). Cleanup levels are based on the equations and assumptions presented in the EPA Region 9 Preliminary Remediation Goals document dated August 1996 (EPA 1996, 1351). The methodology back calculates industrial land use soil concentrations for a target risk level for carcinogens (1×10^{-6}) and a hazard quotient for non-carcinogens (0.1). The equations combine exposure from ingestion, skin contact, and inhalation simultaneously. This conservative approach is adapted to account for the possible presence of multiple constituents and ensure that residual risk will be within the EPA acceptable risk range of 1×10^{-4} to 1×10^{-6} for carcinogens and less than a hazard index of 1 for noncarcinogens following completion of cleanup activities. Additional

assumptions and calculations are provided in Subsection 3.2.3 and Annex 7 of the VCA plan (LANL 1996, 0623).

**TABLE 3.0.1-1
PROPOSED SOIL CLEANUP LEVELS FOR 90s-LINES PRSs**

CHEMICAL	RECOMMENDED CLEANUP LEVEL (mg/kg)	RATIONALE/NOTES
Barium	10 000	HI ^a = 0.1
Beryllium ^b	1.1 11	Risk = 10 ⁻⁶ Risk = 10 ⁻⁵
Cadmium	85	HI = 0.1
Chromium (total)	450	Risk = 10 ⁻⁶ Assumes 1/6 of total Chromium is Chromium (VI)
Copper	6 300	HI = 0.1
Cyanide	1 400	HI = 0.1
DNB mixture	6.8	HI = 0.1
DNT mixture	2.8	Risk = 10 ⁻⁶
HMX	3 400	HI = 0.1
Lead	1 000	EPA Region 6 guidance
Nickel	3 400	HI = 0.1
PAH	10	Risk = 10 ⁻⁵
RDX	17	Risk = 10 ⁻⁶
TNB	3.4	HI = 0.1
TNT	64	Risk = 10 ⁻⁶
Uranium	284	Dose based level of 15 mrem/year

^a HI = Hazard Index

^b Beryllium and chromium (VI) PRGs were not calculated in the VCA plan. The cleanup levels shown are adopted from EPA Region IX (EPA 1996, 1351) using the assumptions outlined above.

These cleanup levels are highly conservative because access for personnel is highly unlikely and residual contamination is at depths below 2 ft. It is difficult to envision a credible exposure scenario that would provide any long-term exposure to significant amounts of subsurface soil at these sites. These hazards would be identified upon issuance of an excavation permit for the area.

The VCA plan prescribed at least six verification samples for the subsurface exposure unit and four verification samples for the surface exposure unit at each building. If analyte levels approached or exceeded the PRG, then an UCL was calculated for that analyte. The UCL provides a conservative upper bound estimate of the average concentration in an exposure unit (EPA 1992, 1120).

3.1 Building TA-16-89, PRSs 16-029(u) and 16-026(p)

3.1.1 Remedial Implementation

The D&D group removed two sumps, 60 ft of drain line from the north drainage, and 42 ft of drain line from the south drainage. The D&D group excavated soil as needed to remove the sumps and drain lines. If soils surrounding the sumps and drain lines tested positive for HE spot testing, the D&D group continued to remove soils until negative HE spot testing results were achieved or until they had removed two feet of soil from around the sump or drain line where the contamination was detected. If a negative HE spot test was achieved, then excavation ceased. Field Unit 3 personnel excavated contamination extending beyond a depth of 2 ft. Field Unit 3 personnel removed soil from locations that contained soil contaminated at levels greater than one-half of cleanup goals based on quantitative field screening from May 20 to May 24, 1996.

In the northwest drain line, chunks of HE were visible and removed by D&D personnel. Seven cubic yards of soil were removed by Field Unit 3 personnel from around location 16-2372 (laboratory sample 0316-96-0043) where there was a hit above cleanup levels for TNT (Fig. 3.1.1-1). The extent of contamination was bounded by six lateral quantitative field screening samples and by one vertical quantitative field screening sample. Following the initial removal of four cubic yards, field screening of the northern bounding sample (16-2243) revealed level above on-half PRGs. The limits were extended an additional 2.5 ft north and an additional three cubic yards were removed. All five final quantitative field screening values were well below one-half PRGs. In the southeast drain line, three cubic yards of soil were removed from around location 16-2373 (samples 0316-96-0044, -0208, and -0149) where there were positive hits above PRGs for TNT and RDX and a positive hit above background/SAL for beryllium. The extent of this contamination was bounded by four lateral quantitative field screening samples and one vertical bounding field screening sample. All five quantitative field screening values were well below one-half PRGs. D-Tech™ RDX and TNT immunoassay field kit (Draft SW846 Methods 4051 and 4050) and HE spot tests for HE were used to determine the extent of contamination at these locations.

After verification sample results were received, trenches from the excavated drain lines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. There were no deviations from the VCA plan. The area was seeded with native grasses.

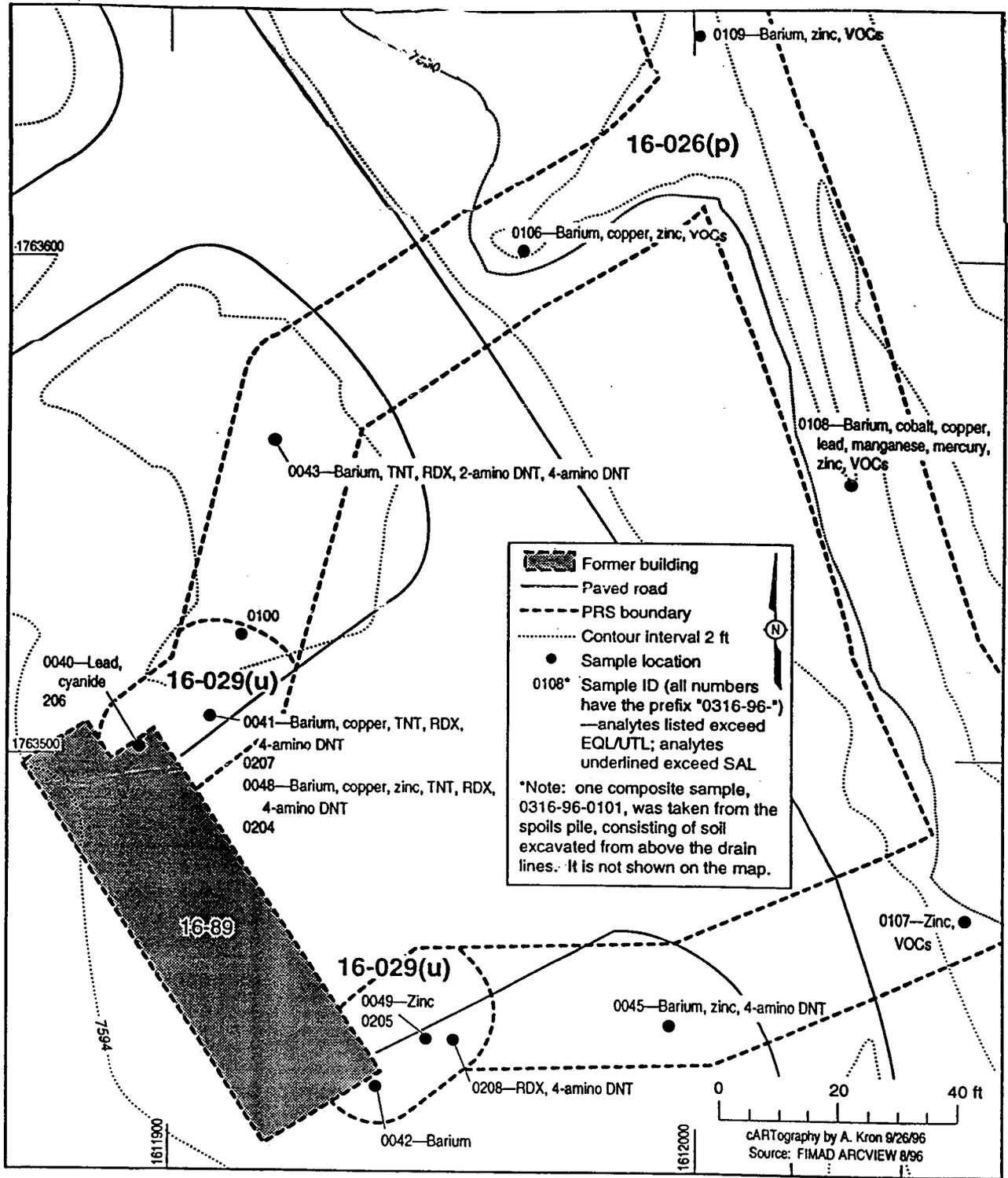


Figure 3.1.1-1. Confirmation sampling for Building TA-16-89.

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	ORIGINAL TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0041	16-2433	4-4.5	16-029(u)	COPC	2013	2014	na	na
0316-96-0204	16-2433	7-8	16-029(u)	Bounding	na	na	2090	2090
0316-96-0042	16-2434	4-4.5	16-029(u)	COPC	2132	2133	2131	2131
0316-96-0043	16-2372	0-0.5	16-026(p)	COPC	2170	2171	2169	2169
0316-96-0045	16-2375	3-3.5	16-026(p)	Confirmatory	2132	2133	na ^a	na
0316-96-0048	16-2433	7-8	16-029(u)	Bounding	2013	2014	na	na
0316-96-0207	16-2433	4-4.5	16-029(u)	COPC	na	na	2128	2128
0316-96-0049	16-2436	6.5-7	16-029(u)	Bounding	2013	2014	na	na
0316-96-0205	16-2436	7-8	16-029(u)	Bounding	na	na	2090	2090
0316-96-0100	16-2370	3.5-4	16-026(p)	Confirmatory	2197	2198	2196	2196
0316-96-0101	Spoils	0-0.5	16-026(p)	Confirmatory	2242	2243	2241	2241
0316-96-0106	16-2376	0-0.5	16-026(p)	Confirmatory	2242	2243	2241	2241
0316-96-0107	16-2377	0-0.5	16-026(p)	Confirmatory	2242	2243	2241	2241
0316-96-0108	16-2378	0-0.5	16-026(p)	Confirmatory	2242	2243	2241	2241
0316-96-0109	16-2379	0-0.5	16-026(p)	Confirmatory	2242	2243	2241	2241
0316-96-0208	16-2373	4-4.5	16-026(p)	Confirmatory	2170	2171	2169	2169

^a na = Not analyzed.

^b Spoils = Sample taken from soil that was removed from the top of the drain line. This soil was stockpiled next to the excavation.

3.2 Building TA-16-90, PRSs 16-029(t) and 16-026(o)

3.2.1 Remedial Implementation

The D&D group removed two sumps, 30 ft of drain line from the south drainage, and 100 ft of drain line from the north drainage. The D&D group excavated soil as needed to remove the sumps and drain lines. If soils surrounding the sumps and drain lines tested positive for HE spot testing, the D&D group continued to remove soils until negative HE spot testing results were achieved or until they had removed two feet of soil from around the sump or drain line where the contamination was detected. Field Unit 3 personnel excavated contamination extending beyond a depth of 2 ft. Field Unit 3 personnel removed soil from locations that contained soil contaminated at levels greater than one-half of cleanup goals based on quantitative field screening from May 20 to May 31, and August 7 to August 13, 1996. (Figs. 3.2.1-1 and 3.2.1-2).

Thirty cubic yards of soil were removed by the D&D group from the northwest drain line, PRS 16-026(o), where TNT, RDX, and TNB were above PRG. Field screening results were still above the one-half PRG level for both TNT and RDX after the D&D excavation, so an additional thirty cubic yards of soil were removed between location 16-2360 (laboratory confirmatory sample 0316-96-0032) and location 16-2363 (laboratory confirmatory sample 0316-96-0033) in the northwest drain line. Field screening analysis of sample location 16-2363 yielded results above PRGs for RDX and TNT. Lateral screening samples were extended until results were below PRGs. Thirty-five cubic yards of soil was removed during this second excavation. All five final quantitative field screening values were well below one-half PRGs. Initial verification samples at location 16-2362 (laboratory confirmatory samples 0316-96-0091 and -0034) (Fig. 3.2.1-1) and 16-2360 (laboratory confirmatory sample 0316-96-0090) did not achieve PRGs for TNB, therefore, an additional twenty-five cubic yards of soil were removed from between 16-2360 and 16-2362 (Fig. 3.2.1-2). Three verification laboratory samples and three vertical bounding samples were collected within the boundaries of the excavation. D-Tech™ RDX and TNT immunoassay kits (Draft SW846 Methods 4051 and 4050) and HE spot tests for HE and XRF for metals were used to determine the extent of contamination at these locations.

Two and one-half cubic yards of soil were removed around location 16-2427 (laboratory confirmatory sample 0316-96-0031) where there was a hit above cleanup levels for RDX and TNT (Fig 3.2.1-2). The extent of contamination was bounded by four lateral quantitative field screening samples and by one vertical quantitative field screening

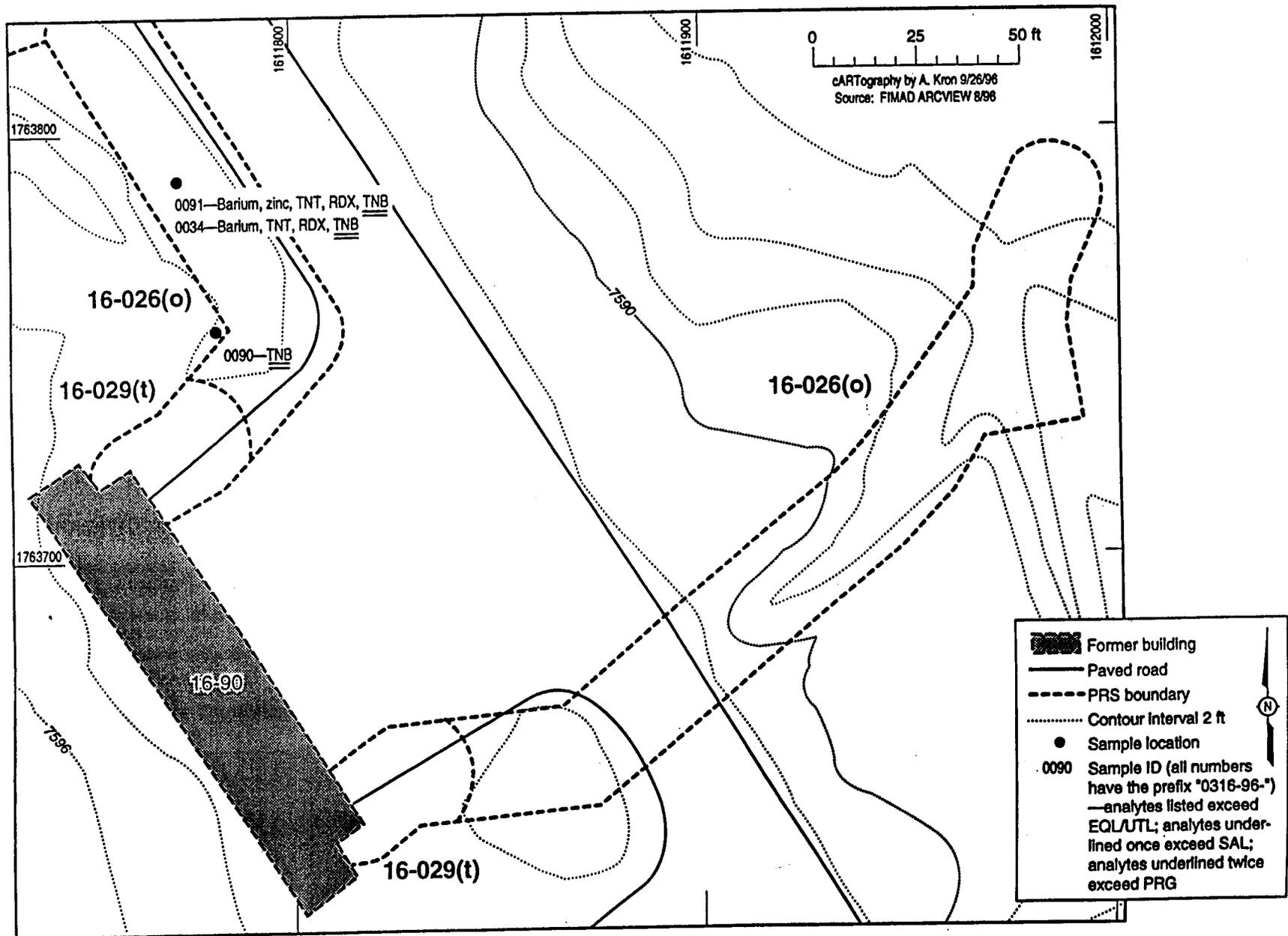


Figure 3.2.1-1. Initial confirmation sampling for Building TA-16-90.

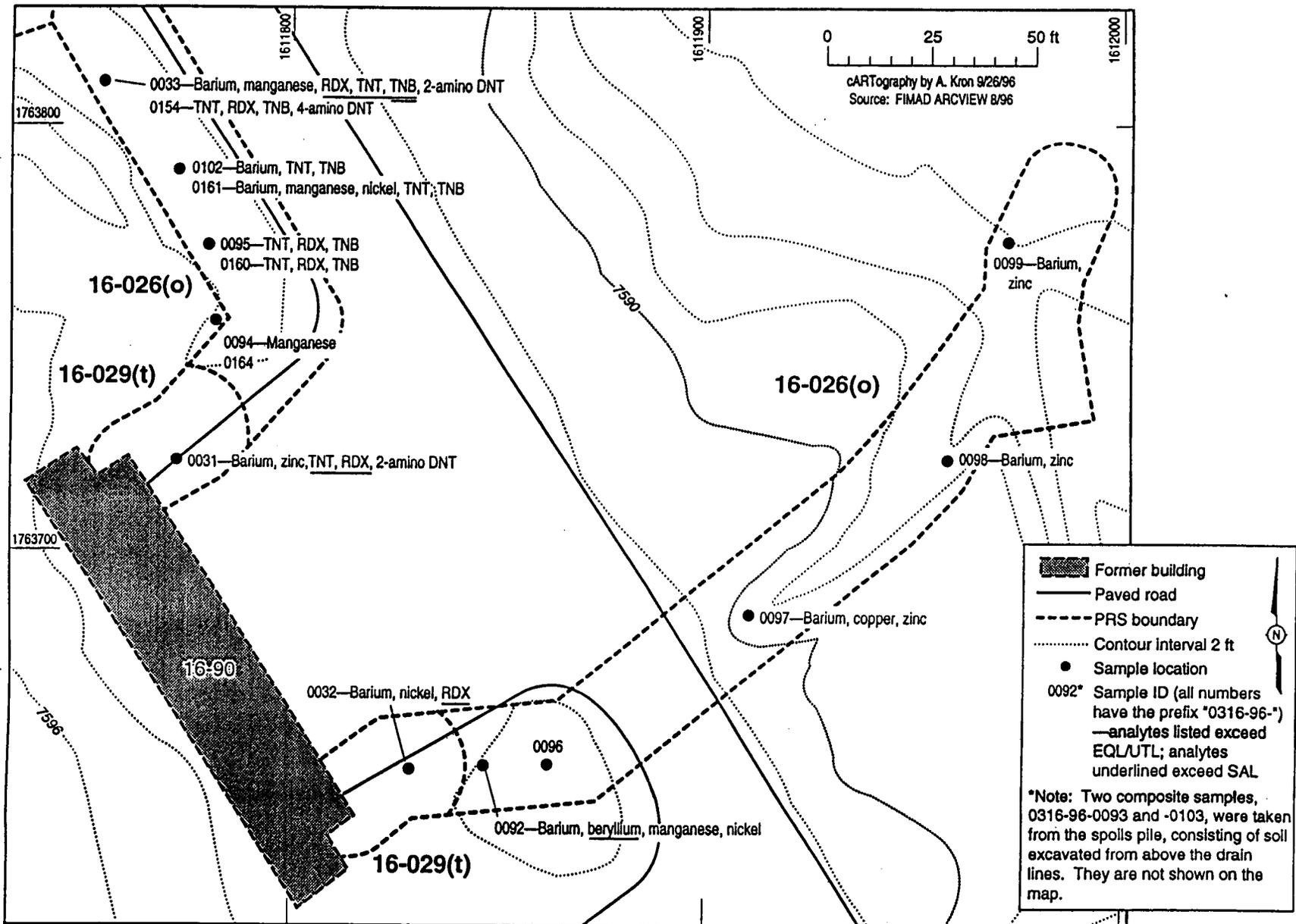


Figure 3.2.1-2. Confirmation sampling for Building TA-16-90.

sample. Three of the lateral screening samples were greater than one-half PRGs, so the boundary of the cleanup was extended 2.5 ft in each direction. All five final quantitative field screening values were well below one-half PRGs.

Two and one-half cubic yards of soil were removed around location 16-2430 (laboratory confirmatory sample 0316-96-0032) where there was a hit above cleanup levels for RDX (Fig 3.2.1-2). The extent of contamination was bounded by four lateral quantitative field screening samples and by one vertical quantitative field screening sample. Three of the lateral screening samples were greater than one-half PRGs, so the boundary of the cleanup was extended 2.5 ft in each direction. All five final quantitative field screening values were well below one-half PRGs.

Stockpiled soil near the NW sump (0316-96-0093) was found to contain potential RCRA waste and was drummed and placed in a <90 day storage area (Section 4.0).

After final verification sample results were received, trenches from the excavated drain lines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. There were no deviations from the VCA plan. The area was seeded with native grasses.

3.2.2 Confirmatory Sampling

Twelve samples were taken, all of which were tested for inorganics, HE, SVOCs, and VOCs. These were distributed in zones where cleanup had occurred and at other areas within the PRS that had not been sampled during COPC sampling. Two locations, (16-2360 and 16-2362) consisting of a total of three samples, failed cleanup criteria, so additional soil was removed. The three initial confirmatory samples are shown in Table 3.2.2-1. The samples were taken approximately 54 and 90 ft down the northwestern drain

line (Fig. 3.2.1-1). The remaining samples and seven new samples are shown in Table 3.2.2-2 and Fig. 3.2.1-2. One sample was taken under the southeastern sump and 18, 34, 95, 152, and 205 ft down the southeastern drain line. One sample was taken under the northwestern sump and the remaining samples were taken 54, 72, 90, and 113 ft down the drain line (Fig. 3.2.1-2). Four bounding samples were included to support the decision process. Confirmatory sampling shows that contamination was bounded both vertically and horizontally within the drainage. Beryllium was detected above background, but is well below a PRG level corresponding to a 10^{-5} risk level. An upper confidence limit was calculated to provide a conservative estimate of the average concentration in an exposure unit (EPA 1992, 1120). The UCL calculated for beryllium is 1.27 mg/kg which is barely above the industrial PRG (1.1 mg/kg) that corresponds to a 10^{-6} risk level. See Appendix D.2 for full results.

Confirmatory sampling shows that the contaminant level in the exposure unit is below PRG. Based on NFA criteria 5, a Class III permit modification will be requested to remove this site from the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit.

TABLE 3.2.2-1

SUMMARY OF REQUEST NUMBERS FOR INITIAL CONFIRMATORY.

SAMPLES COLLECTED AT PRSs 16-029(t) AND 16-026(o)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	INORGANICS	HE	SVOC	VOC
0316-96-0034	16-2362	5-5.5	16-026(o)	2158	2159	2157	2157
0316-96-0090	16-2360	4.5-5	16-026(o)	2197	2198	2196	2196
0316-96-0091	16-2362	4.5-5	16-026(o)	2197	2198	2196	2196

TABLE 3.2.2-2

**SUMMARY OF REQUEST NUMBERS FOR CONFIRMATORY SAMPLES
COLLECTED AT PRSs 16-029(t) AND 16-026(o)**

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0031	16-2427	4-4.5	16-029(t)	Confirmatory	1998	1999	1997	1997
0316-96-0032	16-2430	4-4.5	16-029(t)	Confirmatory	1998	1999	1997	1997
0316-96-0033	16-2363	4.5-5	16-026(o)	Confirmatory	2158	2159	2157	2157
0316-96-0154	16-2363	6.5-7.5	16-026(o)	Bounding	2158	2159	2157	2157
0316-96-0092	16-2364	4.5-5	16-026(o)	Confirmatory	2197	2198	2196	2196
0316-96-0093	Spoils ^a	0-0.5	16-026(o)	Confirmatory	2242	2243	2241	2241
0316-96-0096	16-2366	0-0.5	16-026(o)	Confirmatory	2242	2243	2241	2241
0316-96-0097	16-2367	0-0.5	16-026(o)	Confirmatory	2242	2243	2241	2241
0316-96-0098	16-2368	0-0.5	16-026(o)	Confirmatory	2242	2243	2241	2241
0316-96-0099	16-2369	0-0.5	16-026(o)	Confirmatory	2242	2243	2241	2241
0316-96-0094	16-2360	6.5-7	16-026(o)	Confirmatory	2492	2494	2491	2491
0316-96-0095	16-2361	6.5-7	16-026(o)	Confirmatory	2492	2494	2491	2491
0316-96-0102	16-2362	6-6.5	16-026(o)	Confirmatory	2492	2494	2491	2491
0316-96-0103	Spoils	0-0.5	16-026(o)	Confirmatory	2492	2494	2491	2491
0316-96-0160	16-2361	7-7.5	16-026(o)	Bounding	2492	2494	2491	2491
0316-96-0161	16-2362	6.5-7	16-026(o)	Bounding	2492	2494	2491	2491
0316-96-0164	16-2360	7.5-8	16-026(o)	Bounding	2492	2494	2491	2491

^a Spoils = Sample taken from soil that was removed from the top of the drain line. This soil was stockpiled next to the excavation.

3.3 Building TA-16-91, PRSs 16-029(s) and 16-026(n)

3.3.1 Remedial Implementation

The D&D group removed two sumps, 105 ft of drain line from the southeast drainage, and 75 ft of drain line from the northeast drainage. The D&D group excavated soil as needed to remove the sumps and drain lines. If soils surrounding the sumps and drain lines tested positive for HE spot testing, the D&D group continued to remove soils until negative HE spot testing results were achieved or until they had removed two feet of soil from around the sump or drain line where the contamination was detected. Field Unit 3 personnel excavated contamination extending beyond a depth of 2 ft. Field Unit 3 personnel removed soil from locations that contained soil contaminated at levels greater than one-half of cleanup goals based on quantitative field screening from May 6 to May 10, 1996

(Fig. 3.3.1-1). D-Tech™ RDX and TNT immunoassay kits (Draft SW846 Methods 4051 and 4050) and HE spot tests were used to determine the extent of contamination at these locations.

Four and one-half cubic yards of soil were removed by Field Unit 3 personnel from the northwest sump and drain line at locations 16-2421 and 16-2350 (laboratory confirmatory samples 0316-96-0020 and -0022) where there was a hit above cleanup levels for RDX. The extent of contamination was bounded by four lateral quantitative field screening samples and one vertical quantitative field screening sample. All five final quantitative field screening values were well below one-half PRGs.

The D&D group removed 0.5 yd³ from the northwest trench (confirmatory sample 0316-96-0080) based upon positive HE spot test results. Although the confirmatory sample was below PRGs for all analytes, the bounding sample (0316-96-0153, in Section 2.3.6), taken below the confirmatory sample, was above PRGs for TNB. This contamination was not bounded.

One and one-half cubic yards of soil were removed by Field Unit 3 personnel from the northwest sump and drain line at location 16-2354 (bounding sample 0316-96-0147 in Sections 2.3.4 to 2.3.6) where there was a hit above cleanup levels for RDX and TNB. The extent of contamination was bounded by four lateral quantitative field screening samples and by one vertical quantitative field screening sample. All five final quantitative field screening values were well below one-half PRGs.

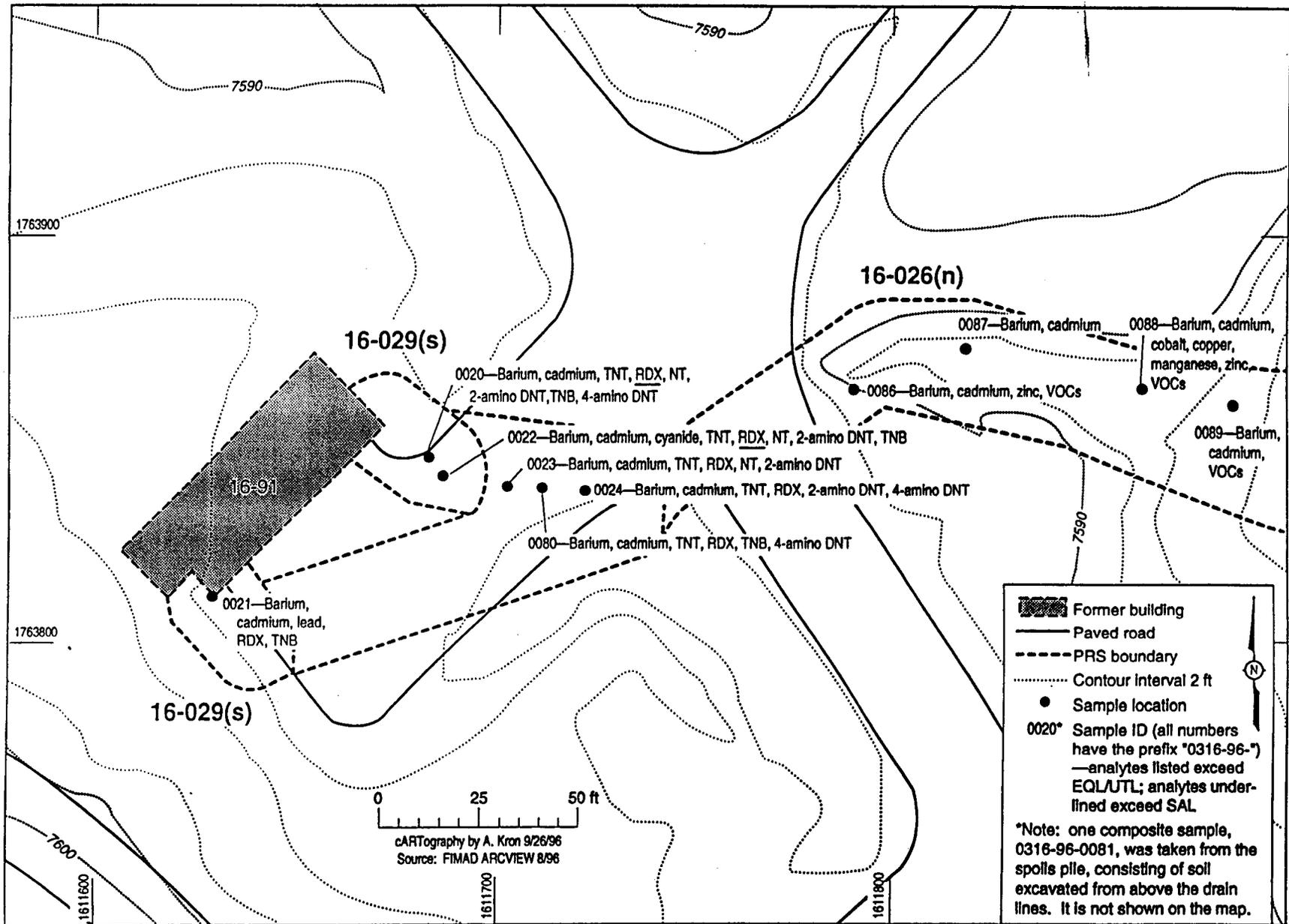


Figure 3.3.1-1. Confirmation sampling for Building TA-16-91.

After verification sample results were received, trenches from the excavated drain lines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. There were no deviations from the VCA plan. The area was seeded with native grasses.

3.3.2 Confirmatory Sampling

Eleven samples were taken and analyzed for inorganics, HE, SVOCs, and VOCs (Table 3.3.2-1). These were distributed in zones where cleanup had occurred and at other areas within the PRS that had not been sampled during COPC sampling. One sample was taken below the southwest sump and one was taken 60 ft down the southwest drain line (Fig. 3.3.1-1). One sample was taken below the northeast sump and 17, 33, 41, 51, 120, 152, 200, and 234 ft down the drain line. Inorganics were at levels well below cleanup levels. RDX was above PRG for one sample, so an UCL was calculated. The UCL provides a conservative estimate of the average concentration in an exposure unit (EPA 1992, 1120). The UCL calculated for RDX is 5.54 mg/kg, which is well below the industrial PRG of 17 mg/kg. An UCL was also calculated for TNB because one sample was close to the PRG of 3.4 mg/kg. The value of the UCL is 2.66 mg/kg, which is below the industrial PRG of 3.4. All other analytes were well below PRGs. Trichloroethene was detected in two samples, 4-isopropyltoluene, and toluene in one sample each. These were detected at locations where no soil removal occurred. All were barely above detection levels and all well below SALs. See Appendix D.3 for full results.

Confirmatory sampling shows that the contaminant level in the exposure unit is below PRG. Based on NFA criteria 5, a Class III permit modification will be requested to remove this site from the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit.

TABLE 3.3.2-1

**SUMMARY OF REQUEST NUMBERS FOR CONFIRMATORY SAMPLES
COLLECTED AT PRSs 16-029(s) AND 16-026(n)**

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0020	16-2421	4-4.5	16-029(s)	Confirmatory	1955	1956	1954	1954
0316-96-0021	16-2422	4-4.5	16-029(s)	Confirmatory	1955	1956	1954	1954
0316-96-0022	16-2350	3-3.5	16-026(n)	Confirmatory	1955	1956	1954	1954
0316-96-0023	16-2351	3-3.5	16-026(n)	Confirmatory	1955	1956	1954	1954
0316-96-0024	16-2352	2-2.5	16-026(n)	Confirmatory	1955	1956	1954	1954
0316-96-0080	16-2240	3-3.5	16-026(n)	Confirmatory	2158	2159	2157	2157
0316-96-0081	Spoils ^a	0-0.5	16-026(n)	Confirmatory	2242	2243	2241	2241
0316-96-0086	16-2356	0-0.5	16-026(n)	Confirmatory	2242	2243	2241	2241
0316-96-0087	16-2357	0-0.5	16-026(n)	Confirmatory	2242	2243	2241	2241
0316-96-0088	16-2358	0-0.5	16-026(n)	Confirmatory	2242	2243	2241	2241
0316-96-0089	16-2359	0-0.5	16-026(n)	Confirmatory	2242	2243	2241	2241

^a Spoils = Sample taken from soil that was removed from the top of the drain line. This soil was stockpiled next to the excavation.

3.4 Building TA-16-92, PRSs 16-029(l) and 16-026(m)

3.4.1 Remedial Implementation

The D&D group removed two sumps, 105 ft of drain line in the west drainage, and 82 ft of drain line in the east drainage. The D&D group excavated soil as needed to remove the sumps and drain lines. If soils surrounding the sumps and drain lines tested positive for HE spot testing, the D&D group continued to remove soils until negative HE spot testing results were achieved or until they had removed two feet of soil from around the sump or drain line where the contamination was detected.

No soil removal activities occurred at 16-029(l) or 16-026(m) for Field Unit 3. After verification sample results were received, trenches from the excavated drain lines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. There were no deviations from the VCA plan.

The area was seeded with native grasses (Fig. 3.4.1-1).

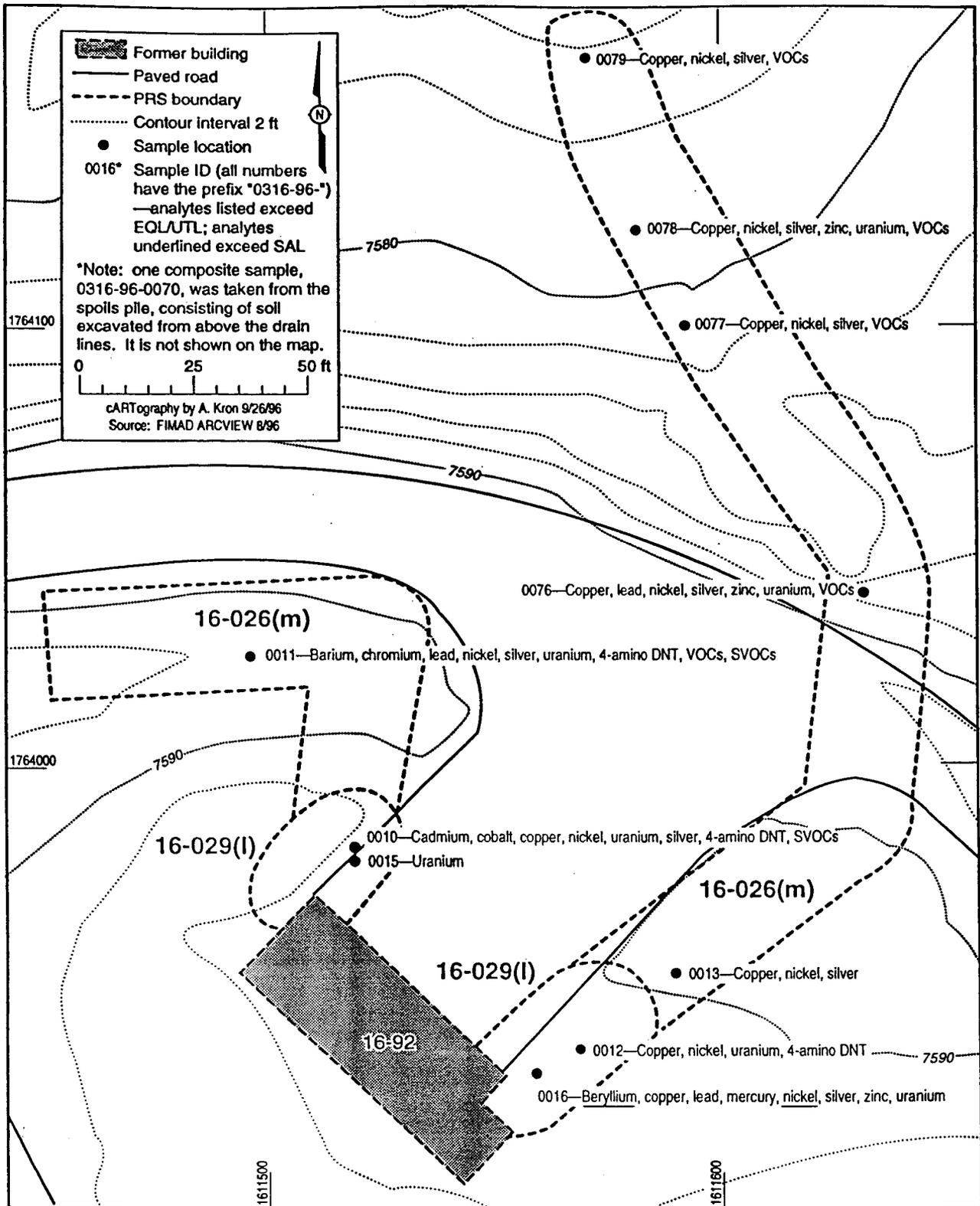


Figure 3.4.1-1. Confirmation sampling for Building TA-16-92.

3.4.2 Confirmatory Sampling

Eleven confirmatory samples were taken and analyzed for inorganics, HE, radionuclides, SVOCs, and VOCs (Table 3.4.2-1). These were distributed in zones where D&D cleanup had occurred and at other areas within the PRS that had not been sampled during COPC sampling. Seven samples were taken in the southeast drain line. One was taken at the southeast sump and the remainder, 29, 69, 126, 189, 239, and 289 ft down drainage. One sample was taken under the northwest sump and the remaining two were taken 3 and 50 ft down drainage (Fig. 3.4.1-1). Beryllium was detected slightly above background/SAL, but is below the industrial cleanup level corresponding to a 10^{-5} risk level. An UCL was calculated to provide a conservative estimate of the average concentration in an exposure unit (EPA 1992, 1120). The UCL calculated for beryllium is 1.18 mg/kg which is barely above the industrial PRG (1.1 mg/kg) that corresponds to a 10^{-6} risk level. Nickel approached the industrial PRG for one sample, so an UCL was calculated. The UCL provides a conservative estimate of the average concentration in an exposure unit (EPA 1992, 1120). The UCL calculated for nickel is 982 mg/kg which is well below the PRG. All other inorganics were well below industrial PRG. Uranium was above SAL, but well below PRG. No HE was detected above EQL. Several organic compounds were detected: bis(2-ethylhexyl)phthalate, trichloroethane, tetrachloroethene, trichloroethene, 4-isopropyltoluene, and toluene. These analytes were detected at locations where no soil removal occurred. All were well below SAL. See Appendix D.4 for full results.

Confirmatory sampling shows that the contaminant level in the exposure unit is below PRG. Based on NFA criteria 5, a Class III permit modification will be requested to remove this site from the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit.

TABLE 3.4.2-1

**SUMMARY OF REQUEST NUMBERS FOR CONFIRMATORY SAMPLES
COLLECTED AT PRSs 16-029(l) AND 16-026(m)**

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	RAD	SVOC	VOC
0316-96-0010	16-2340	4-4.5	16-026(m)	Confirmatory	1968	1969	1970	1967	1967
0316-96-0011	16-2341	2-2.5	16-026(m)	Confirmatory	1968	1969	1970	1967	1967
0316-96-0012	16-2343	3.5-4	16-026(m)	Confirmatory	1968	1969	1970	1967	1967
0316-96-0013	16-2344	3.5-4	16-026(m)	Confirmatory	1968	1969	1970	1967	1967
0316-96-0015	16-2415	4-4.5	16-029(l)	Confirmatory	1968	1969	1970	1967	1967
0316-96-0016	16-2418	4-4.5	16-029(l)	Confirmatory	1968	1969	1970	1967	1967
0316-96-0070	Spoils ^a	0-0.5	16-026(m)	Confirmatory	2242	2243	2244	2241	2241
0316-96-0076	16-2346	0-0.5	16-026(m)	Confirmatory	2242	2243	2244	2241	2241
0316-96-0077	16-2347	0-0.5	16-026(m)	Confirmatory	2242	2243	2244	2241	2241
0316-96-0078	16-2348	0-0.5	16-026(m)	Confirmatory	2242	2243	2244	2241	2241
0316-96-0079	16-2349	0-0.5	16-026(m)	Confirmatory	2242	2243	2244	2241	2241

^a Spoils = Sample taken from soil that was removed from the top of the drain line. This soil was stockpiled next to the excavation.

3.5 Building TA-16-93, PRS 16-029(k)

3.5.1 Remedial Implementation

The D&D group removed two sumps, 180 ft of drain line from the south drainage, and 130 ft of drain line from the north drainage (Fig. 3.5.1-1). The D&D group excavated soil as needed to remove the sumps and drain lines. If soils surrounding the sumps and drain lines tested positive for HE spot testing, the D&D group continued to remove soils until negative HE spot testing results were achieved or until they had removed two feet of soil from around the sump or drain line where the contamination was detected. Field Unit 3 personnel excavated contamination extending beyond a depth of 2 ft. Field Unit 3 personnel removed soil from locations that contained soil contaminated at levels greater than one-half of cleanup goals based on quantitative field screening from April 29 to May 13, 1996.

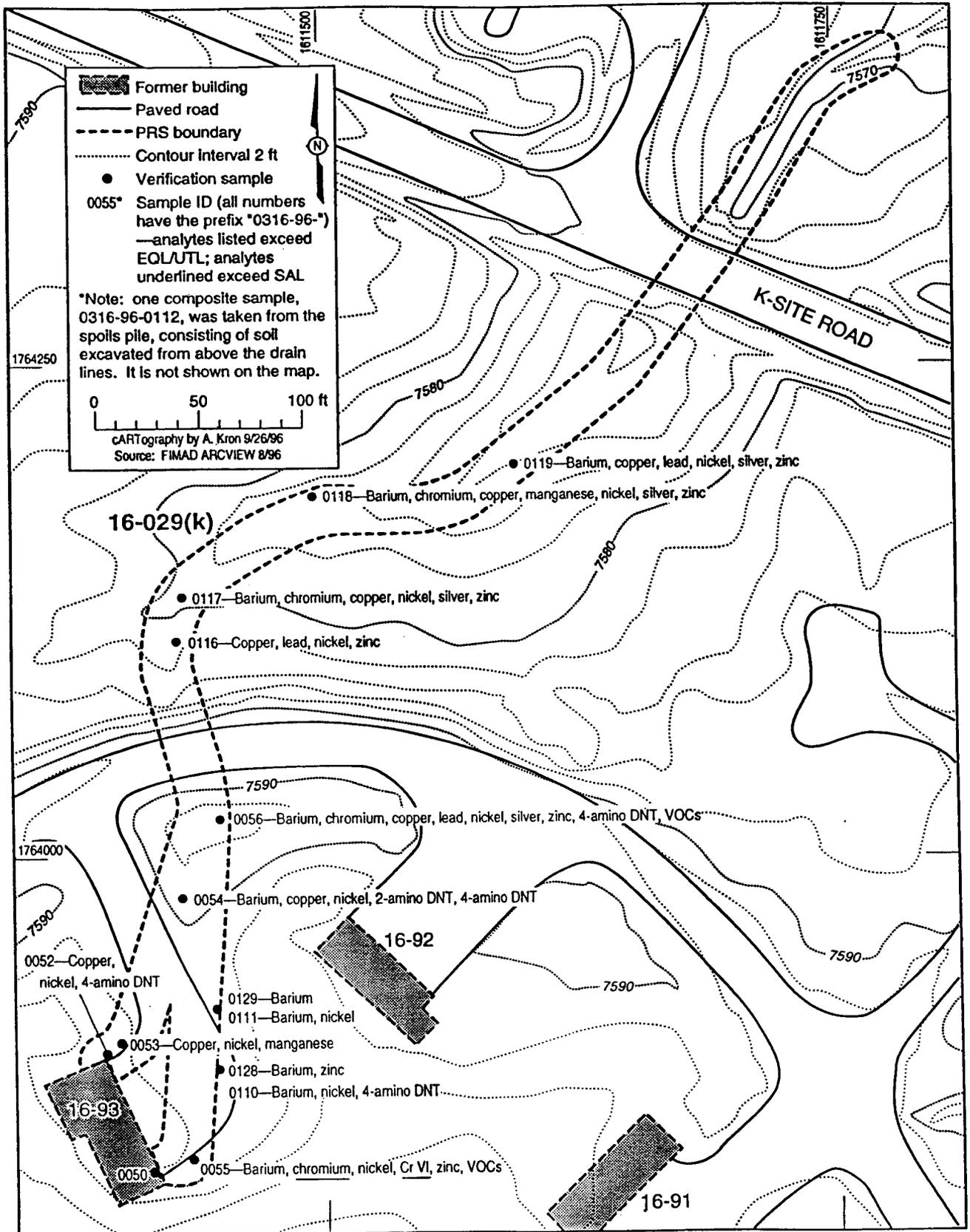


Figure 3.5.1-1. Confirmation sampling for Building TA-16-93.

Chromium (VI) was detected (67.7 mg/kg) at location 16-2384 (COPC sample 0316-96-0055) which slightly above the PRG (64 mg/kg). This was the only sample at the 90s-Line where chromium was detected above SAL, and this location at building TA-16-93, the electroplating building which is the building most likely to have electroplating related contamination. This sample was also bounded by four lateral quantitative field screening samples. These samples all screened below the PRG for total chromium. After review of the all of the chromium data for the SE drainage, the decision was made not to excavate this location.

Three cubic yards of soil were removed around the northwest sump outlet at location 16-2393 (verification sample 0316-96-0052) which was above one-half PRGs based on quantitative field screening. The extent of this contamination was bounded by four lateral quantitative field screening samples and one vertical bounding field screening sample. All five quantitative field screening values were well below one-half PRGs. D-Tech™ RDX and TNT immunoassay kits (Draft SW846 Methods 4051 and 4050) and HE spot tests were used to determine the extent on contamination at each location.

After verification sample results were received, trenches from the excavated drain lines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. There were no deviations from the VCA plan. The area was seeded with native grasses.

3.5.2 Confirmatory Sampling

Thirteen confirmatory samples were taken following soil removal, and analyzed for inorganics, HE, SVOCs, and VOCs (Table 3.5.2-1). These were distributed in zones where cleanup had occurred and at other areas within the PRS that had not been sampled during COPC sampling. One sample was taken below the southeast sump. Two

samples were taken 54 and 77 ft down the drainage. The others were taken under the northwest sump and 9, 60, 189, 222, 278, and 404 ft down drainage (Fig. 3.5.1-1). Two COPC samples are included to support cleanup decisions. All inorganics were well below PRGs as well as SALs. 2-aDNT was detected barely above EQL. All other organics were qualified. See Appendix D.5 for full results.

Confirmatory sampling shows that the contaminant level in the exposure unit is below PRGs. Based on NFA criteria 5, a Class III permit modification will be requested to remove this site from the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit.

TABLE 3.5.2-1
SUMMARY OF REQUEST NUMBERS FOR CONFIRMATORY SAMPLES
COLLECTED AT PRSs 16-029(k)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	Cr VI	HE	SVOC	VOC
0316-96-0050	16-2394	4-4.5	16-029(k)	Confirmatory	1935	na ^a	1936	1934	1934
0316-96-0052	16-2393	4-4.5	16-029(k)	Confirmatory	1935	na	1936	1934	1934
0316-96-0053	16-2381	3-3.5	16-029(k)	Confirmatory	1935	na	1936	1934	1934
0316-96-0054	16-2383	2.5-3	16-029(k)	Confirmatory	1935	na	1936	1934	1934
0316-96-0055	16-2384	3.5-4	16-029(k)	COPC	1935	1935	1936	1934	1934
0316-96-0056	16-2386	1.5-2	16-029(k)	COPC	1935	na	1936	1934	1934
0316-96-0110	16-2255	3-3.5	16-029(k)	Confirmatory	2197	na	2198	2196	2196
0316-96-0111	16-2256	0-0.5	16-029(k)	Confirmatory	2197	na	2198	2196	2196
0316-96-0112	Spoils ^b	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241
0316-96-0116	16-2388	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241
0316-96-0117	16-2389	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241
0316-96-0118	16-2390	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241
0316-96-0119	16-2635	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241
0316-96-0128	16-2255	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241
0316-96-0129	16-2256	0-0.5	16-029(k)	Confirmatory	2242	na	2243	2241	2241

^a na = Not analyzed.

^b Spoils = Sample taken from soil that was removed from the top of the drain line. This soil was stockpiled next to the excavation.

3.6 Building TA-16-99, PRS 16-029(q)

3.6.1 Remedial Implementation

The D&D group removed two sumps, 80 ft of drain line from the southeast drainage, and 60 ft of drain line from the northwest drainage (Fig. 3.6.1-1). The D&D group excavated soil as needed to remove the sumps and drain lines. If soils surrounding the sumps and drain lines tested positive for HE spot testing, the D&D group continued to remove soils until negative HE spot testing results were achieved or until they had removed two feet of soil from around the sump or drain line where the contamination was detected. Field Unit 3 personnel excavated contamination extending beyond a depth of 2 ft. Field Unit 3 personnel removed soil from locations that contained soil contaminated at levels greater than one-half of cleanup goals based on quantitative field screening from April 22 to April 26, 1996 and May 27 to May 31, 1996.

Based upon positive HE spot testing and visible HE residue in both trenches, the D&D crew removed approximately one hundred cubic yards of soil. Three cubic yards of soil were removed around the outfall for the drain lines by Field Unit 3 personnel (sample id 0316-96-0063) where there was an elevated level of RDX. The extent of contamination was bounded by four lateral quantitative field screening samples and by one vertical quantitative field screening sample. The vertical bounding sample was greater than one-half PRG, so an additional three cubic yard of soil were removed from within the previous lateral boundaries. New vertical screening samples were collected at one foot intervals to the soil/tuff interface. A confirmatory laboratory sample were taken from the interval above the soil/tuff interface. All final quantitative field screening values were well below one-half PRGs. D-Tech™ RDX and TNT immunoassay kits (Draft SW846 Methods 4051 and 4050) and HE spot tests were used to determine the extent of contamination at these locations.

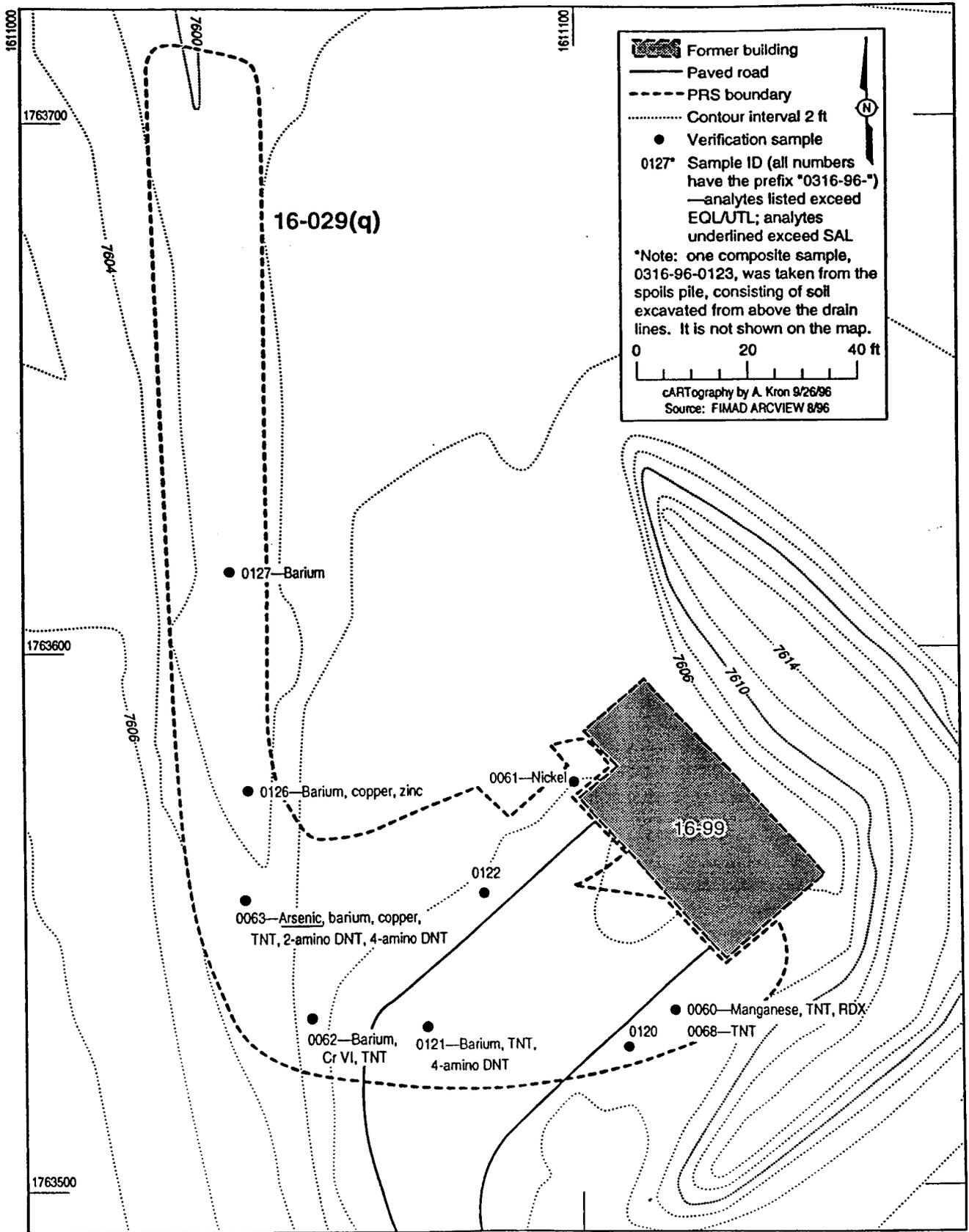


Figure 3.6.1-1. Confirmation sampling for Building TA-16-99.

After verification sample results were received, trenches from the excavated drain lines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. There were no deviations from the VCA plan. The area was seeded with native grasses.

3.6.2 Confirmatory Sampling

Eight confirmatory samples were taken and all were analyzed for inorganics, HE, SVOCs, and VOCs. These were distributed in zones where cleanup had occurred and at other areas within the PRS that had not been sampled during COPC sampling. One sample was additionally tested for chromium (VI). One sample was taken below the southeastern sump. Two samples were taken 21 ft and 85 ft down the drain line from the southwest sump. One sample was taken beneath the northwest sump and one 25 ft down the drain line. Three other samples were taken down the drainage at approximately 100, 135, and 223 ft from the edge of the northwest sump (Fig. 3.6.1-1). One COPC sample where soils remained in place was included to support the decision process. Arsenic was above background/SAL for one sample, so an UCL was calculated. The UCL provides a conservative estimate of the average concentration in an exposure unit (EPA 1992, 1120). The UCL calculated for arsenic is 5.72 mg/kg which is well below the background/SAL. All other inorganics were below PRGs as well as SALs. TNT, RDX and 2-aDNT were detected barely above EQL. All other organics were qualified. See Appendix D.6 for full results. When organics were detected where a soil removal occurred (0316-96-0063), soils were placed in a <90 day storage area. The waste was sampled directly for organics and no VOCs were detected (Section 4.0).

Confirmatory sampling shows that the contaminant level in the exposure unit is below PRG. Based on NFA criteria 5, a Class III permit modification will be requested to remove

this site from the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit.

TABLE 3.6.2-1
SUMMARY OF REQUEST NUMBERS CONFIRMATORY SAMPLES
COLLECTED AT PRS 16-029(q)

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	CR (VI)	HE	SVOC	VOC
0316-96-0060	16-2412	4-4.5	16-029(q)	Confirmatory	1885	na ^a	1886	1884	1884
0316-96-0061	16-2407	4-4.5	16-029(q)	Confirmatory	1885	na	1886	1884	1884
0316-96-0062	16-2399	4.5-5	16-029(q)	COPC	2033	2033	2034	2032	2032
0316-96-0063	16-2404	0-0.5	16-029(q)	Confirmatory	2033	na	2034	2032	2032
0316-96-0120	16-2400	4.5-5	16-029(q)	Confirmatory	2158	na	2159	2157	2157
0316-96-0121	16-2402	4.5-5	16-029(q)	Confirmatory	2158	na	2159	2157	2157
0316-96-0122	16-2397	5.0-6	16-029(q)	Confirmatory	2158	na	2159	2157	2157
0316-96-0123	Spoils ^b	0-0.5	16-029(q)	Confirmatory	2242	na	2243	2241	2241
0316-96-0126	16-2405	0-0.5	16-029(q)	Confirmatory	2242	na	2243	2241	2241
0316-96-0127	16-2406	0-0.5	16-029(q)	Confirmatory	2242	na	2243	2241	2241

^a na = Not analyzed.

^b Spoils = Sample taken from soil that was removed from the top of the drain line. This soil was stockpiled next to the excavation.

3.7 Area of Concern C-16-064

3.7.1 Remedial Implementation

Field Unit 3 personnel removed soil from locations contaminated at levels greater than one-half of cleanup goals based on quantitative field screening from August 7 to August 13, 1996. (Fig. 3.7.1-1).

Five cubic yards of soil were removed from around location 16-2541 (laboratory samples 0316-96-0162 and -163) which had a hit for RDX at a level above PRG. The lateral boundaries for this excavation were determined by previous quantitative field screening.

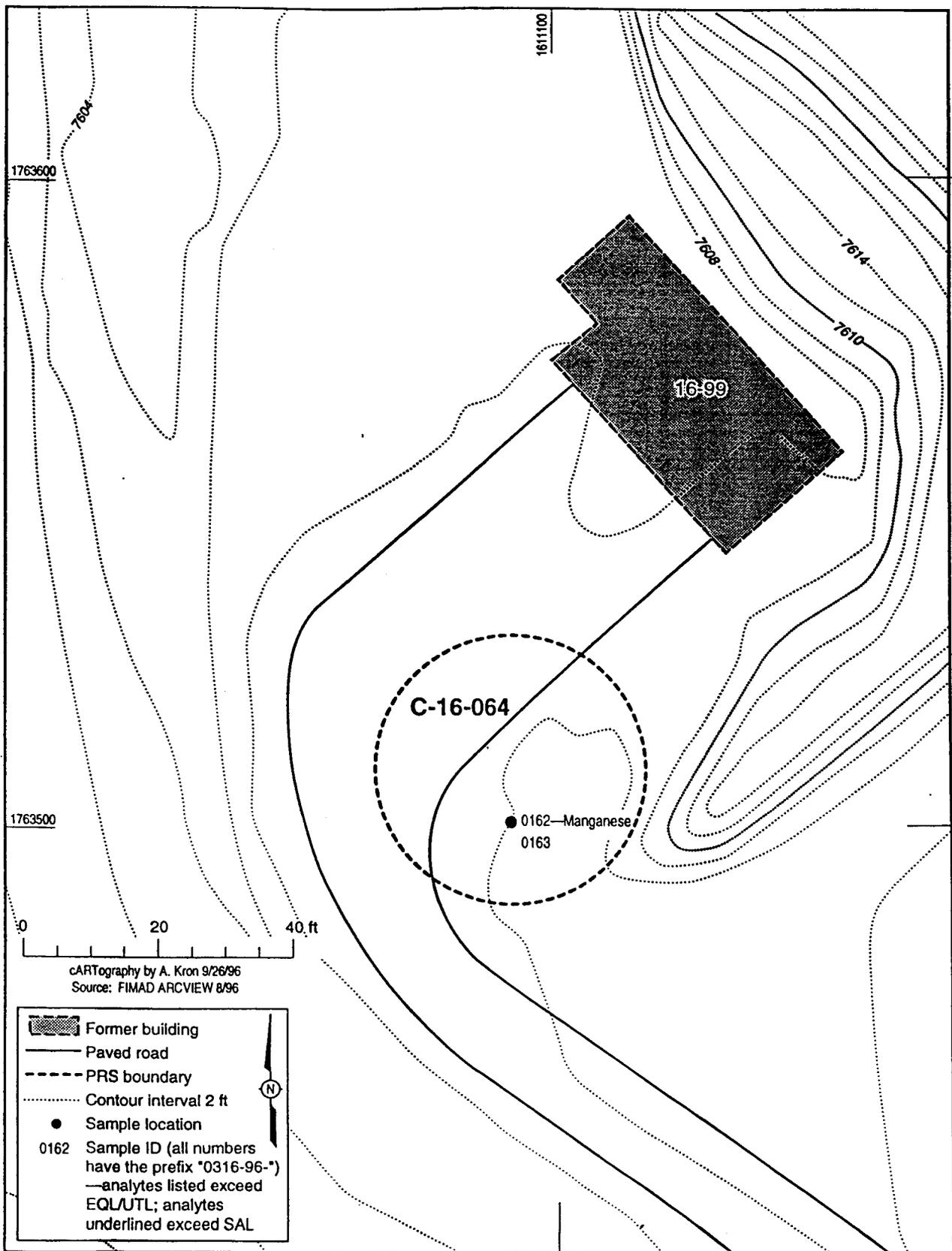


Figure 3.7.1-1. Confirmation sampling for C-16-064.

D-Tech™ RDX and TNT immunoassay kits (Draft SW846 Methods 4051 and 4050) and HE spot tests were used to determine the extent of contamination at these locations.

After verification sample results were received, the PRS was backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. The area was seeded with native grasses. This PRS was not originally included in the VCA plan because contamination was not expected. Upon review of the analytical data, the decision to perform a soil removal was made while the crews and equipment were on site.

3.7.2 Confirmatory Sampling

Two confirmatory samples were taken and were tested for inorganics, HE, SVOCs, and VOCs. Both were taken approximately 58 ft. southwest of building 99. Sample 0316-96-0162 was taken at the bottom of the excavation, and sample 0316-96-0163 was taken one foot below the bottom of the excavation. Manganese was detected above the UTL in one sample. No HE or organics were detected.

Confirmatory sampling shows that the contaminant level in the exposure unit is below PRG. Based on NFA criteria 5, this PRS will not be added to the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit and is proposed for removal from the ER Project list of PRSs.

(See Appendix D.6).

TABLE 3.7.2-1
SUMMARY OF REQUEST NUMBERS CONFIRMATORY SAMPLES
COLLECTED AT C-16-064

SAMPLE ID	LOCATION ID	DEPTH (ft)	PRS	TYPE OF SAMPLE	INORGANICS	HE	SVOC	VOC
0316-96-0162	16-2541	1-1.5	C-16-064	Confirmatory	2492	2494	2491	2491
0316-96-0163	16-2541	1.5-2	C-16-064	Bounding	2492	2494	2491	2491

3.8 Area of Concern C-16-067

3.8.1 Remedial Implementation

C-16-067 was entirely within the cleanup boundaries for PRS 16-029(t) (Section 3.2.1). Five field screening locations were called for in Subsection 5.19.4 of Addendum I to the RFI Work Plan for OU 1082 (LANL 1994, 1160). Because the area of the AOC is small and the bucket on the track hoe used to excavate the samples was large, only two locations were sampled within the AOC. The sampling exercise removed the entire area of the AOC down to a depth of 7.5 to 8.0 ft (Figs. 2.8.2-1 and 3.2.1-2).

3.8.2 Confirmatory Sampling

All the soil was removed from this PRS to a depth of 7.5 to 8.0 ft. The bounding sample that was taken at a depth of 7.0 to 7.5 ft. is below all PRGs (Sections 2.8.5 and 2.8.6).

Bounding sampling shows that the contaminant level in the exposure unit is below PRG. Based on NFA criteria 5, this PRS will not be added to the Hazardous and Solid Waste Amendments Module of the Laboratory's Resource Conservation and Recovery Act operating permit and is proposed for removal from the ER Project list of PRSs.

4.0 WASTE MANAGEMENT

All wastes and volumes are reported in Table 4.0-1. The volumes of all soils excavated at the 90s-Line is shown in Table 4.0-2. Through analysis of laboratory sample 0316-96-0093, the spoils pile located west of the NW sump outlet at building TA-16-90 was found to potentially contain RCRA wastes, approximately 2 yd³ (Table 4.0-1), and was placed into seven 55-gal. drums and managed with an on site <90 day storage facility. This soil was characterized and sent to a certified facility for treatment and disposal. No organics were detected in sample 0316-96-0103 (Appendix D.2), taken from below the area where these soils had been stockpiled.

Four waste characterization samples were taken (Table 4.0-3). Four were tested for metals by TCLP, two for SVOCs and VOCs by TCLP, and one for SVOCs and VOCs analysis by EPA SW-846 (methods 8270 and 8260). Barium was the only metal detected, and was well below regulatory limits. No organics were detected in any of the samples. All TCLP extracts were below EPA regulatory limits. The soils were then shipped off site to an approved industrial disposal area.

Approximately 0.17 yd³ of solid waste were produced from the Millipore™ and D-Tech™ screening kits. An additional 0.17 yd³ of RCRA liquid waste was produced from the Millipore™ and D-Tech™ screening kits. Sample containers from the XRF were decontaminated and thrown away as administrative waste. Personal protective equipment coveralls were laundered, outer gloves were decontaminated and reused, inner gloves were thrown away as administrative trash.

Non-reactive waste was shipped off site to an industrial disposal area.

TABLE 4.0-1
ANTICIPATED WASTE TYPES AND VOLUMES FROM SOIL CLEANUP
ACTIVITIES

ITEM	TYPE	ANTICIPATED VOLUME (yd ³)	ACTUAL VOLUME (yd ³)
Sampling waste/PPE ^a	Solid - potential hazardous	0.3	0.3
Bulk soil	Solid-low level radioactive	3	0
Bulk soil	Solid - RCRA organics and cyanides (assorted F wastes)	24	2
Bulk soil	Solid - RCRA metals (i.e., D005 wastes)	48	0
Bulk soil	Solid - RCRA reactive (K044 and D003 wastes)	2	0
Bulk soil	Solid - industrial (nonreactive levels of HE)	72	319.5

TOTAL		149	321.8
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^a PPE = Personal protective equipment.

TABLE 4.0-2
SOIL EXCAVATION BY BUILDING

BUILDING	LOCATION ID	QUANTITY OF REMOVED SOIL (yd ³) FIELD UNIT 3	QUANTITY OF REMOVED SOIL (yd ³) D&D	EXCAVATED INTERVAL (ft)
TA-16-89, NW drain line	16-2370	nr ^a	10	N/A ^b
TA-16-89, NW drain line	16-2372	4	nr	1-2
TA-16-89, SE drain line	16-2373	3	nr	4-5
TA-16-89, NW drain line	16-2372	3	nr	1-2
TA-16-90, SE drain line	16-2364	nr	10	3.5-4.5
TA-16-90, NW drain line	16-2360 to 16-2363	30	nr	0-2
TA-16-90, NW drain line	16-2360 to 16--2363	nr	30	2-3.5
TA-16-90, NW drain line	16-2360 to 16--2363	30	nr	3.5-5
TA-16-90, NW drain line	16-2363	35	nr	5-7
TA-16-90, NW drain line	16-2360 to 16-2362	25	nr	5-7
TA-16-90, stock piled soil	SAMPLE ID 0316-96-0093	2	nr	N/A
TA-16-90, NW sump	16-2427	2.5	nr	4-5
TA-16-90, SE sump	16-2430	2.5	nr	4-5
TA-16-91, NE drain line	16-2240		0.5	2-3
TA-16-91, NE drain line and sump	16-2350 &16-2421	4.5	nr	3.5-5.5
TA-16-91, SW drain line	16-2354	1.5	nr	3-5
TA-16-93, NW sump	16-2393	3	nr	4-5
TA-16-99, Both drain lines	na ^c	nr	100	3.5-4.5
TA-16-99, outfall	16-2404	3	nr	0-1
TA-16-99, outfall	16-2404	3	nr	1-3
C-16-064	16-2541	5	nr	0-1
C-16-067	16-2542 & 16-2543	14	nr	2-8
	Total	171	150.5	

^a nr = No removal.

^b N/A = Not available.

^c na = Not applicable.

TABLE 4.0-3

RESULTS FROM WASTE CHARACTERIZATION SAMPLES

SAMPLE ID	ASSOCIATED WITH STRUCTURE	TYPE OF ANALYSIS	BARIUM mg/L	ORGANICS
Regulatory limit	NA ^a	TCLP	200	na ^b
0316-96-9000	TA-16-90	TCLP	5.7	None detected
0316-96-9001	TA-16-90	TCLP	16.2	None detected
0316-96-9002	TA-16-99	SVOC & VOC	na	None detected
0316-96-9003	TA-16-91	TCLP	3.66	na

^a NA = Not applicable.

^b na = Not analyzed.

5.0 REFERENCES

EPA (US Environmental Protection Agency), August 1, 1996. "Region IX Preliminary Remediation Goals (PRGs) 1996," San Francisco, California. **(EPA 1996, 1351)**

EPA (US Environmental Protection Agency), May 1992. "Supplemental Guidance to RAGS: Calculating the Concentration Term," OSWER Publication 9285.7-081, Washington, DC. **(EPA 1992, 1120)**

LANL (Los Alamos National Laboratory) November 1989. "Sampling and Analysis Data Document, Volume 1A, Draft, Report EGG-ES-8204 prepared for Los Alamos National Laboratory, Los Alamos, New Mexico. **(LANL 1989, 0425)**

LANL (Los Alamos National Laboratory), July 1993. "RFI Work Plan for Operable Unit 1082," Los Alamos National Laboratory Report LA-UR-93-1196, Los Alamos, New Mexico. **(LANL 1993, 1094)**

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LANL (Los Alamos National Laboratory) 1994. "Site Development Plan, Annual Update 1994," Los Alamos National Laboratory Publication, LALP-94-21, Los Alamos, New Mexico. **(LANL 1994, 1171)**

LANL (Los Alamos National Laboratory), February 1996. "Voluntary Corrective Action Plan for Solid Waste Management Units: 16-026(m), 16-026(n), 16-026(o), 16-026(p), 16-029(k), 16-029(l), 16-029(q), 16-029(s), 16-029(t), and 16-029(u)," Los Alamos National Laboratory Report LA-UR-96-623, Los Alamos, New Mexico. **(LANL 1996, 0623)**

Martin, W.B., November 17, 1993. "Early S-Site History: Lee Hilton Interview," Los Alamos National Laboratory Memorandum CST-6-ER/BM-93-060 to File from W.B. Martin (CST-6), Los Alamos, New Mexico. **(Martin 1994, 15-16-477)**

Martin, B. and D. Hickmott, April 2, 1993. "Early S-Site History: C. Courtright Interview," Los Alamos National Laboratory Memorandum CLS-ER/BM-93:021 to File from B. Martin (CLS-DO) and D. Hickmott (EES-1), Los Alamos, New Mexico. **(Martin and Hickmott 1993, 15-16-497)**

Martin, B. and D. Hickmott, May 6, 1993. "Early S-Site History: Melvin Brooks Interview," Los Alamos National Laboratory Memorandum CLS-ER/BM-93:022 to File from B. Martin (CLS-DO) and D. Hickmott (EES-1), Los Alamos, New Mexico. **(Martin and Hickmott 1993, 15-16-498)**

APPENDIX A. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

Field screening methods were calibrated daily using known standards. The detection limit for the D-Tech™ for RDX is 0.5 mg/kg and for TNT is 0.5 mg/kg.

Samples are submitted to analytical laboratories in batches identified by a request number. Request numbers for the sampling campaign at the 90s-Line are referenced in Tables 2.X.4-1 and 3.X.2-1 of this VCA report. Table A-1 summarizes the results of quality assurance/quality control (QA/QC) data validation for inorganic and radiological analytical results used to support recommendations in this VCA report. Table A-2 summarized high explosive QA/QC data; Tables A-3 and A-4 summarize volatile organic analyses (VOC) and semivolatile organic analyses (SVOC) QA/QC validation data. Table A-5 is the data quality evaluation for waste characterization samples.

TABLE A-1
DATA QUALITY EVALUATION FOR INORGANIC AND RADIOCHEMICAL ANALYSES
AT TA-16, 90s-Line

SUITE	REQUEST NUMBER	COMMENTS
Inorganics	2092	Matrix spike recovery was 250 % for lead and 20% for manganese. These analytes are qualified as J+ (result may be biased high) and rejected, respectively. Calibration standards, blanks, and matrix spikes for all other analytes were in control. Holding times for mercury and cyanide were met.
Inorganics	2158	Several matrix spike recoveries were out of control, leading to qualification of the following analytes: antimony = UJ (estimated as undetected); barium = J+ (biased high); lead = J- (biased low); selenium = UJ (estimated undetected). Matrix spike recovery for manganese was 454% low. Because the manganese result was more than 4 times the spike, results were not rejected, but caution is required in data usage. Duplicates were out of control for aluminum, iron, manganese, and zinc. This discrepancy may be due to sample inhomogeneity and the data were not qualified. Laboratory control sample for mercury was out of control high, possibly due to double spiking. Because mercury was not found in the samples, the results were not qualified. Calibration standards, blanks, and matrix spikes for all other analytes were in control. Holding times for mercury and cyanide were met.

SUITE	REQUEST NUMBER	COMMENTS
Inorganics	2197	Matrix spike recovery was 69.2% for arsenic and 50.0% for selenium. These analytes are qualified as J- (result may be biased low) if the result was greater than estimated detection limits (EDL) and UJ (estimated undetected) if the result was less than EDL. Result greater than the EDL but less than 5x the concentrated of the related analyte in the blank were qualified as U (undetected). Calibration standards, blanks, and matrix spikes for all other analytes were in control. Holding times for mercury and cyanide were met.
Inorganics	2242	Calibration standards, blanks, and matrix spikes were all within control. Holding times were met.
Total Uranium	2244	The blank, matrix spike, duplicate and calibration standards were in control. No anomalies were noted.

TABLE A-2
DATA QUALITY EVALUATION FOR HIGH EXPLOSIVE ANALYSES
AT TA-16, 90s-Line

SUITE	REQUEST NUMBER	COMMENTS
High Explosives	2093	Seven of fourteen analytes were present in the laboratory control sample. All recoveries were within control limits. No qualifiers were applied because of the missing analytes. All blanks, control samples, and surrogates were within control. All holding times were met.
High Explosives	2159	Seven of fifteen analytes were present in the laboratory control sample. Nitrobenzene recovery was 116.7%. Although this is above recovery limits, no qualifiers have been applied to sample results because nitrobenzene was undetected. All calibration standards, surrogates, and blanks were within control. All holding times were met.
High Explosives	2243	Although tetryl, 2-nitrotoluene, 4-nitrotoluene, and 3-nitrotoluene did not meet required EQLs, no qualifiers were applied. The results were accepted as adequate for the purposes of this report. Amino-DNTs were reported as one result in the blanks and the samples. Qualifiers were not applied, and results were considered acceptable. All other calibration standards, control samples, and surrogates were within controls. Holding times were met for all samples.
High Explosives	2494	Blanks and laboratory control samples were in control. Surrogate recoveries were within limits. All holding times and extractions were met. No anomalies were noted.

TABLE A-3
DATA QUALITY EVALUATION FOR VOC ANALYSES
AT TA-16, 90s-Line

SUITE	REQUEST NUMBER	COMMENTS
VOC	2090	The reanalysis of sample 0316-96-0147 was outside the lower limit of count area for 1,4-dichlorobenzene. Detected analytes were J-qualified and undetected analytes were UJ-qualified. Surrogate trichlorofluoromethane recovery was 121% for sample 01316-96-0147 and the reanalysis of the same sample. Results were qualified as J+. Because methylene chloride and acetone were found in the blanks, results in all samples were qualified as undetected in all samples. All other blanks, internal samples, calibration standards, and surrogates were within control. All holding times were met.
VOC	2169	The matrix spike duplicate of sample 0316-96-2002 was out of control for the surrogate dibromofluoromethane. Results were not qualified because the surrogate was in control in both sample and matrix spike. All other blank, matrix spikes, control samples, and surrogates were in control. All holding times were met.
VOC	2241	Internal standards were out of control in several samples and re-analyses of those samples. Results were UJ or J-qualified. Samples 0316-96-0118RE, -0127RE, -0119RE, and -0128RE had a surrogate out of control high and one out of control low. The analytes involved have been qualified as UJ for non-detects and as J for detected results. Samples 0316-96-0119 and -0118 were out of control low and were qualified as J-. Sample 0316-96-0128RE missed holding time by one day. Despite these anomalies, results were considered adequate for the purposes of this report. All other blank, control standards, and surrogates were within control. All other samples met holding times.
VOC	2491	All blanks, internal samples, calibration standards, and surrogates were within control. All holding times were met. No anomalies were noted and no results were qualified.

TABLE A-4
DATA QUALITY EVALUATION FOR VOC ANALYSES
AT TA-16, 90s-Line

SUITE	REQUEST NUMBER	COMMENTS
SVOC	2090	Di-n-butylphthalate was detected in the blank, but was not detected in the samples. No results were qualified. All other blanks, internal samples, calibration standards, and surrogates were within control. All holding times were met.
SVOC	2169	Internal standard exceeded 100% for samples 0316-96-0148, -0148MS, -0148MSD, -0208, -0208RE, -2000, and -2000RE. Since all samples are non-detects, no qualifier is required. Sample 0316-96-0043 has surrogates with less than 10% recoveries. All analytes were rejected. The sample was reanalyzed, but missed holding times by eight days. The re-analysis was accepted as valid.
SVOC	2241	The internal standards naphthalene, acenaphthene, and phenanthrene were out of control for sample 0316-96-0108. Results were J-qualified. Although 2-Fluorobiphenyl was out of control in one blank, sample results were not qualified. Results for di-n-butylphthalate in both blanks were greater than the instrument detection limit and the EQL, however, the compound was not found in any sample. No results were qualified. All other blank, internal samples, calibration standards, and surrogates were within control. All holding times were met.
SVOC	2491	All blanks, internal samples, calibration standards, and surrogates were within control. All holding times were met. No results were qualified.

TABLE A-5
DATA QUALITY EVALUATION FOR WASTE CHARACTERIZATION SAMPLES
AT TA-16, 90s-Line

SUITE	REQUEST NUMBER	COMMENTS
Inorganics (TCLP)	2242	Calibration standards, blanks, and matrix spikes were all within control. Holding times were met.

APPENDIX B. CHARACTERIZATION DATA

Validated data will be available in the Facility for Information, Management, Analysis, and Display (FIMAD) or upon request.

APPENDIX C. BEFORE AND AFTER COST COMPARISON

Total anticipated costs for the VCA are \$514 100, as detailed in Table C.1. The estimated actual cost for the VCA are \$548 868. These costs reflect only those activities that were not completed by the D&D contractor. Significantly more analytical samples were taken than anticipated (140 actual versus 70 expected). This led to the analytical overrun. However, the VCA implementation came in only slightly above the anticipated costs as a result of coordinating the VCA with D&D activities. Waste disposal also came in considerably under anticipated cost.

**TABLE C.1
COST COMPARISON OF ANTICIPATED AND ESTIMATED ACTUAL COSTS**

<u>Activity</u>	<u>Anticipated</u>	<u>Estimated Actual</u>
<u>Pre-Field Activities</u>	\$ 30 000	\$ 7 894
<u>VCA Implementation</u>	\$ 183 600	\$ 171 969
<u>Analytical</u>		
Screening samples (assumes 250 samples -TNT RDX PAH kits)	\$ 25 000	\$ 25 000
Waste characterization samples (14 samples @ \$1 000/sample)	\$ 14 000	\$ 4 000
Analytical samples (70 samples including QA @ \$2 000/sample)	\$ 140 000	\$ 280 000
Subtotal	\$ 179 000	\$ 309 000
<u>Waste Disposal</u>		
Industrial/special (72 yds ³ @ \$150/yd ³)	\$ 10 800	\$ 47 925
RCRA hazardous (55 yds ³ @ \$900/yd ³)	\$ 49 500	\$ 2 070
RCRA reactive (3 600 lbs. @ \$7.00/lb. + \$5 000 shipping)	\$ 30 200	\$ 0
Low-Level Radioactive (11 drums @ \$2 000/drum)	\$ 22 000	\$ 0
Subtotal	\$ 112 500	\$ 49 995
<u>Post-Field Activities</u>		
Acceptance inspection	\$ NA	\$ NA
Final report	\$ 9 000	\$ 10 010
Waste management	\$ NA	\$ NA
Subtotal	\$ 9 000	\$ 10 010
Total	\$514 100	\$548 868

APPENDIX D. CONFIRMATORY SAMPLING RESULTS TABLES

D.1 Building TA-16-89

D.2 Building TA-16-90 (Initial results)

D.2.1 Building TA-16-90 (Final results)

D.3 Building TA-16-91

D.4 Building TA-16-92

D.5 Building TA-16-93

D.6 Building TA-16-99

D.7 C-16-064

D.8 C-16-067

TABLE D.1

**CONFIRMATORY SAMPLE RESULTS FOR TA-16-89, PRSs 16-029(u)
AND 16-026(p)**

**INORGANICS ABOVE UTL IN CONFIRMATORY SAMPLES FOR PRSs 16-029(u) AND
16-026(p)^a**

SAMPLE ID	Ba (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Mn (mg/kg)	Hg (mg/kg)	Zn (mg/kg)
UTL	315	19.2	15.5	23.3	714	0.1	50.8
SAL	5 300	4 600	2 800	400	3 200	23	23 000
PRG	10 000	nc ^b	6 300	1 000	nc	nc	nc
0316-96-0040	164	8.9	10.4	109	534	0.06 (U) ^c	41.6
0316-96-0041	611	7.6	20.0	12.7	302	0.06 (U)	42.1
0316-96-0042	589	2.7	11.3	10.1	222	0.05 (U)	37.8
0316-96-0043	478	12.1	9.6	16.2	543	0.06 (U)	25.2
0316-96-0045	3 070	5.4	14.9	17.0	252	0.09	64.0
0316-96-0048	1 320	7.8	20.6	13.6	308	0.06 (U)	69.1
0316-96-0049	309	3.6	9.4	10.1	540	0.06 (U)	23.5
0316-96-0100	85.8	5.9	12.5	8.9	263	0.05 (U)	29.1
0316-96-0101	198	5.8	29.4	11.9	298	0.05 (U)	55.3
0316-96-0106	320	5.5	28.0	23.0	312	0.05 (U)	484
0316-96-0107	303	11.3	10.4	18.9	640	0.05 (U)	78.6
0316-96-0108	502	38.1	15.8	36.5	1 780	0.11	689
0316-96-0109	406	9.0	11.8	16.8	481	0.05 (U)	152
0316-96-0208	56.0	4.9	8.1	10.1	54.7	0.06 (U)	21.1

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

**DETECTED HIGH EXPLOSIVES IN CONFIRMATORY SAMPLES FOR PRSs 16-029(u)
AND 16-026(p)^a**

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	2-NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNTs (mg/kg)
EQL	0.25	1	2.2	0.25	0.25	0.26	nc ^b	nc
SAL	15	4	3 300	650	3.3	nc	nc	nc
PRG	64	17	3 400	nc	3.4	nc	nc	nc
0316-96-0041	0.654	2.05	0.218	0.161 (U) ^c	0.090 (U)	0.084 (U)	0.094	na ^d
0316-96-0042	0.091	0.165 (U)	0.185 (U)	0.160 (U)	0.080 (U)	0.084 (U)	0.086 (U)	na
0316-96-0043	14.7	2.33	0.207	0.203	0.091 (U)	0.263	0.400	na
0316-96-0045	0.146	0.395	0.185 (U)	0.160 (U)	0.081 (U)	0.144	0.198	na

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	2-NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNTs (mg/kg)
0316-96-0048	1.14	1.28	0.253	0.160 (U)	0.090 (U)	0.185	0.222	na
0316-96-0049	0.135	0.326	0.185 (U)	0.160 (U)	0.135	0.084 (U)	0.087 (U)	na
0316-96-0100	0.155	0.181 (U)	0.187 (U)	0.161 (U)	0.091 (U)	0.085 (U)	0.087 (U)	na
0316-96-0101	0.660	1.70	1.5 (U)	0.700 (U)	0.180 (U)	na	na	0.350 (U)
0316-96-0108	0.200 (U)	1.00	1.7 (U)	0.790 (U)	0.200 (U)	na	na	0.92
0316-96-0208	0.184	2.38	0.285	0.167 (U)	0.094 (U)	0.182	0.099	na

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

^d na = Not analyzed.

**DETECTED ORGANICS IN CONFIRMATORY SAMPLES FOR PRSs 16-029(u) AND
16-026(p)^a**

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0042	Acetone	0.009(JB) ^b	2 000	0.05
	Methylene chloride	0.011(B) ^c	11	0.005
0316-96-0043	Acetone	0.008(JB)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
0316-96-0100	Acetone	0.015(JB)	2 000	0.02
	Methylene chloride	0.012(B)	11	0.005
0316-96-0101	Acetone	0.024(B)	2 000	0.02
	Methylene chloride	0.028(B)	11	0.005
0316-96-0106	Acetone	0.015(JB)	2 000	0.02
	bis(2-Ethylhexyl) phthalate	0.040(J) ^d	32	0.33
	Cis-1,2-dichloroethene	0.004(J)	59	0.01
	Methylene chloride	0.089(B)	11	0.005
	Tetrachloroethene	0.002(J)	7	0.005
	Toluene	0.009	1 900	0.005
	Trichloroethene	0.025	7.1	0.005
	Trichlorofluoromethane	0.003(J)	710	0.005
0316-96-0107	Acetone	0.080(B)	2 000	0.02
	Cis-1,2-dichloroethene	0.003(J)	59	0.01
	4-Isopropyltoluene	0.009	nc ^e	0.005
	Methylene chloride	0.043(B)	11	0.005
	Toluene	0.016	1 900	0.005
	Trichloroethene	0.013	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0108	Acetone	0.019(JB)	2 000	0.02
	Benzo(b)fluoranthene	0.052(J)	0.61	0.33
	Benzo(k)fluoranthene	0.044(J)	6.1	0.33
	bis(2-Ethylhexyl) phthalate	0.110(J)	32	0.33
	Chrysene	0.045(J)	24	0.33
	Cis-1,2-dichloroethene	0.002(J)	59	0.01
	Flouranthene	0.040(J)	2 600	0.33
	Methylene chloride	0.027(B)	11	0.005

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0108	Pyrene	0.044(J)	2 000	0.33
	Toluene	0.005(J)	1 900	0.005
	Trichloroethene	0.011	7.1	0.005
	Trichlorofluoromethane	0.001(J)	710	0.005
0316-96-0109	Acetone	0.059(B)	2 000	0.02
	Cis-1,2-dichloroethene	0.002(J)	59	0.01
	Di-n-octyl phthalate	0.078(J)	1 300	0.33
	4-Isopropyltoluene	0.003(J)	nc	0.005
	Methylene chloride	0.036(B)	11	0.005
	Toluene	0.006	1 900	0.005
	Trichloroethene	0.006	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0204	Methylene chloride	0.040(B)	11	0.005
0316-96-0205	Acetone	0.008(JB)	2 000	0.05
	Benzoic acid	0.140(J)	100 000	3.3
	Di-nitrotoluene(2,4)	0.084(J)	130	0.33
	Methylene chloride	0.036(B)	11	0.005
0316-96-0206	Methylene chloride	0.013(B)	11	0.005
0316-96-0207	Methylene chloride	0.016(B)	11	0.005
	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
0316-96-0208	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005

^a Double bordered cells contain concentrations greater than UTL.

^b JB = Estimated quantity and blank contamination.

^c B = Blank contamination.

^d J = Estimated quantity.

^e nc = Not calculated.

TABLE D.2

**CONFIRMATORY SAMPLE RESULTS FOR TA-16-90, PRSs 16-029(t)
AND 16-026(o) AT LOCATIONS THAT REQUIRED A SECOND SOIL
REMOVAL**

INORGANICS ABOVE BACKGROUND UTL FOR PRSs 16-029(t) AND 16-026(o)^a

Sample ID	Ba (mg/kg)	Zn (mg/kg)
UTL	315	50.8
SAL	5 300	23 000
PRG	10 000	nc ^b
0316-96-0034	2 590	24.8
0316-96-0090	128	31.9
0316-96-0091	1 980	54.6

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

DETECTED HIGH EXPLOSIVES FOR PRSs 16-029(t) AND 16-026(o)^a

Sample ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.25	0.26	nc ^b
SAL	15	4	3 300	3.3	nc	nc
PRG	64	17	3 400	3.4	nc	nc
0316-96-0034	2.35	2.72	0.351	3.71	0.211	0.089
0316-96-0090	0.089 (U) ^c	0.93	0.320	18.9	0.082 (U)	0.085 (U)
0316-96-0091	3.09	2.81	0.391	3.45	0.240	0.123

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED ORGANICS FOR PRSs 16-029(t) AND 16-026(o)

Sample ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0034	Acetone	0.011(JB) ^a	2 000	0.02
	Methylene chloride	0.009(B) ^b	11	0.005
0316-96-0090	Acetone	0.007(JB)	2 000	0.02
	Methylene chloride	0.009(B)	11	0.005
0316-96-0091	Acetone	0.007(JB)	2 000	0.02
	Methylene chloride	0.021(B)	11	0.005

^a JB = Estimated quantity and blank contamination.

^b B = Blank contamination.

TABLE D.2.1

CONFIRMATORY SAMPLE RESULTS FOR TA-16-90, PRSs 16-029(t)
AND 16-026(o)

INORGANICS ABOVE BACKGROUND UTL FOR PRSs 16-029(t) AND 16-026(o)^a

Sample ID	Ba (mg/kg)	Be (mg/kg)	Cu (mg/kg)	Mn (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
UTL	315	1.95	15.5	714	15.2	50.8
SAL	5 300	1.95	2 800	3 200	1 500	23 000
PRG	10 000	11	6 300	nc ^b	3 400	nc
0316-96-0031	708	0.87	7.0	441	10.2	90.3
0316-96-0032	447	1.40	12.6	335	17.1	47.0
0316-96-0033	1 190	0.72	6.8	1 110	15.1	19.6
0316-96-0154	159	0.47	3.6	206	4.8	17.0
0316-96-0092	620	2.00	12.6	804	17.2	49.3
0316-96-0093	196	0.75	6.6	276	8.0	28.6
0316-96-0096	166	0.73	13.9	413	5.6	30.1
0316-96-0097	343	0.74	17.8	434	5.6	430
0316-96-0098	421	0.59	12.8	302	5.0	199
0316-96-0099	398	0.99	14.9	301	8.7	132
0316-96-0094	180	1.4	5.9	730	14.0	31.0
0316-96-0095	140	1.0	5.0	240	6.8	20.0
0316-96-0102	380	0.9	4.7	150	5.7	30.0
0316-96-0103	140	1.2	7.1	300	10.0	29.0
0316-96-0160	46.0	0.68 (U) ^c	1.4 (U)	41.0	2.7 (U)	9.3
0316-96-0161	350	1.5	8.3	2 300	33.0	35.0
0316-96-0164	110	1.1	4.3	360	7.4	20.0

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED HIGH EXPLOSIVES FOR PRSs 16-029(t) AND 16-026(o)^a

Sample ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNT (mg/kg)
EQL	0.25	1	2.2	0.25	0.25	0.26	nc ^b	nc
SAL	15	4	3 300	650	3.3	nc	nc	nc
PRG	64	17	3 400	nc	3.4	nc	nc	nc
0316-96-0031	26.4	5.84	0.601	0.159 (U) ^c	0.089 (U)	0.419	0.495	na ^d
0316-96-0032	0.219	8.92	0.723	0.162 (U)	0.091 (U)	0.085 (U)	0.088 (U)	na
0316-96-0033	22.5	8.89	1.34	0.076	6.08	0.530	0.344	na
0316-96-0154	2.79	3.59	0.548	0.124	0.275	0.140	0.088	na
0316-96-0092	0.093 (U)	0.485	0.190 (U)	0.164 (U)	0.092 (U)	0.086 (U)	0.089 (U)	na

Sample ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNT (mg/kg)
0316-96-0093	1.2	36	3.4	0.770 (U)	0.190 (U)	na	na	0.390 (U)
0316-96-0094	0.25 (U)	1.0 (U)	2.0 (U)	0.25 (U)	0.25 (U)	0.25 (U)	0.25 (U)	na
0316-96-0095	1.3	2.1	2.0 (U)	0.25 (U)	0.6	0.25 (U)	0.25 (U)	na
0316-96-0102	0.72	1.0 (U)	2.0 (U)	0.25 (U)	1.5	0.25 (U)	0.25 (U)	na
0316-96-0103	0.97	3.5	2.0 (U)	0.25 (U)	0.25 (U)	0.25 (U)	0.25 (U)	na
0316-96-0160	1.4	2.1	2.0 (U)	0.25 (U)	0.36	0.25 (U)	0.67	na
0316-96-0161	0.32	1.0 (U)	2.0 (U)	0.25 (U)	1.7	0.25 (U)	0.25 (U)	na
0316-96-0164	0.25 (U)	1.0 (U)	2.0 (U)	0.25 (U)	0.25 (U)	0.25 (U)	0.25 (U)	na

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

^d na = Not analyzed.

DETECTED ORGANICS FOR PRSs 16-029(t) AND 16-026(o)

Sample ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0031	Benzo(b)flouranthene	0.041(J) ^a	0.61	0.33
	Benzo(g,h,i)perlene	0.052(J)	nc ^b	0.33
	bis(2-Ethylhexyl) phthalate	0.071(J)	32	0.33
	Fluoranthene	0.057(J)	2 600	0.33
	Indeno(1,2,3-cd)pyrene	0.043(J)	0.61	0.33
	Methylene chloride	0.006(B) ^c	11	0.005
	Phenanthrene	0.053(J)	nc	0.33
	Pyrene	0.046(J)	2 000	0.33
	Tetrachloroethene	0.002(J)	7	0.005
0316-96-0032	Acetone	0.011(JB) ^d	2 000	0.02
	Benzoic acid	0.120(J)	100 000	3.3
	Methylene chloride	0.012(B)	11	0.005
	Tetrachloroethene	0.003(J)	7	0.005
	Trichloroethane	0.001(J)	3 000	0.005
0316-96-0033	Acetone	0.024(B)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
0316-96-0154	Acetone	0.006(JB)	2 000	0.02
	Methylene chloride	0.006(B)	11	0.005
0316-96-0034	Acetone	0.011(JB)	2 000	0.02
	Methylene chloride	0.009(B)	11	0.005
0316-96-0090	Acetone	0.007(JB)	2 000	0.02
	Methylene chloride	0.009(B)	11	0.005
0316-96-0091	Acetone	0.007(JB)	2 000	0.02
	Methylene chloride	0.021(B)	11	0.005
0316-96-0092	Acetone	0.012(JB)	2 000	0.02
	Methylene chloride	0.021(B)	11	0.005
0316-96-0093	Acetone	0.033(B)	2 000	0.02
	Benzo(a)anthracene	0.056(J)	0.61	0.33
	Benzo(a)pyrene	0.062(J)	0.061	0.33

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Sample ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0093	Benzo(b)fluoranthene	0.054(J)	0.61	0.33
	Benzo(g,h,i)perylene	0.071(J)	nc	0.33
	Benzo(k)fluoranthene	0.047(J)	6.1	0.33
	Chrysene	0.066(J)	24	0.33
	Cis-1,2-dichloroethene	0.001(J)	59	0.01
	Flouranthene	0.140(J)	2 600	0.33
	Indeno(1,2,3-cd)pyrene	0.052(J)	0.61	0.33
	Methylene chloride	0.035(B)	11	0.005
	Phenanthrene	0.110(J)	nc	0.33
	Pyrene	0.130(J)	2 000	0.33
	Toluene	0.005	1 900	0.005
	Trichloroethene	0.004(J)	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
	0316-96-0096	Acetone	0.006(JB)	2 000
Methylene chloride		0.020(B)	11	0.005
Trichloroethene		0.001(J)	7.1	0.005
0316-96-0097	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.033(B)	11	0.005
	Trichloroethene	0.005(J)	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0098	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0099	2-Butanone	0.024	nc	nc
	4-Isopropyltoluene	0.001(J)	nc	0.005
	Acetone	0.140(B)	2 000	0.02
	Cis-1,2-dichloroethene	0.001(J)	59	0.01
	Methylene chloride	0.066(B)	11	0.005
	Toluene	0.004(J)	1 900	0.005
	Trichloroethene	0.005	7.1	0.005
	Trichlorofluoromethane	0.003(J)	710	0.005
0316-96-0160	Bis(2-Ethylhexyl)phthalate	0.23 (J)	32	0.33

^a J = Estimated quantity.

^b nc = Not calculated.

^c B = Blank contamination.

^d JB = Estimated quantity and blank contamination.

TABLE D.3

CONFIRMATORY SAMPLE RESULTS FOR TA-16-91, PRSs 16-029(s)

AND 16-026(n)

INORGANICS ABOVE UTL IN CONFIRMATORY SAMPLES FOR PRSs 16-029(s) AND

16-026(n)^a

SAMPLE ID	Ba (mg/kg)	Cd (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Mn (mg/kg)	Zn (mg/kg)	Cyanide (mg/kg)
UTL	315	2.6	19.2	15.5	23.3	714	50.8	nc ^b
SAL	5 300	38	4 600	2 800	400	3 200	23 000	1 300
PRG	10 000	85	nc	6 300	1 000	nc	nc	1 400
0316-96-0020	1 780	7.6	6.0	8.9	12.6	326	37.7	0.61 (U) ^c
0316-96-0021	567	8.0	4.7	6.8	23.8	273	46.3	0.61 (U)
0316-96-0022	2 190	7.9	12.3	10.6	11.5	672	37.4	1.5
0316-96-0023	1 260	9.4	6.6	11.2	13.9	435	39.6	0.63 (U)
0316-96-0024	2 670	4.4	4.6	5.3	11.6	214	26.7	0.63 (U)
0316-96-0080	691	7.9	6.2	10.0	12.6	334	27.1	0.62 (U)
0316-96-0081	196	8.5	9.8	7.4	11.7	937	28.0	0.52 (U)
0316-96-0086	715	4.4	9.0	8.0	17.5	662	263	0.51 (U)
0316-96-0087	767	3.6	4.7	6.3	7.1	262	26.1	0.51 (U)
0316-96-0088	1 100	7.7	28.2	64.4	20.4	1260	99.9	0.51 (U)
0316-96-0089	3 920	4.1	5.6	9.6	16.8	169	22.6	0.50 (U)

^a Double bordered cells contain concentrations greater than UTL.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED HIGH EXPLOSIVES IN CONFIRMATORY SAMPLES FOR PRSs 16-029(s)

AND 16-026(n)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNTs (mg/kg)
EQL	0.25	1	2.2	0.25	0.25	0.26	nc ^b	nc
SAL	15	4	3 300	650	3.3	nc	nc	nc
PRG	64	17	3 400	nc	3.4	nc	nc	nc
0316-96-0020	9.57	8.13	0.712	0.259	2.53	0.791	0.480	na ^c
0316-96-0021	0.157	1.75	1.61	0.161 (U) ^d	0.375	0.084 (U)	0.087 (U)	na
0316-96-0022	10.7	8.28	0.90	0.262	1.08	1.150	0.922	na
0316-96-0023	1.16	2.18	0.484	0.288	0.113	0.371	0.271	na
0316-96-0024	1.18	2.19	0.343	0.229	0.248	0.389	0.306	na
0316-96-0080	0.313	1.21	0.313 (U)	0.159 (U)	0.451	0.093	0.094	na

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	NT (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNTs (mg/kg)
0316-96-0081	9.5	8.80	1.5 (U)	0.690 (U)	0.170 (U)	na	na	0.350 (U)
0316-96-0087	0.190 (U)	0.770 (U)	1.7 (U)	0.770 (U)	0.190 (U)	na	na	0.75

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c na = Not analyzed.

^d U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED ORGANICS IN CONFIRMATORY SAMPLES FOR PRSs 16-029(s) AND 16-026(n)^a

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0020	Methylene Chloride	0.012(B) ^b	11	0.005
0316-96-0021	Methylene Chloride	0.010(B)	11	0.005
0316-96-0022	Methylene Chloride	0.012(B)	11	0.005
0316-96-0023	Methylene Chloride	0.013(B)	11	0.005
0316-96-0024	Methylene Chloride	0.011(B)	11	0.005
0316-96-0080	Acetone	0.002(JB) ^c	2 000	0.02
	Methylene Chloride	0.007(B)	11	0.005
0316-96-0081	Acetone	0.014(JB)	2 000	0.02
	Methylene Chloride	0.020(B)	11	0.005
	Toluene	0.001(J) ^d	1 900	0.005
	Trichloroethene	0.004(J)	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
	Trichlorotrifluoroethane	0.002(J)	4 100	0.005
0316-96-0086	Acetone	0.019(JB)	2 000	0.02
	Cis-1,2-dichloroethene	0.002(J)	59	0.01
	Methylene Chloride	0.027(B)	11	0.005
	Toluene	0.002(J)	1 900	0.005
	Trichloroethene	0.01	7.1	0.005
0316-96-0087	Trichlorotrifluoroethane	0.002(J)	4 100	0.005
	4-Isopropyltoluene	0.001(J)	nc ^e	0.005
	Acetone	0.034(B)	2 000	0.02
	Methylene Chloride	0.022(B)	11	0.005
	Toluene	0.003(J)	1 900	0.005
	Trichloroethene	0.002(J)	7.1	0.005
0316-96-0088	Trichlorofluoromethane	0.003(J)	710	0.005
	2-Butanone	0.009(J)	nc	0.02
	4-Isopropyltoluene	0.005	nc	0.005
	Acetone	0.087(B)	2 000	0.02
	Methylene Chloride	0.028(B)	11	0.005
	Toluene	0.006	1 900	0.005
0316-96-0089	Trichloroethene	0.004(J)	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
0316-96-0089	Acetone	0.036(B)	2 000	0.02

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0089	Cis-1,2-dichloroethene	0.001(J)	59	0.01
	Methylene Chloride	0.021(B)	11	0.005
	Toluene	0.004(J)	1 900	0.005
	Trichloroethene	0.006	7.1	0.005

^a Double bordered cells contain concentrations greater than EQL.

^b B = Blank contamination.

^c JB = Estimated quantity and blank contamination.

^d J = Estimated quantity.

^e nc = Not calculated.

TABLE D.4

CONFIRMATORY SAMPLE RESULTS FOR TA-16-92, PRSs 16-029(I)

AND 16-026(m)

INORGANICS ABOVE UTL IN CONFIRMATORY SAMPLES FOR PRSs 16-029(I) AND

16-026(m)^a

SAMPLE ID	Ba (mg/kg)	Be (mg/kg)	Cd (mg/kg)	Cr (mg/kg)	Co (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Hg (mg/kg)	Ni (mg/kg)	Ag (mg/kg)	(n
UTL	315	1.95	2.6	19.3	19.2	15.5	23.3	0.1	15.2	nc ^b	
SAL	5 300	1.95	38	210	4 600	2 800	400	23	1 500	3 800	2
PRG	10 000	11	85	450	nc	6 300	1 000	nc	3 400	nc	
0316-96-0010	246	0.99	30.4	8.0	31.1	15.6	20.6	0.04	225.0	1.2	
0316-96-0011	699	1.2	1.0	19.7	5.7	13.2	31.9	0.03	21.7	0.38	
0316-96-0012	125	0.91	0.84	7.3	7.9	682	22.2	0.05	437.0	0.24 (U) ^c	
0316-96-0013	108	0.98	0.74	6.2	6.1	139	11.4	0.02 (U)	277.0	1.5	
0316-96-0015	140	1.4	0.76	8.5	3.3	10.3	15.1	0.02	9.4	0.28 (U)	
0316-96-0016	133	2.10	0.86	8.6	14.1	2 210	47.0	0.11	3 280	2.5	
0316-96-0070	83.3	0.47	0.76 (U)	2.0	2.5	2.4	15.1	0.05 (U)	2.3 (U)	1.1 (U)	
0316-96-0076	80.2	0.38	0.75 (U)	3.7	3.1	200	30.6	0.08	236.0	8.7	
0316-96-0077	72.1	0.34	0.69 (U)	2.6	3.2	129	14.2	0.05 (U)	194.0	6.3	
0316-96-0078	60.4	0.30	0.71 (U)	3.6	3.8	458	13.6	0.10	451.0	13.4	
0316-96-0079	83.6	0.38	0.71 (U)	3.9	4.2	238	13.9	0.05 (U)	212.0	7.3	

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED URANIUM IN CONFIRMATORY SAMPLES FOR PRSs 16-029(I) AND

16-026(m)^a

SAMPLE ID	U (mg/kg)
UTL	5.45
SAL	29
PRG	284
0316-96-0010	28.8
0316-96-0011	9.34
0316-96-0012	22.8
0316-96-0013	4.69
0316-96-0015	49.5
0316-96-0016	64.9
0316-96-0070	2.23

SAMPLE ID	U (mg/kg)
0316-96-0076	8.1
0316-96-0077	3.85
0316-96-0078	7.8
0316-96-0079	4.84

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

DETECTED HIGH EXPLOSIVES IN CONFIRMATORY SAMPLES FOR PRSs 16-029(I) AND 16-026(m)

SAMPLE ID	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.26	nc ^a
SAL	nc	nc
PRG	nc	nc
0316-96-0010	0.095	0.153
0316-96-0011	0.083 (U) ^b	0.148
0316-96-0012	0.083 (U)	0.102

^a nc = Not calculated.

^b U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED ORGANICS IN CONFIRMATORY SAMPLES FOR PRSs 16-029(I) AND 16-026(m)^a

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0010	1,1,1-Trichloroethane	0.003(J) ^b	3 000	0.005
	Acetone	0.010(JB) ^c	2 000	0.02
	Bis(2-ethylhexyl) phthalate	3.3	32	0.33
	Methylene chloride	0.012(B) ^d	11	0.005
	Tetrachloroethene	0.005(J)	7	0.005
0316-96-0011	1,1,1-Trichloroethane	0.032	3 000	0.005
	Acetone	0.008(JB)	2 000	0.02
	Bis(2-ethylhexyl) phthalate	3.3	32	0.33
	Di-n-octyl phthalate	0.570(J)	1 300	0.33
	Methylene chloride	0.011(B)	11	0.005
0316-96-0012	Tetrachloroethene	0.014	7	0.005
	Acetone	0.006(JB)	2 000	0.02
0316-96-0013	Methylene chloride	0.009(B)	11	0.005
	Methylene chloride	0.013(B)	11	0.005
0316-96-0015	Methylene chloride	0.015(B)	11	0.005
0316-96-0016	Methylene chloride	0.013(B)	11	0.005
0316-96-0070	Acetone	0.009(JB)	2 000	0.02
	Methylene chloride	0.024(B)	11	0.005
	Toluene	0.004(J)	1 900	0.005
	Trichloroethene	0.005(J)	7.1	0.005

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0070	Trichlorofluoromethane	0.001(J)	710	0.005
0316-96-0076	Methylene chloride	0.035(B)	11	0.005
	Toluene	0.002(J)	1 900	0.005
	Trichloroethene	0.007	7.1	0.005
	Trichlorofluoromethane	0.001(J)	710	0.005
0316-96-0077	4-Isopropyltoluene	0.002(J)	nc ^e	0.005
	Acetone	0.081(B)	2 000	0.02
	Cis-1,2-dichloroethene	0.004(J)	59	0.01
	Methylene chloride	0.061(B)	11	0.005
	Tetrachloroethene	0.007	7	0.005
	Toluene	0.016	1 900	0.005
	Trichloroethene	0.016	7.1	0.005
	Trichlorofluoromethane	0.003(J)	710	0.005
	Acetone	0.038(B)	2 000	0.02
0316-96-0078	Cis-1,2-dichloroethene	0.002(J)	59	0.01
	Methylene chloride	0.033(B)	11	0.005
	Toluene	0.01	1 900	0.005
	Trichloroethene	0.006	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005
	4-Isopropyltoluene	0.006	nc	0.005
0316-96-0079	Acetone	0.060(B)	2 000	0.02
	Cis-1,2-dichloroethene	0.002(J)	59	0.01
	Methylene chloride	0.048(B)	11	0.005
	Toluene	0.008	1 900	0.005
	Trichloroethene	0.008	7.1	0.005
	Trichlorofluoromethane	0.002(J)	710	0.005

^a Double bordered cells contain concentrations greater than EQL.

^b J = Estimated quantity.

^c JB = Estimated quantity and blank contamination.

^d B = Blank contamination.

^e nc = Not calculated.

TABLE D.5

CONFIRMATORY SAMPLE RESULTS FOR TA-16-93, PRS 16-029(k)

INORGANICS ABOVE UTL IN CONFIRMATORY SAMPLES FOR PRS 16-029(k)^a

SAMPLE ID	Ba (mg/kg)	Cr (mg/kg)	Cr vi (mg/kg)	Cu (mg/kg)	Pb (mg/kg)	Mn (mg/kg)	Ni (mg/kg)	Ag (mg/kg)	Zn (mg/kg)
UTL	315	19.3	nc ^b	15.5	23.3	714	15.2	nc	50.8
SAL	5 300	210	30	2 800	400	3 200	1 500	3 800	23 000
PRG	10 000	450	nc	6 300	1 000	nc	3 400	nc	nc
0316-96-0050	54	1.7 (U) ^c	na ^d	5.0	5.3	188	4.5	1.6 (U)	21.1
0316-96-0052	253	9.3	na	19.2	21.4	254	130	1.6 (U)	40.1
0316-96-0053	192	8.1	na	226	14.4	906	49.4	1.6 (U)	39.8
0316-96-0054	1 550	9.3	na	579	15.5	661	429	1.7 (U)	32.4
0316-96-0055	2 710	226	67.7	14.3	12.2	181	19.1	1.7 (U)	69.8
0316-96-0056	439	52.9	na	37.2	45.2	251	135	1.8	60.3
0316-96-0110	778	10.2	na	14	7	249	26.2	1.4 (U)	35.6
0316-96-0111	331	14.4	na	11.6	19.6	363	30.1	1.5 (U)	28.4
0316-96-0112	133	164	na	12.3	94.5	365	37.5	1.4 (U)	33.6
0316-96-0116	194	18.3	na	119	35.1	423	210	1.3 (U)	284
0316-96-0117	385	25	na	91.6	19.7	512	177	6	161
0316-96-0118	603	25.4	na	137	21.5	735	219	15.3	83.4
0316-96-0119	568	19.1	na	196	29.1	538	224	16.9	71.5
0316-96-0128	1 010	13.4	na	13.4	15.4	254	13.4	1.4 (U)	53.1
0316-96-0129	598	11.8	na	12.2	16.1	305	12.3	1.3 (U)	40.9

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

^d na = Non analyzed.

DETECTED HIGH EXPLOSIVES IN CONFIRMATORY SAMPLES AT PRS 16-029(k)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	NT (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)
EQL	0.25	1	2.2	0.26	nc ^b
SAL	15	4	650	nc	nc
PRG	64	17	nc	nc	nc
0316-96-0052	0.215	0.741	0.161 (U) ^c	0.103	0.101
0316-96-0054	0.147	0.180 (U)	0.19	1.03	0.849
0316-96-0056	0.089 (U)	0.177 (U)	0.158 (U)	0.083 (U)	0.147
0316-96-0110	0.089 (U)	0.208	0.157 (U)	0.082 (U)	0.085 (U)

^a Double bordered cells contain concentrations greater than EQL.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED ORGANICS IN CONFIRMATORY SAMPLES FOR PRS 16-029(k)^a

Sample ID	ANALYTE	Result (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0055	Trichloroethene	0.011	7.1	0.005
	Tetrachloroethene	0.009	7	0.005
0316-96-0056	Cis-1,2-Dichloroethene	0.011	59	0.01
	Trichloroethene	0.12	7.1	0.005
	Tetrachloroethene	0.16	7	0.005
	Butylbenzophthalate	0.083(J) ^b	13 000	0.33
	Bis(2-ethylhexyl)phthalate	0.110(J)	32	0.33
0316-96-0110	Methylene Chloride	0.021(B) ^c	11	0.005
	Acetone	0.047(B)	2000	0.02
	2-Butanone	0.010(J)	8700	0.02
	2-Hexanone	0.001(J)	5200	0.02
0316-96-0111	Methylene Chloride	0.010(B)	11	0.005
	Acetone	0.010(JB) ^d	2000	0.02

^a Double bordered cells contain concentrations greater than EQL.

^b J = Estimated quantity.

^c B = Blank contamination.

^d JB = Estimated quantity and blank contamination.

TABLE D.6

CONFIRMATORY SAMPLE RESULTS FOR TA-16-99, PRS 16-029(q)

INORGANICS ABOVE UTL IN CONFIRMATORY SAMPLES FOR PRS 16-029(q)^a

SAMPLE ID	As (mg/kg)	Ba (mg/kg)	Cr (VI) (mg/kg)	Cu (mg/kg)	Mn (mg/kg)	Ni (mg/kg)	Zn (mg/kg)
UTL	7.82	315	nc ^b	15.5	714	15.2	50.8
SAL	7.82	5 300	30	2 800	3 200	1 500	23 000
PRG	nc	10 000	nc	6 300	nc	3 400	nc
0316-96-0060	5.0	213	nc	9.0	1 210	15.2	47.4
0316-96-0061	3.8	105	na	13.7	277	16.3	47.7
0316-96-0062	0.61	1 600	1.2	3.8	163	4.3	36.2
0316-96-0063	8.7	1 220	na	15.8	247	9.0	34.3
0316-96-0120	0.42	54.9	na	2.8	202	4.8	16.4
0316-96-0121	0.51	1 140	na	2.5	286	4.8	16.1
0316-96-0122	0.76	117	na	7.4	77.2	6.4	21.7
0316-96-0123	3.1	648	na	9.2	407	11.2	42.4
0316-96-0126	7.2	1 160	na	18.1	278	13.6	56.2
0316-96-0127	1.3 (U) ^c	366	na	10.8	268	11.6	38.7

^a Double bordered cells contain concentrations greater than UTL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

DETECTED HIGH EXPLOSIVES IN CONFIRMATORY SAMPLES FOR PRS 16-029(q)^a

SAMPLE ID	TNT (mg/kg)	RDX (mg/kg)	HMX (mg/kg)	TNB (mg/kg)	2-aDNT (mg/kg)	4-aDNT (mg/kg)	aDNTs (mg/kg)
EQL	0.25	1	2.2	0.25	0.26	nc ^b	nc
SAL	15	4	3 300	3.3	nc	nc	nc
PRG	64	17	3 400	3.4	nc	nc	nc
0316-96-0060	1.29	1.74	0.278	0.090 (U) ^c	0.084 (U)	0.087 (U)	na ^d
0316-96-0062	0.328	0.324	0.181 (U)	0.091	0.082 (U)	0.085 (U)	na
0316-96-0063	0.688	0.385	0.401	0.091 (U)	0.674	0.515	na
0316-96-0120	0.125	0.315	0.180 (U)	0.087 (U)	0.082 (U)	0.084 (U)	na
0316-96-0121	0.53	0.459	0.180 (U)	0.087 (U)	0.111	0.111	na
0316-96-0122	0.121	0.179 (U)	0.185 (U)	0.090 (U)	0.084 (U)	0.086 (U)	na
0316-96-0123	6.8	4.8	1.9 (U)	0.220 (U)	na	na	0.440 (U)

^a Double bordered cells contain concentrations greater than EQL. Shaded cells contain results greater than SALs.

^b nc = Not calculated.

^c U = Reported detection limit. Analyte was not detected at or above this level.

^d na = Not analyzed.

DETECTED ORGANICS IN CONFIRMATORY SAMPLES FOR PRS 16-029(q)

SAMPLE ID	ANALYTE	RESULT (mg/kg)	SAL (mg/kg)	EQL (mg/kg)
0316-96-0060	Methylene chloride	0.012(B) ^a	11	0.005
0316-96-0061	Acetone	0.044(B)	2 000	0.02
	Methylene chloride	0.011(B)	11	0.005
0316-96-0062	Acetone	0.003(JB) ^b	2 000	0.02
	Carbon disulfide	0.001(J) ^c	16	0.005
	Dichlorodifluoromethane	0.002(J)	110	0.01
	Methylene chloride	0.010(B)	11	0.005
0316-96-0063	1,1,1-Trichloroethane	0.002(J)	3 000	0.005
	Acetone	0.008(JB)	2 000	0.02
	Dichlorodifluoromethane	0.001(J)	110	0.010
	Methylene chloride	0.011(B)	11	0.005
0316-96-0120	Acetone	0.004(JB)	2 000	0.020
	Methylene chloride	0.007(B)	11	0.005
0316-96-0121	Acetone	0.003(JB)	2 000	0.020
	Methylene chloride	0.006(B)	11	0.005
0316-96-0122	Acetone	0.008(JB)	2 000	0.020
	Methylene chloride	0.013(B)	11	0.005

^a B = Blank contamination.

^b JB = Estimated quantity and blank contamination.

^c J = Estimated quantity.

TABLE D.7

CONFIRMATORY SAMPLE RESULTS FOR C-16-064

INORGANICS ABOVE BACKGROUND UTL FOR C-16-064^a

Sample ID	Mn (mg/kg)
UTL	714
SAL	3 200
PRG	nc ^b
0316-96-0162	850
0316-96-0163	510

^a Double bordered cells contain concentrations greater than UTL.

^a nc = Not calculated.

DETECTED HIGH EXPLOSIVES FOR C-16-064

None detected

DETECTED ORGANICS FOR C-16-064

None detected

TABLE D.8

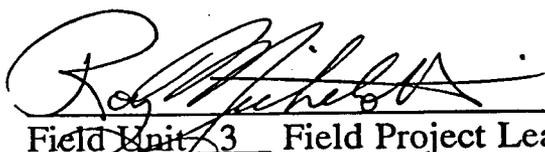
CONFIRMATORY SAMPLE RESULTS FOR C-16-067

See Tables 2.8.5-1, 2.8.6-1, and 2.8.6-2.

APPENDIX E. CERTIFICATION OF COMPLETION

CERTIFICATION OF COMPLETION

I certify that all the work pertaining to the Voluntary Corrective Action Report has been completed in accordance with the Department of Energy approved VCA plan entitled VCA Plan for Potential Release Sites 16-026(m-p), 16-029(k,l,q,s,t,u), C-16-064, and C-16-067. Based on my personal involvement or inquiry of the person or persons who managed this cleanup, a review of all data gathered and a visit to the site, to the best of my knowledge and belief, all criteria of the plan have been met or exceeded. I believe that the completion of this VCA is both protective to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.



Field Unit 3 Field Project Leader
Environmental Restoration Project
Los Alamos National Laboratory

9/12/96
Date Signed