TA-48 3/1/96

Expedited Cleanup Completion Report for

Potential Release Sites

48-002(a)
48-002(b)

Former Container Storage Areas

Field Unit 4

Environmental Restoration Project

March 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-665

10

1.0 SUMMARY OF EXPEDITED CLEANUP

1.1 Overview

Potential Release Sites (PRSs) 48-002(a) and (b) are former container storage areas located adjacent to the south side of the Radiochemistry Laboratory, building Technical Area (TA) 48-1 (Figure 1). The site measures approximately 220 square ft and is situated between the south wall of TA-48-1 and an asphalt roadway located south of the building. TA-48 lies within the boundaries of Los Alamos National Laboratory (LANL) and Los Alamos County. TA-48 is located north of Pajarito Road, and is situated on Mesita del Buey between Mortandad Canyon to the north and Two Mile Canyon to the south.

PRSs 48-002(a) and (b) consist of two adjacent unpaved storage areas, where labeled and unlabeled drums, 2-quart metal flasks and other items were stored. No records have been found that indicate that either site was managed as an formal, active storage area. In 1989, flasks containing high purity mercury were removed from the site. In 1991, a field activity data log noted that the drums and cylinders previously observed at the PRSs had also been removed.

The Phase I RFI conducted at the site consisted of two characterization sampling events. Based on preliminary review of the monitoring and sampling data, mercury was the only metal detected above LANL screening action levels (SALs); and the following six poly-aromatic hydrocarbons (PAHs) were detected above LANL SALs: benzo[a]anthracene, benzo[a]pyrene, benzo[b,k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-cd]pyreneVOC's (sic) were detected above LANL SALs.

The cleanup level for total mercury was set at 545 ppm in the Expedited Cleanup (EC) Plan. The cleanup level for PAH was conservatively based on benzo[a]pyrene and was set at 78 ppm, in the EC Plan.

1.2 Expedited Cleanup

Cleanup activities commenced on 9 August, 1995 and excavation activities were completed on 29 August, 1995. Excavation proceeded by use of hand tools and was completed in three discrete stages. Analytical results for PAHs and mercury obtained from the on-site field laboratory screening samples and the off-site contract laboratory verification samples are presented in Appendix A. Verification of the cleanup was based on analytical results as specified in the EC Plan. Additional data for constituents which were not identified as contaminants of concern, as well as health and safety screening data, are available upon request.

Prior to commencement of excavation activities, a 3-foot by 3-foot grid was established at the cleanup site. Mercury vapor was field screened at each grid node using a Jerome Mercury Vapor Analyzer (MVA). Figure 2 is a map of the cleanup site showing the grid nodes. Visible mercury was not present on the soil surface prior to excavation.

Soil excavation began on August 9, 1995, and continued through August 15, 1995. The soil was excavated in four to six inch lifts, from August 9 and 10, while on August 11 through 15, soil was excavated from depths ranging from 8 to 48 inches. Mercury beads were encountered at grid node 19, at a depth of 4 inches, where the vapor concentration was recorded to be 0.03 mg/m3. The high-powered mercury vacuum, equipped with carbon and high efficiency particulate air (HEPA) filtration,

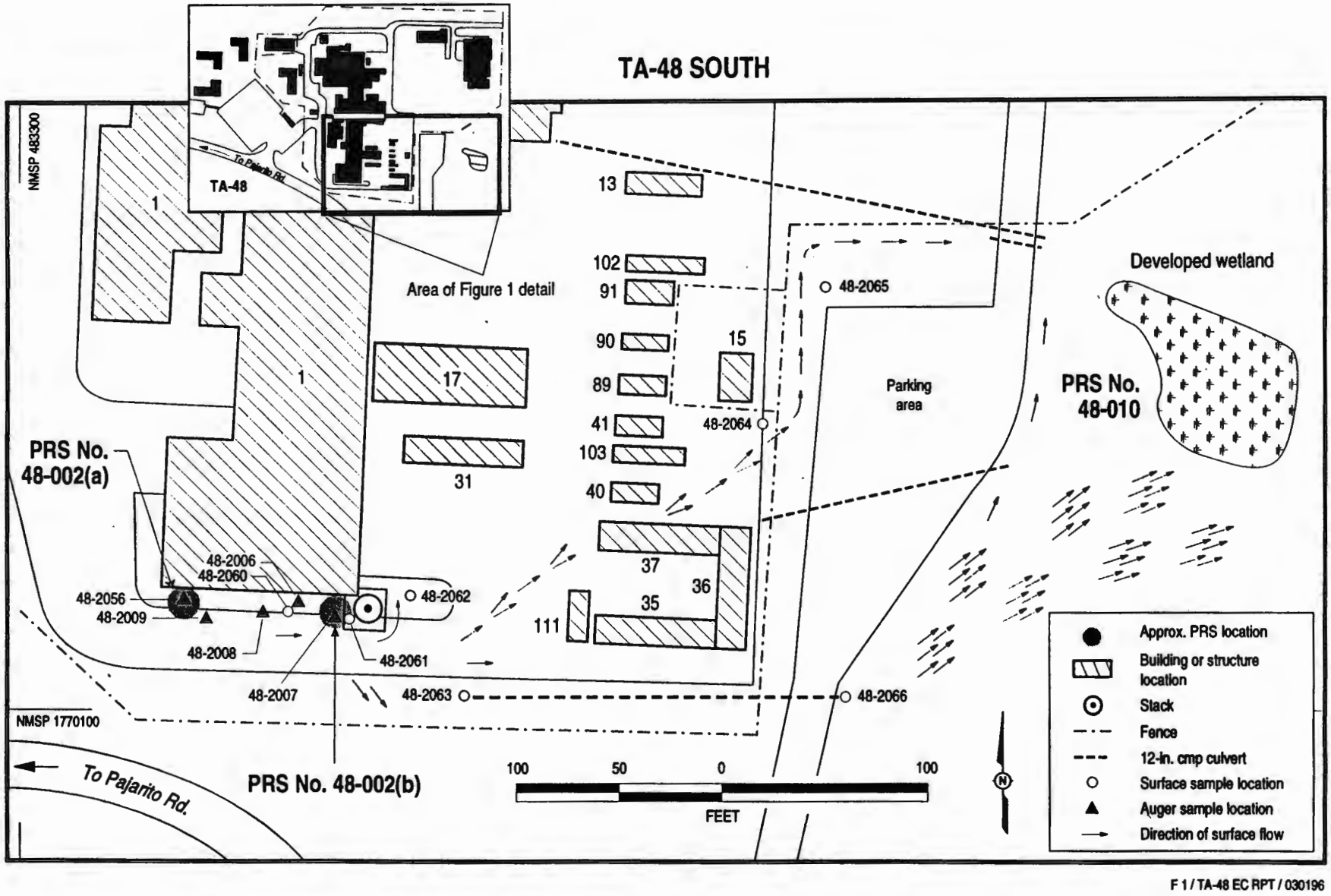

Figure 1. Location map for PRS Nos. 48-002(a and b).

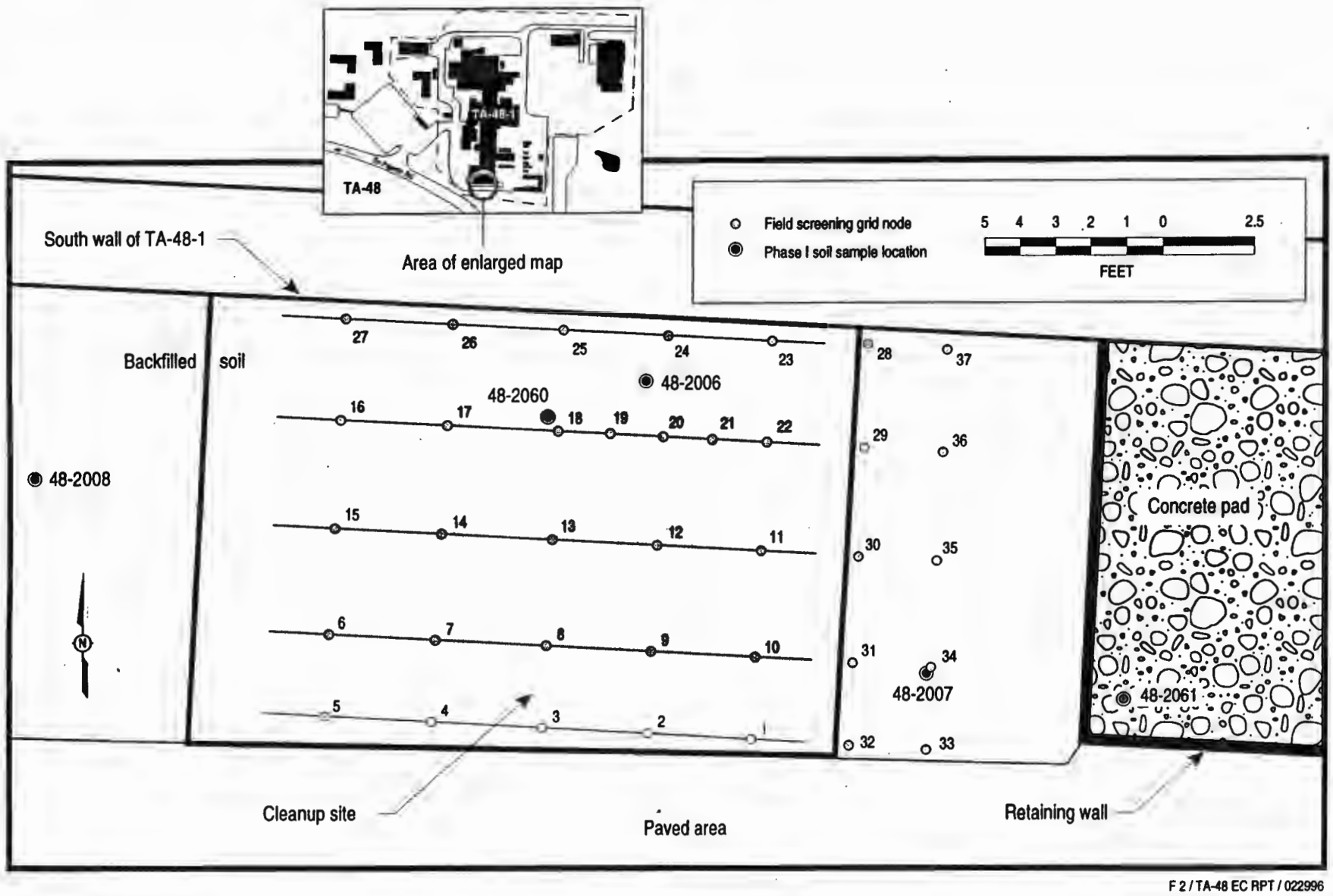

Figure 2. Locations of field screening grid nodes for PRS Nos. 48-002(a and b).

manufactured by Hako-Minuteman, was used to remove visible mercury from the soil. The MVA detected mercury vapor between grid nodes 17 and 18, recorded as 0.055 mg/m³ at a depth of 6 inches. Liquid mercury was encountered near grid nodes 19, 20, 21, 24, and 25 at depths between 0 and 6 inches during further soil excavation. Each time visible mercury was encountered, the vacuum was used to remove the mercury from the disturbed soil. A buried aluminum tag that had been stamped with the following: "Mercury 99% Pure", was unearthed approximately one and one half feet south of grid node 27, at a depth of 4 inches. Visible mercury was encountered and was removed with the vacuum, near grid points 18 - 21, and 23 - 27. The visible mercury was removed by the vacuum. Excavation proceeded to depths ranging from 8 to 48 inches. Twenty-three 55-gallon drums were filled with excavated soil.

The first set of samples were collected on August 15, 1995, following the first stage of excavation. A total of eighteen soil sampling locations were established (Figure 3) and site identification numbers 2084 through 2101 assigned. These sampling locations were generally established at the center points of the 3-foot by 3-foot grid (Figure 2). Four of the eighteen sampling locations were intentionally offset from the grid array and biased towards areas where visible mercury had been observed. Field screening of the collected sample material yielded mercury vapor concentrations that ranged from 0.0 mg/m³ to 0.297 mg/m³. The samples were delivered to the on-site field laboratory and screened for metals using x-ray fluorescence (XRF) following LANL internal protocol, and for PAH compounds by EPA SW846 method 8100 (modified). Analytical results (Appendix A) indicated mercury concentrations greater than the cleanup level at sites 2085 (1408 ppm) and 2086 (873 ppm).

The second stage of soil excavation was performed on August 21, 1995. This stage of excavation was based on analytical results from the first set of samples. At that time, only the mercury screening data was available and the decision was made to proceed with excavation, however, activity was limited to the areas of concern with respect to mercury. Six to 10 inches of soil was excavated from sample locations 2084, 2085, and 2086. During excavation, visible mercury was observed in the vicinity of sample site 2086. The visible mercury was vacuumed and an additional 6 inches of soil was removed in a radial pattern around the site. One 55-gallon drum was filled with excavated soil, for a total of twenty-four drums to date. The total depth of excavation at sample locations 2084 and 2085 was 24 inches, and at sample location 2086, 40 inches.

The second set of samples were collected on August 21, 1995, following the second stage of excavation. A total of three locations (Figure 3) were sampled, and site identification numbers assigned as follows: 2102 (at former 2084), 2103 (at former 2085), and 2104 (at former 2086). Field screening of the collected sample material yielded mercury vapor levels ranging from 0.0 mg/m³ and 0.9 mg/m³. Analytical results (Appendix A) from the on-site field laboratory indicated that mercury was still present at site 2104 at a concentration of 553 ppm, slightly above the cleanup level.

The third stage of soil excavation was performed on August 29, 1995. Excavation was based on analytical results from the first and second set of samples. Several PAH compounds were detected at concentrations above the cleanup level (Appendix A) at sample sites 2090, 2100 and 2101. Visible mercury was encountered at grid node 18 (near sample location 2104), and south of grid nodes 20 and 21 (near sample location 2090), and was removed with the vacuum. Excavation continued at this location to a depth of 48 inches, at which point no additional visible mercury was observed. Vacuuming was conducted and excavation directed both laterally and at depth in order to remove the soil surrounding the area where visible mercury had been observed. Four to 10 inches of soil material was removed from the area of sample sites 2096, 2099, 2100 and 2101. Four 55-gallon drums of excavated soil were filled, for a total of twenty-eight drums.

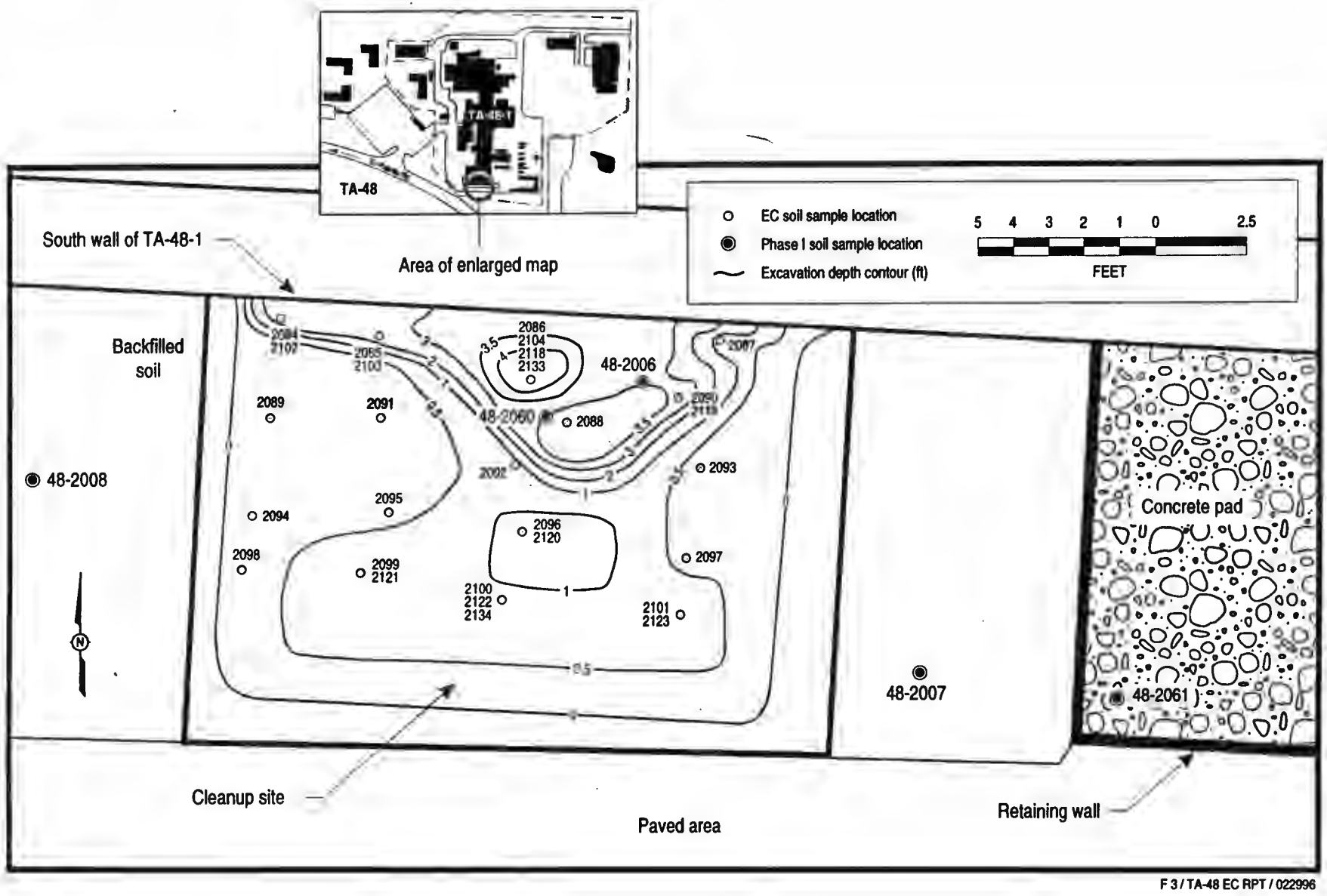

Figure 3. Sample locations and excavation depths for the expedited cleanup of PRS Nos. 48-002(a and b).

A third set of samples were collected on August 29, 1995, following the third stage of excavation. A total of six locations (Figure 3) were sampled, and site identification numbers assigned as follows: 2118 (at former 2014), 2119 (at former 2090), 2120 (at former 2096), 2121 (at former 2099), 2122 (at former 2100), and 2123 (at former 2101). Analytical results (Appendix A) from the on-site field laboratory indicated levels of mercury and PAHs to be less than the cleanup levels at all sample locations. Field screening did not indicate the presence of mercury vapor in any of the collected sample material.

On August 31, two verification samples (2133 and 2134) were collected and sent to an off-site contract laboratory as specified in the EC Plan. The sites were selected conservatively (Figure 3) as having the highest probability to yield detectable mercury and PAHs. Analytical results (Appendix A) confirmed all verification samples to be less than the cleanup levels for all contaminants of concern, fulfilling the requirements specified in the EC Plan.

2.0 SITE RESTORATION

Site restoration, including backfilling, regrading, and reseeding will be completed according to the Storm Water Pollution Prevention Plan and LANL Facilities Engineering Standards, 216, "Landscaping." These activities are scheduled for the week of October 2, 1995.

3.0 MODIFICATIONS TO THE EC PLAN

Cleanup activities followed the EC Plan with only one minor deviation. The deviation from the EC Plan was that each lift of soil was not excavated to a depth interval of one foot; instead, the depth of each lift of soil was based on best management practices decided by the Field Team Leader and site specific conditions. Each lift ranged from four to six inches in depth, to as much as three and one half feet in depth, which allowed excavation to be more precise and increase waste minimization opportunities.

4.0 QUANTITIES AND TYPES OF WASTE GENERATED

A total of twenty-eight 55-gallon drums were filled with excavated soil. Additional waste containers included: two 55-gallon drums of personal protective equipment (PPE), two 5-gallon pails of mercury vacuum filter bags, two 5-gallon pails of returned sample material, and one 5-gallon pail of decontamination water. A total of 35 containers of waste were generated from the EC. The drums were stored on site, within the boundary of the PRS, awaiting treatment and disposal.

The waste was sampled for characterization purposes on September 28, 1995. The following analyses was performed: gamma spectroscopy, isotopic Uranium, Plutonium, and Thorium, toxicity characteristic leaching procedure (TCLP) for metals and organics, total mercury, total organic halides, hydrogen sulfide, hydrogen cyanide, soil pH, and Standard Proctor Test.

Upon receipt of analytical results, Waste Profile Forms and Chemical Waste Disposal Requests were completed in accordance with LANL waste management requirements. The thirty-five containers were shipped by Rollins CHEMPAK on February 15 and 16, 1996.

The February 15 shipment included ten containers of non-RCRA regulated soil, PPE, and decontamination water. These wastes were shipped to the CST-5 permitted Treatment, Storage, and Disposal (TSD) Facility located at TA-54, Area L. The soil (and PPE) containers will be stored temporarily at TA-54 awaiting off-site shipment to the LANL-approved Highway 36 landfill in Colorado, for final disposal. The decontamination water will be blended with other wastewater's at TA-54 and shipped to the Chem Waste OSCO treatment facility in Henderson, Colorado.

The February 16 shipment included twenty-five 55-gallon drums of RCRA-regulated soil and debris. The containers were contaminated with mercury (D009) at levels above and below the 260 ppm level mandated by RCRA for differing treatment technologies. All containers were initially shipped to the RCRA permitted storage facility at TA-54. The high mercury waste, greater than 260 ppm, will be shipped for final disposition to Bethlehem Apparatus, a commercial mercury retorter located in Pennsylvania. The low mercury waste, less than 260 ppm, will be shipped to the Highway 36 RCRA landfill where it will be stabilized to meet TCLP standards prior to disposal. All waste materials will be shipped from TA-54 to their final destination within thirty to sixty days.

5.0 OUTSTANDING ITEMS FROM THE ACCEPTANCE INSPECTION

The acceptance inspection checklist (Appendix B) was completed by an independent party. There were no outstanding items identified during the acceptance inspection. Based on this inspection, this action is certified (Appendix D) by the independent party.

6.0 PROBLEMS ENCOUNTERED AND LESSONS LEARNED

The most significant lesson learned was that supplemental sampling to determine extent of contamination should have been performed prior to excavation. This would have allowed for excavation to proceed in one stage instead of the three stages which actually occurred. In addition to saving time, this also would have ultimately decreased the total number of samples required to verify completion of the EC.

Another lesson learned was based on scheduling. For future ECs that have health and safety concerns regarding exposure to volatile vapors, preference should be given to perform these projects during cooler months of the field season. Longer working hours in the exclusion zone would have been possible if this job had not been accomplished during August. Also, engineering controls such as HEPA units or industrial fans should be identified to minimize health and safety issues.

As much as possible, waste characterization should be completed up front. Waste streams should be profiled from site characterization data, where possible, and a waste management subcontractor identified prior to remedial activities. If site characterization data is insufficient to profile waste, additional samples should be collected to accomplish this task. Upon completion of cleanup activities, the waste profiles can be changed if necessary and additional data requirements identified.

7.0 CONCLUSIONS

This report serves as the formal request for regulator concurrence to remove PRSs 48-002(a) and (b) from the Hazardous and Solid Waste Amendment (HSWA) Module in the Resource Conservation and Recovery Act (RCRA) Permit.

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APPENDIX A

Analytical Results

TABLE 1

SUMMARY OF SVOC AND HG (CHEMICALS OF CONCERN) ANALYTICAL RESULTS FOR PRS 48-002(A AND B)

Sample ID	Location[1]	Date	Benzo(A)-anthracene (ppm)	Benzo(B,K)-fluoranthene (ppm)	Benzo(A)-pyrene (ppm)	Indeno(1,2,3-cd) Pyrene (ppm)	Dibenzo(A,H)-Anthracene (ppm)	Hg (ppm)
0448-95-0013	48-2084	15AUG95	10.10	21.33	11.29	9.5	0.93	444
0448-95-0034	(48-2102)	21AUG95	1.83	2.68	0.45	1.06	0.12	8
0448-95-0014	48-2085	15AUG95	3.60	8.73	3.90	2.88	0.36	1408
0448-95-0035	(48-2103)	21AUG95	1.53	2.69	0.40	0.85	0.09	41
0448-95-0015	48-2086	15AUG95	2.05	5.31	2.35	1.92	0.20	873
0448-95-0036	(48-2104)	21AUG95	0.35	0.81	0.15	0.21	0.03	553
0448-95-0051	(48-2118)	29AUG95	0.50	0.31	0.15	0.16	0.01	41
0448-95-0068	(48-2133)[2]	31AUG95	0.40	0.80	0.40	0.4	0.40	73.6
0448-95-0069	(48-2133)[3]	31AUG95	0.42	0.62	0.43	0.28	0.40	199
0448-95-0016	48-2087	15AUG95	1.30	3.31	1.42	1.12	0.13	235
0448-95-0017	48-2088	15AUG95	0.66	2.03	0.89	0.68	0.05	118
0448-95-0018	48-2089	15AUG95	0.21	0.79	0.31	0.26	0.10	<5
0448-95-0019	48-2090	15AUG95	0.26	0.80	0.29	0.28	0.09	53.7
0448-95-0052	(48-2119)	29AUG95	0.50	1.47	0.37	0.52	0.29	<5
0448-95-0021	48-2091	15AUG95	2.19	5.63	0.70	1.71	0.19	143
0448-95-0022	48-2092	15AUG95	0.55	1.63	0.73	0.56	0.07	16
0448-95-0023	48-2093	15AUG95	4.74	8.37	1.62	3.84	0.47	9.39
0448-95-0024	48-2094	15AUG95	3.69	9.62	1.38	3.53	0.38	<5
0448-95-0025	48-2095	15AUG95	0.44	1.63	0.71	0.53	0.07	30.3
0448-95-0026	48-2096	15AUG95	32.46	65.68	9.83	24.76	2.75	132
0448-95-0053	(48-2120)	29AUG95	0.50	0.98	0.31	0.36	0.19	<5
0448-95-0027	48-2097	15AUG95	9.55	22.93	2.93	6.96	0.89	<5
0448-95-0028	48-2098	15AUG95	6.82	18.02	2.47	6.72	0.62	10.6
0448-95-0029	48-2099	15AUG95	29.68	75.25	10.00	24.73	3.18	78.9
0448-95-0054	(48-2121)	29AUG95	0.50	0.79	0.31	0.4	0.09	<5
0448-95-0031	48-2100	15AUG95	319.00	740.00	400.00	316.88	218.37	120
0448-95-0055	(48-2122)	29AUG95	0.50	88.26	25.61	66.93	57.70	<5
0448-95-0070	(48-2134)[2]	31AUG95	0.12	0.53	0.12	0.4	0.40	0.73
0448-95-0032	48-2101	15AUG95	82.58	137.00	91.52	46.57	7.01	56.3
0448-95-0056	(48-2123)	29AUG95	0.50	0.78	0.23	0.73	0.66	<5

1. Additional samples collected at the same location following further excavation in parentheses.
2. Confirmatory sample (contract laboratory analysis).
3. Duplicate sample.

APPENDIX B

Acceptance Inspection Checklist

APPENDIX B

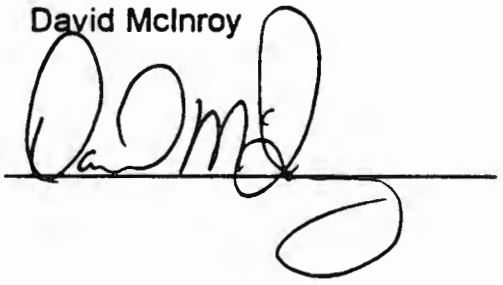
ACCEPTANCE INSPECTION CHECKLIST

Unit Number and Description

48-002(a) and (b), Former Container Storage Areas

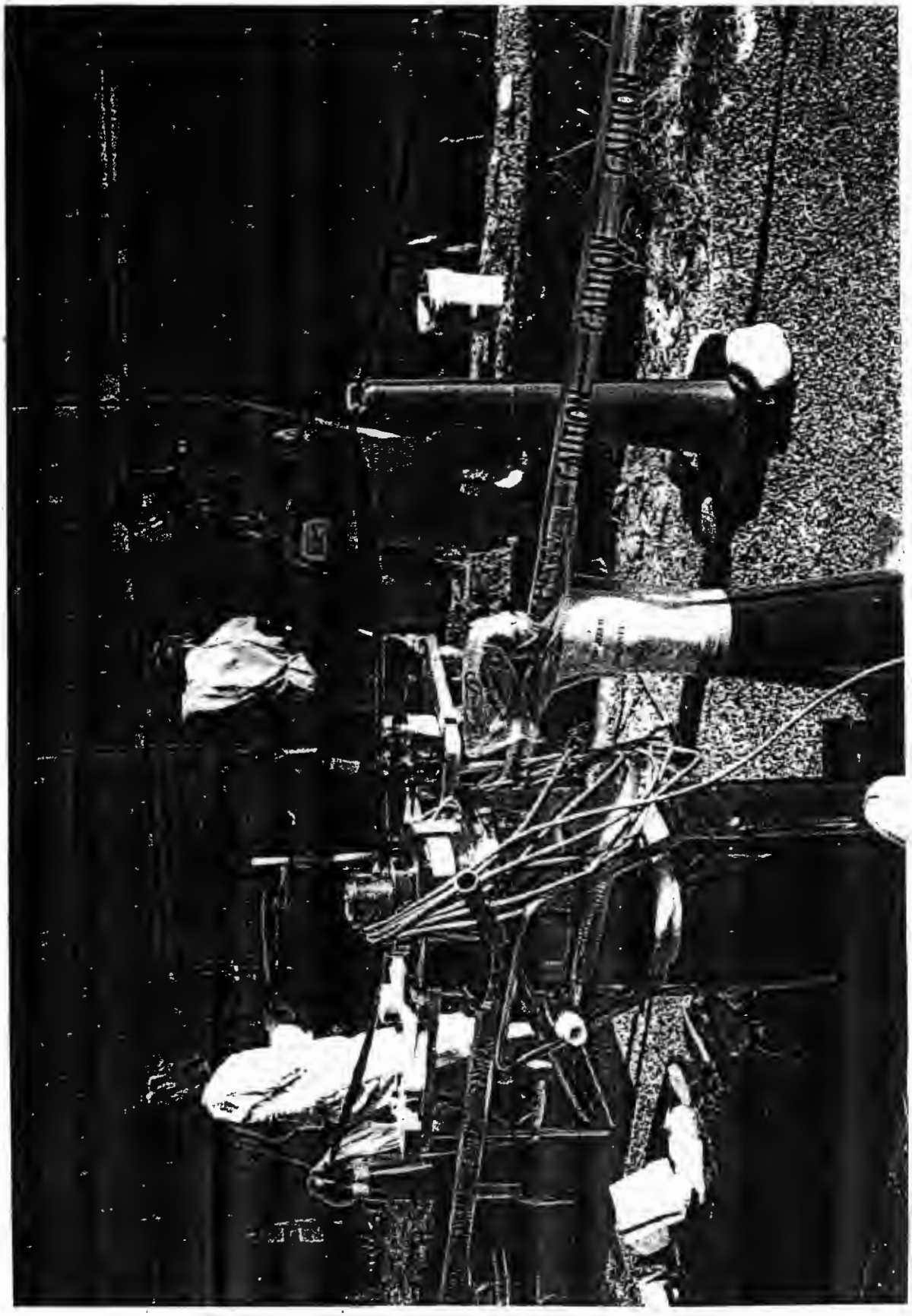
- ✓ EPA and DOE notified at least 10 days in advance of field work.
- ✓ Field screening and chem van utilized to identify contaminated areas.
- ✓ Contamination removed in lifts utilizing shovels, backhoes, and/or vacuums.
- ✓ Verification sampling complete and ensures cleanup levels are met.
- ✓ All waste generated is characterized and managed appropriately.
- ✓ Site restored.

Reviewer: David McInroy

Signature: 

APPENDIX C

Photograph



PRS No. 48-002(a and b) Removal of mercury-contaminated soil using shovels and mercury vacuum.

APPENDIX D

Certification of Completion

CERTIFICATION OF COMPLETION

I certify that all the work pertaining to the expedited cleanup (EC) of PRSs 48-002(a) and (b) has been completed in accordance with the Department of Energy approved EC Plan entitled ***Expedited Cleanup Plan for Solid Waste Management Units 48-002(a) and 48-002(b), April 1995, Revision 1.*** Based on my personnel involvement or inquiry of the person or persons who managed this clean up, 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 the EC is both protective to human health and the environment. I am aware that there are significant penalties for submitting false information, including the possibilities of fines and imprisonment for knowing violations.

Allyn Pratt
Field Unit 4 Project Leader
Environmental Restoration Project
Los Alamos National Laboratory

27 Sept 95
Date Signed

Dave McInroy
Regulatory Compliance Manager/Independent Review
Environmental Restoration Program Office
Los Alamos National Laboratory

27 Sept 95
Date Signed