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Decommissioning Completion Report for Phase Separator Pit at Technical Area 35

(Phase 1, Phase 3 [TSL-4, 5 & 6], Phase 4-6 LAPRE I Tanks, and LAPRE II Vent Line)

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CONTENTS

CONTENTS i

1.0 INTRODUCTION 1

2.0 PROJECT DESCRIPTION 1

2.1 Phase 1: System Overhead Ducts, Exhaust Hoods, Fans, and Stacks 1
2.2 Phase 3: Holding Tanks TSL-4, -5, and -6 (Excluding the PSP) 3
2.3 Phase 4: South-Side Underground Ducts 3
2.4 Phase 5: North-Side Underground Ducts 3
2.5 Phase 6: Building 2 Basement Ducts 3
2.6 LAPRE-I: Fuel System Storage Tanks 3
2.7 LAPRE-II: Three-Inch Vent Line 4

3.0 DECOMMISSIONING OBJECTIVES 4

3.1 Work Scope 4
3.2 LAPRE-I and LAPRE-II 5
3.3 Project Management/Oversight 6

4.0 SUMMARY OF DECOMMISSIONING 6

4.1 Site Characterization 6

4.1.1 Additional Waste Characterization 7

4.2 Decommissioning Operations 8

4.2.1 Phase I 8
4.2.2 Phase 3 9
4.2.3 Phase 4 9
4.2.4 Phase 5 10
4.2.5 Phase 6 10
4.2.6 LAPRE-I Removal 11
4.2.7 LAPRE-II Removal 11

5.0 WASTE MANAGEMENT 12

5.1 Managing Generated Waste 12
5.2 Waste Volume Summary 12
5.3 Final Disposition 13
5.4 Waste Minimization 13

6.0 COST AND SCHEDULES 13

6.1 Baseline Cost and Schedule 13

7.0 FINAL SITE CONDITION 14

8.0 LESSONS LEARNED, CONCLUSIONS, AND RECOMMENDATIONS 15

9.0 REFERENCES 16

APPENDICES

APPENDIX A ACRONYMS AND ABBREVIATIONS
APPENDIX B CERTIFICATE OF COMPLETION

1.0 INTRODUCTION

This report summarizes the successful decommissioning of portions of the Phase Separator Pit (PSP) located at Technical Area 35 (TA-35). The project management plans for this project [1,2] provide the history, location, and decommissioning process.

The PSP exhaust system consisted of ducts, separator tanks, and a filtering facility designed to remove and dispose of gases and liquids from experimental laboratories and hot cells in Building 2. To decommission this system, six phases were developed (see Section 3.1). This report describes the decommissioning work performed in phases 1, 5, and 6, as well as the removal of TSL-4, -5 & -6 (part of Phase 3) and the removal of remaining Los Alamos Power Reactor Experiment (LAPRE-I and LAPRE-II) items. Table 1 summarizes this projects start and end dates.

Table 1. Project Start and End Dates

Objective Description	Start	Finish
Phase 1: Overhead duct	January 1995	September 1995
Phase 3 : Holding tanks	August 1996	September 1996
Phase 4: South-side ducts	March 1996	September 1996
Phase 5: North-side ducts	October 1995	June 1996
Phase 6: Building 2 basement ducts	February 1996	April 1996
LAPRE-I: Tanks, box, steam line	July 1996	August 1996
LAPRE-II: Vent line	August 1996	August 1996

This effort's primary goal was to decommission the facilities in a safe and cost-effective manner. Activities were integrated with those of the Environmental Restoration Field Unit #4 team. which produced the Resource Conservation and Recovery Act (RCRA) Facility Investigation Work Plan (RFI Work Plan) for TA-35 [3]. This team provided much of the site's historical information.

All decommissioning activities complied with all applicable environmental, safety, and health requirements. The project conducted operations under a Site-Specific Health and Safety Plan [4], a Waste Management Plan [5], a Storm Water Pollution Prevention Plan [6], and a Spill Prevention, Control, and Counter measures Plan [7]. A final report will be published in the spring of 1997. The final report will provide additional information and serve as the formal record of completion.

2.0 PROJECT DESCRIPTION

Also known as Ten Site, TA-35 is located on a finger mesa between Mortandad and Ten-Site canyons. Within TA-35, on the north-central portion of Los Alamos National Laboratory, resides the PSP exhaust system. Figure 1 pinpoints the location of the facilities within TA-35.

2.1 Phase 1: System Overhead Ducts, Exhaust Hoods, Fans, and Stacks

The exhaust system for TA-35-2 consisted of above-grade and underground ducts that led to the PSP and/or the filter building (Building 7). Phase 1 of this project consisted of removing and safely disposing of the following equipment:

Technical Area 35 East

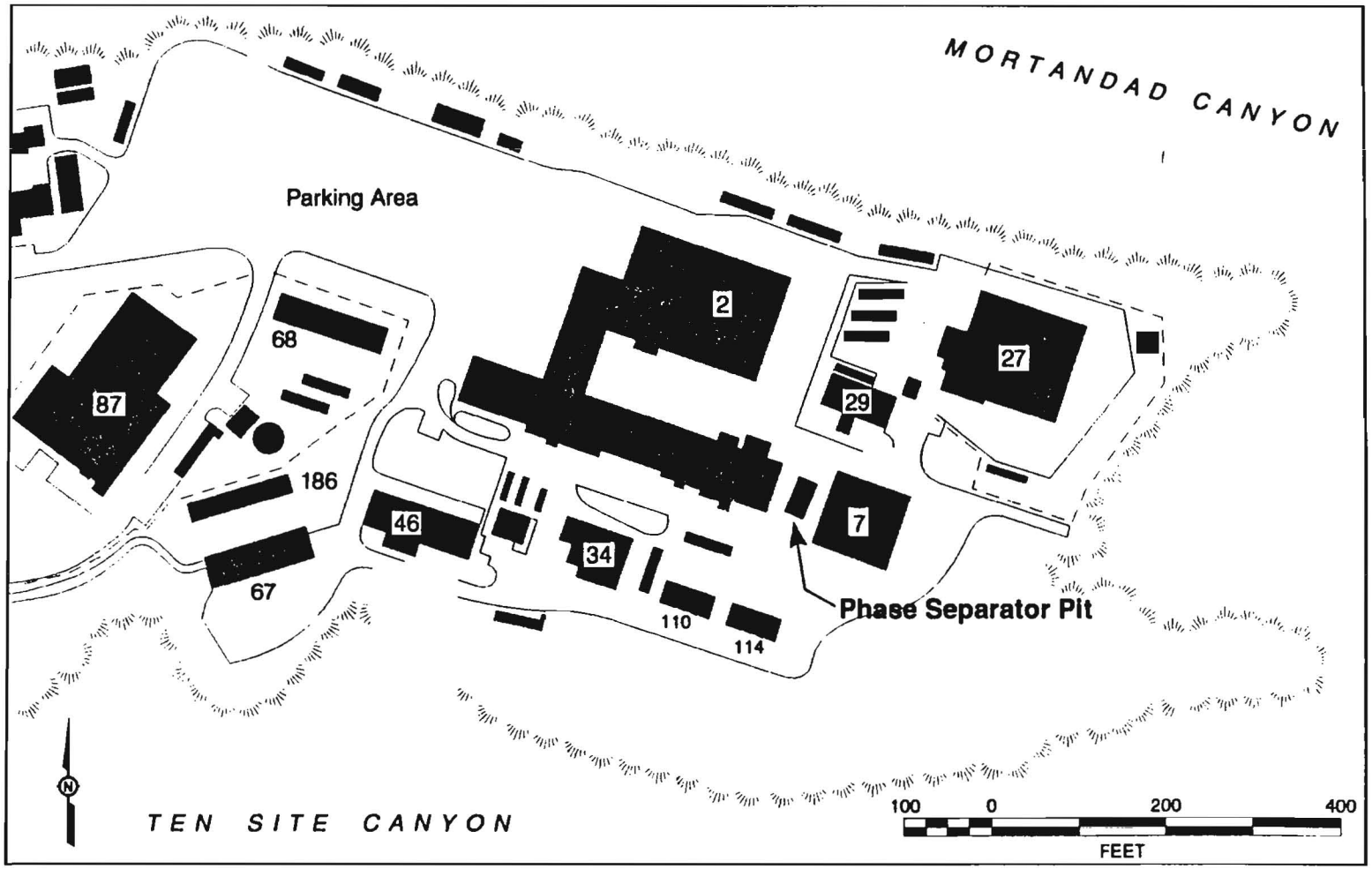

Figure 1. Phase Sepaarator Pit Decommissioning Facilities located at Technical Area 35.

- above-grade exposed ductwork in and around Building 2, over the PSP, and in and around Building 7;
- exhaust hoods with high-efficiency particulate air (HEPA filters in five of the laboratories in Building 2;
- three Building 7 exhaust fans, two stacks, and a bank of HEPA filters in Building 7.

2.2 Phase 3: Holding Tanks TSL-4, -5, and -6 (Excluding the PSP)

Phase 3 consisted of the removal and safe disposal of the PSP and its contents, as well as the holding tanks. The main component of the exhaust system, the PSP was designed to receive and separate waste gases and liquids extracted from Building 2 laboratories.

Seven separator tanks in the PSP collected liquids from the system and drained to holding tanks. Three 1300-gallon waste-holding tanks in the system received liquids separated by the separator tanks in the PSP; these tanks held liquids until they could be pumped to a neutralizing tank, which also was located in the PSP. Liquids were finally drained to the TSL-10 tank farm.

At the end of FY96, TSL-4, -5, and -6 were completely decommissioned. The PSP and its contents will be completely decommissioned in FY97.

2.3 Phase 4: South-Side Underground Ducts

Phase 4 of this project consisted of removing and safely disposing of all underground ducting that exited Building 2's south basement wall. The system ducts consisted of large-diameter stainless-steel ducts (15-, 18-, 24-, and 30-inch diameters), which exited Building 2 and routed underground to the PSP. The ducts' depth varied from two feet to approximately 12 feet; the ducts used gravity to ensure the flow of liquids.

2.4 Phase 5: North-Side Underground Ducts

Phase 5's objective was to remove and safely dispose of the system of ducts on the north side of Building 2. A mirror image of the south-side ducts, the north-side ducts did differ in the obstructions and obstacles in the area. For example, a spent fuel rod storage vault had been built directly over the underground ducting. The vault resided in Room A175A and contained 125 fuel storage cells embedded in a five-foot deep magnetite concrete foundation.

2.5 Phase 6: Building 2 Basement Ducts

The original exhaust system removed waste gases and liquids from Building 2 laboratories by routing them through the basement and out the north and south sides (using the ductwork described in previous sections). Phase 6 consists of removing and safely disposing of exposed ducts routed through the basement.

2.6 LAPRE-I: Fuel System Storage Tanks

During the excavation of Phase 4 ducting, the metering tank cooling jacket for LAPRE-I was discovered. Although long-since decommissioned, the LAPRE-1 and its dump tank still required removal and disposal.

This equipment, as well as some quarter-inch tubing, were part of an enriched uranium fuel-handling system for the LAPRE-I experiment. In addition, the steam discharge line used to vent the cooling system of the reactor was also in its original location. The LAPRE-I items were added to the scope of work during the removal of Phase 4 ducting.

2.7 LAPRE-II: Three-Inch Vent Line

During the removal of the LAPRE-I steam discharge line, the end of a contaminated 3-inch-steel pipe line was discovered. It was later determined that this pipe worked as a vent line leading from the decommissioned LAPRE-II reactor pump pit (long-since removed) to the PSP. The LAPRE-II vent line was added to the scope of work during the removal of Phase 4 ducting.

3.0 DECOMMISSIONING OBJECTIVES

The principal goal of this effort was to safely and cost-effectively remove radiologically contaminated ductwork, equipment, and structures related to the TA-35 PSP exhaust system. Project objectives included

- reducing the health and environmental exposure risks associated to radiological and RCRA-listed contamination.
- removing contaminated materials and facilities.
- decontaminating remaining structures.
- restoring land for potential re-use.

In addition, the project planned to minimize contaminated wastes sent to TA-54 by recycling all metals removed during decommissioning activities, as well as decontaminating as much waste material as economically feasible.

3.1 Work Scope

This project's work scope consisted of six phases, as described in the Project Management Plans [1,2]. The project remediated soil only within a two-foot working envelop around the buried structures. Table 2 summarizes the phases that made up the Work Scope.

Table 2. Work Scope Phases

Phase	Tasks
1	• Remove contaminated hoods, HEPA filters, and associated overhead ducts (except in the basement) from Building TA-35-2. • Permanently cap and seal in place the exhaust ducts under the floor. • Remove the exhaust ducts under the floor after the below-grade ducts along the north and south sides Building 2 are excavated.

Phase	Tasks
2	• Decontaminate and demolish Building TA-35-7; this task includes associated electrical and mechanical building services, abandoned waste piping along the northern edge of the facility, and exhaust stacks. Note: The concrete floor of this facility has a two part construction. The upper layer consists of a nominal 4-inch concrete cap layer over the original slab. The building structure consists of a steel- and concrete-column-supported roof and a block-wall exterior (with spread footings for the interior columns).
3	• Remove the PSP and the three buried underground holding tanks (TSL-4, -5 & -6), including all piping leading to and from the tanks. • Remove approximately 1700 radioactively contaminated lead bricks.
4	• Excavate and remove external underground ducts along the south side of Building 2. Note: A stairwell toward the east end of Building 2 was originally planned to be removed to allow the removal of below-grade ducting; it was finally elected to leave the stairwell in place. A 24-inch duct underneath this stairwell and associated corridor also was left in place.
5	• Excavate and remove the underground ducts on the north side of Building 2. • Remove Room A-175A. This is necessary because of its degraded condition, as well as its location over the underground exhaust ducts.
6	• Remove exposed basement ducts in Building 2 not associated with Phases 1, 4, or 5.

The original project scope did not include the removal of exposed exhaust ducting in Building 2's basement. The original budget had been planned to support Phases 1–5, but when the Laboratory sent a bid package to external contractors, it included (as an option) the basement duct removal. The contract bids were low enough that basement duct removal was included in the overall project.

3.2 LAPRE-I and LAPRE-II

Also not a part of the original scope of work was the removal of LAPRE-I items (including tanks, tubing, and a steam discharge line) and the LAPRE-II vent line. The Laboratory had not been aware that LAPRE-I and II items had been left in place even after previous decommissioning activities (December 1991). Phase 4 operations exposed these items and the Laboratory decided to obtain additional funding to successfully remove them.

3.3 Project Management/Oversight

The Environmental Restoration (ER) Office functioned as the principal managing organization for this project and assumed full responsibility for removing the PSP exhaust system, including the PSP itself and the filter building (Building 7). The TA-35 Decommissioning Project Leader was responsible for overall TA-35 decommissioning activities. The Project Leader coordinated activities with the ER Project's FPL for Field Unit 4, the site facility manager, the on-site contractor (JCI) and the external contractor (IDM Environmental Inc.). This coordination ensured that decommissioning and remedial action activities at TA-35 were fully integrated.

Both JCI and IDM Environmental Inc. conducted decommissioning work for this project, with the former working on Phase 1 and the latter working on phases 2 through 6. This decommissioning project was the first to award a fixed price contract to an external contractor for decommissioning work conducted at the Laboratory. The Laboratory instigated this contract to ensure that the tasks were done in a faster and more economical manner. Los Alamos prepared and distributed a request for proposals to select the best qualified contractor; in August 1995, the Laboratory made its award.

- The TA-35 Decommissioning Project team consisted of the following:
- Los Alamos Project Leader,
- Department of Energy Los Alamos Area Office Representative,
- oversight personnel,
- operations contractor, and
- IDM Environmental Inc., and its subcontractors.

The Los Alamos oversight team consisted of an FSS-6 Project Coordinator, an ESH-1 Team Leader, radiological control technicians (RCTs), and representatives of the Industrial Hygiene and Safety Group (ESH-5). For detailed information regarding this team, see the Project Management Plans for this project [1,2].

The project instituted weekly meetings so that team members could discuss progress, address any issues or concerns, and to plan for the following week's activities. Most problems were discovered and solved in the field. The field team held daily "tailgate" meetings to discuss the day's plans and alert personnel to health physics and safety concerns. All task-level activities were planned and accomplished by incorporating Work Packages that consisted of task hazard analyses, detailed work procedures, and required permits [4].

4.0 DECOMMISSIONING SUMMARY

4.1 Site Characterization

Before decommissioning activities could begin, the TA-35 Decommissioning Project characterized the PSP exhaust system and associated facilities to identify chemical, radiological, and physical hazards. These activities were conducted as planned in the TA-35 PSP Decommissioning Project Characterization Plan [11] and presented in the TA-35 PSP Decommissioning Project Characterization Reports for Phase I and Phases II-V) [12,13].

Characterization tasks included reviewing historical records, interviewing former users, collecting and revising applicable drawings, identifying and reviewing utilities, and conducting radiological and chemical sampling. Sampling was performed according to approved work packages and followed ER project standard operating procedures for collecting and handling samples. Analyses were performed at commercial laboratories.

Sampling was conducted on the exhaust system at locations that were easily accessible. Manual and automated drilling equipment took soil samples around the exhaust system and associated facilities at designated locations at several depths. Overhead and floor ducts in Building 2 were sampled at strategic locations. Collectors entered the PSP, where they collected samples from the standing water, liquids, and sediments in the separator tanks. Samples also were taken from the liquid collected from the TSL-6 holding tank. TSL-4 was found empty and TSL-5 was not sampled due to the discovery of back pressure during an attempt to open the access flange, which could have potentially released contamination. The filter building was also sampled. No excavation was used to obtain samples from buried ducts or tanks.

The TA-35 PSP Decommissioning Project Characterization Reports [12,13] compiled site characterization results. In general, contaminates found were relatively low in radioactivity; only TSL-6 was found to contain RCRA F-listed constituents, which made the liquids a mixed waste. The highest levels of radioactivity found during the preliminary site characterization were located in liquids of holding tank TSL-6 (180 uCi/L).

4.1.1 Additional Waste Characterization

During project decommissioning, additional radiological and chemical field surveys and sample analysis of materials were performed. Table 4.1 identifies the levels of radiological contaminants found in various project operations; Table 4.2 identifies the RCRA contaminants found in the liquid mixed waste of the holding and caustic treater tanks.

Table 3. TA-35 Project Characterization Summary

Direct/Smear Survey

Location	Alpha dpm/100cm^2	Beta/Gamma dpm/100cm^2
Phase 1 ducting	<MDA to 85	<MDA to 15
Phase 3 holding tanks TSL-5 and -6, plus caustic treater tank	<MDA	4,800 to 400,000
Phase 4 duct removals	<MDA to 133	<MDA to 931,380
Phase 5 duct removals	< MDA to 7,367	<MDA to 1,100,370
Phase 5 (Room A175 A)	<MDA to 752	<MDA to 465,920
Phase 6: Building 2 basement duct removal	<MDA to 7,367	<MDA to 116,100
LAPRE-I removals	<MDA	**50 to 200 pCi/g in tank**
LAPRE-II removals	<MDA	3,610 to 500,000
"As-left" soils in all locations	<MDA	<MDA

MDA = minimum detectable activity (ranges of 11-40 dpm for alpha and 100-700 dpm for beta/gamma depending on the instrument used).

Table 4. Project Chemical and Metal Characterization Summary

Location	Type	Results
Ducts in Building 2 rooms and in Building 7 were sampled	Perchlorates	Below 750 ppm action level
Located in TSL-5, -6, and the caustic treater tanks	**RCRA Listed** Acetone Benzene Carbon Tetrachloride 1.1-Dicloroethene 2-Butanone 1,1,1-Trichloroethane Methylene Chloride	 1900 ug/L 56 ug/L 380ug/L 15,000ug/L 75 ug/L 12,000 ug/L 5600 ug/L
located in TSL-5, -6 and the caustic treater tanks	**RCRA Metals** Lead: Chromium: Mercury: Others below RCRA limits	 110 ppm 42 ppm 5.5 ppm

4.2 Decommissioning Operations

JCI and IDM Environmental Inc., performed decommissioning operations. JCI was responsible for Phase 1 and IDM was awarded a fixed price contract to perform the remaining scope of work (phases 2–6).

This report covers only the project tasks that have been accomplished through September 30, 1996. All ducts were recycled either to a commercial metal recycler after decontamination or sent to SEG, Inc., for low-level waste metal recycling.

4.2.1 Phase 1

Task: Remove above-ground ducts, exhaust hoods, HEPA filters, exhaust stacks, fans, and motors.

Schedule: January 1995 to July 1995.

- Thirty rooms, hallways, and above-ceiling areas in Building 2 contained ducts, five exhaust hoods, and several HEPA filters. All these were removed. Nibblers or saws were used to disconnect or cut stainless-steel overhead ducts. Cut ends were covered with sheet metal end caps and sealed with duct tape and plastic. Ducts were later split and decontaminated for release to salvage.

- Each laboratory also contained exhaust ports in the floor. These ports were opened, checked for contamination, decontaminated, then capped and sealed.

- Building 2 also had ducting (hung externally) that led to Building 7; this ducting was removed. Duct piping was cut and ends sealed using duct tape and sheet metal end caps.

- Large-diameter ducting over the PSP was also removed during this phase.
- In addition, Building 7 contained ducting, a HEPA filter bank, and two motors, fans, and stacks; these were removed. This left one motor, fan, and stack for removal for Phase 2.
- Phase 1 included the removal of approximately 760 linear feet of 10- to 20-inch-diameter stainless- steel ducting, as well as approximately 200 linear feet of 36- to 44-inch-diameter ducts over the PSP.

All operations that involved the removal of contaminated ducts and equipment connected to the exhaust system were done with the system operational and under negative pressure. This helped ensure that any loose contamination did not escape to the environment but was contained within the HEPA-filtered system. The exhaust system (including all motors, fans, and stacks) was shut down during this phase of the project.

4.2.2 Phase 3

Task: Remove holding tanks TSL-4, -5, and -6.

Schedule: August 1996 to September 1996.

Project personnel excavated the holding tanks (buried just east of the PSP) to the top flanges; they then opened the tanks to determine content levels and to sample for analyses. The results were as follows:

- Because TSL-4 was found empty, it was excavated and removed. It had no exterior penetrations or leaks.
- TSL-5, which had never been open, contained 1300 gallons of liquid, which subsequent analysis revealed to be mixed waste. It was pumped out, rinsed out, excavated, and removed. It had no exterior penetrations or leaks.
- TSL-6 had two feet of liquid mixed waste (approximately 200–300 gallons). TSL-6 was also pumped out, rinsed out, excavated, and removed. It had no exterior penetrations or leaks.

The soil under all three tanks was sampled and found clean

4.2.3 Phase 4

Task: Remove south-side underground ducts.

Schedule: March 1996 to September 1996.

Program personnel excavated and exposed ducting on the south side of Building 2, starting with the west end. Personnel first opened an inspection hold in a section of duct; they then inspected and analyzed contaminates and levels of radioactivity.

Cutting operations were selected based on analytical results, as well as whether the operations would be conducted under containment. Containments ranged from using localized glove bags to full-blown structures covered in plastic (ventilated using HEPA-filtered exhaust units).

A large HEPA-filtered exhaust unit was connected at the PSP to all exhaust duct lines to ensure openings in the duct systems were under negative pressure during all sampling and cutting operations. This procedure ensured that no contaminates were released to the environment. Several unexpected utilities were located underground during the duct excavation, thereby delaying operations.

A portion of the 24-inch duct was left in place. The facility manager requested that a corridor and a stairwell built at a later date directly over that portion of duct be left in place. Removal of this portion of the duct would have undermined the foundation of these structures, so the duct was left in place. A risk analysis determined that no risk for exposure was present to on-site workers or the general public. Approximately 730' linear feet of duct and pipe were removed during this phase. No soil contamination was discovered.

4.2.4 Phase 5

Task: Remove north-side underground ducts and Room A175A.

Schedule: October 1995 to June 1996.

Program personnel excavated and exposed ducting on the north side of Building 2, beginning the work on the west end of the building. The three branch ducts located at the far west side were left in place because of the potential undermining of an existing structure. These ducts were not contaminated.

To remove these ducts, personnel first opened an inspection hole in the duct section then conducted analyses for contaminants and radioactivity levels. Cutting procedures were selected based on analytical results, as well as whether the operations could be conducted under containment.

Containments ranged from localized glove bags to 2 x 4 wooden structures covered in plastics (ventilated with HEPA-filtered exhaust units). To ensure openings in the duct systems were under negative pressure during all sampling and cutting operations, personnel connected a large HEPA-filtered exhaust unit to the PSP that led to all exhaust duct lines. This procedure also ensured that no contaminants were released to the environment.

A number of obstacles delayed operations. For example, personnel located several unexpected utilities underground during the duct excavation. Personnel also discovered a 13.5-Kv electrical conduit encased in concrete, as well as a 480-volt line (also encased in concrete) leading to Building 7. Approximately 750 linear feet of duct and pipe were removed during Phase 5.

Project personnel also removed a spent fuel storage vault located in Room A175A. The room foundation was located directly over the path of the underground exhaust ducts leading to the PSP. With 125 storage cells imbedded in it, the foundation consisted of magnetite concrete and took the contractor six weeks longer to demolish than planned. No contaminated soil was found.

4.2.5 Phase 6

Task: Remove Building 2 basement ducts.

Schedule: February 1996 to April 1996.

Most ducts resided in cramped quarters, yielding just enough space for removal. Some ducts were in unexcavated areas under Building 2; these were left in place. Thirty three 12- to 15-inch-diameter duct sections were removed, for a total linear footage of approximately 425 feet.

Of the 33 duct sections, 30 began at the laboratories on Building 2's first floor, went through the basement, and out through the basement wall. Personnel removed these exposed duct lines using procedures developed for phases 4 and 5. A sampling hole was used to inspect and analyze for contaminates and rad levels. A plasma arc was used to cut the duct sections; containment was used if contaminant levels warranted its use. Following removal of the sections, the first floor penetrations were decontaminated up to the first floor seal caps. No contamination was released to the basement area. All ducts were recycled.

4.2.6 LAPRE-I Removal

Task: Remove LAPRE-1 and associated equipment.

Schedule: August 1996.

During Phase 4, personnel discovered that two of four original LAPRE-1 storage tanks remained in place. In addition, a short section of a 2.5-inch-diameter, highly contaminated (12,000,000 dpm of U-235) steel pipe was located next to the building. There was also some contamination in a concrete box used to house LAPRE-I control valves and lines. Finally, the steam discharge line leading from the location of the LAPRE-I reactor within Building 2 to the edge of the canyon was also still in place and believed to be contaminated.

To address these problems, personnel excavated a trench along the side of the buried tanks (approximately one-half the depth of the tanks) and attempted to pull out the tanks intact. When this attempt failed, personnel cut off the tanks at a depth of approximately 15–18 feet below-grade, leaving them in place. Only the metering-tank soil contents showed levels of radioactive contamination (190 pCi/g, of U-235). A risk analysis (report to be included in the project final report) showed that the section of tank left in place posed no health risk to the public or on-site workers.

The contaminated stainless-steel tubing and contaminated 2.5-inch pipe were pulled out of the building wall and disposed of. Approximately 65 feet of the steam discharge line and the concrete through it were removed. Because no contamination was found in this line, the remainder of the line (approximately 200 feet) and trough leading to the canyon was left in place. More information regarding LAPRE-I is available in reports LA-2292 and LAMS-1611 [8,9].

4.2.7 LAPRE-II Removal

Task: Remove LAPRE-II and associated equipment.

Schedule: August 1996.

During the removal of the LAPRE-I steam discharge line, personnel discovered a highly contaminated (10,000,000 dpm) 3-inch-diameter steel pipe. The pipe functioned as a vent line for the LAPRE-II reactor experiment. The pipe made an unusually large number of 90° turns, later found out to be expansion loops. Total linear footage removed was 131.5 feet, which extended from the former LAPRE-II site to the PSP. Report LA-12464 contains detailed information regarding this decommissioning effort [10].

Personnel excavated and removed the pipe section by section. Glove bags were used to contain the spread of contamination caused by work at each cutting location. The pipe was sealed at both ends and staged for contaminated metals recycling.

5.0 WASTE MANAGEMENT

5.1 Managing Generated Waste

Principal responsibility for managing generated waste fell to the Project Leader, who worked closely with the contractor to ensure proper waste-handling procedures were followed. The TA-35 Waste Management Plan [5] provided guidance for all waste management activities.

A Radioactive Control Area was established to stage recyclable metals and wastes. Waste minimization was a high priority for the project, resulting in a high percentage of materials being decontaminated and free released or recycled to metal-recycling companies. An RCRA (less than 90-day storage limit) and a satellite storage area were created to handle mixed waste generated as a result of pumping and handling the liquid mixed waste found in holding tanks TSL-5 and -6, as well as the Caustic Treater Tank in the north end of the PSP.

5.2 Waste Volume Summary

This project generated the following wastes: low-level mixed, low-level radioactive, asbestos-radioactive and non-radioactive, and non-radioactive releasable waste. Table 5 shows the quantities of waste generated, as well as their final disposition.

Table 5. Description of Project Wastes and Disposal Methods

Waste Stream	Estimated Volume (ft^3)	Actual Volume (ft^3)	Destination
Recyclable metal—low-level waste	54.5 tons	34 560	Low-level waste to SEG
Recyclable metal—releasable	not estimated	16 700	Salvaged by local recycling company
Liquids—low-level waste	260	17 466	Low-level waste to TA-50
Liquids—mixed waste	260	300	Off-site to DOE treatment center
Solids—mixed waste	150	264	Off-site to DOE treatment center
Building debris, Room A175A	not estimated	6988	County Landfill
Personal protective equipment and miscellaneous—low-level waste	7660	1811	Low-level waste to TA-54, Area G

This project managed to recycle the majority of metal either to a low-level waste recycling company (SEG Inc.) or to a local recycler dealing with non-contaminated metals. Much of the recyclable metal consisted of ducts, pipes, exhaust hoods, and tanks that could not be readily compacted and occupied a large volume not originally estimated.

Original estimates for low-level contaminated liquids did not include all the PSP pumping that took place during the project. Water in the PSP was caused by a unknown and unexpected constant flow of water from a drain in Building 2, which should have been connected to the sanitary system. The source was finally located during Phase 6.

Mixed waste volumes were moderately greater than originally estimated; these volumes were much more expensive and time consuming to dispose of than originally planned

Personal protective equipment (PPE) was low compared to the original estimate due to (1) compaction and (2) the project has not been fully completed. PPE from work on the PSP will increase the volumes generated.

5.3 Final Disposition

Low-level waste (consisting of contaminated equipment, PPE, and building debris) was placed in the low-level waste disposal cell at TA-54, Area G. Approximately 95% of all metal was recycled, minimizing the waste destined for Area G. Liquid and solid mixed wastes are temporarily stored; this waste will be shipped to an off-site DOE TSD facility.

5.4 Waste Minimization

This project generated a significant amount of contaminated metal waste, a good candidate for decontamination and/or recycling. As shown in Table 5, much of the metal was survey released and/ or decontaminated for free release to a metal recycler. Low-level radioactively contaminated metal was recycled by SEG Inc., in Oak Ridge, TN. Decontaminated and surveyed-out concrete materials were crushed and stockpiled for later use as backfill material.

6.0 COST AND SCHEDULE

Increased waste management costs and the failure of the contractor to meet stipulated deadlines have led to both cost and schedule increases that extend beyond the FY96 estimate. In addition, the removal of LAPRE-I and LAPRE-II contaminated items added unexpected costs and delayed the completion of Phase 4.

6.1 Baseline Cost and Schedule

In April 1995, the baseline cost and schedule indicated that the project would be completed in February 1997 and cost $6.8 million. However, the estimates of the contractor were very optimistic and caused the Project Leader to move up the finish date to October 1996 and lower the estimated cost to $5.8 million (see Tables 6.1 and 6.2).

Poor planning and execution on the part of the contractor caused scheduling delays. In addition, the removal of LAPRE-I and LAPRE-II materials and an increase in liquid mixed waste disposal costs incurred additional costs. This project was re-baselined for the previously estimated February 1997 finish date and $7.06 million cost.

Table 6.1. Funding Required for the TA-35 PSP Decommisssioning Project

Fiscal Year	Activity	Estimated ($1,000)	Actual ($1,000)
93	Assessment (project halted)	—	275
94	Assessment (project restart)	1,300	1,254
95	Begin remediation (Phase 1)	1,900	1,763
96	Continue remediation (Phases 2–6)	2,600	2,531
97	Finish remediation	1140	—
97	Project close-out	100	—
	Total	7060	5,823

Table 6.2. Costs in Thousands by WBS Element

WBS Element	FY93 actuals	FY94 actuals	FY95 actuals	FY96 actuals	FY97 (estimated)	Totals
Environmental Compliance		16	12	8		36
Site Characterization		188	0	0		188
Engineering		250	150	150	13	570
Project Planning	275	160	180	0	0	340
Project Support		275	320	320	54	675
Dismantlement		0	681	1327	550	2558
Waste Management		35	95	400	570	1110
Health Physics		120	265	291	50	401
Material		210	60	35	0	95
Total	275	1254	1763	2531	1237	7060

7.0 FINAL SITE CONDITION

Once ducts, exhaust hoods, and HEPA filters were removed, all areas inside Building 2 (as well as floor penetrations) were decontaminated, sealed, repaired, repainted, and restored. Soil under the excavated and removed ducts (phases 4 and 5) was tested for radioactive contamination; no samples had levels above background.

The areas north and south of Building 2 where ducts were removed have been backfilled and compacted. Areas north and south of Building 2 will be paved during the restoration phase of the project. During the restoration phase, an as-left drawing will be prepared to identify utilities still in the area.

Three branch ducts and a section of main duct located on the north side of Building 2 (part of Phase 5) were left in place to avoid undermining a Building 2 wing structure. The duct is not contaminated and will be removed when that part of Building 2 is decommissioned.

A section of 24-inch-diameter duct was left in place to avoid undermining a corridor and stairwell on the southeast side of Building 2 (part of Phase 4). The duct was contaminated; the cut end was welded sealed with a stainless-steel plate. A risk analysis was performed and a report produced that showed no risk of exposure to site workers or the public.

The LAPRE-I metering tank cooling jacket could not be excavated and extracted, so it was cut off at a depth of approximately 18 feet and sealed with a welded plate. A risk analysis was performed and a report produced that showed no risk of exposure to site workers or the public.

The dump tank was pulled out of its cooling jacket, found clean of contamination, cut up, and recycled. The dump tank cooling jacket (non-contaminated) could not be pulled out, so it was also cut off at the same depth as the metering tank cooling jacket and buried. Sixty-five feet of the steam vent line and other pipes and tubes associated with the LAPRE-I were removed. The remaining steam vent line (approximately 200 feet) and its concrete trough are not contaminated and remain in place.

8.0 LESSONS LEARNED, CONCLUSIONS, AND RECOMMENDATIONS

This project was the first Decontamination and Decommissioning (D&D) effort that elected to award all or part of the operational phase to an external contractor. Before this project, all operations work had been performed by the on-site contractor (JCI). The Department of Energy encouraged its M&O contractors to allow external contractors the opportunity to bid and perform Los Alamos D&D work in the hope the such work would be conducted in a shorter and more cost-effective manner. The contract to perform phases 2 through 6 was awarded to IDM Environmental Inc. in August, 1995, after a lengthy evaluation of eligible contractors and an extensive bidding process.

The Scope of Work proved crucial for the contract and award. Although a decommissioning project is often laden with unexpected and unplanned findings, it is critical to define as much detail as possible. This will minimize the potential for claims.

The project recorded no radiological incidents, health and safety accidents, or worker injuries. This was mainly due to tight oversight over the contractor by Laboratory health physics and industrial safety personnel. Another reason for the good record was the use of the Site Specific Health and Safety Plan work package procedure. This document guided the project team to identify hazards by performing task-hazard analysis on each task, create safe detailed procedures, obtain required permitting, and encourage communication among the field team. Worker input into procedures ensured efficient, safe work packages. Also, daily safety tailgate meetings introduced and reinforced safety topics.

Another lesson learned was the importance of working closely with the ER Field Unit Leader, Allyn Pratt, and personnel of FU#4 (OU 1129). Any time excavation is planned as part of the scope of work, it is critical that project leaders and team personnel communicate on a frequency appropriate to the amount of activity being performed. Communication ensured that the ER team collected soil samples as needed to document soil conditions and conduct clean up activities as needed.

Project operations are expected to be completed in February 1997, with a final report completed at the end of FY97 that will serve as a formal record of completion. In addition to the information presented in this report, it will provide dosimetry data, industrial hygiene sampling results, risk analyses reports, and more detailed discussions of decontamination and assay methods.

9.0 REFERENCES

Dennis Basile, The TA-35 D&D Project, Phase Separator Pit, Project Management Plan (PMP) Phase 1, Los Alamos National Laboratory, Revision 1 (April 12, 1995).

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APPENDIX A

ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

DOE	Department of Energy
ESH-1	Health Physics Operations Group
ESH-5	Industrial Hygiene and Safety Group
FSS-6	Field Operations Group
HEPA	High-efficiency particulate air
JCI	Johnson Controls World Services, Inc.
LAPRE	Los Alamos Power Reactor Experiment
MDA	minimum detectable activity
PPE	Personal protective equipment
PSP	Phase separator pit
RCRA	Resource Conservation and Recovery Act
TA	Technical Area

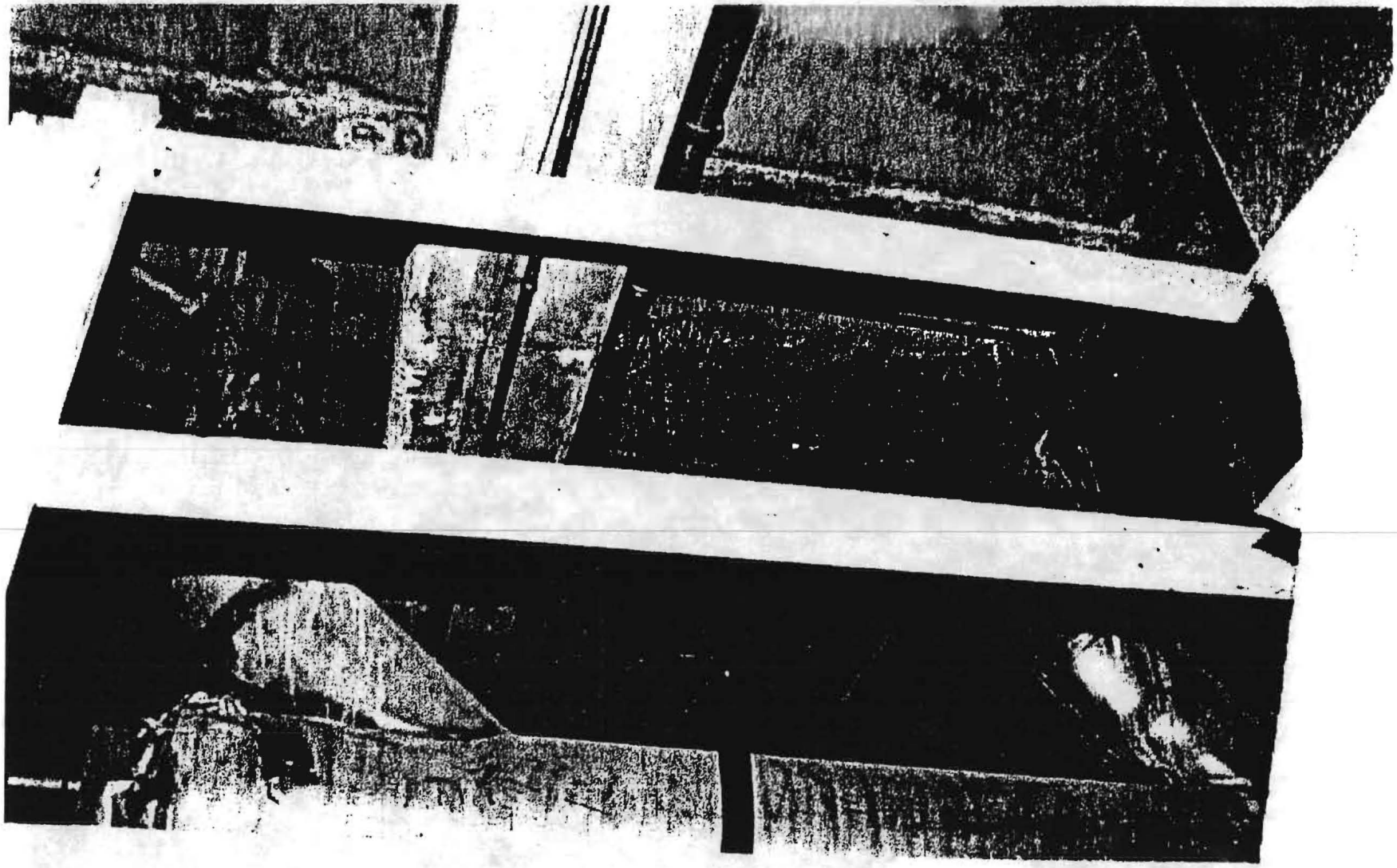
APPENDIX B

PHOTOGRAPHS

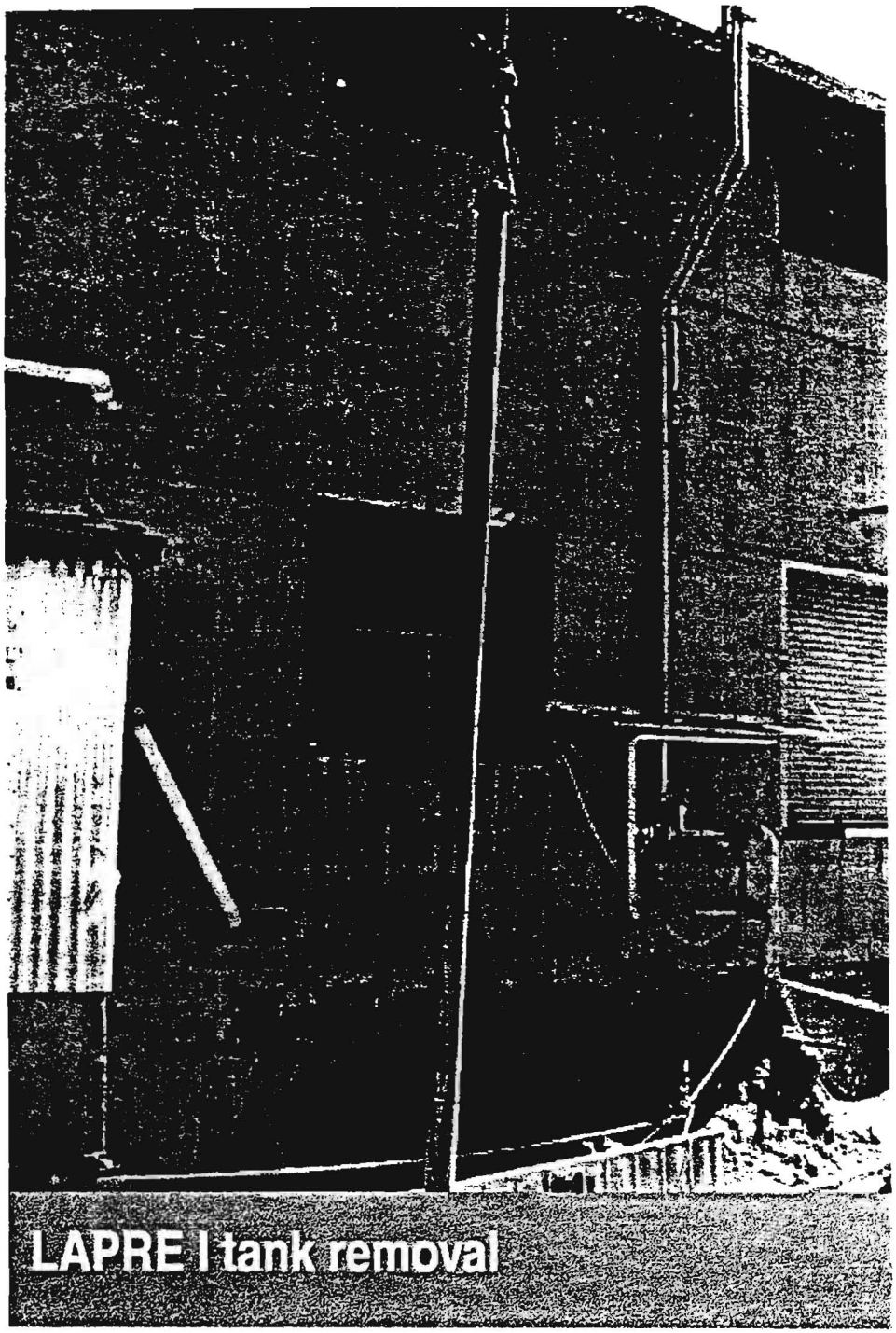
TSL-6 holding tank removal

Excavation and removal of south-side underground ducts

Excavation and removal of north-side underground ducts



Preparations to remove basement ducts



LAPRE I tank removal

APPENDIX C

CERTIFICATE OF COMPLETION

Los Alamos
NATIONAL LABORATORY

memorandum

Engineering Sciences and Applications Division
ESA-DE • Design Engineering

To/MS: Miguel Salazar, EM/ER, MS M769
From/MS: Alfredo S. Rey, ESA-DE, H821
Tel/FAX: 7-9088/FAX 7-3559
Symbol: ESADE-96-290
Date: September 26, 1996

SUBJECT: CERTIFICATE OF COMPLETION FOR TA-35 PSP DECOMMISSIONING PROJECT ITEMS AS FOLLOWS: Phase 1, Phase 3: TSL-4, 5, & 6, Phase 4, Phase 5, Phase 6, LAPRE-I Items, and LAPRE-II Vent Line.

The purpose of this memo is to certify that the items listed above and described in the Completion Report for FY96 were completed by September 30th, 1996. All ducts, pipes, tanks, structures, and other equipment associated with the listed items above were removed in accordance with the Project Management Plan, the Waste Management Plan, and the Site Specific Health and Safety Plan for the TA-35 Phase Separator Pit Decommissioning Project. The overall project operations will be completed by end of calendar 1996, and a final report will be completed in FY97. It will serve as the official record of completion for this project.

Distribution:
Decommissioning Completion Report for the TA35 Project, 1996.
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