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INEL-95/0453

INEL D&D Long-Range Plan

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ABSTRACT

This Long-Range Plan presents the Decontamination and Dismantlement (D&D) Program planning status for facilities at the Idaho National Engineering Laboratory (INEL). The plan provides a general description of the D&D Program objectives, management criteria, and policy; discusses current activities; and documents the INEL D&D Program cost and schedule estimate projections for the next 15 years. Appendices are included that provide INEL D&D project historical information, a comprehensive descriptive summary of each current D&D surplus facility, and a summary database of all INEL contaminated facilities awaiting or undergoing the facility transition process.

ACKNOWLEDGMENTS

This plan was first published in 1978 and has received 10 revisions to date. The authors are indebted to all those individuals who have contributed information in past revisions that is still included in the current document.

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ACRONYMS/ABBREVIATIONS

ADS	Activity Data Sheets
ANL-W	Argonne National Laboratory-West
ARA	Auxiliary Reactor Area
ARVFS	Army Reentry Vehicle Facility Site
ASA	Auditable Safety Analysis
ATR	Advanced Test Reactor
BORAX	Boiling Water Reactor Experiment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CPP	Chemical Processing Plant
CRS	Chloride Removal System
D&D	decontamination and dismantlement
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy, Idaho Operations Office
DOE-HQ	U.S. Department of Energy, Headquarters
EA	environmental assessment
EBR-I	Experimental Breeder Reactor-I
EBR-II	Experimental Breeder Reactor-II
EC	environmental checklist
EIS	environmental impact statement
EPA	Environmental Protection Agency
ETR	Engineering Test Reactor
FECF	Fuel Element Cutting Facility
FFA/CO	Federal Facilities Agreement/Consent Order
FPC	Fuel Processing Complex
HLWTF	High Level Waste Tank Farm
HPP	Headend Processing Plant
HQ	headquarters
HTRE	Heat Transfer Reactor Experiment
HWSF	Hazardous Waste Storage Facility
ICPP	Idaho Chemical Processing Plant
IET	Initial Engine Test
IFSF	Irradiated Fuel Storage Facility

INEL	Idaho National Engineering Laboratory
IVC	Independent Verification Contractor
LITCO	Lockheed Idaho Technologies Company
LLW	low-level waste
LOFT	Loss-of-Fluid Test
MTA	mobile test assembly
MTR	Materials Test Reactor
MWSF	Mixed Waste Storage Facility
NEPA	National Environmental Policy Act of 1969
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NRF	Naval Reactor Facility
OMRE	Organic-Moderated Reactor Experiment
ORR	Operational Readiness Review
PBF	Power Burst Facility
RCRA	Resource Conservation and Recovery Act
RESRAD	Residual Radioactive Material Code for Soils
RSM	radioactive scrap metal
RWMC	Radioactive Waste Management Complex
SAA	Satellite Accumulation Area
SAR	Safety Analysis Report
SFE	Stored Fuel Exterior
SFMP	Surplus Facilities Management Program
SPERT	Special Power Excursion Reactor Test
SWDF	Service Waste Diversion Facility
TAN	Test Area North
TRA	Test Reactor Area
TSCA	Toxic Substances Control Act
TSF	Test Support Facilities
TTAF	Test Train Assembly Facility
WAG	waste area group
WCF	Waste Calcining Facility
WERF	Waste Experimental Reduction Facility
WRRTF	Water Reactor Research Test Facility

INEL D&D Long-Range Plan

1. INTRODUCTION

The Department of Energy (DOE) program for decontamination and dismantlement (D&D) of excess facilities is driven by *DOE Order 5820.2A, Chapter V, "Decommissioning of Radioactively Contaminated Facilities."*[1] This order establishes policies and guidelines for the management and decommissioning of radioactively-contaminated facilities under DOE ownership or control. The Department of Energy Idaho Operations Office (DOE-ID) has assigned responsibility for D&D of Idaho National Engineering Laboratory (INEL) surplus facilities under DOE-ID management, to Lockheed Idaho Technologies Company (LITCO).

The Surplus Facilities Management Program (SFMP), which in the past provided management of the national D&D Program, no longer exists and national management is now provided by DOE Headquarters (HQ). The *Surplus Facilities Management Program Resource Manual*[2] which provided the requirements and procedural basis for D&D Program management controls instituted by INEL contractors, has been replaced by the *Decommissioning Resource Manual*[3]. This document, issued in August 1995, now serves as the primary reference resource for the DOE decommissioning program conducted by the Office of Environmental Restoration (EM-40).

The INEL D&D Program was established in late 1977 and has remained active. Of the original 45 surplus contaminated facilities originally identified, 27 have been decommissioned to date. Appendix A provides a summary of the INEL D&D project history including a project documentation reference list (Tables A-1 and A-2) and summary tables providing project completion dates, D&D costs, waste volumes, and decommissioning modes (Tables A-3 and A-4). In the past several years, the DOE D&D Program has undergone significant organizational changes including the elimination of the "lead lab" concept and the combining of the defense and civilian offices under the D&D branch of the Office of Environmental Restoration.

1.1 Scope

The INEL D&D Program currently involves DOE-ID facilities managed by LITCO, the management and operating contractor for the INEL. LITCO was awarded the new INEL consolidated contract in October 1994, replacing EG&G, Idaho Inc., Westinghouse Idaho Nuclear Company, Inc., and Babcock and Wilcox Company. The INEL D&D Program is managed by the Inactive Sites Department within the Environmental Restoration Directorate of LITCO. The LITCO D&D Program includes surplus facilities located at Test Area North (TAN), Test Reactor Area (TRA), Idaho Chemical Processing Plant (ICPP), Central Facilities Area (CFA), Power Burst Facility (PBF), Auxiliary Reactor Areas (ARAs), and the reactor experimental areas located near the Radioactive Waste Management Complex (RWMC). Areas of the INEL excluded from this plan are the areas assigned to Argonne National Laboratory-West (ANL-W) and the Naval Reactors Facility (NRF), operated by Westinghouse Electric Corporation. However, the INEL D&D Program does interface with ANL-W and NRF D&D Programs to share technology and planning.

All radioactively contaminated areas, facilities, and components that have been accepted as a D&D surplus facility for which DOE-ID is responsible are included in this plan. Uncontaminated facilities and those contaminated soil areas listed as part of the INEL Federal Facility Agreement and Consent Order (FFA/CO) are not included in the INEL D&D Program. Remediation of the FFA/CO areas are driven by the requirements of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) and is managed by the Soil Restoration Department within the Environmental Restoration Directorate of LITCO. In some cases, it is expedient or cost effective to satisfy the requirements of the FFA/CO for the remediation of soil areas adjacent to surplus facilities undergoing D&D. The CERCLA process may also become a prerequisite when facility entombment is the selected D&D alternative.

One of the main interface problems at the INEL involves the transfer of responsibilities between the FFA/CO Waste Area Groups (WAGs), dealing with CERCLA cleanup of soil areas, and the D&D Projects. Many underground tanks, seepage pits, and evaporation ponds are initially a WAG responsibility under CERCLA. When the CERCLA process results in a "No Further Action" determination, the WAGs then relinquish responsibility. If it is then determined that removal actions are required, these areas become the responsibility of the D&D project. The D&D projects must perform these removals in compliance with RCRA regulations which require additional sampling and analysis.

A policy is currently being jointly developed by the Environmental Protection Agency (EPA) and DOE that would require the decommissioning of surplus DOE facilities to be consistent with CERCLA requirements, and effectively integrate EPA oversight responsibility, DOE lead agency responsibility, and state and stakeholder participation. This policy is intended to establish that certain decommissioning activities be conducted as non-time critical CERCLA removal actions if the DOE Operations Office determines that a hazardous substance release or a substantial threat of release into the environment is involved. Release to the environment is defined as release to natural media and not that contained within facility structures. Once an INEL D&D project has been designated by DOE-ID as a CERCLA activity, full compliance with the requirements of CERCLA and the National Contingency Plan will be required.

1.2 Objectives

D&D Program activities for surplus facilities encompass radiological, chemical, and physical characterization; decision analyses, which guide the selection of preferred D&D alternatives; detailed project planning for D&D performance and disposition of waste streams; and establishment and maintenance of project documentation. In addition, the requirements for surveillance and maintenance of contaminated surplus facilities are addressed. These efforts support the following D&D objectives:

- Provide for surveillance and maintenance of contaminated surplus facilities awaiting decommissioning to assure the health and safety of both onsite personnel and the public, and to reduce the potential risk to the environment

- Implement a structured decommissioning program for the appropriate disposition of all present and future INEL surplus facilities in compliance with applicable Federal and state standards and any other contractual or legal requirements

- Conduct financial estimating, budgetary project management, integrated planning and scheduling, and facility engineering to support cost-effective and priority-based decommissioning activities on a long-term basis

- Identify and make available surplus materials, equipment, facilities, and property for potential reuse.

1.3 Long-Range Plan Structure

The function of this plan is to guide the selection and priority scheduling of INEL D&D activities involving contaminated areas, components, and facilities under the jurisdiction of LITCO. The plan and subsequent revisions provide a general description of the INEL D&D Program, serve as ready references of past accomplishments, provide a comprehensive descriptive summary of each current surplus facility, and document the most recent cost and schedule estimates at the INEL for the next 15 years.

Revisions to this Long-Range Plan are anticipated to be required every two years. The revisions will contain updated schedule and priority listings and revised cost estimates. Additional appendix information will be generated as projects are completed and new projects are identified. Additional guidance will be integrated into this document as required by new or revised regulations and as expertise is developed in the performance of D&D activities.

An overall description of the INEL is provided in Section 2. Elements of program management for the INEL D&D Program are discussed in Section 3. These elements include (a) criteria and priorities for selecting D&D projects, (b) procedural requirements and decommissioning methodology for completing all phases of D&D work, (c) release criteria and material reclamation, and (d) compliance issues. Section 4 provides a discussion of accomplishments since the last long-range plan revision and status of the currently active projects. Section 5 provides current long range projections of resource requirements (funding, manpower, equipment, and infrastructure), and a discussion of D&D technology development issues. The INEL D&D Program cost and schedule plan for the next 15 years is illustrated by Figure 7 in Section 5.

Appendix A provides a summary of INEL D&D project history, Appendix B contains detailed description forms for each uncompleted D&D project, and Appendix C provides a summary database listing of all INEL contaminated facilities awaiting or undergoing the facility transition process.

2. DESCRIPTION OF THE IDAHO NATIONAL ENGINEERING LABORATORY

2.1 INEL

The INEL, formerly the National Reactor Testing Station, was established in 1949 by the U.S. Atomic Energy Commission to build, test, and operate various nuclear reactors and fuel reprocessing plants with maximum isolation. In addition to its nuclear reactor research, other facilities have been constructed and operated to support the reactors and other government programs. These facilities include high- and low-level waste processing and storage sites, hot cells, analytical laboratories, machine shops, contaminated laundry, railroad, and administrative facilities.

The INEL, bordered by mountains on the west and north, covers approximately 2,315 km^2 of sagebrush-covered basalt on the Snake River Plain in southeastern Idaho, at an average elevation of 1,483 m. It is nearly 63 km long north to south, and about 58 km across at its southern end. Although basalt flows are exposed over much of the land, considerable gravel and sand deposits exist. Depths to the basalt or lava rock vary, providing a variety of footing conditions. In general, construction of roads, railroads, etc., requires only stripping the overburden and brush, adding gravel to the required depth, and grading. Construction of basement portions of facility buildings has required the blasting and removal of basalt.

Annual precipitation averages less than 25 cm. Underlying the area within the basaltic lava rock is a large aquifer. The lateral, southwesterly flow rate of this water ranges from 1.5 to 6 m/day. Depth to the water table from land surface ranges from about 60 m in the northeast corner of the INEL to 300 m in the southeast corner. The aquifer is mainly supplied from the North Fork of the Snake River. Additional water comes from the Big and Little Lost Rivers, Camas Creek, and Birch Creek, which start in the mountains to the north and west and sink into the porous soils and fractured basalt. The average annual temperature is 6°C, with extremes of 38°C and -43°C.

Personnel do not reside at the INEL. Permanent employees live in adjacent communities, with the largest percentage in Idaho Falls. The nearest INEL boundaries are 11 km southeast of Arco, 47 km west of Idaho Falls, 52 km northwest of Blackfoot, and 80 km northwest of Pocatello. The location of the INEL in relation to surrounding states is shown in Figure 1; and its relation to nearby communities is shown in Figure 2.

2.2 Facilities

There are several major facility complexes located across the INEL. Most of the complexes originally supported the testing and operation of various types of nuclear facilities. Since 1949, 53 reactors have been constructed on the INEL. Two reactors at the Test Reactor Area and three at Argonne National Laboratory-West are still operational, but most have been deactivated

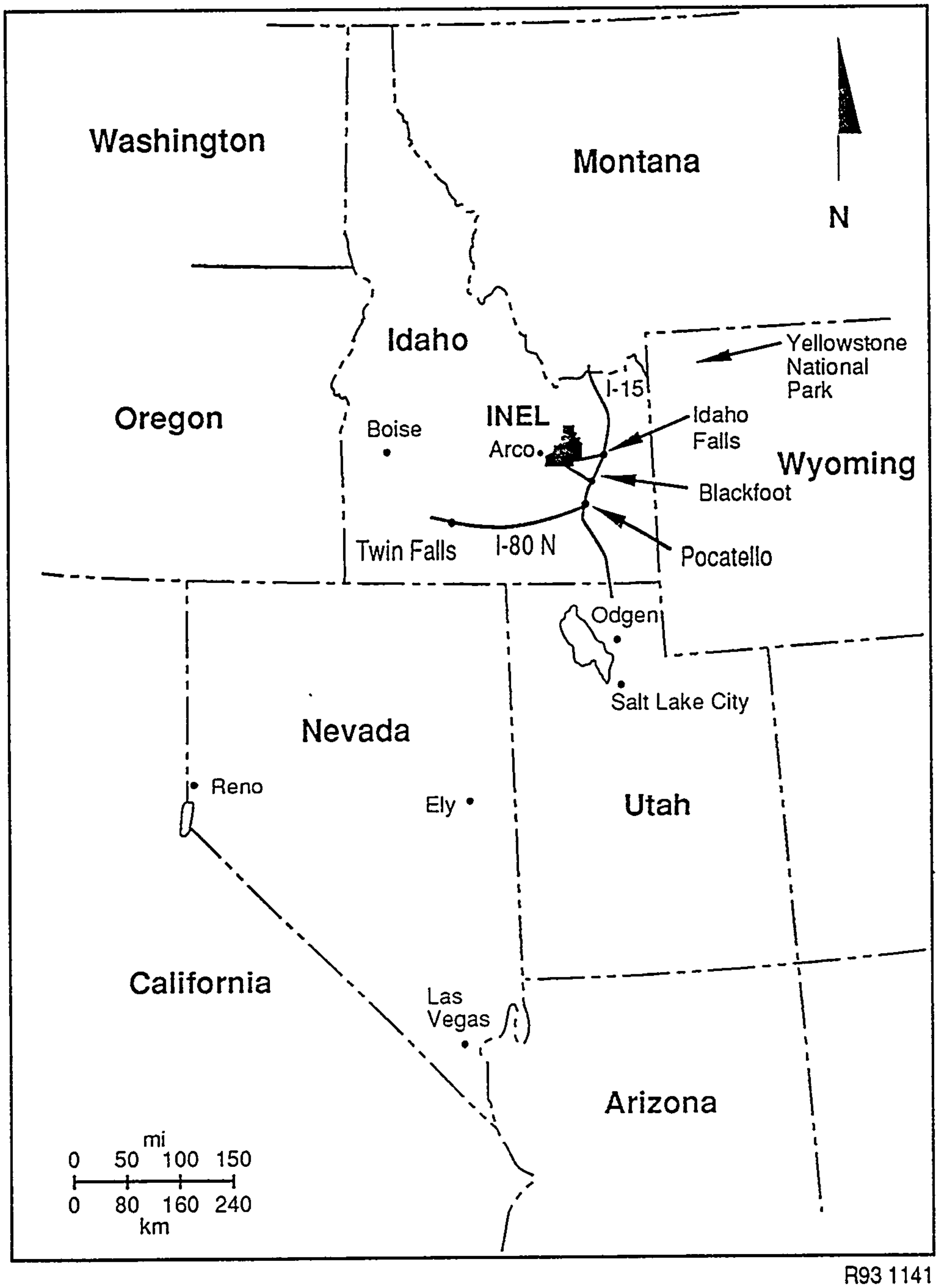

Figure 1. Location of INEL in relation to surrounding states.

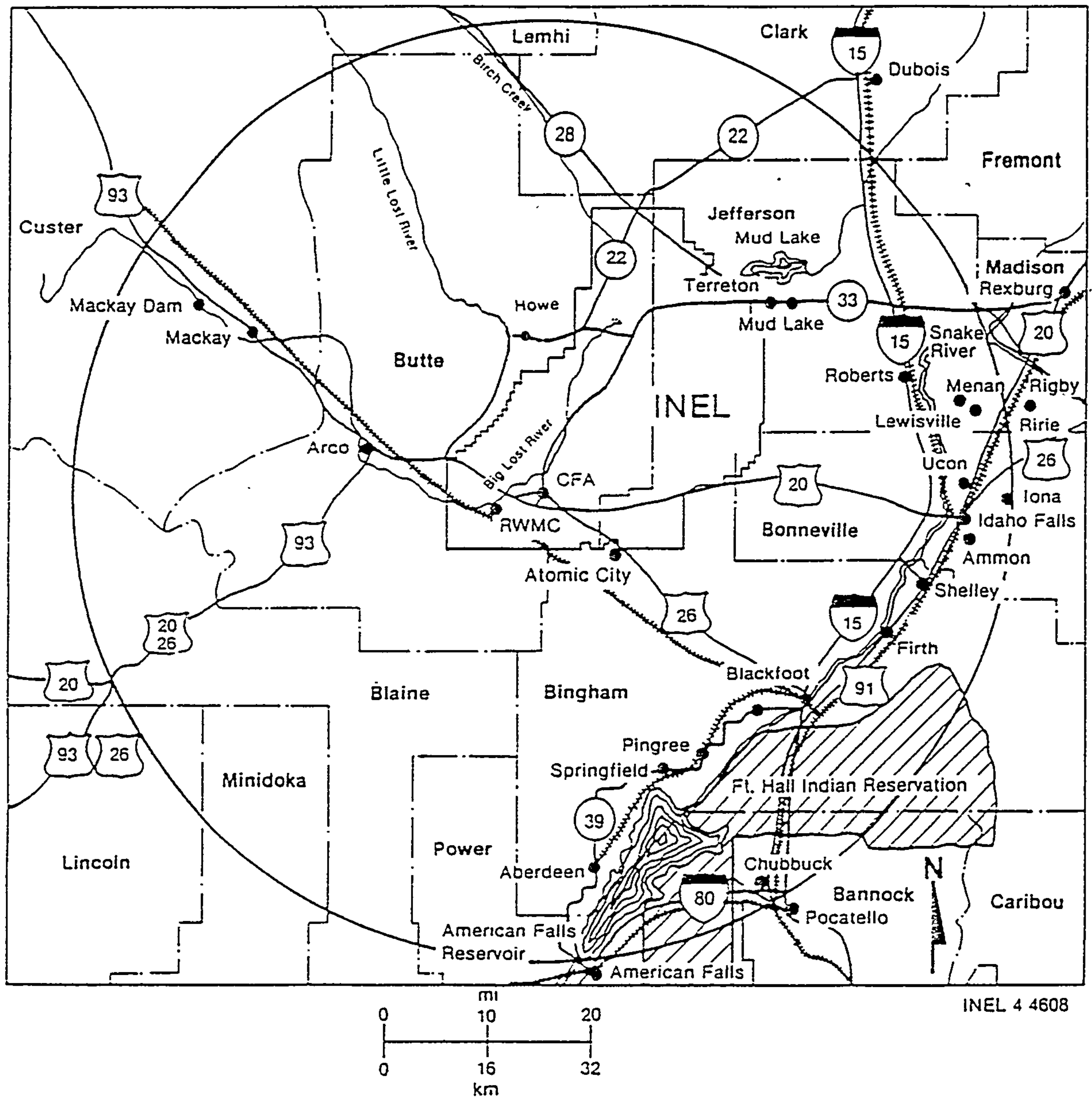

Figure 2. INEL vicinity map (50-mile radius).

or decommissioned to varying degrees. The present facilities of the INEL Site are illustrated in Figure 3. The major facility areas are as follows:

- TAN: Several past programs, including the Loss of Fluid Test (LOFT), the Initial Engine Test (IET), and the Water Reactor Research Test Facility (WRRTF), have been located at TAN the past 40 years. Current, active programs include the Special Manufacturing Capability facilities and a large hot cell facility, which is currently storing Three-Mile Island fuel.

- NRF: This area comprises nuclear powered prototype facilities that were used to provide training to Navy personnel. The Large Ship Reactor (A1W) and the Natural Circulation Submarine Prototype (S5G) were shutdown in 1994 and 1995 respectively. There are now no operational reactors at NRF, however nuclear fuel handling and inspection facilities remain operational.

- TRA: The primary programs at TRA support the operation of the Advanced Test Reactor (ATR), which conducts materials testing for U.S. Navy fuel systems. The ATR Critical Facility is an adjacent pool reactor operated in direct support of the ATR. In past years, the area also supported the operation of two other large test reactors, the Materials Test Reactor (MTR) and the Engineering Test Reactor (ETR), which have been deactivated.

- ICPP: The ICPP is a complex of facilities constructed over the last 42 years to store and reprocess reactor fuels and to provide radioactive waste processing capability. The mission to recover uranium through nuclear fuel reprocessing was discontinued in May 1992. Waste calcining of radioactive liquid waste to a solid form, and reactor fuel element storage remains as the primary operational mission of ICPP.

- CFA: The CFA serves as the centralized support area for programmatic and nonprogrammatic activities involving all INEL areas. Support services provided include transportation, warehouse storage, personnel services, and radiation monitoring.

- PBF: The PBF area is currently utilized by the Waste Experimental Reduction Facility (WERF) and other related programs dealing with the storage and treatment of both radioactive and mixed waste forms. The area initially supported the operation of the four Special Power Excursion Reactor Test (SPERT) reactors and PBF. The SPERT reactors have been deactivated and decommissioned to varying degrees, and the PBF test reactor is currently in standby.

- ARA: This area is not currently utilized. In past years, it has supported a variety of programs involving smaller-scale military reactors and a hot cell area.

- ANL-W: The Experimental Breeder Reactor II (EBR-II), shutdown in 1995, was operated to support liquid metal breeder reactor development and reactor research. The Transient Reactor Test Facility, the Zero Power Physics Reactor, and the Neutron Radiography Reactor remain operational in support of ANL-W programs.

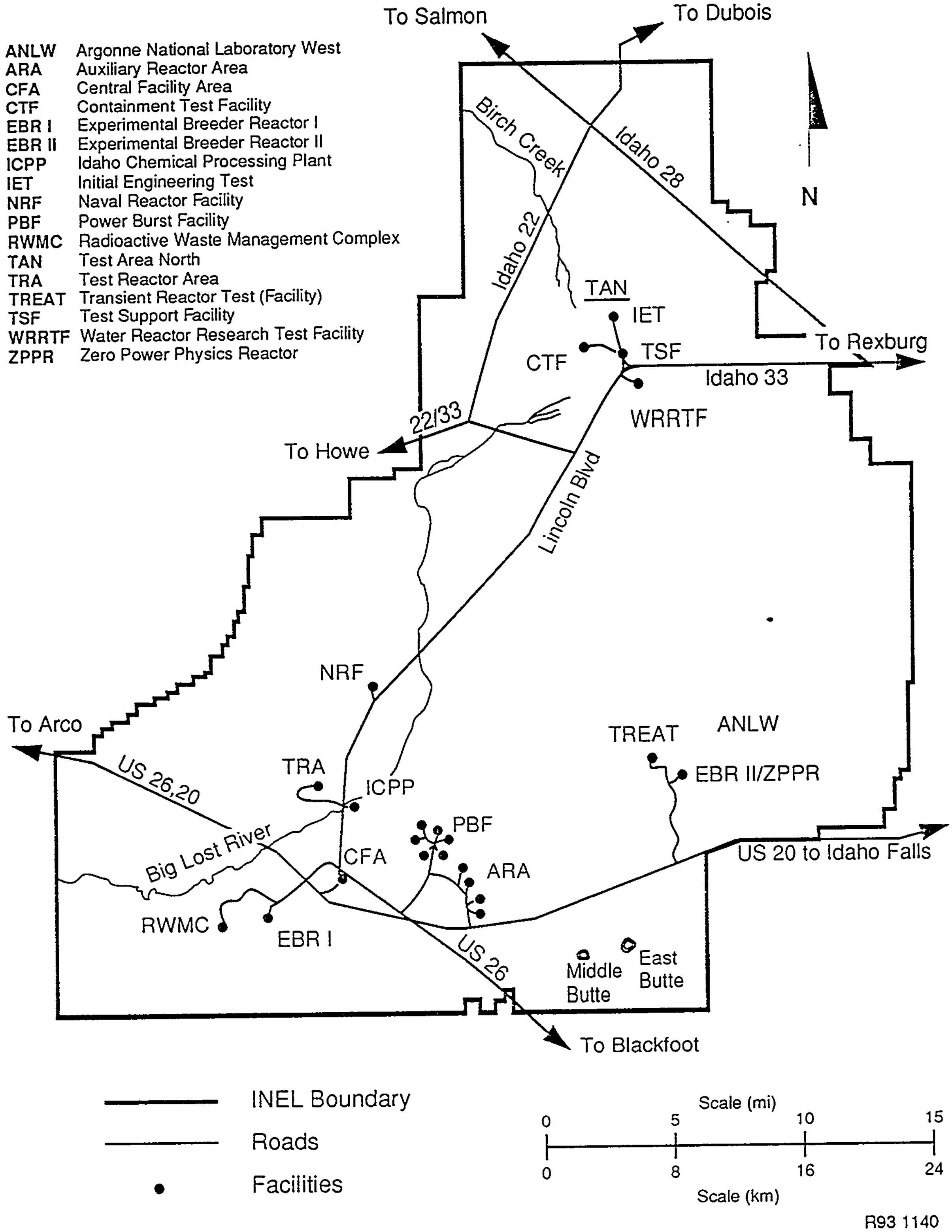

Figure 3. INEL primary facilities.

- RWMC: The RWMC contains the facilities and land required for disposal of low-level radioactive waste and storage of retrievable transuranic waste. Several reactor experiments involving the first nuclear generation of electricity were located near the RWMC. These early reactor experiments were performed at the Experimental Breeder Reactor I (EBR-I) and the Boiling Water Reactor Experiments (BORAX) I through V.

Contaminated surplus facilities, managed by LITCO, for which D&D has been designated but not completed are listed in Table 1. A listing of the major facility buildings/structures common to a project are grouped into a single D&D project title. This listing does not include all buildings and/or structures (e.g. guard houses, substations, underground tanks, etc.).

Facility description forms have been completed for each D&D project and provide condensed information regarding project identification, facility description, current status, special circumstances, safety/environmental considerations, estimated costs, and estimated waste volumes. The INEL D&D Project Facility Description Forms are included in Appendix B.

2.3 Security

All INEL surplus facilities are within the physical boundaries of the INEL, which is a government-controlled area with restricted public access. Security personnel provide regular patrols and surveillance of the area. In addition to regular security practices, most unoccupied surplus facilities are locked or are within fenced and locked areas. Keys are controlled by security personnel or the operational contractor of nearby or associated facilities.

Table 1. INEL D&D surplus facility list.

Project title/facility	Structures
ARVFS Site	ARVFS NaK Barrels
	ARVFS Bunker
Auxiliary Reactor Area I	ARA-626 Hot Cell Building
	ARA-627 Shop and Maintenance Building
	ARA-729 Hot Waste Tank
Auxiliary Reactor Area II	ARA-602 Office Building
	ARA-606 Technical Support Building
	ARA-613 Administration Building
	ARA-615 Power Extrapolation Building
Auxiliary Reactor Area III	ARA-607 Control Building
	ARA-608 Reactor Building
	ARA-630 Assembly/Lab Building
	ARA-621 Office Building
BORAX V Facility	BOR-717 Reactor Building
	BOR-718 Turbine Building
Engineering Test Reactor	TRA-642 Reactor Building
	TRA-643 Compressor Building
	TRA-644 Heat Exchanger Building
	TRA-645 Secondary Coolant Pumphouse
	TRA-647 Office Building
	TRA-648 Electrical Building
	TRA-654 Critical Facility
	TRA-655 Air Intake Building
	TRA-663 Diesel Building
	TRA-706 Delay Tanks
	TRA-753 Waste Gas Stack
	TRA-755 Filter Pit Building
LOFT Ancillaries	LOFT Mobile Test Assembly (MTA)
	Irradiated Fuel Storage Facility
	Fuel Handling Fixtures and Casks

Table 1. (continued).

Project title/facility	Structures
Materials Test Reactor	TRA-603 Reactor Building
	TRA-604 Reactor Building Wing
	TRA-605 Process Water Building
	TRA-607 Auxiliary Facility
	TRA-610 Fan House
	TRA-611 Plug Storage
	TRA-626 Compressor Building
	TRA-630 Catch Tank Pump Pit
	TRA-635 Reactor Services Building
	TRA-641 Gamma Facilities Building
	TRA-651 Auxiliary Facility
	TRA-657 North Plug Storage Building
	TRA-661 South Wing Extension
	TRA-706 Pipe Pit
	TRA-710 Stack and Monitor Building
	TRA-712 Retention Basin
	TRA-730 Waste Catch Tanks
TAN Technical Support Facilities	TSF-007 Sewage Disposal Plant
	TAN-608 Calibration Well
	TAN-616 RAD Liquid Treatment Facility
ICPP D&D Projects:	
Service Waste Diversion Facility	CPP-631 RALA Off-Gas Vault
	CPP-709 East Waste Monitor Building
	CPP-734 West Waste Monitor Building
Fuel Receipt and Storage Facility[a]	CPP-603 Fuel Storage Building
Fuel Processing Building[a]	CPP-601 Fuel Processing Building
Headend Processing Plant[a]	CPP-640 Headend Processing Plant

Table 1. (continued).

Project title/facility	Structures
High Level Waste Tank Farm[a]	Storage Tanks (11) and Vaults
CPP-740/SFE-20	SFE-20 SFE Waste Tank CPP-642 Compressor Building CPP-740 Settling Basin
Waste Calcine Facility[a]	CPP-633 Waste Calcine Facility

a. Currently transferred to EM-60 to complete transition requirements.

3. PROGRAM MANAGEMENT

The successful D&D of a facility involves the structured and sequential completion of several project phases. These include project transition and acceptance; surveillance and maintenance; planning and budget requests; radiological, chemical, and physical characterization; environmental and safety documentation; field operations; and site or facility release. Depending upon project size, it will normally require 1 to 5 years of planning and document approvals before actual D&D field activities can begin. Figure 4 is a process flow diagram for the D&D of INEL surplus facilities.

3.1 Organization

The D&D activities for all radioactively and chemically contaminated areas, components, and facilities on the DOE-ID surplus inventory, that are under the jurisdiction of LITCO, are administered by the respective organizations in accordance with established interface agreements. Areas of the INEL excluded from this Long-Range Plan are those assigned to ANL-W and NRF.

Figures 5 and 6 provide the organizational structure and interfaces involving DOE-HQ, DOE-ID, and the operating contractor managing D&D activities at the INEL. LITCO is assigned responsibility for the planning, management, and execution of the INEL D&D Program and receives funding through DOE-ID from the Office of Environmental Restoration (EM-40).

For INEL D&D activities, program requirements have been implemented to ensure compliance with DOE Order 5820.2A, Chapter V,[1] and the DOE-HQ D&D Program guidelines. Project documentation requirements, including review and approval levels, are specified by contractor procedures to ensure the appropriate level of management and DOE concurrence in each D&D project.

3.2 Surplus Facility Acceptance

The initial step in the D&D of any candidate facility is inclusion on the surplus facilities list. This list is currently documented by DOE-HQ through the authorization budget document termed an Activity Data Sheet (ADS). Each accepted facility is included in the INEL D&D Department ADS which provides a summary description of each INEL D&D project activity, and a projected estimate of schedule and funding requirements.

The original requirements for acceptance and transfer of facilities to the surplus facilities list were specified in the *Surplus Facilities Management Program Resource Manual*[2], and are now defined in the new *Decommissioning Resource Manual*[3]. Meeting these requirements is achieved through the facility transition process termed "Deactivation", a process whereby systems/equipment are deenergized, drained, isolated, or removed to minimize the surveillance and maintenance costs of maintaining the facility in a safe and environmentally secure condition. The INEL facility deactivation mission has been assigned to the Office of Facility Transition and Management (EM-60).

Lockheed Idaho Technologies Company (LITCO) Idaho National Engineering Laboratory (INEL)

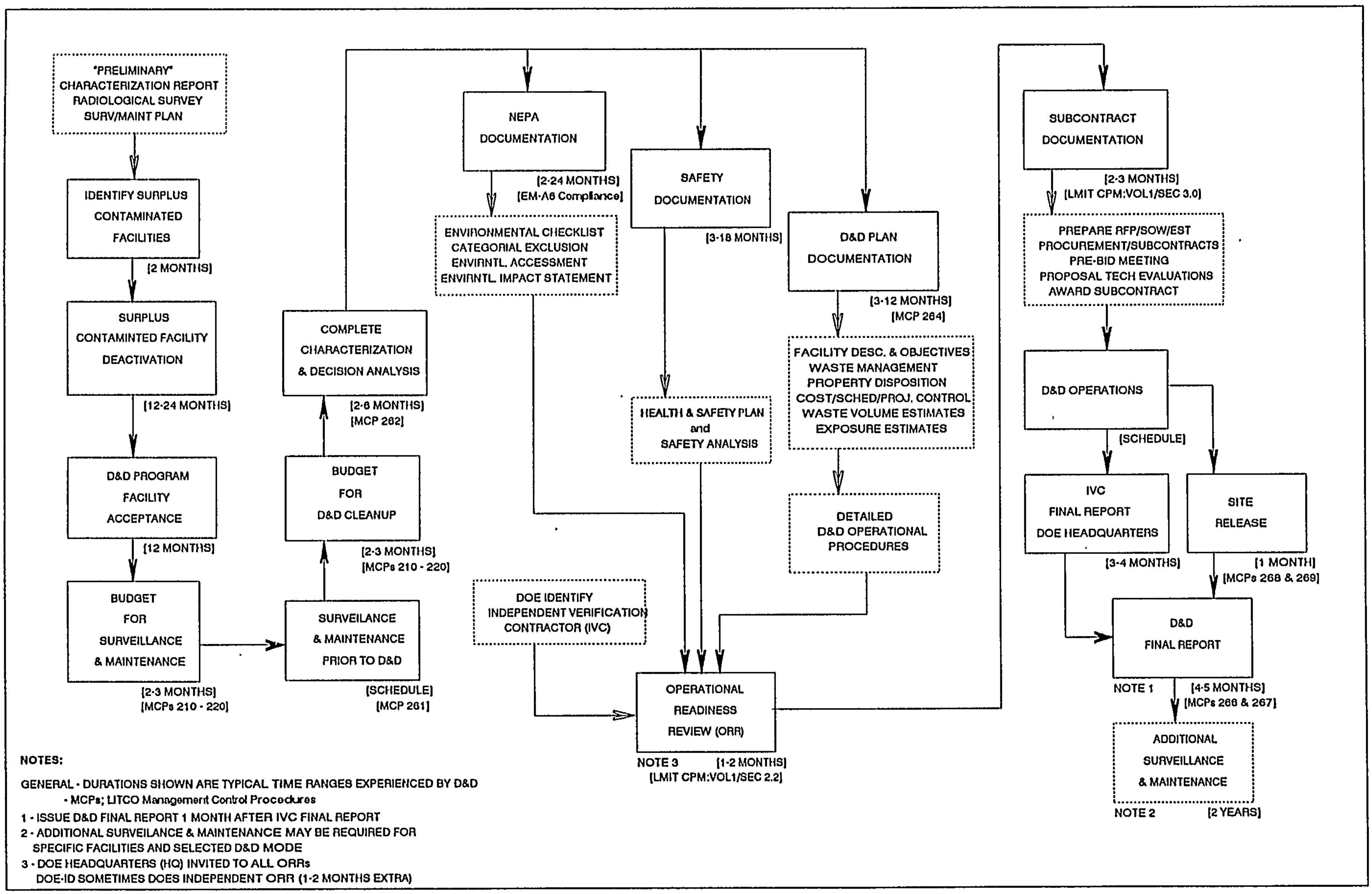

Figure 4. Decontamination and Dismantlement (D&D) process flow diagram.

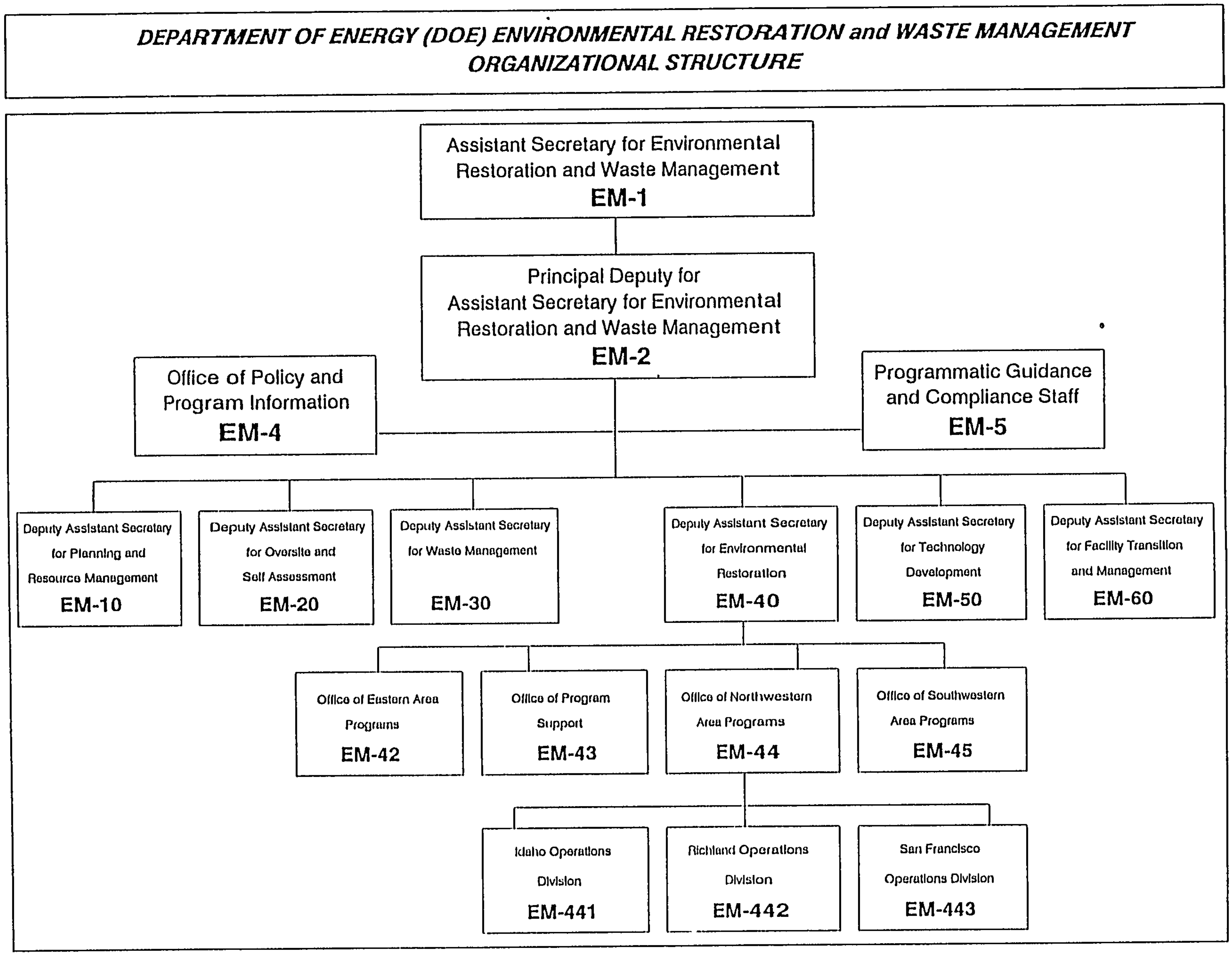

Figure 5. DOE Environmental Restoration and Waste Management organizational structure.

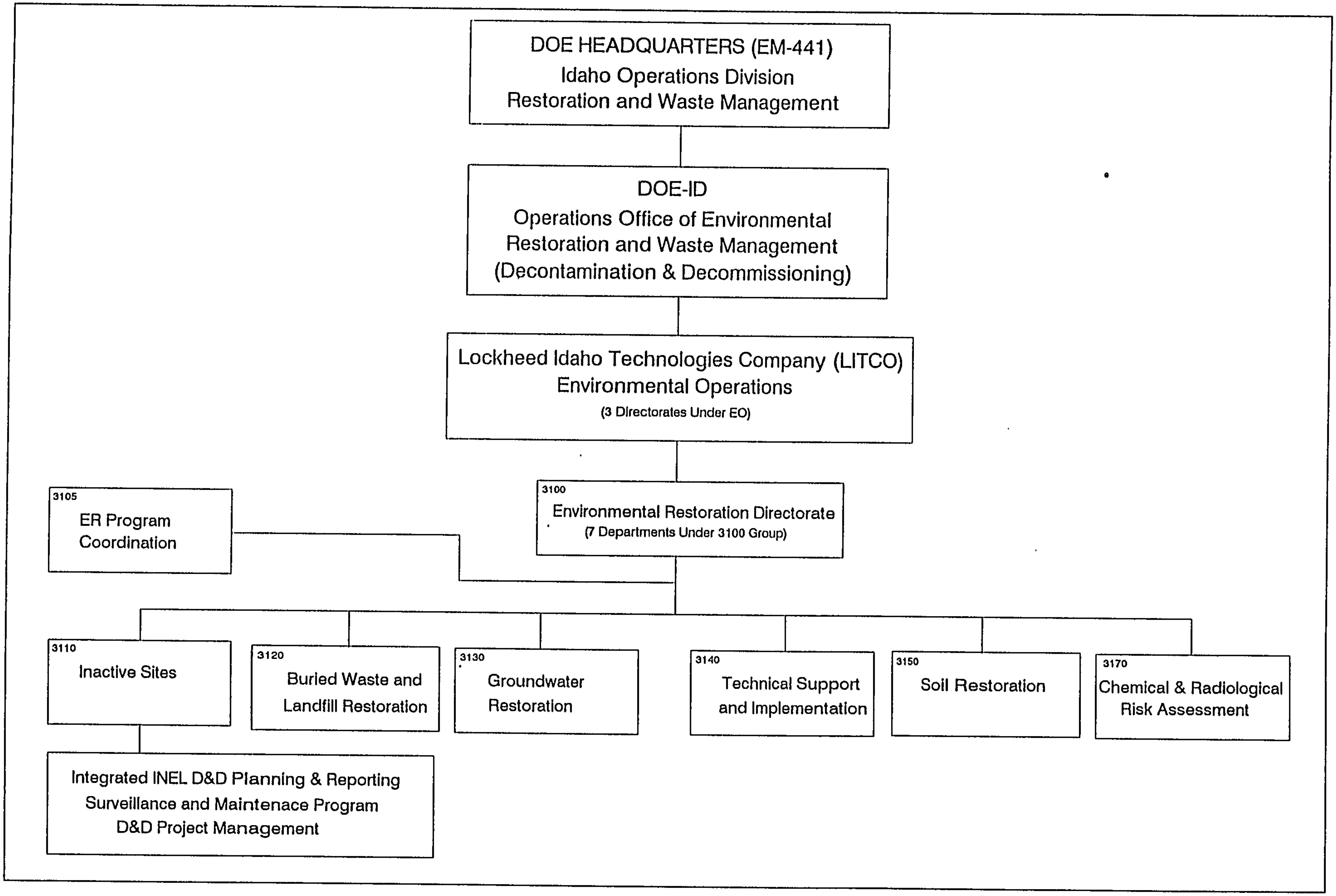

Figure 6. DOE-ID ER&WM Decontamination and Dismantlement organizational structure.

To qualify for acceptance into the D&D Program, the following requirements must be met:

- The facility status shall be identified as radiologically contaminated
- The deactivation or shutdown of the facility shall be established and documented
- The facility shall be in compliance with all current environmental regulations
- Special Nuclear Materials shall be reduced to less than Category IV quantities per DOE Order 5633.3A[4]
- All stored hazardous material shall be removed from the facility
- All actions required to protect personnel and public health and safety shall be completed.

The program office responsible for facility operation is required to maintain a file of as-built drawings, photographs, operational history, and so on, for use during the D&D characterization and planning phases. Periodic decontamination will have been provided as normal operational cleanup over the life of the program. Once deactivated, facility safety analysis documentation may require revision to reflect the new shutdown status.

In 1989, the Defense Facilities Decommissioning Program Office developed the Non-Orphan Facility Incorporation Plan.[5] This plan was intended to begin transfer of inactive contaminated Defense Program facilities to either the Defense D&D Program or the Remedial Actions Program. The program has since undergone substantial changes at the DOE-HQ level. In 1992, EM-60 was formed by DOE-HQ to take control of the "Non-Orphaned" facilities and eliminate the Non-Orphan Facility Incorporation Plan. This includes the necessary reconditioning of the facility to meet safe-store conditions and the surveillance and maintenance as required until accepted into the Environmental Restoration Program, directed by EM-40.

To add a candidate facility to the surplus facilities list, acceptance is requested through the Deputy Assistant Secretary for Facility Transition and Management, EM-60. When a facility is accepted into the D&D Program, a transition period will be required to allow time to appropriate funds for D&D. Activities required for facility turnover during this period, including surveillance and maintenance, will be the responsibility of the operating program. Beyond this period, surveillance and maintenance and the ultimate D&D costs will be provided by the DOE-HQ D&D Program. Chapter 3 of the *Decommissioning Resource Manual*[3] provides a discussion of the facility transition process.

The LITCO EM-60 facility transition and management program is actively planning for the disposition of over 100 INEL surplus buildings and structures. The majority of these facilities will not be transferred to the EM-40 D&D Program, primarily because they have little or no radioactive contamination. Although disposal of these facilities will be accomplished with EM-60 funding, the utilization of D&D personnel experience and specialized demolition equipment has proven to be an efficient and safe means of accomplishing EM-60 cleanup/demolition projects.

Appendix C provides a summary of the INEL D&D Program activities associated with EM-60 cleanup and demolition objectives, and a listing of the INEL transitional facilities.

3.3 Surveillance and Maintenance Program

The responsibilities and requirements for a D&D surveillance and maintenance program are provided in Chapter 4 of the *Decommissioning Resource Manual.*[3] This activity manages the inspection and maintenance of surplus facilities identified for D&D and assures compliance of all applicable safety, environmental, and procedural standards while these facilities are under D&D Program control. The purposes of the surveillance and maintenance function for surplus facilities awaiting D&D are (a) to ensure adequate containment of contamination and (b) to provide physical safety and security controls and regulated surveillance to maintain the facilities in a manner that will minimize potential hazards to the public. The elements of the D&D surveillance and maintenance program are

- Surveillance and maintenance planning to accomplish the appropriate integration of facility conditions, surveillance frequencies, security requirements, routine maintenance, and major facility repair

- The performance and documentation of periodic inspections at each surplus facility

- A deficiency control system that provides for the prioritization, tracking, resolution, and documentation of identified deficiencies

- The performance of maintenance, repair, and cleanup tasks required to (a) correct deficiencies and (b) complete routine scheduled maintenance.

3.4 Priority Determination

All current and future D&D projects listed on the INEL surplus facilities list, Table 1, have been prioritized according to existing hazards, programmatic considerations, and cost benefit. The factors that are considered when determining priority ranking of the INEL D&D projects are as follows:

- Hazards reduction

    - Current hazards
    - D&D hazards
    - Advantages of relocating contamination to approved storage or disposal
    - Weather effects

- DOE legal and contractual obligations

    - Tri-party or state agreements
    - Environmental drivers
    - DOE Orders

- Current project status
    - phase of completion
    - project continuity
    - shutdown and startup impacts

- Cost/benefit
    - D&D costs
    - Surveillance and maintenance costs
    - Alternative costs and benefits
    - Completion time
    - Associated development and training costs
    - Labor availability
    - Knowledge of the facility
    - Impact on other programs

- Unrestricted/restricted reuse
    - Planned reuse
    - Contamination type and location
    - Achievable decontamination versus offsite background radioactivity
    - Potential public reactions.

In addition to consideration of these factors, it is also important to implement a weighting system that places more or less emphasis on certain factors. Priority weighting guidance is provided by Table 2.

These guidelines are reviewed and used for assigning priorities to INEL surplus facilities projects, recognizing that the results are subjective and are based on available facility data and the experience of D&D personnel. The priorities identified in this plan are subject to change. In the interval between identification of the facility as surplus and the initiation of D&D operations, a facility may be evaluated several times for alternate uses, or factors previously considered may change.

Project prioritization analysis has been performed on the current D&D projects. Table 3 is a matrix summarizing this analysis process.

3.5 Decommissioning Procedure

The INEL decommissioning activities are performed in a documented and structured manner, consistent with the DOE D&D Program guidelines and DOE Order 5820.2A, Chapter V.[1] This management approach includes a facility characterization, a decision analysis aided by a cost-risk-benefit assessment, a D&D plan, generation of a project data file, a post D&D characterization, and a final report. Several key documents are required and prepared during the assessment and cleanup phases of a D&D project. Table 4 provides a list and a brief requirements description of required D&D documents.

Table 2. Priority weighting guidance.

Consideration	Determination	Weighting factor[a]
Hazard to the public	Pathways analysis	10
Hazard to INEL personnel	Pathways analysis	9
DOE legal or contractual requirements	Requirements search	8
Facility conditions/surveillance and maintenance requirements	Characterization	7
Current project status	Current schedule	6
Facility or space reuse need	Programmatic need	6

a. The weighting factor is an arbitrary scale from 0 to 10, with 10 being the highest priority.

A D&D Program Project Manager's Handbook[6] was prepared and issued in FY 1994. This handbook, updated on an annual basis, serves as a resource manual for the INEL D&D Project Manager by providing in-depth descriptions and requirement discussions of documents and activities related to each phase of a D&D project. An invaluable part of this handbook is the continuing documentation of "lessons learned" from completed D&D projects.

3.5.1 Characterization

A significant objective of the program is the orderly characterization of all surplus contaminated facilities. A detailed radiological, chemical, and physical characterization of each facility must be performed and documented. Baseline data for each project follows:

- Drawings, photographs, and other records reflecting the as-built and as-modified condition of the facility and grounds

- The condition of all structures, existing protective barriers, and systems installed to ensure public, occupational, and environmental safety

- The type, form, quantity, and location of hazardous chemical and radioactive material from past operations at the site

- Information on factors that could influence the selection of decommissioning alternatives such as potential future use, long-range site plans, facility condition, and potential health, safety, and environmental hazards.

Table 3. INEL D&D Project Prioritization Analysis

Priority Weighting Factors (1 Low to 10 High)	
Hazard to the Public	10
DOE-ID Legal Driver	8
Hazard to INEL Personnel	9
Facility S&M Costs	7
D&D Project Status	6
Facility or Space Reuse Known	6
Estimated D&D Costs	39

Additional Notes:

1 - Estimated D&D Cost weighted to Off-Set the previous weighting of the three Hazards: Hazard to the Public, DOE-ID Legal Driver, & Hazard to INEL Personnel and of the two Conditions: D&D Project Status & Facility or Space Reuse Known (10+9+8+6+6 = 39).

2 - The D&D Projects were prioritized utilizing the Cost/Benefit Weighted totals. An additional column was added to provide information relating to a Risk Only Weighted total which does NOT consider the D&D Project Costs.

Prioritization Numerical Range Explainations

Public Hazard
7-10 Immediate Health Hazard
4-6 Potential Risk
1-3 Minimal Risk

S&M Costs
7-10 >$2 million per year
4-6 >$500k per year
1-3 <$500k per year

D&D Costs
7-10 <$1 million
4-6 $1 - $10 million
1-3 >$10 million

Legal Driver
7-10 CERCLA Time Critical or FFA/CO Milestone
4-6 CERCLA Non-Time Critical or RCRA Closure
1-3 No CERCLA or Potential Liability

Project Status
7-10 Field Work Progressing
4-6 Characterization Complete
1-3 In Transition

Personnel Hazard
7-10 High Concentration of Personnel Exposure
4-6 Good-Fair FacilityCondition/Average Concentration
1-3 Underground/Low Concentration

Facility Reuse
7-10 Known Reuse
4-6 Potential Reuse
1-3 No Known Reuse

D&D Project	ADS No.			Specific Notes	Public Hazard	Legal Driver	Personnel Hazard	S&M Costs	Project Status	Facility Reuse	D&D Costs	Cost/Benefit Weighted Totals	Cost/Benefit D&D Priority	Risk Only Weighted Totals
Boiling Water Reactor Experiment (BORAX)-V	63-EG				1	2	1	1	8	1	7	369	1	96
Service Waste Diversion Facility (SWDF) [CPP-631/-709/-734	1306				2	1	2	1	6	1	7	368	2	95
Army ReEntry Vehicle Facility Site (ARVFS)	46-EG				2	4	2	1	8	1	6	365	3	131
CPP-740 / SFE-20	1305				3	3	3	2	3	1	6	353	4	119
Loss of Fluids Test Reactor (LOFT) Ancillaries (MTA)	65-EG				1	1	1	1	4	1	7	337	5	64
Test Area North/Test Support Facilities (TAN/TSF)	51-EG				3	2	5	2	5	1	5	336	6	141
Auxiliary Reactor Area (ARA)-II	48-EG				1	1	1	0	10	1	6	327	7	93
Auxiliary Reactor Area (ARA)-III	49-EG				0	0	2	2	8	1	6	320	8	86
Auxiliary Reactor Area (ARA)-I	52-EG				2	3	2	2	6	1	5	313	9	118
Headend Processing Plant (HPP) [CPP-640]	1307			1	4	3	6	6	2	4	3	313	10	196
Fuel Receipt & Storage Facility (FRSF) [CPP-603]	1304			1	4	4	5	5	2	1	3	287	11	170
Fuel Processing Building (FPB) [CPP-601]	1308			1	3	4	6	8	2	4	2	286	12	208
Waste Calcine Facility (WCF) [CPP-633]	1309			1	5	6	7	9	2	1	1	281	13	242
Engineering Test Reactor (ETR)	60-EG				3	2	5	5	4	6	2	264	14	186
High Level Waste Tank Farm	1310			1	5	4	4	4	2	1	2	242	15	164
Materials Test Reactor (MTR)	54-EG				3	1	5	5	3	5	2	244	16	166

General Notes:

1 - Prioritization Analysis Matrix based upon "Relative Rankings" of each D&D Project (1 Low to 10 High).

2 - Prioritization Analysis Matrix Weighted Totals based upon the "Relative Rankings" multiplied by the Priority Weighting Factors.

3 - Prioritization Analysis Matrix ONLY considers those facilities currently on the INEL Surplus Contaminated Facilities List.

4 - There is no written history on the development of the INEL D&D Program Ranking or Prioritization System from previous reports (Prior to Revision 9).

Specific Notes:

1 - Facilities not yet transferred to EM-40 but expected in the next few years. Advanced planning & scheduling has been started. Priority based upon expected post transition condition.

Acronym Notes:

MTA - Mobile Test Assembly

Table 4. Key D&D Program Documents.

Document	*Facility Status*	*Criteria and Purpose*
Characterization Report	Deactivated facility	Comprehensive radiological, chemical, and physical description of facility.
Safety Analysis [Auditable Safety Analysis (ASA) or Safety Analysis Report (SAR) as determined by Hazard Class]	Deactivated facility	Safety analysis document reflecting the deactivated status of the facility. Required for all surplus facilities awaiting D&D.
National Environmental Policy Act (NEPA) [Categorical Exclusion (CX), Environmental Assessment (EA), or Environmental Impact Statement (EIS)]	Initiation of D&D operations	Preparation and DOE approval of appropriate project NEPA documentation.
Decision Analysis Report	Completion of characterization	Utilizes cost-risk-benefit analysis to compare alternatives and select the preferred mode of D&D.
D&D Plan	Initiation of D&D operations	Comprehensive project management plan that defines and develops a planned sequence strategy for achieving D&D objectives. Based on the characterization and decision analysis results.
Safety Analysis-D&D Phase	Initiation of D&D operations	Safety analysis document revised to include the D&D process to be utilized in the completion of the project. Based upon the D&D Plan.
Final Report	Project completion	Formal overview of project activities, accomplishments, final status, and lessons learned.
Data Files	D&D phase	Archive of all pertinent records for each D&D project.

Facility characterization activities and objectives, with respect to hazardous waste are subject to the requirements of the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act (TSCA), and in some instances CERCLA, depending upon the facility operational date and the requirements of the INEL FFA/CO.

3.5.2 Decision Analysis

Following characterization, a decision analysis is performed and documented for each facility. The decision analysis identifies disposition alternatives and assesses those alternatives to provide a basis for selecting the preferred decommissioning mode.

A decommissioning mode is defined as the method selected for the D&D of a surplus contaminated facility. The four general decommissioning modes applicable to INEL facilities are (1) safe storage, (2) in place stabilization, (3) decontamination for reuse, and (4) dismantlement. The characteristics of each mode are summarized in Table 5. Combinations or variations of these modes are considered for each facility, along with the priority factors specified in Section 3.4.

Drawings, photographs, and comparative tables are used whenever possible to enhance clarity of the report. The information required for assessment of alternatives includes as follows:

- The impact of each alternative on the public and INEL personnel
- Hazards that each alternative would present to D&D workers, including dose estimates
- The potential for facilities and material reuse
- The cost and schedule of each alternative
- The waste volumes expected to result from each alternative

A cost-risk-benefit methodology, to a level of detail consistent with the complexity of the project, is utilized in the comparative analysis. In general, the analysis considers all operational costs including those associated with waste disposal, surveillance and maintenance costs, the value of the estimated radiation dose D&D workers will receive, the value of the dose reduction to INEL personnel and the public, and the reuse value of the facility and the materials and equipment it may contain. The resulting data are tabulated and analyzed for each alternative considered. Generally, the alternative with the best ratio is selected as the preferred alternative for further planning. In some instances, nonquantifiable considerations indicate that an alternative be selected that is less favored in the quantitative basis (e.g., DOE programmatic considerations and guidance).

The alternative selected in the decision analysis is for planning purposes only. No decommissioning mode is considered final until NEPA and RCRA requirements are satisfied and DOE concurs with the D&D process defined by the project D&D Plan.

Table 5. Decommissioning mode characteristics

Mode	Facility status	Contamination control	Potential use of site
Safe storage site	Leave facility in place	Remove loose contamination, provide temporary but rigid physical barriers, operate passive protective systems, surveillance required.	Restricted use of most of exclusion area around the immediate vicinity. site is unavailable for other uses.
In-place stabilization	Leave facility in place	Remove loose contamination, provide hardened permanent physical barriers, remote surveillance and periodic direct surveillance.	Unrestricted use of much of site, exclusion area around the immediate facility, site is available for other uses with restrictions to prevent compromising the physical barriers.
Decontamination for reuse	Leave facility in place	Completely remove contamination from facility areas with potential for reuse, provide permanent physical barriers for remaining contaminated areas, surveillance required until assumed by new user.	Unrestricted use of decontaminated facility areas, exclusion restrictions established for remaining areas, which may be partially reused when considered impractical to fully decontaminate.
Dismantlement	Fully decontaminate or remove facility	Reduce contamination to unrestricted level, no surveillance	Unrestricted use.

3.5.3 D&D Planning

A LITCO approved D&D Plan is required before initiating the actual D&D tasks on a project. Based on the characterization and decision analysis results, the D&D Plan defines and develops the preferred decommissioning mode into a planned sequence strategy for achieving project objectives.

This comprehensive plan addresses the project management philosophy and control methods, and establishes the technical baseline for all planned project D&D activities. Essential elements of the D&D Plan are as follows:

- Project objectives and completion criteria
- Facility description and history

- Management and operational control requirements

- Technical plan identifying and defining the total work breakdown structure and approach for the D&D operation

- Cost and schedule

- Estimates of waste volumes and worker exposures

- Quality assurance

- Safety and environmental documentation requirements.

DOE-ID concurrence with the D&D Plan provides authorization to proceed with the project as defined. A formal project readiness review is then performed to ensure that all requirements for initiation of the field activities have been completed.

3.5.4 Project Operations and Documentation

Project operations are performed in accordance with the approved D&D Plan. D&D field operations generally include decontamination, dismantlement, demolition, transportation, recycle and/or reuse, waste reduction and disposal, and excavation and backfill activities. All field activities are conducted in accordance with the project specific Health and Safety Plan, and task specific, approved procedures.

The information generated over the life of the project is retained and archived in the project data file. Typical contents of a project data file include all project reports, safety analysis documents, environmental documents, readiness or design review results, completed work orders, waste disposal records, property disposition records, supporting engineering documents, photographs, incident reports, cost and schedule performance, and all survey and sampling data. The completed project data package is assigned an identification number for retrieval from the INEL permanent records storage system. This identification number is included in the final report.

At the conclusion of D&D activities, a final report is required for each project. The project final report formally documents an overview of the project activities, accomplishments, final facility/area status, and lessons learned. The primary sections of a D&D Final Report are as follows:

- Facility description before D&D

- Objectives and work scope

- Work performed

- Cost and schedule (estimated vs. actual)

- Volume of waste generated
- Personnel exposure
- Post-D&D condition
- Lessons learned.

3.5.5 Independent Verification

An independent verification is required by the *Decommissioning Resource Manual*, Chapter 5[3] to validate the accuracy and completeness of post cleanup field measurements to ensure that the facility/site meets the established release criteria (see Section 3.7).

The level of verification required by the Independent Verification Contractor (IVC) may range from a simple review of the D&D plans and post cleanup characterization results to onsite visits involving direct measurements and sampling. The level of verification is determined by DOE with input from the IVC. Verification activities may be required throughout the cleanup effort and are therefore integrated into overall project planning.

DOE-HQ has assigned Oak Ridge National Laboratory, Grand Junction, as the current IVC for INEL D&D projects.

3.6 Waste Management and Disposition

Management and disposition of D&D generated wastes is an important aspect of the D&D Program at the INEL. Projected volumes of D&D waste are determined for all projects. The projections are based on preliminary engineering estimates, characterization data, or the finalized planning documented in project D&D Plans. Current estimates of all D&D project generated waste are documented in DOE-ID-10417, *Waste Stream Projections for the Environmental Restoration Program at the INEL.*[7] This report is updated and reissued semiannually and presents the most current data available. The report contains waste definitions, locations, mediums, types and projected volumes and need dates for treatment, storage, and disposal actions.

The bulk of INEL D&D generated radioactive waste is classified as low-level waste (LLW) and is disposed on-Site at the RWMC. Hazardous waste and mixed waste are also encountered on most D&D projects. Strategies for the treatment, storage, and disposal of mixed waste forms vary depending upon the material, applicable regulations, and available treatment technologies. Interim storage of hazardous and mixed waste on the INEL is provided by the Hazardous Waste Storage Facility (HWSF) located in CFA-637 at CFA, and the Mixed Waste Storage Facility (MWSF) in PER-613 at PBF. Nonradioactive and nonhazardous material is reused through placement into the INEL excess material system or through the recycling process, or it is buried in the INEL landfill. The criteria for the reuse, recycling, storage, or disposal of all INEL waste/material are contained in DOE-ID-10381, *INEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria.*[8]

All D&D projects are required to implement the precepts of pollution prevention. Pollution prevention opportunity assessments are performed during the planning phase of each D&D project and applicable pollution prevention/waste minimization practices are incorporated into D&D Plan requirements. Waste volume reduction is accomplished by processing certain low-level wastes at the Waste Experimental Reduction Facility (WERF) before disposal at RWMC. WERF volume reduction capabilities include incineration, compaction, and metal component size reduction.

Reuse and reclamation of valuable equipment, material, or facilities is a major consideration factored into the planning of a D&D project. Economic savings because of resource recovery receive high priority weighting in the decision analysis. The D&D Program initiates actions required to transfer custodianship and ensure the availability of material and equipment to other facilities or users.

3.7 Release Criteria

D&D release criteria specific to INEL application were developed in 1986 and described in EGG-2400, *Development of Criteria for Release of INEL Sites Following D&D*.[9] Use of this document for the release of INEL sites has been discontinued due to revised DOE requirements.

Release of an INEL decommissioned facility or site must currently comply with the requirements of DOE Order 5400.5, *Radiation Protection of the Public and the Environment, Chapter IV, Residual Radioactive Material*.[10] Guidelines for residual concentrations of radionuclides shall be derived from the basic dose limits by means of a project specific pathways analysis. The basic public dose limits for exposure to residual radioactive material, in addition to natural occurring "background" exposures, are 100 mR effective dose equivalent in a year. The monitoring, cleanup, and control of residual radioactive material are also subject to the DOE "as low as reasonably achievable" (ALARA) policy. The effective dose equivalent requires the weighted summation of doses to various organs of the body, as determined from the pathways analysis. The Environmental Protection Agency (EPA) and Nuclear Regulatory Commission (NRC) have each recently proposed rules governing radiological criteria for site cleanup and decommissioning, with both organizations proposing a 15 mR per year limit. EPA's regulations, when approved, would most probably apply to DOE sites.

DOE Order 5400.5 suggests the implementation of DOE/CH 8901, *A Manual for Implementing Residual Radioactive Material Guidelines*,[11] which specifies the use of a pathways analysis computer code termed "Residual Radioactive Material Code for Soils" (RESRAD). Another code, "RESRAD-BUILD", calculates the effective dose equivalent via a pathways analysis, from residual radioactivity in buildings. Its guidance document is ANL/EAD/LD-3, *RESRAD-BUILD: A Computer Model for Analyzing the Radiological Doses Resulting from the Remediation and Occupancy of Buildings Contaminated with Radioactive Material*.[12] The RESRAD code was utilized in FY 1994 to verify site release of the INEL's CFA-669 Hot Laundry D&D site. The code calculated the effective dose equivalent out to a 1000 year timeframe, with the maximum dose at approximately 15 mR per year.

Post D&D radiation and contamination levels are compared to the applicable release limits. Controls are then established for those facilities not meeting release limits, depending on planned use. These controls may range from restricted access with physical and administrative barriers, to minimal security controls common to all INEL areas. Completed D&D projects will basically fall within the following categories:

- Unrestricted release for programmatic use—The facility or area is decontaminated until no hazard exists and is considered radiologically clean, permitting unrestricted full-time occupancy.

- Restricted release for use by DOE-ID approved programs—The facility or area is decontaminated to minimize remaining hazards. However, access may be restricted, depending on cleanup success. The facility or area is removed from D&D Program responsibility and transferred to the appropriate operating program.

- Radiologically contaminated at a level that makes occupation for programmatic use impractical—These facilities or areas will remain under assigned custodianship. Long-range surveillance and maintenance planning must be included in budget appropriations.

3.8 Program Directives

The LITCO *Management Control Procedures for Environmental Restoration*[13] establish the policy, procedure, and guidance for conducting the administrative and technical processes of the LITCO D&D Program. In addition to providing general administrative, documentation control, quality, and safety procedure, the manual contains detailed guidance for D&D activities. Specific D&D program requirement procedures include the following:

- D&D surveillance and maintenance program
- Preparation of D&D project characterization and decision analysis reports
- Radioactive waste disposal
- Preparation of project D&D Plans
- Decommissioned Site marker requirements
- Maintenance of D&D project data files
- Preparation of D&D project final reports
- Release criteria for INEL D&D projects
- Removal of surplus facilities from the D&D Program inventory.

3.9 Compliance

The *Quality Program Plan for the Environmental Restoration Program*, QPP-149,[14] defines the quality program for the LITCO D&D Program. This quality program plan addresses codes, standards, and regulations applicable to the D&D Program and encompasses the quality program elements of configuration control, process control, inspection, waste storage and handling, nonconformance action, and records. A revised quality program plan, specifically written for the INEL D&D Program, is currently being developed and will be available in FY 1996.

The provisions of the LITCO *Safety Manual*,[15] *Radiological Controls Manual*,[16] and *Industrial Hygiene Manual*,[17] which incorporate applicable DOE directives and provide the safety requirements for industrial and radiological conditions associated with D&D activities, are invoked without exception. "As low as reasonably achievable" (ALARA) radiation goals are mandated and are included in the planning of D&D projects.

Environmental compliance is a major consideration during all phases of D&D activities. D&D projects must comply with the applicable environmental protection requirements of DOE, other Federal agencies, and the State of Idaho. The unique requirements of these agencies must be identified early in the project planning to avoid project delays, penalties, and possible compromise of state and Federal environmental objectives. Implementation requirements at the INEL are provided and documented by the *Environmental Compliance Planning Manual at the INEL*, DOE/ID-10166.[18] Principal environmental regulations and statutes potentially applicable to D&D projects include the following:

- NEPA
- RCRA
- CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- National Historic Preservation Act (NHPA)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- State Air Permit.

4. CURRENT ACTIVITIES

This section discusses the progress and accomplishments of the active INEL D&D Projects since the issuance of the last INEL D&D Long-Range Plan, Revision 9, October 1993[19]. A summary status and progress report for each of the current surplus facility projects is provided as follows:

4.1 Auxiliary Reactor Area-I

The project will result in the removal and disposal of all ARA-I area buildings and structures. There are two main buildings in the area, one of which contains adjacent hot cells involving significant radiological contamination. An underground contaminated waste storage tank containing transuranic/hazardous mixed waste will require treatment prior to disposal. Major project accomplishments through July 1995 are as follows:

- FY 1993 — Completed the Characterization and Decision Analysis Report.[20]
- FY 1994 — Completed the D&D Plan[21] to accomplish the specific removal of the ARA-729 Hot Waste Tank.
- FY 1995 — Completed a supplementary Characterization Report[22] to better characterize the transuranic and hazardous contaminants in the hot cells and hot waste tank. Completed a D&D Plan[23] for the specific removal of the ARA-627 Shop and Maintenance Building.

4.2 Auxiliary Reactor Area-II

The project will accomplish the demolition and removal of all buildings, structures, and utilities within the ARA-II area. Included are 7 metal buildings and one cinder block facility. Major project accomplishments through July 1995 are as follows:

- FY 1991 — Completed the update of the Characterization and Decision Analysis Report.[24]
- FY 1992 — Completed D&D Plan[25] and Safety Analysis Report.[26] Completed asbestos removal and initiated the disposal of heavy equipment associated with the cleanup of the Army Stationary Low-Power Reactor (SL-1) accident at ARA-II in 1961.
- FY 1993 — Completed disposal of SL-1 heavy equipment.
- FY 1994 — Initiated demolition and disposal of area structures.
- FY 1995 — Completed demolition and disposal of all above ground buildings and structures.

Excavation of underground utilities and foundations, and soil cleanup, have not been performed. Current planning is being finalized and will probably result in no removal and the installation of a soil cap in FY 1996.

4.3 Auxiliary Reactor Area-III

The original ARA-III project objectives involved the removal of 2 stacks and 3 waste tanks, and the decontamination and release of all area buildings for future use. Because no programmatic use for the area has been identified, current plans now include total demolition of all 7 area buildings and associated structures. Major project accomplishments through July 1995 are as follows:

- FY 1991 — Completed the update of the Characterization and Decision Analysis Report.[27]

- FY 1992 — Completed the D&D Plan[28] and Safety Analysis Report.[29]

- FY 1993 — Initiated cleanup of area structures.

- FY 1994 — Completed original objective scope by removing the majority of radiologically contaminated materials and structures from the area. Completed the Final Report[30] for this initial project phase.

- FY 1995 — Initiated removal of asbestos materials in preparation for total building and structure demolition and removal.

Current plans for proceeding with total demolition are dependent upon funding approval.

4.4 Army Reentry Vehicle Facility Site (ARVFS) NaK

The objectives and responsibilities for this D&D project have been subject to several changes over the last few years. The original D&D objectives involved chemical treatment of 4 containers of radioactively contaminated NaK stored in the ARVFS bunker, and subsequent disposal of the solidified residue. Current efforts involve transportation to EBR-II for eventual treatment at that facility. The D&D Program is not currently involved with this effort.

- FY 1991 — Conducted nonradioactive NaK/chlorine reaction prototype testing.

- FY 1992 — Converted system to NaK/water reaction testing instead of the NaK/chlorine reaction testing. Prototype testing halted as a result of compliance concerns with the treatment system.

- FY 1993 — Placed treatment facility in a safe standby mode. Evaluation of alternatives resulted in pursuit of private sector services for transportation and treatment of the ARVFS NaK.

- FY 1994 — Completed Auditable Safety Analysis[31] for the storage and handling of the ARVFS NaK containers.

- FY 1995 — Completed a design and planning package to accomplish the transport and treatment of the ARVFS NaK at EBR-II.

4.5 BORAX V

Only the below grade portion of the BORAX V Reactor Building remains to be completed. This Reactor Building basement area contains miscellaneous equipment, piping, and two reactor vessels. Major project accomplishments through July 1995 are as follows:

- FY 1991 — Initiated field activities with the removal of three underground storage tanks, an electrical substation and overhead power lines, and 90% of radiologically contaminated equipment from the Turbine Building.

- FY 1992 — Completed D&D of the Turbine Building and demolition of its decontaminated foundation/basement to 6 feet below grade.

- FY 1993 — Completed the Final Report[32] on the D&D of the BORAX-V Turbine Building. Completed the Safety Analysis Report[33] and the D&D Plan[34] for the D&D of the BORAX-V Reactor Building.

- FY 1994 — Revised the Safety Analysis Report[33] and D&D Plan[34] to incorporate entombment activities.

- FY 1995 — Project delayed.

This project is currently delayed until FY 1996. Entombment of the Reactor Building basement has been selected as the D&D mode and will require the addition of concrete to the reactor vessels and the installation of an engineered concrete cap.

4.6 CFA-669 Old Hot Laundry

This project has been completed and accomplished the total demolition and removal of the Old Hot Laundry building located at CFA. Major project accomplishments are as follows:

- FY 1992 — Completed the Characterization and Decision Analysis Report[35], the D&D Plan[36], and the Safety Analysis Report.[37]

- FY 1993 — Completed Readiness Review and initiated field work with removal of contamination and asbestos from the building.

- FY 1994 — Completed building demolition and disposal, and graded and reseeded the area.

- FY 1995 — Completed the project Final Report[38] and removed project from the INEL Surplus Facilities List.

4.7 LOFT Ancillaries

The project involves the Loss of Fluid Test (LOFT) Mobile Test Assembly (MTA), a railroad car mounted shielding tank module of the LOFT reactor core; several fuel handling fixtures and equipment; and two fuel transport casks. Only the MTA remains to be completed. Major project accomplishments through July 1995 are as follows:

- FY 1992 — Completed the Characterization and Decision Analysis Report for the MTA.[39] Initiated cleanup and disposal actions on the fuel handling fixtures and equipment.

- FY 1993 — Dispositioned all LOFT Ancillary items except for the MTA. Completed the MTA D&D Plan.[40]

- FY 1994 — Project delayed

- FY 1995 — Project delayed

The MTA remains in outdoor storage, encased in a stripable paint to prevent contamination spread. D&D is scheduled to be performed within the TAN-607 Hot Shop which will not be available for this task until FY-1999 due to conflicting activities.

4.8 SPERT IV Waste Holdup Tank

This project has been completed. Cleanup activities required the removal and on site treatment of the SPERT IV Waste Holdup Tank sludge which contained quantities of Uranium, Plutonium, and several heavy metals. Following sludge removal, the 61,000 gallon tank and associated underground piping were removed, sized, and disposed. Major project accomplishments are as follows:

- FY 1991 — Completed Safety Analysis Report[41] and updated the D&D Plan.[42]

- FY 1992 — Completed Readiness Review and initiated field cleanup activities.

- FY 1994 — Completed project field activities and the Final Report[43], and removed the project from the INEL Surplus Facilities List.

4.9 TAN-607 Decon Shop

This project has been completed. Project activities included removal of process system tanks and air filter units, and decontamination of the shop floors, walls, and ceiling.

- FY 1994 — Completed the Characterization and Decision Analysis[44], and completed the project by removing radiological contamination and releasing the facility for programmatic reuse. Completed the project Final Report[45] and removed the project from the INEL Surplus Facilities List.

4.10 TAN Technical Support Facilities

D&D cleanup activities on this project were not scheduled to begin until FY 1999[19], however facility characterization and an interim remedial action to maintain radiological containment were scheduled for FY 1993 and FY 1994. The project includes the TAN-616 Liquid Waste Treatment Facility, the TAN-606 Calibration Well, and the TAN-007 Sewage Disposal Plant. The TAN-011 IET Valve Pit was transferred to TAN Waste Area Group responsibility for cleanup under CERCLA requirements. Major project accomplishments through July 1995 are as follows:

- FY 1993 — Completed the TAN-011 IET Valve Pit as a CERCLA removal action. Completed the TAN-616 Liquid Waste Treatment Facility remedial action which accomplished the removal of a roof cooling tower and associated equipment and installed a temporary roof. Issued the Final Report[46] for this action.

- FY 1994 — Completed the Characterization and Decision Analysis for the TAN-616 Liquid Waste Treatment Facility.[47] Assessment and closure of the TAN-606 Calibration Well was completed and Final Report[48] issued.

- FY 1995 — Completed system upgrades and refurbishment (non-D&D activity) of the TAN-007 Sewage Disposal Plant. Per current planning, system will now be utilized until the year 2015 and no D&D activities will be pursued until then.

Dismantlement and demolition of the remaining TAN/TSF project, the TAN-616 Liquid Waste Treatment Facility, is now scheduled to begin in FY 1997.

4.11 Materials Test Reactor

Characterization and planning activities on this project were scheduled to begin in FY 1996.[19] The project involves 17 major buildings/structures associated with the MTR, a deactivated 40 MW light water test reactor. Characterization of selected areas was performed in FY 1995 to supplement the project Characterization Report.[49]

4.12 Engineering Test Reactor

Characterization and planning activities on this project were scheduled to begin in FY 1996.[19] The project involves 12 major buildings/structures associated with the ETR, a deactivated 175 MW light water test reactor. Characterization of selected areas was performed in FY 1995 to supplement the project Characterization Report.[50]

4.13 Service Waste Diversion Facility

D&D field activities on this project are scheduled for FY 1996. This project consists of CPP-631, Radioactive Lanthanum (RaLa) Offgas Building, CPP-734, West Side Service Waste Monitoring Station, and CPP-709, East Side Service Waste Monitoring Station. These facilities diverted wastes from the CPP-601 fuel processing building and were designed to prevent the release of radioactive solutions to the environment. Major project accomplishments through July 1995 are as follows:

- FY 1993 — Completed Characterization and Decision Analysis Reports[51, 52, & 53] for the 3 buildings.

- FY 1994 — Completed the D&D Plan.[54]

- FY 1995 — Project documentation ready to perform readiness review and initiate field cleanup activities.

4.14 CPP-740/SFE-20

D&D assessment activities on this project are scheduled to begin in FY 2000. The project includes the SFE-20 hot waste tank, used to collect low level liquid wastes, and the CPP-740 settling basin, used to separate solids from a filter backwash slurry. Major project accomplishments through July 1995 are as follows:

- FY 1994 — The CPP-740 basin sludge was removed as part of a CERCLA removal action.

- FY 1995 — The top of the basin will be backfilled this year to stabilize the area until D&D cleanup activities can be initiated in FY 2001.

4.15 Waste Calcine Facility

D&D activities on this project have not been started. The facility was used to convert high level radioactive liquid waste into granular solids via a process utilizing high level waste feed tanks, a calciner vessel, and off-gas cleanup systems. In FY 1993, a Memorandum-of-Agreement between EM-40 and EM-60 was signed transferring responsibility for the facility from EM-40 to EM-60 to complete the deactivation process. Transfer back to EM-40 and initiation of D&D assessment is scheduled in FY 1998.

4.16 Headend Processing Plant

D&D activities on this project have not been started. The facility, CPP-640, housed two unique fuel reprocessing headend systems and a liquid waste handling system. Project responsibility was transferred to EM-60 in FY 1993 to complete the deactivation process which will involve removal of over 100 kg of highly enriched uranium. Transfer back to EM-40 and initiation of D&D assessment is scheduled in FY 2001.

4.17 High Level Waste Tank Farm

D&D activities on this project have not been started. The project involves 11 interconnected 300,000 gallon stainless steel tanks and associated concrete vaults that were used to store high level liquid radioactive waste generated as a result of fuel reprocessing activities. The tanks are currently being deactivated under EM-60 responsibility by emptying the tanks and treating the liquid waste. Transfer to EM-40 and initiation of D&D assessment is scheduled in FY 2000.

4.18 Fuel Processing Building

D&D activities on this project have not been started. The facility, CPP-601, contains systems for recovering uranium from various types of spent nuclear fuels. Facility deactivation is currently being performed by EM-60 with scheduled transfer to EM-40 in FY 1998 to initiate D&D assessment activities.

4.19 Fuel Receipt and Storage Facility

D&D activities on this project have not been started. The facility, CPP-603, consists of a concrete hot cell used to conduct nuclear fuel cutting operations, and three 19 ft deep storage basins connected by a transfer canal. Deactivation activities, under EM-60 responsibility, will involve the removal of spent fuel from the facility. Transfer to EM-40 and initiation of D&D assessment is scheduled in FY 2001.

5. LONG-RANGE PLAN OF ACTIVITIES

A detailed discussion of the various program management aspects of planning a Long-Range D&D Program is provided in the following sections. Specific INEL resource allocations (including funding, manpower, and equipment), infrastructure needs and development, equipment requirements, technology development, and program risks are addressed.

5.1 Resource Allocations

There are three major resources required to perform D&D projects: 1) funding, 2) manpower, and 3) equipment. The first and most important is the funding necessary to actually perform characterization, engineering, planning, and physical work. All facilities currently on the INEL surplus inventory were ranked using the priority factors described in Section 3.4. Based on assigned priorities, available resources, and DOE projected funding allotments, an INEL long-range plan of D&D activities is maintained and presented in Figure 7, *INEL D&D Projects Cost and Schedule*. Cost and schedule estimates are provided for each INEL D&D project out to FY 2010.

The priorities and funding identified in this plan are subject to change. Cost estimates submitted for out-year projects are preliminary and will be adjusted after characterization is complete and a more thorough work scope is developed. Changes in project start and finish dates are also expected because of priority changes and funding availability. Schedules and cost estimates are revised annually to meet INEL D&D Program needs. A relatively stable level of funding for D&D projects is desirable for maintaining cost effective allocation of resources.

Manpower requirements to perform specific work tasks will drive the mix of trained and qualified personnel necessary to accomplish the scheduled D&D projects. Detailed planning and scheduling of the individual project personnel requirements will allow the INEL to obtain the appropriate mix to support future D&D projects by providing accurate manpower projections. The current DOE yearly funding appropriations system may impact this personnel mix on a yearly basis depending upon the shift in priorities or INEL mission emphasis. Figure 8, *INEL D&D Program Manpower Projections*, shows the manpower requirements necessary to perform the D&D operations according to the current DOE funding profiles/schedules. As DOE funding profiles/schedules change, manpower projections will shift accordingly.

Equipment requirements to perform specific work tasks will drive the required mix of general and specialized equipment necessary to accomplish the scheduled D&D projects. Detailed planning and scheduling of the individual equipment will allow the INEL to procure or lease the appropriate equipment to support future D&D projects by providing accurate equipment projections. The current DOE yearly funding appropriations system may impact this equipment need on a yearly basis depending upon the shift in priorities or INEL mission emphasis. Future revisions of this Long Range Plan will include a figure depicting equipment requirements related to D&D operations according to the current DOE funding profiles/schedules. This information is currently being input into the baseline resource loaded schedule and is not available for inclusion into this revision of the INEL D&D Long-Range Plan.

95BUGET, Revision 0, dated 29-Aug-95
Prepared by DJ Kenoyer, SA LaBuy

Project Description	*ADS No.*	*Prior Years & FY94*	*FY95*		*FY96*	*FY97*	*FY98*	*FY99*	*FY2000*
ARA-I	52EG	1,094,800	605,844		1,204,457	2,025,104	1,241,351		
ARA-II	48EG	3,923,900	901,949		1,246,285	1,290,700			
ARA-III	49EG	2,987,200	0		40,412	40,412	3,024,955	201,208	
BORAX-V	63EG	3,866,800	95,668		952.017				
LOFT Ancillaries	65EG	9,600	40,999		9,050	40,999	9,050	971,001	
ETR	60EG	258,300	232,338		77,781	29,988	564,481	1,020,295	2,886,394
MTR	54EG	69,200	30,916		29,987	29,987	598,441	1,131,217	2,778,759
Programmatic Support	111E1	2,676,700	586,643		508,513	508,513	508,513	508,513	508,513
TAN/TSF	51EG	977,500	51,006		50,993	442,692	606,243	804,068	441,326
ARVFS NaK	46EG	5,655,136	874,042		369,212				
WCF	1309-WN	53,000	102,387		0	0	874,272	945,978	935,291
CPP-631/709/734	1306-WN	120,600	249,997		649,980	685,606			
SFE-20/740	1305-WN	76,300	102,049		45,169	45,169	45,169	45,169	974,498
CPP-640	1307-WN	45,900	102,940		0	0	0	0	0
Tank Farm	1310-WN	0	0		0	0	0	0	558,614
CPP-601	1308-WN	0	102,940		0	0	1,030,020	1,892,702	2,798,026
CPP-603	1304-WN	0	0		0	0	0	0	20,570
Subtotals (All Activities)		21,814,936	4,079,718		5,183,856	5,139,170	8,502,495	7,520,151	11,901,991

Figure 7. INEL D&D Project Costs and Schedule.

FY96 Budgeting (FY1994 - FY2010)

FY01	*FY02*	*FY03*	*FY04*	*FY05*	*FY06*	*FY07*	*FY08*	*FY09*	*FY10*	*Totals*
										6,171,556
										7,362,834
										6,294,187
										4,914,485
										1,080,699
,596,710	5,935,022	6,470,279	6,470,271	5,983,985	4,993,695	3,991,134	267,238			42,777,911
,700,609	5,937,650	6,492,731	4,996,853	3,996,517	3,133,603					32,926,470
508,513	508,513	508,513								7,331,447
										3,373,828
										6,898,390
0	0	1,203,838	1,454,284	1,589,282	2,198,216	369,999				9,726,547
										1,706,183
,052,088	648,218									4,033,829
772,444	1,500,755	4,219,123	4,133,675	2,053,081						12,827,918
670,261	846,221	2,476,557	5,817,099	6,367,095	6,367,095	6,367,095	1,672,839	369,999		31,512,875
,203,838	5,817,100	6,357,095	6,357,095	1,672,839	369,998					27,601,653
,088,293	931,328	1,203,838	1,454,284	1,589,282	2,198,216	369,999				8,855,810
,592,756	22,124,807	28,931,974	30,683,561	23,252,081	19,260,823	11,098,227	1,940,077	369,999	0	215,396,622

LITCO ER D&

Baseline, Revision 0, dated 29-Aug-95

Prepared by DJ Kenoyer, SA LaBuy   Full Time Equivalent ==>   2080 Manhours per year

Project Description	*ADS No.*	*Prior Years & FY94*	*FY95*		*FY96*	*FY97*	*FY98*	*FY99*	*FY2000*
ARA-I	52EG				7	13	8		
ARA-II	48EG				7	7			
ARA-III	49EG				0	0	23	1	
BORAX-V	63EG				7				
LOFT Ancillaries	65EG				0	0	0	3	
ETR	60EG				1	0	5	4	1
MTR	54EG				0	0	6	6	[illegible]
Programmatic Support	111E1				3	3	3	3	
TAN/TSF	51EG				0	3	4	5	
ARVFS NaK	46EG				1				
WCF	1309-WN				0	0	4	4	[illegible]
CPP-631/709/734	1306-WN				2	1			
SFE-20/740	1305-WN				0	0	0	0	
CPP-640	1307-WN				0	0	0	0	[illegible]
Tank Farm	1310-WN				0	0	0	0	
CPP-601	1308-WN				0	0	7	9	[illegible]
CPP-603	1304-WN				0	0	0	0	[illegible]
Subtotals (All Activities)		0	0		27	28	60	36	[illegible]

Figure 8. D&D Manpower Projections

FY96 Manpower Projections (FY1994 - FY2010)

FY01	*FY02*	*FY03*	*FY04*	*FY05*	*FY06*	*FY07*	*FY08*	*FY09*	*FY10*	*Totals*
										28
										13
										25
										7
										4
6	24	25	24	25	25	13	1			166
10	27	27	27	15	15					143
3	3	2								23
										15
										1
0	0	3	3	3	4	3				27
										3
4	2									12
14	14									37
3	3	10	10	10	10	3				54
3	10	10	10	3	3					65
5	6	3	3	3	4	3				25
48	89	80	77	58	60	22	1	0	0	646

5.2 Infrastructure Needs and Development

The volume estimates of the various waste types to be generated by a D&D project are updated on a semi-annual basis and included in the *Waste Stream Projections for the Environmental Restoration Program at the INEL*, DOE/ID-10417[7]. As DOE funding profiles/schedules change, affecting work scope tasks, waste stream projections will shift accordingly. An INEL D&D waste stream projection spreadsheet is currently being developed to accurately provide project waste projections based upon the most current funding profiles and schedules. This data will be presented in future Long Range Plan revisions.

The D&D Waste Stream Projections will directly impact the Radioactive Waste Management Complex (RWMC) design life expectancy, INEL Bulk Landfill design life expectancy, and D&D Program disposal techniques. The RWMC has a projected remaining design life of approximately 7 years and the INEL Bulk Landfill has a projected remaining design life of approximately 10 years, based upon current projected INEL waste disposal rates. In the early engineering phase is the study of RWMC "Enhanced Storage Capacity Designs" which could expand the remaining design life of the RWMC to 17 years.

The current INEL policy for waste disposal provides separate funding to operate disposal operations and the waste generators are ***not*** charged a disposal fee. This practice is being scrutinized and is scheduled to be changed to simulate the commercial sector, where disposal fees are charged on a per unit basis to the waste generators. This will provide an economic incentive for waste generators to implement waste minimization principles. Current plans will implement a pilot "charge-back" program to be run in FY 1996, with full implementation targeted for FY 1997. The INEL D&D Program currently practices waste minimization and material reuse/recycle as a "Best Management Practice," due to the currently limited RWMC and Bulk Landfill space available.

The RWMC and Bulk Landfill are in the process of changing their acceptance criteria outlined in the *INEL Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC)*[8] to include specific recyclable materials acceptance criteria. Specifically, the RWMC will no longer dispose of radioactive scrap metal (RSM), but accept it for segregation and storage until shipped to RSM Program recyclers, while the Bulk Landfill will no longer dispose of scrap metal, but accept it for segregation and storage until excessed by local/regional scrap metal recyclers. These revised acceptance criteria will force waste generators to segregate their materials and extend the design life of INEL disposal facilities.

The INEL roadway and railroad infrastructure must be maintained or upgraded to meet the future D&D transportation needs for shipping waste to INEL or commercial disposal sites. The main highway from TAN to CFA was reworked and upgraded in 1990. Engineering is currently investigating the design and construction of an overpass to the RWMC to eliminate the need to cross of State Highway 26.

There is no connecting rail system on-site from TAN to CFA, this means that rail shipments must leave the INEL site boundry and are then subject to all applicable DOT rules and regulations. All other on-site rail systems connect to the RWMC and CFA. The RWMC rail spur is not currently certified for railcar traffic and must be "re-certified" prior to any shipments being made over this rail spur. Some of the rail systems are in a state of "disrepair" which must be corrected prior to utilization. These two items may cause some impacts to the D&D Program in the future, since the TAN D&D schedule is being accelerated in order to completely restore the area by 2015.

5.3 Equipment Requirements

The need for specialized decontamination and demolition equipment, both manual and remote, will increase as the INEL D&D Program moves forward. The D&D Program utilizes approximately 30 pieces of Government Furnished Equipment (GFE) which has been procured by DOE-ID over the last two to three years. The INEL D&D Program equipment list is shown in Figure 9. Cost analysis has shown that the procurement, operation, and maintenance of equipment is cheaper than using rental equipment to perform similar tasks. Also, the risk of radiological contamination of the equipment precludes the use of rental equipment. Such equipment would have to be procured if the equipment could not be "free released." The standard heavy construction equipment and specialized demolition equipment (e.g., LaBounty hydraulic shear and a Case 9060 tracked excavator with concrete crusher attachment) are used to automate D&D operations as much as possible, reducing the personnel safety risks associated with manual demolition work.

The INEL has a current need for three dedicated D&D crews of approximately 11 men each that are fully supported by these 30 pieces of GFE. As the INEL D&D Program grows, the need for additional dedicated D&D crews will increase, as will the need for additional GFE to support these crews. If this same ratio of equipment to dedicated D&D crews is maintained for future work at the INEL, it can be estimated from Figure 8 that there is a need for approximately 20 additional GFE items within the next 3-5 years.

Due to the distance separating sites at the INEL, the future work at TAN will require additional equipment to alleviate transportation logistical problems. The recent priority shift to the TAN facilities will result in the deactivation of all TAN facilities by 2005 and all D&D being completed by 2015. This will require the utilization of additional dedicated crews and associated demolition equipment.

5.4 Technology Development

The technology development needs of the INEL D&D Program are outlined in the *INEL Technology Logic Diagram*.[55] This document was developed as a means of providing technical alternatives for specific decommissioning activities, and suggests solutions to problems relating to the five main categories: 1) Characterization, 2) Decontamination, 3) Dismantlement/Demolition, 4) Material Disposition, and 5) Robotics/Automation. D&D operations' immediate need in technology development is for a time efficient, cost effective, secondary waste minimized, concrete surface decontamination technique. Almost all radiologically contaminated surplus facilities have concrete surfaces that need to be decontaminated prior to demolition in order to minimize the disposal volumes of Low-Level Waste (LLW).

Property ID No.	Description	Model Type	Serial No.	Property Category
305242131	Camera Video	Sony SSC520AMS	17601	1-CE / Camera Equipme
305385131	Display Unit	Sony SSM930	S0101024610	1-CE / Camera Equipme
305386131	Camera Video	Sony SSC520AM	S010022117	1-CE / Camera Equipme
307945131	Camera Video	Sony SSC520AM	22118	1-CE / Camera Equipme
071737131	Vacuum Truck	Ford 9000	DYY90W5DVA42690	1-HE / Heavy Equipment
071784131	Lube Truck	Ford F700	1FDPK74A4MVA15514	1-HE / Heavy Equipment
071792131	Dump Truck	Volvo Gem Autocar	4V2SCBCF7RR513165	1-HE / Heavy Equipment
071797131	Lube Truck	Ford F700	DXK74C8RRRRVA16111	1-HE / Heavy Equipment
071798131	Hydroseeder Truck	GMC Topkick	1GDS7H4J6RJ503721	1-HE / Heavy Equipment
071799131	Dump Truck	Volvo Gem Autocar	4V2SCBCF5RR513164	1-HE / Heavy Equipment
075198131	Propane Forklift	Caterpilar V100	60W00487	1-HE / Heavy Equipment
075604131	Hydraulic Crane	Galion C-80	C-80-D6-6817	1-HE / Heavy Equipment
075609131	Vibrating Roller Dsl	Infer Rand 5D70D	5611SHC	1-HE / Heavy Equipment
075620131	Skid Loader	Case J I 1840	JAF0118837	1-HE / Heavy Equipment
075625131	Hydraulic Crane	Grove Hyd RT865B	77726	1-HE / Heavy Equipment
075626131	Front End Loader	John Deere 744E	CK744ED000388	1-HE / Heavy Equipment
075627131	Front End Loader	John Deere 744E	CK744ED000399	1-HE / Heavy Equipment
075628131	Mobile Crane 60 to	Lima 550TC	36634	1-HE / Heavy Equipment
075629131	Sheep Ft. Vibrator	Caterpilar 815B	17Z01495	1-HE / Heavy Equipment
075631131	Front End Loader	Michigan L120	60721	1-HE / Heavy Equipment
075653131	Dozer Tractor	John Deere 850BLT	T0850BH788877	1-HE / Heavy Equipment
075654131	Crawler Tractor	John Deere 750 BLT	T0750BH790205	1-HE / Heavy Equipment
075655131	Earth Scraper	John Deere 862B	T0862BX790767	1-HE / Heavy Equipment
075712131	Crawler Tractor	Caterpilar D8N	5TJ01413	1-HE / Heavy Equipment
076001131	Road Grader	Dresser 870	G780007U200688	1-HE / Heavy Equipment
076647131	Excavator	John Deere 690ELC	DW690EL541707	1-HE / Heavy Equipment
290802131	Mobile Shear	LA Bounty MSD15R	15502	1-HE / Heavy Equipment
71668	Super SAP Truck	Ford F700		1-HE / Heavy Equipment
75291	Forklift	Gehl Co 1083		1-HE / Heavy Equipment
75648	Endloader	Case JI 680L		1-HE / Heavy Equipment
75649	Processor	John Deere		1-HE / Heavy Equipment
75676	Excavator	Case JI	IC9060	1-HE / Heavy Equipment
799000351	Washer Extractor		29336	1-HE / Heavy Equipment
071978131	Towable Generator	Inger Rand E50XWCU	218910UJC811	1-ME / Misc. Equipment
076691131	Manlift	Genie Ind 24522	Z45000981	1-ME / Misc. Equipment
254165131	Pumping System	ADMAC 10320113ED	AA01475-10	1-ME / Misc. Equipment
312244131	Compressor	MSA Quadaire	09089216	1-ME / Misc. Equipment
312245131	Compressor	MSA Quadaire	09019127	1-ME / Misc. Equipment
312246131	Compressor	MSA Quadaire	09019127	1-ME / Misc. Equipment
313621131	Vacuum Pak	Pentek Inc 9A	342607	1-ME / Misc. Equipment
313622131	Scabbler	Pentek Inc Squirrel3	SQL01669	1-ME / Misc. Equipment
319218131	Space Heater	TIOGA FSL16HE	47SS162T0R1008934	1-ME / Misc. Equipment
071906131	Decon. Trailer	Advance LabDTS3210	1A9VHG320P12Y7158	1-TD / Trailer Decon
071907131	Decon. Trailer	Advance LABDT53210	1AGVHG320P1247175	1-TD / Trailer Decon
071908131	Decon Trailer	Advance LABDTS321	1A9VHG322P1247176	1-TD / Trailer Decon

Figure 9. INEL D&D Equipment List.

071910131	Decon. Trailer	Adv Cont DT54010	1A9VXG722P1247160	1-TD / Trailer Decon
071813131	Drop Neck Trailer	Load King 602 DFP T	16620	1-TF / Trailer Field
071849131	Flatbed Trailer	Trailer PL Shop made		1-TF / Trailer Field
071871131	Tilt Top Trailer	Econoline TG324FT	1E9TGJ326P1094045	1-TF / Trailer Field
071902131	Diversified Trailer	Wells Cargo	1LL200L2101000426	1-TF / Trailer Field
316670131	Lowboy Trailer	TWAMCO STLBHT3	SQL01669	1-TF / Trailer Field
71917	Trailer Semi Van	Utility 28 ft.	MC528102	1-TF / Trailer Field
71976	Trailer	Wells Cargo CW142		1-TF / Trailer Field
71983	Heating Trailer	Allmand BR MHTL12	9312H02	1-TF / Trailer Field
071929131	Office Trailer	Advance	1A9VXG7241247161	1-TO / Trailer Office
071965131	Office Trailer	Gelco	88795	1-TO / Trailer Office
130978131	Office Trailer	Northwest 8x28	92094	1-TO / Trailer Office
130979131	Office Trailer	Northwest 8x28	92095	1-TO / Trailer Office
071398131	Pickup Crew Cab	Chevrolet Chey 3500	1GCHK33N6PJ390659	1-V / Vehicle
071399131	Pickup Crew Cab	Chevrolet Chey 3500	1GCHK33N4PJ395312	1-V / Vehicle
71486	Dodge Van	Ram 350		1-V / Vehicle

Figure 9. (continued)

At the INEL the most accepted practice of concrete decontamination is the utilization of mechanical scabbling devices and high-efficiency particulate air (HEPA) filter vacuums. Carbon Dioxide and water blasting systems are being investigated for utilization as a surface decontamination technology and are the next readily available technology that may be implemented at the INEL in the near future.

The other major technology need, which will be required in the next 3-5 years, is for robotic/automation systems capable of utilizing multiple end-effectors to perform a variety of work tasks, such as characterization sampling and surveys, decontamination, and demolition. There are several technologies currently being developed to specifically meet these needs in the Technology Development Branch of EM-50. These will start field demonstrations at various DOE sites within the next 1-2 years. The INEL has proposed to be utilized for field demonstrations of the remote telescopic manipulator in 1996 and 1997.[56] This field demonstration would occur at the Engineering Test Reactor (ETR) and the Idaho Chemical Processing Plan (ICPP) 601 "J" Cell.

5.5 INEL Transition of Surplus Facilities

The most recent effort for the long range planning and integration of surplus facilities is the *INEL Surplus Building and Structure Transition Plan*.[57] This plan will outline the EM-60 schedule for the demolition of their surplus facilities under the Facilities Demolition Initiative (FDI). Many of these facilities will go through the transition or deactivation process, in which EM-60 removes spent fuel and/or hazardous materials prior to transfer into EM-40. This plan has several tables that outline these transfers through building/structure listings identifying EM-60/EM-40 responsibilities and prioritized scheduling details. This plan is scheduled to be published by September 1995.

The INEL is currently undertaking a large engineering effort that will accomplish the integration of all EM programs and provide a comprehensive integrated site plan encompassing all waste streams and facilities from current status to final site remediation and waste disposition. The Environmental Management Integrated Plan (EMIP), prepared by LITCO, will supersede the current Waste Management Program Plan (DOE/ID-10429, Revision 1, June 1994) and the ICPP Strategic Implementation Plan (WIN-365, Revision 2, September 1994). The EMIP is scheduled to be published September 30, 1995.

There are three major initiatives at the INEL which will bring additional facilities into the EM-40 program and that will require an extensive characterization, planning, engineering, and estimating prior to accomplishment of physical work tasks necessary to perform the selected D&D alternative. These are listed below and discussed briefly:

- The INEL "Spent Fuel Consolidation Initiative" will gather all spent nuclear fuel from the various outlying storage facilities, specifically TAN and TRA, and relocate the spent fuel to the ICPP for long term storage in a seismically certified facility. This effort will accelerate the deactivation and transfer of these facilities to EM-40.

- The EM-60 "Facility Demolition Initiative" (FDI) will consolidate INEL site personnel and services to newer facilities and demolish older, high maintenance, and energy inefficient facilities. This will reduce overall operational costs at the INEL and reduce the risks to INEL personnel working in and around these old facilities. Many INEL facilities are 45 to 50 years old and have exceeded their design life. This initiative is currently active with many CFA facilities undergoing demolition in accordance with the completion of several new buildings.

- The "TAN Restoration Initiative" will deactivate all TAN facilities by 2005, accomplish their D&D or demolition by 2015, and transfer the area from DOE-ID to the Bureau of Land Management.

Appendix C consists of a summary database listing of all radiologically contaminated INEL facilities that will eventually undergo the deactivation/D&D process. This spreadsheet calculates surveillance and maintenance, deactivation, and structure demolition costs based upon facility size, magnitude of hazardous or radiological contamination, and the expected characterization required. Future INEL D&D planning will require complete integration with the deactivation process. The start and finish dates utilized in the Appendix C spreadsheet reflect the initial results of this integration effort.

5.6 Program Risks

There are several issues and concerns that could have an adverse impact on the INEL D&D Program. Current unresolved issues involving CERCLA implementation, funding stability, and surplus facility inventory discrepancies will probably result in increased program costs and schedule durations, increased facility S&M costs, and unrealistic estimates of future D&D resource needs and generated wastes.

5.6.1 Performing D&D Operations Under CERCLA Regulations

DOE-HQ is currently developing guidance for the utilization of CERCLA regulations on certain DOE D&D operations which have typically been accomplished under RCRA regulations. The utilization of the CERCLA process will almost certainly increase costs and extend completion schedules due to more rigorous requirements and the public involvement/review/comment process required during the planning phase. Current guidance on the use of CERCLA for D&D operations is provided in Chapter 2 of the *Decommissioning Resource Manual*[3], and a DOE/EPA Policy Memorandum dated May 22, 1995, with the subject title: *Policy on Decommissioning Department of Energy Facilities Under CERCLA.*[58]

5.6.2 Outyear Funding Reductions for D&D Operations

Due to the current down-sizing efforts within the Federal Government, the INEL D&D Program is subject to the risk of the funding to perform D&D field operations being delayed. Delay of field operations for multiple years would result in continuing surveillance and maintenance (S&M) work tasks on the delayed projects. These project S&M costs would tend to increase in the outyears as the facilities age. Most of the INEL facilities were built in the 1940s and 1950s and are approaching 40 to 50 years of age (design life of a nuclear facility is approximately 40 years), and require considerable S&M to maintain their integrity. Radiological containment and industrial worker safety is a prime concern. Further, if the INEL D&D Program funding is reduced to minimal field operations, the expertise and training of dedicated D&D crews will be lost.

5.6.3 INEL D&D Surplus Facility Inventory Discrepancy

It is recognized that the current INEL D&D Surplus Facilities List, which is the basis for future planning and DOE funding requests, includes only a fraction of the probable D&D projects that will require D&D in the next 20 years. The concern is that there are no current baseline estimates of the total INEL D&D scope, and therefore realistic funding, schedule, resource need, and waste estimates do not exist. The LITCO EM-60 Facility Transition and Management Program is developing disposition plans for all projected INEL facilities, which will improve the situation.

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Appendix A

INEL D&D Project History

Appendix A

INEL D&D Project History

Historical data for D&D activities completed at the INEL is summarized in the following tables.

Documentation developed for various phases of D&D activities is based upon DOE-HQ D&D Program guidelines and EG&G Idaho D&D Program Directives. A tabulation of INEL D&D documentation is presented in Tables A-1 and A-2 and provides references documenting the various D&D activities ranging from initial characterization efforts through project completion.

Tables A-3 and A-4 list all INEL facilities for which D&D is currently in progress or has been completed, and provides data summaries of start and finish dates, estimated and actual costs, waste volumes, and the mode of D&D.

Table A-1. Tabulation of INEL D&D documentation—completed projects.

INEL Decontamination & Dismantlement - Projects Listing / Documentation

DDLRPR10, Revision 10, Dated 31-Aug 95
Prepared by RJ Buckland, DJ Kenoyer, SA Laduy

INEL ER Inactive Sites Dept.

D&D Project Description	*Characterization Report*	*Date*	*Decision Analysis Report*	*Date*	*Health & Safety Plan*	*Date*	*Transport Plan*	*Date*	*Safety Analysis Report (SAR)*	*Date*	*D&D Plan*	*Date*	*D&D Final Report*	*Date*
Previous FYs (FY75 to FY92)														
EBR-1 Complex	Note C		Note C						ANCR-1243		Note C		ANCR-1242	Jul-75
MTR Overhead Reservoir	Note C		Note C								Note C		ANCR-1257	Oct-75
Hallam Reactor Components									PR-W-78-013	May-78	WMP-77-18	Dec-77	PR-W-78-018	Sep-78
SPERT IV Reactor Facility	Note A		None								PR-W-79-002	Feb-79	TREE-1373	Aug-79
OMRE Leach Pond	PR-W-79-029	Sep-79	Note B								PR-W-79-003	Jan-79	None	
OMRE Reactor Facility	Note C		None						PR-W-78-010	Apr-78	WMP-77-17	Dec-77	EGG-2059	Sep-80
SPERT II & III Reactor Buildings	None		None										EGG-2074	Feb-81
TAN Rad Liquids Evaporator (PM-2A)	PR-W-80-018	Aug-80	None						WM-F1-81-017	Aug-81	PR-W-78-022	Jan-82	EGG-2236	Mar-83
S1G Reactor Vessel	None						WM-F1-83-007	Aug-83	WM-F1-83-015	Jun-83	WM-F1-83-001	Aug-83	EGG-2298	Sep-84
MTR-657 Plug Storage Facility	WM-F1-81-020	Sep-81	WM-F1-83-005	Feb-83							WM-F1-83-008	May-83	EGG-2286	Jan-84
SPERT I Seepage Pond	WM-F1-82-016	Dec-82	WM-F1-83-011	Jul-83							PG-WM-84-001	Feb-84	EGG-2291	Nov-84
SPERT II Leach Pond	WM-F1-82-017	Dec-82	WM-F1-83-010	Jun-83										
CPP-603 BIF Filter Room	WM-F1-83-006	May-83	Note B										WINCO-1028	Dec-84
TAN/TSF-3 Concrete Pad	Note A		WM-F1-83-004	Feb-83							WM-F1-83-002	May-83	EGG-2292	Apr-84
BORAX V Leach Pond	WM-F1-82-019	Dec-82	WM-F1-83-013	Aug-83	???	Jun-83					PG-WM-84-004	May-84	EGG-2300	Jan-85
CPP-601 Process Cells A,B,C,D,L	Note A		Note B								PR-W-80-007	Apr-80	EGG-2304	Sep-84
SPERT III Large Leach Pond	WM-F1-82-018	Dec-82	WM-F1-83-009	Jun-83							WM-F1-83-023	Sep-83	EGG-2306	Apr-84
MTR-605 Process Water Bldg	PR-W-79-015	Jun-79									PG-WM-84-006	Apr-84	EGG-2361	Jan-85
SPERT I Reactor Facility	WM-F1-81-012	Jul-81	PG-WM-83-036	Dec-83							PG-WM-84-016	???-84	EGG-2399	Feb-86
MTR-603 HB-2 Cubicle	WM-F1-81-016	Jul-81	PG-WM-84-002	Apr-84							PG-WM-84-023	Mar-84	EGG-2431	Dec-85
CPP-631 RALA Off-Gas Cell & Storage Tank	WINCO-1030	Apr-85									WINCO-1032	Jul-85	WINCO-1036	Feb-86
IETF (Facilities & Hot Waste Line)	WM-F1-82-013	Aug-82	PG-WM-84-012	Feb-85							PG-WM-85-008	May-85	EGG-2468	Apr-87
ARA IV	WM-F1-83-025	Aug-83	Note B								WM-PD-97-037	May-87	EGG-2518	Mar-88
HTRE-2 & HTRE-3	Note A						NOTE 1	Nov-88			PR-W-79-001	Jan-88	EGG-2575	Sep-89
Subtotal thru September 1992 ==> 24 Projects														
FY-1993 (01-Oct-92 to 30-Sep-93)														
BORAX V Facility Turbine Building			PG-WM-81-003	Dec-88							PR-WM-79-017	Sep-90	EGG-2683	Dec-92
CRS Annex	WINCO-1089	Jun-91	Note B		Note D						WINCO-332	Aug-91	WINCO-1124	Feb-93
SL-1 Demo Equip	None		None		EGG-WM-9721				WM-ERP-91-002	Jul-91	None		None	
SPERT IV Ancillaries	WM-PD-86-002	Feb-86	EGG-WM-9649	Jun-92	EGG-WM-9508	May-91			WM-ERP-91-001	Oct-92	EGG-WM-8587	Aug-89	EGG-2709	Oct-93
TAN-616 Interim Action	WM-F1-93-012	Jul-93	Note B								None		EGG-2714	Sep-93
FY-1994 (01-Oct-93 to 30-Sep-94)														
ARA-III	PG-WM-81-011	Feb-85	Note B		EGG-WM-10136	Oct-92			WM-ERP-91-003	Mar-92	WM-ERP-92-023	May-93	EGG-ER-11493	Sep-94
TAN-607 Decon Shop	BWI-1385	Sep-84	Note B		EGG-DD-8740	Aug-87							EGG-2726	Sep-94
TAN-606 Calibration Well					Note D						EGG-2743	Apr-94	EGG-2745	Sep-94
CFA-669 Hot Laundry	EGG-WM-10034	May-92	EGG-WM-9394	Mar-91	EGG-WM-10170	Nov-92			WM-ERP-92-017	Sep-92	EGG-WM-10125	Nov-92	INEL-94/0139	Jan-95

Notes:

A - Characterization Report Information part of the D&D Plan
B - Decision Analysis part of the Characterization Report
C - Characterization, Decision Analysis, and D&D Plan are part of the Final Report
D - Health & Safety Plan part of the D&D Plan
1 - Transportation Plan is Revision A but has no document number assigned
S1G Original Final Report ==> PE-WM-83-031, Sep-83
Hallam Reactor Components External Final Report ==> TREE-1368, dated Aug-79
CPP-631 RALA Off-Gas Original Characterization Report ==> WM-F1-81-010, May-81

Acronyms:

ARA - Auxiliary Reactor Area
BORAX - Boiling Water Reactor Experiment
CPP - Chemical Processing Plant
EBR - Experimental Breeder Reactor
ETR - Engineering Test Reactor
HTRE - Heat Transfer Reactor Experiment
IETF - Initial Engine Test Facility
MTR - Materials Testing Reactor
OMRE - Organic Moderated Reactor Experiment
RALA - Radioactive Lanthanum
SPERT - Special Power Excursion Reactor Test
TAN - Test Area North
TSF - Test Support Facilities

Table A-2. Tabulation of INEL D&D documentation—active projects.

INEL Decontamination & Dismantlement - Projects Listing / Documentation

DDLRPR10, Revision 10, Dated 31-Aug 95
Prepared by RJ Buckland, DJ Kenoyer & SA LaBuy

INEL ER Inactive Sites Dept.

D&D Project Description	Characterization Report	Date	Decision Analysis Report	Date	Health & Safety Plan	Date	Transport Plan	Date	Safety Analysis Report (SAR)	Date	D&D Plan	Date	D&D Final Report	Date
ARA, CFA, PBF, TAN, TRF Areas														
ARVFS (NaK)	PG-WM-84-009	Jul-84	Note B				NOTE 1	Apr-90	EGG-WM-7802	Sep-87	EGG-WM-7845	Sep-86		
ARVFS (Area)	PG-WM-84-013	Aug-84	Note B											
ARA-II	PT-WM-84-010	Aug-84	EGG-WM-9457	Jun-91	EGG-ERD-10231	Sep-92			WM-ERP-91-006	Oct-91	WM-ERP-92-016	May-92		
ARA-III Clean Facilities Demolition														
ARA-I	EGG-WM-10757	Jun-93	Note B						ERD-92-019	Jun-92				
ARA-I Hot Waste Tank	EGG-WM-10757	Jun-93			EGG-ER-11425	Sep-94			ERD-92-019	Jun-92	EGG-ER-11426	Sep-94		
MTR Facility	WM-F1-83-016	Apr-84												
ETR Facility	EGG-PR-5784	Sep-82												
TAN/TSF	WM-F1-83-029	Sep-83	Note B											
Borax V	PR-W-74-017	Sep-90	PG-WM-84-003	Dec-88	EGG-ER-10801	Sep-94			ER-93-024	Apr-93	EGG-ER-10900	Aug-93		
LOFT Ancillaries	EGG-ERD-10282	Sep-92	Note B						RE-A-74-037	Jun-79	EGG-ERD-10594	Feb-93		
TTAF (MTR-603 Canal)														
ICPP Areas														
WCF // CPP-633														
SFE-20 & CPP-740	WINCO-1021	Sep-84	Note B											
CPP-640														
Tank Farm														
CPP-601														
FECF // CPP-603	WM-F1-83-024	Sep-83												
CPP-631, -709, & -734														
CPP-734														

Notes:

B - Decision Analysis part of the Characterization Report
1 - Transportation Plan is Revision A but has no document number assigned
ARA III Original Characterization Report PR-W-79-030, Sep-79
2 - CPP-740 Characterization Report WM-F1-81-023, dated May-82

Acronymes:

ARA - Auxiliary Reactor Area
ARVFS - Army ReEntry Vehicle Facility Site
BORAX - Boiling Water Reactor Experiment
CFA - Central Facilities Area
CPP - Chemical Processing Plant
CRS - Chloride Removal System
EBR - Experimental Breeder Reactor
ETR - Engineering Test Reactor
FECF - Fuel Element Cutting Facility
MTR - Materials Testing Reactor
SPERT - Special Power Excursion Reactor Test
TAN - Test Area North
TSF - Test Support Facilities
TTAF - Test Train Assembly Facility
WCF - Waste Calcining Facility

Table A-3. Tabulation of INEL D&D cost/schedule/waste—completed projects.

INEL Decontamination & Dismantlement - Projects Listing / Documentation

DDLRPR10, Revision 10, Dated 31-Aug-95
Prepared by RJ Buckland, DJ Kenoyer, SA LaBuy

INEL ER Inactive Sites Dept.

Project Description	Estimated Start Date	Estimated Finish Date	Estimated Budget Cost ($k)	Actuals Start Date	Actuals Finish Date	Actuals Cost Prior to 1992 ($k)	Actuals Project Cost ($k)	Actuals Waste Volumes (m3)	Actuals D&D Mode	Remarks / Explanations / Status
Previous FYs (FY75 to FY92)										
EBR-1 Complex	Sep-73	Sep-75	740.0	Oct-73	Jun-75		???	???	Note D	
MTR Overhead Reservoir	???	???	105.0	May-75	Jun-75		???	???	Note D	
Hallam Reactor Components	Oct-77	Sep-78	451.0	Oct-78	Oct-79		428.0	???	Note D	Est. Waste Vol—> 362 m3
SPERT IV Reactor Facility	???	???	???	Dec-78	Feb-79		123.0	66.0	Note D	
OMRE Leach Pond	???	???	???	???	???		???	???	Note C	
OMRE Reactor Facility	Oct-77	Oct-79	768 0	Oct-77	Sep-79		500 0	1,446.1	Note D	
SPERT II & III Reactor Buildings	???	???	215 0	Jun-80	Sep-80		221.3	23.9	Note B	
TAN Rad Liquids Evaporator (PM-2A)	???	???	???	Oct-81	Sep-82		529.0	397.7	Note D	
S1G Reactor Vessel	Oct-82	Sep-83	1,700 0	Dec-82	Sep-83		1,340 8	82.3	Note D	
MTR-657 Plug Storage Facility	Apr-83	Sep-83	???	Jun-83	Sep-83		84.4	4 8	Note C	Est. Waste Vol—> 51 cf or 1.4 m3
SPERT I Seepage Pond	Mar-84	Sep-84	75 0	Aug-84	Sep-84		67.0	49.8	Note B	Est. Waste Vol—> 2000 cf or 56 6 m3
SPERT II Leach Pond	???	???	???	???	???		???	???	Note B	
CPP-603 BIF Filter Room	Jan-84	Sep-84	126 0	Jul-84	Sep-84		147.8	119.5	Note C	Est. Waste Vol—> 608 cf or 17.2 m3
TAN/TSF-3 Concrete Pad	???	???	50.0	Jun-83	Sep-83		75 0	70.7	Note D	Est. Waste Vol—> 1665 cf or 47.1 m3
BORAX V Leach Pond	???	???	20 0	Jul-84	Aug-85		20.0	???	Note B	
CPP-601 Process Cells A,B,C,D,L	???	???	???	Jul-80	Jun-84		1,070.0	458.2	Note C	
SPERT III Large Leach Pond	Sep-83	Feb-84	16 0	Sep-83	Nov-84		30.6	???	Note B	
MTR-605 Process Water Bldg.	Nov-83	Sep-84	256 0	May-81	Aug-84		297.0	167.3	Note C	
SPERT I Reactor Facility	???	???	???	Aug-85	Dec-85		139.5	???	Note C	
MTR-603 HB-2 Cubicle	???	Sep-85	270.0	May-85	Aug-85		228 0	89.6	Note D	Est. Waste Vol—> 398 cf or 11.3 m3
CPP-631 RAL A Off-Gas Cell & Storage Tank	Jul-85	Feb-86	200 0	Aug-85	Nov-85		124.2	38.2	Note D	
IETF (Facilities & Hot Waste Line)	Mar-85	Dec-87	914 0	Apr-85	Apr-87		900.0	???	Note D	Est. Waste Vol—> 3551 cf or 100 6 m3
ARA IV	???	???	77.5	???	???		???	???	Note D	Est. Waste Vol—> 5100 cf or 144.4 m3
HTRE-2 & HTRE-3	???	???	2,580 0	Oct-86	Sep-89		1,364.0	13 4	Note B	
Subtotal thru September 1992 —> 24 Projects			8,563.5				7,689 6	3,027.5		
FY-1993 (01-Oct-92 to 30-Sep-93)										
BORAX V Facility Turbine Building	Apr-88	Sep-90	693 0	Apr-89	Mar-92		1,528 0	465.0	Note D	
CRS Annex	Jun-91	Feb-91	570 0	Apr-92	Nov-92		699.0		Note C	
SL-1 Demo Equip										
SPERT IV Ancillaries	Jul-92	Sep-93	294.6	Jul-92	Sep-93	381.0	817.0	93.8	Note D	RWMC - 416 cf waste tank steel / 224 cf steel piping / 96 cf PPEs / 2 each, 55 gallon drums solidified sludge.
TAN-616 Interim Action	Oct-92	Sep-93	304.0	Oct-92	Sep-93	0.0			Note E	
FY-1994 (01-Oct-93 to 30-Sep-94)										
ARA-III	Nov-92	Nov-93	1,202.0	Oct-93	Sep-94	0.0	1,826 0	335.1	Note D	Recycle - 178,800 lbs Scrap Metal // RWMC - 176 8 m3 concrete / 38 9 m3 asbestos / 119.4 m3 D&D debris
TAN-607 Decon Shop	Jan-94	Sep-94	483.1	Jun-94	Sep-94	0.0		325.7	Note C	RWMC - 1216 cf steel / 384 cf other metals / 480 cf asbestos / 120 cf concrete / 312 cf other waste
TAN-606 Calibration Well	Feb-94	Apr-94	42 0	Feb-94	Apr-94	0 0	42 0		Note C	
CFA-669 Hot Laundry	Oct-92	Jul-95	2,598 0	Oct-92	Sep-94	369.0	2,410.5	2,427.7	Note D	WERF - 875 cf filter units / 576 cf combustible building materials / 732 cf combustible PPEs // RWMC - 2,304 cf equipment / 1,920 cf asbestos & piping / 3,072 cf concrete rubble // CFA Landfill - 9,135 cf building debris // HWSF - 9 63 cf hazardous waste

NOTES:
A - Safe Storage // B - In-Place Stabilization // C - Decontamination for Reuse // D - Dismantlement // E - Remedial Action prior to D&D Operations

Table A-4. Tabulation of INEL D&D cost/schedule/waste—active projects.

INEL Decontamination & Dismantlement - Projects Listing / Documentation

DDLRPR10, Revision 10, Dated 31-Aug-95
Prepared by RJ Buckland, DJ Kenoyer, SA LaBuy

INEL ER Inactive Sites Dept.

Project Description	Estimated Start Date	Estimated Finish Date	Estimated Budget Cost ($k)	Actuals Start Date	Actuals Finish Date	Actuals Cost Prior to 1992 ($k)	Actuals Project Cost ($k)	Actuals Waste Volumes (m3)	Actuals D&D Mode	Remarks / Explainations / Status
ARVFS (NaK)						4199			Note D	
ARVFS (Area)									Note D	
ARA-II	Oct-92	Sep-97	6177			1367			Note C & D	
ARA-III Clean Facilities Demolition										
ARA-I	Oct-93	Sep-97	6342			99			Note C & D	
ARA-I Hot Waste Tank										
MTR Facility	Oct-95	Sep-01	33026	N/A		0			Note C & D	
ETR Facility	Oct-95	Sep-03	44914	N/A		0			Note C & D	
TAN/TSF	May-93	Sep-02	4193	Apr-93		0			Note C & D	
Borax V	Oct-92	Sep-95	5455			3067			Note D	
LOFT Anacillaries	Oct-92	Sep-98	1938			295			Note D	
TTAF (MTR-603 Canal)	Oct-93	Sep-00	5178	N/A		0			Note C & D	
ICPP Areas										
WCF // CPP-633	Oct-93	Sep-02							Note D	
SFE-20 & CPP-740	Oct-97	Note E							Note D	
CPP-640	Oct-94	Note E							Note D	
Tank Farm	Oct-95	Note E							Note D	
CPP-601	Oct-96	Note E							Note D	
FECF // CPP-603	Oct-97	Note E							Note D	
CPP-631, -709, & -734	Oct-97	Note E							Note D	
CPP-734	Oct-97	Note E							Note D	

NOTES:

A - Safe Storage
B - In-Place Stabilization
C - Decontamination for Reuse
D - Dismantlement
E - WINCO Planning Window 1994-2002

Budget Costs are based upon Actuals thru FY 92 / FY 93 EACs / FY 94 CAPs and include escalation & contingency
Estimated Start & Finish Dates are based upon the FY 93 Baseline dated November 1992
(as revised for FY 94 CAPs, i.e. ARA-II & -III delayed due to NEPA EA approval delay)

Appendix B

Facility Descriptions

CONTENTS

FIGURES

Appendix B

Facility Descriptions

The facility descriptions provided in this appendix supply project information for the active INEL D&D projects and for some future projected projects. Information includes project identification, cost and schedule estimates, waste volume projections, regulatory requirements, facility contamination, and facility physical descriptions.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Idaho Technologies Company			
PROJECT: AUXILIARY REACTOR AREA (ARA) I					
TOTAL ESTIMATED COST:[a] $ 6178K			REMAINING SCHEDULE DURATION: 3 yrs		
FUNDING SOURCE: EW2010402 and EW2010404 ADS: 52-EG			WBS: 1.2.01.2 CAP: 3KNAC1000		
Actual Cost through FY-94: $ 1095K		FY-95: $ 605.8K	FY-96: $ 1204.5K	FY-97: $ 2025.1K	FY-98: $ 1241.4K
FY-99:	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: ARA-626 — Radiological Facility, prepare ASA. ARA-729 Tank — Radiological Facility, prepare ASA. Remaining structures are Industrial, prepare H&SP.			Project Priority: 9 of 16 Basis: Low cost to complete. Characterization complete.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions. ARA-729 - CERCLA Non-time Critical Removal Action.					
TOTAL WASTE VOLUME ESTIMATE: [b] 1230 m^3				ESTIMATE BASE YEAR: 1993	
LOW-LEVEL WASTE:	307 m^3				
HAZARDOUS WASTE:	none				
MIXED WASTE:	2 m^3				
INDUSTRIAL WASTE:	920 m^3				
TRU WASTE:	0.5 m^3				
HIGH-LEVEL WASTE:	none				

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

ARA-I is one of four facilities built in support of military nuclear reactor programs in the late 1950s. It is located 7.5 mi east of the CFA of the INEL and approximately 0.3 mi north of U.S. Highway 20. ARA-I was constructed as a support facility for the other three nearby ARA facilities (ARA-II, -III, & -IV). The Army Reactor Program was phased out by 1965. The main structures at ARA-I are buildings ARA-626 and ARA-627. ARA-627 houses some offices and laboratory space. The Hot Cells are located in Building ARA-626. ARA-I is owned by EM-40.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

ARA-626

The principal areas are the two shielded hot cells designed to handle highly radioactive materials. The two hot cells are constructed of high-density concrete with walls 37 in. thick and viewing windows of high-density glass and oil, which provide equivalent shielding. Roof shielding for the cells is approximately 24 in. Interior walls and floors are covered with painted carbon steel metal. Penetrations for six pairs of master-slave manipulators at the windows have been plugged, and the plugs spot-welded in place. Penetrations of the front wall are provided for manipulators, periscopes, and service piping. Penetrations not in use are plugged or capped to maintain containment and to reduce personnel exposure.

Cell 1 is 8 ft × 16 ft and has two viewing windows. Cell 2 is 8 ft × 8 ft and has a single viewing window. The wall separating the two cells is high-density concrete, 18 in. thick, and is covered by a 4 in. thick, 87 in. high lead brick liner on the Cell 1 side. A remotely-operated sliding shield door is provided in this wall for passage of materials between the cells. Personnel access to the cells was provided through motor-operated sliding doors in the isolation rooms adjacent to the cells. These doors are made from a cast-iron concrete composite of sufficient thickness to provide approximately the same shielding as the concrete walls. A charging port, designed for use with horizontal charging casks, is located in the access door of Cell 1 and is closed with a plug door. The charging port minimized personnel exposure and the potential for the spread of contamination. Heavy pieces of equipment or casks were moved into and out of Cell 2 by a dolly mounted on floor tracks. The two hot cells could be used individually or in combination depending on the nature of the work. Materials can be transferred between Cell 1 and Cell 2 through the transfer port in the common wall. Cell 1 is equipped with a two-ton bridge crane, and Cell 2 with a two-ton monorail crane. The cells are empty except for the crane and the high-efficiency particulate air (HEPA) prefilter assembly.

Liquid effluent from the cells was piped from each floor drain to an underground 1,000-gal contaminated Waste Storage Tank, ARA-729, also called the Hot Waste Catch Tank. The openings to the drains are plugged to prevent the inadvertent transfer of liquid to the underground tank. Airborne effluents from each cell were exhausted through independent ventilation systems. Prefilters are located within each cell and can be remotely replaced. Effluents passed from the prefilters to HEPA filters located in a loft over the cells before being discharged through a roof stack.

The isolation rooms, rooms 117 and 118, are located immediately behind each cell and were used for initial decontamination of equipment removed from the cells. The service area, room 123, was used for equipment repair, modification, cell setup, cask loading and unloading, and cask and equipment storage. Located in the floor are 20 below-grade storage holes with locking covers, that were used for temporary storage of radioactive materials. The equipment decontamination room, room 124, has a hood and sink with HEPA-filtered ventilation. A metallography lab, room 125, was designated as a "hot" lab, capable of performing metallography work on low-level radioactive materials. This capability was provided mainly by two hoods, two glove boxes, and a sink routed to the waste catch tank. The exhaust from the hoods is routed through a HEPA filter. The flow through this exhaust system established a slight negative pressure in the lab to prevent contamination spread.

ARA-627

ARA-627 is the shop and maintenance building used to support work at ARA-626. It contains shops, office space, wash and locker rooms.

Contaminated Waste Storage Tank (ARA-729)

The contaminated waste storage tank is a 1,000-gal stainless steel underground tank. It rests on a bed of gravel inside a concrete bunker. Five ft of earth overburden provide radiological shielding. The tank received drains from the following areas in ARA-626: Hot Cell 1, Hot Cell 2. Isolation Area, Service Areas, Decontamination Room Sink and Floor, and Hot Metallography Area.

Fuel Storage Tank (ARA-728)

The fuel storage tank located between Buildings 626 and 627 has a 7,000-gal capacity. Fuel oil was stored for use in ARA-626 boiler. This above-ground storage tank has been drained to less than 1% of capacity.

Water Reservoir and System (ARA-727 and 629)

The water reservoir is a 100,000-gal elevated storage tank located about 110 yd west of ARA-626. The tank is filled from a well via two electric pumps. Water is supplied to ARA-626 and -627 by gravity.

Sanitation (ARA-726)

Sanitary sewage and liquid wastes from cold drains in ARA-626 and ARA-627 are piped to a septic tank and drain-field treatment system. Liquid effluent from the drain field percolates into surrounding soil. This sanitary waste system does not have any radiation monitoring instrumentation or provisions for flow diversion.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

Radioactive material exists primarily in ARA-626. The sludge in the bottom of the 1,000 gallon hot waste tank contains mixed transuranic waste. Minor amounts exist in ARA-627. Other contamination exists inside drain lines running from the Hot Cells to the hot waste tank and in sealed ventilation ducts. Buildings ARA-628, 629, and 631 have no known contamination. Tanks ARA-727, 728, and 733 are also uncontaminated. The sanitary septic tanks located outside the fenced area (not part of this D&D effort) contain several hazardous and radioactive wastes and the buried lines originating from the buildings within the fenced area will contain some of the same contaminants.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

Rod V. Nelson, ARA-I Project Manager, LITCO, 526-9863, MS 3921.

D&D/S&M Previous Accomplishments

In 1988, as part of facility deactivation, the hot cells were cleared of equipment and partially decontaminated. In-cell ventilation filters were removed, bagged, and shipped for disposal. The hot cell ventilation openings were sealed by cover plates. The hot cell doors were locked and sealed with caulking material. The periscopes and master-slave manipulator assemblies were removed and shipped off the ARA-I site. The wall openings created by this removal were filled with metal plugs, tack welded in place. Oil was drained from the three hot cell windows and shipped to another facility.

The Equipment Decontamination Room HEPA filters were removed, bagged, and disposed of. The ventilation openings were closed by cover plates. After decontamination, the room was sealed by padlocking the access door and caulking the door's sealing surfaces.

The Metallography Lab was stripped of equipment and instrumentation and sealed. Contaminated lead was placed in a concrete box. Biological test tube samples were shipped for disposal. Internally contaminated off-gas hoods were removed, packaged, and shipped for disposal. Other equipment in the laboratory was removed for reuse or disposal. The HEPA filters were removed from their housings, packaged, and shipped for disposal. The housing filter doors were tack welded. The decontamination sink trap was removed and the drain was capped. The room was sealed by padlocking the door and installing sheet metal plates across the windows.

The hot waste tank, ARA-729, was pumped, leaving approximately 100 gal of sludge. The asbestos was removed, and the access lines cut and capped. Inlet lines, instrument lines, and the outlet pump housing were closed off by cutting, capping, and installing a blind flange.

Unique Conditions/Special Circumstances

None.

Permitting Requirements

The ARA-I D&D activities were reviewed for applicable NEPA documentation in 1991. An Environmental Assessment (EA) was prepared in 1991 and formally submitted to DOE-HQ in September 1992. DOE-HQ approved the EA in June 1993. The tank removal is covered by an categorical exclusion.

Surveillance and Maintenance Status

The only S&M activities occurring at ARA-I are routine periodic surveillance and maintenance for security, environmental, and health and safety measures, and radiological surveys. All facilities are in good condition and pose no threat for loss of containment integrity.

Safety and Environmental Considerations

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D Recommended Methodology

Total dismantlement and unrestricted release of site.

Specialized Capital Equipment and Tools Required

Tank emptying system.

Facility Reuse Considerations

The cost of existing facility renovation for reuse equals or exceeds the cost of a new facility and the risk of residual contamination remains. No use has been identified.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. D. J. Larsen and T. N. Thiel, Characterization and Decision Analysis for Auxiliary Reactor Area I, EGG-WM-10757, June 1993.

3. S. L. Pickett, Sampling and Analysis Plan for Characterization of Potential Waste Sources at Auxiliary Reactor Area-I Operable Unit 5-07 Sites ARA-02 and ARA-03, EGG-WM-10187, May 1992.

4. C. E. Klassy, Safety Analysis Report for the Auxiliary Reactor Area Facility (ARA-I), ERD-92-019, May 1992.

5. B. D. Andersen, Abbreviated Sampling and Analysis Plan for Auxiliary Reactor Area-I (ARA-I) Facility, ER-94-039, July 1994.

6. S. A. LaBuy, Health and Safety Plan for the ARA-I Facility Sampling, ER-94-040, July 1994.

7. S. A. LaBuy, ARA-729 Hazardous Waste Tank Data, EDF-ER-016, August 1994.

8. S. A. LaBuy, Decontamination and Dismantlement Plan for the ARA-729 Hot Waste Tank, EGG-ER-11426, August 1994.

9. S. A. LaBuy, Health and Safety Plan for D&D of the ARA-729 Hot Waste Tank, EGG-ER-11425, September 1994.

10. C. Klassy, Initial Hazard Categorization for the D&D of Tank ARA-729, ER-94-45, September 1994.

11. H. G. Vega, Characterization Report for Auxiliary Reactor Area I, INEL-94/0161, March 1995.

12. H. G. Vega, Decontamination and Dismantlement Plan for the ARA-I Facility, INEL-94/0222, March 1995.

13. R. V. Nelson, Health and Safety Plan for D&D of ARA-I Facility, INEL-95/0193, May 1995.

14. R. V. Nelson, Decontamination and Dismantlement Plan for ARA-627, INEL-95/0259, May 1995.

15. R. V. Nelson, Health and Safety Plan for D&D of ARA-627, INEL-95/0260, May 1995.

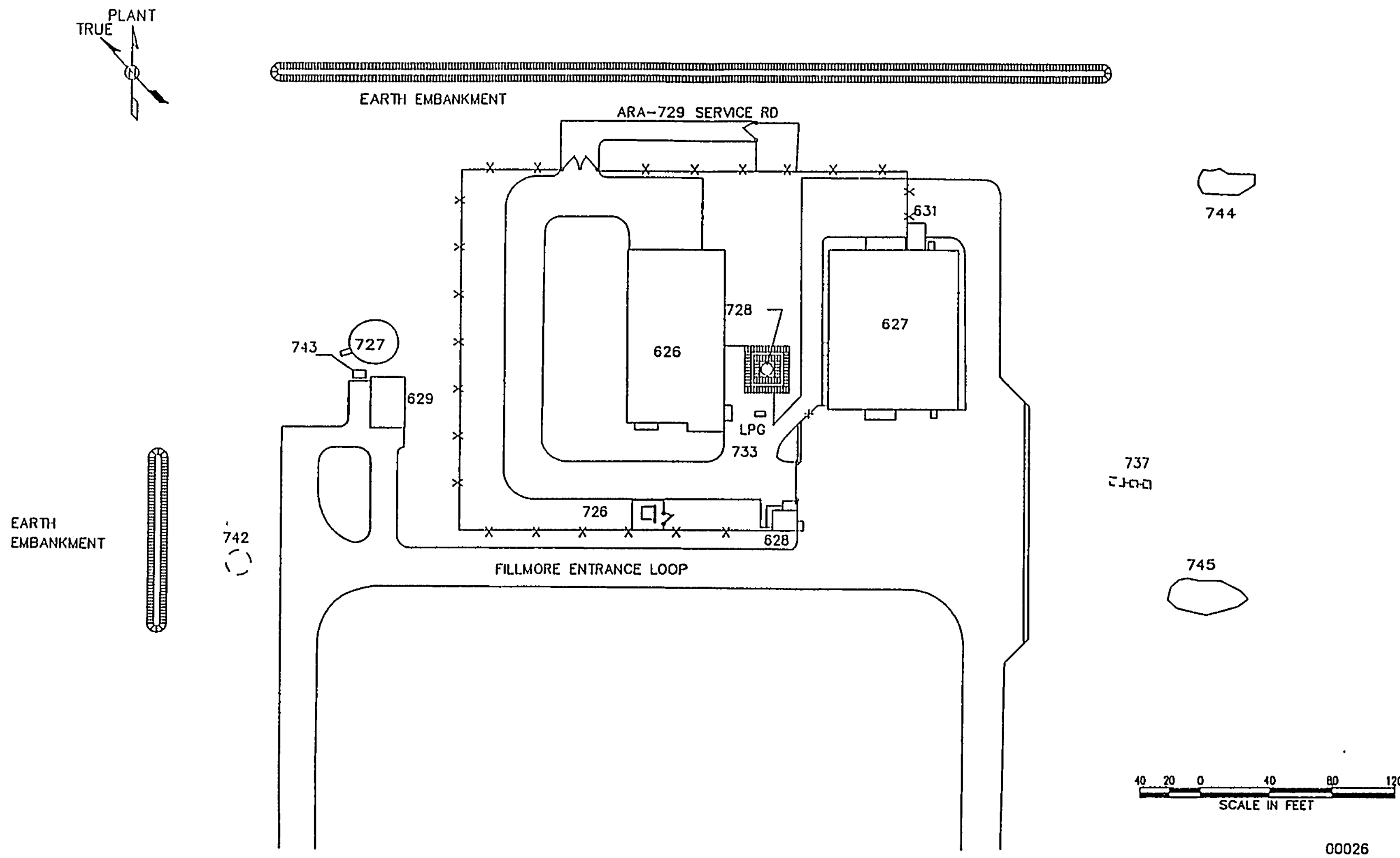

Figure B-1. ARA-I Plot Plan.

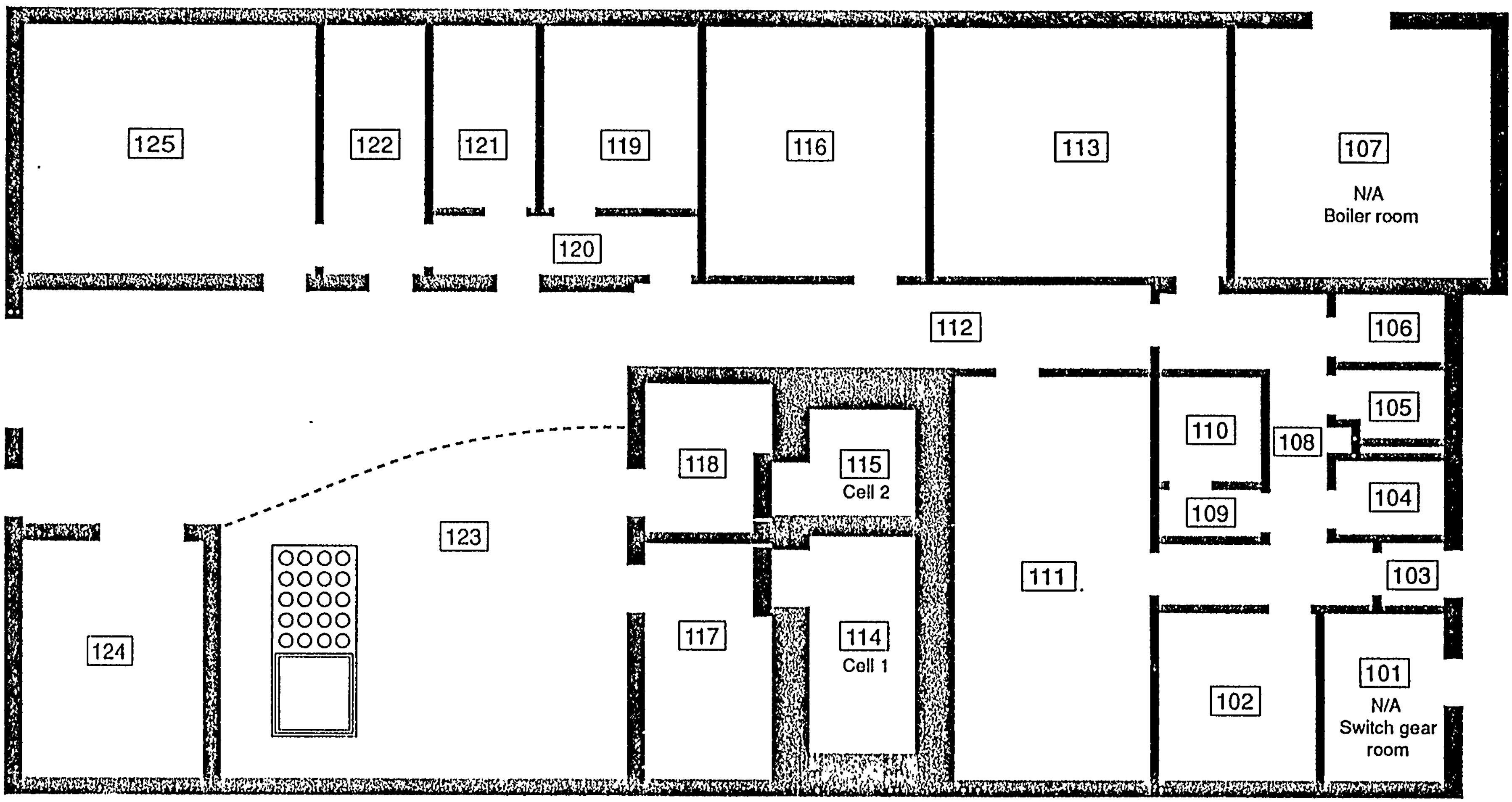

Figure B-2. ARA-626 Floor Plan.

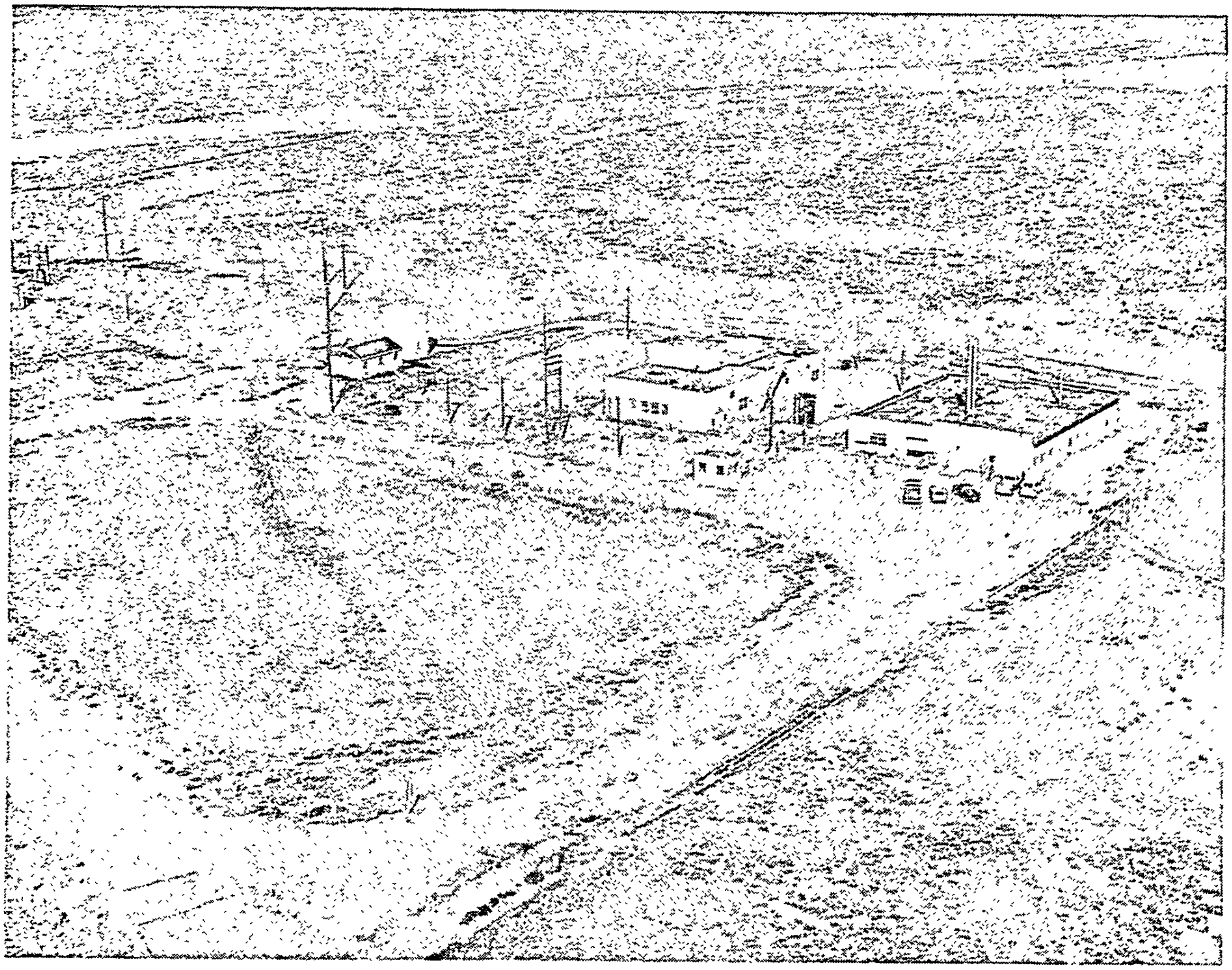

Figure B-3. Aerial view of ARA-I.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID	CONTRACTOR: Lockheed Martin Idaho Technologies

PROJECT: **AUXILIARY REACTOR AREA (ARA) II**

TOTAL ESTIMATED COST: [a] $ 6765K	REMAINING SCHEDULE DURATION: 2 yrs
FUNDING SOURCE: EW2010402 ADS: 48-EG	WBS: 1.2.02.2 CAP: 3KNAR2000

Actual Cost through FY-94: $ 3327K		FY-95: $ 901.9K	FY-96: $ 1246.3K	FY-97: $ 1290.7K	FY-98:
FY-99:	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:

DOE HAZARD CLASSIFICATION: Low Hazard per DOE 5481.1. Use existing SAR.	Project Priority: 7 of 16 Basis: Field work almost completed. Low cost to complete.

RCRA/CERCLA REQUIREMENTS:
RCRA Land Disposal Restrictions. Detention tank and septic tanks listed in FFA/CO. Remaining soils are in FFA/CO.

TOTAL WASTE VOLUME ESTIMATE: [b] 1495 m^3	ESTIMATE BASE YEAR: 1995

LOW-LEVEL WASTE:	1077 m^3
HAZARDOUS WASTE:	none
MIXED WASTE:	none
INDUSTRIAL WASTE:	418 m^3
TRU WASTE:	none
HIGH-LEVEL WASTE:	none

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

ARA II is located at the south central end of the INEL, approximately 10 miles east of the Central Facilities Area (CFA). A military reactor testing program was conducted at ARA II from August 1958 until December 23, 1960. A nuclear excursion and steam explosion occurred on January 3, 1961, in which the three-man operating crew was fatally injured. Cleanup operations were completed 18 months later. The SL-1 reactor building was buried in the burial ground located 1600 ft northeast of ARA II. Blacktop was placed over the entire 350-ft × 375-ft ARA II area within the perimeter fence to stabilize the area. Following cleanup, the three main buildings were converted to offices and welding shops and were utilized for these purposes until 1986. ARA II has remained abandoned since that time. ARA-II is owned by EM-40.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

The following is a description of each building and structure that was present at the start of D&D.

Guardhouse

ARA-604 was a vacant 172-ft^2, one-story building with corrugated metal siding and roofing and a reinforced concrete floor.

Administration Building

ARA-613 was a 1280-ft^2, two-story vacant building with masonry exterior walls, a concrete frame, a flat, tar-and-gravel roof, and a reinforced concrete floor.

Support Building

ARA-602 was a 3900-ft^2, one-story, steel frame building built as a laboratory and converted for offices. It had metal panel walls, corrugated sheet metal siding and roofing. It was partially decontaminated after the SL-1 accident and was used until the mid-1970s for offices.

Weld Shop and Technical Support Building

ARA-606 was a vacant 3900-ft^2, one-story, steel frame building with metal panel walls and sheet-metal siding and roofing, and a large double door.

Power Extrapolation Building

ARA-615 was an 836-ft^2, one-story, steel frame, power extrapolation building, with corrugated sheet metal siding and roofing and a reinforced concrete floor. This building extrapolated power, by way of steam, from the reactor.

Storage Building

ARA-614, a decontamination and laydown building, was 532 ft^2, single story with steel frame and metal panel walls, and had corrugated sheet-metal siding and roofing. It was un-insulated, unheated, and unoccupied. Parts of the building were radioactively contaminated. The building was located just northwest of where the SL-1 reactor building, now dismantled and removed.

Electrical Power Substation and Power Distribution

The Substation, ARA-701, had a single 13.8 kVA feeder. Power was stepped to 2400 V by three 300-kVA transformers, for the deep-well pump, to 480 V for equipment, and to 208/120 V for distribution. Much of the cables and wiring was underground. A pit covered by a carbon steel plate housed the connections to the three transformers.

Water Supply Facilities

The water supply included pumping, storage, and treatment equipment that supplied potable water to ARA II and ARA I. The Wellhouse, ARA-601, had fixed contamination and was a one-story, 294-ft^2 building with a gabled roof, reinforced concrete floor, and sheet metal siding and roofing. Storage Tank, ARA-702, was a 50,000 gal steel tank. The water was chlorinated in a one-story 53 ft^2 Building, ARA-605, with corrugated siding and roofing, and a reinforced concrete floor.

Fuel Oil Tanks and Lines

Aboveground 1400 gal fuel oil tank, ARA-705, was surrounded by a 2 ft earth berm. The tank supplied a diesel generator in ARA-602 and equipment in ARA-613.

Waste Storage and Drainage Systems

ARA II East Side Sanitary Waste System consisted of two septic tanks, a chlorinator tank, and a seepage pit. ARA-738 was a 1026 gal septic tank containing both liquid and sludge. It was connected to a 200 gal chlorinator tank (ARA-718). Both drained into ARA-07 seepage pit. ARA-10 is a second 500 gal septic tank and drained into ARA-07. This tank was dry and contained a small amount of sediment. The seepage pit was dry and the gravel base was visible. ARA II West Side Sanitary Waste System consisted of a 500 gal septic tank, a 200 gal chlorinator tank, and a seepage pit (dry well) (ARA-08), and received wastes from ARA-606. The septic tank was full with 40 in. of liquid and 6 to 8 in. of sludge. ARA-08 was dry with about 1 to 2 ft of sediment.

A 1000 gal radioactive waste detention tank was located underground adjacent to fuel oil tank ARA-705. The detention tank is 10.5 ft long by 4 ft in diameter and was 4 ft underground and drained to the seepage pit. A 2.5 in. access pipe protruded 2 in. above ground level and had a removable cover.

Grounds

At the conclusion of he SL-1 recovery operation, low-level radioactive contamination remained throughout the soil areas at ARA II. The widespread low-level contamination was due primarily to cross contamination during recovery operations.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

All structures contained varying amounts of low-level radiological contamination. A layer of noncontaminated soil was placed over ground areas with high radiation fields to stabilize the contamination and attenuate the fields. To further fix and stabilize the contamination, a layer of asphalt was placed over the entire area inside the fence. The asphalt has deteriorated and eroded over the last 20 years and left the contamination exposed in some areas.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

Rod V. Nelson, ARA-II Project Manager, LITCO, 526-9863, MS 3921.

D&D/S&M Previous Accomplishments

ARA II was radiologically and physically characterized in 1984. Additional characterization was conducted in 1991 for hazardous substances. Several underground fuel lines to ARA-602 were cut and capped. Fuel oil tank, ARA-705, was emptied in 1986. Fuel oil tank, ARA-606, was removed in 1990. Equipment associated with the cleanup and disposal of the SL-1 Reactor accident was disposed of in 1992. In 1993 and 1994, all above ground structures were decontaminated and dismantled including all eight buildings, foundations, and nine structures. The underground utilities remain.

Unique Conditions/Special Circumstances

The widespread ground soil contamination may require the removal of hot spots or approval to leave the soil in place.

Permitting Requirements

The ARA-II D&D Project was reviewed for applicable NEPA documentation in 1991. An Environmental Assessment (EA) was prepared in 1991 and formally submitted to DOE-HQ for approval in September 1992. DOE-HQ approved the EA in June 1993.

Surveillance and Maintenance Status

There are no longer any above ground structures at ARA-II. Radiological soil surveys will continue.

Safety and Environmental Considerations

Standard industrial safety environmental and radiological controls will be required. No special or high hazard conditions exist.

D&D Recommended Methodology

The 1984 Characterization and Decision Analysis Report considered six alternatives that varied from restoring the area to a natural condition to leaving the area in its present condition. The recommended alternative specified removal of all buildings, structures, and underground utilities, leaving only the contaminated soil, which would be monitored with the contaminated soil that exists outside the fence as part of this Federal Facility Agreement/Consent Order (FFA/CO) Operable Unit. Current plans are to leave the underground utilities in place with the contaminated soil.

Specialized Capital Equipment and Tools Required

None.

Facility Reuse Considerations

None.

REFERENCES

1. J. D. Bradford and J. H. Clark, Characterization and Decision Analysis for the ARA-II, PT-WM-84-010, August 1984.

2. T. N. Thiel, Decontamination and Dismantlement Plan for ARA-II, WM-ERP-92-016, May 1993.

3. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

4. W. D. Schofield, Safety Analysis Report for the Auxiliary Reactor Area (ARA-II) at the INEL, WM-ERP-91-006, October 1991.

5. D. K. Nims, Health and Safety Plan for D&D of ARA-II, EGG-ERD-10231, September 1992.

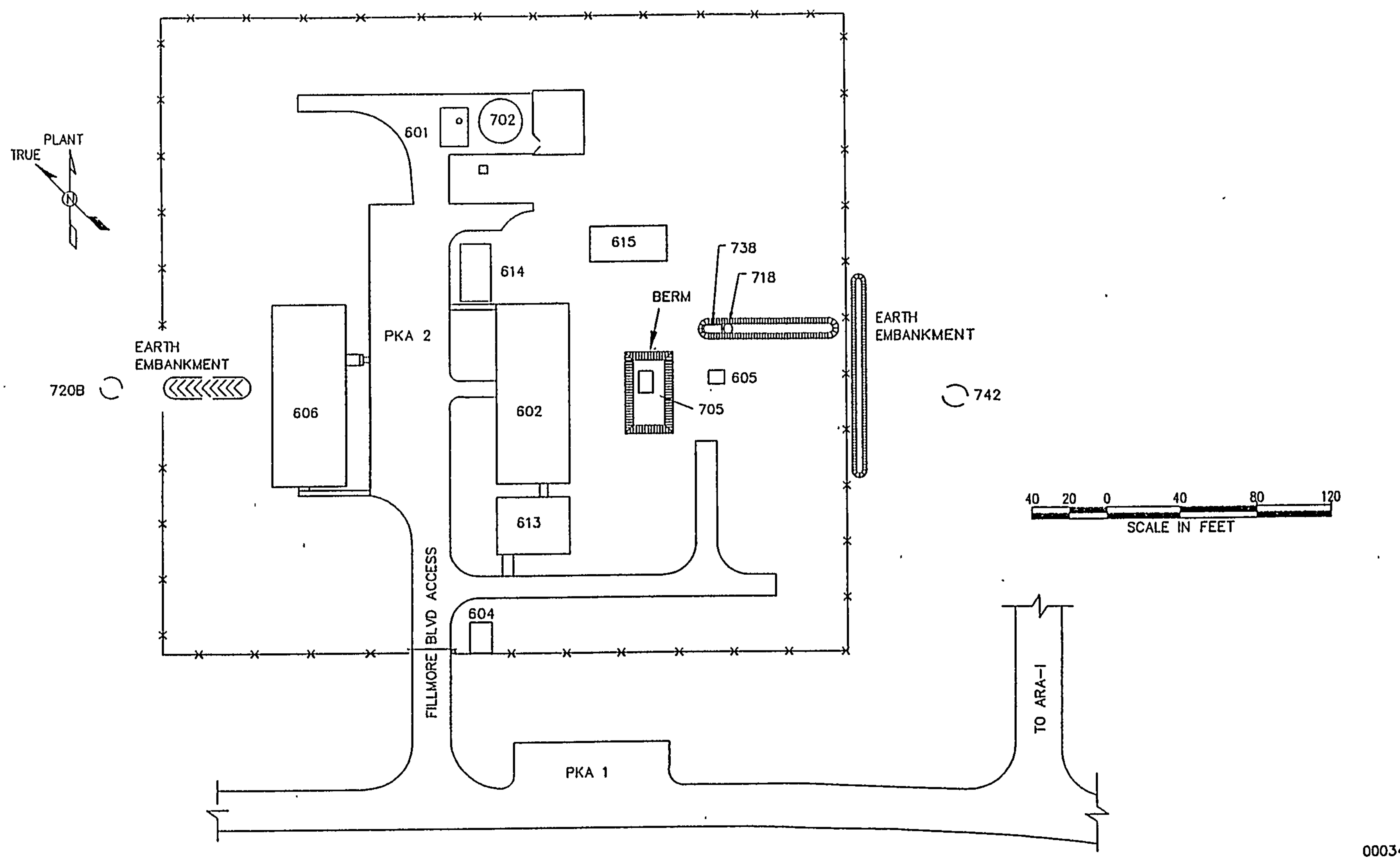

Figure B-4. ARA-II Plot Plan.

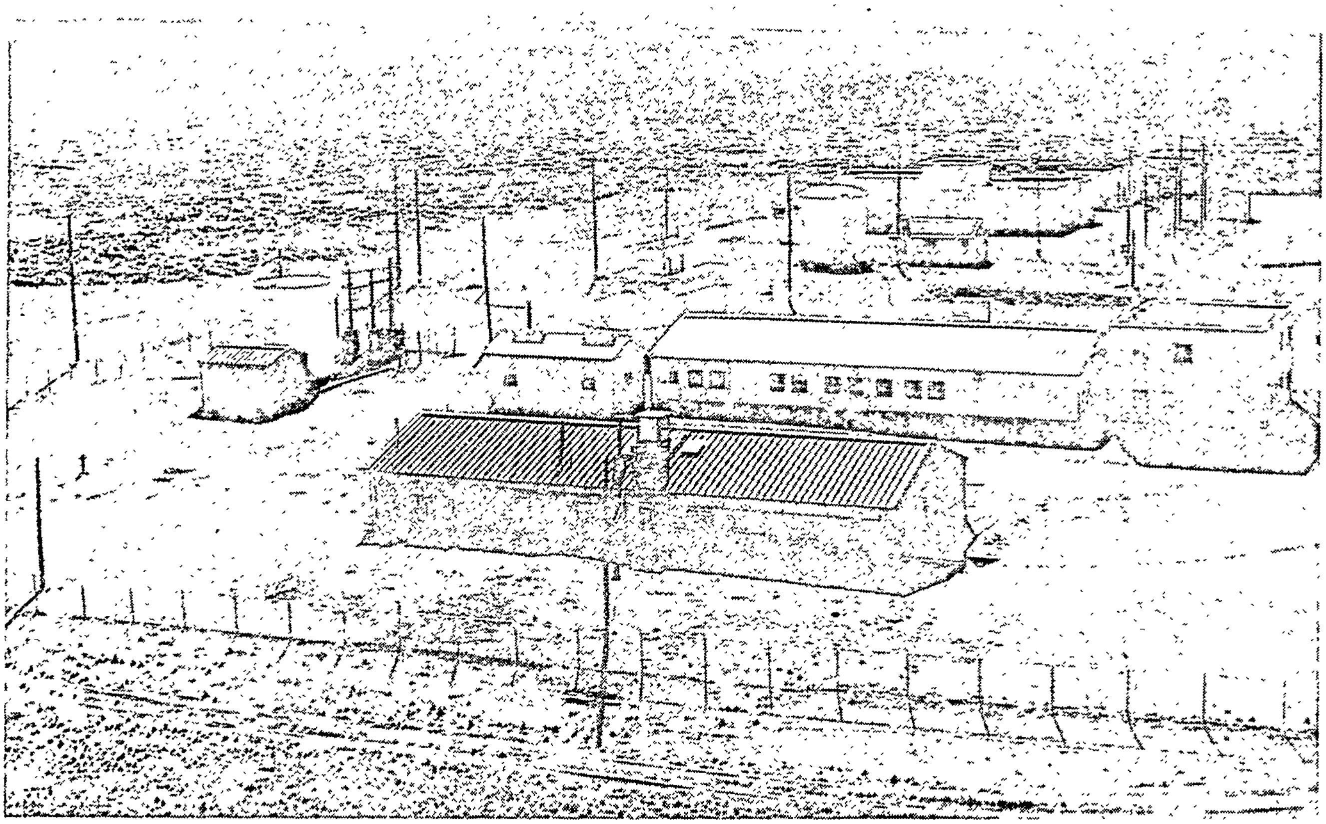

Figure B-5. Aerial view of ARA-II.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: . Lockheed Martin Idaho Technologies			
PROJECT: AUXILIARY REACTOR AREA (ARA) III					
TOTAL ESTIMATED COST: [a] $ 6130K			REMAINING SCHEDULE DURATION: 3 yrs		
FUNDING SOURCE: EW2010402 ADS: 49-EG			WBS: 1.2.03.2 CAP: 3KNAR3000		
Actual Cost through FY-94: $ 2823K		FY-95: $ 0K	FY-96: $40.4K	FY-97: $40.4K	FY-98: $3025K
FY-99: $201.2K	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Low Hazard per DOE 5481.1. Remaining structures are industrial facilities.			Project Priority: 8 of 16 Basis: Field work in progress. Low cost to complete.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions. The 2 waste storage tanks were listed in the FFA/CO.					
TOTAL WASTE VOLUME ESTIMATE: [b] 3171 m^3 *				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: 94 m^3					
HAZARDOUS WASTE: none					
MIXED WASTE: none					
INDUSTRIAL WASTE: 3077 m^3					
TRU WASTE: none					
HIGH-LEVEL WASTE: none					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The ARA III reactor area is located at the south central end of the INEL, approximately 8 miles east of the Central Facilities Area (CFA). The ARA III Facility was initially constructed for development and experimental testing of an Army Gas-Cooled Reactor (AGCR). The site was originally called the Gas-Cooled Reactor Experiment Facility (GCREF). The goal of the first Gas-Cooled Reactor Experiment (GCRE-I) program was the test operation for a developmental model of an AGCR. Construction began in the spring of 1958 and was completed in 1959. Reactor test programs were conducted at ARA III until 1965, when the entire Army Reactor Program was phased out. From 1966 through 1988, the facility was used as a component and instrumentation laboratory for testing and evaluating items used in nuclear reactor experiments. Since this time, the area has been in a safe storage condition. ARA-III is owned by EM-40.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

Reactor Building

ARA-608 is a 7,270 ft^2, one-story reactor building with a high bay. It is a steel frame building with metal panel walls, a reinforced concrete floor, and corrugated sheet metal siding and roofing. The high bay is made of high-density concrete and has a 20-ton bridge crane. The reactor pit was covered with large concrete shielding blocks. The building is attached to ARA-607. Part of ARA-608 is the reactor heater pit, which contained the nitrogen-fired heater tank and associated piping. ARA-607 is a 6,150 ft^2, one-story building, made of concrete blocks on a reinforced concrete floor.

Service Building

ARA-610 is a 1,344 ft^2 steel frame building with corrugated metal sides and roof and sits on a reinforced concrete pad. The 1 ton bridge crane is still present.

Gatehouse

ARA-609 is a one-story slab-on-grade building with metal siding.

Well Control Room

ARA-611 is a 557 ft^2 one story masonry building with tar and gravel roof and sits on reinforced concrete slab. It is located over the deep well.

Contaminated Water Pumphouse

ARA-612 is a 240 ft^2, one-story, contaminated water pumphouse. It has masonry exterior walls, a tar and gravel roof, and a reinforced concrete floor.

Instrument Building

ARA-621 is a 5,154 ft^2 one-story concrete block building, with a reinforced concrete floor. All equipment has been removed.

Warehouse Building

ARA-622 is a 1,280 ft^2 one-story building with metal sides and roof on a reinforced concrete slab. All equipment has been removed.

Prototype Building

ARA-630 is a 2,903 ft^2 one-story concrete block building on a reinforced concrete slab. All equipment has been removed.

Power

Power is supplied to ARA-III at 13.8 kV from SPERT Substation No. 10. The ARA-713 substation contains a transformer that was removed and the power system was deactivated in 1988.

Water

All water is supplied to ARA-III from a deep well in ARA-611 and a 56,900 gal water storage tank (ARA-709).

Fuel Oil and Gas Systems

ARA-710 is a 42,000 gal fuel oil tank that contained No. 2 fuel oil. ARA-711 is a fuel oil storage pump canopy that contains pumps and valving.

Drains and Waste Systems

The drainage and waste systems include sewage, service waste, and abandoned warm and hot contaminated waste lines or tanks. ARA-708 was a 75,000 gal wastewater storage tank. Attached to this tank was a process stack (ARA-714), a 10,000 gal high-level waste storage tank (ARA-735), and a 10,000 gal low-level radioactive liquid waste storage tank (ARA-736). ARA-739 and ARA-740 are septic tanks with 500 gal and 1,500 gal capacities. ARA-715 is a ventilation stack.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

The majority of the facilities and grounds are uncontaminated. Most areas of contamination are limited to portions of ARA-608 and ARA-612, and the drain and waste systems. No chemical hazards have been identified during characterization. Stacks 714 and 715 and tanks ARA-735 and 735 indicated small amounts of radiological contamination.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

Stan T. Fenn, ARA-III Project Manager, LITCO, 526-9823, MS 3921.

D&D/S&M Previous Accomplishments

Transported 14 radioactive sources and carrying pigs to a vendor for recycling in 1992. In 1993 and 1994, Tanks ARA-735 and 736 were removed and sectioned. Stacks ARA-714 and 715 were dropped and sectioned. ARA-608 was decontaminated and the heater was removed and excessed. Asbestos was removed from several areas. ARA-612 was dismantled.

Unique Conditions/Special Circumstances

None.

Permitting Requirements

ARA-III D&D was reviewed for applicable NEPA documentation in 1991 and it was determined that an Environmental Assessment (EA) would be required. This EA was prepared in 1991 and was formally submitted into DOE-HQ in September 1992. DOE-HQ approved the EA in June 1993.

Surveillance and Maintenance Status

The S&M activities occurring at ARA-III are routine periodic surveillance and maintenance for security, environmental, and health and safety measures, and routine radiological surveys. All facilities are in good condition and pose no threat for loss of containment integrity.

Safety and Environmental Considerations

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exists.

D&D Recommended Methodology

ARA III was characterized in 1984 and again in 1990. The 1985 decision analysis considered five alternatives that varied from restoring the area to a natural condition to leaving the area in its present condition. The recommended alternative would remove all radioactively contaminated material from the area. Recent changes in scope specify the removal of all structures.

Specialized Capital Equipment and Tools Required

None.

Facility Reuse Considerations

The cost of existing facility renovation for reuse equals or exceeds the cost of new facility and the risk of residual contamination remains. No reuse identified.

REFERENCES

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2. M. R. Dolenc and J. H. Clark, Characterization and Decision Analysis of the ARA-III, PG-WM-84-011, February 1985.

3. C. K. Hardy, Sampling and Analysis Results for the Auxiliary Reactor Area III, EGG-WM-9507, February 1991.

4. T. N. Thiel and D. J. Larsen, D&D Plan for ARA-III, WM-ERP-92-023, May 1993.

5. W. D. Schofield, Safety Analysis Report for the Auxiliary Reactor Area (ARA-III) at the INEL, WM-ERP-91-003, July 1991.

6. D. K. Nims, Health and Safety Plan for D&D of Contaminated Equipment and Miscellaneous Items at ARA-III, EGG-WM-10136, October 1992.

7. S. A. LaBuy, Final Report - Decontamination and Dismantlement of ARA-III, EGG-ER-11493, September 1994.

8. C. E. Klassy, Hazard Classification for Demolition Activities at the ARA-III Facility, ER-94-042, August 1994.

9. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

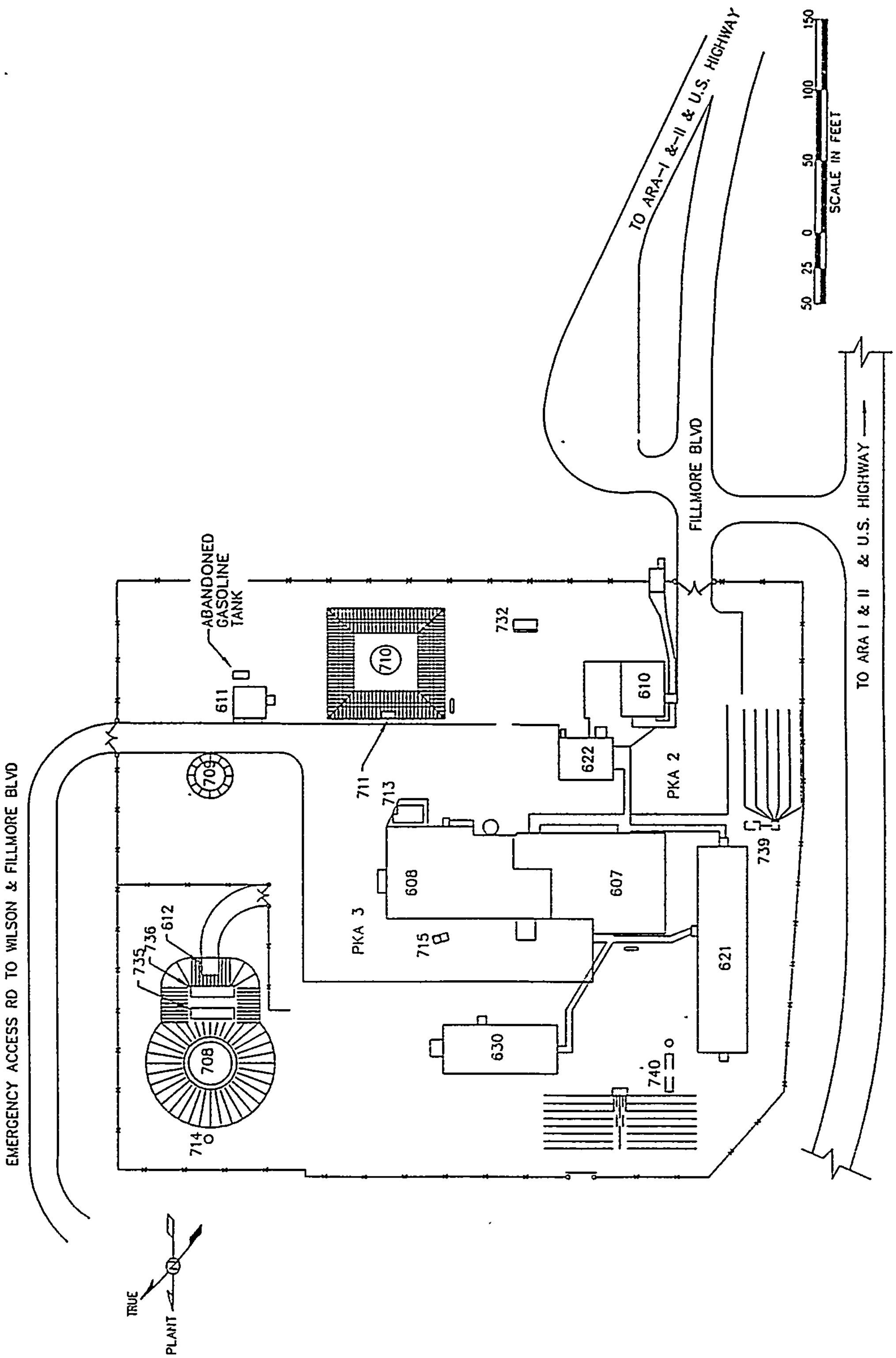

Figure B-6. ARA-III Plot Plan.

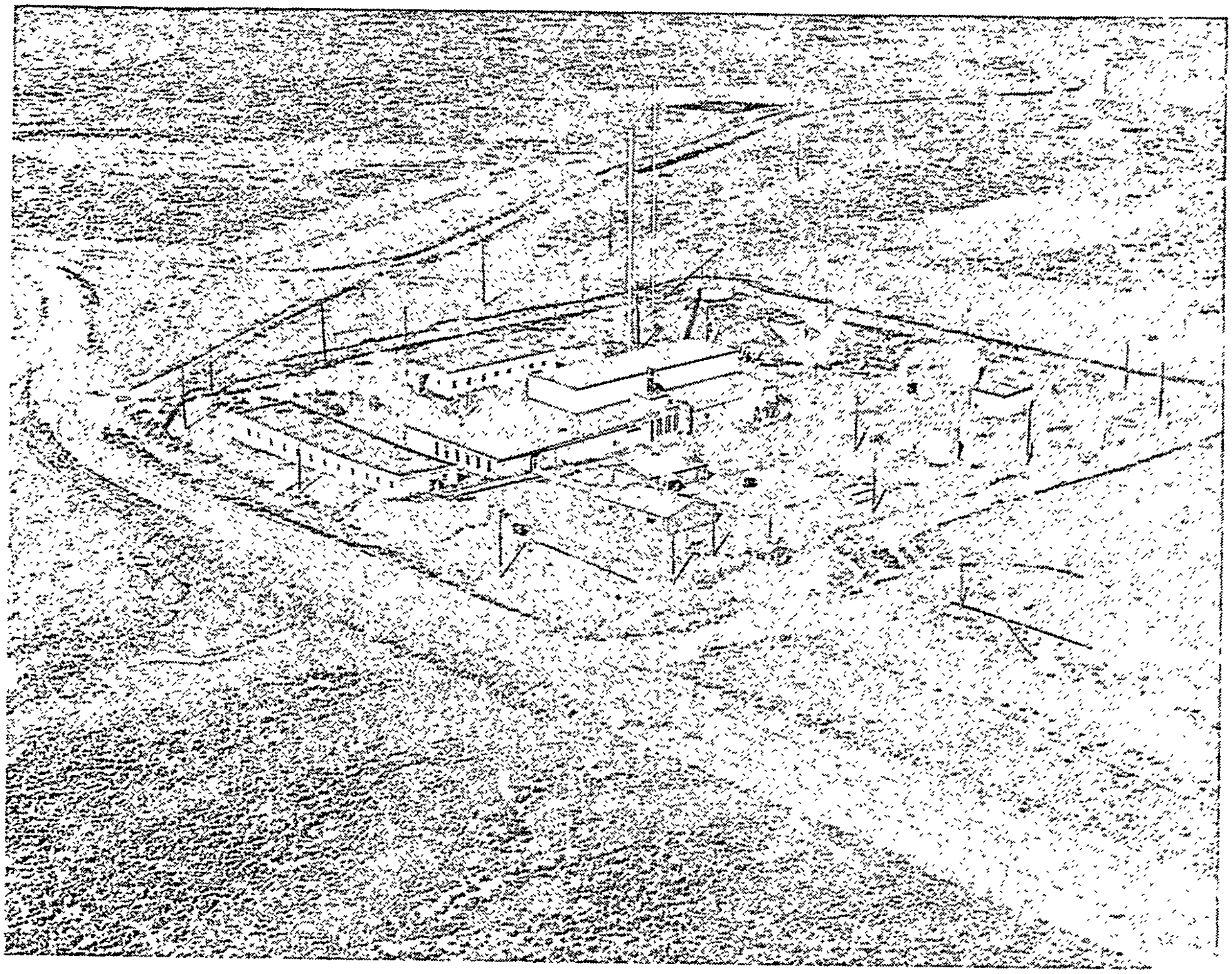

Figure B-7. Aerial view of ARA-III.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: BOILING WATER REACTOR EXPERIMENT (BORAX-V)					
TOTAL ESTIMATED COST: [a] $ 2528K			REMAINING SCHEDULE DURATION: 1 yr		
FUNDING SOURCE: EW2010401 ADS: 63-EG			WBS: 1.2.15.2 CAP: 3KNBR0000 and 3KNBR1000		
Actual Cost through FY-94: $ 1478K		FY-95: $ 95.7K	FY-96: $ 952K	FY-97:	FY-98:
FY-99:	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Low Hazard per DOE 5481.1. Use existing SAR.			Project Priority: 1 of 16 Basis: Project well underway. Minimal effort and relatively low cost to complete.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.					
TOTAL WASTE VOLUME ESTIMATE: [b] 795 m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE:	297 m^3				
HAZARDOUS WASTE:	none				
MIXED WASTE:	6 m^3				
INDUSTRIAL WASTE:	492 m^3				
TRU WASTE:	none				
HIGH-LEVEL WASTE:	none				

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The BORAX Facility, located in the southwestern part of INEL, was the site for reactor experiments conducted between 1951 and 1954. The BORAX experiment series began with BORAX-1, an open-top boiling water reactor. This reactor was intentionally destroyed and, after cleanup, buried in place during 1953. A new site, northeast of BORAX-I, was chosen for subsequent experiments. The BORAX-II, -III, -IV, and -V experiments were performed on the same site as the existing BORAX-V facility.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

BORAX experiments, except BORAX-I, were housed in the reactor building (AEF-601) and the turbine building (AEF-602), later designated as buildings 717 and 718, respectively. The BORAX-V facility comprised the reactor and turbine buildings, the cooling tower, the heating and ventilating (H&V) building, and miscellaneous outdoor structures.

The reactor building was a Butler-type structure, with sheet metal skin and structural steel frame, and only the basement portion remains. This building housed the BORAX-V reactor vessel, the BORAX-II, -III, and -IV reactor vessel, and associated reactor support systems. The turbine building was also a Butler-type structure and contained a 3750 kVA turbine-generator, associated steam piping, instrumentation, and testing loops. Condenser circulating water was cooled by a forced-draft redwood cooling tower. The H&V building provided heat and air circulation for the reactor building. It was constructed of concrete block and was located west of the reactor building. Also considered part of this facility were a guard house, piping to the leaching pond, security fence, electrical service, septic tank system, raw water distribution, and buried fuel tanks.

BORAX-V

The BORAX-V reactor vessel is cylindrically shaped with ellipsoidal heads. It is constructed of carbon steel, and clad internally with Type 304 stainless steel. The vessel is equipped with 40 nozzles and ports for access, instrumentation, control rods, etc., to provide flexibility in experiments. The vessel is supported from the bottom end by an A-7 carbon steel skirt and four sole plates, welded to 14-in. wide flange beams cast into the concrete support and shield slab. The vessel is insulated with a 2-in. blanket of fine, Type 430 stainless steel wool, supported by a series of steel rings welded to the vessel, and enclosed in a skin of 20-gauge, Type 304 stainless steel sheet. Certain sections are removable for access to the flange bolts. The vessel nozzles and extensions are insulated and jacketed.

BORAX-V was designed as an extremely flexible system with three separate core configurations: 1) a boiling core with a centrally located superheater, 2) a boiling core with a peripherally located superheater, and 3) a boiling core without a superheater. It was possible to operate with either natural or forced circulation of water through the core. The water served as the moderator in both the boiling and superheater regions of the core, and as coolant in the boiling region. The superheater was cooled by steam. The steam formed in the core continued into the steam space, while the water flowed down through the annular downcomer. The reactor vessel was equipped with and connected at three points to reactor water-level standpipe T-1, that is located in the access shaft alongside the vessel. The standpipe is equipped with a number of instruments and devices.

BORAX-V used nine control rods to control the reactor. The poison sections are centered in the core when the drives are disconnected or deenergized. The rod drives mount below the reactor vessel and operate to raise the poison section of the rod up and out of the core. There are five cruciform-shaped rods and four T-shaped rods having a stainless steel clad Boral section 2 ft long and an overall length of 10 ft The rods have a 2 ft aluminum follower below the Boral section.

BORAX-II, -III, and -IV

The BORAX-II, -III, and -IV reactor vessel was later used for superheater fuel element storage during the BORAX-V experiments. The vessel internals and head have been removed and the vessel is located in the old reactor pit. The space between the vessel and its concrete shield has been filled with sand and capped with concrete. Piping connects the vessel to the circulating water system for fuel storage.

Raw water (brown piping) is supplied through a 4-in. underground line from the EBR-I well pit. This line branches to the reactor building, turbine building, and a fire hydrant. Makeup water (light brown piping) supplied demineralized water for filling the reactor primary coolant and fuel storage systems. It provided, as makeup water, the difference between reactor water demand and condensate water supply.

The condensate system (painted tan) condensed steam and returned it, via the underground trench, to the feedwater storage tank T-5. It also delivered water to gland-seal storage tank T-7; received water from the condensate drain tank T-8; was a source of water for the turbine air ejector; and provided high quality plant water via primary condensate filter F-3, condensate demineralizer DM-2, and secondary condensate filter F-2. The feedwater system (dark green) delivered a water to the reactor vessel. This system supplied seal water to the control rod drives, the forced convection pump, and the auxiliary water pump. It was also the water source for the steam system desuperheater. The feedwater storage tank has been removed. Remaining are the two feedwater pumps and the distribution system.

The auxiliary water system (painted green) is composed of a pump, a bank of electric heaters, strip heaters, a demineralizer, heat exchangers, piping, valves, and instruments. Reactor water was circulated and heated without nuclear heat. The forced convection system (painted green) delivered water to the boiling fuel elements at higher flow rates than could be obtained by natural circulation within the reactor vessel. These higher rates permitted operation at higher useful powers.

The process steam system (burnt orange) is similar to a conventional steam plant. Complete loss of air and electric power resulted in full containment. This fail-safe design preserved reactor steam pressure after a shutdown resulting from power failure. Because BORAX was an experimental facility, provisions were made to take steam from the vessel at a number of points. The major piece of equipment is the 1926 Westinghouse 3600-rpm turbine-generator. The turbine-generator was used as a reactor heat sink. The principle systems are the turbine, air ejector, air ejector exhaust, gland seal water, circulating water, raw water, and lube oil. The lube oil system (painted blue) contains a 110 gal sump tank, suspended from the forward turbine bearing housing.

The air ejector unit (painted tan) was supplied with main steam. The first-stage air ejector drew off gases from the main turbine condenser through a 10-in. pipe and deposited, along with the first-stage ejector steam, into the innerstage condenser. Condensate from this condenser was returned to the main condenser. The air ejector exhaust system (painted yellow) used a heat exchanger with demister, two filter units, a blower, and a gas activity monitor. Approximately 10 cfm of radioactive air ejector exhaust gases passed through the shell side of the exchanger and out the demister. Condensate drained from the heat exchanger to the condensate drain tank. Two filter units are located downstream from the heat exchanger. The gland seal system (painted tan) contained a 200-gal water storage tank located in the turbine building.

The circulating water system (light green) is similar to a conventional secondary cooling system. The circulating pump took suction from the condenser 16-in. diameter pipe outlet and delivered water into the top of the induced-draft cooling tower via a 20-in. line. As air was drawn upward by the 4-bladed, 16-ft-diameter fan in the top of the tower, it removed heat from the water by evaporation. The tower was designed to cool 6600 gpm from 105° to 90°F. The compressed air system consisted of four compressors, two filter-dryer combinations, two air-pressure-reducing stations, and air storage loop, and the necessary piping and tubing for air distribution.

The boron addition system (painted purple) consists of boron storage tank T-2; electric heaters, a steam supply line, a tank-to-reactor discharge line; and a number of valves, controls, and gauges. The batch feedwater system (painted dark green) consists of batch feed tank T-3, bath storage tank T-6, plus a system of piping and valves that connect the tanks to one another and to the reactor vessel.

The electrical power system consisted of the powerline, outdoor substation, motor control centers, lighting transformers, distribution panels, emergency power battery (removed), and emergency generator (removed). The control building has been disconnected from BORAX-V and is not included in the D&D project. The powerline from CFA also supplied power to the WMO-601 substation, EBR-I substation, and the deep well pump substation. Power to BORAX can be disconnected by a pole-top switch located on the second pole. The BORAX substation is enclosed by a fence and includes three lightning arresters, six fused cutouts, three 167-kVA transformers, and a 500-kVA transformer with motor controller. A circuit breaker in the reactor building motor control center supplied the turbine building motor control center. A 45-kVA, 3-phase transformer located in the reactor building steps the voltage down from 480 to 208/120V to feed distribution panels LB, LC, LH.

Biological shielding was accomplished by locating the BORAX-V reactor and other equipment carrying radioactive materials below ground level. Concrete walls, movable concrete slabs, lead blocks, and water were used to provide personnel and equipment protection from radiation exposure. The reactor pit is shielded horizontally by 4.5 ft of concrete on the access shaft side and by earth and concrete on the other three sides. A 3 ft thick slab of high-density concrete is located between the floor of the reactor pit and the ceiling of the subreactor room. Penetrations into the reactor pit are offset or stepped as required. The piping trench between the reactor building and the turbine building is covered with 6 in. of concrete and 3 ft of earth. Reactor pit lead blocks were positioned around the reactor vessel just below the reactor vessel top flange. Two layers of 31 in. thick, high-density concrete slabs cover the vessel top head. These slabs weigh as much as 10 tons each. The following biological shielding still exists:

- Water Storage Pit: 1 ft thick concrete slabs were used to shield the demineralizer and fuel.

- Equipment Pit and Pipe Trenches: 1 ft thick concrete slabs were moved for equipment maintenance. Manholes are provided in the equipment pit and west trench for entrance.

- Dry Storage Pit: 1 ft thick concrete covers this pit.

The fuel storage demineralizer system maintained water quality in both the boiling and superheater fuel element storage facilities. The BORAX-II, -III, and -IV reactor vessel was used for superheater fuel element storage during BORAX-V operation. Boiling fuel assemblies were stored in the water storage pit. The water chemistry equipment consists of the makeup demineralizer, the reactor water demineralizer, the condensate demineralizer, and the sampling station.

Heating units were provided for the reactor and turbine buildings. A pit exhaust system was provided for the reactor building below-grade operating areas. Air conditioning equipment was provided for the reactor building instrument room.

Reactor Building

This building was a Butler building with sheet metal skin and a structural steel frame. It is insulated and equipped with two equipment doors. The building is 40 ft by 86 ft with 20 ft high eaves and a 26 ft high gable. All construction at floor level and below is reinforced concrete.

Turbine Building

This building was a Butler building, 40 ft wide by 60 ft long, with 17 ft eaves and 24 ft gable. It is equipped with an equipment door. Floor level and below is constructed of reinforced concrete, except for a heavy steel structure used to support and isolate the turbine generator.

The insulated building exterior is galvanized sheet steel on a structural steel frame. A 10-ton maintenance rail crane is in place over the turbine generator.

Heating and Ventilating Building

The H&V building was constructed of concrete block walls and a metal roof. The building is 15 ft by 12 ft by 8 ft high.

Guard House

The wooden guard house was 6 ft by 8 ft by 8 ft high.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

General low-level contamination exists throughout the remaining basement areas of the reactor building. Direct radiation readings taken on the two reactor vessels are generally less than 10 R/hr.

Contact Information

[Name, title, company affiliation, phone]

G. R. Rodman, BORAX-V D&D Project Manager, LITCO, 526-8077.

D&D/S&M Previous Accomplishments

Previous D&D tasks completed from 1984 through 1992 include the leaching pond, cooling tower, above grade components of the reactor building and the H&V building, USTs, and the turbine building.

Unique Conditions/Special Circumstances

The remaining reactor vessel exhibits significant radiation levels and will require special rigging and lifting techniques because of its weight.

Permitting Requirements

NEPA requirements for performing D&D of the reactor building will be satisfied through an EA.

Surveillance and Maintenance Status

Current S&M requirements include the maintenance of a temporary cover constructed over the reactor building main floor concrete slab to prevent water access.

Safety and Environmental Considerations

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D Recommended Methodology

Entomb the remaining portions of the reactor building.

Specialized Capital Equipment and Tools Required

None.

Facility Reuse Considerations

No facility reuse has been identified.

REFERENCES

1. G. R. Rodman and F. E. Stoll, D&D Plan for the BORAX-V Facility, EGG-ER-10900, August 1993.

2. C. E. Klassy, Safety Analysis Report for the D&D of the BORAX-V Facility, ER-93-024, April 1993.

3. G. R. Rodman, et. al., Final Report of the Decontamination and Dismantlement of the Borax-V Facility Turbine Building, EGG-2683, December 1992.

4. G. R. Rodman, Health and Safety Plan for the Decontamination and Dismantlement of the BORAX-V Facility, EGG-ER-10801, September 1994.

5. D. L. Smith, Decision Analysis for the Dismantlement of the BORAX-V Reactor Facility, PG-WM-84-03, August 1984.

6. D. L. Smith, et. al., BORAX-V Decontamination and Dismantlement Plan, PR-W-79-017, September 1979.

7. D. L. Smith, D&D Plan for the BORAX-V Facility, PR-W-79-017, Rev. 1, April 1985.

8. D. L. Smith, D&D Plan for the BORAX-V Facility, PR-W-79-017, Rev. 2, November 1988.

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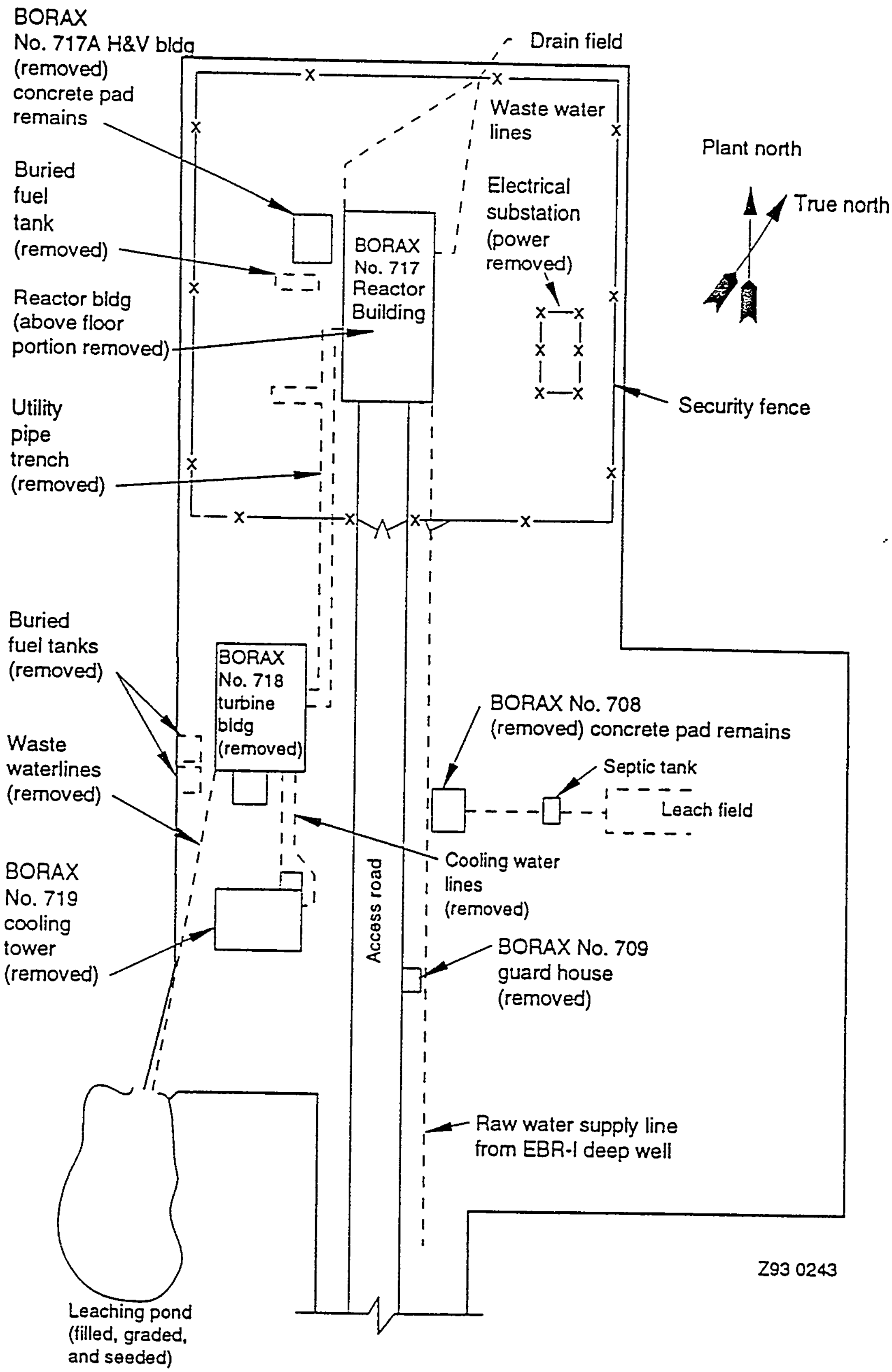

Figure B-8. BORAX-V Plot Plan.

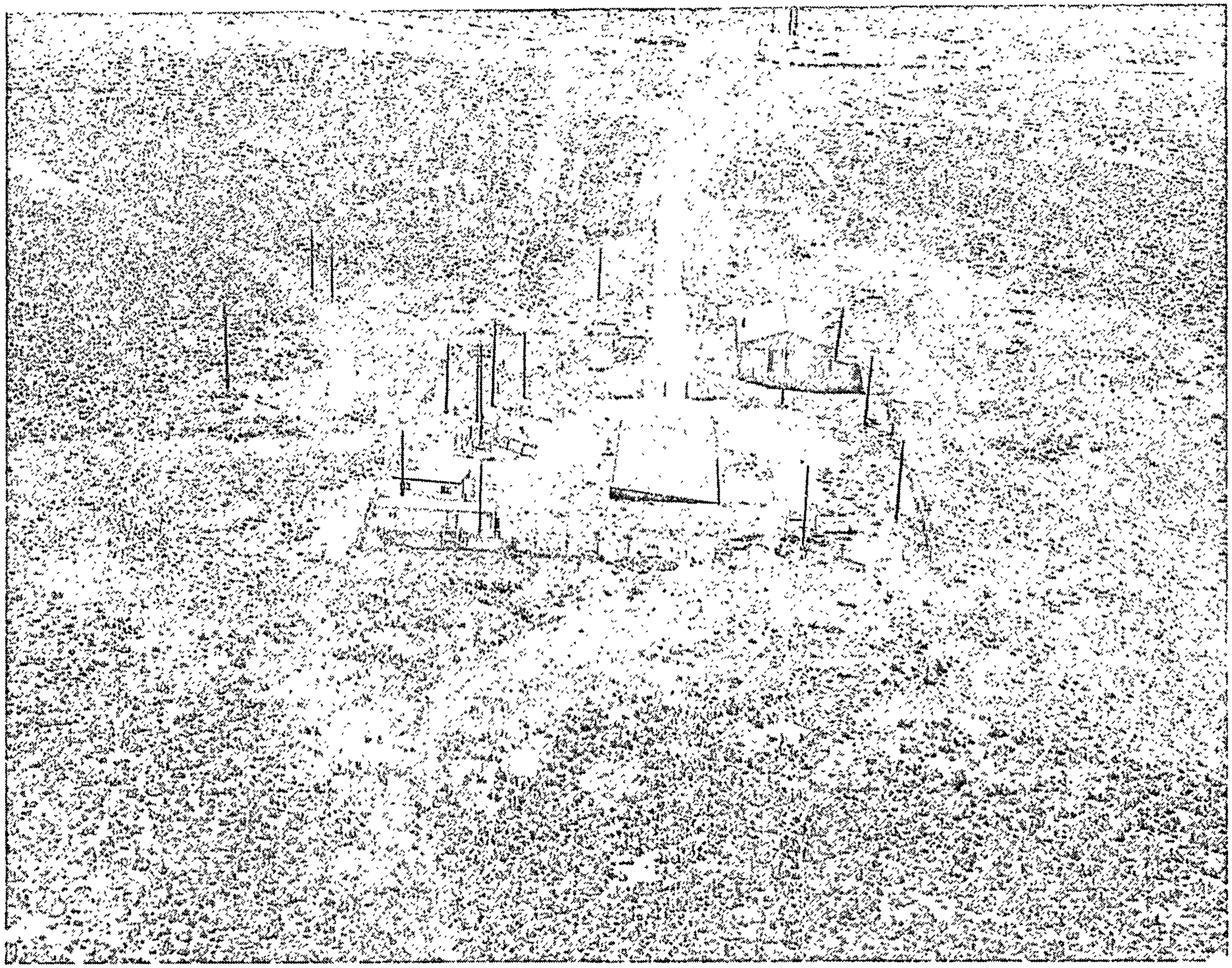

Figure B-9. BORAX-V facility (aerial photograph).

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: **MATERIALS TEST REACTOR (MTR) FACILITY**					
TOTAL ESTIMATED COST: [a] $ 36,289.5K			REMAINING SCHEDULE DURATION: 11 yrs		
FUNDING SOURCE: EW2010401 ADS: 54-EG			WBS: 1.2.06.1 and 1.2.06.2 CAP: 3KNMTA000 and 3KNMTC000		
Actual Cost through FY-94: $ 112.5K		FY-95: $ 30.9K	FY-96: $30.0K	FY-97: $30.0K	FY-98: $598.4K
FY-99: $ 1248.2K	FY-00: $ 3108.9K	FY-01: $ 3989.4K	FY-02: $ 7361.9K	FY-03: $ 7652.3K	FY-04: $ 4996.9K
FY-05: $ 3996.5K	FY-06: $ 3133.6K				
DOE HAZARD CLASSIFICATION: Nuclear Facility. Prepare SAR.			Project Priority: 16 of 16 Basis: Reduce S&M costs, personnel hazards, and reuse facility.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.					
TOTAL WASTE VOLUME ESTIMATE: [b] 23,470 m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE:	7,860 m^3				
HAZARDOUS WASTE:	TBD m^3				
MIXED WASTE:	10 m^3				
INDUSTRIAL WASTE:	15,600 m^3				
TRU WASTE:	none				
HIGH-LEVEL WASTE:	none				

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

MTR-603 Reactor Building

The oldest of the INEL Test Reactors, the Materials Test Reactor (MTR), is located at the Test Reactor Area (TRA) and was first operated in 1952. Successful operation resulted in the development of several plate-type fueled reactors including the Engineering Test Reactor (ETR) and the Advanced Test Reactor (ATR). The MTR also contributed to the development of pressurized water reactors, organic reactors, liquid metal reactors, and homogeneous reactors. The 40 MW_t (thermal) MTR could provide neutron fluences averaging 2.5×10^{14} n/cm^2-s.

In August 1958, the MTR became the first reactor to be operated using plutonium-239 fuel at power levels up to 30 megawatts, proving the feasibility of fabricating a plutonium-fuel core capable of withstanding high-power, high-flux conditions. The test also demonstrated that a reactor fueled with plutonium can be satisfactorily controlled. The MTR logged just under 180,000 MW-days and more than 19,000 neutron irradiations before retirement in August 1970 and partial dismantling and decommissioning in 1974.

In 1980, water used for additional shielding was drained from the reactor vessel after external radiation levels indicated it was no longer required, thus reducing the volume of water being pumped to the leaching pond by 1.987×10^3 m^3 per year.

The MTR-603 main floor has been used as a valve operation and remote maintenance mockup area since 1976. The main reactor overhead 50 ton crane is extensively used for loading and unloading casks from trucks. The portion of the main floor not used for valve testing provides access for trucks as well as for cask and other experimental equipment storage. The primary sump tank, seal tank, and some auxiliary cooling loop piping will be used in an upgrade of the TRA radioactive liquid waste handling capability. The east end of the MTR water canal is connected to the ARMF canal by a 5.1 cm shuttle tube, which was inactivated in 1983. Spent fuel, irradiated samples, and associated equipment are still stored in the canal.

The MTR Water Canal, formerly the Test Train Assembly Facility (TTAF), is located in the basement of the MTR building. TTAF was used in support of the NRC's Thermal Fuels Behavior Program, in the 1980's, to build and disassemble nuclear fuel tested at the Power Burst Facility (PBF). The only remaining portion of the TTAF is the MTR-603 Water Canal. MTR is owned by DOE-NE and will be turned over to EM-40 beyond the year 2000.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

MTR-603 Reactor Building

The main building is 130 ft square, 80 ft high, and has a 17 ft deep basement. The reactor shielding is in the center of the building. The building utilizes precast insulated concrete slabs, which are bolted to the concrete-encased structural columns to form the walls. The flat roof is constructed of precast concrete panels laid on steel purlins covered with foam-glass insulating blocks and built-up roofing. The reinforced concrete main floor is 3 ft thick around the reactor vessel and the remainder of the floor is 1 ft thick. The balcony floors are 4 in. thick reinforced concrete. The basement floor is 1 ft thick reinforced concrete and rests on soil, which can carry a load of 57 psi.

The reactor shielding is in the center of the building. The removable top head of the reactor provides access to the reactor core for refueling and test train handling. Most irradiated material left the reactor tank through an underwater discharge mechanism, passing downward through the subpile room to the storage canal.

MTR-603 Canal

The canal in the reactor building basement is considered an integral part of the overall facility design. The canal, which is located in the MTR basement, is 8 ft wide, 15.5 ft below floor level, and extends 121.5 ft eastward from the reactor structure. The reactor building east wall is 40 ft from the reactor structure; therefore, the canal extends 81.5 ft beyond the reactor building east wall. Outside the reactor building, the canal has a 6 ft wide working space on each side and at the east end. This working space is enclosed by a tunnel 13 ft 8 in. high and 21 ft wide.

A "rabbit canal" lies directly west of the reactor structure and is 6 ft wide × 6 ft deep × 18.5 ft long. A 7 ft wide portion of the canal below the subpile room and reactor structure connects the rabbit canal and main canal. This section, as well as the rabbit canal, has been drained of all water and sealed off. A permanent bulkhead was installed to isolate it from the remainder of the main canal. A cover and shielding has been placed over this section to protect personnel.

A parapet around the main canal is 10 in. thick at the bottom and projects outward to a width of 13 in. at the top. This projection provides toe space and gives personnel better stability for fuel handling operations. The top of the parapet is 3 ft above floor level. The water level in the canal was maintained 2 ft above the basement floor level providing a depth of water in the main canal of 17.5 ft The canal walls were originally covered with 8 by 16 in. white glazed structural tile 4 in. thick, and the bottom was lined with 4 in. of white concrete. A stainless steel liner was later installed to inhibit leakage. All of the canal except the section underneath the reactor vessel was lined with stainless steel.

MTR-604 Reactor Building Wing

The west wall of the MTR reactor building is common with the east side wall of the wing. The wing is concrete block, is about 142 ft by 130 ft and has a full basement and a partial second floor. The basement floor is concrete and the first floor is concrete largely covered by tile. The roof is composition on steel beams with a ceiling of noncombustible tile.

In the basement are heating and ventilation equipment, electrical switchgear, storage areas, and offices. The first floor has offices, chemical and instrumentation laboratories, a machine shop, shops, a computer area, storage areas, and the Radiation Measurements Laboratory. The latter provides a range of services including specialized radiation dosimetry and spectroscopy, neutron activation analyses, and radioactive effluent monitoring and analyses. The second story (fan loft) has offices and a storage area.

The wing has three single story extensions of similar construction. The north extension (MTR-668) was constructed in 1956 and has a utility tunnel below grade. It is used for instrumentation and physics labs, and office space. The alpha wing extension (TRA-661) was constructed in 1962 and has labs to perform radiochemical separation for measuring particle and photon energies, and to perform nuclear spectrometry. It also has a utility basement tunnel. Two wing extensions (TRA-652 and 649) were built in 1966 and are used as offices. Wing "B" (TRA-652) is a two-story structure and wing "C" (TRA-649) is a single story structure.

MTR-605 Process Water Building

MTR-605 housed the equipment for the MTR primary loop cooling water heat removal. Three flash evaporators are located in the upper story above the tank room. The building contains a 100,000 gal sump tank, a ventilation system, and various pumps and piping. The primary pumps and flash evaporators are contaminated to an extent that would present problems in decontamination and disposal. A modification to use the building, sump tank, and seal tank as an integral part of the TRA radioactive water cleanup system was completed in 1980, and new piping and equipment has been installed.

This structure is 120 ft by 76 ft and has a basement and the 50 ft east end has a second floor The building has concrete walls and floors and a composition roof with steel beams and a gravel top. Along the north side beneath the first floor at the basement level is a pipe tunnel that contains the old MTR primary coolant piping as well as some newly installed piping that is being used as part of the TRA radioactive waste cleanup system.

MTR-610 Fan House

MTR-610 is 66 ft by 48 ft by 18 ft high. This one-story concrete block building has a reinforced concrete floor and a composition roof (poured concrete on fiberboard on steel beams). MTR-610 contains five large contaminated fans, which draw air from various MTR buildings and exhaust through the MTR-710 stack. Three motors have been removed leaving two fans and motors in operation. The above-ground air ducts between various MTR buildings and the fan house are internally contaminated. The switchgear in the building was removed to facilities electrical equipment storage. Three large radioactively contaminated blower rooms are separated from the rest of the fan house by closed doors.

MTR-611 & 657 Plug Storage Facilities

These structures are horizontal pipes provided to contain the reactor neutron beam hole plugs when not in use. These receptacles (32 in MTR-657 and 14 in MTR-611) are shielded by earth. MTR-611 is contained by a faceplate that opens to the reactor services building. MTR-657 is contained by concrete walls facing the side of the reactor building. The contamination is moderate.

MTR-657 comprises two structures adjacent to the north side of the MTR-603 first floor. One structure is the 9200 ft^2 roofed enclosure, which is used as a storage area and vehicle passageway through the roll-up truck doors. This structure has concrete block walls on the north and east sides, a reinforced concrete floor, and a composition roof on a reinforced concrete deck. The other structure is 40 ft by 50 ft and has 32 horizontal steel tubes embedded in 12 ft deep gravel backfill, that is contained within 8 in. thick reinforced concrete walls on the north and west sides (without a roof).

MTR-611 abuts the west side of the MTR reactor services building (MTR-635) and consists of a mound of earth fill covering 14 horizontal storage tubes. The steel tubes are at least 8 ft deep in the mound, which extends 22 ft west of the services building and measure about 35 ft The mound tapers off to ground level and consists of 870 cubic yards of compacted earth fill.

MTR-626 Compressor Building

This structure is 48 ft by 31 ft and is approximately 20 ft high. The building is concrete block. A new roof was installed and consists of concrete supports, steel joists, metal decking, rigid insulation, and polyester fabric, topped with a layer of crushed gravel. The floor is concrete. All compressor equipment and piping have been removed, although two air receivers remain outside. Outside the compressor building is an operating transformer on a 10 ft square concrete pad. The transformer is enclosed on three sides by a 15 ft high cyclone fence. The unit contains PCBs.

MTR-630 Catch Tank Pump Pit

The pump pit is located west of the reactor services building beneath a concrete slab that measures 22 ft by 16 ft The slab is 1 ft above ground level and has a 3 ft by 5 ft access hatch with a steel cover. The pump pit is 6 ft deep and has 1 ft thick concrete retaining walls and floor. A drain sump is in the floor, two catch tank transfer pumps are on the floor. Thirty-odd valve stems with handles or handwheels extend about 3 ft above the concrete slab. The stems connect to valves in the pump pit.

MTR-635 Service Building

MTR-635 is adjacent to the reactor building south wall. MTR-635 is 160 ft by 97 ft with a 46 ft wide walled off extension extending 13 ft west, where it abuts the plug storage area (MTR-611). The high bay area is 26 ft high. A third of the building has a second floor, used as offices. At the northeast corner is a two story walled off room that is used as a temporary laboratory, interim fissile material storage area, and a data acquisition facility associated with the neutron chopper house accelerator.

MTR-706 Working Reservoir Pipe Pit

About 75 ft east of MTR-605 is the process piping pit and steam injector pit. The concrete building enclosing the injector pit is 6 ft by 12 ft and 7 ft high. The pit floor is about 10 ft below grade. which is the top of the process piping pit. Surrounding this is a radiation control area fence that also encloses four concrete piers. Nearby is a badly deteriorated concrete plug covering a hatch opening to some underground piping.

MTR-710 Stack & Monitor Building

The MTR exhaust stack is 250 ft high and tapered from 10 ft inside diameter at the base to 5 ft inside diameter at the top. Metal ladder rungs are integral with the concrete structure, for exposed personnel access to the stack top. The MTR stack was decommissioned, the main blowers were shut down, and the draft bypass was activated. Laboratory exhausts not containing acid vapors are filtered through a High Efficiency Particulate (HEPA) filter and then discharged to the atmosphere. The monitoring building to the north measures approximately 11 ft by 11 ft and is 8 ft high inside. It is concrete block and has a concrete slab floor. A delay tank is buried east of the monitoring building.

MTR-712 Retention Basin

The retention basin is located about 150 ft directly south of the MTR fan house and consists of two underground rectangular concrete tanks. Each tank is 130 ft long by 20 ft wide by 20 ft deep, separated by a 1 ft thick common concrete wall. A serpentine flow path is created through the tanks by use of 1 ft thick concrete baffles across the width of each tank at 10 ft intervals. Six baffles hang from the roof and 5 alternate baffles stand on the basin floor.

MTR-730 Catch Tanks

These tanks are located to the south of the MTR-630 Catch Tank Pump Pit. They are 7.5 ft underground and are labeled 309-A, B, C, and D. They are mounted on steel frames on a concrete slab that is 15 ft below grade. Centrally located on the slab are natural drainage sumps and a dry well that extends 1 ft above grade. The four black-iron glass lined tanks are 1500 gal capacity. Two catch tanks receive water from the laboratories and selected building drains. The other two catch tanks receive water from the TRA hot cells. While one of the tanks is receiving water from its source, the other is either in a standby condition or is being sampled for radioactivity in preparation for pumping.

MTR-758 Leaching Pond

The leaching pond is a fenced area southeast of the TRA perimeter fence and is used for disposal of radioactively contaminated water. The pond area encompasses more than

700,000 square feet and has within it three excavated pits. The eastern most pit is 250 ft wide by 400 ft long, the other two are 130 ft wide by 240 ft long each.

MTR-607 Auxiliary Facility

This one-story building is concrete block with insulated metal siding. It has a composition roof and concrete floors. The building measures 48 ft by 44 ft and served as the pump room. A battery bank is in service and is used for backup electrical power for the TRA fire alarm system.

MTR-612 Sump Pump House

This is a small 10 ft square wood frame building built on a concrete pad.

MTR-636 Monitoring Station

At the north end of the retention basin is the basin monitoring station (MTR-636). This one-story building is about 10 ft square with a corrugated metal roof and sides and a concrete floor. A concrete pad on the east, north, and west sides of the building has three metal hatch covers, several valve reach rod stems and handles, motor controls, and a 1 ft diameter metal vent stack about 20 ft high. A similar concrete pad more than 100 ft to the south has a similar arrangement of hatch covers, valve and motor controls and a 20 ft high stack.

MTR-641 Gamma Facilities Building

This structure is 60 ft by 33 ft and is a single story building about 22 ft high. Constructed of concrete blocks, it has a reinforced concrete floor and composition roof of poured concrete on steel beams and steel joists. Adjacent to the south wall is a corrugated metal cold storage building measuring 30 ft by 10 ft and is being used for cold storage of unrefrigerated chemical stock.

A 40 ft long by 16 ft deep (dry) canal runs south of the building's east-west centerline. The canal is 2.6 ft wide and has a 3 ft high 1 ft thick concrete parapet around it. Along the south wall is a 40 ft long, 16 ft deep, and 4 ft wide piping pit under concrete covers except at the east end which has a 2 ft by 4 ft metal grating. The pit contains a pump, motor, valves, and piping. There is a sump near the east end. Exiting the south wall underground is a warm drain pipe (cast iron) that is routed to the catch tank outlet piping which in turn goes to the retention basin.

MTR-651 Auxiliary Facility

This storage building is 28 ft by 24 ft by 14 ft high at the sides. The building walls and roof are corrugated metal on steel frame and fiberglass insulation on the inside. The floor is reinforced concrete. A covered pipe trench below grade extends from the storage building into the reactor building basement.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

Widespread low-level contamination exists in most facility structures. The full extent will be determined during the D&D Characterization phase. Significant contamination levels are expected in the MTR canal because of the past fuel handling operations.

Contact Information

[Name, title, company affiliation, location, phone, mail stop,etc.]

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S. A. LaBuy, MTR Water Canal Project Manager, LITCO, 526-9856, MS 3921.
C. W. Woolstenhulme, Fuel Custodian, LITCO, 526-4226.

D&D/S&M Previous Accomplishments

The MTR-605 Process Water Building was decontaminated and decommissioned in 1984, D&D Final Report EGG-2361, January 1985. The four evaporators and associated pumps, valves, piping, strainers, etc. were removed from the building. The finished, post-D&D area, is an open floor space (approximately 5600 sf). Total decontamination of the building was not completed because of cost/benefit trade-offs. Those areas still contaminated are shielded vaults with no future need.

The MTR-657 Plug Storage Facility was decontaminated and decommissioned in 1983, D&D Final Report EGG-2286, January 1984. All but four of the storage holes are empty and have been decontaminated to levels below 500 dpm/40 cm^2 ß-α.

The MTR-603 HB-2 Cubicle was decontaminated and decommissioned in 1985, D&D Final Report EGG-2431, December 1985. All equipment was removed, walls and ceiling were decontaminated and removed, and the floor scabbled and replaced. The finished, post-D&D area, is an open floor space, which has since been modified for additional office space.

No D&D activities have been performed on the water canal; however, a portion of the water canal, under the reactor vessel, has been drained and sealed off to prevent further leakage into the surrounding soil. A stainless steel liner was installed in the remaining portion of the main canal.

Unique Conditions/Special Circumstances

The primary concern with this project will be the determination of the mode and method for D&D of the MTR reactor vessel and components. The reactor core components are highly radioactive.

The MTR-603 Canal contains irradiated fuel elements that must be removed before MTR Canal D&D Assessment activities can proceed. The canal will be partially drained following fuel removal, until a radiation level of 10 mR/hr is present at the canal floor level.

Permitting Requirements

It is anticipated that D&D of the MTR will require an EA to satisfy NEPA requirements. The MTR water canal has an approved Safety Analysis, EGG-PRP-8239, which addresses fuel handling activities for the current contents of the canal. The SAR will be reviewed for applicability to D&D activities during the D&D assessment phase.

Surveillance and Maintenance Status

The D&D Unit does not currently perform any surveillance and maintenance (S&M) activities for the MTR Facility. The MTR Facility Landlord has responsibility for performing routine S&M.

Safety and Environmental Considerations

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D Recommended Methodology

A decision analysis has not been performed for this facility; the recommended D&D mode has yet to be determined. Following all fuel removal, D&D assessment and cleanup will be performed to remove the contamination in the canal and the surrounding soil area. The extent of soil cleanup will be determined during the decision analysis phase.

Specialized Capital Equipment and Tools Required

TBD

Facility Reuse Considerations

Reuse considerations will be determined per the Decision Analysis Report to be prepared in 1998.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. L. L. Kaiser, Decontamination and Dismantlement MTR-657 Plug Storage Facility - Final Report, EGG-2286, January 1984.

3. D. L. Smith, Decontamination and Dismantlement MTR-603 HB-2 Cubicle - Final Report, EGG-2431, December 1985.

4. J. H. Browder and E. L. Wills, Decontamination and Dismantlement MTR-605 Process Water Building - Final Report, EGG-2361, January 1985.

5. Idaho National Engineering Laboratory Publication, BP 380-R-0886-5M-A, page 33, assumed date August 1986. (Details INEL history for public relations)

6. R. L. Rolfe and E. L. Wills, "Characterization of the Materials Testing Reactor," WM-Fl-83-016, April 1984.

7. E. V. Mobley, Safety Analysis for the Power Reactor Programs MTR Canal Facility, EGG-PRP-8239, April 1990.

8. S. A. LaBuy, MTR Fuel Removal Program Plan, PB-T-94-003, April 1994.

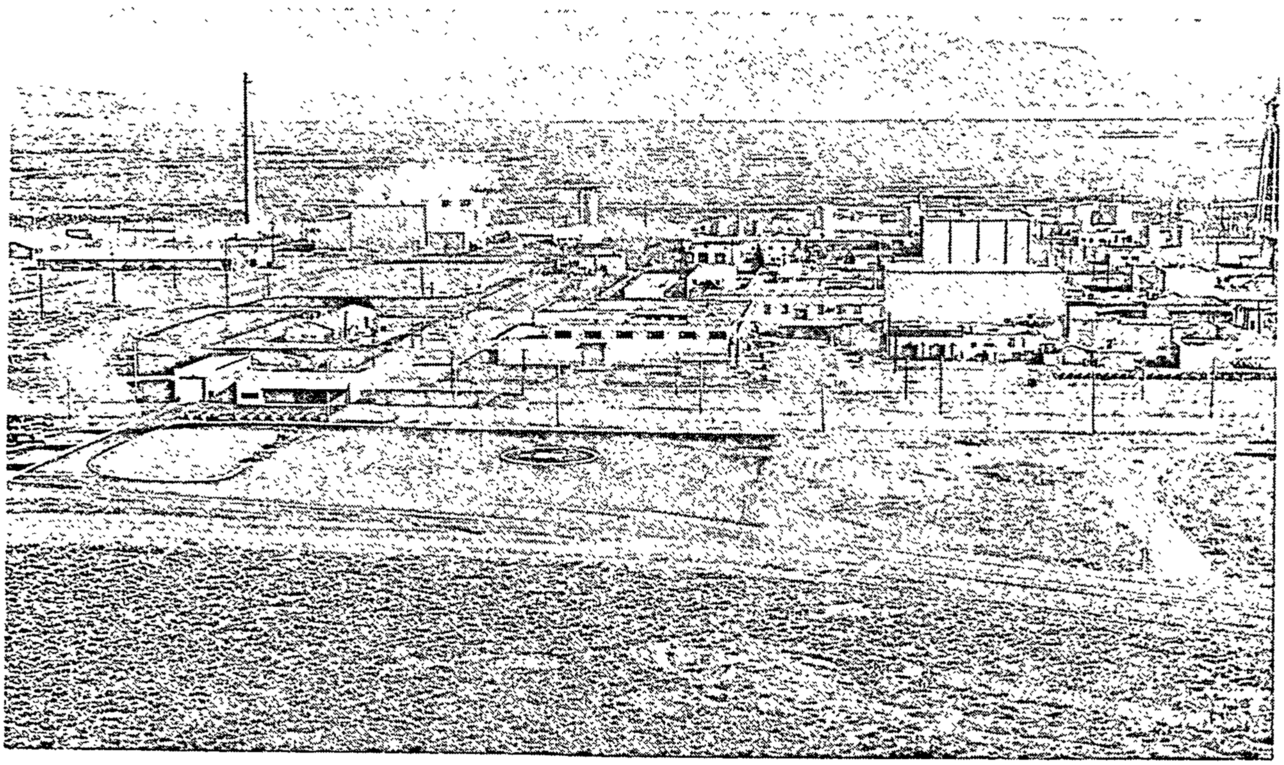

Figure B-10. Aerial photograph of TRA.

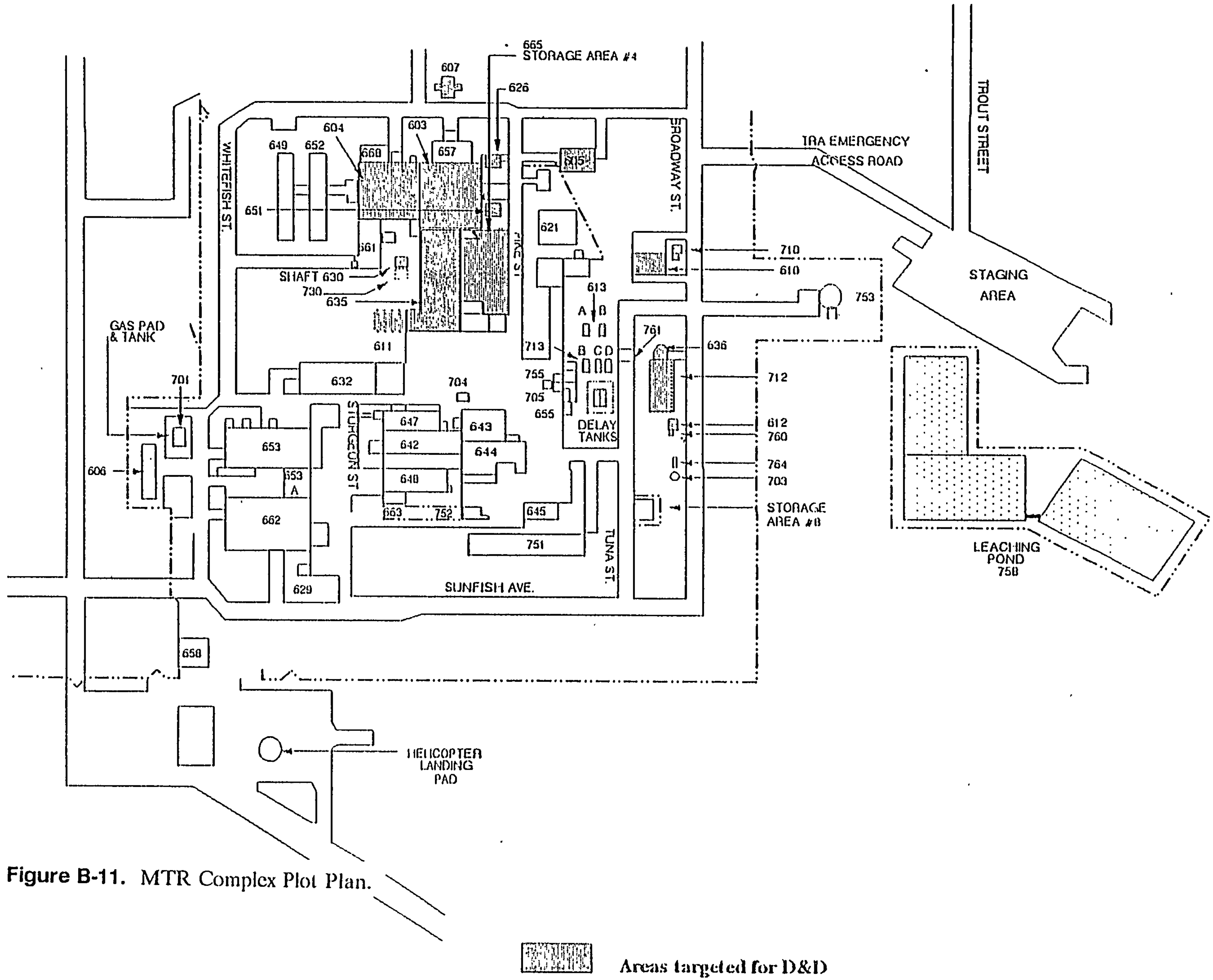

Figure B-11. MTR Complex Plot Plan.

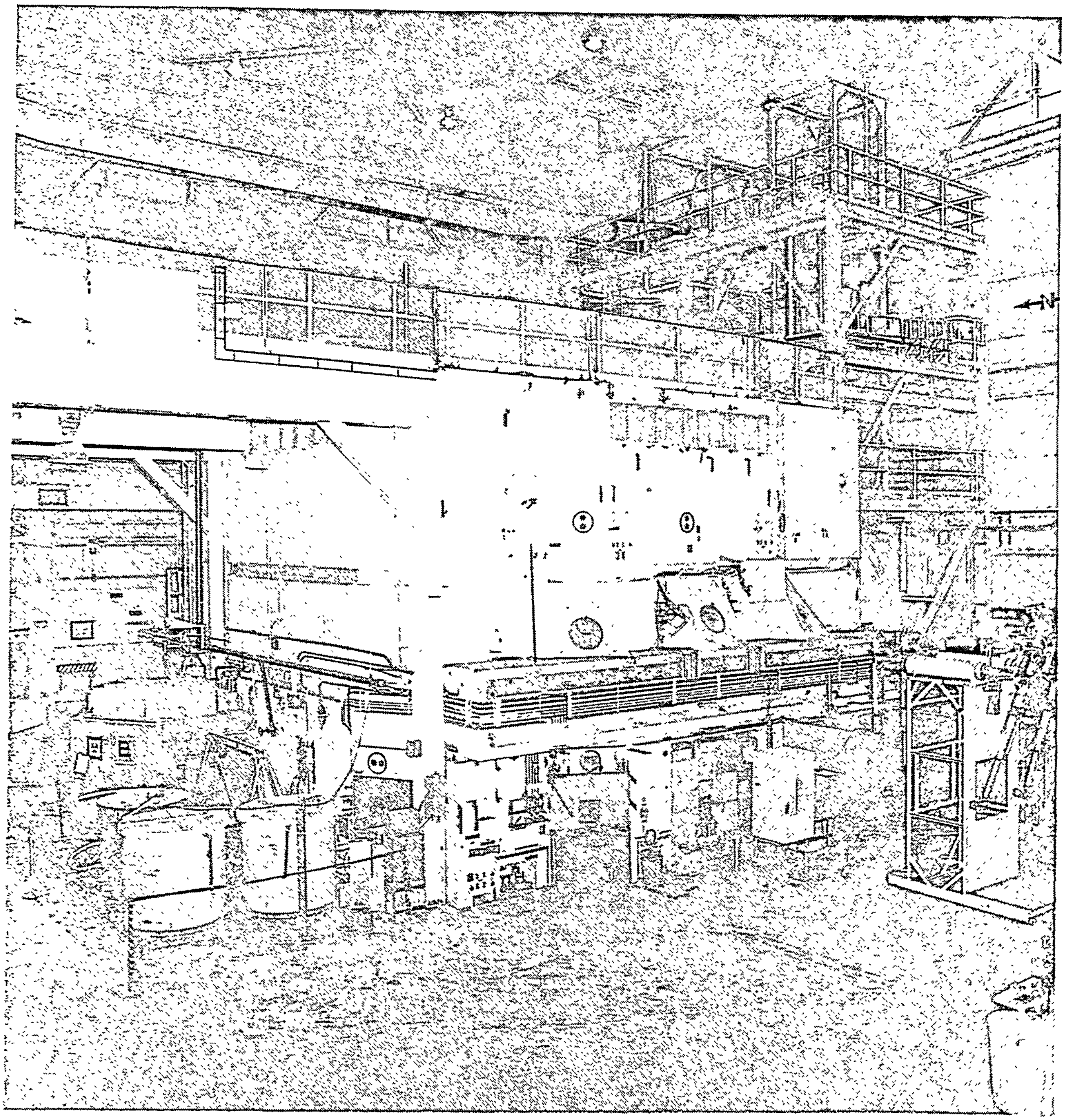

Figure B-12. Part of the first floor of reactor building showing south side of reactor structure.

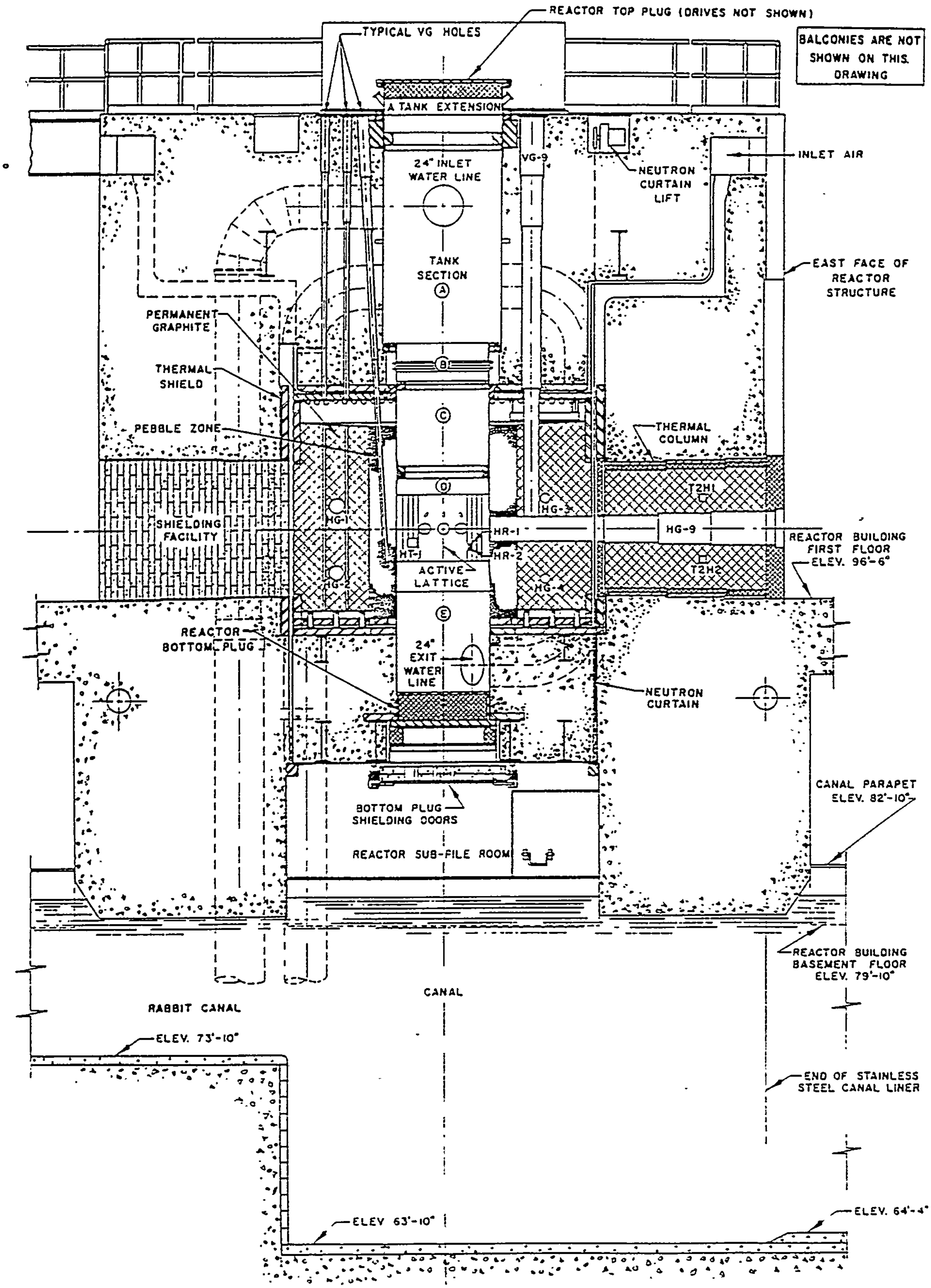

Figure B-13. Cross-section of reactor structure as viewed from south at east-west center plane.

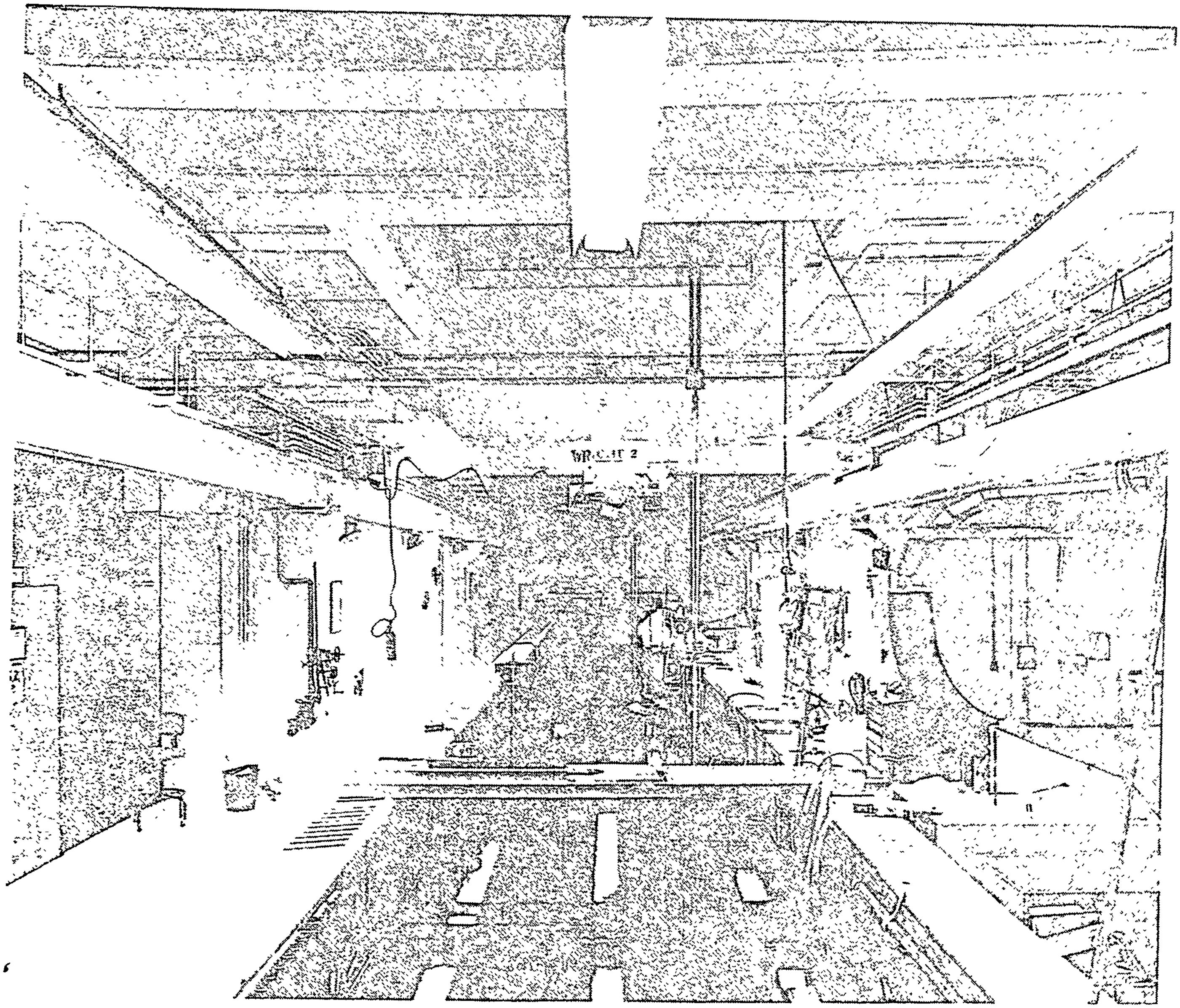

Figure B-14. The water-filled canal extends underground 88 ft east of the reactor building basement.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: ENGINEERING TEST REACTOR (ETR) FACILITY					
TOTAL ESTIMATED COST: [a] $ 45,185.7K			REMAINING SCHEDULE DURATION: 13 yrs		
FUNDING SOURCE: EW2010401 ADS: 60-EG			WBS: 1.2.08.1 and 1.2.08.2 CAP: 3KNETA000 and 3KNETC000		
Actual Cost through FY-94: $258K		FY-95: $232.4K	FY-96: $77.8K	FY-97: $ 30.0K	FY-98: $564.5K
FY-99: $ 1020.3K	FY-00: $ 2886.4K	FY-01: $ 3596.7K	FY-02: $ 5935.0K	FY-03: $ 6470.3K	FY-04: 6470.3K
FY-05: $ 5984.0K	FY-06: $ 4993.7K	FY-07: $ 3991.1K	FY-08: $2675.2K		
DOE HAZARD CLASSIFICATION: Nuclear Facility. Revise existing SAR.			Project Priority: 14 of 16 Basis: Reduce S&M costs, personnel hazards, and reuse facility.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.					
TOTAL WASTE VOLUME ESTIMATE: [b] 18,854 m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE:	6,178 m^3				
HAZARDOUS WASTE:	TBD m^3				
MIXED WASTE:	18 m^3				
INDUSTRIAL WASTE:	12,658 m^3				
TRU WASTE:	none				
HIGH-LEVEL WASTE:	none				

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The Engineering Test Reactor (ETR) first operated in 1957. The ETR evolved from the demand for high flux testing space, more stable flux, a greater variety of flux levels than the MTR could provide, and the need for through-the-core facilities. Fuel, coolant, and moderator characteristics were studied in environments similar to those that would exist in many types of reactors. The 175 MW_t ETR could provide neutron fluences averaging 3-5 $\times 10^{15}$ n/cm^2.

In 1972, the ETR was modified for a new role to support DOE's breeder reactor safety program. Test programs relating to reactor core design and operation were performed by means of the Sodium Loop Safety Facility (SLSF) inserted into the ETR core. The water loop programs were terminated in 1975. As a test vehicle supporting DOE breeder reactor safety programs, the reactor was modified with a new top closure accommodating the irradiation loop in 1975. Other modifications included adding a helium coolant system and sodium-handling system.

From 1975 to 1981, self-contained sodium (liquid-metal) loops supported a national safety program. The sodium in the loops was removed and the system flushed during ETR deactivation. ETR was deactivated and radiologically characterized in 1982 (EGG-PR-5784). ETR is owned by EM-60 and will be turned over to EM-40 in 1998.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, number of floors and relative elevations, number of subfacilities]

ETR Reactor Building (TRA-642)

The reactor building is 136 ft by 112 ft and extends 58 ft above grade and 38 ft below grade to the basement floor. The walls, floors, and columns below grade are reinforced concrete. The walls above grade are insulated metal siding with the interior surface sealed and taped to make the structure gastight. The roof was reworked in 1982 and consists of steel decking covered with light weight concrete, asphalt, felt vapor retardant, another layer of asphalt, a layer of 3/4 in. fiberboard and 3 in. of urethane foam, 3/4 in. fiberboard covered with fiberglass felt and two layers of asphalt and gravel. The panel walls, roof, and crane structure are supported on a steel superstructure of columns and trusses. The steel columns rest on reinforced concrete columns, which extend to bedrock from the first floor level.

The first basement level, or console floor, housed all experimental control panels. The second basement level contained all radioactive experimental equipment in shielded concrete cubicles. The reactor pressure vessel is about 35 ft long and 12 ft in diameter at the top, with a lower section diameter of 8 ft It has a cluster of perforations in the bottom head to accommodate the control rod drives and experimental loop through-piping. The reactor top is approximately 7 ft 10 in. above the main floor level. The high pressure experimental water loops had nonregenerable-resin bypass demineralizers to control water quality. In general, the water loop radioactivity level was approximately that of the primary coolant (10^5 dpm/ml). Each loop could be drained to either the warm or hot drain system.

Compressor Building (TRA-643)

TRA-643 housed the equipment used to supply heated, hydrocarbon-free air to various experiments. The process control room controlled all plant services and a sample laboratory conducted chemistry samples on the primary and secondary coolant systems. TRA-643 is 125 ft by 108 ft by 30.5 ft high. The primary coolant system (PCS) pump pits extend 10 ft 3 in. below the floor, and 21 ft 6 in. from the wall. A plywood barrier separates the contaminated storage items from the noncontaminated items.

The above grade walls are 12 in. pumice block to a height of 8 ft with insulated metal panels above. The north wall contains 4 ft high manually operated metal louvers for a 52 ft long section just above the pumice block, which have been covered with aluminum sheets. The foundation is a spread-footing type supported by pipe piling. Floors are concrete, with asphalt tile covering in the control room only. Much of the flooring contains a grating-covered trench extending as far as 8 ft below the floor. The compressor building roof is steel deck on steel frame, vapor-sealed, with 2 in. of glass insulation. The roofing is built-up with a gravel top and is surrounded by a 1 ft parapet. The process control room walls are constructed of 4 in. pumice blocks with 3 in. of glass fiber insulation between. The balcony has an 11 in. concrete floor and contains three motor control centers. A 7.5 ton overhead crane with top running trolley, has a lift of 27 ft, span of 40 ft 2 in., and spread of 7 ft The rail is 20 ft above the floor and has a 100 ft runway. The main floor is served with 20 drains that drain to a sump that pumps to the cold waste leaching pond.

Four evaporator coolers with steam heating units penetrate the roof, as well as five exhaust blowers. The building has been converted to electrical heat with eight units. The process control room has an air conditioning unit. All heating and cooling units have been electrically disconnected, and all liquid systems have been drained.

On the main floor are five large access hatches made of high-density concrete, which provide access to the pipe tunnel. Access plugs are provided into the pump pits from above. The tunnel floor elevation is 17 ft 9 in. below the compressor building floor and extends 172 ft from the reactor in a dog-leg configuration. The pipe tunnel overhead is solid concrete varying from 4 ft 9 in. thick to 2 ft 6 in. thick. The north and east walls are 1 ft thick and the south wall is 18 in. thick. Access to the pipe tunnel is from the heat exchanger building (TRA-644). The tunnel is ventilated by the exhaust blower, which draws through the heat exchanger building. Warm drains are in the tunnel at about 25 ft intervals and in the area below the pressurizing and emergency pump pits and below the sample laboratory.

TRA-643 contains the following electric motors/pumps: (a) four PCS (800 hp); (b) two emergency (20 hp); (c) two pressurizing (50 hp); (d) two gland seal (25 hp); and (e) experimental cooling loop (100 hp). Major components of an aircraft nuclear propulsion testing program remain, including two large air compressors, an emergency air compressor, an experimental air heater combustion air blower, and the turbo compressor motor. Outside are two air receivers. The Clark compressor system was mothballed in 1965. Its cooling water system is blank-flanged downstream and dessicant has been added to the compressors. TRA-643 also contains three experimental air heaters, which were fired by diesel fuel, and two oil vapor absorption filters filled with activated alumina. An experimental loop heat exchanger weighs 12,200 pounds.

Heat Exchanger Building (TRA-644)

TRA-644 includes: (a) main room and lower level, (b) demineralizer wing (valve room and tank room), (c) degassing tank room, (d) cubicle exhaust booster blower room, and (e) secondary pipe pit. The primary function of the main room was to house the 12 primary to secondary heat exchangers and piping. The 26 ft long by 4 ft diameter heat exchangers each contain 1700 5/8 in. OD tubes.

TRA-644 is constructed of reinforced concrete; the west wall is 5 ft thick, the east wall 4 ft thick, and the north and south walls are 4 ft 6 in. thick. The building is 66.5 ft by 78 ft by 22 ft high above ground. The lower level on the north side extends down an additional 17 ft 9 in. below grade. The roof is 3 ft thick reinforced concrete. The west wall rests on the east wall of the reactor building and connects on the north to the compressor building. Four knockout wall sections are provided on the south wall for removal of the heat exchanger banks. The knockout sections are high density shielding block. The building was ventilated by an exhaust fan installed on the building roof that discharged to the exhaust stack through the cubicle exhaust piping. The automatic heat exchanger vents, primary piping and pumps drained to the warm drains. The heat exchangers and associated piping are drained.

The degassing tank room houses the degassifier tank and associated piping. The room is located on the roof and measures 22 ft 9 in. by 18 ft 9 in. by 8 ft high. The walls are 1 ft 4 in. thick high density shielding blocks. The roof and floor are high density concrete, with two 3 ft by 3 ft shield plug hatches on the roof. The stainless steel degassing tank is 8 ft OD by 12 ft long, 5000 gallons. The tank and associated piping have been drained and left in place. One warm drain line from the degassing tank overflow and one floor drain run to the warm drains in the heat exchanger building lower level.

The cubicle exhaust blower room, located on the roof, houses the heat exchanger exhaust building blower and the reactor building cubicle exhaust booster blower. Electrical power to the cubicle exhaust blower has been shut off; the heat exchanger exhaust blower remains in service. The blower room is 22 ft 9 in. by 20 ft 9 in. by 13 ft high. The walls are cinder block and the roof is reinforced concrete.

The demineralizer wing of TRA-644 is divided into the tank room and the valve room. The tank room contains four resin bed demineralizer tanks and the valve room contains valves and piping associated with the demineralizers. The four demineralizer tanks measure 42 in. OD by 84 in. high. The tanks are constructed of single sheet welded 5/8 in. thick rubber-lined carbon steel; tank nozzles and outlets are stainless steel. The valve room has one caustic addition pump. The walls, ceiling, and floor are reinforced concrete. The valve room walls are 1 ft thick, and the tank room walls 2 ft 6 in. thick. The wing is 45 ft by 12 ft 6 in. by 17 ft high. Access to the tank room is through two hatch openings in the roof. There is one high density shielding block knockout door on the east wall to facilitate removal of the demineralizer tanks. There are two warm drains, under the cation and anion units. The resin discharge header has a hose connection to enable used resin discharge to a tank truck. The resin tanks have been emptied and are in dry lay-up. The caustic tank has been removed and the system drained.

The underground secondary coolant system pipe trench houses the heat exchanger isolation valves, drain sump, and sump pump. The sump is 7 ft below floor level. Power to the sump pump has been shut off. All secondary coolant piping has been drained. The walls, ceiling, and floors are 1 ft thick reinforced concrete. The trench is 14.5 ft by 78 ft by 14 ft high. The heat exchanger building south wall rests on the secondary pipe trench north wall. Three roof hatch openings access the pipe trench.

Secondary Coolant Pump House (TRA-645)

TRA-645 is a pumice block structure 40 ft by 92 ft by 16 ft high. It has a reinforced concrete floor slab, a reinforced concrete cold well and a pipe trench below floor level. The building has a metal roof deck and built-up insulated roof with gravel top. The roof has eight hatch covers for pump removal. A monorail is located in the treatment room that houses the chlorinator, chemical proportioning pumps, chemical day tanks, and chemical storage tanks. TRA-645 houses four secondary coolant system (SCS) pumps, four utility cooling water (UCW) pumps, and a cooling tower fire water control and distribution system. The building also houses switchgear. Secondary water flowed from the cooling tower canal to the cold well. The four SCS and four UCW pumps took suction from the cold well, which is 14 ft deep. All water systems and chemical processing equipment have been drained.

ETR Office Building (TRA-647)

TRA-647 is 42.5 ft by 93 ft by 25.5 ft above grade and 11 ft below grade. The south wall of the basement rests on the north wall of the reactor building. The below grade walls are reinforced concrete and the above grade walls are pumice block. The roof was reworked in 1982 and consists of steel roof decking covered with light weight concrete, asphalt, felt vapor retardant, another layer of asphalt, a layer of 3/4 in. fiberboard covered with fiberglass felt and two layers of asphalt and gravel.

The office spaces are being used. The smooth surface concrete floors are covered with asbestos tile. The concrete ceilings are supported by steel frame and in some rooms are dropped acoustic tile. The interior walls are gypsum board over wood framing. The Health Physics room sink and the men's change room sink drain to the warm waste system. All other drains go to the cold waste system. A hood vent remains installed in the Health Physics room. The office building basement was utilized as an instrument repair shop and amplifier room. The basement also housed heating and ventilation equipment, including three chill water air conditioning units, three air blowers, and two large capacity blowers. All basement floors are smooth finish concrete; the instrument shop and amplifier room floors are covered with asbestos tile. The floors drain to the cold waste system.

Electrical Building (TRA-648)

TRA-648 consists of the 13.8-KV, 4160 V, and 480 V switchgear, No. 1 diesel generator, five motor-generator units, and one lead-storage battery bank. The building is a two-level structure consisting of the upper level and a basement level referred to as the cable vault. The upper level is structural steel frame, 54 ft by 115 ft by 16.5 ft high. The north wall is common with the ETR reactor building (TRA-642) south wall and is metal panel installed on a steel frame. The exterior walls are 12 in. pumice block. The floor, basement walls, and basement slab are reinforced concrete. Footings are spread-type supported by pipe piling. The roof is steel deck on steel frame, insulated, vapor sealed, built-up, and topped off with gravel. There are five rooms within the upper level; the No. 1 battery room, No. 2 battery room, No. 1 diesel generator room, the motor-generator room and the switchgear room. All water systems in the building have been drained. The CO_2 fire protection system was left in service to provide fire protection to the building. The dry pipe firewater valve supplies fire protection systems in the cable vault, the reactor building low-bay, and the diesel engine rooms.

The No. 1 battery room is 17 ft 10 in. by 21 ft 4 in. The No. 2 battery room is 17 ft 10 in. by 14 ft The walls are 8 in. pumice block. No. 1 battery room has four monorails and a 0.5 ton trolley. The room contains 120 lead acid battery cells. The battery has been left in service and is connected to the motor-generator switchgear units. No. 2 battery room has had the battery bank removed and is used for archiving of ETR records. A demineralized water line supplies both battery rooms. Two CO_2 fire protection lines supply the battery rooms, motor-generator room, switchgear room, and cable vault.

The No. 1 emergency diesel room measures 26 ft by 40 ft The interior walls are 8 in. pumice block. The room has a large louvered roof opening for summer ventilation and has a roof-mounted evaporator cooler. A trolley and monorail system is located directly over the diesel engine. The diesel generator is mounted in a pit 26.5 ft long, 12 ft wide, and 7.5 ft deep. The 1423 hp, six cylinder diesel engine weighs 79,000 lbs. Remaining equipment includes two air compressors and their receivers, two lube oil pumps, a jacket water pump, and a lubricating oil filter. The No. 1 diesel generator has been mothballed. The engine internal components were coated with a wax based oil and the air intake was covered. All generator brushes were lifted and the generators are covered with plastic sheeting. The lubricating oil, fuel oil, and cooling water systems were drained.

The motor-generator room measures 55 ft 9 in. by 14 ft The north wall is prefabricated vinyl-covered, fire retardant sheet rock on a steel frame. The east and west walls utilize the electrical building 12 in. pumice block wall. The room has a roof-mounted evaporator cooler that was used for summer ventilation. Five motor-generator units are in the MG room. Each is mounted on a cement pedestal. MG units -1, -2, -3, -4, and -7 were all inactivated. The MG switchgear units were inactivated by removing power leads and bussing. The brushes were removed from the MGs and each was covered with plastic sheeting. The MG switchgear was left partially energized for use with a new TRA un-interruptable power supply (UPS) installed to provide battery backed power to the TRA evacuation system. The new UPS was installed in the MG room in 1982. During loss of 480V power, the UPS converts dc power from the No. 1 battery bank to 480 V, 60-hz power.

There are separate areas for the 4160 V, the 13.8-kV, the 480 V, and the motor control center switchgear units. These units contain circuit breakers, controllers, regulators, transformers, instrumentation, and bussing. Most of the cabling enters through the bottom of the units from the basement (cable vault). Some units have cabling entering the top through conduit leading from overhead wireways. The switchgear room has a 300 lb capacity monorail over the 480V switchgear. The switchgear room has roof-mounted evaporator coolers for summer ventilation. Air passes through a duct and force ventilates the cable vault area.

The 4160 V switchgear is 85 ft 9 in. in length. The height of the switchgear is nominally 7 ft 5 in. The 4160-V switchgear consists of 35 steel-enclosed units bolted together. The 13.8-kV switchgear is 30-ft 2-in long and consists of 10 units. The 13.8-kV and 4160-V switchgear remains energized to supply power to the electrical equipment necessary to support the ETR complex in an inactivated status and to TRA for support equipment. Power supplies to equipment that has been inactivated (i.e., motors and motor control centers, have had their breakers racked out or power leads disconnected to remove power from inactivated components). The 480 V switchgear is 35.5 ft long and consists of 18 units. Some sections of the 480 V switchgear have been deenergized. The motor control center (MCC) switchgear is 42 ft 8 in and consists of 19 units.

The cable vault distributes power from underground conduits outside the building to the bottom of the switchgear room. The cable vault has a walled-off room that houses two cubicle exhaust blowers that exhaust the basement cubicles and systems gaseous effluent to the ETR stack. The cable vault measures 113 ft by 28 ft and 13 ft inside height. The walls are reinforced concrete. The north wall is common with the reactor building console floor level and is 1 ft 8 in. thick. Six support columns in the north wall measures 5 ft 10 in. wide. The cable vault is ventilated by fan forced air from the switchgear room and is protected by CO_2 and dry-pipe firewater sprinkler systems, which have been left in service. Two cold drains (no warm or hot drains) drain to the secondary pipe tunnel. The south cubicle exhaust blower is still operational to provide reactor building exhaust. Various cabling is still energized. The cable vault exhaust system is inactivated.

ETR Critical Facility (TRA-654)

TRA-654 consisted of a low-power reactor that was an ETR mock-up. The critical facility was housed in a 40 ft by 50 ft by 30 ft high building addition on TRA-635. The facility was used to duplicate fuel and experiment arrangements before their use in ETR to facilitate calculation of neutron flux, excess reactivity, and operating parameters. The addition has concrete block walls, a truck door, concrete floors, and a canal. The canal is 10 ft by 13 ft by 20 ft deep. North of the canal is a sump with sump pump. In the canal is a storage box that contains various reactor equipment (e.g., poison sections, filler pieces, aluminum blocks). In the north end of the canal is a 2 ft wide storage canal separated from the main canal by a 10 ft by 5 ft by 1 ft wall. The canal was drained and left covered with a plywood sheeting cover. All radioactive components have been removed from the facility. General radiation fields in the canal are 0.5 mR/h and less than 3.0 mR/h in the reactor vessel. The building contains instrumentation and a control console. All equipment has been electrically inactivated. The building has an operable 10 ton capacity overhead crane. Remaining operable systems include raw water, heating and ventilating, and firewater. ETRC is being utilized for office space and laboratory operations.

ETR No. 2 Diesel Building (TRA-663)

A second diesel generator was added to ETR, allowing one to be off-line for maintenance while the other generator was operated. The No. 2 diesel building houses the No. 2 diesel generator, a starting air compressor, air receiver tank, lubricating oil and jacket water coolers, a lubricating oil filter, motor control center (MCC-4A), and space heating units. TRA-663 is 53.5 ft by 19 ft by 20 ft high. The north wall is common with the ETR electrical building south wall. All walls are 12 in. cinder block. The floor is 6 in. thick concrete. The roof was reworked in 1982 and consists of steel decking covered with concrete, asphalt, felt vapor retardant, asphalt, 3/4 in. fiberboard, 3 in. urethane foam, 3/4 in. fiberboard, fiberglass felt, and two layers of asphalt and gravel.

Two large fans on the roof served as the ventilation system. Each vertical fan duct is 52 in. in diameter and is covered by a louver that opens via airflow. An abandoned steam heating unit is suspended from the ceiling. An overhead monorail carries a manually operated 4000 lb chain fall and passes over the diesel. Diesel fuel oil was supplied by a day tank buried outside. The diesel engine lubricating oil and jacket water were cooled by UCW. Demineralized water supplied the jacket water expansion tank. Fire water supplies the dry pipe system sprinkler. Steam lines supplying the space heater were abandoned in 1980. The diesel engine rests on a concrete pad 13 ft by 6 ft by 18 in. above floor level and extends 6 ft below floor level. The generator is in a 55 in. deep pit. The engine was mothballed in place in 1982. The lubricating oil system was treated with a preservative and the oil pumped out. The jacket water was drained, as have been the oil filter, oil cooler, and jacket water cooler. The starting air receivers have been drained and power to the compressor has been interrupted. The generator and exciter have been covered with plastic sheeting.

Transformer Station (TRA-752)

The transformer station provides power to the ETR complex. The yard is a locked exclusion area. The ten transformers are identified as T-1, T-2, T-3, T-4, T-5, T-7, T-8, T-9, T-11, and HT-1. T-6 was removed in 1980, a new concrete pad was installed and HT-1 was placed on the pad. HT-1 provides power for the electric resistance heaters throughout ETR. Two sets of resistors are located in cages and were used for ground detection on T-1 and T-2. The transformer station is 110 ft by 33.5 ft The east fence is corrugated asbestos on an iron frame. The north boundary is common to the No. 2 diesel building and the remaining boundary is cyclone type fence. The floor is 6 in. gravel base. Concrete pillars or pads of various dimensions bear transformer weight and provide cable ways for the underground cable runs to the cable vault. The transformers are isolated from each other by asbestos fence or fire walls. All transformers, except HT-1, were dielectric tested for the presence of polychlorinated biphenyl (PCB) and are placarded per 44 CFR 106. HT-1 was manufactured November 1979, after the ban on PCB usage went into effect. Each transformer, except T-9, has less than 50 ppm PCBs and is classified as PCB free. T-9 indicated a PCB content between 50 and 499 ppm and is classified as PCB contaminated.

Air Intake Building (TRA-655)

TRA-655 was built as a filter building and air intake for an experimental air system. The filters have since been removed and the building has been used as a storage area. TRA-655 is 12 ft by 25 ft with 12 in. thick walls. The exterior walls are 17 ft high with a roof cap of a double plywood deck with built-up roofing on top. The roofing is supported by three 10 ft I-beams. Half the building is floored by a 4 in. concrete slab and the other half contains four removable grates at floor level and a 7 ft pit below the grates, which served as the experimental air suction plenum. The pit floor is poured concrete 1 ft thick and forms part of the foundation. Three 36 in. exhaust pipes, in the pit, were the air intake for the experiment air compressors, and emptied into a chamber under the change room in the compressor building. There is one condensate drain in the center of the pit floor.

Liquid Effluent Systems

The liquid effluent systems consist of the hot, warm, and cold liquid waste, and the sanitary sewer systems. There are various sump pits that either have french drains or are pumped into some of the other systems. The hot and warm liquid effluent systems provide for the removal of radioactive contaminated liquids to either the hot waste catch tank or the warm sump tank.

The hot waste system routed experiment leakage and control rod seal leakage to a 500 gal hot catch tank located under hatch covers. There are numerous hot drains located on the reactor main floor, the console floor, and the basement floor. The effluent from the hot catch tank was pumped to the hot waste storage tanks and then to the retention basin.

The warm waste system consists of drains on the reactor building main floor, console floor, basement floor, compressor building, and heat exchanger building. Warm effluents enter 4 in. collector piping and route to a 5000 gal stainless steel warm sump tank. Two sump pumps take suction from the warm sump tank and discharge to the sump tank pit and route to the retention basin. Warm effluent could be pumped to any of three MTR hot waste storage tanks. The sump tank has a level sensor to prevent overflow.

The cold waste system consists of a 1000 gal tank that routes cold liquids (i.e., drinking fountains, safety shower drains, air conditioning, and core deluge leakage) to the tank and then to the cooling tower blowdown drain. The sanitary sewer system routed waste from the restrooms in the office building and compressor building to the main TRA sewer system.

ETR Exhaust Stack (TRA-753)

The 250 ft vertical stack is a tapered reinforced concrete tube with an outside diameter of 14 ft at the base and 6 ft at the top and an inside diameter of 10 ft at the bottom and 5 ft at the top. A concrete block gas monitoring room, at the base of the stack, is 8 ft by 10 ft by 8 ft high and has a 4 in. thick concrete floor. All monitoring equipment has been removed.

Filter Pit Building (TRA-755)

This concrete block building houses fans associated with the experimenters service exhaust. The building is 13 ft by 13 ft by 13 ft high. The 20 in. exhaust line exits to the exhaust stack. The loop filters are a canister charcoal-activated type contained in a lead and concrete shield. Present are an exhaust fan, an exhaust booster fan, and an auxiliary fan.

ETR Experiment Gaseous Effluent System

The gaseous effluent system suctioned effluents from several sources and discharged to the exhaust stack. Located on the reactor pressure vessel top is a service exhaust ring that received effluent waste from experiments. This exhaust ring discharged to a hot filter located under the filter pit building (TRA-755), which then discharged to the exhaust stack.

Cubicle Exhaust System

The cubicle exhaust system is a continuation of the reactor console floor and basement heating and ventilating system. Air flow passes through rectangular openings along the basement perimeter into the cubicles. Flow then enters individual exhaust ducts, which connect to the main cubicle exhaust header, and exits to the cubicle exhaust fans. Two cubicle exhaust fans discharge to a booster fan, which discharges to the exhaust stack by way of a continuation duct. The exhaust system also draws from the cold, warm, and hot waste tanks, the rod access room, and the subpile room. Another portion of the system provides suction on the reactor building main floor working canal, storage canal, and reactor top. These ducts penetrate the reactor building main floor and combine into a common duct on the south console floor balcony, which contains an Axivane fan that is electrically disconnected. The Axivane fan header connects to the main cubicle exhaust header at the suction side of the cubicle exhaust fans.

Overview of Facility Contamination

[Containment integrity and contamination data]

Widespread low-level contamination exists in most facility structures.

Contact Information

[Name, title, company affiliation, phone, etc.]

D. E. Baxter, ETR Project Manager, LITCO, 526-5519, MS 3921.

D&D/S&M Previous Accomplishments

ETR was deactivated in 1982, at which time a radiological characterization was performed. This was the first reactor facility to be deactivated and documented immediately after shutdown at the INEL.

Unique Conditions/Special Circumstances

The reactor core components are highly radioactive.

Permitting Requirements

It is anticipated that D&D of ETR will require an EA to satisfy NEPA requirements.

Surveillance and Maintenance Status

The Facility Landlord (not D&D) performs routine surveillance and maintenance of this facility.

Safety and Environmental Considerations

Standard industrial safety and radiological controls will be required. No high hazard conditions exist.

D&D Recommended Methodology

D&D methods will be determined in the Decision Analysis Report to be prepared in 1998.

Specialized Capital Equipment and Tools Required

TBD

Facility Reuse Considerations

Facility reuse will be determined in the Decision Analysis Report to be prepared in 1998.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. Idaho National Engineering Laboratory Publication, BP 380-R-0886-5M-A, page 34, assumed date August 1986. (Details INEL history for public relations)

3. L. L. Kaiser, R. L. Rolfe, B. J. Sneed, and E. L. Wills, Characterization of the ETR Facility, EGG-PR-5784, September 1982.

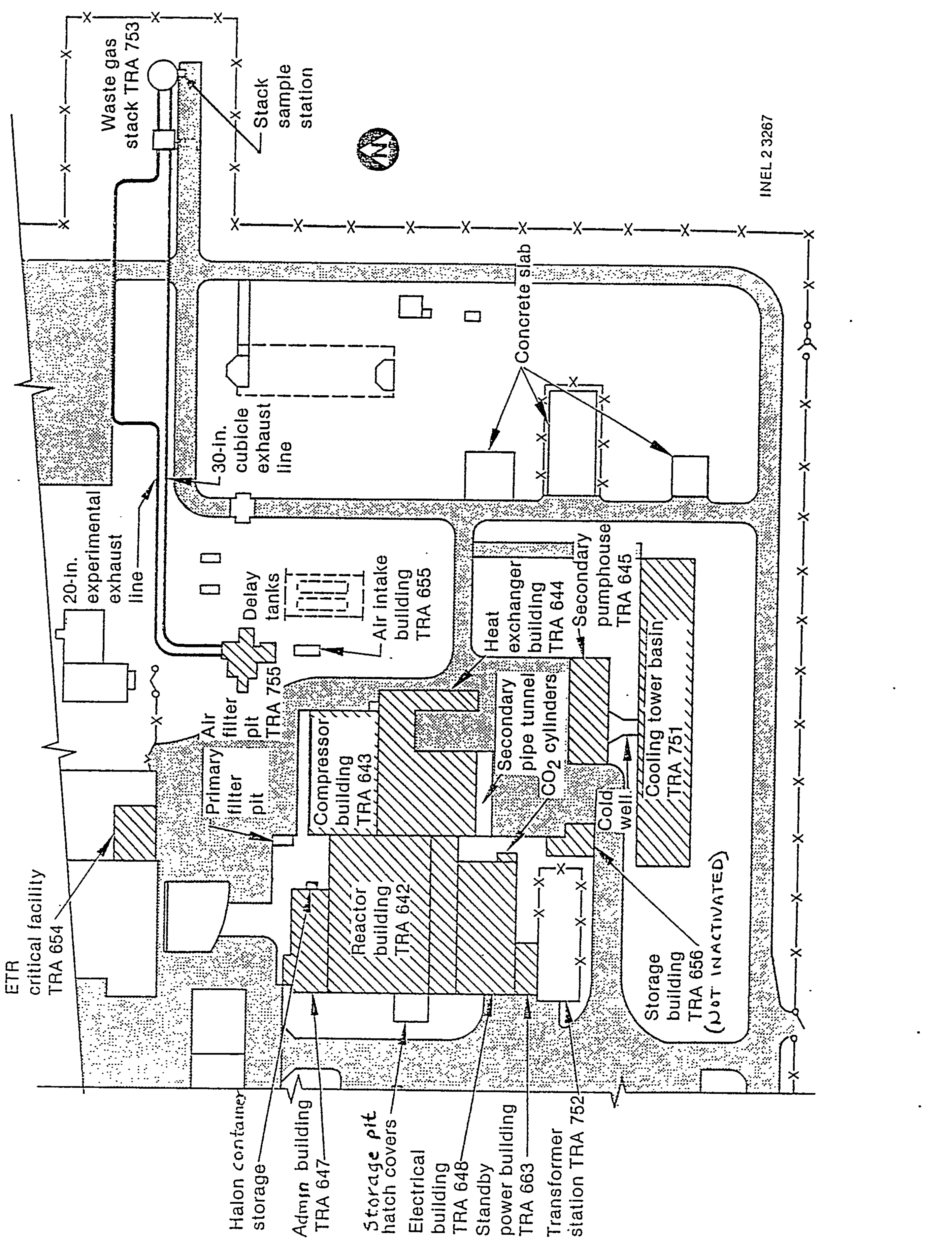

Figure B-15. ETR Complex Plot Plan.

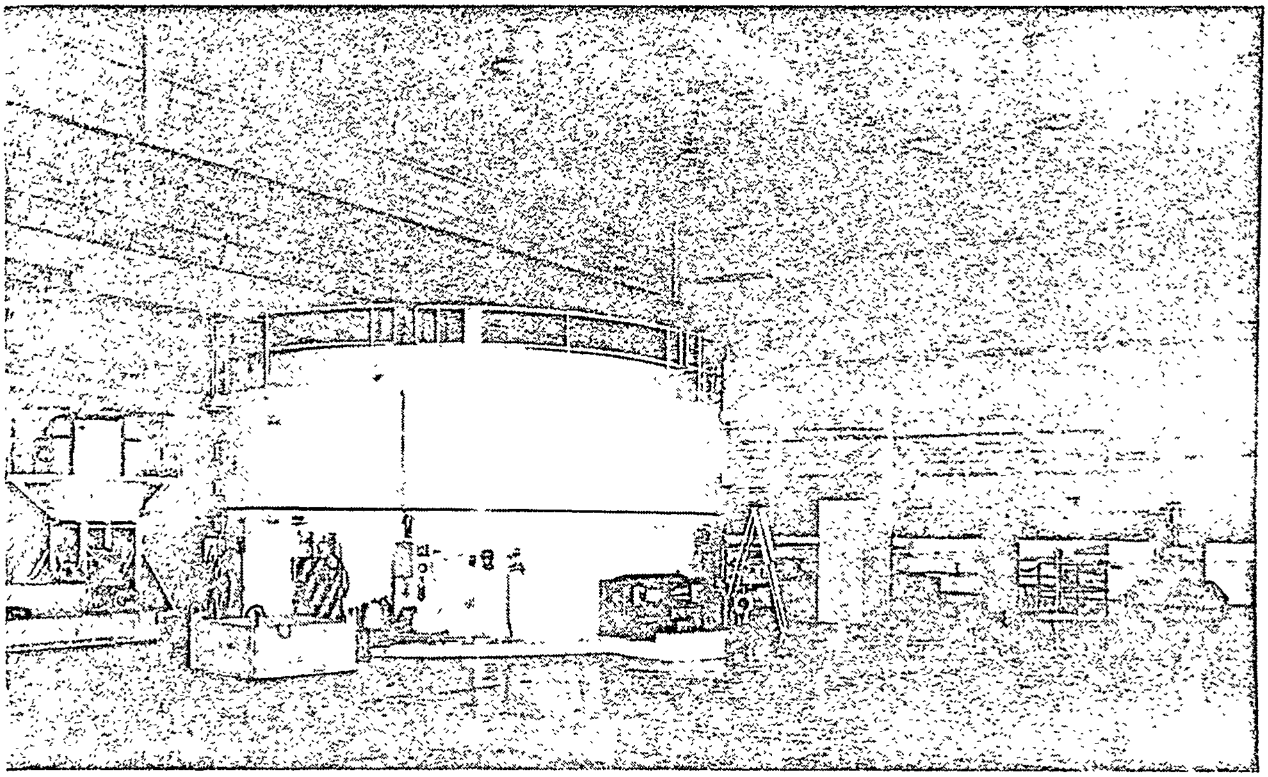

Figure B-16. The ETR and high bay area.

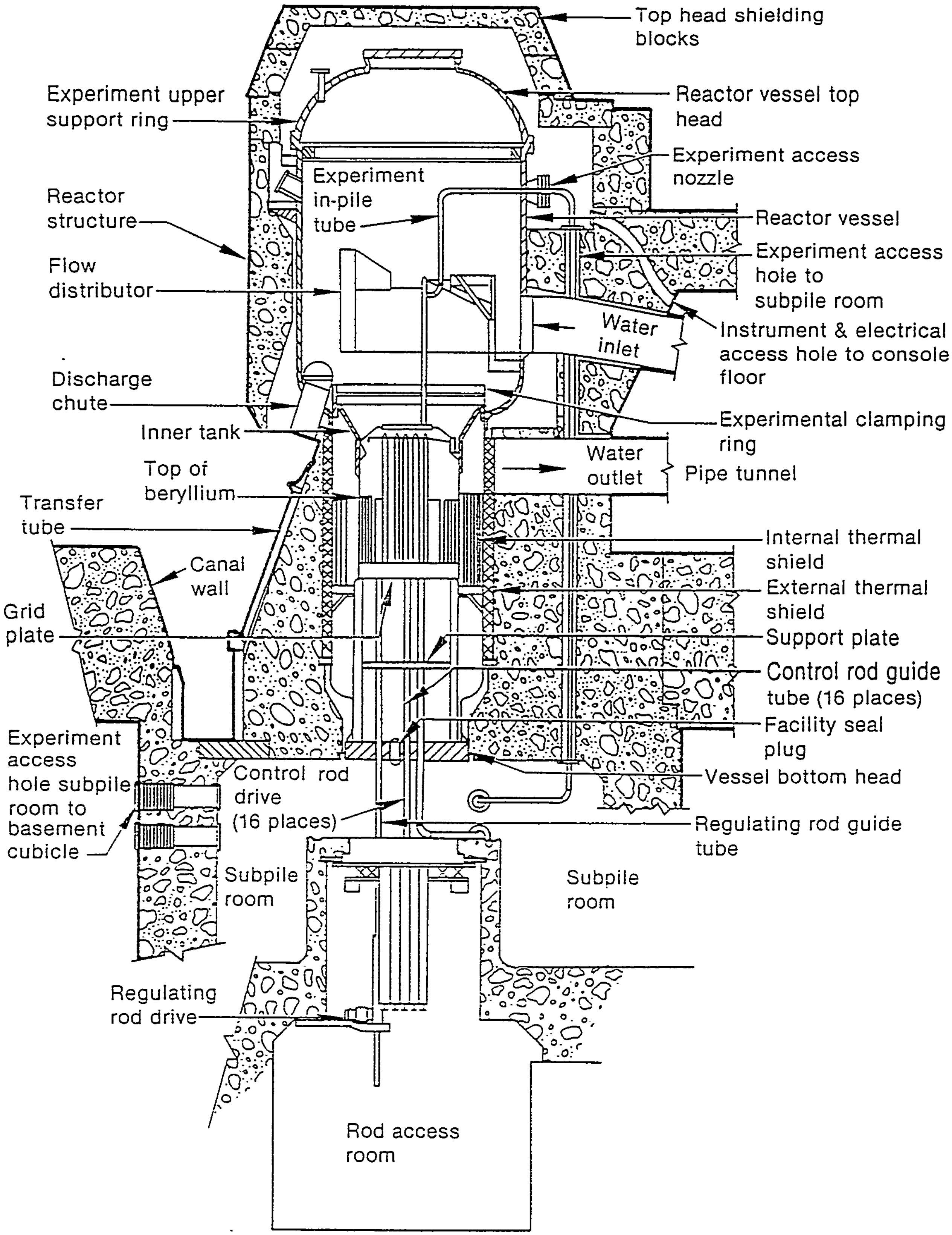

Figure B-17. Cross-section diagram of the reactor pressure vessel and associated components.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: ADVANCED REACTIVITY MEASUREMENT FACILITY (ARMF)					
TOTAL ESTIMATED COST: [a] $ TBD			REMAINING SCHEDULE DURATION: TBD		
FUNDING SOURCE: TBD ADS: TBD			WBS: N/A CAP: N/A		
Actual Cost through FY-94: $ 0K		FY-95: $ 0K	FY-96:	FY-97:	FY-98:
FY-99:	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Nuclear Facility. Revise existing SAR.			Project Priority: N/A Basis:		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.					
TOTAL WASTE VOLUME ESTIMATE: [b] TBD m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: TBD					
HAZARDOUS WASTE: TBD					
MIXED WASTE: TBD					
INDUSTRIAL WASTE: TBD					
TRU WASTE: TBD					
HIGH-LEVEL WASTE: TBD					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The two ARMF reactors achieved criticality in 1960 and 1962. Neither of the reactors has operated since February 5, 1991. The pool-type reactors are still fueled and the facility is owned by DOE-NE. The fuel removal is currently funded by EM-60 and the facility will be turned over to EM-40 in 1998.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

The two reactors are located about 15 ft apart in a common water canal, in the 40 ft by 60 ft ARMF building, TRA-660. The building is just east of the MTR facility at TRA. The building accommodates the canal, a sample preparation room, instrument repair area, and equipment storage. A ventilation system supplies the building with outside air. The building still contains several reactor instrumentation panels.

Each reactor structure consists of a control bridge, lattice support frame, and grid plates. These components are suspended from the canal parapet. The control bridges are made of steel I-beams and plates. The top of the active core is 12 ft below the water surface.

The canal is 8 ft wide, 18 ft deep, and 28 ft long. A 4 ft by 8 ft storage pit at the center of the canal extends down an additional 5 ft The reactor bridge platforms provide space for fuel, experiment, and reactor component handling. A neutron radiography structure extends out from one reactor. The canal can be drained, transferring water to the TRA warm waste treatment system. The canal has no water cleanup system and is filled with approximately 30,000 gal A 15 ton bridge crane spans most of the floor and canal area of the building. The crane has a total lift of 36 ft (from 19 ft above floor level to 17 ft below floor level). The 66 fuel elements will be removed prior to facility transfer to D&D.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

TBD

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

S. A. LaBuy, D&D Project Manager, 516-9856.
D. E. Baxter, D&D Project Manager, 526-5519.

D&D/S&M Previous Accomplishments

None.

Unique Conditions/Special Circumstances

None.

Permitting Requirements

TBD

Surveillance and Maintenance Status

TBD

Safety and Environmental Considerations

Standard industrial safety, environmental, and radiological controls will be required.

D&D Recommended Methodology

TBD

Specialized Capital Equipment and Tools Required

None.

Facility Reuse Considerations

TBD

REFERENCES

1. S. A. LaBuy, ARMF/CFRMF Fuel Removal Program Plan, PG-T-94-004, May 1994.

2. Safety Analysis and Technical Specifications for the ARMF and CFRMF, No Document Number, DOE-ID approval letter A. A. Pitrolo to J. O. Zane, February 22, 1991.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID	CONTRACTOR: Lockheed Martin Idaho Technologies
PROJECT: LOSS OF FLUID TEST FACILITY (LOFT) ANCILLARIES	
TOTAL ESTIMATED COST: [a] $ 1,534K	REMAINING SCHEDULE DURATION: 4 yrs
FUNDING SOURCE: EW2010402 ADS: 65-EG	WBS: 1.2.09.2 CAP: 3KNLFT000

Actual Cost through FY-94: $ 463K		FY-95: $ 41.0K	FY-96: $ 9.0K	FY-97: $ 41.0K	FY-98: $ 9.0K
FY-99: $ 971.0K	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:

DOE HAZARD CLASSIFICATION: D&D of the MTA to be performed in TAN-607 under Hot Shop SAR requirements.	Project Priority: 5 of 16 Basis: Minimal effort to start field work. Low cost to complete.
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.	
TOTAL WASTE VOLUME ESTIMATE: [b] 124 m^3	ESTIMATE BASE YEAR: 1995

LOW-LEVEL WASTE:	114 m^3
HAZARDOUS WASTE:	TBD
MIXED WASTE:	10 m^3
INDUSTRIAL WASTE:	TBD
TRU WASTE:	none
HIGH-LEVEL WASTE:	none

NOTES:

a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The LOFT Facility was operated from 1978 through 1985 to provide experimental data during accident conditions that result from simulated loss of reactor coolant testing. Following inactivation of the facility, several contaminated items were identified for D&D and termed the "LOFT Ancillaries." The major element remaining for D&D is the Mobile Test Assembly (MTA). This project was delayed until 1999, to coincide with the availability of the TAN-607 hot shop to perform D&D operations.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

The MTA was a removable shielding tank that surrounded the LOFT reactor core. It was removed from the LOFT containment building in 1986 and currently resides on a double-wide railroad flatbed car outside at TAN.

The MTA now consists of only the dolly platform and shield tank. The dolly is approximately 20 ft wide × 46 ft long. The shield tank is approximately 13 ft high and approximately 17 ft in diameter. The circular opening (core barrel) in the center of the shield tank previously contained the reactor vessel but is now empty. The core barrel diameter is approximately 6.5 ft The annulus surrounding the core barrel in now empty but originally contained water for shielding. The circular region around the outside of the shield tank is still filled with lead shot. The lead shot is assumed to be contaminated.

Lead sheets and lead wool were installed in the I beams in the substructure of the dolly. The lead sheets and wool are present, and their radiological condition will be determined when the MTA is disassembled and sized. This will be performed inside the TAN Hot Shop. The lead sheets and lead wool are assumed to be contaminated.

Overview of Facility Contamination

[Containment integrity and contamination data]

Radiological contamination is widespread both inside and out. Removable contamination on the outside is low and containment is currently maintained by a strippable paint covering.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

G. R. Rodman, LOFT Ancillaries Project Manager, LITCO, 526-8077.

D&D/S&M Previous Accomplishments

All of the smaller LOFT Ancillary items have been disposed or recycled and only the MTA remains. The MTA was painted in June 1992 with a durable, strippable paint, which can be incinerated at WERF upon removal.

Unique Conditions/Special Circumstances

The large amount of potentially contaminated lead will result in the generation of mixed waste. Treatment and disposal will be a primary consideration.

Permitting Requirements

In compliance with NEPA requirements, an EC will be prepared. It is anticipated that this activity can be preformed under a categorical exclusion (CX).

Surveillance and Maintenance Status

The MTA is on a periodic surveillance and maintenance schedule. The protective containment coating will be maintained as required.

Safety and Environmental Considerations

Standard industrial safety, environmental, and radiological controls will be required. No special or high hazard conditions exist.

D&D Recommended Methodology

The recommended D&D is to dismantle, size, package, and dispose of the entire MTA.

Specialized Capital Equipment and Tools Required

None.

Facility Reuse Considerations

Decontamination and reuse of the lead will be determined. The MTA is of little reuse value and will be dismantled and disposed of.

REFERENCES

1. D. L. Smith, Characterization and Decision Analysis Report for the LOFT MTA, EGG-ERD-10282, September 1992.

2. D. L. Smith, D&D Plan for the LOFT MTA, EGG-ER-10594, February 1993.

3. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

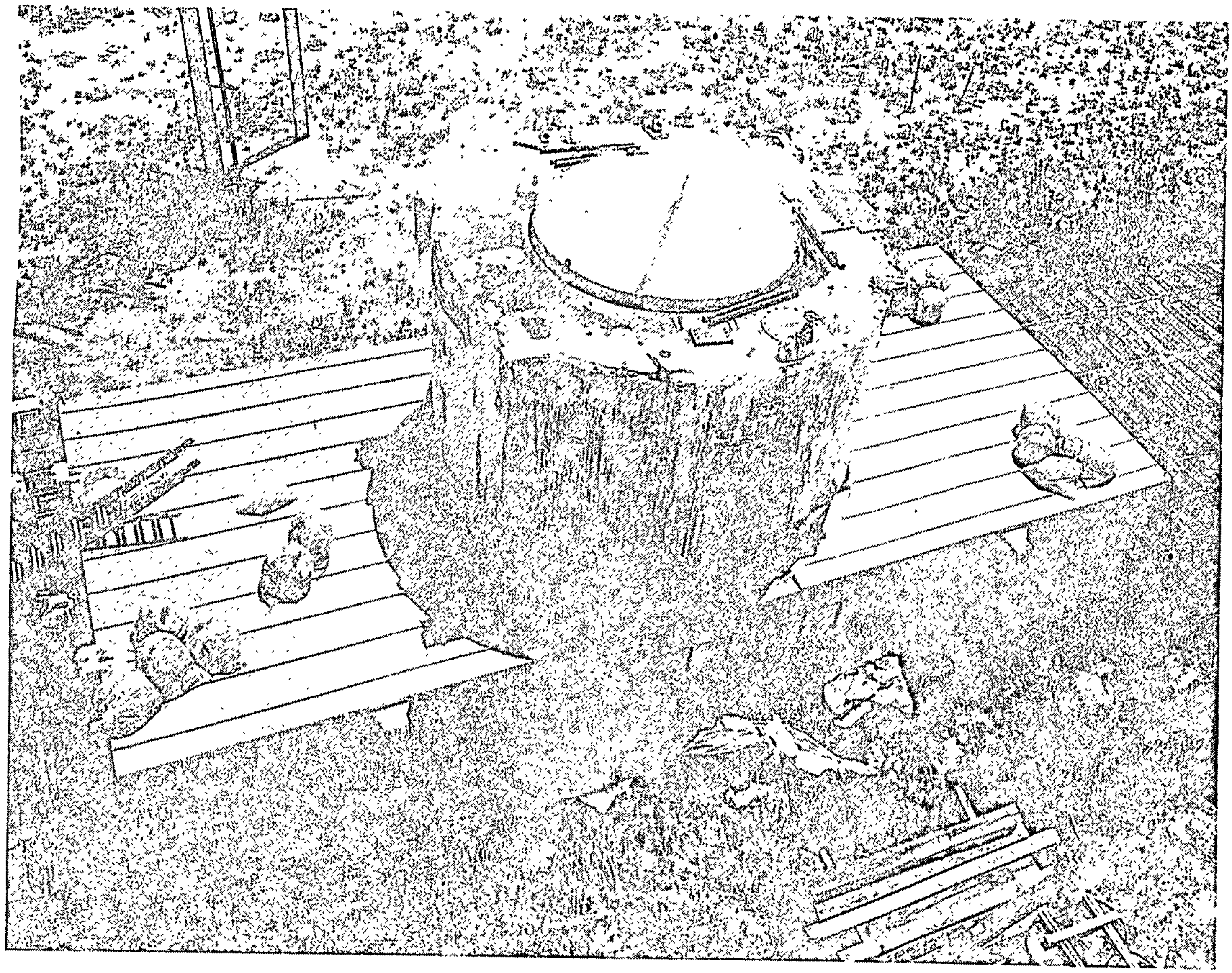

Figure B-18. Photograph of the MTA.

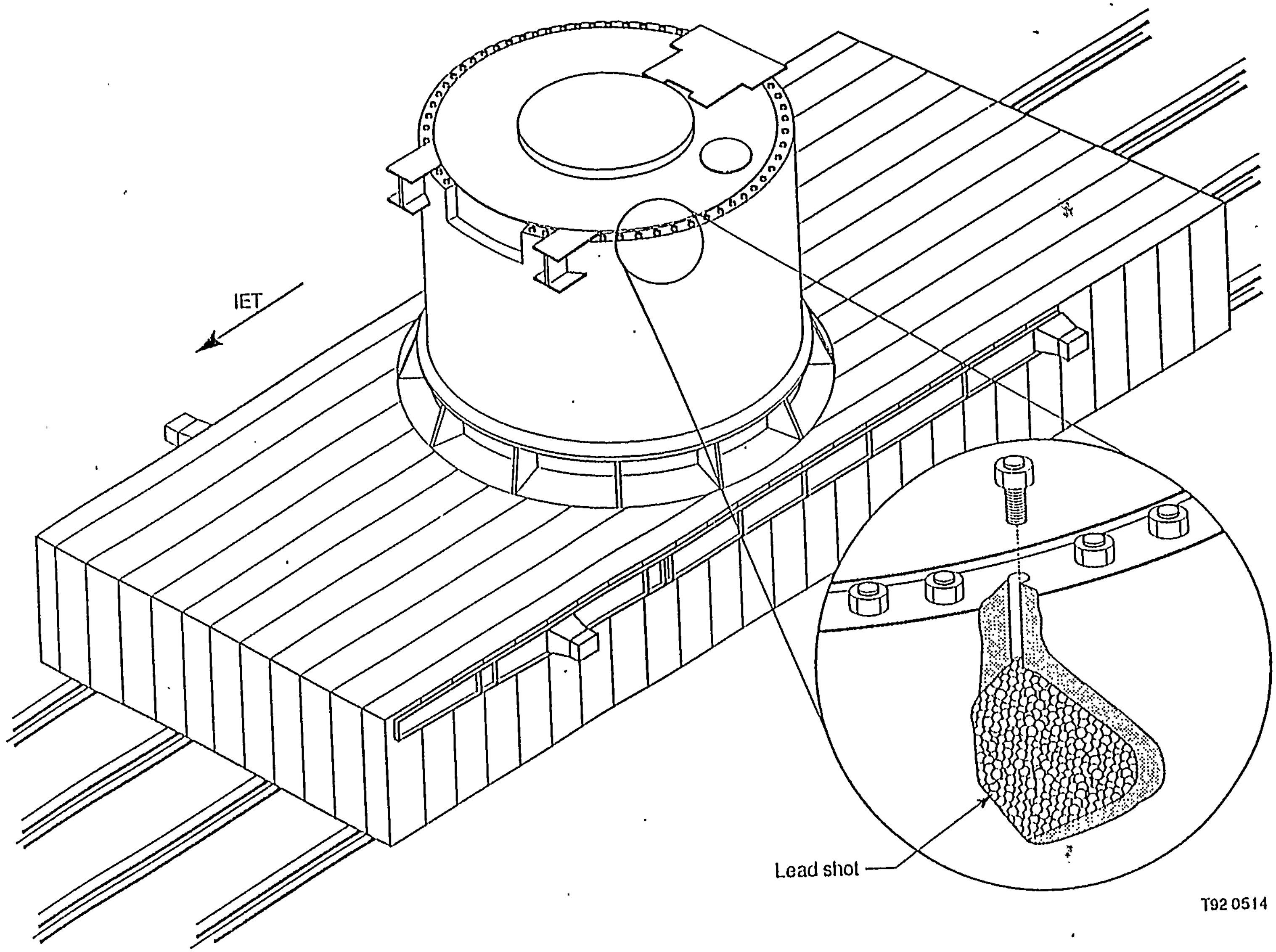

Figure B-19. Sketch of shield tank showing circular region containing lead shot.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: TEST AREA NORTH - TECHNICAL SUPPORT FACILITIES (TAN-TSF)					
TOTAL ESTIMATED COST: [a] $ 3,374K			REMAINING SCHEDULE DURATION: 5 yrs		
FUNDING SOURCE: EW2010401 ADS: 51-EG			WBS: 1.2.23.1 CAP: 3KNTSA000 and 3KNTSC000		
Actual Cost through FY-94: $ 977.6K		FY-95: $ 51.0K	FY-96: $51.0K	FY-97: $442.7K	FY-98: $606.3K
FY-99: $ 804.1K	FY-00: $ 441.3K	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: TBD			Project Priority: 6 of 16 Basis: Reduce personnel hazards, minimal effort to start field work, low cost to complete.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.					
TOTAL WASTE VOLUME ESTIMATE: [b] 520 m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: 252 m^3					
HAZARDOUS WASTE: TBD					
MIXED WASTE: < 1 m^3					
INDUSTRIAL WASTE: 268 m^3					
TRU WASTE: none					
HIGH-LEVEL WASTE: none					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The TAN/TSF area was built in phases as the need for the facilities developed from major projects, during 1952 to 1987. Many facilities are no longer in use for their original purpose and are scheduled for demolition. In 1993, several areas at TAN/TSF were transferred from D&D to the Environmental Restoration Waste Area Group - 1. DOE-ID did this to maintain all soil and tank related remedial actions within the WAGs, with D&D Projects concentrating on buildings and structures.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of subfacilities]

TAN-616, Liquid Waste Treatment Facility

TAN-616 is a one story cast in place, reinforced concrete building with a basement and mechanical penthouse on the roof. The building was constructed in 1955 and began operations in 1958 as an Evaporative Liquid Waste Treatment Facility. The facility operated successfully for several years and then because of evaporator malfunctions and pump leaks, waste began escaping to the surrounding area. The facility was removed from service in 1970. The above grade dimensions are 36 × 46 × 15 ft high. The facility is located approximately 60 ft north of the TAN-607 building. The ground floor is internally sectioned into an evaporator pit, valve-operating room, caustic pump room, control room, and a vestibule. There is a pump room in the basement and a cooling tower and heating/ventilating equipment room on the roof.

TAN-606

This building had been used as a health physics facility, offices, analytical laboratory, and as a maintenance facility. The building is currently used for the Special Manufacturing Capability Program. TAN-606 is a 5,752 ft^2 one-story structure with pumice block walls, concrete floors, and a steel truss roof with a metal deck. An instrument calibration well (16 in. diameter by 30 ft deep) was utilized by placing a cobalt 60 source in the well at varying heights. The abandoned well was minimally contaminated and was wiped down, filled, and sealed in 1994.

TAN/TSF-7, Sewage Disposal Plant Area

The Sewage Disposal plant area is approximately 112 m^2 of surface and subsurface contamination with radiation levels up to 6.5 mR/h. DOE-ID has delayed the D&D of this site for approximately 20 years. The existing sewage treatment plant has been upgraded to supply the TAN/TSF area with the required sanitary capabilities.

TAN/TSF-2, Liquid Waste Evaporator Complex

The TSF-2 area (approximately 500 m^2) is a surface and subsurface contaminated soil area located northeast of the TAN-616 building and surrounds the V1, V2, and V3 liquid waste holding tanks. These tanks contain approximately 25 m^3 of sludge each. The tanks are currently under the cognizance of the WAGs, but may require D&D removal support.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

TAN-616 contains extensive radiological and hazardous material contamination per BWI-1398 characterization.

Contact Information

[Name, title, company affiliation, location, phone, mailstop]

G. R. Rodman, TAN D&D Project Manager, LITCO, 526-8077.
T. J. Meyer, TAN WAG Manager, LITCO, 526-9286.

D&D/S&M Previous Accomplishments

The TAN-616 Liquid Waste Treatment Facility underwent a remedial action in 1993. The cooling tower and other equipment were removed from the roof. Roof penetrations were sealed and a new metal roof was installed. A concrete pad was also removed.

The TAN-606 calibration well was wiped, filled, and sealed in 1994. It possessed minimal contamination prior to this remedial action.

Unique Conditions/Special Circumstances

None

Permitting Requirements

Future TAN/TSF D&D projects require an Environmental Checklist.

Surveillance and Maintenance Status

The only S&M occurring at the TAN/TSF site is routine S&M for security, environmental, and health and safety measures, and radiological surveys. All facilities are in good condition and pose no threat for lose of containment integrity.

Safety and Environmental Considerations

TAN-616 is moderately contaminated with the most heavily contaminated being the evaporator in the basement. The only access to this evaporator is through the concrete roof slab.

D&D Recommended Methodology

TAN-616 will be totally dismantled and demolished.

Specialized Capital Equipment and Tools Required

None

Facility Reuse Considerations

TAN/TSF-07 Sewage Treatment Plant has been upgraded to supply TAN/TSF needs. No other facility reuse is known.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. INEL Site Development Plan, Site Characteristics, Volume II, TAN/TSF Area, March 1993.

3. B. E. Olaveson, et. al., Characterization and Decision Analysis for TAN-616, BWI-1398, September 1994.

4. T. A. Evans, et. al., Sampling, Analysis, and Closure Activities for the TAN Building 606 Calibration Well, EGG-2743, April 1994.

5. T. A. Evans, et. al., Final Report of the Remedial Action Taken for the TAN Building 616 Liquid Waste Treatment Facility, EGG-2714, September 1993.

Figure B-20. Aerial view of TSF.

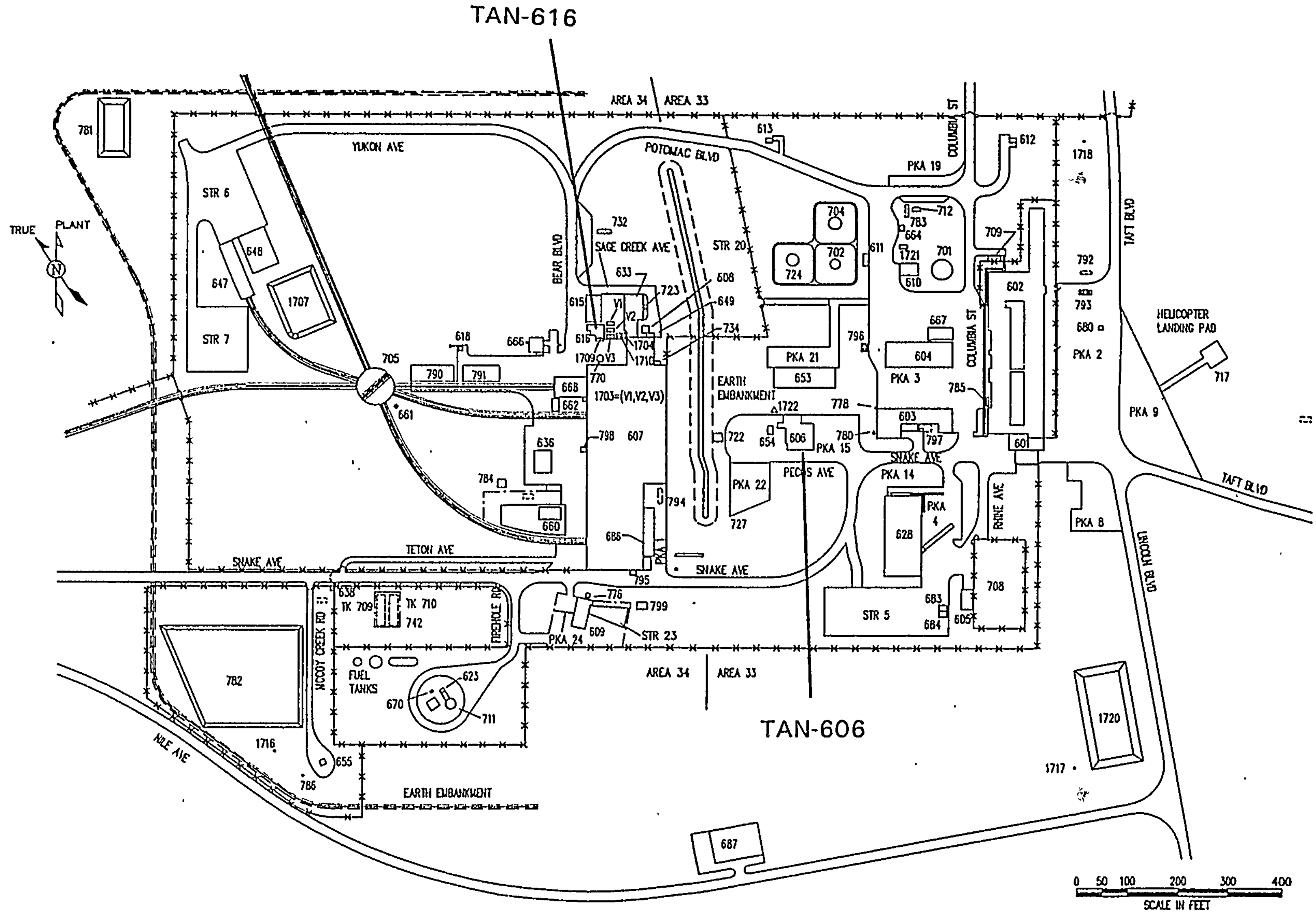

Figure B-21. TSF plot plan.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: SERVICE WASTE DIVERSION FACILITY (CPP-631/709/734)					
TOTAL ESTIMATED COST: [a] $ 2,580.6K			REMAINING SCHEDULE DURATION: 2 yrs		
FUNDING SOURCE: ADS: 1306-WN			WBS: 1.2.17.1 and 1.2.17.2 CAP: 3KN631000 and 3KN709000		
Actual Cost through FY-94: $ 995K		FY-95: $ 250.0K	FY-96: $ 650.0K	FY-97: $ 685.6K	FY-98:
FY-99:	FY-00:	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Industrial Facilities			Project Priority: 2 of 16 Basis: Ready to start field work, relatively low cost to complete.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions					
TOTAL WASTE VOLUME ESTIMATE: [b] 35 m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: 25 m^3					
HAZARDOUS WASTE: TBD					
MIXED WASTE: none					
INDUSTRIAL WASTE: 10 m^3					
TRU WASTE: none					
HIGH-LEVEL WASTE: none					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The Service Waste Diversion Facility, as defined by this project, consists of the CPP-631, RaLa Offgas Building, the CPP-734, West Side Service Waste Monitoring Station, and CPP-709, East Side Service Waste Monitoring Station. These facilities diverted wastes from the CPP-601 fuel processing building and were designed to prevent the release of radioactive solutions to the environment.

CPP-709 and CPP-734 diverted service waste flow to a 300,000 gallon hold tank (WM-191) if the stream(s) were excessively contaminated. The normal path was to an injection well. CPP-709 was constructed in 1951 and CPP-734 was constructed in 1959. These two structures were replaced by CPP-796 and CPP-797 as part of the ICPP service waste upgrade in 1990. At that time, all service waste lines transferring waste to and from these structures were cut and capped.

The RaLa Offgas Building, CPP-631, was constructed in 1957 and contained equipment for processing off-gas generated by the Radioactive Lanthanum (RaLa) recovery system located in CPP-601. The off-gas was ultimately released to the ICPP main exhaust stack. By 1986, all of the RaLa processing equipment in CPP-601 and CPP-631 was removed and the pipe tunnel connecting the two buildings was cut and capped. CPP-631 still contains areas of radioactive contamination.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

The three subsurface structures to be decommissioned as part of this project total approximately 400 ft^2.

CPP-631 RaLa Off-Gas Facility

CPP-631 is a subsurface reinforced concrete building with a steel entry door, and interior dimensions of 10 ft by 10 ft by 8 ft high. The ceiling, walls, and floor thicknesses vary from 6 to 12 in. The reinforced concrete volume is 715 ft^3. The ceiling exterior is 1 ft below grade. The wall surfaces are spalling and cracking. Structural failure could provide a pathway for stormwater penetration and water staining is already apparent. Floor debris, ¼ in. thick, covers the 100 ft^2 floor area. The debris includes concrete chips, paint chips, and soil. Lead was also detected in this debris. The only utility remaining is electric power; however, the lighting is not working. The pipe tunnel leading to CPP-601 is capped off. All equipment was removed in 1986.

CPP-709

CPP-709 is a subsurface bi-level reinforced concrete building. The exterior dimensions are 16 ft by 10 ft by 18 ft high. The reinforced concrete volume is 1800 ft^3. The concrete is deteriorating and stormwater has infiltrated. The basin is generally dry, with sediment thickness averaging 3 in. CPP-709 still contains pumps, piping, and electrical equipment.

CPP-734

CPP-734 is a subsurface bi-level reinforced concrete building. The exterior dimensions are 14 ft by 10 ft by 14 ft high. The reinforced concrete volume is 900 ft^3. The concrete is deteriorating and the steel grate flooring has corroded. The basin is generally dry, with sediment thickness averaging 9 in. CPP-734 still contains pumps, piping, and electrical equipment.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

CPP-631 is highly contaminated and has the "potential" for ground contamination. The facility surfaces exhibit whole body radiation levels to 50 mrem/hr ß,τ. Fixed contamination levels are at levels up to 560,000 dpm/100 cm^2 ß,τ and 5600 dpm/100 cm^2 α.

CPP-709 is slightly radiologically contaminated with dose rates < 1 mrem/hr and fixed contamination levels to 3000 cpm/100 cm^2 ß,τ. CPP-734 is not radiologically contaminated.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
D. A. Peterson, D&D Project Manager, LITCO, 526-7441.
S. A. LaBuy, D&D Project Manager, LITCO, 526-9856.

D&D/S&M Previous Accomplishments

The facilities were characterized in 1993 and the D&D plan was prepared in 1994. In 1995, the health and safety plan and hazard classification were completed.

All equipment was removed from CPP-631 in 1986. The structure was decontaminated to the maximum extent possible and the sump was filled with cement. The pipe tunnel was capped.

Unique Conditions/Special Circumstances

The pipe tunnel from CPP-601 to CPP-631 will be left in place. The soil under CPP-631 may be contaminated.

Permitting Requirements

A NEPA categorical exclusion has been approved.

Surveillance and Maintenance Status

Minimal S&M has been conducted since the RaLa equipment removal in 1986 and the Service Waste Monitoring Systems equipment shutdown in 1989. S&M is limited to routine radiological surveys.

Safety and Environmental Considerationsp

Excavations and equipment removal will require monitoring and radiological controls.

D&D Recommended Methodology

All equipment will be removed and the facilities will be decontaminated to the maximum extent possible. The roof and walls will be caved into the remaining portions of the affected structures to a level 4 ft below grade. The areas will be backfilled and graded.

Specialized Capital Equipment and Tools Required

No specialized equipment or tools are anticipated. Chemical decontamination techniques may be used in CPP-631.

Facility Reuse Considerations

No facility reuse is reasonable due to the condition.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. D. L. Smith and D. J. Bradford, Characterization of the RaLa Off-Gas Cell, CPP-631, WM-F1-81-010, May 1981.

3. C. L. Moser, Radiological Characterization and Decision Analysis for the RaLa Off-Gas Cell and Storage Tank (CPP-631 and VES-702), WINCO-1030, April 1985.

4. C. L. Moser, RaLa Off-Gas Cell and Storage Tank (CPP-631 and VES-702) Decontamination and Dismantlement Plan, WINCO-1032, July 1985.

5. C. L. Moser, Final Report: Decontamination and Dismantlement of RaLa Off-Gas Cell and Storage Tank, WINCO-1036, February 1986.

6. D. A. Peterson, Characterization and Decision Analysis for the CPP-631 Building, WIN-366, November 1993.

7. C. L. Moser, Characterization and Decision Analysis for the CPP-709 Building, WIN-371, November 1993.

8. C. L. Moser, Characterization and Decision Analysis for the CPP-734 Building, WIN-369, November 1993.

9. R. F. Graefe, D. A. Peterson, D. H. Preussner, D&D Plan for the CPP-631 RaLa Building and CPP-709 & CPP-734 Monitoring Stations at the ICPP, WIN-378, September 1994.

10. B. M. Meale, Hazard Classification for the D&D of CPP-631, CPP-709, and CPP-734 at ICPP, INEL-95/100, May 1995.

11. S. A. LaBuy, D. A. Peterson, Health and Safety Plan for D&D of CPP-631, -709, -734, INEL-95/0292, June 1995.

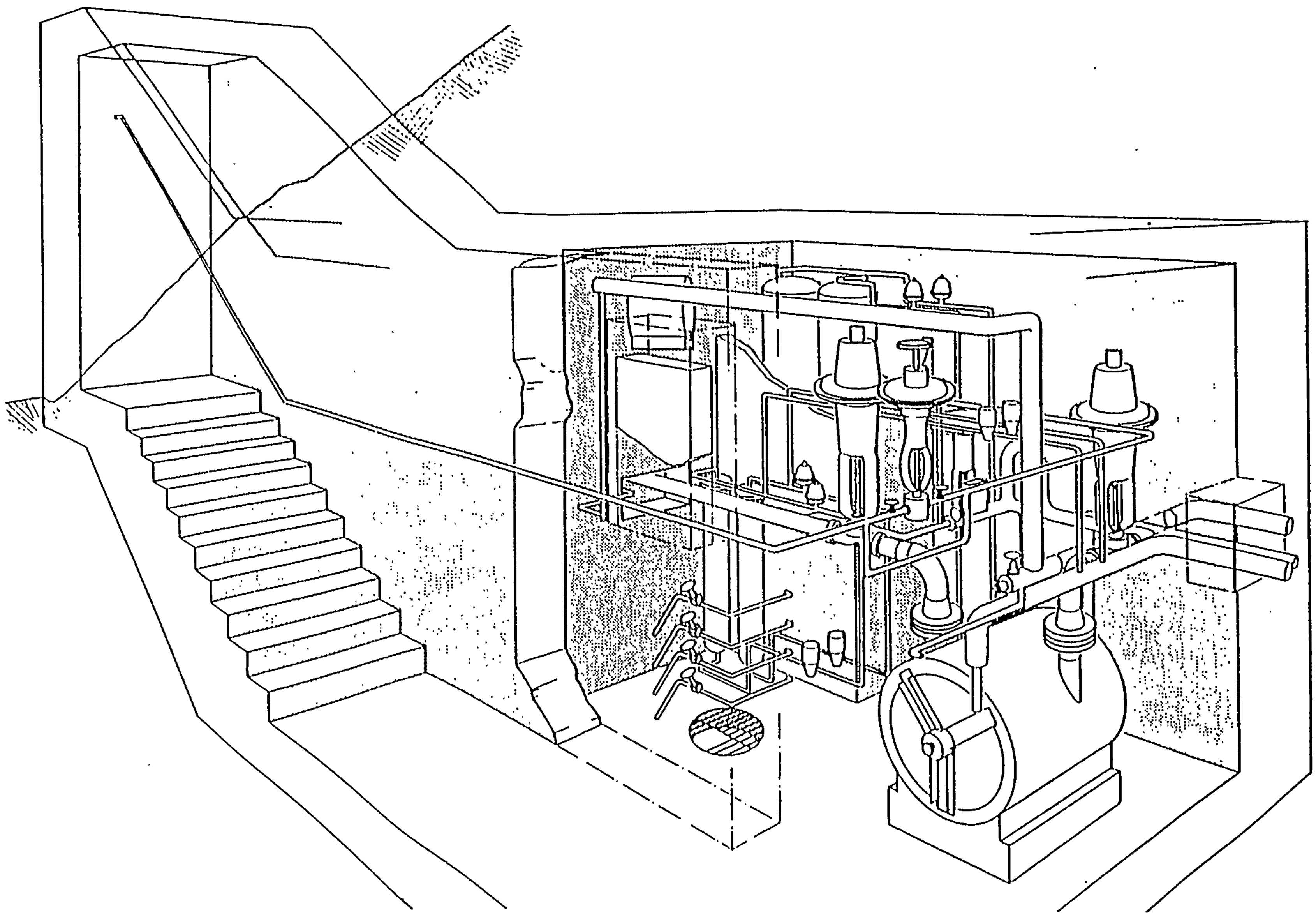

Figure B-22. Cutaway drawing of the RaLa Off-gas Cell.

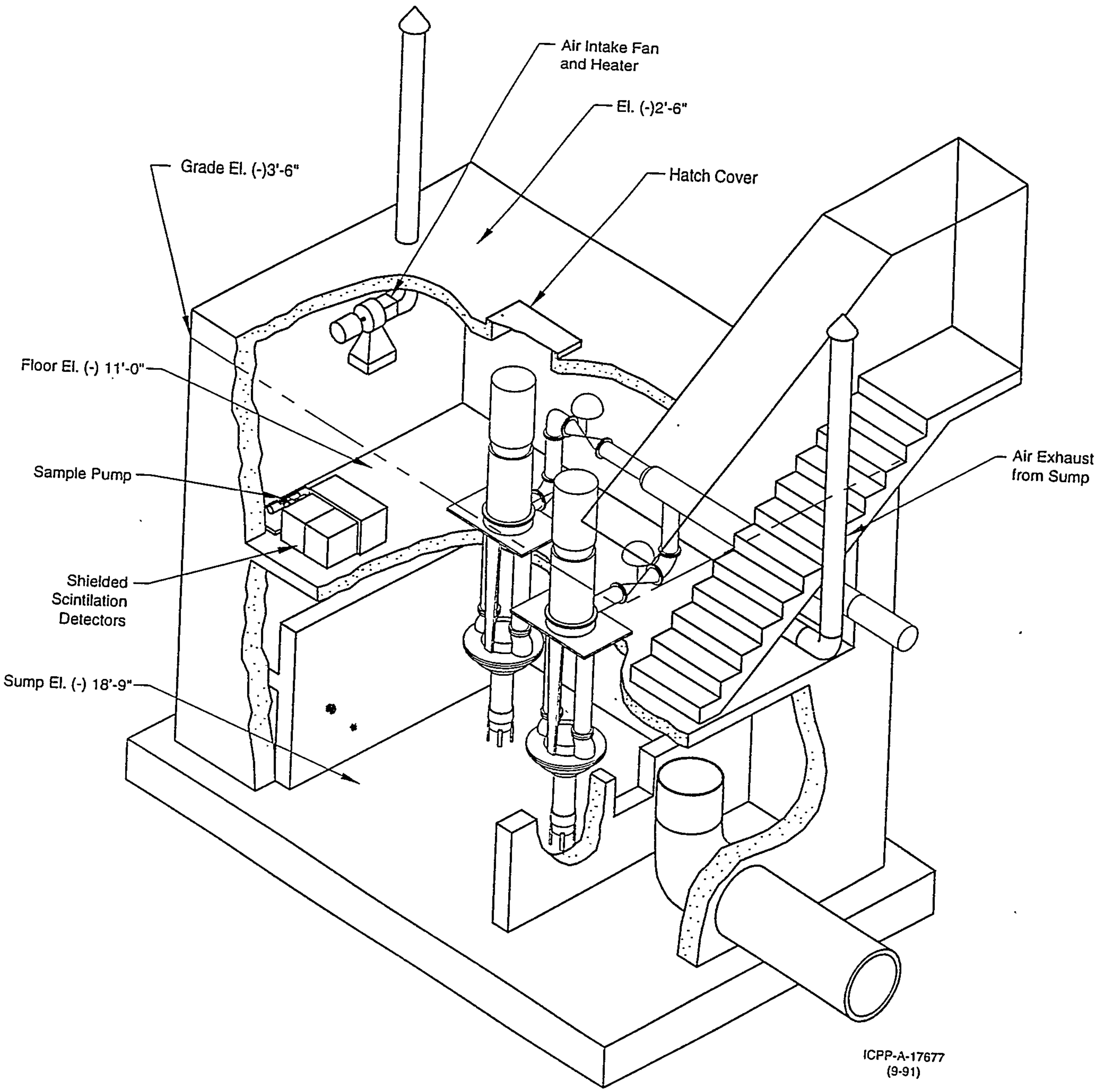

Figure B-23. CPP-734 Monitoring Station.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: CPP-740/SFE-20					
TOTAL ESTIMATED COST: [a] $ 4,031.8K			REMAINING SCHEDULE DURATION: 3 yrs		
FUNDING SOURCE: ADS: 1305-WN			WBS: 1.2.18.1 and 1.2.18.2 CAP: 3KN740000 and 44182		
Actual Cost through FY-94: $ 131K		FY-95: $ 45.2K	FY-96: $45.2K	FY-97: $45.2K	FY-98: $45.2K
FY-99: $ 45.2K	FY-00: $ 974.5K	FY-01: $2052.1K	FY-02:$648.2K	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Radiological Facility. Auditable Safety Analysis required.			Project Priority: 4 of 16 Basis: Relatively low cost to complete.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Requirements.					
TOTAL WASTE VOLUME ESTIMATE: [b] 122 m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: 40 m^3					
HAZARDOUS WASTE: none					
MIXED WASTE: none					
INDUSTRIAL WASTE: 82 m^3					
TRU WASTE: none					
HIGH-LEVEL WASTE: none					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The SFE-20 hot waste tank was constructed in 1957 to collect low level liquid wastes from the CPP-603 south basin and Fuel Element Cutting Facility (FECF). The low transfer rate of the SFE-20 pump, lack of easy access, system size, and frequent flooding of the pump pit contributed to a decision to replace the entire SFE-20 waste handling system. This replacement decision was implemented in 1975 and the SFE-20 system was characterized in 1984, however, the decommissioning phase has not been initiated yet.

The CPP-740 settling basin was constructed in 1962 to receive the backwash slurry of filter aid material (diatomaceous earth) from the "BIF" filter system. The BIF filter system was decommissioned with D&D funds in 1984. CPP-740 separated the slurry from the backwash and passed the supernatant to the CPP-303 deep well. Prior to CPP-740 operation, the backwash went through the CPP-301 settling vault and into CPP-303. No waste water has been released into the ground since 1966, due to tighter regulations, which limited the amount of backwash into CPP-740. CPP-301 was then reactivated, from where waste was then sent to the SFE-20 hot waste tank. The use of CPP-740 was terminated in 1977 with the BIF filter system. A cleanup of the CPP-301 pit in the late 1970s resulted in the spread of contamination outside of CPP-740, requiring a backfill of dirt to prevent the further spread. The feed lines from CPP-603 were flanged off to isolate CPP-740. CPP-740 was radiologically characterized in 1982. In 1994, all sludge was removed from CPP-740 as part of a CERCLA removal action.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

CPP-740 Settling Basin

The CPP-740 area consists of four components and their associated piping: two slurry-settling facilities, a dry well, and a valve box manhole.

CPP-301, settling vault, measures 5 ft square by 19 ft deep. It is constructed of 5 in. thick square concrete barrels, about 4 ft high, and a platform-type floor structure.

CPP-740, settling basin, measures 4 ft wide by 5 ft high by 30 ft long. Most of the facility is buried under 7 ft of backfill. CPP-740 consists of a manway and 8 weir compartments which measure 4.5 ft by 4 ft and are constructed of 2x6 redwood planks. The facility is constructed of reinforced concrete slabs, ranging from 4 to 8 in. in thickness. There are four triangular counter fort walls that support the side walls of this facility.

CPP-303, dry well, is bottomless with the intent for all liquids discharged into it to be absorbed into the surrounding ground. The dry well is 4 ft in diameter and 23 ft deep. It is constructed of 5 in. thick concrete barrels, 4 ft high, with a 2 ft manhole for maintenance access.

SFE-20 Waste Tank

The Stored Fuel Exterior Waste Tank (SFE-20) system includes the SFE-20 tank, tank vault, access tunnel, pump pit, and CPP-642 compressor building with related piping and instruments. SFE-20 is a 640 gal stainless steel tank with a 3 ft 6 in. inside diameter. It has a 7 ft 5 in. straight shell with elliptical ends extending 1 ft The tank sits in a 13 ft by 6 ft by 10 ft high concrete vault. The bottom of the vault is 20 ft below ground. The tank sits on a 10" concrete pad. The inlet pipe to SFE-20 was cut and capped in 1977. The tank contains approximately 55 gal of sludge and 400 gal of liquid.

CPP-642 is a 9.5 ft by 13 ft by 6 ft high compressor building that sits above SFE-20 and provides access to the tank through a pump pit and access tunnel. A steam line, electrical service lines, and air lines that are essential to CPP-603 operation are routed through this building. A waste transfer line is routed underground adjacent to CPP-642. CPP-642 is radiologically clean.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

Surveys indicate the subsurface soil directly adjoining the CPP-740 and SFE-20 facilities is radiologically contaminated. 1994 sampling results indicated: CPP-301 contains 1 to 2 ft of sludge. CPP-303 contained cohesive soil in the bottom. CPP-740 several inches of sludge and 4 ft of water prior to removal. Attempts were made to obtain a sample from SFE-20 in 1994 and were unsuccessful due to no water return with a suction on a sample line. The samples contained calcium, iron, potassium, manganese, nickel, silver, chlorine, NO_3, SO_4, Co^{60}, Cs^{137}, plutonium, uranium, and americium.

Contact Information

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
A. H. Owen, WAG 3 Project Manager, LITCO, 526-9887.

D&D/S&M Previous Accomplishments

The CPP-740 basin was desludged in 1994 as part of a CERCLA removal action. The top of the basin will be backfilled in 1995, to place the area in a stable condition while it awaits D&D in FY2001.

Unique Conditions/Special Circumstances

Removal of the drywells and other potential release pathways will include their concrete casings and the contaminated surrounding soils.

Permitting Requirements

The sludge removal project was covered by a CX; therefore, it is anticipated that the D&D of these facilities would also be covered by a CX.

Surveillance and Maintenance Status

Minimal surveillance and maintenance has been conducted.

Safety and Environmental Considerations

Excavation would require extensive radiological monitoring and controls.

D&D Recommended Methodology

The D&D mode will be selected during the decision analysis phase.

Specialized Capital Equipment and Tools Required

No specialized equipment or tools needs have been identified.

Facility Reuse Considerations

None. Facilities to be removed.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. J. O. Low, Radioactive Waste Characterization of CPP-603 Cleanup Basin System - CPP740, WM-Fl-81-023, Rev. 1, May 1982.

3. D. A. Schmidt and C. L. Moser, Radiological Characterization and Decision Analysis for the SFE-20 Waste Tank and Vault, WINCO-1021, September 1984.

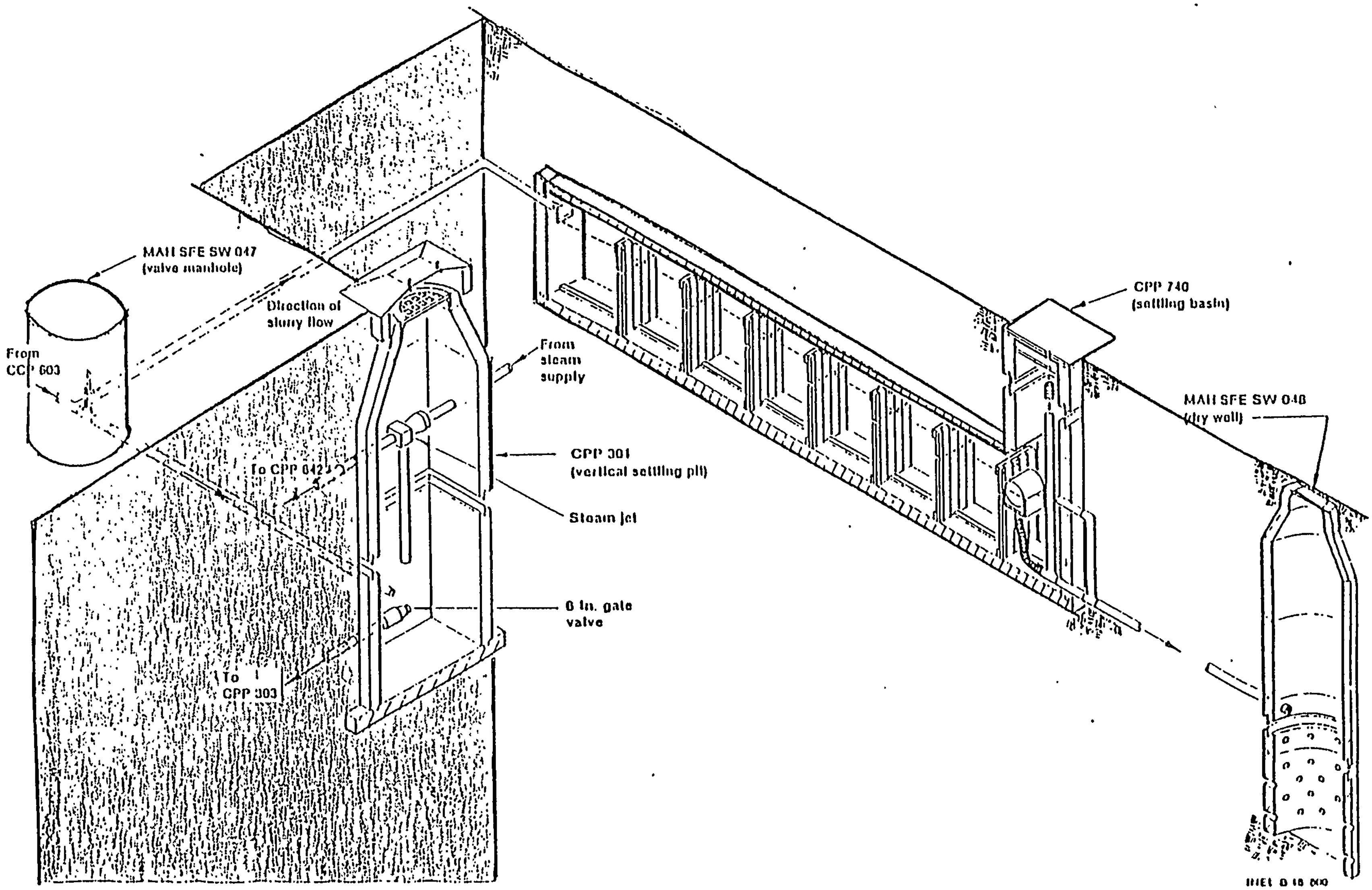

Figure B-24. CPP-740 Facility Isometric.

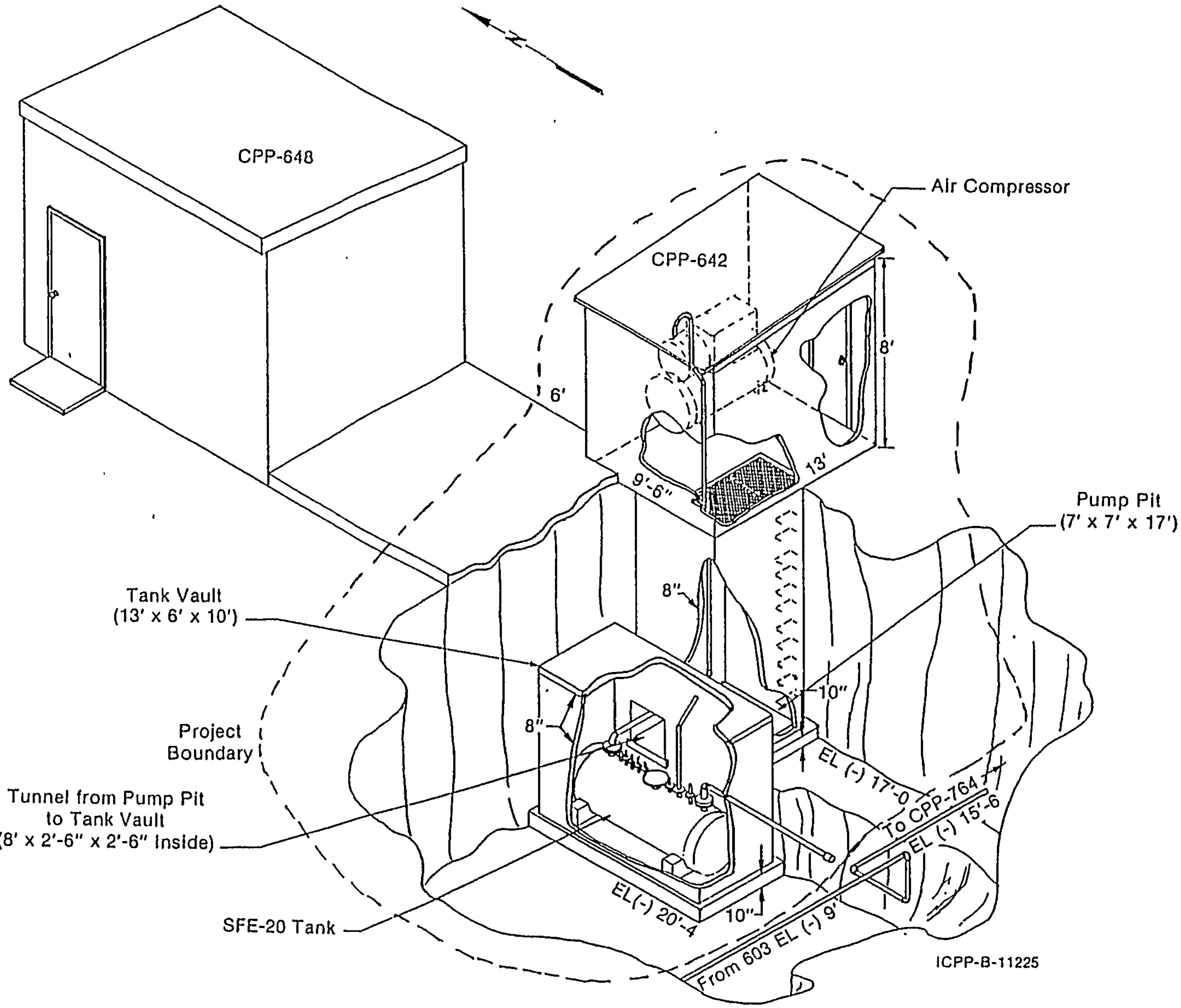

Figure B-25. Drawing of SFE-20.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

<table>
<tr><td colspan="3">FIELD OFFICE: DOE-ID</td><td colspan="4">CONTRACTOR: Lockheed Martin Idaho Technologies</td></tr>
<tr><td colspan="7">PROJECT: FUEL PROCESSING BUILDING (CPP-601)</td></tr>
<tr><td colspan="4">TOTAL ESTIMATED COST: [a] $5,746.7K (Assessment Only)</td><td colspan="3">REMAINING SCHEDULE DURATION: 3+ yrs</td></tr>
<tr><td colspan="4">FUNDING SOURCE:
ADS: 1308-WN</td><td colspan="3">WBS: 1.2.21.1 and 1.2.21.2
CAP: 3KN601000 and 44212</td></tr>
<tr><td colspan="2">Actual Cost through FY-94: $ 0K</td><td>FY-95: $ 26K</td><td>FY-96:</td><td>FY-97:</td><td colspan="2">FY-98:
$ 1030.0K</td></tr>
<tr><td>FY-99:
$ 1892.7K</td><td>FY-00:
$ 2798.0K</td><td>FY-01:</td><td>FY-02:</td><td>FY-03:</td><td colspan="2">FY-04:</td></tr>
<tr><td colspan="4">DOE HAZARD CLASSIFICATION:
Nuclear Facility. Revise existing SAR.</td><td colspan="3">Project Priority: 12 of 16
Basis: Reduce personnel hazards and S&M costs. RCRA closure of deep tanks.</td></tr>
<tr><td colspan="7">RCRA/CERCLA REQUIREMENTS:
RCRA Land Disposal Restrictions</td></tr>
<tr><td colspan="5">TOTAL WASTE VOLUME ESTIMATE: [b] TBD</td><td colspan="2">ESTIMATE BASE YEAR: 1995</td></tr>
<tr><td colspan="7">LOW-LEVEL WASTE: TBD</td></tr>
<tr><td colspan="7">HAZARDOUS WASTE: TBD</td></tr>
<tr><td colspan="7">MIXED WASTE: TBD</td></tr>
<tr><td colspan="7">INDUSTRIAL WASTE: TBD</td></tr>
<tr><td colspan="7">TRU WASTE: TBD</td></tr>
<tr><td colspan="7">HIGH-LEVEL WASTE: TBD</td></tr>
</table>

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The CPP-601 fuel processing facility was built in 1953 and played a key role in recovering highly enriched uranium (HEU) from government spent nuclear fuels. In 1992, the Department of Energy directed ICPP to terminate its uranium recovery mission. The Office of Facility Transition (EM-60) assumed responsibility for CPP-601 and initiated deactivation of uranium systems.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

CPP-601 is rectangular, 244 ft long by 102 ft wide, and is 95 ft 3 in high. CPP-601 has over 58,000 ft^2 of floor space. It extends from 57 ft 6 in below grade to 37 ft 9 in above grade at the peak of the roof. The process building is joined on the north by the laboratory building, CPP-602, and on the west by the Headend Process Plant, CPP-640, and the remote analytical facility, CPP-627.

CPP-601 encloses 29 process cells, which are typically 20 ft square by 28 ft deep, numerous corridors, and auxiliary cells. The process cells are positioned in two rows and are identified by alphabetic designations, "A" through "Z", except for "I". Most of the process equipment is controlled from an operating corridor that runs the length of the building between the two rows of cells. The operating corridor contains the valves and instrumentation. Below the operating corridor are service and access corridors. Outside of the row of cells are sampling and vent corridors. The top story of the building, referred to as the process makeup (PM) area, is an unpartitioned area for storage and makeup of chemical solutions and for charging materials into the cells.

Access to the cells for equipment maintenance or removal is through hatches in the cell ceilings. Cells "B", "U", "W", and "Y" lie below other cells. Equipment for these lower cells must be moved in through the upper cell. Personnel access to each cell is through labyrinth corridors and doors located at the lowest floor level. Most of the cell floors and walls are lined to varying heights with Type-347 stainless steel. Process cell floors are pitched so that solutions drain to a sump of critically-safe geometry in the event of a spill.

Most of the processing equipment is located in the heavily shielded cells and was operated remotely. The equipment includes tanks, extraction columns, evaporators, dissolvers, heat exchangers, and spray nozzles for introducing decontamination solutions. Steam and air lines entered for heating, valve operation, and equipment operation. Most equipment is constructed of stainless steel, with the exception of several items made of acid-resistant alloys.

High Vacuum Cell

The High Vacuum Cell originally provided vacuum for solution transfers associated with operating the dissolution equipment in Cells A, C, and D. The decommissioning process for these dissolution cells was completed in 1984. The High Vacuum Cell is a high radiation area that requires decontamination prior to equipment removal. The cell is 6 × 7 × 8 ft high and contains vacuum pumps, vacuum reservoir tanks, and demisters.

A-, B-, and D-Cells

These cells underwent D&D in the early 1980's and all piping, vessels, valves, and other equipment (except lights, stainless steel floor and walls, air line to operate floor drain valves, and some sump level instrumentation) were removed. Piping embedded in concrete was capped and left in place. Condensers were salvaged and were stored in D-Cell. Post-D&D surveys indicated radiation levels up to 100 mR/hr beta-gamma. Little effort, aside from a water flush of the cell floor and sump is planned for these cells. A-Cell is 15 ft by 19 ft by 16 ft high. B-Cell is 15 ft by 19 ft by 17 ft high. A-Cell is directly above B-Cell. D-Cell is 20 ft by 19 ft by 28 ft high.

E-Cell (Original Zirconium Dissolution)

The equipment for the original semicontinuous zirconium process is located primarily in E-Cell with utility and chemical makeup facilities in the process makeup (PM) area. E-Cell, the fourth cell on the west side of CPP-601, is 20 ft by 19 ft by 28 ft high. The walls are 5 ft thick. Personnel access is through a labyrinth from the process access corridor, while equipment access is through a 5 ft by 5 ft hatch in the ceiling. The floor and lower 9.5 ft of walls are lined with stainless steel. The cell is vented to the west vent tunnel (cell off-gas system) through a louvered vent in the west wall.

F-Cell (Feed Clarification System)

The feed clarification system contains centrifuge equipment. F-Cell is 19 ft by 20 ft by 28 ft high. The floor is covered with stainless steel that extends 10 ft up each wall. The wall adjacent to the operating corridor is honeycombed with offset pipe sleeves for the entrance and exit of piping and instrumentation. The floor is pitched so that solution will drain to the geometrically favorable sump. The sump is instrumented with a liquid level alarm and equipped with jets to transfer the sump contents to the Process Equipment Waste (PEW) system.

G-Cell (Aluminum Dissolution)

The continuous aluminum-alloyed fuel dissolution equipment is located primarily in G-Cell and the heated digestion tanks are located in E-Cell. Chemical makeup is located above G-Cell in the PM area. G-Cell is 20 ft by 19 ft by 28 ft high. The north and south walls are 4 ft thick, and the other walls are 5 ft thick. All walls are reinforced concrete to provide radiation shielding. Personnel access is through a labyrinth from the access corridor and equipment access is through a 5 ft by 5 ft hatch in the cell ceiling. The floor is covered with stainless steel that extends 10 ft up each wall. The cell is vented to the west vent corridor.

C, J, and L-Cells (Uranium Rework Systems)

Out-of-specification uranium solutions are reworked in C- and L-Cells. J-Cell was set up to receive out-of-specification PEW streams, but has not been used since C- and L-Cells were revamped in the early 1980's. No further J-Cell use is anticipated. L-Cell is 16 ft by 17 ft by 37 ft high. The floor is 10 ft below the access corridor floor. Personnel entry is via a pit in the access corridor floor. The cell floor is sloped to a favorable geometry sump and the floor is covered with Raschig rings for criticality control. The sump is 18 in deep and 5 in diameter. The cell is completely lined with stainless steel.

C-Cell is on the opposite side of the access corridor. Its floor is at access corridor floor level and slopes to a geometrically favorable sump, identical to the sump in L-Cell. C-Cell is 20 ft by 19 ft by 28 ft high with stainless steel lining on the walls to 9.5 ft above the floor. Floor drains near the sumps in both L-Cell and C-Cell are welded closed and are no longer accessible. Process piping from L-Cell to C-Cell is routed through the service corridor, which is above the access corridor.

J-Cell is 19 ft by 20 ft by 29 ft high. The cell floor is covered with a stainless steel liner that extends 3 ft up each wall. The sump is instrumented with a liquid level alarm and equipped with jets to transfer the sump contents either to the rework collection tanks or to the PEW system.

G, H, and S-Cells (First Cycle Extraction)

The first cycle extraction process consists of four liquid-liquid extraction columns and supporting equipment. Dissolution product was fed into G-Cell where uranium was separated from waste fission products and dissolved fuel cladding by liquid-liquid solvent extraction with an organic tributyl phosphate solution. The uranium bearing stream was transferred to H-Cell, where residual fission products were removed and returned to G-Cell and the uranium stream, which was an organic phase, was transferred to a column to strip uranium into an aqueous phase. The aqueous phase was cleansed of organic and concentrated in the evaporator. Process reagents were supplied to the extraction system from the overhead PM area. Equipment for pulsing solution through the column sieve trays is also located in the PM area.

M-Cell (Accountability Storage) and N-Cell (Intercycle Storage)

Production solutions from first cycle extraction were sent to M-Cell. The primary function of the M-Cell was to provide temporary storage and sampling capability for concentrated uranium solutions. Accountability of uranium solutions flowing from both first cycle extraction and second/third cycle extraction was maintained. M-Cell received highly enriched uranyl nitrate solutions from H-Cell for temporary storage and accountability sampling before being transferred to N-Cell. Off-gases were vented to the VOG system and released to the ICPP stack. M-Cell contains four large vertical solution storage tanks, four pumps, and four sample pots. Each of the tanks is annular with a capacity of 550 L (3 ft OD by 17.5 ft tall). Two tanks are wrapped in Boraflex I neutron absorbing material. The four pumps are located behind a shielding wall on the west side of the cell. N-Cell received highly enriched uranyl nitrate solutions L-Cell or M-Cell. The solution is temporarily stored in N-Cell and later transferred to P- and Q- cells for hexone extraction and final recovery. Off-gases were vented to the VOG system and released to the

ICPP stack. Process equipment includes 48 storage tanks and associated piping. The 100 L. (5.25 in. OD by 28 ft tall) stainless steel tanks are manifolded into six banks of eight tanks each, with drip pans and instrumentation, an off-gas knockdown tower, air and steam sparging equipment, samplers, and tank-washing inlets and spargers.

M-Cell is 16 ft by 17 ft by 37 ft high. Penetrations at the base of the shielding walls allow any spilled solution to drain to the sump. The 1 ft thick concrete floor is covered with borosilicate glass Raschig rings. A stainless steel floor grating is mounted above the rings. Personnel access is through a doorway in a well below the access corridor; equipment access is through the ceiling hatch or cell door. The cell floor is 32.5 ft below the process operating floor and 10 ft lower than the access corridor. The floor and walls are reinforced concrete with thicknesses of 1 ft for the floor and 5, 6, 6, and 5 ft for the north, west, east, and south walls, respectively. The ceiling is 3 ft of concrete over a layer of 6 in. thick concrete T-beams. A concrete shielding wall, 1.5 ft thick by 15.5 ft tall, shields the pumps in the cell from the vessels. All tanks, piping, and exposed materials are stainless steel. The floor and walls are lined with stainless steel to a height of 3 ft

N-Cell is the largest of the process cells at 57 ft by 19 ft by 38 ft high. The floor is lined with stainless steel that extends 6 ft up the walls. Borosilicate glass Raschig rings cover the floor surface for criticality control and extend up to the elevation of the overflow point (bottom of door). The reinforced concrete thicknesses are 5 ft for the ceiling, and 4, 5, 5, and 5 ft for north, west, east, and south walls, respectively. Personnel access is through a labyrinth located below the access corridor.

O-Cell (Pump cell)

O-Cell is located entirely below the access corridor level. O-Cell is primarily an auxiliary equipment room for N-Cell containing four pumps that are used to transfer solution from N-Cell to P- and Q-Cells. O-Cell is 20 ft by 9.5 ft by 10 ft high. The floor and walls are lined with stainless steel. The reinforced concrete thicknesses are 1 ft for the floor and 3, 1, 5, and 1 ft for the north, west, east, and south walls, respectively. The floor and walls are lined with stainless steel and the floor is covered with Raschig rings. It is a pit with an aluminum plate roof, which is part of the access corridor floor. Access to O-Cell is through a labyrinth. Two lead caves shield radiation emanating from the pump heads used for moving solution out of N-Cell and between P- and Q-Cells.

Cells K, P, Q, U, W, and Y (Second and Third Cycle Extraction)

The second and third cycle extraction will be operated as part of the phaseout for fuel reprocessing. This process, consisting of two essentially identical hexone extraction cycles, is located in P- and Q-Cells. Product is collected in Q-Cell for transfer to product storage. Feed for the hexone extraction process is aqueous uranyl nitrate solution, which is stored temporarily in N-Cell after first cycle extraction. Liquid product from the hexone process is stored in Z-Cell before it is processed through the denitrator and shipped from CPP as a solid. Used hexone, collected in W-Cell, purified in K-Cell, and recycled for reuse in the process. The aqueous waste streams containing transuranics and fission products are collected in U- and Y-Cells and transferred to the liquid waste tank farm to await eventual calcination.

Z-Cell (Aqueous Uranyl Nitrate Storage)

After the final hexone extraction in Q-Cell, slightly acidic purified uranyl nitrate is transferred to M-Cell and then to interim storage in Z-Cell. The solution is accumulated for subsequent conversion to UO_3 powder in the denitrator, located in CPP-602. Z-Cell is part of CPP-601, but all access is through CPP-602. The cell is 6 ft by 24 ft by 21 ft high and contains nine storage tanks (5.25 in. OD by 17 ft high), a sampling station, two pumps, a vacuum pump, monitoring equipment, and a fire-suppression system. All equipment is stainless steel. Reinforced concrete thicknesses are 1 ft for the ceiling and floor, and 1.2, 1.5, 1.5 and 3 ft for north, west, east, and south walls, respectively. The floor and walls are lined with stainless steel to a height of 3.3 ft

Separations Facilities Denitrator

In the denitration process, located in CPP-602, purified and concentrated uranyl nitrate solution from the hexone extraction processes is converted to granular UO_3 in a heated fluidized bed. The granular product is packaged and stored in a vault adjacent to the denitration process, pending shipment to the CPP-651 Unirradiated Fuel Storage Facility or to off-site users. The denitrator will be operated as part of the phaseout of fuel reprocessing.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

CPP-601 still contains fissile material; however, the quantity is at levels that do not require criticality controls. Radiological and chemical contamination exists.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
D. A. Peterson, D&D Project Manager, LITCO, 526-7441.
S. A. LaBuy, D&D Project Manager, LITCO, 526-9856.

D&D/S&M Previous Accomplishments

The CPP-601 process cells "A", "B", "C", "D", and "L" underwent D&D in 1984. Current deactivation activities include rinsing walls, removing Source Nuclear Material, flushing vessels, and flushing process lines. The criticality alarm and plant protection system will be taken out of service. The liquid waste system, off-gas, ventilation, and fire protection will remain in service.

Unique Conditions/Special Circumstances

Several cells may exhibit high radiation areas.

Permitting Requirements

TBD

Surveillance and Maintenance Status

Periodic surveillance, monitoring, and maintenance is performed on CPP-601.

Safety and Environmental Considerations

The risks of radiological material releases from CPP-601 to the environment are increasing.

D&D Recommended Methodology

TBD

Specialized Capital Equipment and Tools Required

D&D closure will require handling and packaging of low-level radioactive waste for disposal. Structural removal requires radiological demolition efforts and waste handling and packaging. No specialized equipment or tools are anticipated.

Facility Reuse Considerations

TBD

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. D. L. Smith and J. G. Scott, Final Report - D&D of CPP-601 Process Cells "A", "B", "C", "D", and "L", EGG-2304, September 1984.

3. M. W. Patterson, Nuclear Fuel Reprocessing Phaseout for the Idaho Chemical Processing Plant, WINCO-1193-R1, February 1994.

1. Elevator
2. Cell hatch (Typical)
3. Access chute (Typical)
4. Truck stop (Typical)
5. East H&V room
6. Loading ramp

7. Vehicle ramp
8. Foul weather entry
9. West H&V room
10. Filter room
11. Blower room

12. West sample corridor
13. East sample corridor
14. Operating corridor
15. North corridor
16. South corridor
17. Service corridor

18. West vent corridor
19. East vent corridor
20. South vent corridor
21. High vacuum cell
22. Personnel ramp
23. Fill

24. Access corridor
25. South access corridor
26. Pipe tunnel
27. West control room, WA
28. East control room, WF
29. Pump cell, WB

30. Pump cell, WC
31. Pump cell, WD
32. Pump cell, WE
33. West tank cell, WG
34. East tank cell, WH

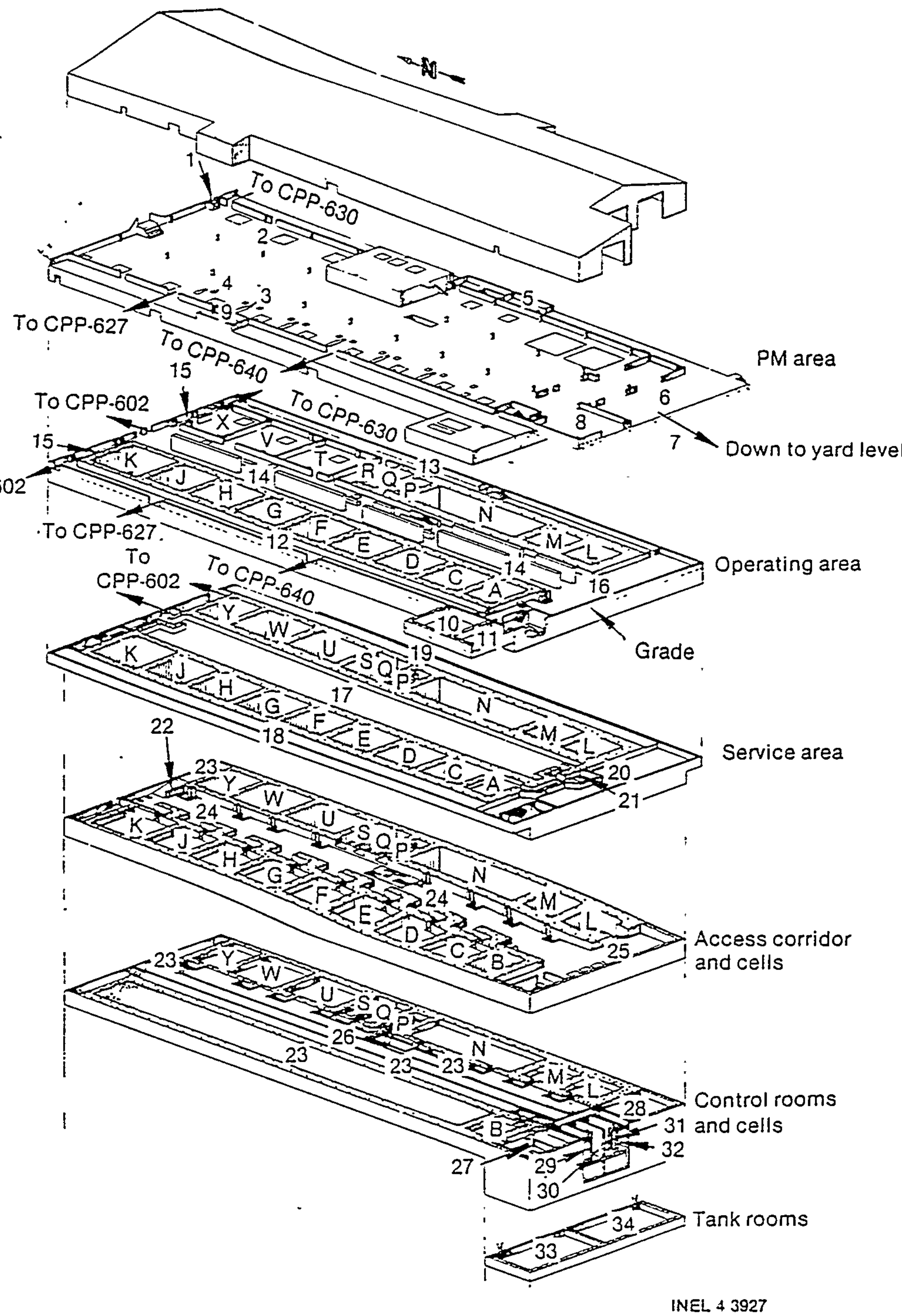

Figure B-26. CPP-601 Process Building Isometric.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: HEADEND PROCESSING PLANT (CPP-640)					
TOTAL ESTIMATED COST: [a] $ 12,755.1K			REMAINING SCHEDULE DURATION: 5 yrs		
FUNDING SOURCE: ADS: 1307-WN			WBS: 1.2.19.1 and 1.2.19.2 CAP: 3KN640000 and 44192		
Actual Cost through FY-94: $ 50K		FY-95: $ 26K	FY-96:	FY-97:	FY-98:
FY-99:	FY-00:	FY-01: $ 772.4K	FY-02: $1500.8K	FY-03: $ 4219.1K	FY-04: $ 4133.7K
FY-05: $ 2053.1K					
DOE HAZARD CLASSIFICATION: Nuclear Facility. Revise existing SAR.			Project Priority: 10 of 16 Basis: Reduce personnel hazards and S&M costs. RCRA closure.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions					
TOTAL WASTE VOLUME ESTIMATE: [b] TBD m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: TBD					
HAZARDOUS WASTE: TBD					
MIXED WASTE: TBD					
INDUSTRIAL WASTE: TBD					
TRU WASTE: TBD					
HIGH-LEVEL WASTE: TBD					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The Headend Processing Plant (HPP), constructed in 1961, housed two unique fuel reprocessing headend systems and a liquid waste handling system. One of the HPP headends, the ROVER rocket fuel headend, has been shut down since 1984. The other, the Electrolytic dissolution headend for stainless-clad fuel, has been shut down since 1981. Although much of the original chemical and radionuclide inventory has been removed from the headend systems, neither system has been fully decontaminated. In fact, part of the ROVER system still contains quantities of fissile material.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

CPP-640 is a five-level structure with dimensions of 66 ft by 89 ft The facility extends from 33 ft below grade to 34 ft above grade, with three levels below grade, one level at grade, and one level above grade. Each level contains at least one shielded process area. The structure is reinforced concrete to an elevation of 10.5 ft above grade and pumice block above this level. The facility has approximately 15,000 ft^2 of floor space and the three stories are of concrete construction. CPP-640 shares a common wall with CPP-601 to the east and CPP-627 to the north. The separate processing areas include the process makeup area, the truck bay, fuel transfer port, and the waste tank control room. The shielded areas include the mechanical handling cave (MHC) and cells 1 through 5.

The process makeup area is an unshielded area, located one level above grade and contains tanks and vessels used for the storage and makeup of process solutions. The tanks contained hydrofluoric acid, nitric acid, aluminum nitrate, and borated water.

The truck bay is at grade level and was the starting point of the ROVER fuel processing system. The transfer cask was removed from the transport vehicle by an overhead 30-ton crane for transfer to the alignment car and transfer port outside the MHC. The fuel transfer port outside the MHC on the second level of CPP-640 allowed for irradiated fuel elements to be transferred into the MHC.

The waste tank control room is located on the lowest accessible level. The waste tanks are located in the shielded cells below the control room. Each of the three waste tanks is constructed of stainless steel with a maximum capacity of 500 gal Both cells contain a sump for recovery of released liquids. The tank vaults are constructed of reinforced concrete and are accessible only through hatches in the floor of the control room. The tanks were included in the RCRA Part A permit but the transfer lines from the tanks do not meet secondary containment requirements. The tanks and vault are to be closed under interim status and decommissioned.

ROVER Headend

The ROVER headend process was divided into 1) combustion of the graphite rocket fuel in the "Dry side", and 2) dissolution of the ash in the "Wet side." The Dry side was housed in the MHC and Cells 3 and 4. The Wet side was housed in Cells 1 and 2.

The ROVER process used two stages of fluidized-bed burning to burn the graphite from the fuel. ROVER fuel elements were periodically charged to the burner system and the resulting Uranium-containing ash was collected, weighed, and transferred to the dissolver in the Wet side for dissolution. The solution was then transferred to CPP-601 where the uranium was further purified and converted back to an oxide. Removable walls allowed cells 3 and 4 to be combined into one larger unit. Cells 1 and 2 and the MHC have manipulators and viewing windows for remote operations.

Electrolytic Headend

The electrolytic dissolution system was located in Cell 5 of the HPP. Stainless steel-clad fuel assemblies or cans were transported in a bottom-opening cask form the fuel storage basin and dropped through a charging port to a table in the Electrolytic Cell. An operator used remotely-operated manipulators to load the fuel into the open top of a trough-shaped titanium dissolver. The dissolver product solution, essentially a metal nitrate, nitric acid solution containing nuclear poison, circulated continuously to a surge tank from which it was pumped through a flowmeter, heat exchanger, conductivity meter, and control valve before being returned to the dissolver. Fresh dissolvent was added as product was transferred to CPP-601 for further processing. Cell 5 is 11.5 ft wide at the top and 17 ft wide at the bottom, 17 ft long and 17 ft deep. The 4.5 ft thick walls and ceiling are concrete. The floor is lined with stainless steel and extend up the walls 5 ft

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

The dissolution systems and their respective cells (5) are highly contaminated. The HW tanks (3) contain hazardous wastes and high levels of radioactive contamination. The ROVER system still contains about 100 kg of uranium. Radiation levels are up to 50 R/hr.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
D. A. Peterson, D&D Project Manager, LITCO, 526-7441.
S. A. LaBuy, D&D Project Manager, LITCO, 526-9856.

D&D/S&M Previous Accomplishments

No previous D&D activities have been completed. Current deactivation activities include flushing the process vessels to remove fissile material and chemical inventories. The ROVER dry side vessels and piping will be sectioned to remove materials.

Unique Conditions/Special Circumstances

The fissile uranium must be removed before system decontamination can be completed. This will facilitate cell entries for hazardous waste removal and decommissioning to clean close the HPP. These conditions and circumstances require special tools and techniques to support this closure.

Permitting Requirements

The liquid waste system was included in the RCRA Part A permit and is currently being closed under RCRA interim status control.

Surveillance and Maintenance Status

Plant maintenance, security surveillance, and equipment monitoring continue as required to maintain the ROVER, ELECTROLYTIC, and HW Tank systems in a safe shutdown condition. Access to the ROVER/ELECTROLYTIC dissolution systems and HW Tank vaults is restricted such that in-cell maintenance is not allowed.

Safety and Environmental Considerations

The fissile uranium entrapped in the dissolution systems cannot be wet decontaminated due to the existing moderator/criticality limits and controls. This dissolution system and its 3 cells include areas of very high radiation and are highly contaminated. The HW Tank systems and 2 vaults are moderately contaminated. The HW Tank outlets (underground pipelines) require rerouting, since the existing pipelines do not meet RCRA double containment/leak detection requirements.

D&D Recommended Methodology

The D&D mode will be selected during the decision analysis phase.

Specialized Capital Equipment and Tools Required

This D&D closure will require handling and packaging of the various waste classes for disposal. These efforts will require specially adapted tools and techniques, but no capital equipment has been identified. Structural removal will require typical radiological controls for demolition, waste handling, and packaging.

Facility Reuse Considerations

None

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. M. W. Patterson, Nuclear Fuel Reprocessing Phaseout for the Idaho Chemical Processing Plant, WINCO-1193-R1, February 1994.

3. Engineering Science, Inc., Decontamination and Dismantlement Options Analysis for the Hot Pilot Plant, January 1991.

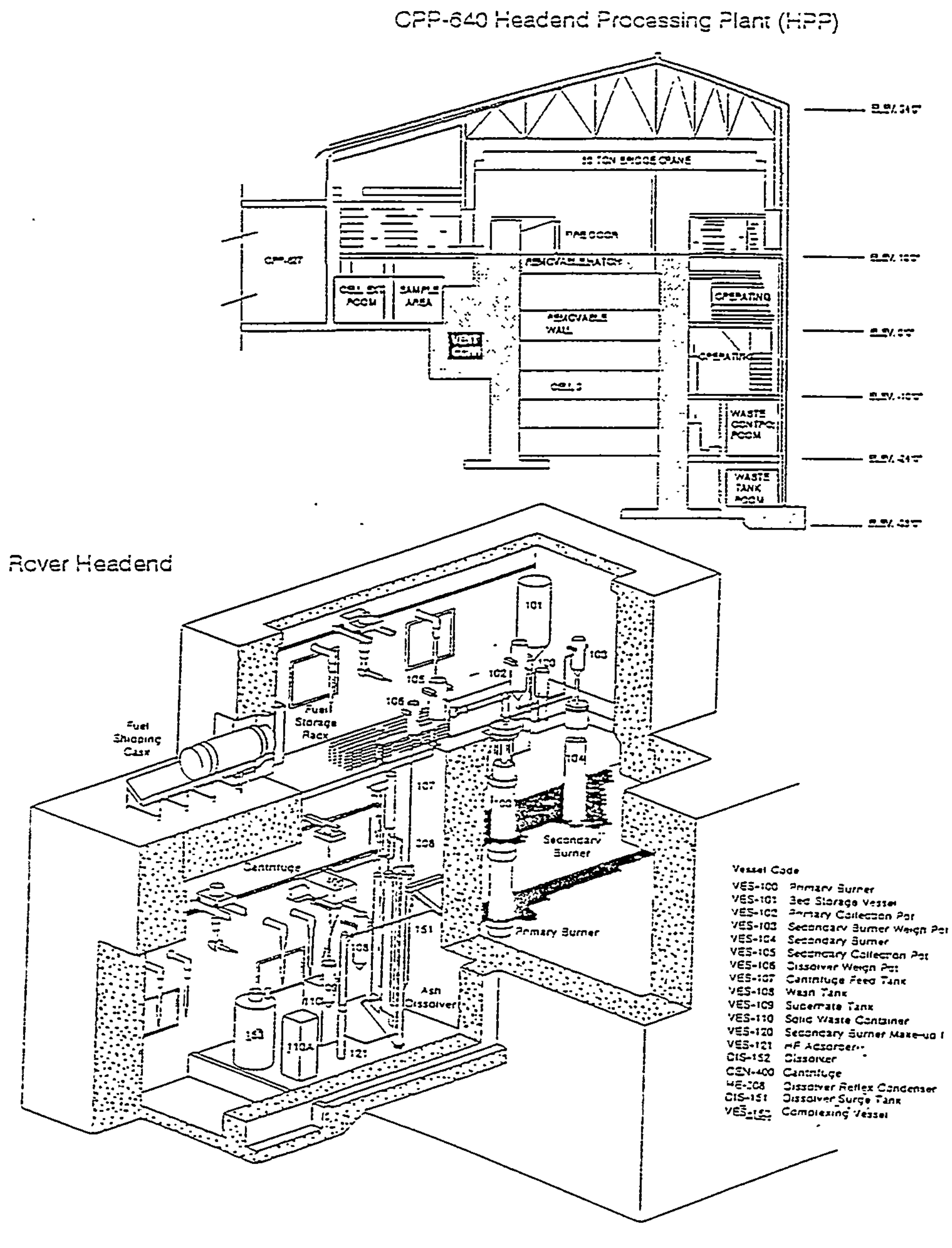

Figure B-27. Headend Processing Plant.

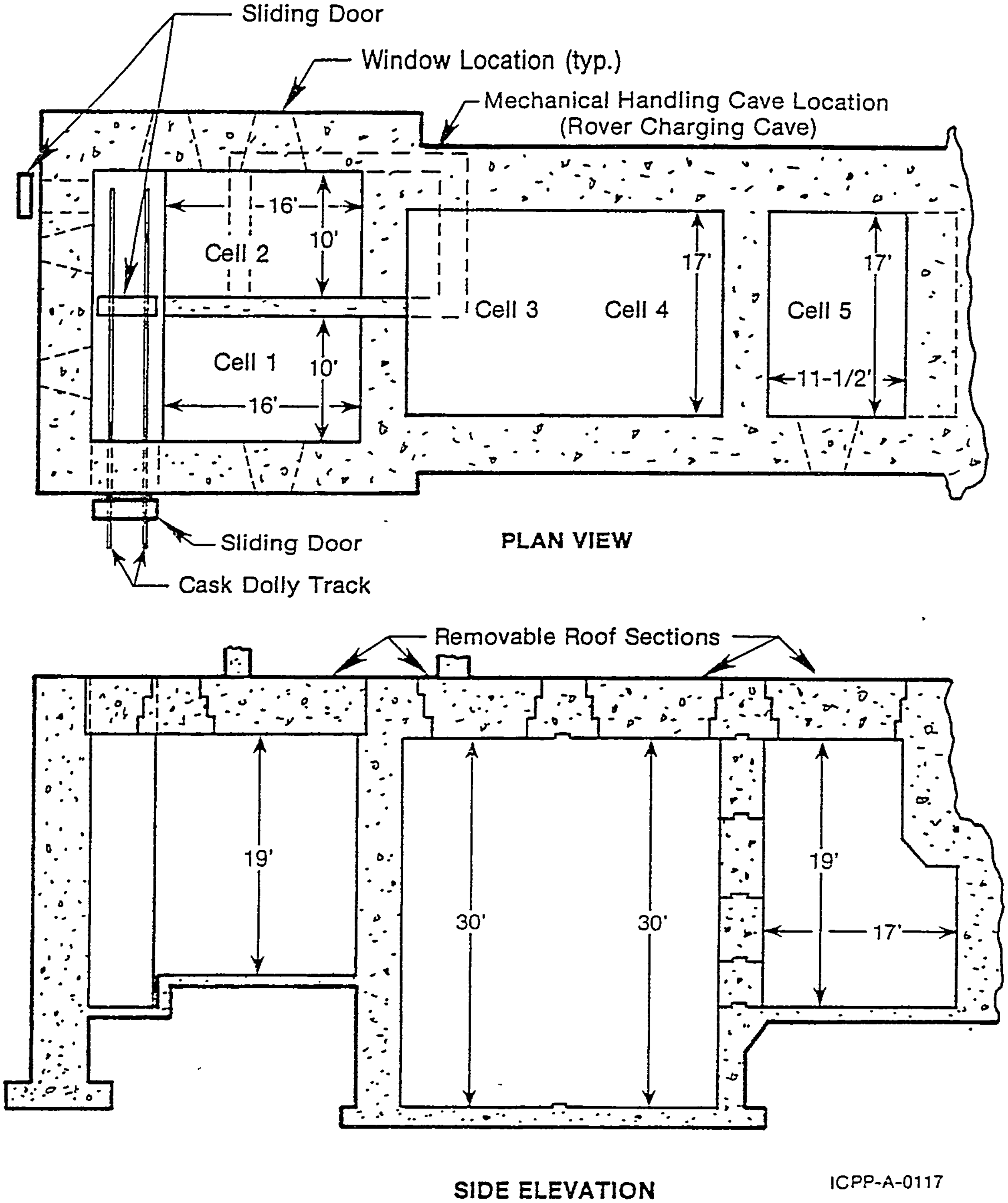

Figure B-28. Cell Layout.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: FUEL RECEIPT AND STORAGE FACILITY (CPP-603)					
TOTAL ESTIMATED COST: [a] $ 2040.2K (Assessment Only)			REMAINING SCHEDULE DURATION: 3+ yrs		
FUNDING SOURCE: N/A ADS: 1304-WN			WBS: N/A CAP: N/A		
Actual Cost through FY-94: $ 0K		FY-95:	FY-96:	FY-97:	FY-98:
FY-99:	FY-00: $ 20.6K	FY-01: $ 1088.3K	FY-02: $ 931.3K	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Nuclear Facility. Revise existing SAR.			Project Priority: 11 of 16 Basis: Reduce personnel hazards and S&M costs.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions.					
TOTAL WASTE VOLUME ESTIMATE: [b] TBD m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: TBD					
HAZARDOUS WASTE: TBD					
MIXED WASTE: TBD					
INDUSTRIAL WASTE: TBD					
TRU WASTE: TBD					
HIGH-LEVEL WASTE: TBD					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

The Fuel Receipt and Storage Facility (FRSF) in and near the CPP-603 building consists of a number of contaminated systems which have been shut down for several years. CPP-603 contains three underwater storage basins, which currently contain spent nuclear fuel. The fuel is scheduled to be removed by 1997. Several areas require D&D. Some of the systems are closely associated with the interagency agreement currently being negotiated by EPA, State of Idaho, and DOE. The SFE-20 hot waste tank and CPP-740 settling basin have been separated into an individual project. The CPP-603 Chloride Removal System D&D was completed in 1993. The Fuel Element Cutting Facility (FECF) is a hot cell area that was used to prepare spent nuclear fuel for reprocessing.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

CPP-603 was built in 1951 and contains three storage basins connected by a transfer canal, making it an E-shaped building. The basins are filled with water to a depth of about 19 ft Two of the basins are covered with steel grating for suspending fuel storage buckets. The third basin is open, and some 2000 to 3000 fuel elements can be stored in special racks. The total basin system contains about 1.5 million gal of water that is recirculated through a filter system. CPP-603 is a 12,376 ft^2 building. CPP-603 is serviced by overhead cranes and related equipment for unloading and retrieving fuel elements.

The fuel element cutting facility (FECF) is a concrete hot cell measuring 20 ft by 41 ft and 17 ft high. FECF is located adjacent to the underwater fuel storage basin at the south end of CPP-603. The walls are 5 ft thick and contain viewing windows and master-slave manipulators, which allowed operators to safely conduct fuel cutting operations. Some of the equipment inside the cell has been removed but significant radiation and contamination levels are still present. Two spent fuel elements were present when the system was characterized in 1983 and must be removed prior to turnover to D&D.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

Contact Information

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
D. A. Peterson, D&D Project Manager, LITCO, 526-7441.

D&D/S&M Previous Accomplishments

Unique Conditions/Special Circumstances

TBD

Permitting Requirements

TBD

Surveillance and Maintenance Status

Routine S&M is ongoing.

Safety and Environmental Considerations

TBD

D&D Recommended Methodology

TBD

Specialized Capital Equipment and Tools Required

TBD

Facility Reuse Considerations

None identified.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

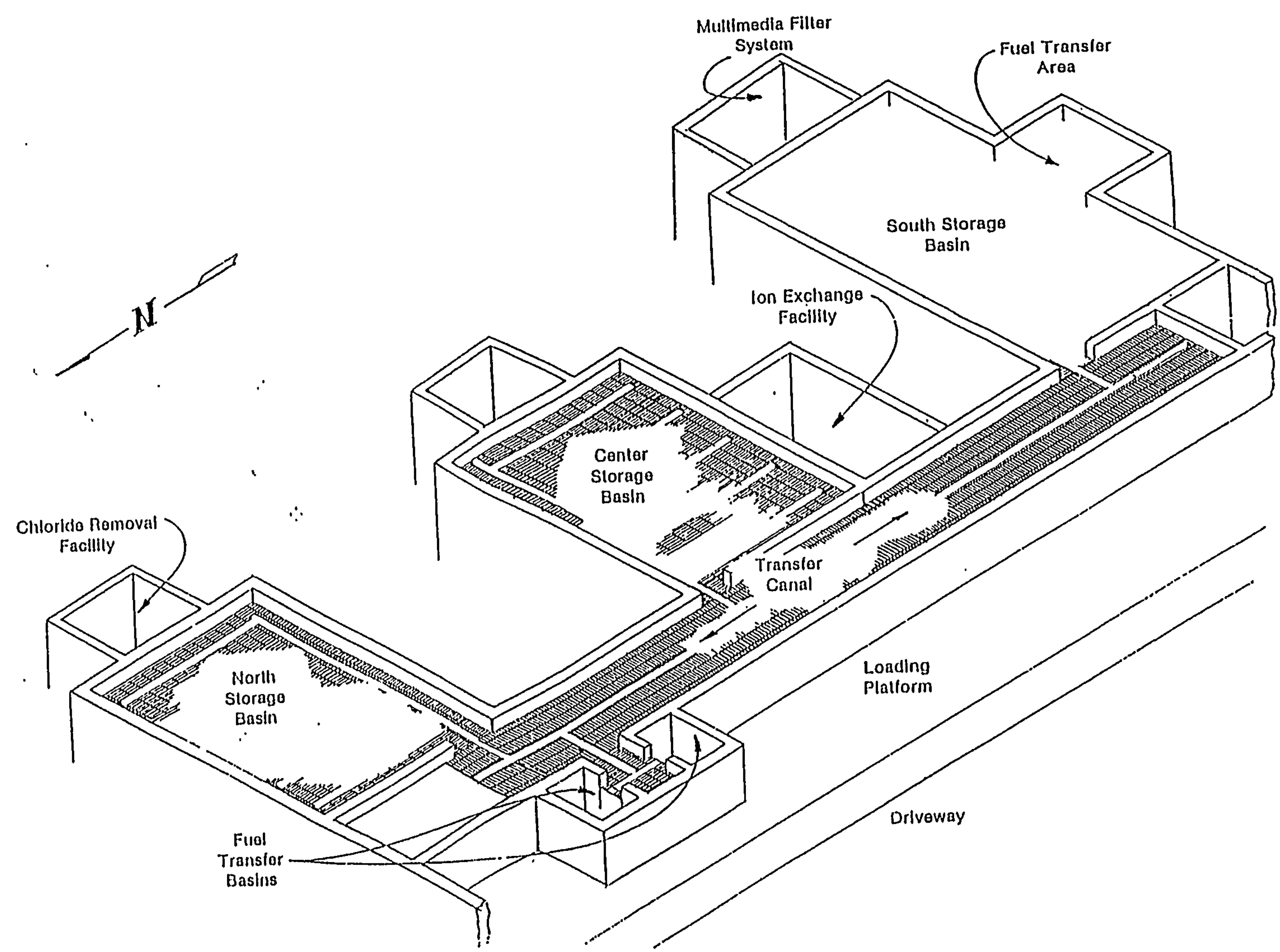

Figure B-29. CPP-603 Fuel Element Storage Basins.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID		CONTRACTOR: Lockheed Martin Idaho Technologies			
PROJECT: WASTE CALCINE FACILITY (CPP-633)					
TOTAL ESTIMATED COST: [a] $ 3,033.6K (Assessment Only)			REMAINING SCHEDULE DURATION: 3+ yrs		
FUNDING SOURCE: ADS: 1309-WN			WBS: 1.2.16.1 and 1.2.16.2 CAP: 3KNWCF000 and 44162		
Actual Cost through FY-94: $ 252K		FY-95: $ 26K	FY-96:	FY-97:	FY-98: $ 874.3K
FY-99: $ 946.0K	FY-00: $ 935.3K	FY-01:	FY-02:	FY-03:	FY-04:
DOE HAZARD CLASSIFICATION: Nuclear Facility. Revise existing SAR.			Project Priority: 13 of 16 Basis: Reduce personnel hazards and S&M costs. RCRA Closure.		
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions					
TOTAL WASTE VOLUME ESTIMATE: [b] 1330+ m^3				ESTIMATE BASE YEAR: 1995	
LOW-LEVEL WASTE: 1325+ m^3					
HAZARDOUS WASTE: 5+ m^3					
MIXED WASTE: TBD					
INDUSTRIAL WASTE: TBD					
TRU WASTE: TBD					
HIGH-LEVEL WASTE: TBD					

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

WCF was the world's first plant-scale facility built to achieve safe, efficient disposal of high-activity radioactive wastes resulting from reprocessing of nuclear fuels. The WCF converted high-level radioactive liquid wastes into granular solids which were less corrosive, more immobile, and occupied less storage volume. First-cycle solvent-extraction waste from reprocessing spent nuclear fuels was sprayed into a hot, air-fluidized bed of granular solids where water flashed off and the metallic slats were converted to their corresponding oxides and fluorides. The WCF was designed for direct maintenance of equipment during periodic shutdowns.

Operation of the WCF with the radioactive wastes began in 1963 and terminated in 1981. During that time over 4,000,000 gallons of aqueous waste was calcined producing approximately 77,000 cubic feet of solids. Due to its deteriorated condition the WCF was replaced by a new Waste Calcining Facility (NWCF) which was completed shortly after WCF was shut down.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

The facility is a multi-level structure of masonry, reinforced concrete, and structural steel with approximately 20,000 ft^2 of floor space. The processing cells lie underground in two banks with the service corridors lying between them. Nonradioactive service areas for the facility are located in the concrete block structure above grade.

The WCF feed system consists of two waste hold tanks, a feed tank, a feed evaporator and blend tank, and feed lines and valves. Radioactive solutions are transferred from the liquid waste storage tanks to the hold tanks, and then to the feed tank. The calciner vessel is a fluidized bed reactor which converts the liquid waste solution to a granular solid. The solid product is pneumatically transferred to the solid waste storage bins. Most of the dry particles which are not removed in the dry cyclone are removed by the off-gas scrubbing system, which consists of a scrubbing solution surge tank, a spray quench tower, a venturi scrubber, a cyclone separator, and a wire-mesh demister. The off-gas stream from the scrubbing system passes through a heat exchanger, silica gel adsorbers, and final filters prior to being exhausted to the stack.

The hot sump tank collects waste solutions from the cell floor drains and from most of the WCF process vessels. The waste solutions are sent to either the PEW evaporator or the high-level waste storage tanks.

Two 1000 gal decontamination solution makeup tanks are located on the uppermost level of WCF. Several decontamination lines lead from the decontamination deck to various locations on WCF vessels and lines to allow localized application of water, steam, or decontamination solutions.

The heat required for calcination was originally provided by circulating NaK which transferred heat from an oil-fired furnace to the calciner. In 1971, the NaK system was replaced with in-bed combustion of kerosene and oxygen. The NaK has been removed, along with several components. The 18,000 lb. NaK furnace and 400 lb. heater blower are still present.

Other WCF structures include the following:

CPP-639 - WCF Blower Building
CPP-735 - WCF Transformer Area
CPP-753 - Service Waste Monitoring Station for CPP-633
CPP-754 - Service Waste Diversion System for CPP-633

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

Extensive radiological contamination exists. High radiation fields are present. The material inventory includes over 3300 curies of Sr, Y, Sb, Cs, Ba, and Eu.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
D. A. Peterson, D&D Project Manager, LITCO, 526-7441.

D&D/S&M Previous Accomplishments

No previous D&D has been accomplished. Current deactivation activities include removal of bulk radioactive and hazardous materials. Process vessels will be flushed. Asbestos has been removed. The silica gel will be removed and packaged for disposal. The off-gas system will remain in service.

Unique Conditions/Special Circumstances

The WCF contains a silica-gel adsorber media (25 m^3) and several RCRA regulated wastes. The silica-gel media was an adsorber of highly radioactive off-gas byproducts and is a high radiation source. The RCRA regulated wastes include acid residues contaminated with heavy metals, elemental lead (Pb), and asbestos.

Permitting Requirements

The facility contains a number of high radiation areas and is Part A-permitted under RCRA. RCRA Closure activities are currently in progress.

Surveillance and Maintenance Status

Minimal surveillance and maintenance has been conducted since 1981 and many systems within the WCF have deteriorated significantly. Repair of the utility systems, decon piping systems, and instrumentation, to meet DOE Order 5480.19, will be required before initiation of the decon effort.

Safety and Environmental Considerations

The risk of releasing RCRA regulated material and/or radiological material to the environment increases as the WCF's deterioration continues. The WCF process system in building CPP-633 presents an increased risk to on-site personnel, because of the increasing probability of containment migration beyond the system and building.

D&D Recommended Methodology

The current planning being conducted by EM-60 Facility Transition specifies removal of all above ground portions and entombing the remaining portions of the facility. This methodology would reduce the cost of D&D, yet remains to be approved by authorities.

Specialized Capital Equipment and Tools Required

The D&D closure will require handling and packaging of low level radioactive waste for disposal. Structural removal will require radiological demolition and waste handling and packaging. Remotely operated, specialized tools are anticipated.

Facility Reuse Considerations

None

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. D. L. Smith, CPP-633 NaK Furnace Characterization, WM-FL-81-004, March 1981.

3. M. W. Patterson, Nuclear Fuel Reprocessing Phaseout for the Idaho Chemical Processing Plant, WINCO-1193-R1, February 1994.

4. Engineering Science Inc., Decontamination and Dismantlement Options Analysis for the Waste Calcining Facility, December 1990.

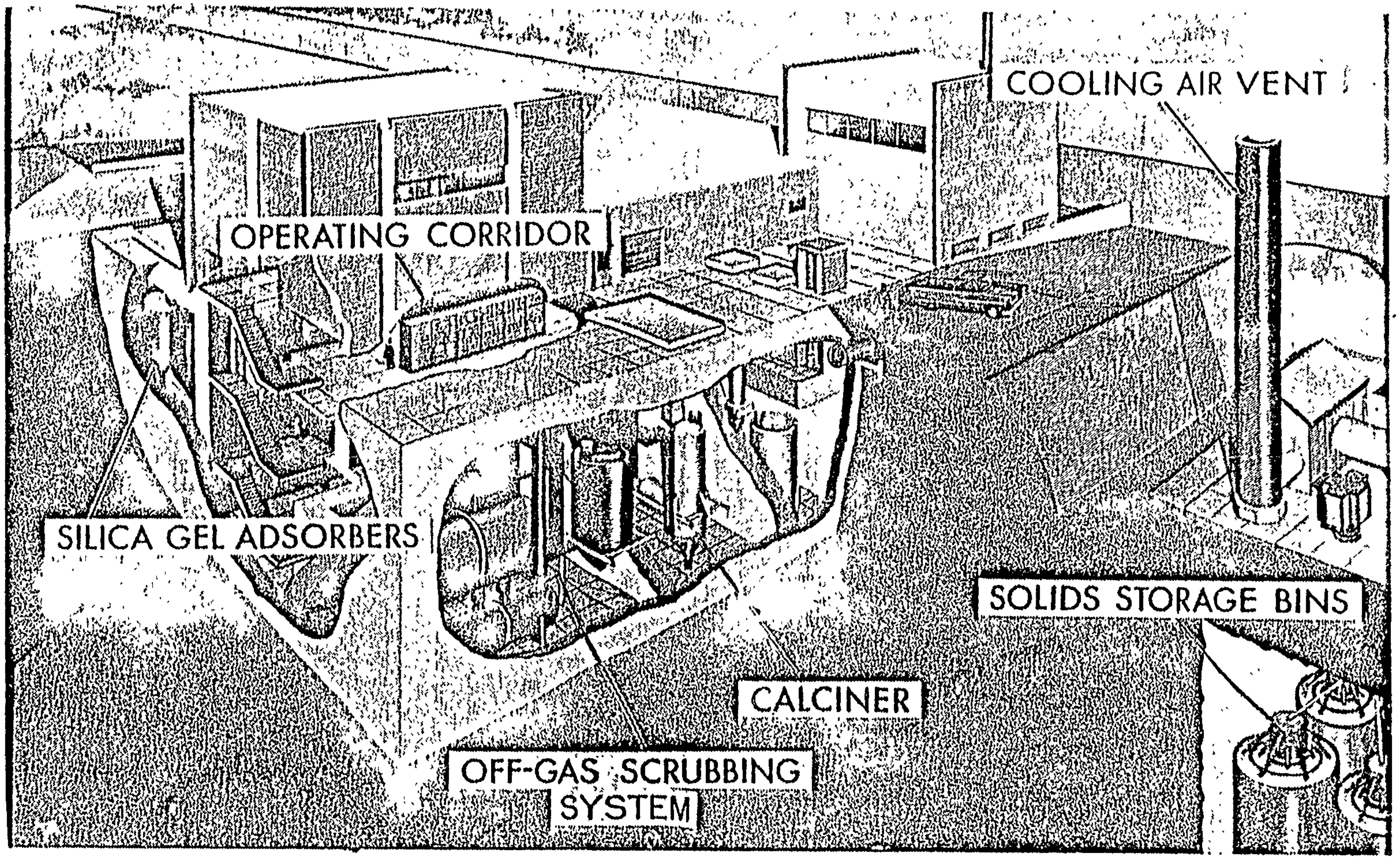

Figure B-30. Cutaway sketch of the Waste Calcining Facility.

DECONTAMINATION AND DISMANTLEMENT PROGRAM
FACILITY DESCRIPTION FORM

FIELD OFFICE: DOE-ID	CONTRACTOR: Lockheed Martin Idaho Technologies
PROJECT: HIGH LEVEL WASTE TANK FARM (HLWTF)	

TOTAL ESTIMATED COST: [a] $ 3,347.8K (Assessment Only)	REMAINING SCHEDULE DURATION: 4+ yrs
FUNDING SOURCE: ADS: 1310-WN	WBS: 1.2.20.1 and 1.2.20.2 CAP: 44201 and 44202

Actual Cost through FY-94: $ 0K		FY-95:	FY-96:	FY-97:	FY-98:
FY-99:	FY-00: $ 558.6K	FY-01: $ 670.3K	FY-02: $ 846.2K	FY-03: $ 1,272.7K	FY-04:

DOE HAZARD CLASSIFICATION: Nuclear Facility. Revise existing SAR.	Project Priority: 15 of 16 Basis: Reduce personnel hazards and S&M costs.
RCRA/CERCLA REQUIREMENTS: RCRA Land Disposal Restrictions	

TOTAL WASTE VOLUME ESTIMATE: [b] TBD m^3	ESTIMATE BASE YEAR: 1995

LOW-LEVEL WASTE:	TBD
HAZARDOUS WASTE:	TBD
MIXED WASTE:	TBD
INDUSTRIAL WASTE:	TBD
TRU WASTE:	TBD
HIGH-LEVEL WASTE:	TBD

NOTES: a. Total Estimated Cost includes all Actual Costs through FY 94 plus all planning costs.

b. Detailed estimates of waste form (concrete, soil, liquid, metals, etc.) quantities are provided in the "Waste Stream Projections for Environmental Restoration at the INEL", DOE/ID-10417, current issue, for both low-level waste and industrial waste.

FACILITY DESCRIPTION

History and Use

[Including start and finish operational years]

High level liquid radioactive waste is generated at ICPP as a result of fuel reprocessing activities. This waste is collected in a network of eleven 300,000 gallon stainless steel tanks. The solutions are stored in these tanks for subsequent treatment in the new waste calcining facility (NWCF). The tank farm was constructed in 1953 and the tanks and their associated vaults are approaching the end of their design life and are scheduled to be declared surplus upon completion of a replacement project which is currently in progress. Five of these tanks will be declared surplus in 1997.

Physical Description

[Including type of construction (cast in place concrete, concrete block, steel frame, etc.), overall dimensions of floors, walls, foundations, etc., number of floors and relative elevations, number of sub-facilities]

The eleven 300,000 gal stainless steel tanks are located to the north of CPP-633. First-, second-, and third-cycle extraction processes generate radioactive high-level liquid waste raffinates containing fluoride bearing waste. Decontamination solutions used on extraction process equipment and facilities produce sodium-bearing high-level liquid waste.

The tanks are doubly contained in concrete vaults. Additional storage was provided by four 30,000 gal stainless steel tanks that rest on concrete storage pads with curbing. Five 18,000 gal tanks are housed in vaults, where waste can be stored before being transferred to one of the 300,000 gal tanks. These five tanks are kept empty and have not been used in recent years. The tank farm consists of these 19 underground tanks, interconnecting lines and valves, an airlift pit, cooling equipment, and controls.

The tanks are housed in concrete vaults with sumps to jet transfer any solution leaking into the vault back to the tanks. Radiation shielding is provided by the soil overburden. Removable shielding is also provided for tank risers and access ways into valve boxes. Corrosion coupons are installed in various components, including the tanks. No significant corrosion has been identified to date. Encasement of the underground transfer lines provides secondary containment and protects the lines from external corrosion. The 300,000 gal tanks do not have an acceptable secondary containment.

The 11 tank numbers are WM-180 through WM-190. Tanks WM-180 through WM-186 are located in vaults CPP-780 through CPP-786, respectively. Tanks WM-187 through WM-190 are located in vault CPP-713. The five 18,400 gal tanks are WM-100, -101, -102, WL-101, and -102. The four 30,000 gal storage tanks are identified as WM-103 through WM-106 located in vaults CPP-717A through CPP-717D, respectively.

Each large tank is 50 ft in diameter with a 21 ft wall and a 32 ft height from the floor to the top of the hemispherical roof. The vessel floors and lower 8 ft of the sides are made of 5/16 in thick stainless steel plate. The upper 13 ft of the sides is made of 1/4 in thick plate. The roof is made of 3/16 in thick plate. Eight of the eleven tanks are equipped with cooling coils on the floor and walls. The normal tank venting system is to the process vessel off-gas in the main plant, which is filtered. The tanks are monitored for temperature, pressure, specific gravity, and level. The vault thickness is approximately 2 ft of reinforced concrete. The vaults are either octagonal or square and are about 60 ft across by 33 ft tall. The vaults rest on bedrock and the tanks sit on a layer of sand at the bottom of the vault. Each of the vaults has a sump to collect any leakage.

The four 30,000 gal tanks are buried horizontally and measure 12 ft in diameter and have a 38 ft long straight side. The shell and head of these tanks is 11/16 in and 9/16 in thick, respectively. These rest on a concrete pad, but are not surrounded by a vault.

All 9000 ft of underground waste lines are stainless steel. All lines that carry radioactive waste have secondary containment which is either a stainless steel clad concrete encasement, a steel pipe, or a tile pipe encased in concrete.

Other tank farm structures include the following:

CPP-712, instrument house for WM-180 and WM-181.
CPP-723, relief valve pit for WM-181.
CPP-721 and -722, condenser pits for WM-182 and WM-183.
CPP-638, waste station for WM-180.
CPP-622, -623, and -632, instrument houses for the tank farm.
CPP-628, tank farm control house.
CPP-634, -635, and -636, waste storage pipe manifold buildings.
CPP-619, waste storage control building.
CPP-618, measurement and control building.

Overview of Facility Contamination

[Confinement integrity status, active confinement equipment requirements, and contamination data]

The tanks contain mixed wastes including the following constituents: Am, Pu, Cs, Co, Sr, and many hazardous chemicals.

Contact Information

[Name, title, company affiliation, location, phone, mailstop,etc.]

D. H. Preussner, CPP Facility Transition, LITCO, 526-3814.
D. A. Peterson, D&D Project Manager, LITCO, 526-7441.

D&D Previous Accomplishments

No previous D&D activities have been performed on the tank farm.

Unique Conditions/Special Circumstances

Interfaces with surrounding active systems will present D&D challenges.

Permitting Requirements

TBD

Surveillance and Maintenance Status

The tank farm is undergoing a transition project where all liquid wastes are being removed and calcined prior to D&D. The tank farm is monitored continuously and is maintained in a safe configuration.

Safety and Environmental Considerations

There is a potential for further degradation to the environment from the release of contamination.

D&D Recommended Methodology

TBD

Specialized Capital Equipment and Tools Required

TBD

Facility Reuse Considerations

New tanks are to be installed to replace the existing tanks. No further reuse of the existing tanks is anticipated.

REFERENCES

1. R. J. Buckland, et. al., INEL D&D Long Range Plan, EGG-WM-10924, Appendix B, Facility Description Forms, October 1993.

2. INEL Site Development Plan, 1986.

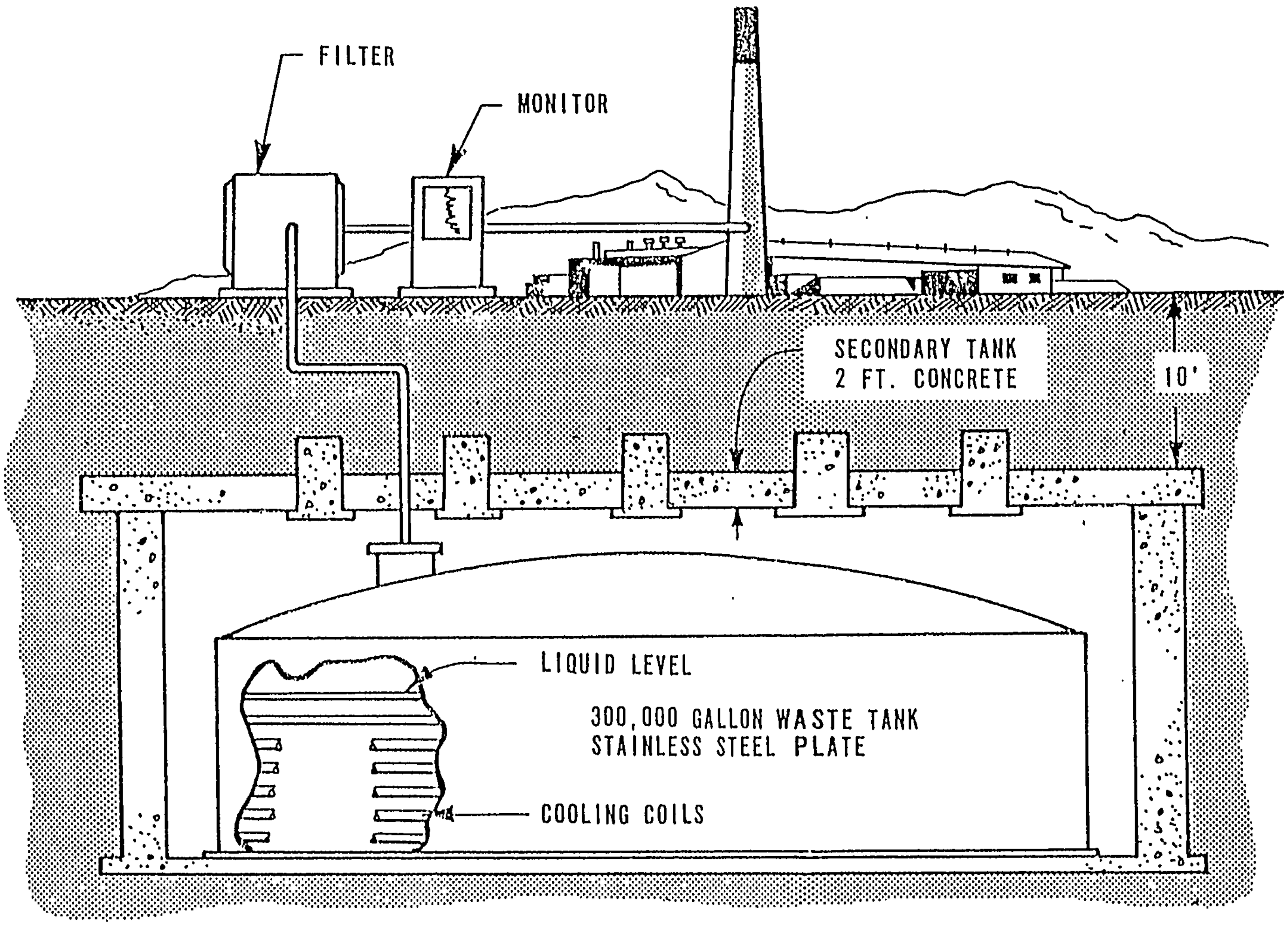

Figure B-31. Schematic diagram of typical 300,000 gal liquid waste tank.

Appendix C

INEL Radiologically Contaminated Surplus Facility Future Inventory

Appendix C

INEL Radiologically Contaminated Surplus Facility Future Inventory

The following table provides a comprehensive list and description of all radiologically contaminated INEL buildings/structures that must eventually undergo the deactivation/D&D process.

The spreadsheet performs calculations of surveillance and maintenance, deactivation, and structure demolition costs. The cost estimates are rough order of magnitude based on facility square footage, tank capacities, degree and type of radiological contamination, hazardous material concerns, and the expected characterization required.

The schedule implied by the start and finish dates reflects the current status of efforts to develop an INEL site integrated plan that includes all facilities that will eventually undergo deactivation/D&D. Surveillance and maintenance costs are covered by the deactivation program until the start of D&D.

INEL EM40/60 RAD Contaminated Surplus Facilities Future Inventory ==> Deactivation and D&D Cost

Projected Cost for All Future D&D of INEL Radiologically Contaminated Surplus Facilities

Prepared by DJ Kenover, SA LaBuy, DJ Preussner, LZ Smith, Revision 0, dated 17-Aug-95

Class ID	ID Number	Facility Description	Year Built	Total Usable Floor Space Sqaure Feet	Bldg Lvls	Tank Gallons	Facility Rating ACM	HAZ	RAD	SYS
		Central Facilities								
F	CFA 617	Laundry Decontamination Facility	1981	11,494	1		A	L	A	L
F	CFA 657	Septic Tank Pumphouse	1953	114	1		L	L	L	L
F	CFA 674	Excess Warehouse	1952	49,326	1		L	L	L	L
F	CFA 691	Sewage Plant	1953	504	1		A	A	A	L
F	CFA 692	Scale House	1950	99	1		L	L	L	L
		Central Facilities Subtotals		60,934		0				
		BORAX-V/EBR-1/RWMC								
		EBR/BORAX Areas								
F	EBRI 601	EBR-1 Reactor Bldg.	1950	2,050	2		A	L	A	A
F	EBRI 705	Rod Farm	1950	1,000	1		L	L	A	L
F	EBRI 711	Deep Well Pump House	1950	150	1		L	L	L	L
F	EBRI 716	Seepage Pit	1950		1	2,200	L	L	L	L
B	BOR-717	Reactor Building		7,500	3		L	L	A	A
		EBR/BORAX Area Subtotals		10,700		2,200				
		RWMC Area								
F	WMF 612	SWEPP C&S Waste Storage Bldg.		88,500	1		L	L	L	L
F	WMF 615	SWEPP Drum Venting Bldg.		1,320	1		L	L	L	L
F	WMF 711	SWEPP Air Support Structure		31,500	1		L	L	L	L
N	WMF ???	TSA Retrieval	2001	50,000	1		L	L	H	A
N	WMF ???	Type II Storage	2001	50,000	1		L	L	A	L
N	WMF ???	TRU PACT	2005	50,000	1		L	L	H	A
N	WMF ???	New SWEPP	2005	50,000	1		L	L	A	A
N	AMWTF	Advanced Mixed Waste Treatment Facility	2002	50,000	1		L	H	H	A
N	WMF 636	Future TRU Retrieval Building		531,000	1		L	L	L	L
		RWMC Area Subtotals		902,320		0				
		BORAX-V/EBR-1/RWMC Subtotals		913,020		2,200				
		ARA/PBF/STF Area								
		ARAs Area								
B	ARA 626	Hot Cell Building	1960	6,372	1		A	L	A	A
B	ARA 627	Maintenance Building	1960	8,500	1		L	L	L	L
B	ARA 628	Guard House	1960	192	1		L	L	L	L
B	ARA 629	Pumphouse	1960	666	1		L	L	L	L
B	ARA 631	Hydraulic Test Facility	1960	192	1		L	L	L	L
B	ARA 726	Substation	1960	600	1		L	L	L	L
B	ARA 729	Hot Waste Tank	1960		1	1,000	A	H	H	L
B	ARA 737	Sewage Treatment Facility	1960		1	1,200	L	A	L	L
B	ARA 607	Control Building	1959	6,150	1		A	L	L	L
B	ARA 608	Reactor Building	1959	7,270	2		A	L	L	A
B	ARA 609	Guardhouse	1959	204	1		L	L	L	L
B	ARA 610	Service Building	1959	1,344	1		A	L	L	L
B	ARA 622	Warehouse	1962	1,280	1		A	L	L	L
B	ARA 713	Substation	1959	600	1		L	L	L	L
B	ARA-II	Underground Utility Removal/Soil Cleanup	1959	20,000	1		L	A	A	L
		ARAs Area Subtotals		53,370		2,200				
		PBF/STF Area								
F	PBF 609	SPERT III Reactor Building (WERF)	1959	14,706	2		A	L	A	A
F	PBF 622	WERF Metal Processing Bldg.	1989	5,075	1		A	L	A	L
F	PBF 623	WERF Waste Storage Bldg.	1991	9,803	1		A	L	A	L
F	PBF 635	WERF Waste Storage Bldg.	1982	3,424	1		A	L	A	L
F/NC	PBF 637	Office Trailer (Rented)	1992	1,680	1		L	L	L	L

		Program Dates (Start - Finish)						DEACTIV	S&M Program			D&D
	EM	FDI	FDI	Deact	Deact	D&D	D&D	ROM	Total	Annual	Total	ROM
CHRTZ	ID No.	Start	Fin	Start	Fin	Start	Fin	Cost ($)	Years	Cost ($)	Cost ($)	Cost ($)
	1-FDI											
	2-Dea											0
	3-DD								0	0	0	0
L	1	1997	1999					0	0	0	0	0
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
A	1	1996	1997					0	0	0	0	0
L	1	1996	1996					0	0	0	0	0
								0			0	0
A	1							0	0	0	0	0
L	1	1998	1998					0	0	0	0	0
L	1	1998	1998					0	0	0	0	0
L	1	2001						0	0	0	0	0
L	3					1996	1996	0	0	0	0	1,060,290
								0			0	1,060,290
L	3					1999	1999	0	0	0	0	2,168,498
L	3					1998	1998	0	0	0	0	134,078
L	3					1998	1998	0	0	0	0	660,701
A	2			2012	2013	2017	2021	952,875	6	285,863	857,588	9,528,750
L	2			2016	2017	2025	2028	504,900	10	151,470	605,880	5,049,000
A	2			2020	2022	2023	2028	952,875	4	285,863	929,053	9,528,750
A	2			2012	2013	2014	2016	736,313	3	220,894	497,011	7,363,125
A	2			2016	2017	2029	2032	1,212,750	14	363,825	1,819,125	12,127,500
L	3					2032	2042	0	0	0	0	42,580,890
								4,359,713			4,708,657	89,141,292
								4,359,713			4,708,657	90,201,582
L	3					1996	1998	0	0	0	0	1,660,123
L	3					1996	1998	0	0	0	0	681,615
L	3					1996	1998	0	0	0	0	27,029
L	3					1996	1998	0	0	0	0	93,758
L	3					1996	1998	0	0	0	0	27,029
L	3					1996	1998	0	0	0	0	84,467
A	3					1996	1998	0	0	0	0	124,165
L	3					1996	1998	0	0	0	0	42,525
L	3					1998	1999	0	0	0	0	908,859
L	3					1998	1999	0	0	0	0	1,504,125
L	3					1998	1999	0	0	0	0	28,719
L	3					1998	1999	0	0	0	0	251,584
L	3					1998	1999	0	0	0	0	239,604
L	3					1998	1999	0	0	0	0	84,467
A	3					1996	1997	0	0	0	0	2,390,625
								0			0	8,148,694
L	3					2009	2012	0	0	0	0	3,831,414
L	2			2007	2008	2009	2012	94,444	3	28,333	63,749	944,436
L	2			2007	2008	2009	2012	182,430	3	54,729	123,140	1,824,297
L	2			2007	2008	2009	2012	80,711	3	24,213	54,480	807,110
L	3					2005	2008	0	0	0	0	170,644

INEL EM40/60 RAD Contaminated Surplus Facilities Future Inventory ==> Deactivation and D&D Cost

Projected Cost for All Future D&D of INEL Radiologically Contaminated Surplus Facilities

Prepared by DJ Kenoyer, SA LaBuy, DJ Preussner, LZ Smith, Revision 0, dated 17-Aug-95

Class ID	ID Number	Facility Description	Year Built	Total Usable Floor Space Sqaure Feet	Bldg Lvls	Tank Gallons	Facility Rating ACM	HAZ	RAD	SYS
F/NC	PBF 705	Fuel Oil Tank (No. 2)	1987		1	4,000	L	L	L	L
F/NC	PBF 708	Elecritical Substation	1956	200	1		L	L	L	L
F/NC	PBF 709	Fuel Oil Tank	1960		1	3,000	L	L	L	L
F/NC	PBF 711	Fuel Oil Tank (No. 2)	1988		1	350	L	L	L	L
F/NC	PBF 726	Septic Tank	1960		1	625	L	L	L	L
F/NC	PBF 755	WEDF Exhaust Stack-North	1983	236	3		L	L	L	L
F/NC	PBF 756	WEDF Exhaust Stack-South	1983	236	3		L	L	L	L
F/NC	PBF 761	Spray Dryer Absorber Structural Support	1990	2,000	1		L	L	L	L
F/NC	PBF 763	Septic Tank	1990		1	1,900	L	L	L	L
F/NC	PBF 765	Exhaust Stack	1960	236	3		L	L	L	L
F/NC	PBF 726	Seepage Pit	1960		1	1,000	L	L	L	L
F	PBF 612	SPERT II Reactor Building (WEDF)	1960	7,937	2		A	L	A	A
F/NC	PBF 710	Elecritical Substation	1960	150	1		L	L	L	L
F/NC	PBF 725	Septic Tank	1960		1	1,000	L	L	L	L
F/NC	PBF 751	RAD Liquid Storage Tank	1960		1	50,000	A	A	H	L
F/NC	PBF 752	Fuel Oil Storage Tank	1960		1	2,000	L	L	L	L
F/NC	PBF 760	Seepage Pit	1960		1	2,200	L	L	L	L
F/NC	PBF 7??	Propane Tank	1960		1	500	L	L	L	L
F/NC	PBF 7??	Gasoline Storage Tank	1960		1	500	L	L	L	L
F	PBF 613	SPERT IV Reactor Building (MWSF)	1970	18,902	1		A	L	A	A
F/NC	PBF 713	Elecritical Substation	1962	150	1		L	L	L	L
F/NC	PBF 714	Waste Holdup Tank	1960		1	61,000	A	A	H	L
F/NC	PBF 716	Fuel Oil Storage Tank (No. 2 / UST)	1962		1	3,000	A	L	A	L
F/NC	PBF 727	Septic Tank			1	1,000	A	L	A	L
F/NC	PBF 757	Leaching Pit	1960		1	1,000	L	L	L	L
F	PBF 620	PBF Reactor Building	1970	18,902	1		A	L	A	A
F/NC	PBF 604	Terminal Building	1955	610	1		A	L	A	L
F/NC	PBF 606	Instrument Cell	1955	230	1		A	L	A	L
F/NC	PBF 621	Emergency Generator Building	1970	320	1		A	L	A	L
F/NC	PBF 624	Auxiliary Building	1973	192	1		A	L	A	L
F/NC	PBF 625	Maintenace & Storage Building	1966	3,200	1		A	L	A	L
F/NC	PBF 627	Gas Cylinder Storage Building	1966	130	1		A	L	A	L
F/NC	PBF 629	PBF Stack Gas Monitor Building	1981	90	1		A	L	A	L
F/NC	PBF 634	Firewater Pumphouse	1983	750	1		A	L	A	L
F/NC	PBF 704	Subtation	1955	200	1		A	L	A	L
F/NC	PBF 719	Subtation	1976	200	1		A	L	A	L
F/NC	PBF 720	Cooling Tower	1976	1,000	1		A	L	A	L
F/NC	PBF 722	Fuel Oil Storage Tank (No. 2 / UST)			1	10,000	A	L	A	L
F/NC	PBF 728	Septic Tank			1	1,000	A	L	A	L
F/NC	PBF 730	Primary Water Storage Tank	1976		1	14,000	A	L	A	L
F/NC	PBF 731	Corrosive Waste Disposal Sump	1980	50	1		A	L	A	L
F/NC	PBF 732	Hot Waste Storage Tank	1978		1	10,000	A	L	A	L
F/NC	PBF 734	Fire & Domestic Water Storage Tank	1984		1	280,000	A	L	A	L
F/NC	PBF 749	Diesel Fuel Tank	1977		1	5,000	A	L	A	L
		PBF/STF Area Subtotals		90,608		453,075				
		ARA/PBF/STF Area Subtotals		143,978		455,275				
		ICPP Area								
		ICPP- Fuel Processing Complex								
B	CPP-601	Process Building	1953	57,981	1		A	A	H	H
F	CPP-602	Laboratory & Office Building	1953	38,102	1		A	A	A	L
F	CPP-627	Remote Analytical Facility	1955	11,800	1		A	A	H	A
F	CPP-630	Safety & Spectrometry Building	1956	13,000	1		A	L	L	L
B	CPP-640	Headend Process Plant	1961	13,000	1		A	A	H	H
B	CPP-631	L-Cell Off gas Blower Bldg	1957	400	1		L	L	A	A
		ICPP-FPC Area Subtotals		134,283		0				
		ICPP-603 Area								

EMIPDD
9/11/95
9:35 AM

		Program Dates (Start - Finish)						DEACTIV	S&M Program			D&D
CHRTZ	EM ID No.	FDI Start	FDI Fin	Deact Start	Deact Fin	D&D Start	D&D Fin	ROM Cost ($)	Total Years	Annual Cost ($)	Total Cost ($)	ROM Cost ($)
	1-FDI											
L	3					2005	2008	0	0	0	0	87,318
L	3					2005	2008	0	0	0	0	28,156
L	3					2005	2008	0	0	0	0	65,489
L	3					2005	2008	0	0	0	0	31,185
L	3					2005	2008	0	0	0	0	19,491
L	3					2005	2008	0	0	0	0	33,170
L	3					2005	2008	0	0	0	0	33,170
L	3					2005	2008	0	0	0	0	203,148
L	3					2005	2008	0	0	0	0	59,252
L	3					2005	2008	0	0	0	0	33,170
L	3					2005	2008	0	0	0	0	31,185
L	3					2000	2003	0	0	0	0	2,067,859
L	3					2000	2003	0	0	0	0	21,117
L	3					2000	2003	0	0	0	0	31,185
L	3					2000	2003	0	0	0	0	2,128,546
L	3					2000	2003	0	0	0	0	62,370
L	3					2000	2003	0	0	0	0	48,025
L	3					2000	2003	0	0	0	0	44,550
L	3					2000	2003	0	0	0	0	44,550
L	2			2002	2003	2004	2008	492,462	3	147,738	332,412	4,924,615
L	3					2004	2008	0	0	0	0	21,117
L	3					2004	2008	0	0	0	0	2,596,827
L	2			2002	2003	2004	2008	15,198	3	4,559	10,259	151,978
L	2			2002	2003	2004	2008	7,237	3	2,171	4,885	72,371
L	3					2004	2008	0	0	0	0	31,185
L	2			2002	2004	2005	2011	9,683,000	4	2,100,000	6,825,000	4,924,615
L	2			2002	2004	2005	2011	19,929	4	5,979	19,431	199,288
L	2			2002	2004	2005	2011	7,514	4	2,254	7,326	75,141
L	2			2002	2004	2005	2011	10,454	4	3,136	10,193	104,544
L	2			2002	2004	2005	2011	6,273	4	1,882	6,116	62,727
L	2			2002	2004	2005	2011	75,431	4	22,629	73,545	754,308
L	2			2002	2004	2005	2011	4,247	4	1,274	4,141	42,471
L	2			2002	2004	2005	2011	2,940	4	882	2,867	29,403
L	2			2002	2004	2005	2011	24,503	4	7,351	23,890	245,026
L	2			2002	2004	2005	2011	6,534	4	1,960	6,371	65,340
L	2			2002	2004	2005	2011	6,534	4	1,960	6,371	65,340
L	2			2002	2004	2005	2011	32,670	4	9,801	31,853	326,701
L	2			2002	2004	2005	2011	50,659	4	15,198	49,393	506,594
L	2			2002	2004	2005	2011	7,237	4	2,171	7,056	72,371
L	2			2002	2004	2005	2011	40,528	4	12,158	39,514	405,275
L	2			2002	2004	2005	2011	1,634	4	490	1,593	16,335
L	2			2002	2004	2005	2011	50,659	4	15,198	49,393	506,594
L	2			2002	2004	2005	2011	173,689	4	52,107	169,347	1,736,894
L	2			2002	2004	2005	2011	25,330	4	7,599	24,696	253,297
								11,102,246			7,947,020	30,841,194
								11,102,246			7,947,020	38,989,888
A	2			1996	2000	2015	2025	3,689,000	20	991,730	8,677,635	33,057,656
A	2			2005	2007	2015	2025	839,325	11	251,798	1,258,988	8,393,254
A	2			2005	2007	2015	2025	470,941	11	141,282	706,411	4,709,409
A	3					2015	2025	0	0	0	0	2,001,214
A	2			1996	2005	2015	2025	42,107,000	20	0	0	7,411,903
L	3					1996	1997	0	0	0	0	1,300,000
								47,106,266			10,643,034	56,873,436

INEL EM40/60 RAD Contaminated Surplus Facilities Future Inventory ==> Deactivation and D&D Cost

Projected Cost for All Future D&D of INEL Radiologically Contaminated Surplus Facilities

Prepared by DJ Kenoyer,SA LaBuy, DJ Preussner, LZ Smith, Revision 0, dated 17-Aug-95

Class ID	ID Number	Facility Description	Year Built	Total Usable Floor Space Sqaure Feet	Bldg Lvls	Tank Gallons	Facility Rating ACM	HAZ	RAD	SYS
F	CPP-603	Fuel Receipt & Storage Building	1953	26,851	1		H	A	H	A
B	CPP-642	Hot Waste Pumphouse Pit	1958	100	1		H	A	A	A
B	CPP-740	Settling Basin & Dry Well	1953	707	3		L	A	H	L
F	CPP-648	CPP-603 Basin Sludge Tank Control	1973	500	1		L	A	A	L
		ICPP-603 Area Subtotals		28,158		0				
		ICPP-WCF Area								
F	CPP-633	Waste Calcine Facility	1962	17,250	1		H	H	H	H
		ICPP-WCF Area Subtotals		17,250		0				
		ICPP-NWCF Area								
F	CPP-659	New Waste Calcining Facility (NWCF)	1980	77,000	1		L	A	H	H
		ICPP-NWCF Area Subtotals		77,000		0				
		ICPP-FAST Area								
F	CPP-666	FAST Facility	1983	95,600	1		L	A	H	A
		ICPP-FAST Area Subtotals		95,600		0				
		ICPP-MISC Area								
F	CPP-604	Rare Gas Plant	1953	9,600	1		A	A	A	A
F	CPP-605	Blower Building	1953	2,360	1		A	H	H	H
F	CPP-635	Waste Storage Pipe Manifold Bldg	1960	200	1		L	A	A	L
F	CPP-636	Waste Storage Pipe Manifold Bldg	1965	200	1		L	A	A	L
F	CPP-637	Process Improvement Facility	1959	35,000	1		A	L	L	A
F	CPP-638	Waste Station	1960	50	1		L	A	A	L
F	CPP-639	CPP-663 Blower Bldg	1962	300	1		A	L	L	A
F	CPP-641	Waste Holdup Tank Pumphouse	1961	300	1		L	A	A	A
F	CPP-646	Instrument Building (2nd Bin Set)	1966	50	1		H	A	A	L
F	CPP-649	Atmospheric Protection Building	1976	3,325	1		H	L	H	H
F	CPP-684	Remote Analytical Laboratory	1985	11,780	1		L	A	H	A
F	CPP-1608	Contaminated Equipment Repair	1987	3,500	1		L	L	A	L
F	CPP-1646	Anti-C/Safety Handling Building	1991	3,500	1		L	L	A	L
F	CPP-708	Stack (Main ICPP)	1953	14,844	21		L	A	A	L
F	CPP-729	Vault for 1st Set Bins	1960	707	3		L	H	H	A
F	CPP-741	WCF Solids Storage Vault	1962	707	3		L	H	H	L
F	CPP-742	Vault for 2nd Set Bins	1966	707	3		L	H	H	A
F	CPP-744	Vault for 2nd set Equipment	1965	707	3		L	A	H	L
F	CPP-746	Vault for 3rd Set Bins	1971	707	3		L	H	H	A
F	CPP-747	Vault for 3rd set Equipment	1971	707	3		L	A	H	L
F	CPP-756	PreFilter Vault	1976	707	3		L	A	H	L
F	CPP-760	Vault for 4th Set Bins	1977	707	3		L	H	H	A
F	CPP-761	Vault for 4th Set Equipment	1977	707	3		L	A	H	L
F	CPP-764	SFE Hold Tank Vault	1980	707	3		L	A	H	L
F	CPP-765	Unassigned ???	1981	707	3		L	A	H	L
F	CPP-791	Vault for 6th Set Bins	1984	707	1		L	A	A	A
F	CPP-795	Unassigned ???	19??	5,000	1		L	A	A	A
N	CPP ???	WIF	2018	50,000	2		L	A	A	L
N	CPP ???	TMI-2 Storage	1997	50,000	1		L	L	A	A
N	CPP ???	New Tank Farm (Vault)	2010	50,000	2		L	A	H	A
N	CPP ???	New Tank Farm	2010	0	2	1,200,000	L	A	H	A
N	CPP ???	Multi-Purpose-Canister (MPC) Storage	2003	50,000	1		L	A	A	A
		ICPP-MISC Area Subtotals		298,491		1,200,000				
		ICPP-Tank Farm Area								
F	CPP-628	Tank Farm Control House	1953	1,185	1		L	L	H	L
F	CPP-713	Tank Enclosure	1972	14,400	1		L	A	A	L
F	WM-187	Waste Tank (w/CPP-713 [] Tank Farm)	1972			300,000	L	H	H	L
F	WM-188	Waste Tank (w/CPP-713 [] Tank Farm)	1972			300,000	L	H	H	L
F	WM-189	Waste Tank (w/CPP-713 [] Tank Farm)	1972			300,000	L	H	H	L
F	WM-190	Waste Tank (w/CPP-713 [] Tank Farm)	1972			300,000	L	H	H	L
F	CPP-721	Condenser Pit for WM-182	1953	707	3		L	A	H	L

		Program Dates (Start - Finish)						DEACTIV	S&M Program			D&D
	EM	FDI	FDI	Deact	Deact	D&D	D&D	ROM	Total	Annual	Total	ROM
CHRTZ	ID No.	Start	Fin	Start	Fin	Start	Fin	Cost ($)	Years	Cost ($)	Cost ($)	Cost ($)
	1-FDI											
A	2			2002	2005	2015	2022	1,561,768	14	0	0	15,617,680
A	3					2000	2002	0	0	0	0	78,904
L	3					2000	2002	0	0	0	0	184,278
A	2			2002	2003	2015	2022	10,492	14	3,148	15,738	104,922
								1,572,260			15,738	15,985,784
H	2			1996	1999			9,177,000	4	0	0	0
								9,177,000			0	0
A	2			2022	2025	2034	2044	2,382,188	13	714,656	4,466,602	23,821,875
								2,382,188			4,466,602	23,821,875
H	2			2045	2047	2048	2055	2,153,151	4	645,945	2,099,322	21,531,510
								2,153,151			2,099,322	21,531,510
A	2			2048	2050	2051	2055	296,061	4	88,818	288,660	2,960,615
L	2			2048	2050	2051	2055	183,253	4	54,976	178,671	1,832,525
A	3			2010	2012	2014	2015	4,197	5	1,259	4,407	41,969
A	3			2010	2012	2014	2015	4,197	5	1,259	4,407	41,969
L	2			2010	2012	2015	2020	724,131	6	217,239	814,648	7,241,315
A	2			2010	2012	2014	2015	1,049	5	315	1,102	10,492
L	3			2048	2050	2051	2054	10,896	4	3,269	10,624	108,965
A	2			2010	2012	2014	2015	8,813	5	2,644	9,254	88,134
A	2			2050	2052	2054	2060	2,818	5	845	2,959	28,180
H	2			2048	2050	2051	2055	320,279	4	96,084	312,272	3,202,787
A	2			2050	2052	2053	2059	255,111	4	76,533	248,733	2,551,106
A	3					2037	2039	0	0	0	0	466,331
A	3					2037	2039	0	0	0	0	466,331
H	3			2048	2050	2055	2058	184,530	8	55,359	235,275	1,845,296
A	2			2050	2052	2054	2060	30,099	5	9,030	31,604	300,987
A	2			2050	2052	2054	2060	21,499	5	6,450	22,574	214,991
A	2			2050	2052	2054	2060	30,099	5	9,030	31,604	300,987
A	2			2050	2052	2054	2060	19,196	5	5,759	20,155	191,956
A	2			2050	2052	2054	2060	30,099	5	9,030	31,604	300,987
A	2			2050	2052	2054	2060	19,196	5	5,759	20,155	191,956
A	2			2050	2052	2054	2060	19,196	5	5,759	20,155	191,956
A	2			2050	2052	2054	2060	30,099	5	9,030	31,604	300,987
A	2			2050	2052	2054	2060	19,196	5	5,759	20,155	191,956
A	2			2030	2032	2033	2037	19,196	4	5,759	18,716	191,956
A	2			2030	2032	2033	2037	19,196	4	5,759	18,716	191,956
A	2			2050	2052	2054	2060	20,766	5	6,230	21,804	207,662
A	2			2030	2032	2033	2037	105,984	4	31,795	103,335	1,059,844
A	2			2049	2052	2053	2058	597,656	5	179,297	762,012	5,976,563
A	2			2030	2032	2040	2045	736,313	11	220,894	1,104,469	7,363,125
H	2			2040	2045	2046	2053	1,126,125	7	337,838	2,111,484	11,261,250
H	2			2040	2045	2046	2053	900,900	7	270,270	1,689,188	9,009,000
A	2			2040	2042	2044	2048	836,719	5	251,016	878,555	8,367,188
								6,576,866			9,048,899	66,701,321
L	2			2002	2015	2026	2031	19,615	25	5,885	98,566	196,151
A	2			2002	2015	2026	2031	172,125	25	51,638	864,928	1,721,250
A	2			2002	2015	2026	2031	173,250	25	51,975	870,581	1,732,500
A	2			2002	2015	2026	2031	173,250	25	51,975	870,581	1,732,500
A	2			2002	2015	2026	2031	173,250	25	51,975	870,581	1,732,500
A	2			2002	2015	2026	2031	173,250	25	51,975	870,581	1,732,500
A	2			2002	2015	2026	2031	19,196	25	5,759	96,458	191,956

	INEL EM40/60 RAD Contaminated Surplus Facilities Future Inventory ==> Deactivation and D&D Cost									
	Projected Cost for All Future D&D of INEL Radiologically Contaminated Surplus Facilities									
	Prepared by DJ Kenoyer, SA LaBuy, DJ Preussner, LZ Smith, Revision 0, dated 17-Aug-95									
				Total Usable			*Facility Rating*			
Class ID	*ID Number*	*Facility Description*	*Year Built*	*Floor Space Sqaure Feet*	*Bldg Lvls*	*Tank Gallons*	*ACM*	*HAZ*	*RAD*	*SYS*
F	CPP-722	Condenser Pit for WM-183	1953	707	3		L	A	H	L
F	CPP-780	Vault for Waste Tank (WM-180)	1960	3,600	3		L	A	H	L
F	WM-180	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	CPP-781	Vault for Waste Tank (WM-181)	1960	3,600	3		L	A	H	L
F	WM-181	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	CPP-782	Vault for Waste Tank (WM-182)	1960	3,600	3		L	A	H	L
F	WM-182	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	CPP-783	Vault for Waste Tank (WM-183)	1960	3,600	3		L	A	H	L
F	WM-183	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	CPP-784	Vault for Waste Tank (WM-184)	1960	3,600	3		L	A	H	L
F	WM-184	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	CPP-785	Vault for Waste Tank (WM-185)	1960	3,600	3		L	A	H	L
F	WM-185	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	CPP-786	Vault for Waste Tank (WM-186)	1960	3,600	3		L	A	H	L
F	WM-186	Waste Tank (Tank Farm)	1960			300,000	L	A	H	L
F	DVB-WM-As	A2, A5, A6, A7, & A8 (Assume 5'x5' each)	1960	250	2		L	A	A	A
F	DVB-WM-Bs	B1-B11 (Assume 5'x5' each)	1960	600	2		L	A	A	L
F	DVB-WM-Cs	C1-C38 (Assume 5'x5' each)	1960	1,950	2		L	A	A	L
F	DVB-WM-Ds	D1-D5 (Assume 5'x5' each)	1960	300	2		L	A	A	L
F	DVB-WM-Tanks	WM-178 to WM-190 (Assume 10'x10' each)	1960	2,400	2		L	A	A	L
		ICPP-Tank Farm Area Subtotals		47,699		3,300,000				
		ICPP Area Subtotals		698,481		4,500,000				
		TAN Areas								
		TAN - IET Area								
F	TAN 620	IET Control & Equipment Bldg.	1956	22,400	1		A	L	L	L
F	TAN 656	Change Room	1956	720	1		A	L	L	L
		TAN-IET Area Subtotals		23,120		0				
		TAN - CTF Area								
F	TAN 624	Containment Building (LOFT)	1956	3,036	1		L	L	L	L
F	TAN 650	Containment & Service Bld. (LOFT)	1977	34,666	1		H	A	H	H
F	TAN 725	Exhaust Stack	1956	2,500	1		H	A	A	L
F	TAN 726	Liquid Waste Storage Tank Bldg.	1975		1	100,000	L	A	H	L
B	MTA	Mobile Test Assembly		1,200	1		A	H	A	L
		TAN-CTF Area Subtotals		3,700		100,000				
		TAN - TSF Area								
F	TAN 603	Service Building	1956	10,048	1		L	L	L	L
F	TAN 607	Manufacturing Assembly & Hot Shop/Cells	1955	150,701	1		H	A	H	A
F	TAN 608	Water Filtration Building	1955	334	1		L	L	L	A
F	TAN 609	Equipment Maintenance Shop	1956	2,894	1		L	L	L	L
F	TAN 615	Assmebly & Maintenance Facility	1976	4,214	1		L	L	L	L
B	TAN 616	Liquid Waste Treatment Plant	1955	2,958	1		H	H	H	A
F	TAN 623	Sewage Treatment Plant Control Building	1956	108	1		L	A	A	L
F	TAN 633	Hot Cell Annex	1958	3,296	1		H	A	H	A
F	TAN 647	Containment Storage Building	1961	5,274	1		A	L	A	L
F	TAN 648	PREP	1961	6,862	1		L	L	L	A
F	TAN 649	Water Filtration Building	1960	210	1		L	L	L	L
F	TAN 655	Liquid Waste Lift Station	1972	225	1		L	H	H	L
F	TAN 666	Radioactive Liquid Waste Transfer & Storage Building	1980	1,599	1		A	H	H	H
F	TAN 668	Heavy Equipment Cleaning Facility	1985	2,760	1		L	L	L	L
F	TAN 705	TAN-TSF Railroad Turntable	1956	1,963	1		L	L	L	L
F	TAN 711	TAN-TSF Sanitary Treatment Plant	1955	2,500	1		L	A	A	L
F	TAN 734	TAN-607 Hot Shop Exhaust	1969	314	4		A	A	A	L
		TAN - TSF Area Subtotals		192,965		0				
		TAN - WRRTF Area								
F	TAN 646	Semiscale Assembly & Test Building	1965	16,870	1		A	L	L	L

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		Program Dates (Start - Finish)						DEACTIV	S&M Program			D&D
	EM	FDI	FDI	Deact	Deact	D&D	D&D	ROM	Total	Annual	Total	ROM
CHRTZ	ID No.	Start	Fin	Start	Fin	Start	Fin	Cost ($)	Years	Cost ($)	Cost ($)	Cost ($)
	1-FDI											
A	2			2002	2015	2026	2031	19,196	25	5,759	96,458	191,956
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	70,538	25	21,161	354,451	705,375
A	2			2002	2015	2026	2031	154,688	25	46,406	777,305	1,546,875
A	2			2002	2015	2026	2031	7,345	25	2,203	36,906	73,445
A	2			2002	2015	2026	2031	12,591	25	3,777	63,268	125,906
A	2			2002	2015	2026	2031	29,524	25	8,857	148,359	295,242
A	2			2002	2015	2026	2031	6,295	25	1,889	31,634	62,953
A	2			2002	2015	2026	2031	36,338	25	10,901	182,596	363,375
								2,591,798			13,023,787	25,917,985
								71,559,529			39,297,382	210,831,910
A	1	2001						0	0	0	0	0
A	1	2001						0	0	0	0	0
								0			0	0
L	1	1997	1997			-		0	0	0	0	0
H	3					2000	2005	0	0	0	0	29,956,777
A	3					2000	2005	0	0	0	0	1,016,615
A	3					2000	2005	0	0	0	0	2,406,250
A	3					1999	1999	0	0	0	0	375,011
								0			0	33,754,654
L	1	2001						0	0	0	0	0
A	2			2002	2005	2006	2014	8,765,409	5	2,629,623	11,175,897	87,654,092
L	2			2002	2005	2006	2014	6,583	5	1,975	8,393	65,828
L	1	1996	1996					0	0	0	0	0
L	2			2002	2005	2006	2014	42,803	5	12,841	54,574	428,033
L	3					1997	2000	0	0	0	0	2,343,181
L	1	2001						0	0	0	0	0
A	2			2005	2007	2008	2013	191,709	4	57,513	186,917	1,917,093
A	3					2008	2013	0	0	0	0	1,022,364
L	3					2008	2013	0	0	0	0	770,369
L	2			2005	2007	2008	2014	2,956	4	887	2,882	29,563
A	3					2008	2014	0	0	0	0	68,434
A	2			2005	2007	2008	2014	129,335	4	38,800	126,101	1,293,347
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
L	3					2008	2014	0	0	0	0	363,375
A	3					2008	2014	0	0	0	0	121,492
								9,138,795			11,554,764	96,077,171
L	1	2001						0	0	0	0	0

	INEL EM40/60 RAD Contaminated Surplus Facilities Future Inventory ==> Deactivation and D&D Cost									
	Projected Cost for All Future D&D of INEL Radiologically Contaminated Surplus Facilities									
	Prepared by DJ Kenoyer,SA LaBuy, DJ Preussner, LZ Smith, Revision 0, dated 17-Aug-95									
				Total Usable			*Facility Rating*			
Class ID	*ID Number*	*Facility Description*	*Year Built*	*Floor Space Sqaure Feet*	*Bldg Lvls*	*Tank Gallons*	*ACM*	*HAZ*	*RAD*	*SYS*
		TAN - WRRTF Area Subtotals		16,870		0				
		TAN - SMC Area								
F	TAN 606	Special Manufacturing Capabilities (SMC)	1956	5,752	1		A	L	A	A
F	TAN 628	Special Manufacturing Capabilities (SMC)	1958	19,549	1		A	L	A	A
F	TAN 629	Hanger	1959	82,865	1		L	L	L	L
F	TAN 677	Truck Docking Building	1984	13,790	1		L	L	L	L
F	TAN 679	Manufacturing & Assembly	1986	56,574	1		L	L	L	L
F	TAN 681	Waste Treatment Building	1986	12,619	1		A	A	A	L
F	TAN 682	Storage Building	1986	20,064	1		L	L	L	L
F	TAN 688	SMC Warehouse	1988	20,000	1		L	L	L	L
F	TAN 692	SMC Liquid Waste Storage	19??	5,000	1		L	A	A	L
		TAN - SMC Area Subtotals		236,213		0				
		TAN Area Grand Totals		472,868		100,000				
		TRA Area								
		TRA - MTR Area								
B	TRA 603	Material Test Reactor (MTR)	1952	45,184	1		A	L	A	H
B	TRA 604	MTR "A" Wing Building	1952	41,744	1		A	L	L	L
B	TRA 605	Process Water Building	1952	22,040	1		A	L	L	A
B/NC	TRA 607*	Carpenter Shop	1952	2,433	1		L	L	L	L
B	TRA 610	MTR Fan House	1952	3,216	1		A	L	A	A
B	TRA 611*	Plug Storage	1952	964	1		L	L	A	L
B	TRA 612*	Sump Pump House	1952	225	1		A	A	L	L
B	TRA 613A	Sampling Station Radioactive Fluid	1952	210	1		L	A	H	L
B	TRA 613B	Sampling Station Radioactive Fluid	1952	210	1		L	A	H	L
F/NC	TRA 622	Cold Waste Handling Facility	1952	1,338	1		L	L	L	L
B/NC	TRA 626*	Maintenance Storage Building	1952	1,472	1		A	L	L	L
B	TRA 630	Catch Tank Pump House	1952	396	1		L	L	L	L
B	TRA 635	Material Receiving Area & Laboratory	1952	22,046	1		A	A	L	L
B	TRA 636	Retention Basin Inlet Sample House	1981	86	1		L	L	L	L
B	TRA 641	Gamma Building	1955	2,365	1		A	A	A	A
B/NC	TRA 657	North Plug Storage	1952	2,924	1		L	L	A	L
B	TRA 661	Radiochemistry Labs	1962	7,760	1		A	A	H	L
B/NC	TRA 710	MTR Exhaust Stack		14,844	21		L	A	A	L
B/NC	TRA 712	Retention Basin (underground)		*	1	75,000	L	A	H	L
F	TRA 713B	Hot Waste Storage Tank (underground)		*	1	9,000	L	A	H	L
F	TRA 713C	Hot Waste Storage Tank (underground)		*	1	10,000	L	A	H	L
F	TRA 713C	Hot Waste Storage Tank (underground)		*	1	10,000	L	A	H	L
F	TRA 715	Evaporation Pond			1	0	L	L	L	L
F	TRA 716	Warm Waste Transfer Sump		100	1		L	L	L	L
B	TRA 730A	Catch Tank #1 (underground / Hot Waste)			1	1,500	L	A	H	L
B	TRA 730B	Catch Tank #2 (underground / Hot Waste)			1	1,500	L	A	H	L
B	TRA 730C	Catch Tank #3 (underground / Hot Waste)			1	1,500	L	A	H	L
B	TRA 730D	Catch Tank #4 (underground / Hot Waste)			1	1,500	L	A	H	L
		TRA-MTR Subtotals		169,557		110,000				
		TRA- ETR Area								
B	TRA 642	Engineering Test Reactor (ETR) Bldg.	1957	47,762	3		A	L	A	H
B	TRA 643	Compressor Building	1957	11,151	2		A	L	A	A
B	TRA 644	ETR Heat Exchanger Building	1957	6,793	2		H	L	A	A
B/NC	TRA 645*	Storage Building	1957	3,500	1		A	L	L	L
B/NC	TRA 647*	ETR Office Building	1957	11,793	3		A	L	L	L
B/NC	TRA 648*	ETR Electircal Building	1957	9,785	3		A	L	L	L
B/NC	TRA 655*	Air Intake Building	1957	330	1		A	L	L	A
B/NC	TRA 663*	Superior Diesel Building	1957	1,120	1		A	L	L	L
B/NC	TRA 704	ETR Primary Filter Pit	1971	120	1	*	A	L	A	L
B/NC	TRA 705	ETR Secondary Filter Pit	1957	120	1	*	A	L	A	L
B/NC	TRA 706	ETR Delay Tanks	1957	*	1	1,200	L	L	L	L

		Program Dates (Start - Finish)						DEACTIV	S&M Program			D&D
	EM	FDI	FDI	Deact	Deact	D&D	D&D	ROM	Total	Annual	Total	ROM
CHRTZ	ID No.	Start	Fin	Start	Fin	Start	Fin	Cost ($)	Years	Cost ($)	Cost ($)	Cost ($)
	1-FDI											
								0			0	0
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
L	2			2006	2009	2011	2014	453,667	6	136,100	612,450	4,536,669
A	3					2011	2014	0	0	0	0	2,779,762
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
A	3					2011	2014	0	0	0	0	757,031
								453,667			612,450	8,073,462
								9,592,463			12,167,215	137,905,287
A	2			1996	1998	2022	2033	4,228,000	27	0	0	17,517,815
A	3					2022	2033	0	0	0	0	6,426,051
L	3					2022	2033	0	0	0	0	4,559,959
L	1	2001						0	0	0	0	0
L	3					2022	2033	0	0	0	0	1,061,312
L	3							0	0	0	0	170,894
L	1	2001						0	0	0	0	0
A	3					2013	2020	0	0	0	0	57,028
A	3					2013	2020	0	0	0	0	57,028
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
L	3					2013	2020	0	0	0	0	55,748
A	3					2022	2033	0	0	0	0	3,856,535
L	3					2022	2033	0	0	0	0	12,107
A	3					2022	2033	0	0	0	0	923,856
L	3					2022	2033	0	0	0	0	374,003
A	2			2010	2012	2022	2033	221,217	13	66,365	365,008	2,212,168
A	3					2031	2033	0	0	0	0	1,774,323
A	3					2022	2033	0	0	0	0	1,804,688
L	2			2010	2012	2013	2020	36,383	4	10,915	35,473	363,825
L	2			2010	2012	2013	2020	40,425	4	12,128	39,414	404,250
L	2			2010	2012	2013	2020	40,425	4	12,128	39,414	404,250
L	WAG							0	0	0	0	0
L	2			2010	2012	2013	2020	1,408	4	422	1,373	14,078
L	2			2010	2012	2013	2020	8,663	4	2,599	8,446	86,625
L	2			2010	2012	2013	2020	8,663	4	2,599	8,446	86,625
L	2			2010	2012	2013	2020	8,663	4	2,599	8,446	86,625
L	2			2010	2012	2013	2020	8,663	4	2,599	8,446	86,625
								4,602,507			514,466	42,396,418
A	2			2002	2003	2015	2019	1,851,730	14	555,519	2,777,596	18,517,305
L	3					2013	2019	0	0	0	0	2,905,216
L	2			2002	2003	2013	2019	257,928	12	77,378	348,202	2,579,276
L	1							0	0	0	0	0
L	3					2013	2019	0	0	0	0	1,742,792
L	3					2013	2019	0	0	0	0	1,446,046
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
A	3					1998	2002	0	0	0	0	40,838
A	3					1998	2002	0	0	0	0	40,838
L	3					1998	2002	0	0	0	0	37,422

INEL EM40/60 RAD Contaminated Surplus Facilities Future Inventory ==> Deactivation and D&D Cos

Projected Cost for All Future D&D of INEL Radiologically Contaminated Surplus Facilities

Prepared by DJ Kenoyer, SA LaBuy, DJ Preussner, LZ Smith, Revision 0, dated 17-Aug-95

Class ID	ID Number	Facility Description	Year Built	Total Usable Floor Space Sqaure Feet	Bldg Lvls	Tank Gallons	Facility Rating ACM	HAZ	RAD	SYS
B/NC	TRA 752	ETR Transformer Yard		3,630			L	L	L	L
B/NC	TRA 753	ETR Exhaust Stack		14,844	21		L	A	A	L
B/NC	TRA 755	ETR Filter Pit Bldg	1952	670	1		A	L	L	L
NC	TRA 751	ETR Cooling Tower Basin	1957	12,910	1		L	L	A	L
		TRA-ETR Subtotals		124,528		1,200				
		TRA- ARMF								
F	TRA 660	Advanced Reactivity Measurement Facility (ARMF)	1959	2,400	1		A	L	H	L
		TRA-ARMFSubtotals		2,400		0				
		TRA- ATR/MISC								
F	TRA 621	Nuclear Material Inspection & Storage Bldg (NMIS)	1982	7,116	1		A	L	A	L
F	TRA 632	Hot Cell Building (Addition 1956)	1952	17,037	1		A	A	H	A
F	TRA 634	ATR Storage Facility	1982	8,400	1		A	L	A	A
B/NC	TRA 651*	Maintenance Storage Building	1960	672	1		A	L	L	L
B/NC	TRA 665*	Maintenance Storage Building	1962	776	1		A	L	L	L
F	TRA 670	Advanced Test Reactor (ATR) Bldg.	1964	140,694	1		A	A	H	H
NC	TRA 761	Loading Facility (Hot Waste)		400	1		A	A	A	L
NC	TRA 664	Hot Storage Building	1957	800	1		A	L	A	L
NC	TRA 666A	Tritium Research Facility	1963	4,391	1		A	L	A	A
		TRA- ATR/MISC Subtotals		175,095		0				
		TRA Area Subtotals		471,580		111,200				
	INEL EM40 /60 RAD Contaminated Grand Totals			2,760,860		5,168,675				

		Program Dates (Start - Finish)						DEACTIV	S&M Program			D&D
	EM	FDI	FDI	Deact	Deact	D&D	D&D	ROM	Total	Annual	Total	ROM
CHRTZ	ID No.	Start	Fin	Start	Fin	Start	Fin	Cost ($)	Years	Cost ($)	Cost ($)	Cost ($)
	1-FDI											
L	1	2001						0	0	0	0	0
A	3					2021	2021	0	0	0	0	1,774,323
A	3					1998	2002	0	0	0	0	181,067
A	3					1998	1999	0	0	0	0	1,357,971
								2,109,658			3,125,798	30,623,093
A	2			1996	1997	1998	2000	1,068,000	3	22,879	51,477	762,628
								1,068,000			51,477	762,628
A	2			2020	2025	2026	2030	137,943	7	41,383	258,644	1,379,435
A	2			2020	2025	2026	2030	679,951	7	203,985	1,274,908	6,799,508
A	2			2020	2025	2026	2030	227,967	7	68,390	427,439	2,279,673
L	1	2001						0	0	0	0	0
L	1	2001						0	0	0	0	0
A	2			2020	2025	2033	2048	8,021,617	14	2,406,485	19,251,881	80,216,172
A	3					2020	2024	0	0	0	0	154,688
A	3					2020	2024	0	0	0	0	155,080
A	3					2020	2024	0	0	0	0	1,191,672
								9,067,479			21,212,872	92,176,229
								16,847,644			24,904,613	165,958,368
								113,461,594			89,024,887	643,887,034