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Idaho National Engineering Laboratory Site Development Plan

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ACRONYMS

ATR	Advanced Test Reactor
B&W	Babcock & Wilcox
BNCT	Boron Neutron Capture Therapy
BPA	Bonneville Power Administration
BTU	British thermal unit
C&S	certified and segregated
CADMOST	Canning and Dry Modular Storage
CFA	Central Facilities Area
CSSF	Calcine Solids Storage Facility
CTF	Containment Test Facility
D&D	decontamination and decommissioning
DOE	Department of Energy
DOE-ID	Department of Energy, Idaho Operations Office
EBR	Experimental Breeder Reactor
ECF	Expended Core Facility
EROB	Engineering Research Office Building
FH&D	fuel handling and dissolution
FSA	Fuel Storage Area
FY	fiscal year
GPCE	general purpose capital equipment
GPP	general plant project
HLW	high-level radioactive waste
ICPP	Idaho Chemical Processing Plant

IET	Initial Engine Test
IFSF	Irradiated Fuel Storage Facility
INEL	Idaho National Engineering Laboratory
IPC	Idaho Power Company
IRC	INEL Research Center
ISC	INEL Supercomputing Center
kV	kilovolt
kW	kilowatt
LICP	line item construction project
LLW	low-level radioactive waste
MVA	megavolt ampere
MW	megawatt
MWSF	Mixed Waste Storage Facility
NWCF	New Waste Calcining Facility
OE	operating expense
PBF	Power Burst Facility
PEW	process equipment waste
RAL	Remote Analytical Laboratory
RCRA	Resource Conservation and Recovery Act
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
SMC	Specific Manufacturing Capability
SPERT	Special Power Excursion Reactor Test
SWEPP	Stored Waste Examination Pilot Plant

TAN	Test Area North
TBD	to be determined
TMI-2	Three Mile Island Unit-2
TRA	Test Reactor Area
TRU	transuranic
TRUPACT	transuranic package transporter
TSA	Technical Support Annex; or Transuranic Storage Area
TSAR	Transuranic Storage Area Retrieval
TSB	Technical Support Building
TSD	treatment, storage, and disposal
TSF	Technical Support Facility
UP&L	Utah Power and Light
WCB	Willow Creek Building
WEDF	Waste Engineering Development Facility
WERF	Waste Experimental Reduction Facility
WIF	Waste Immobilization Facility
WINCO	Westinghouse Idaho Nuclear Company
WIPP	Waste Isolation Pilot Plant
WROC	Waste Reduction Operations Complex
WRRTF	Water Reactor Research Test Facility
WWSB	WERF Waste Storage Building

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Introduction

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Idaho National Engineering Laboratory Site Development Plan

SECTION 1 INTRODUCTION

This plan briefly describes the 20-year outlook for the Idaho National Engineering Laboratory (INEL). Missions, workloads, worker populations, facilities, land, and other resources necessary to fulfill the 20-year site development vision for the INEL are addressed. In addition, the plan examines factors that could enhance or deter new or expanded missions at the INEL. And finally, the plan discusses specific site development issues facing the INEL, possible solutions, resources required to resolve these issues, and the anticipated impacts if these issues remain unresolved.

General Description of the INEL

The INEL site is an 890-square-mile research and engineering reservation located in southeastern Idaho (see Figure 1-1). The site is divided into several distinct and geographically separate areas. Operations are directed by the Department of Energy (DOE) and carried out by contractors. This plan covers the seven INEL areas currently operated by EG&G Idaho, Babcock & Wilcox Company (B&W), and Westinghouse Idaho Nuclear Company (WINCO):

- Central Facilities Area (CFA) (EG&G Idaho)
- Test Reactor Area (TRA) (EG&G Idaho)
- Test Area North (TAN) (B&W and EG&G Idaho)
- Radioactive Waste Management Complex (RWMC) (EG&G Idaho)
- Power Burst Facility (PBF) (EG&G Idaho)
- Idaho Falls Area (EG&G Idaho)
- Sitewide Area (EG&G Idaho)
- Idaho Chemical Processing Plant (ICPP) (WINCO).

The northwestern edge of the Eastern Snake River Plain, where the INEL site is situated, is an arid, high-desert region. The topography of the INEL site is flat to gently rolling, with an average elevation of 5,000 feet above sea level. The Bitterroot, Lemhi, and Lost River mountain ranges border the site on the north and west.

The Big Lost River enters the southwestern corner of the INEL site and flows north. Water in the river percolates into the Snake River Aquifer, which lies beneath the site.

Figure 1-1. General features and major functional areas of the INEL.

The site is bordered by six major population areas that lie between 23 and 72 miles from its center. These areas are Arco, Rexburg, Rigby, Blackfoot, and the two largest population areas, Pocatello and Idaho Falls.

The site was designated as a National Environmental Research Park in 1975. The purpose of this designation was to foster scientific research and studies to determine the impact to the environment from DOE energy-related research.

The INEL includes laboratory, research and development, engineering, reactor, storage, maintenance, and administrative support buildings. These buildings total approximately 580. They range in age from recently constructed to more than 40 years old. They range in condition from excellent to poor (or even abandoned).

A Note About This Plan and Changes at the INEL

This plan is a requirement of, and follows the format stipulated in, DOE Order 4320.1B, "Site Development Planning." This plan is actually a compilation of eight site development plans — one for each of the primary functional areas currently operated by EG&G Idaho, B&W, and WINCO. This approach of writing separate plans for each functional area was taken because activities within the functional areas are distinct from each other.

DOE Order 4320.1B requires that this plan address the 20-year site development outlook for the INEL. Predicting activities 20 years from now is obviously a difficult undertaking, but the task is especially challenging at this juncture in INEL history. Since 1949 when the INEL was established, its personnel have constructed, and conducted research on, 52 nuclear reactors, most of them first-of-a-kind facilities. However, shifts in political attitudes toward nuclear energy, combined with subsequent reductions in funding for nuclear-energy research, have compelled leaders of the INEL to alter its direction and expand its horizons.

Today, INEL personnel are adapting their scientific and engineering expertise to a changing world. They are researching, engineering, developing, and transferring technologies in disciplines that include waste management, alternate energy, biotechnology, and the environment. INEL personnel are teaming up with industry, academia, and other Federal research laboratory personnel to bridge the gap between basic research and market-driven technology needs. More than ever, the INEL is learning to be a partner with the private sector in meeting regional, national, and international needs for engineering applications.

In addition, DOE recently named Lockheed Idaho Technologies Company as the new consolidated contractor for the INEL, merging five INEL management and operations contracts (except Argonne National Laboratory-West and the Naval Reactors Facility) into one. The consolidated contract invokes innovative cost reductions and financial management practices. The INEL will be the first DOE laboratory to implement the requirements of performance-based contracting in support of the National Performance Review. This contract is scheduled to go into effect on October 1, 1994.

Such changes will make the INEL more cost effective and progressive. And while they also make predicting the long-term future of the INEL rather challenging, this plan reflects site

development steps necessary to support waste reduction, improved productivity, increased safety, preservation of the environment, and the elimination of many operational problems.

The mission of the INEL today is to integrate engineering, applied science, and operations in an environmentally conscious, safe, and cost-effective manner. Personnel at the INEL solve critical problems related to the environment, energy production and use, U.S. economic competitiveness, and national security.

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Central Facilities Area (CFA)

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SECTION 2

CENTRAL FACILITIES AREA (CFA)

SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

CFA provides effective, centralized, sitewide services at the Idaho National Engineering Laboratory (INEL) in support of the primary INEL mission.

Workload

Eighty percent of the activity at CFA consists of INEL-wide programmatic support. CFA support activities include transportation, maintenance, and capital construction. Many technical and support services for the entire INEL site are headquartered at CFA. These services include environmental monitoring and calibration laboratories, communication systems, security, fire protection, medical services, warehouses, a cafeteria, vehicle and equipment pools, and bus operations.

Population

Currently, 1,199 people are employed at CFA.

Site and Regional Information

CFA is located in the southern portion of the INEL (see Figure 2-1) and is divided into eight zones for planning purposes:

- The Remote Service Facilities Zone is located on the northeast end of CFA and includes light laboratories, the Scoville Substation, a sewage treatment plant, hazardous waste storage, and petroleum fuel storage.
- The Administrative Offices and Support Zone is located in the middle of CFA. This zone includes a fire station, a medical dispensary, a cafeteria, and office buildings.
- The Handling and Storage Zone contains a large stockpile of processed manganese ore, the railroad spurs and transfer yard used for open storage and handling of large items, and a switch track.
- The Service Shops Zone includes vehicle maintenance shops, a bus dispatch building, a motor pool, a heavy equipment yard, and a multicraft shop complex.
- The Engineering and Light Laboratory Zone includes engineering work space, offices, and laboratories.

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Figure 2-1. Location of CFA (shaded area).

- The Landfill and Open Pit Zone is located on the northwest end of CFA. It contains the previously used and existing sanitary landfills, a gravel pit, and a batch plant.
- The Warehousing and Storage Zone, located in the southeast portion of CFA, contains two large warehouses, craft material storage buildings and yards, and several fenced storage areas.
- The Security Complex Zone is located on the extreme southwest side of CFA. This zone contains the Security Headquarters, the Helicopter Storage and Maintenance Facility, and a helicopter landing pad.

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

A changing political support base in the State of Idaho could negatively affect the INEL and, therefore, CFA. Support of work done for the Department of Energy (DOE) remains strong across the State, but political conflicts over the transportation and storage of hazardous waste have created some friction at the State level.

In addition, the possible contamination of the Snake River Aquifer, which lies beneath the INEL, worries some Idaho residents, particularly those downstream from the INEL. Although the INEL bolsters the State's economy, these concerns may influence support for INEL programs.

Several initiatives for new work at the INEL are being pursued aggressively. Acquisition of new work will determine the future of the INEL and CFA.

Condition of Facilities

Eighty-two buildings are located at CFA and comprise approximately 550,000 ft². The average age of CFA buildings is 29 years. Nineteen percent of these buildings are recommended for excess or demolition (8% of the CFA space), and another 6% of the buildings are in poor condition (9% of the CFA space). A large backlog of maintenance and repair items requires continued funding and application of manpower to make existing facilities and utilities safe, useable, and free from further deterioration.

Conditions That Would Enhance/Deter New or Expanded Missions

Conditions that would enhance or deter new or expanded missions at CFA include the following:

- Significant changes in programs at the INEL
- Major adjustments in CFA operations resources
- Systematic closure of the INEL
- An increase in the decontamination and decommissioning activities at the INEL
- A change in the mission of the INEL.

Factors That May Influence Future Use of the Area

CFA is the main support area of the INEL site. Consequently, major increases or decreases in program activities at other functional areas of the INEL could correspondingly increase or decrease work at CFA. Specific examples of INEL-wide interests that would influence CFA are strategic initiatives; strategic partnerships; scientific and technical programs; environmental restoration and waste management; and environmental, safety, and health management.

Program Mission Projections and Mission Resource Requirements

Mission Projections

Mission projections for CFA are directly related to the mission projections for the INEL and its programs. The CFA mission will be adjusted as necessary to meet future program support requirements.

Mission Resource Requirements

Most of the CFA resource requirements are met by the Environmental Restoration and Waste Management Landlord Secretarial Office at DOE Headquarters. Specific resource requirements for the future are estimated to remain constant or increase slightly.

Future Workload

The future workload at CFA is linked directly to the workload at other areas of the INEL and could increase or decrease with the workload of these other areas. However, the workload at CFA has been stable during the past several years and is expected to remain so, with the potential for a slight increase.

Future Population

Projections show that CFA's current worker population of 1,199 will remain stable and may increase slightly as programmatic activity throughout the INEL expands.

Master Plan

Goals

Long-range planning goals for CFA include the following:

- Expand laboratory capabilities to include environmental radiation measurement as well as research and development in support of nonproliferation.
- Consolidate facilities and functions to lower operating and maintenance costs.

- Complete the transportation infrastructure revitalization, and continue to improve utilities and support facilities.
- Dispose of nonessential facilities, thereby eliminating surveillance costs, maintenance costs, and safety concerns associated with such facilities.

Facility and Land Requirements

Future facility and land requirements at CFA will be driven by the need for program support from other areas of the INEL. An abundance of land surrounds CFA. Land is available for expansion of activities and for construction or modification of facilities. Utility services are also available to accommodate required upgrades and future development.

A lack of resources for expansion projects would inhibit increases in support activities at CFA. Funding is also necessary to upgrade substandard facilities and utilities and to support continued work efforts.

Future Land Uses

Future land uses at CFA will be directed at providing the required support infrastructure for program activities throughout the INEL. The land within CFA has been zoned to support specific areas, and all expansion will be guided by this zoning.

Future Facility Locations and Construction Programs

Table 2-1 lists the construction activities slated for CFA. Figures 2-2 and 2-3 show existing facility locations, future facility locations, and construction projects at CFA.

Utility Sources, Loads, and Distribution/Collection System Configurations

Electrical power is supplied to the INEL and CFA from two sources: the Idaho Power Company (IPC), a privately owned utility, and the Experimental Breeder Reactor II (EBR-II), a Federally owned facility operated at the INEL by Argonne National Laboratory-West. Approximately 60% of the power required for INEL site operations is provided by the commercial power source (IPC). The remaining 40% is generated onsite by the EBR-II as a secondary output of its primary test mission.

Commercial power is transmitted to CFA through the Antelope Substation (located on the INEL site), which is owned by Utah Power and Light (UP&L), via two major substations on the Pacific Northwest Power Grid: the IPC Brady Substation and the UP&L Goshen Substation. If necessary, power may also be delivered to the Antelope Substation from Montana Power Company's Anaconda Substation. Power service within the INEL is provided by an extensive, INEL-owned, electrical transmission/distribution system comprising 56.5 miles of 138-kV transmission line, 122.6 MVA of transformer capacity, and seven major substations.

Power consumption at CFA is restricted by the loading capacity of the transformers at the Scoville Substation. The transformers have a redundant capacity of 7.5 MW maximum redundant load capacity. Peak loads at CFA average only 2.5 MVA, leaving substantial spare capacity.

Future electrical power requirements will be met by the commercial power companies with little effect on their current substations and distribution equipment. However, the INEL-owned substations and distribution equipment will require upgrades in the future to ensure consistent and reliable electrical power distribution to INEL facilities.

Water for CFA is supplied by two deep wells. Water is pumped from, and stored in, a 500,000-gallon water storage tank and a 200,000-gallon covered reservoir. These sources provide potable and fire water.

Other utility sources at CFA include a waste water treatment system, steam and condensate systems, area lighting, fuel oil tanks, and a fuel oil distribution system.

Telecommunication services for voice and data transmission are available at all INEL operational areas. Communications capabilities also include radio networks for safety, security, emergency, and operational purposes.

Table 2-1. CFA modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord/Program Funding	Estimated Completion Year	Scope
FY 1992	CFA Modular Laboratory Upgrade	450K	General plant project (GPP)	Landlord	FY 1995	This upgrade will accommodate personnel moving from CF-633. CF-625 will be modified to accommodate tenant equipment. End users will be Engineering Research and Applications personnel.
FY 1992	Transportation Complex	13,953K	Line item construction project (LICP)	Landlord	FY 1995	This complex will consolidate all INEL vehicle and equipment repair shops and operations/administrative offices currently housed in six buildings at CFA. The complex will be sized to accommodate work now being done on overtime and backshifts due to inadequate room in current facilities.
FY 1993	CF-601 Warehouse Roof Replacement	1,075K	GPP	Landlord	FY 1994	The CF-601 Warehouse roof will be completely reconstructed. Leaks are severe. Water intrusion into electrical conduit now creates safety concerns, and saturation of the roof significantly increases truss loading. Leaks sometimes require covering a third of the bulk storage area with plastic sheeting.
FY 1993	CF-623 Paint Process Room Addition	890K	GPP	Landlord	FY 1995	This addition will provide a lumber storage area, a paint storage area, a paint process room, and a satellite accumulation area. The addition will correct noncompliance with National Fire Protection Association rules and Idaho Rules, Regulations, and Standards for Hazardous Waste.
FY 1994	Aircraft Hangar Solvent Exhaust System	200K	GPP	Landlord	FY 1995	This project will provide an exhaust system in areas where Protection Technology Idaho's helicopter mechanics use organic solvents when cleaning parts and overhauling engines. Currently, mechanics are subject to inhalation of solvent fumes when doing such work.
FY 1995	Diesel Fuel Boiler	300K	General purpose capital equipment	Landlord	FY 1995	The existing boiler in CF-662 (Cafeteria) is obsolete and will be replaced, since replacement parts are unavailable. The existing boiler cannot maintain constant temperatures on cold days.
FY 1995	CF-698 Building Addition	1,500K	GPP	Landlord	FY 1995	This 3,000 ft ² addition and modifications to the existing facility will correct noncompliances with requirements in DOE-ID Order 5700.6D.
FY 1995	CF-690 Roof Replacement	1,100K	GPP	Landlord	FY 1995	The existing built-up roof and degraded insulation will be replaced. CF-690 houses the Radiological and Environmental Sciences Laboratory.

Table 2-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1995	CF-699 Heating, Ventilating, and Air Conditioning Upgrade	340K	GPP	Landlord	FY 1995	The current heating, ventilating, and air conditioning system is inadequate to support operations within CF-699. This upgrade will correct inadequacies in the system.
FY 1996	CFA Heating, Ventilating, and Air Conditioning Upgrade	1,000K	GPP	Landlord	FY 1996	This project will provide for the engineering, evaluation, design, and replacement or reconfiguration of heating, ventilating, and air conditioning systems and controls in CF-612 and CF-629.
FY 1996	CFA Telecommunications Upgrade	250K	GPP	Landlord	FY 1996	The outside distribution plant cable network at CFA will be reconfigured. The system now operates at its functional limits. The upgrade will alleviate existing congestion and allow for growth.
FY 1996	CFA Material Handlers Facility	1,100K	GPP	Landlord	FY 1997	This facility will replace three existing structures, CF-618, -684, and -684T. CF-618 and -684 are used to store flammable and combustible materials. CF-618 is used to store construction/repair materials and equipment.
FY 1996	CFA Fire Station Remodel	250K	GPP	Landlord	FY 1997	A new DOE Fire Station is slated for construction. When the new station is completed, the current fire station (CF-666) will be renovated to create office and shop space for the Power Management Organization.
FY 1996	CFA Relay and Meter Test Room	To be determined (TBD)	GPP	Landlord	FY 1997	This addition to CF-681 will house state-of-the-art relay and meter test equipment, which is currently housed in underpowered, overcrowded space where the equipment must be set up and taken down each time a test is run.
FY 1996	CFA Maintenance Vehicle/Equipment Storage Facility	600K	GPP	Landlord	FY 1997	This facility will provide inside storage for CFA maintenance equipment and vehicles such as lawnmowers and snowblowers. The facility will centralize equipment, thereby eliminating the delays, breakdowns, and deterioration associated with exposure to winter conditions.

Table 2-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1996	CFA Heavy Equipment Storage	904K	GPP	Landlord	FY 1997	This facility will be a high-bay building that protects CFA heavy equipment against freezing and other harmful weather conditions. Currently, the equipment is parked outside. In severe weather, equipment with hydraulic systems cannot be operated until hours after starting. This delay is unacceptable for equipment such as snowplows that may be needed on short notice.
FY 1996	CFA Mini Storage	325K	GPP	Landlord	FY 1997	This project will provide a building divided into individual, secure storage garages to support the miscellaneous and continuously varying needs of organizations at CFA. This building will allow for the institution of control over the various storage and staging activities currently housed in CFA buildings scheduled for demolition.
FY 1996	CFA Road Upgrade	TBD	GPP	Landlord	FY 1997	East Portland Avenue and East Ogden Avenue will be chipped, sealed, and striped. Potholes, large cracks, and edge deterioration will be repaired. Intermittent freezing and thawing coupled with heavy industrial vehicle use have caused these streets to deteriorate faster than regular maintenance can correct.
FY 1996	CFA Craft Shop	10,700K	LICP	Landlord	FY 1999	This project will provide a craft shop and modifications to existing facilities (i.e., CF-621 through -624). All CFA craft operations and associated technical support personnel that are now located in 11 buildings will be consolidated in the new shop. Many of the buildings have deteriorated to the point that routine maintenance and repair can no longer correct structural, electrical, plumbing, heating, and ventilation deficiencies. Current buildings contain numerous health and safety deficiencies.
FY 1996	Health Physics Instrumentation Laboratory	14,300K	LICP	Landlord	FY 1999	This facility will contain laboratory, administrative, and support space. The laboratories will be used for gamma, alpha, beta, and neutron source calibration and irradiations. Current facilities were constructed by the U.S. Navy in the early 1940s. The buildings have been demolition candidates for more than 10 years but continue to be used because of a lack of alternative space.

Table 2-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1996	Radiological Research and Development Laboratory	TBD	GPP	Landlord	FY 1997	This facility will consist of a suite of research and development laboratories to support experimental activities involving radioactive sources and materials.
FY 1997	CFA Administrative Support Facility	11,300K	LICP	Landlord	FY 2000	This facility will provide office space and multipurpose space for a food service area, conference rooms, a photography studio, a copy/print shop, a satellite technical library, an emergency control center, a mail service facility, a common-use area, and sleeping quarters for overtime personnel. The facility will replace maintenance-intensive, deteriorating buildings that exceed their design life. It will also provide space for projected needs.
FY 1999	INEL Technical Skills Center	16,000K	LICP	Landlord	FY 2001	This facility will centralize hands-on, performance-based, and technical skills training and testing. The center will support DOE training and certification requirements. Current training and certification is decentralized, fragmented, and inconsistent among contractors. Current training facilities are limited and, in the case of some contractors, inadequate or nonexistent, as determined by Tiger Team Finding TC.7-1.

CFA

FIGURE 2-2. CFA EXISTING LAND USE MAP.

LEGEND

- NEW CONSTRUCTION
- ▨ MODIFICATIONS
- ▩ DEMOLITION
- ▧ SECURITY COMPLEX DEVELOPMENT ZONE
- ▦ ENGINEERING AND LIGHT LABORATORY DEVELOPMENT ZONE
- ▥ HANDLING AND OPEN STORAGE DEVELOPMENT ZONE
- ▤ LANDFILL AND OPEN PIT DEVELOPMENT ZONE
- ▣ REMOTE SERVICE FACILITIES DEVELOPMENT ZONE
- ▢ ADMINISTRATIVE OFFICES AND SUPPORT DEVELOPMENT ZONE
- SERVICE SHOPS DEVELOPMENT ZONE
- WAREHOUSE AND STORAGE DEVELOPMENT ZONE

CFA

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
1	FY 1992	CFA MODULAR LABORATORY UPGRADE	FY 1995
2	FY 1992	TRANSPORTATION COMPLEX	FY 1995
3	FY 1993	CF-601 WAREHOUSE ROOF REPLACEMENT	FY 1994
4	FY 1993	CF-623 PAINT PROCESS ROOM ADDITION	FY 1995
5	FY 1994	AIRCRAFT HANGAR SOLVENT EXHAUST SYSTEM	FY 1995
6	FY 1995	DIESEL FUEL BOILER	FY 1995
7	FY 1995	CF-698 BUILDING ADDITION	FY 1995
8	FY 1985	CF-690 ROOF REPLACEMENT	FY 1995
9	FY 1995	CF-699 HEATING, VENTILATING, AND AIR CONDITIONING UPGRADE	FY 1995
10	FY 1996	CFA HEATING, VENTILATING, AND AIR CONDITIONING UPGRADE	FY 1996
11	FY 1996	CFA TELECOMMUNICATIONS UPGRADE (NOT SHOWN DUE TO EXPANSIVE NATURE OF THE PROJECT)	FY 1996

12	FY 1996	CFA MATERIAL HANDLERS FACILITY	FY 1997
13	FY 1996	CFA FIRE STATION REMODEL	FY 1997
14	FY 1996	CFA RELAY AND METER TEST ROOM	FY 1997
15	FY 1996	CFA MAINTENANCE VEHICLE/EQUIPMENT STORAGE FACILITY	FY 1997
16	FY 1996	CFA HEAVY EQUIPMENT STORAGE	FY 1997
17	FY 1996	CFA MINI STORAGE	FY 1997
18	FY 1996	CFA ROAD UPGRADE	FY 1997
19	FY 1996	CFA CRAFT SHOP	FY 1999
20	FY 1996	HEALTH PHYSICS INSTRUMENTATION LABORATORY	FY 1999
21	FY 1996	RADIOLOGICAL RESEARCH AND DEVELOPMENT LABORATORY (NOT SHOWN - LOCATION TO BE DETERMINED)	FY 1997
22	FY 1997	CFA ADMINISTRATIVE SUPPORT FACILITY	FY 2000
23	FY 1999	INEL TECHNICAL SKILLS CENTER (NOT SHOWN - LOCATION TO BE DETERMINED)	FY 2001
S1	FY 1992	INEL SEWER SYSTEMS UPGRADE (SITEWIDE)	FY 1995
S2	FY 1994	INEL EMERGENCY RESPONSE FACILITIES (SITEWIDE)	FY 1997
S3	FY 1994	INEL MEDICAL FACILITIES (SITEWIDE)	FY 1997
S4	FY 1996	INEL RADIO COMMUNICATIONS UPGRADE (SITEWIDE)	FY 1999
S5	FY 1998	MATERIAL HANDLING AND WAREHOUSE UPGRADE (SITEWIDE)	FY 2000

FIGURE 2-3. CFA MASTER PLAN MAP.

Special Considerations

Table 2-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 2-2. CFA site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
Resources are inadequate to maintain the CFA infrastructure efficiently and effectively.	Provide additional money and personnel to upgrade the CFA infrastructure.	The resources needed to resolve this issue will have to be determined through formal work package development and scheduling processes.	The CFA infrastructure will continue to deteriorate, resulting in increased maintenance and repair costs in the future.
Long-range integrated program planning issues are not being communicated in a thorough or timely manner to personnel working in CFA support operations.	Develop a process to communicate support needs to the appropriate personnel.	Time will have to be expended to develop, implement, and ensure continued use of an effective communication process.	Activities that support CFA will continue to be reactive instead of planned, creating unnecessary delays and abnormally high costs.

Idaho National Engineering Laboratory

Site Development Plan

Test Reactor Area (TRA)

September 1994

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SECTION 3 TEST REACTOR AREA (TRA) SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

The major mission at TRA is to conduct scientific and engineering experiments at the Idaho National Engineering Laboratory (INEL) for and in behalf of the Department of Energy (DOE) and to support various nuclear and nonnuclear programs.

Workload

Personnel in chemical sciences and physics programs use a variety of laboratory facilities at TRA for broad-based research and development, analysis, and testing work. The Advanced Test Reactor (ATR) at TRA is still considered the "cutting edge" of nuclear test reactors after almost 30 years of operation. Since the Materials Test Reactor and the Engineering Test Reactor are now deactivated, the ATR is the only large test reactor operating at TRA. The ATR is projected to remain a major program for research and radiation testing into the next century.

The ATR produces about 50% of the iridium and 2% of the cobalt-60 used domestically. Iridium-192 is used primarily for nondestructive examination technology in metal manufacturing processes, but recent developments have expanded its applications to include cancer teletherapy. Cobalt-60 has numerous uses. Most of the cobalt produced is for product sterilization, but it is also used in industrial and medical processes.

Population

Currently, 586 people are employed at TRA.

Site and Regional Information

TRA is located in the southwestern portion of the INEL, 4.9 miles northwest of the Central Facilities Area (CFA) (see Figure 3-1). TRA was originally established in the early 1950s with the development of the Materials Test Reactor. Two other major reactors followed: the Engineering Test Reactor and the ATR. The Engineering Test Reactor has been inactive since January 1982. The Materials Test Reactor was shut down in 1970, and the building is now used for offices, storage, and test areas in support of the Idaho Chemical Processing Plant (ICPP).

The major program at TRA is now the ATR. Half of the current TRA personnel provide direct support to the ATR. The remaining personnel support numerous programs and activities located throughout the INEL.

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Figure 3-1. Location of TRA (shaded area).

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

Since the ATR achieved initial criticality in 1967, it has been used almost exclusively by the DOE's Naval Reactors Program. However, this program will be reduced due to cuts in defense spending, thereby releasing four highly desirable test positions within the reactor core. This scaleback provides the INEL with an opportunity to broaden the customer base of the ATR and develop new areas of growth. The three- to five-year plan for TRA calls for development of new programs that will use available test space in the ATR and other TRA facilities.

It is unlikely there will be a serious national champion for nuclear power in the foreseeable future. Nevertheless, several potential programs could expand TRA's business base for continued operations well into the next century. These programs include nuclear medicine, product sterilization, weapons material dispositioning, and materials testing. The number of serious competitors for these programs has decreased significantly in the past two or three years. The ATR has several advantages, including high neutron flux, large test spaces, the flexibility to serve multiple missions, and some continued base funding from the Naval Reactors Program. Further, the infrastructure at TRA provides sponsors with reactor canal services, hot cell handling, hot laboratory capability, and full engineering services.

Condition of Facilities

Seventy-seven buildings and 65 structures are located at TRA. These facilities have been modified to fit the changing needs of the INEL, and they provide five major types of functional space: reactor, laboratory, office, training, and craft support for maintenance.

The 77 TRA buildings encompass about 609,000 ft². Eighteen percent of TRA's buildings are in excellent condition, 60% are in good condition, and the remaining 22% are in fair to poor condition. TRA facilities are aging and require higher than normal maintenance and repair.

Conditions That Would Enhance/Deter New or Expanded Missions

The number of sponsors and the variety of work at TRA are increasing. Many private firms buy isotopes from TRA. Gamma irradiation service in either the hot cells or reactor canal is a small, but growing, market. Other U.S. Government programs, such as space power and defense programs, are looking to the ATR for support.

All customers share a common interest in obtaining high-quality services and products as quickly and inexpensively as possible. Isotope customers, in particular, need significant improvement in schedule performance.

Changing from a single sponsor to multiple programs presents a significant challenge to TRA operations. Current practices are constantly evaluated against new requirements. The workforce is changing to more effectively accomplish several tasks in parallel as opposed to the past primary series work methods. More than ever, careful planning and strict adherence to schedules and milestones are unconditional requirements for success.

Factors That May Influence Future Use of the Area

Continued viability of TRA and the ATR depends on the acquisition of adequate support funding from TRA's landlord sponsor, the Division of Nuclear Energy at DOE. Without proper support, the long-term operation of the area — and subsequently the reactor — is in jeopardy because of age-related failure or the inability of the TRA infrastructure (e.g., utility systems, buildings, and roads) to meet the needs of new customers.

Program Mission Projections and Mission Resource Requirements

Mission Projections

The current political climate in the United States is unsupportive of commercial nuclear power, and strong political support for new nuclear power programs in the foreseeable future seems unlikely. Consequently, new programs that would require major new facilities will probably not be proposed any time soon. New programs must use existing facilities and tie to initiatives beyond nuclear power, such as medical isotopes, product sterilization, defense needs, space power, and plutonium dispositioning.

Chemical sciences and physics programs that use TRA for broad-based research and development are projected to expand.

The plans for ATR radioisotope production include extensive expansion of iridium and cobalt production as well as the addition of two radioisotopes per year to the production mix. The radioisotope products will become available following the completion of ATR facility changes that will permit the introduction and removal of products without interruption of reactor operations.

Funding from the U.S. Navy for reactor experimentation will be reduced by fiscal year (FY) 1995. This will create a surplus of experimental space (loops) in the ATR. TRA is turning to private industry and NASA to fill test loops in the reactor left by removal of U.S. Navy experiments.

Waste management and site remediation at TRA will begin to play a major role in its future. TRA will continue its current mission for an estimated 20 years. Because of funding adjustments, mission objectives will be adjusted to obtain the maximum return on taxpayers' dollars.

The demand for nuclear research is decreasing. However, the number of large research reactors is also decreasing. The ATR is the world's premiere test reactor and the only domestic reactor capable of performing several DOE missions simultaneously. Therefore, TRA personnel plan to continue to pursue research projects and more product-oriented programs.

Mission Resource Requirements

Mission resource requirements for TRA are reported in the *Department of Energy Office of Environmental Management Budget Formulation and Activity Data Sheet Development FY 1996 Planning and Budget Cycle* budget submittals. Resources needed to accomplish TRA objectives for new business development include \$400K in overhead, about \$200K from Business Development for approximately 1.5 full time employees, and \$250K for research funding. This totals \$850K of

resources specifically aimed at developing new programs. Achieving a goal of \$4M in new business in the coming year will represent a return of over four times the investment. Achieving full reactor utilization within five years could provide up to \$20M annually on a total investment of less than \$5M.

However, increased maintenance costs due to the age of the facility are expected to increase the basic resource requirements. One of the key issues that must be addressed is maintaining and upgrading TRA so it is capable of accepting future projects. Resources are needed to maintain and expand existing roads, sewer, utilities, and structures to support research and development now and in the future.

Future Workload

The future objective for reactor operations is to maintain a reliable schedule. This will be monitored monthly to track reactor operating history, availability, and cost. Objectives for the University Fuels Program are to provide 33 universities in the United States with DOE-owned nuclear reactor fuel under budget and ahead of schedule and to improve fuel manufacturing processes.

The TRA hot cell revenues are expected to increase from about \$80K per year to over \$200K per year by 1999. Revenues from isotope production are expected to increase by \$2M over the next two or three years.

The objective of new program development is to market the four vacated flux traps in the ATR. This would amount to an annual business of up to \$20M, which would be nearly half of the operating budget for the Power Reactor Programs. The immediate goal for FY 1995 is to book \$4M from new programs, of which \$1.5M is for work actually performed in FY 1995. TRA personnel will obtain a commitment for one flux trap position at full cost recovery from a non-Naval Reactors Program customer by FY 1997. By FY 1998, a funding commitment for 80% of all irradiation units in the ATR irradiation facilities will be obtained at full cost recovery.

To complete the long-term goal, TRA personnel plan to pursue potential programs worth at least three times the amount needed, or a \$60M annual potential.

A new TRA waste handling facility is planned to come on line in the future to perform handling, recycling, and minimization of TRA wastes.

In FY 1996, TRA will begin defueling and deactivating the Advanced Reactivity Measurements Facility/Coupled Fast Reactivity Measurements Facility. In addition, the transfer of nuclear fuel from the Materials Test Reactor to the ICPP is anticipated as projects terminate.

Future Population

Projections show that TRA's current worker population of 586 will decrease by about 15% in the near term and then increase as TRA acquires new missions.

Master Plan

Goals

The major goals identified for TRA are as follows:

- Increase isotope sales by \$2M over the next two to three years.
- Achieve new sales of \$4M (10% of annual budget) in FY 1995.
- Acquire and develop Helium 3 Mass Spectrometry capability in FY 1995.
- Fully utilize the ATR by FY 1999, providing up to \$20M annually.
- Preserve and extend TRA's capabilities while minimizing negative effects on the environment.
- Build and maintain facilities that enhance employee performance and safety.

Facility and Land Requirements

An abundance of land is available inside and outside of the TRA boundary for expansion of facilities to support new missions. Water is plentiful and readily accessible. Electrical rates are among the lowest in the nation.

Future Land Uses

The land at TRA will continue to be used to conduct nuclear and nonnuclear scientific and engineering experiments for DOE, private industry, and academia.

Future Facility Locations and Construction Programs

Table 3-1 lists the construction activities slated for TRA. Figures 3-2 and 3-3 show existing facility locations, future facility locations, and construction projects at TRA.

Utility Sources, Loads, and Distribution/Collection System Configurations

Power comes from the CFA Scoville Substation to the TRA Substation via the INEL's 138-kV West Loop and is fed to the ATR and Engineering Test Reactor areas through 13.8-kV transformers and feeders. The Materials Test Reactor feeder supplies 24 kV.

Water is supplied through a complex water system that processes and separates lines into raw water, demineralized water, potable water, makeup water, and fire water systems. Steam is no longer used at TRA. Electric heat is used throughout TRA supplemented by a waste heat recovery system on the ATR.

Major utility upgrades are required to support TRA's current and future missions.

Table 3-1. TRA modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord/Program Funding	Estimated Completion Year	Scope
FY 1994	TRA Temporary Accumulation Area	820K	General plant project (GPP)	Landlord	FY 1994	This facility will consist of separate prefabricated, metal storage structures that are about 700 ft ² in all. Each structure will be used to store different types of hazardous waste. Fire protection at the current temporary accumulation area is inadequate.
FY 1994	TRA Gas Bottle Staging Facility	620K	GPP	Landlord	FY 1994	This facility will provide separate rooms for storing flammable gases and oxidizers away from each other. The current facility does not meet requirements of the Occupational Health and Safety Administration and the National Environmental Policy Act.
FY 1995	ATR Secondary Chemical Addition System	1,100K	GPP	Program	FY 1995	This project will provide a 1,083 ft ² pre-engineered addition to TRA-671 and replace systems and components of the Secondary Coolant System chemical and biological control systems. These components are in reduced status from plant aging. This project will bring the control systems into compliance with required codes and standards.
FY 1995	TRA Catch Tank Valve Pad Enclosure and Glove Boxes	500K	GPP	Nuclear Engineering (NE) Landlord	FY 1995	This project will upgrade existing glove boxes at TRA-630, -613A, and -613B. A weather enclosure will also be installed around the TRA-630 valve pad. The existing glove boxes are constructed of wood and are deteriorating. Various audits have shown that the glove boxes are deficient.
FY 1995	TRA Water Chlorination System	1,000K	GPP	NE Landlord	FY 1995	A new chlorination system will be installed in the TRA potable water system. The present system does not meet the requirements of the State of Idaho and cannot be upgraded without total system replacement.
FY 1995	TRA Radiological Waste Upgrade	6,300K	Line item construction project (LICP)	Program	FY 1996	This upgrade will include installation of underground double-contained piping from a new tank storage facility to a new truck transfer facility, construction of new tank vaults to hold 15,000-gallon holding tanks, and construction of a sampling-and-mixing station. The current system uses single-wall piping and storage tanks with no capability of monitoring the system's integrity.

Table 3-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1995	TRA Fire and Life Safety Improvements	15,500K	LICP	NE Landlord	FY 1999	This project provides for the design, procurement, and construction activities to correct fire protection and life safety code deficiencies at TRA.
FY 1996	ATR Communications Upgrade	1,100K	GPP	Program	FY 1996	This upgrade will provide voice paging to all areas of TRA-670 and to several secondary support buildings. The existing voice paging system has exceeded its normal design life.
FY 1996	TRA Raw Water Storage	1,200K	GPP	NE Landlord	FY 1996	This project will upgrade the storage system for raw water at TRA. The current steel component system is more than 40 years old and requires replacement of key components to continue functioning.
FY 1996	Hot Cell Truck Enclosure	1,800K	GPP	NE Landlord	FY 1997	An enclosure will be added to TRA-632 to protect the area from adverse weather during hot cell loading, and an addition will be built containing one office, a change/locker room, restrooms, and a briefing room. Currently, snow and ice accumulation in the area causes a safety hazard during loading, and winds cause a significant potential for environmental contamination.
FY 1997	TRA Bunk House	1,800K	GPP	NE Landlord	FY 1997	This facility will consist of a 2,800 ft ² single-story, pre-engineered, metal building. It will include 24 sleeping rooms, janitor and storage closets, restrooms, shower facilities, and a reading room. The current bunkhouse is a temporary mobile unit that is 15 years old, houses six people, and has no showers or restrooms. The new facility will allow personnel to stay onsite after working a double shift. This will improve the safety and efficiency of personnel working double shifts, because they will not have to use part of the time between shifts to drive home and then back to work again.

Table 3-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1997	ATR Secondary Coolant System Refurbishment	6,800K	LICP	Program	FY 1998	This refurbishment will involve all secondary coolant, utility cooling water piping, pumps, and equipment outside ATR along with the Cooling Tower structure and equipment. The project will eliminate the age-related maintenance costs and environmental concerns due to deteriorated asbestos currently installed on the tower. The existing secondary coolant system and tower structure were constructed in the early 1960s for an expected design life of 20 years. The refurbishment will avoid future environmental and personnel safety concerns.
FY 1998	ATR Chemistry Laboratory Consolidation	1,800K	GPP	Program	FY 1999	This project will consolidate chemistry laboratories into one ATR facility, resulting in more efficient sampling of various systems. Consolidation will allow modification of sampling procedures and methods to reduce the radiation exposure of personnel during sampling activities.
FY 1998	TRA Controlled Industrial Facility	8,900K	LICP	NE Landlord	FY 2000	This 16,000 ft ² facility will provide a waste disposal processing area with recycling capability, an area for storage of valuable contaminated equipment, a machining area with containment capabilities for contaminated equipment, a decontamination area, and office space for the Radiological Control Group. This facility will help the INEL to comply with DOE directives for radioactive material management, environmental issues, and the INEL five-year planning goals.
FY 1999	TRA Maintenance Facility	16,000K	LICP	NE Landlord	FY 2000	This facility will replace the current TRA maintenance building (TRA-653), which is deteriorating and has numerous code and standards deficiencies.
FY 1999	TRA Utility Upgrades	7,400K	LICP	NE Landlord	FY 1999	This upgrade will refurbish the cathodic protection, sewer, potable water, and electrical systems throughout TRA. The average age of current utilities is more than 30 years, with many portions being 40 to 50 years old.

PLANT
&
TRUE

NOTE:
H = HELICOPTER LAN.

TRA

FIGURE 3-2. TRA EXISTING LAND USE MAP.

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TRA

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
1	FY 1994	TRA TEMPORARY ACCUMULATION AREA	FY 1994
2	FY 1994	TRA GAS BOTTLE STAGING FACILITY	FY 1994
3	FY 1995	ATR SECONDARY CHEMICAL ADDITION SYSTEM	FY 1995
4	FY 1995	TRA CATCH TANK VALVE PAD ENCLOSURE AND GLOVE BOXES	FY 1995
5	FY 1995	TRA WATER CHLORINATION SYSTEM	FY 1995
6	FY 1995	TRA RADIOLOGICAL WASTE UPGRADE	FY 1996
7	FY 1995	TRA FIRE AND LIFE SAFETY IMPROVEMENTS (NOT SHOWN DUE TO EXPANSIVE NATURE OF THE PROJECT)	FY 1999
8	FY 1996	ATR COMMUNICATIONS UPGRADE	FY 1996
9	FY 1996	TRA RAW WATER STORAGE	FY 1996
10	FY 1996	HOT CELL TRUCK ENCLOSURE	FY 1997
11	FY 1997	TRA BUNK HOUSE	FY 1997
12	FY 1997	ATR SECONDARY COOLANT SYSTEM REFURBISHMENT	FY 1998
13	FY 1998	ATR CHEMISTRY LABORATORY CONSOLIDATION	FY 1999
14	FY 1998	TRA CONTROLLED INDUSTRIAL FACILITY	FY 2000
15	FY 1999	TRA MAINTENANCE FACILITY	FY 2000
16	FY 1999	TRA UTILITY UPGRADES (NOT SHOWN DUE TO EXPANSIVE NATURE OF THE PROJECT)	FY 1999
S1	FY 1992	INEL SEWER SYSTEMS UPGRADE (SITEWIDE)	FY 1995
S2	FY 1994	INEL MEDICAL FACILITIES (SITEWIDE)	FY 1997

FIGURE 3-3. TRA MASTER PLAN MAP.

Special Considerations

Table 3-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 3-2. TRA site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
The need for a reliable, high-quality radioisotope supply is urgent and substantial.	Increase ATR radioisotope production.	Increased ATR radioisotope funding will be required to resolve this issue.	The United States will have to rely on foreign sources of radioisotopes.
The existing TRA buildings and utilities will not support current or expanded ATR missions.	Update and expand TRA buildings and utilities.	Additional GPP and LICP funding will be required to resolve this issue.	TRA's buildings and utilities will continue to deteriorate, current programs will continue to be interrupted, the capability to support new missions will be limited, and maintenance costs will be high.
Additional space is needed at TRA to support current and future missions.	Characterize, decommission, and decontaminate TRA buildings to facilitate transition to other uses.	Funding for decontamination and decommissioning activities will be required to resolve this issue.	Underuse of existing buildings and the need for additional space will continue.

September 1994

Test Area North (TAN)

Site Development Plan

Idaho National Engineering Laboratory

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SECTION 4

TEST AREA NORTH (TAN)

SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

TAN provides facilities for specific programs located in the northern portion of the Idaho National Engineering Laboratory (INEL) site. TAN is composed of three active operations areas: the Containment Test Facility (CTF), the Technical Support Facility (TSF), and the Water Reactor Research Test Facility (WRRTF). A fourth area, the Initial Engine Test (IET) area, is inactive.

The original program at CTF involved nuclear reactor loss-of-coolant experiments. Structures that supported this program are maintained in standby condition. Now the major project at CTF is the Specific Manufacturing Capability (SMC), which develops and produces tank armor for the U.S. Army.

TSF is the main administration, assembly, and maintenance portion of TAN.

WRRTF was used mainly for reactor flow experiments but now houses a variety of small projects, including one in which personnel are working on ways to test systems used to detect explosives.

Workload

Specific Manufacturing Capability (SMC). Currently, the SMC is the major project located at TAN. Personnel involved in this project develop and produce armor for the U.S. Army's M1A1 Abrams Tank Program.

Spent Fuel Program. The Spent Fuel Program comprises the Cask Systems Acquisition Program, the Prototypical Consolidation Demonstration Project, the Transportable Storage Cask Demonstration Project (Nuclear Fuel Service Project), the Concrete Cask Testing Project, the Dry Rod Consolidation Technology Project, and the Long-Term Cask Storage and Monitoring Project.

The Cask Systems Acquisition Program, Phase I, will develop and implement a method to transport civilian spent fuel from a reactor site to a Federal facility. The program will develop overweight truck casks, rail/barge transportable casks, and legal-weight truck casks certified by the Nuclear Regulatory Commission.

The Prototypical Consolidation Demonstration Project will consolidate production-scale quantities of nuclear fuel rods at the INEL. Consolidation equipment that is to be developed will provide a standard for future equipment used at waste repositories or at monitored retrievable storage facilities.

The Transportable Storage Cask Demonstration Project is a dual-purpose storage/transport project using casks and DOE-owned fuel currently located at West Valley, New York.

The Concrete Cask Testing Project uses INEL fuel to test a concrete cask for dry storage of spent fuel.

The Long-Term Storage and Monitoring Project temporarily stores and monitors casks and spent fuel assemblies from the various cask testing projects. This project is performed on the Spent Fuel Storage Pad at TAN and is part of the overall effort to support licensing efforts for at-reactor dry storage.

Three Mile Island Unit-2 (TMI-2) Damaged Core Off-Site Examination/Receipt. The TMI-2 core was shipped in canisters to the INEL beginning in fiscal year (FY) 1986 and ending in FY 1990. INEL facilities have been involved in the receipt, transfer, preparation, examination, and interim storage of the TMI-2 damaged core. Archive storage of the core will continue to provide contaminated and low-level radioactive sample materials for future research and development and for examination activities.

WRRTF Programs. Projects at WRRTF include SRS 1/4 Scale Separate Effects Testing, which is expected to continue until 1995. Testing of systems used to detect explosives is also under way at WRRTF as part of a project for the Federal Aviation Administration. This project could continue for three to nine more years. In addition, personnel working on the Super Critical Water Oxidation Project are developing a new method to treat mixed waste.

Population

Currently, 511 people are employed at TAN, of which 336 are assigned to the SMC Program.

Site and Regional Information

TAN is located at the north end of the INEL, approximately 27 miles northeast of the Central Facilities Area (CFA) (see Figure 4-1). TAN was originally established in the 1950s to support the U.S. Air Force and Atomic Energy Commission Aircraft Nuclear Propulsion Program. However, the program was terminated before a nuclear-powered aircraft could be built.

The IET area is located at the north end of TAN, 28 miles north of CFA. The IET area includes buildings and structures that were constructed in the early 1950s for the Aircraft Nuclear Propulsion Program. After that program ended in 1961, the IET was used for the Space Nuclear Auxiliary Power Transient Program through 1967 and then for the Hallam Decontamination and Decommissioning Project for two years in the 1970s. Currently, the facility is being demolished. The demolition is expected to be completed in FY 1995.

The CTF area is located at the west end of TAN, about 29 miles north of CFA. The area includes the CTF Containment and Service Building (reactor facility), an aircraft hangar, the CTF Reactor Control and Equipment Building, and numerous support facilities. The CTF reactor was part of the Mobile Test Assembly mounted on a specially-designed railroad flatcar that was located inside the domed containment vessel. Systems for operating and monitoring the reactor are located inside

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Figure 4-1. Location of TAN (shaded area).

structures immediately adjacent to the containment vessel. SMC operations are also located in the CTF area. Any portions of CTF not involved in the SMC Program are now inactive.

The TSF area is located about 27 miles northeast of CFA. These buildings and utilities have been modified over the years to fit the changing needs of the INEL. The TSF area serves as the main administration, assembly, and maintenance section for TAN. Major programs now located at the TSF include the TMI-2 Core Offsite Examination, the Process Experimental Pilot Plant (currently in standby condition), the Spent Fuel Program, and portions of the SMC Program.

WRRTF is located 1.6 miles southeast of TSF. It includes the Thermal-Hydraulic Experimental Facility (THEF) assembly and Test Building (TAN-640), the THEF Control Building (TAN-641), the Semiscale Control and Administrative Building (TAN-645), and the Semiscale Assembly and Test Building (TAN-646). These facilities were used in support of the Loss-of-Fluid Test (LOFT) Program that was previously located at CTF. Semiscale was a non-nuclear program that simulated the principal thermal-hydraulic features of a commercial nuclear reactor on a much smaller scale in order to predict what occurs in a nuclear system during a loss-of-coolant accident and other transients. Testing was performed in the Semiscale facility in support of the LOFT Program. The THEF provided a separate-effect test capability for LOFT. The test loop was used to assess and calibrate LOFT external fuel cladding thermocouples under transient conditions, test performance of flow instrumentation, study basic blowdown heat transfer, qualify the Power Burst Facility blowdown values, and test the performance of Semiscale's scaled high-speed pump. The Two-Phase Flow Loop at WRRTF was a large, high-temperature steam water system designed and installed to test LOFT flow instrumentation over the full range of two-phase flow conditions expected to occur during a LOFT blowdown.

TAN also maintains a small medical facility, a fire station, a cafeteria, and sleeping areas.

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

Potential conditions that could enhance or deter from accomplishing the missions at TAN include the following:

- Increased oversight and demands from the State of Idaho to clean up all hazardous areas at TAN on an escalated schedule
- Technology transfer needs that would require the unique capabilities and facilities at TAN
- Increased activities at other INEL functional areas that would require support from TAN.

Condition of Facilities

Eighty-six buildings are located at TAN. Thirteen percent of these buildings are in excellent condition, 39% are in good condition, 28% are in fair condition, and 20% are in poor condition.

The condition of structures and equipment at TAN is undocumented. However, the percentages of poor-to-excellent structures and equipment at TAN are believed to be comparable to the percentages for TAN buildings.

Conditions That Would Enhance/Deter New or Expanded Missions

Continued reduction of defense-related programs by the U.S. Government will restrict the need to create new, or expand existing, missions at TAN. In light of today's military defense climate, the SMC Program (currently TAN's largest project) will probably be terminated about the year 2000.

A need to resume defense-related activities by the U.S. Government would result in an extension of the Abrams Tank project and would renew the demand for nuclear reactor safety technology. Development of such technology would require support from most TAN facilities.

Factors That May Influence Future Use of the Area

The following factors will influence the future use of TAN:

- A need to conduct reactor research suited to the capabilities of TAN facilities
- An increased need for tank armor produced by the SMC Program
- A need to restart the Process Experimental Pilot Plant.

Program Mission Projections and Mission Resource Requirements

Mission Projections

Unless it becomes necessary for the United States to resume former levels of defense-related activities, work at TAN will be directed at completing existing programs, then deactivating all facilities and completing environmental restoration activities.

Mission Resource Requirements

Mission resource requirements for TAN will remain constant until the programs located there are completed. The need for resources will then increase to ensure deactivation, environmental restoration, and demolition are completed in a timely, efficient manner.

Future Workload

Work on program activities will decrease as existing projects at TAN are completed. Meanwhile, work on deactivating and dispositioning of TAN facilities will increase for a time and then end by the year 2010, when work at TAN is projected to cease.

Future Population

Forecasting the future population of TAN personnel is a difficult undertaking, because funding for deactivating and dispositioning TAN facilities is uncertain. As existing programs are completed, however, the population at TAN is expected to decrease. It will then rebound somewhat when deactivation and dispositioning begin.

Master Plan

Goals

The major goals at TAN are to complete existing programs and then deactivate and dispose of TAN facilities. The following activities will help to achieve these goals:

- Complete work necessary to ensure compliance with Environmental Protection Agency regulations.
- Reduce maintenance expenses for nonessential facilities.
- Maintain and manage existing facilities for maximum support and use.
- Excess or demolish facilities that are no longer needed.
- Prepare for the possible early shutdown of CTF.

Facility and Land Requirements

Any demands for facilities and land at TAN will be met with the current building and land inventory. Moreover, the expected downturn in activities at TAN will result in surplus space, which would be available for any future programs.

Future Land Uses

Land at TAN will be used to complete existing programs. As these programs are completed, buildings that house the programs will be deactivated and disposed of.

Future Facility Locations and Construction Programs

Major facility construction will not be part of the future of TAN due to the proposed reduction in activities there. Construction projects will be proposed and completed only when they are needed to ensure that existing programs are completed in a safe, efficient manner.

Table 4-1 lists the construction activities slated for TAN. Figures 4-2 through 4-9 show existing facility locations, future facility locations, and construction projects at TAN.

Utility Sources, Loads, and Distribution/Collection System Configurations

Power comes to the TAN-TSF Substation via the INEL's 138-kV loop, which originates at the CFA Scoville Substation. The power is transformed down to 13.8 kV and is fed to TSF, CTF, and WRRTF. Power is transformed down to lower voltages as needed throughout TSF and flows through overhead and underground lines.

Types of water systems at TAN include water wells and storage, domestic water, service water, softened water, demineralized water, and fire protection water.

Various sections of each utility system need some form of upgrade. Water to all of TAN is periodically contaminated in one manner or another. Treatment of this water is expensive, and the treatment systems are subject to mechanical breakdown. TAN electrical systems need upgrading to meet current electrical codes. Sanitary waste collection systems need repair or replacement.

Table 4-1. TAN modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1993	TAN-629 Re-roof (SMC)	1,800K	Line item construc- tion project (LICP)	Depart- ment of the Army	FY 1995	An overbuild support structure will be constructed, and a standing seam metal roof system will be installed. Metal access walkways and a ladder will be included in the installation. The lightning protection system for the building will also be upgraded.
FY 1993	Dry Cask Storage Project	20,600K	LICP	Program	FY 1998	This project will correct deficiencies in the storage of fuel-bearing materials in the TAN Hot Shop Pool. The pool and surrounding facilities lack the positive means of leak protection and ventilation control required. This project will provide long-term, dry, in-cask storage for this material.
FY 1994	SMC Sanitary Waste System Upgrade	1,100K	General plant project (GPP)	Depart- ment of the Army	FY 1995	This project will consist of constructing a double-lined pond with three separate cells to handle all of the sanitary waste and the industrial waste water generated at the SMC.
FY 1995	TAN-607 Roof Replacement	1,030K	GPP	Landlord	FY 1995	About 34,500 ft ² of the TAN-607 roof surface area will be repaired or replaced. Wet insulation will be removed and replaced by new insulation.

TAN-IET

FIGURE 4-2. TAN-IET EXISTING LAND USE MAP.

TAN-IET

FIGURE 4-3. TAN-IET MASTER PLAN MAP.

TAN-CTF (SMC)

FIGURE 4-4 AN-CTF EXISTING LAND USE

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2 (NOT TO SCALE)

TAN-CTF (SMC)

FIGURE 4-5. TAN-CTF MASTER PLAN MAP.

FIGURE 4-6. TAN-TSF EXISTING LAND USE MAP.

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TAN-TSF

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
3	FY 1993	DRY CASK STORAGE PROJECT	FY 1998
4	FY 1995	TAN-607 ROOF REPLACEMENT	FY 1995
SI	FY 1994	INEL MEDICAL FACILITIES UPGRADE (SITEWIDE)	FY 1997

FIGURE 4-7. TAN-TSF MASTER PLAN MAP.

TAN-WRRTF

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SCALE IN FEET

FIGURE 4-8. TAN-WRRTF EXISTING LAND USE MAP.

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TAN-WRRTF

FIGURE 4-9. TAN-WRTF MASTER PLAN MAP.

Special Considerations

Table 4-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 4-2. TAN site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
The TAN utility systems are past their life expectancy and require constant maintenance and repair.	Escalate the closure rate of TAN on a systematic basis, or provide additional funds to upgrade the utility systems to support existing programs in a cost-effective manner.	Quicker closure of TAN would require an increase in funding for demolition and environmental restoration. Upgrading the TAN utility systems would require a commitment of GPP, LICP, general purpose capital equipment, and maintenance funding.	Failure of utility systems will continue, resulting in increased maintenance expenditures and program downtime. Programs may eventually be cancelled or relocated.

Idaho National Engineering Laboratory

Site Development Plan

Radioactive Waste Management Complex (RWMC)

September 1994

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SECTION 5

RADIOACTIVE WASTE MANAGEMENT COMPLEX (RWMC) SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

The primary mission of the RWMC is twofold:

- a. Manage, in a safe and environmentally sound manner, the disposal of low-level radioactive waste (LLW) and the storage of transuranic (TRU) radioactive waste.
- b. Develop technologies that will serve the waste management needs of present and planned facilities at the Idaho National Engineering Laboratory (INEL).

Workload

About 80,000 ft³ of LLW per year are processed at the RWMC. At the Subsurface Disposal Area (SDA) of the RWMC, LLW is placed into shallow land disposal.

TRU waste, generated by national defense programs, was disposed in the SDA from 1954 to 1970 and was placed in storage from 1970 to the present. At the RWMC's Stored Waste Examination Pilot Plant (SWEPP), some of the TRU waste is being vented, examined, and certified for eventual disposal at a permanent national repository, such as the Waste Isolation Pilot Plant (WIPP) in New Mexico. SWEPP personnel use nondestructive examination techniques to determine if TRU waste meets the WIPP acceptance criteria. Certified containers are stored at the Certified and Segregated (C&S) Waste Storage Building until shipment to WIPP.

The current emphasis at the RWMC is on providing support to WIPP for a five-year experimental test program that will demonstrate WIPP compliance with Federal regulations. As part of the testing, wastes are being retrieved from storage in the C&S Waste Storage Building and examined at SWEPP. Transuranic Package Transporter (TRUPACT) II shipping capability is being implemented to support shipments to WIPP.

As part of a resolute effort to comply with the Resource Conservation and Recovery Act (RCRA), a consent order agreement is in force to move 50% of the waste containers in the Air Support Weather Shield II and the C&S Waste Storage Building to the new Waste Storage Facilities (which are under construction) by January 1, 1996, and to move the remaining waste by January 1, 1998. This effort includes preparation of documents, construction of facilities, operational readiness tests, movement of waste, sampling, and inspection.

Personnel in the Environmental Restoration Program are conducting remedial investigations of the SDA. Site characterization activities included in the investigation consist of drilling wells for

characterizing and monitoring purposes, sampling various aspects and features of the SDA, and characterizing waste disposed in the SDA. Remedial technologies being investigated include:

- Vapor vacuum extraction (which uses a pump attached to a wellhead to extract volatile organic vapors from the subsurface geology)
- Retrieval (which is a remote operation that excavates within containment).

Population

Currently, 345 personnel are located at the RWMC.

Site and Regional Information

The RWMC is a restricted area located seven miles southwest of the Central Facilities Area (CFA) (see Figure 5-1). The characteristics of the land surrounding the RWMC are favorable for the mission of the facility. The RWMC is located in the southwestern quadrant of the INEL in a depression circumscribed by basaltic and lava ridges. The ground surface is relatively flat. The elevation is approximately 5,000 ft above sea level. The Snake River Plain Aquifer, a significant natural resource, lies beneath the RWMC at a depth of approximately 600 ft. The Eastern Snake River Plain is a shrub-steppe biotic community. Weather and vegetation are representative of a cool desert ecosystem.

A limited danger of localized flooding exists at the RWMC from occasional rapid snow melt. However, steps have been taken to protect against this danger.

For planning purposes, the RWMC is divided into three zones:

- The Administrative Area, located in the northeast section of the RWMC, consists of structures supporting RWMC operations. This area contains buildings used for office space and other activities that support RWMC operations.
- The SDA, an 88-acre area located in the western section of the RWMC, is dedicated to permanent shallow land disposal of solid low-level beta-gamma waste. The SDA is contained within a security fence and contains pits, trenches, and vaults for underground waste disposal.
- The Transuranic Storage Area (TSA), a 56-acre area located in the southern section of the RWMC, is dedicated to the temporary storage of contact- and remote-handled solid TRU wastes. The TSA is contained within a security fence and includes the SWEPP Building, the Air Support Weather Shield II Building, the C&S Waste Storage Building, the Drum Venting Building (where filters are installed in the lids of waste drums to prevent hydrogen buildup), a maintenance shop, the TRUPACT loading station, storage structures, and several portable temporary offices.

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Figure 5-1. Location of the RWMC (shaded area).

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

The RWMC can expect some opposition to long-term storage of radioactive waste. Political momentum may be gained by certain groups opposed to waste storage. Such a development could undermine public support of the RWMC mission. It appears, however, that a substantial majority of residents of southeast Idaho support the RWMC. Public opinion expressed in the local media and through civic and professional groups supports this observation. Idaho's delegation in the U.S. Congress also supports the RWMC, as do the majority of representatives to the State legislature from the counties surrounding the INEL.

The success or failure of environmental restoration and waste management activities at the RWMC will be closely watched by interested persons and environmental groups. The RWMC will likely become the showcase for environmental restoration at the INEL.

Condition of Facilities

Virtually all of the buildings at the RWMC are in good or excellent condition.

Conditions That Would Enhance/Deter New or Expanded Missions

The electrical supply system at the RWMC is at or near its maximum load. An upgrade of this system is needed to accommodate any further expansion of the RWMC.

Factors That May Influence Future Use of the Area

Failure to open WIPP would drastically influence the RWMC. Two of the main goals at the RWMC are to retrieve waste and ship it to a permanent repository, such as WIPP. WIPP is the only repository of its kind, and no other waste repositories are currently planned. Consequently, the RWMC will have to modify its mission in order to manage waste onsite for the long term if WIPP does not open.

Program Mission Projections and Mission Resource Requirements

Mission Projections

The skilled workforce at the RWMC will continue to conduct and improve waste handling, packaging, storage, and certification operations for the next 30 years or until the RWMC's capabilities are no longer needed. The long-range plan to manage mixed radioactive TRU waste at the INEL is to repackage and remove as much of the waste now stored at the RWMC as possible. The INEL is also implementing waste minimization programs to reduce the amount of waste generated.

The mission of the RWMC is not expected to change in the future, but site remediation and environmental restoration will begin to play a more significant role as remediation investigations give way to actual retrieval activities.

Mission Resource Requirements

Disposal practices once thought to be state-of-the-art at the RWMC have now been found to be potentially detrimental to the environment. The full extent of environmental contamination due to past disposal practices is being investigated. Correcting the damage will take a considerable amount of time and money, but cleanup of significant contamination, where it is discovered, is imperative. The Department of Energy (DOE) is committed to using environmentally sound waste management practices that minimize waste and handle it properly, cleaning up contamination to the greatest extent feasible, and restoring the environment of the site.

RCRA requirements for mixed TRU waste at the RWMC have precipitated the need to monitor, upgrade, and build new structures. Several new facilities will be required to meet the requirements of RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act. The taxpayers and DOE must be willing to dedicate the resources required to maintain and expand existing roads, sewer, utilities, and buildings to support the current and future mission of the RWMC.

It is also important to maintain a skilled workforce so that RWMC waste operations and site remediation activities can continue as planned.

Future Workload

Imminent and ongoing activities include closure of part of the Intermediate Level Transuranic Storage Facility, closure of the Air Support Weather Shield II Building by approximately 1996, and closure of the C&S Waste Storage Building by approximately 1998. Negotiations are also under way to move the earthen-covered radioactive element wastes from the TSA to storage that complies with RCRA. A consent order agreement for control of wastes addressed in the Toxic Substances Control Act is being negotiated.

In about 30 years, the RWMC will cease active disposal. Storage operations and other waste management facilities will assume responsibility for waste currently handled there.

Future Population

The current RWMC workforce is projected to increase by fiscal year (FY) 1999 due to expanding RCRA activities. Increases are also expected when WIPP begins receiving waste from the RWMC. Due to the current political situation, however, estimating the date WIPP will open is not possible.

Master Plan

Goals

The major strategic goals identified for the RWMC are as follows:

- Continuously improve safe and compliant operations.

- Implement DOE ownership and contractor management of the RWMC.
- Develop joint ownership by facility and program, on both DOE and contractor parts, of environmental restoration schedules and activities.
- Develop a long-term LLW disposal strategy that adequately addresses INEL environmental concerns, cost-effectiveness, and program needs.
- Prepare the RWMC adequately to support all TRU waste treatment, storage, disposal, and programmatic needs.
- Permanently disposition all wastes and eventually close the RWMC.

Facility and Land Requirements

Facility expansion will continue to be a part of the future of the RWMC. However, this expansion is not expected to require any land outside of the current RWMC boundaries.

Future Land Uses

Land at the RWMC will continue to be used to manage and store radioactive waste.

Future Facility Locations and Construction Programs

Table 5-1 lists the construction activities slated for the RWMC. Figures 5-2 and 5-3 show existing facility locations, future facility locations, and construction projects at the RWMC.

Utility Sources, Loads, and Distribution/Collection System Configurations

Power comes from the Experimental Breeder Reactor I/Waste Management Office main feeder line, which originates at the CFA Scoville Substation. The 12.5-kV lines pass through the RWMC administrative area, into the TSA, and to the north perimeter of the SDA. The power is transformed down to lower voltages as needed in the various areas of the RWMC and distributed via aboveground and underground lines.

Security lighting, emergency power lines, a warning system beacon, sirens, and telephones are used and maintained throughout the RWMC.

Domestic and fire water is pumped from a deep well in pumphouse WMF-603. The water is then stored in a 260,000-gallon water storage tank (WMF-709) or pressurized by the fire water and domestic water pumps and distributed to the different facilities. The current fire water system is being modified, and a new fire water pumphouse and storage tank are being added.

Sanitary sewer system lines lead from the Lunch Room/Change Room Building (WMF-604) and the Radiation Control Field Office (WMF-601) to a 2,500-gallon septic tank and drain field located northwest of WMF-601. A second system leads northeast from the SWEPP Building (WMF-610) to a 2,500-gallon septic tank and drain field. A third system leads west from the new

WMF-613 facility to a 1,250-gallon septic tank and drain field. The sanitary sewer system components are being upgraded or replaced with more modern systems.

Propane is stored in tanks near the pumphouse and near the C&S Waste Storage Building. This propane is distributed through underground lines.

Table 5-1. RWMC modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord/Program Funding	Estimated Completion Year	Scope
FY 1990	Type II Storage Modules (#1 and 2)	4,900K	Line item construction project (LICP)	Program	FY 1994	Each Type II storage module provides 28,800 ft ² of storage area for the TRU stored waste containers. This storage complies with RCRA.
FY 1990	Operations Control Building	4,800K	LICP	Program	FY 1995	This building will be used to monitor and control access to, and work within, the RWMC.
FY 1990	Type I and Type II Storage Modules (#3)	6,100K	LICP	Program	FY 1995	The Type I storage module covers the existing drum venting facility, allows for year-round venting operations, and provides an area to heat and aspirate the waste containers. The Type II storage module provides 28,800 ft ² of RCRA-compliant storage area for the TRU stored waste containers.
FY 1990	Type II Storage Modules (#4 and 5)	3,100K	LICP	Program	FY 1995	Each Type II storage module provides 28,800 ft ² of storage area for the TRU stored waste containers. This storage complies with RCRA.
FY 1990	Transuranic Storage Area Retrieval (TSAR) Enclosure Modifications	4,200K	LICP	Program	FY 2001	This project modifies the south end of the TSAR enclosure to provide additional TRU waste storage. The modified area is equivalent to two Type II storage modules.
FY 1990	Waste Characterization Facility	37,800K	LICP	Program	FY 1997	This facility provides the capability to open waste containers and remove samples for RCRA analysis and to perform a quality verification with respect to meeting the WIPP waste acceptance criteria.
FY 1990	Type II Storage Modules (#6 and 7)	3,100K	LICP	Program	FY 1995	Each Type II storage module provides 28,800 ft ² of storage area for the TRU stored waste containers. This storage complies with RCRA.
FY 1990	Waste Characterization Storage Facility Site Improvements	11,000K	LICP	Program	FY 1997	The site improvement portion of the Waste Characterization Storage Facility will upgrade the utility infrastructure at the RWMC, including potable and fire water, electrical power, sewer, communications, alarms, roads, grounds, and flood control.
FY 1992	TSAR Enclosure	41,000K	LICP	Program	FY 1996	This project provides a weather enclosure over the TRU stored waste containers that are not in the air-supported buildings and also provides equipment to retrieve the waste containers for transfer to the Type II storage modules.

Table 5-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1992	Cold Test Pit Weather Shield	To be determined	LICP	Program	FY 1996	This project will provide a dust-free environment and shelter in which to conduct the Innovative Grouting/Retrieval Demonstration.
FY 1993	Material Handling Facility	1,035K	General plant project (GPP)	Program	FY 1995	This project will provide a consolidated and environmentally controlled area for year-round receiving and storage of materials and spare parts.
FY 1993	RWMC Maintenance Facility	1,083K	GPP	Program	FY 1995	This project will provide a facility for year-round repair and maintenance activities and fabrication of small support items required by RWMC operations.
FY 1994	DOE/RWMC Office Facility	1,050K	GPP	Program	FY 1995	This project will provide office space for 26 RWMC personnel.
FY 1995	Alert/Evacuation and Public Address System Upgrade	510K	GPP	Program	FY 1996	This project will upgrade the alert/evacuation and public address system at the RWMC, including all buildings, trailers, and areas not now adequately covered.
FY 1996	Ethernet/Fiber Optic Connection to CFA	643K	GPP	Program	FY 1996	Fiber optic cable will be installed from WMF-619 to CF-668. It will also provide equipment needed to connect the RWMC to the INEL network communication system.
FY 1996	RWMC Communication and Alarm Interface with the RADCON Data Acquisition and Alarm Processing System	490K	GPP	Program	FY 1996	This project will connect existing site information and alarm systems to the new RADCON Data Acquisition and Alarm Processing System, which will be located in the Operations Control Building. The systems included are fire alarms, remote area monitors, constant air monitors, industrial data and alarms, and meteorological data and alarms.

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FIGURE 5-2. RWMC EXISTING LAND USE MAP

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MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
1	FY 1990	TYPE II STORAGE MODULES (#1 AND #2)	FY 1994
2	FY 1990	OPERATIONS CONTROL BUILDING	FY 1995
3	FY 1990	TYPE I AND TYPE II STORAGE MODULES (#3)	FY 1995
4	FY 1990	TYPE II STORAGE MODULES (#4 AND #5)	FY 1995
5	FY 1990	TSAR ENCLOSURE MODIFICATIONS	FY 2001
6	FY 1990	WASTE CHARACTERIZATION FACILITY	FY 1997
7	FY 1990	TYPE II STORAGE MODULES (#6 AND #7)	FY 1995
8	FY 1990	WASTE CHARACTERIZATION STORAGE FACILITY SITE IMPROVEMENTS (ONLY A SMALL ASPECT OF PROJECT IS SHOWN; REMAINDER IS TOO EXPANSIVE TO MAP)	FY 1997
9	FY 1992	TSAR ENCLOSURE	FY 1996
10	FY 1992	COLD TEST PIT WEATHER SHIELD	FY 1996
11	FY 1993	MATERIAL HANDLING FACILITY	FY 1995
12	FY 1993	RWMC MAINTENANCE FACILITY	FY 1995
13	FY 1994	DOE/RWMC OFFICE FACILITY	FY 1995
14	FY 1995	ALERT/EVACUATION AND PUBLIC ADDRESS SYSTEM UPGRADE (NOT SHOWN DUE TO EXPANSIVE NATURE OF PROJECT)	FY 1996
15	FY 1996	ETHERNET/FIBER OPTIC CONNECTION TO CFA	FY 1996
16	FY 1996	RWMC COMMUNICATION AND ALARM INTERFACE WITH THE RADCON DATA ACQUISITION AND ALARM PROCESSING SYSTEM (NOT SHOWN DUE TO EXPANSIVE NATURE OF PROJECT)	FY 1996

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FIGURE 5-3. RWMC MASTER PLAN MAP.

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Special Considerations

Table 5-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 5-2. RWMC site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
The electrical supply system for the RWMC is at or near its maximum load.	Upgrade the RWMC power supply with a 138-kV spur and substation.	About \$10,000K are required to upgrade the electrical power supply system at the RWMC.	Future expansion of the RWMC will be severely limited by a lack of available electrical power.

Idaho National Engineering Laboratory

Site Development Plan

Power Burst Facility (PBF)

September 1994

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SECTION 6

POWER BURST FACILITY (PBF)

SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

PBF is divided into five areas: the PBF Reactor Area, the PBF Control Area, the Waste Engineering Development Facility (WEDF), the Mixed Waste Storage Facility (MWSF), and the Waste Experimental Reduction Facility (WERF).

The PBF Reactor Area is in shutdown status. It was built in 1970 for use in studies of fuel behavior during normal and off-normal operating conditions. Boron Neutron Capture Therapy (BNCT), which is a cancer research and treatment project, is being considered for the PBF Reactor Area. If this new mission is not realized, the PBF Reactor Area will be characterized and then scheduled for decommissioning and demolition.

Buildings in the PBF Control Area house the PBF reactor controls and instrumentation, administrative offices, mechanical work areas, and a data acquisition and reduction system that recorded data from PBF reactor experiments.

WEDF is a decommissioned reactor facility that has been modified for storage of clean lead and use as a craft staging area.

The MWSF is another decommissioned reactor facility that has been modified to store mixed waste.

WERF is also a decommissioned reactor area. It has been modified to create a facility used to reduce the volume of low-level radioactive waste (LLW) and to treat mixed LLW. WERF activities are projected to increase, and it is slated to become the central location for incineration, stabilization, and size reduction of INEL radioactive and mixed waste.

WEDF, MWSF, and WERF are part of the Waste Reduction Operations Complex (WROC). WROC provides for the safe treatment, storage, disposal, and recycling of radioactive hazardous, mixed, and industrial/commercial wastes in accordance with Federal regulations, Department of Energy (DOE) Orders, and environmental, safety, and health requirements. WROC also supports the transport of hazardous, radioactive, and general commodity shipments on and off the INEL site by providing transportation requirements, guidance, and training.

Workload

WROC personnel develop and carry out an annual work plan in support of the strategic objectives agreed upon by DOE. WROC supports the following strategic objectives:

- Become a regional and national center for waste reduction, mixed waste treatment, research, development, information, and expertise.
- Become the flagship of the DOE national laboratory complex in terms of waste management.
- Become recognized for efficient management of stored and disposed waste in compliance with regulations.
- Provide the DOE national laboratory complex with mixed waste planning, treatment, and disposal coordination for wastes generated from operations, environmental restoration, and decontamination and decommissioning activities.

Specific goals and workload projections for WROC include the following:

- Maximize use of available technology and facilities to expeditiously treat, store, and dispose of existing and projected INEL waste.
- Obtain recertification from the Nuclear Regulatory Commission for the CNS 1-13C cask by September 30, 1994.
- Size reduce 2,800 m³ of metallic LLW at WERF by September 30, 1995.
- Compact 5,700 m³ of compactible LLW at WERF by September 30, 1995.
- Dismantle 12 lead-lined casks by September 30, 1995.
- Process 620 hazardous waste containers by September 30, 1995.
- Process 84,500 yd³ of commercial/industrial waste annually [fiscal year (FY) 1996 through FY 2000].
- Treat 33 m³ of nonincinerable mixed LLW by September 30, 1996.
- Size reduce 2,400 m³ of metallic LLW at WERF annually (FY 1996 through FY 2000).
- Compact 4,896 m³ of compactible LLW at WERF annually (FY 1996 through FY 2000).
- Complete the acquisition of certified casks and containers by September 30, 1999.
- Complete the surface decontamination of 1,000,000 pounds of lead bricks/sheets by September 30, 2000.
- Aggressively pursue regional treatment center capability for mixed LLW by 2000, including identification of treatment facilities and development of a complementary disposal facility.
- Develop a waste treatment technology prototyping center with private industry by 2000.

- Transform the INEL into a national model of pollution prevention through industrial partnership where processes and facilities recycle, treat waste in-process, and develop treatment technology improvements to achieve a zero discharge goal by 2010.

Population

Currently, 159 people are employed at PBF.

Site and Regional Information

PBF is located in the south-central portion of the INEL site, about nine miles east of the Central Facilities Area (CFA) (see Figure 6-1). PBF was established in the 1950s to test four reactors for reactor transient behavior and to study the safety of light-water-moderated, enriched-fuel systems. The tests, called the Special Power Excursion Reactor Tests (SPERT), began in the late 1950s.

The PBF Control Area formed the control center for the reactors used in early research at PBF. The PBF Control Area housed reactor controls and instrumentation. These controls still reside in the PBF Control Area, but the area is now used primarily for administrative office space.

The PBF Reactor Area encompasses the area where the first reactor and associated buildings were constructed at PBF. Testing on that reactor began in 1956. It was decommissioned in 1964 and demolished in 1985. In 1970, another reactor was built north of the original reactor to support studies of fuel behavior during various operating conditions. The PBF Reactor Area is in shutdown status pending inactivation or transition to another mission.

WEDF, once the site occupied by the second reactor built at PBF, is now used to store clean lead and stage craft projects. Future plans call for installation of mixed LLW treatment processes at WEDF.

WERF is situated on the site once occupied by the third reactor in operation at PBF. That reactor was decommissioned and decontaminated in 1980 and was later converted to WERF. The purpose of the conversion was to create a facility where the volume of LLW and mixed waste could be reduced before being shipped to disposal sites. WERF is equipped with a 5.5-million BTU/hr incinerator, a 524-kW induction melting furnace (not operational), a 200-ton compactor, and a 960 ft² sizing shop where waste can be cut up. Also included are an offgas system, ash solidification room, indoor mixed waste storage within the WERF Waste Storage Building, and a 4,600 ft² outdoor radioactive waste storage area.

MWSF is located on the site of the fourth reactor built at PBF. It has been converted to a Resource Conservation and Recovery Act (RCRA) storage facility having interim status for mixed waste that is both hazardous (as defined in 40 CFR 261) and radioactive. Waste forms are low-level (transuranic activity less than 10 Ci/g). The storage facility consists of a decommissioned reactor area retrofitted to store the waste. Up to 62,500 gallons of nonreactive, solid mixed waste can also be stored in cargo containers stacked around the periphery of the storage building. The facility has areas to accommodate storage of polychlorinated biphenyls (PCBs), corrosives, and flammables in compliance with RCRA.

M94 0356

Figure 6-1. Location of PBF (shaded area).

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

The waste management mission and activities carried out at PBF are enhanced by the fact that the waste management processes are RCRA approved. RCRA approval has been obtained for facilities, storage of waste, treatment of waste, and disposal (at the Radioactive Waste Management Complex) of contaminated and commercial/industrial wastes at PBF.

Fiber optic communication systems at PBF also enhance the quality and timeliness of work performed at PBF.

However, uncertainties about continued funding for some PBF activities is a potential deterrent to current operations.

Condition of Facilities

The facilities at PBF are in relatively good condition. Only 8% of PBF facilities are in poor condition. Sixty-one percent are in fair to good condition, and 8% are in excellent condition. Most of the construction planned for PBF consists of upgrades to existing buildings and utilities rather than new building construction.

Conditions That Would Enhance/Deter New or Expanded Missions

The expansion of existing, or the development of new, missions at PBF is enhanced by the large quantities of available land and water as well as the good roads and utilities that serve the area. Depending on the nature of the mission, the remote location of PBF may be attractive or problematic.

The State of Idaho supports existing and developing waste treatment processes at PBF. However, the development of new or expanded missions at PBF may be hampered by uncertainty over the current Administration's support of waste treatment technologies and processes, especially the incineration processes now conducted at WERF.

Factors That May Influence Future Use of the Area

RCRA approval of PBF facilities and systems is a positive factor in attracting expanded and new missions to PBF. However, political support for PBF is also necessary in order to ensure future use beyond the existing missions.

Program Mission Projections and Mission Resource Requirements

Mission Projections

PBF will continue waste reduction activities and the treatment of mixed waste and LLW, the treatment and storage of mixed LLW, treatability studies for mixed waste and LLW, and new treatment demonstrations and studies for mixed waste, LLW, and mixed LLW.

In addition, surveillance and maintenance of the PBF Reactor Area will continue until a new mission is established or funding is available to begin inactivation of the facility.

Mission Resource Requirements

The mission resource requirements for PBF activities are reported in the *Department of Energy Office of Environmental Management Budget Formulation and Activity Data Sheet Development FY 1996 Planning and Budget Cycle*.

Future Workload

WROC is working toward becoming the regional and national center for waste reduction; mixed waste treatment; and waste management research, development, information, and expertise. Specific work goals include cask certifications; cask dismantlement; decontamination activities; size reduction of 49,796 m³ of waste; and processing, treating, or incinerating an additional 89,333 m³ of waste.

Future Population

Projections show that the number of personnel working at PBF will remain at about 150 until at least FY 2000. Beyond that time, the number of personnel at PBF will depend on the amount of additional waste management work directed toward PBF and/or the level of decontamination and decommissioning work to be conducted at PBF upon completion of current missions.

Master Plan

Goals

Planning goals for WROC include the following:

- Eliminate 25% of the solid waste at the INEL through process re-engineering, substitution, reuse, and recycling.
- Fully certify waste transport casks by FY 1999.
- Close hazardous waste storage areas, thereby eliminating onsite interior storage.
- Identify and develop treatment capabilities for mixed LLW to meet regional needs.

Planning goals for the PBF Reactor Area include transitioning the complex to a BNCT cancer treatment and research center or, if this goal goes unrealized, beginning the decontamination and demolition process.

Facility and Land Requirements

Land requirements are seldom an issue at PBF. Manmade and natural features place some limitations on the siting of facilities and utilities, but PBF is surrounded by a vast expanse of Government-owned land suitable for expansion.

Future Land Uses

Ongoing emphasis will be placed on evaluating the capability and condition of existing facilities, formulating construction projects designed to ensure that facilities fulfill their intended missions, and transitioning and deactivating surplus facilities.

Future Facility Locations and Construction Programs

Table 6-1 lists the construction activities slated for PBF. Figures 6-2 through 6-11 show existing facility locations, future facility locations, and construction projects at PBF.

Utility Sources, Loads, and Distribution/Collection System Configurations

Power comes to PBF from the CFA Scoville Substation. The 138-kV power is received at SPERT Substation Number 10, transformed to 13.8 kV, and distributed to the various buildings at PBF. Power lines that go to WERF, the PBF Reactor Area, and WEDF may need to be replaced because of deterioration from age. Transformers in the area are expected to be sufficient if maintained properly.

Domestic and fire water is pumped from PBF Deep Wells 1 and 2 and distributed to PBF buildings. The piping system provides separate lines for raw, sanitary sewer, and waste water.

Some repair of these utility systems is planned within the 1994 to 2000 planning period. More upgrades and repairs should be expected and budgeted for.

Table 6-1. PBF modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1993	Portable Water Treatment Unit Project	260K	Program capital equipment	Program	FY 1995	This project will provide a means to process aqueous mixed waste.
FY 1994	WERF Liquid Waste Injection System	530K	General plant project (GPP)	Program	FY 1996	This system will be used to incinerate liquid mixed LLW.
FY 1995	MWSF Mixed and Low-Level Waste Handling Room	720K	GPP	Program	FY 1995	Verification and sampling of mixed LLW will be done in this room before the waste is stored at the MWSF.
FY 1995	WEDF Upgrades	930K	GPP	Program	FY 1996	This upgrade will allow the existing facility (PBF-612) to support mixed waste treatment processes.
FY 1996	WROC Local Area Network	525K	GPP	Program	FY 1996	This project will install fiber optic cable to PBF-601 and -632, connecting them to the INEL communications network. The project will also provide a premise distribution system in the two buildings.
FY 1996	MWSF Storage Pad Expansion	330K	GPP	Program	FY 1996	The existing pad used to store portable storage unit cargo containers will be expanded to accommodate additional units. The existing access roads and operation areas around the MWSF will be resurfaced.
FY 1996	WERF Waste Storage Building (WWSB) Hazardous Waste Storage Modifications	224K	GPP	Program	FY 1996	This project will modify the south end of the WWSB (PBF-623) to provide for storage of nonradioactive hazardous waste.
FY 1997	PBF-601 Second Floor Expansion	To be determined	GPP	Program	FY 1998	This project will expand the second floor of PBF-601 over the existing high bay.

PLANT
&
TRUE

PBF-REACTOR AREA

FIGURE 6-2. PBF-REACTOR AREA EXISTING LAND USE MAP.

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BF-REACTOR AREA

FIGURE 6-3. PBF-REACTOR AREA MASTER PLAN MAP.

PBF-CONTROL AREA

748 ○ ○745
747 ○ ○746

□
744

FIGURE 6-4. PBF-CONTROL AREA EXISTING LAND USE MAP.

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LEGEND

- NEW CONSTRUCTION
- MODIFICATIONS
- DEMOLITION
- CANDIDATE 20-YEAR DEACTIVATION AND ENVIRONMENTAL RESTORATION AREA

PBF-CONTROL AREA

748 ○ ○745
747 ○ ○746

□
744

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
2	FY 1996	WROC LOCAL AREA NETWORK	FY 1996
3	FY 1997	PBF-601 SECOND FLOOR EXPANSION	FY 1998
S1	FY 1992	INEL FIRE AND LIFE SAFETY IMPROVEMENTS (SITEWIDE)	FY 1997

FIGURE 6-5. PBF-CONTROL AREA MASTER PLAN MAP.

PLANT
TRUE

PBF-WEDF

0 15 30 60 90 120
SCALE IN FEET

FIGURE 6-6. PBF-WEDF EXISTING LAND USE MAP.

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6-17

PLANT
TRUE

LEGEND

- NEW CONSTRUCTION
- MODIFICATIONS
- DEMOLITION
- CANDIDATE 20-YEAR DEACTIVATION AND ENVIRONMENTAL RESTORATION AREA

PBF-WEDF

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
4	FY 1995	WEDF UPGRADES	FY 1996

0 15 30 60 90 120

 SCALE IN FEET

FIGURE 6-7. PBF-WEDF MASTER PLAN MAP.

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PBF-MWSF

FIGURE 6-8. PBF-MWSF EXISTING LAND USE MAP.

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LEGEND

- NEW CONSTRUCTION
- MODIFICATIONS
- DEMOLITION
- CANDIDATE 20-YEAR DEACTIVATION AND ENVIRONMENTAL RESTORATION AREA

PBF-MWSF

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
5	FY 1995	MWSF MIXED AND LOW-LEVEL WASTE HANDLING ROOM	FY 1995
6	FY 1996	MWSF STORAGE PAD EXPANSION	FY 1996

FIGURE 6-9. PBF-MWSF MASTER PLAN MAP.

PBF-WERF

30 15 0 30 60 90
SCALE IN FEET

FIGURE 6-10. PBF-WERF EXISTING LAND USE MAP.

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MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
7	FY 1994	WERF LIQUID WASTE INJECTION SYSTEM	FY 1996
8	FY 1996	WWSB HAZARDOUS WASTE STORAGE MODIFICATIONS	FY 1996

LEGEND

- NEW CONSTRUCTION
- MODIFICATIONS
- DEMOLITION
- CANDIDATE BUILDING EXPANSION AREA
- CANDIDATE 20-YEAR DEACTIVATION AND ENVIRONMENTAL RESTORATION AREA

PBF-WERF

SDP09005
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Special Considerations

Table 6-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 6-2. PBF site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
DOE has yet to formulate a long-term strategy for dealing with mixed LLW.	DOE should make a decision about how to deal with mixed LLW, coordinating the decision with the State of Idaho, the Western Governors' Association, and regulations in the Federal Facilities Compliance Act.	None.	The INEL may eventually be in violation of the Federal Facilities Compliance Act.
Waste incineration is viewed by the Environmental Protection Agency as an acceptable waste-reduction technology and is performed in the private sector. However, incineration now appears to be unacceptable to DOE. This has resulted in a delay in processing incinerable waste at WERF.	DOE should accept and support waste incineration as a viable waste reduction method.	None.	Noncompliance with RCRA regulations for treatment of mixed LLW could result.

Idaho National Engineering Laboratory

Site Development Plan

Idaho Falls Area

September 1994

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SECTION 7 IDAHO FALLS AREA SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

Idaho National Engineering Laboratory (INEL) facilities located in the Idaho Falls Area provide training, administrative, and technical-support work space as well as laboratory and scientific-computer facilities in support of the Department of Energy (DOE) and other U.S. Government agencies.

Workload

Research and Development. Multi-discipline teams of scientists and engineers at the INEL Research Center (IRC) and five other leased laboratory facilities in the Idaho Falls Area work on a wide variety of advanced scientific research and development projects. These projects are designed to produce new technologies that can be transferred to the private sector.

Scientific Computing. The INEL Supercomputing Center (ISC) provides computing services needed to accomplish the INEL's engineering, scientific, and administrative functions. The ISC houses a CRAY X-MP/216 parallel architecture mainframe computer used for scientific applications and an IBM 3090 mainframe computer used for business applications.

Administrative Support. Fifteen leased buildings in the Idaho Falls Area provide general engineering and administrative office space in support of landlord and programmatic activities at the INEL. A training center located in the Technical Support Annex (TSA) consists of seven training rooms totalling over 4,500 ft².

Population

Currently, about 4,100 people are employed at INEL facilities in Idaho Falls.

Site and Regional Information

Idaho Falls, a community of about 45,000 people, is located 29 miles from the eastern boundary of the INEL site. DOE owns or leases 31 buildings throughout Idaho Falls for DOE and DOE contractor personnel who administer and support work at the INEL. Nearly 30% of INEL employees in administrative, scientific-support, and nonnuclear laboratory programs work in facilities in Idaho Falls. These facilities include the ID-North and ID-South buildings, the Willow Creek Building (WCB), the Engineering Research Office Building (EROB), TSA, the Technical Support Building (TSB), IRC, ISC, and several other administrative/technical support buildings.

The IRC and ISC are the only facilities in the Idaho Falls Area that are owned by DOE. All other facilities in the Idaho Falls Area are leased. The IRC is a 35.5-acre, nine-building complex with a population of 436. About 100 technical and support personnel work at the ISC.

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

Conditions that would enhance existing missions in the Idaho Falls Area include the following:

- Ability to sub-lease space in Idaho Falls Area facilities for private business ventures
- Opportunities to streamline operations due to the consolidated contract
- Opportunities to outsource many support service functions due to the consolidated contract
- Proposed technology park slated for land east of the IRC
- Increased competition among subcontractors, thereby reducing the cost of their services
- INEL User Resources Program.

Conditions that would deter from accomplishing the existing missions in the Idaho Falls Area include the following:

- Further budget cuts at the congressional level
- Weak education base
- Limited availability of high-quality leasable space
- Delays in funding for new facilities
- Regulatory changes that would impose additional requirements that increase costs, making the INEL a non-preferred choice of industry
- Decentralizing laboratory management
- Municipalities invoking stricter requirements on facilities that are currently "routinely accepted by the public." (The City of Idaho Falls is revising the Industrial Waste Agreement for the IRC and is issuing new agreements for the other Idaho Falls Area facilities).

Condition of Facilities

About 1,000,000 ft² of office, laboratory, and storage space are leased in the Idaho Falls Area for use by the INEL. Sixty-nine percent of this space is in excellent condition. The remaining 31% is in good condition based on facility manager/Condition Assessment Survey evaluations. The WCB and the newly constructed EROB account for more than 50% of the leased administrative office space in the Idaho Falls Area.

DOE owns 10 buildings in the Idaho Falls Area. The nine buildings located at the IRC are no more than 10 years old and are in excellent condition. The ISC, which was built in 1968, is in good condition.

Conditions That Would Enhance/Deter New or Expanded Missions

The Interim Engineering Demonstration Facility slated for completion in fiscal year (FY) 1995 at the IRC will greatly enhance the INEL's capability to expand current, and accommodate new, missions. This new facility will provide space needed to demonstrate how IRC projects can be applied to private industries.

Factors That May Influence Future Use of the Area

Establishing the INEL User Resources Program would make designated INEL resources available to small businesses, academia, industry, and government agencies for research and development purposes.

In addition, Bonneville County will be constructing a new high-technology business incubator on an eight-acre parcel of land east of the IRC. This new facility will be about 40,000 ft² and will include light industrial bays, wet and dry laboratories, offices, and conference rooms.

This construction project supports the charter and objectives of the Bonneville County Idaho Innovation Center for incubating small business ventures. It will also serve to establish the transition artery for deployment of technology from the INEL to the private business sector.

Program Mission Projections and Mission Resource Requirements

Mission Projections

Projections show that current capabilities for bench-scale research will be expanded to include scale-up and prototype research, with the goal of transferring technology to the private sector.

Mission Resource Requirements

Funding for the Idaho Falls Area comes from numerous sources. Mission resource requirements for the Idaho Falls Area are reported in the *Department of Energy Office of Environmental Management Budget Formulation and Activity Data Sheet Development FY 1996 Planning and Budget Cycle*.

Future Workload

The future workload in the Idaho Falls Area depends on the ability to attract internal and external sponsors. To attract sponsors, the INEL will need to become a low-cost/high-quality world leader in engineering and research capabilities.

Future Population

The number of personnel based in Idaho Falls in the future will depend on the support needs of program activities being conducted at the INEL site and the growth of research and development activities associated with the IRC. Current levels of INEL personnel working in the Idaho Falls Area (approximately 4,100) are projected to remain stable for several years.

Master Plan

Goals

Long-range planning goals for the Idaho Falls Area include the following:

- Construct and modify facilities to house larger-scale process research projects.
- Consolidate facilities and functions to lower operating and maintenance costs.
- Foster partnerships with innovation-technology centers.
- Continue to emphasize maintenance of existing strategic assets.
- Ensure regulatory compliance, and institute a culture of continuous improvement.

Facility and Land Requirements

Future facility needs in the Idaho Falls Area will be met by constructing and leasing facilities, with an emphasis on consolidating personnel and activities adjacent to the WCB, the EROB, and the ID-North and ID-South office buildings.

Productivity studies have shown that nonproductive time can be reduced drastically by consolidating personnel in a localized area. Personnel located in satellite facilities accumulate a substantial number of nonproductive hours commuting to core facilities for staff meetings, delivery of documents, printing services, medical services, etc. To rectify this situation, consolidation efforts will be focused on the area adjacent to the WCB, EROB, ID-North, and ID-South. Currently, about 400 personnel work at satellite facilities in the Idaho Falls Area.

Future Land Uses

Future land uses in the Idaho Falls Area will be limited to the current DOE-owned land, i.e., the IRC and ISC locations. All other land use will be provided by leases and will be limited to the short term whenever possible.

Future Facility Locations and Construction Programs

Table 7-1 lists the construction activities slated for the Idaho Falls Area. Figures 7-1 through 7-3 show existing facility locations, future facility locations, and construction projects in the Idaho Falls Area.

Utility Sources, Loads, and Distribution/Collection System Configurations

INEL facilities located in Idaho Falls receive electric power from the City of Idaho Falls, which operates a municipal 44-kV transmission system, as well as power generation, substation, and distribution facilities. Power purchased from the Bonneville Power Administration (BPA) supplies city loads. The city also operates three bulb turbine generating stations located along the Snake River and sells the output to the BPA. These stations have a total capacity of 26 MW and can supply about 30 to 40% of the city's power requirements.

The IRC facilities are supplied power by a City of Idaho Falls substation located adjacent to the IRC property. This substation has a 25-MW capacity and feeds the IRC laboratory facilities with two 3000-A service lines. The current IRC facilities use approximately 45% of the power available from the City of Idaho Falls substation.

Table 7-1. Idaho Falls Area modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1992	INEL Fire and Life Safety Improvements (Sitewide project)	29,000K	Line item construc- tion project	Landlord	FY 1997	This project is composed of eight subprojects that will correct fire protection and life safety code deficiencies in facilities controlled by the landlords at the INEL.
FY 1994	IRC Chemical Storage Facility	960K	General plant project (GPP)	Landlord	FY 1995	This project will provide a centralized building with separate rooms for safely receiving, storing, and dispensing chemicals of different classifications. Necessary chemicals are currently stored in individual laboratories in the Idaho Falls Area, resulting in decreased laboratory space, ineffective tracking of chemical inventories and expiration dates, and increased fire and health hazards to building occupants and emergency personnel.
FY 1994	IRC Fume Hood Upgrade	1,200K	GPP	Landlord	FY 1995	This upgrade will allow all 62 fume hoods in the IRC to be used simultaneously to provide once-through air. Currently, only 51 of the hoods can be used simultaneously, resulting in scheduling problems and additional time, resources, and paperwork to lock out one hood and bring another hood on line.
FY 1994	IRC Craft Shop	1,024K	GPP	Landlord	FY 1995	This project will provide a 5,760 ft ² craft shop at the IRC. It will include code-compliant work space for IRC carpenters, pipe fitters, electricians, and mechanics.
FY 1994	Interim Engineering Demonstration Facility	1,600K	GPP	Landlord	FY 1995	This project will support all project/program systems at the INEL that need to demonstrate proof-of-principle, engineering-scale research efforts. Capability for upscaling and feasibility demonstration is critical to the support of core competency growth, partnering opportunities, and technology transfer.
FY 1995	IF-627 and IF-611 Modifications	800K	GPP	Landlord	FY 1996	Modifications to these buildings are needed to accommodate classified projects. This project will support the DOE Secretary's Openness Initiative by moving classified projects from IF-602 and IF-603. Projected increases in the National Security Research and Development Business Initiative will also require more secure laboratory space, and compartmentalization will be more of a security concern.

Table 7-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1996	IRC Exhaust Stack Extension	300K	GPP	Landlord	FY 1996	Exhaust stacks at the IRC will be extended. Exhaust from laboratory fume hoods now exits the building in a lateral and downward direction. Depending on weather conditions, the exhaust can be drawn into the intake for the makeup air or can linger at ground level where pedestrians may be present.

LEGEND:

1. WCB
2. UNIVERSITY PLACE AND TECHNICAL LIBRARY (UP)
3. IRC
4. NORTH HOLMES COMPLEX
5. ID-SOUTH
6. NORTH HOLMES LABORATORY FACILITY
7. MAY STREET NORTH AND SOUTH FACILITIES
8. LINDSAY BLVD. COMPLEX (LBC)
9. ISC, TSA, TSB
10. DOE BUS LOT AND DISPATCH BUILDING
11. NORTH BOULEVARD ANNEX (NBA)
12. ID-NORTH
13. SHOUP AVE FACILITY (WINCO)
14. WOODRUFF AVE. COMPLEX
15. NORTH SKYLINE COMPLEX (TRAINING AND LABORATORY)
16. NORTH YELLOWSTONE COMPLEX
17. ENGINEERING RESEARCH OFFICE BUILDING

POSSIBLE DEVELOPMENT AREA
FOR IDAHO FALLS BASED FACILITIES

IDAHO FALLS

FIGURE 7-1. IDAHO FALLS AREA EXISTING LAND USE MAP.

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IRC/ISC-IDAHO FALLS AREA

FIGURE 7-2. IRC/ISC-IDAHO FALLS AREA EXISTING LAND USE MAP.

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
1	FY 1994	IRC CHEMICAL STORAGE FACILITY	FY 1995
2	FY 1994	IRC FUME HOOD UPGRADE	FY 1995
3	FY 1994	IRC CRAFT SHOP	FY 1995
4	FY 1994	INTERIM ENGINEERING DEMONSTRATION FACILITY	FY 1995
5	FY 1995	IF-627 AND IF-611 MODIFICATIONS	FY 1996
6	FY 1996	IRC EXHAUST STACK EXTENSION	FY 1996
S1	FY 1992	INEL FIRE AND LIFE SAFETY IMPROVEMENTS (SITEWIDE) (NOT SHOWN DUE TO EXPANSIVE NATURE OF PROJECT)	FY 1997

LEGEND

- NEW CONSTRUCTION
- MODIFICATIONS
- DEMOLITION
- RESEARCH AND DEVELOPMENT EXPANSION ZONE

IRC/ISC-IDAHO FALLS AREA

Special Considerations

Table 7-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 7-2. Idaho Falls Area site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
If program work continues to grow, there is no single programmatic sponsor to fund the required research, development, and demonstration facilities. Without a single-fund source or a well-defined group of sponsors, these facilities will not be built.	Establish a process for funding multipurpose laboratory facilities that do not have a single, large sponsor.	Sufficient GPP, line item construction project, and general purpose capital equipment funding is needed to support future growth.	Important new research may not be pursued, and new technologies may not be developed and implemented for transfer to the private sector for implementation.

Idaho National Engineering Laboratory

Site Development Plan

Sitewide Area

September 1994

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SECTION 8 SITEWIDE AREA SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

The 890-square-mile Sitewide Area is the whole of the Idaho National Engineering Laboratory (INEL) site, excluding land within the designated boundaries of the primary functional areas, such as the Power Burst Facility (PBF), the Test Reactor Area (TRA), Test Area North (TAN), and the Central Facilities Area (CFA) (see Figure 8-1).

Workload

No programs or projects are located in the Sitewide Area. All INEL programs and projects are sited at the primary functional areas.

Site Population

Less than 10 people are permanently assigned to specific Sitewide Area locations. Employees perform day-to-day work assignments in locations such as security guard gates, the INEL firing range, and Experimental Breeder Reactor I (EBR-I) historical site. However, most of these employees are permanently assigned to one of the INEL's primary functional areas.

Site and Regional Information

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

Some conditions exist outside of the INEL that could have a detrimental effect on the current mission and future of the Sitewide Area and the INEL. Specifically, a changing political support base in the State of Idaho affects the INEL. While support for Department of Energy (DOE) work remains strong across the State of Idaho, recent political conflicts concerning the transportation and storage of hazardous waste have created some friction at the State level. Potential contamination of the Snake River Aquifer (beneath the INEL) worries some Idaho residents, particularly those downstream from the INEL.

Condition of Facilities

Fifty-nine facilities are located in the Sitewide Area. Most of these facilities are old, abandoned reactor area buildings (such as those located in the Auxiliary Reactor Area) or other substandard buildings that once supported INEL projects. Forty of the 59 buildings are abandoned and/or are scheduled to be excessed or demolished in the near future. The remaining occupied Sitewide Area buildings include the INEL firing range facilities, the EBR-I historical site, guard gate facilities, and small utility buildings such as pumphouses and communications

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Figure 8-1. Location of Sitewide Area (shaded area).

buildings. Most of the viable facilities in the Sitewide Area are communication, utility, and transportation systems that serve and connect the INEL's primary functional areas.

Program Mission Projections and Mission Resource Requirements

Mission Projections

Future missions at the INEL will require support from the Sitewide Area. The following strategic thrusts will require this support:

- Natural resource processing and environmental management
- Spent nuclear fuel management
- Environmental technology development
- Mixed waste characterization and treatment
- Nonproliferation and counterproliferation
- Advanced manufacturing
- Alternate energy supply and energy efficiency
- Transportation technologies.

Mission Resource Requirements

Sitewide Area resources are used to support multiprogram facilities, roadways, maintenance, and utilities required to operate safely and cost-effectively. Sitewide Area support systems are crucial to the INEL's primary functional areas. Adequate funding is necessary to maintain or upgrade existing facilities and utilities in support of continued work efforts. A large backlog of maintenance and repair items requires continued funding and application of manpower to bring existing facilities and utilities into safe, useable condition and to prevent further deterioration.

Future Workload

Several initiatives for new INEL work are being pursued aggressively. Acquisition of new work will determine the future of the INEL and the Sitewide Area. The INEL is working during this time of change and opportunity to capitalize on its strengths, including those listed below:

- Materials, biological, and chemical processing technology
- Advanced manufacturing
- Remote handling and process automation

- Radioactive and hazardous waste management
- Materials irradiation and isotope production
- Earth and environmental sciences
- Instrumentation and sensors
- Safety and risk assessment
- Simulation and software development
- Human/system integration
- Testing and proof of principle.

Future Population

Personnel levels within the Sitewide Area will continue to be low.

Master Plan

Goals

Long-range planning goals for the Sitewide Area are as follows:

- Ensure regulatory compliance, and institute a culture of continuous self-improvement.
- Improve program management and control.
- Continue emphasis on maintaining and preserving existing strategic assets.
- Consolidate facilities and functions to lower operating and maintenance costs.
- Complete transportation infrastructure revitalization and shift emphasis to utilities and support facilities.

Future Land Uses

Manmade and natural physical, geological, and hydrological features within the Sitewide Area place some limitation on long-range planning and development of the land. Examples of these features are firing range safety zones, lava flows, buttes, spreading ponds, volcanic vents, floodplains, earthquake faults, and seismic zones.

The center of the Sitewide Area is zoned as prime development land. It is most suitable for development because of the absence of physical constraints to development, such as volcanic vents,

faults, floodplains, and steep slopes. Other factors include the proximity of the area to existing roads, power lines, and the CFA support facilities and services.

The firing range safety zones are down-range safety fans for the INEL Firing Ranges. For safety reasons, these areas are restricted from further development.

EBR-I, the world's first operational nuclear reactor, is the INEL's primary historic site and is located in the southwest corner of the INEL site. The immediate area surrounding this site is protected from development.

The floodplain of the Big Lost River is an area identified by estimating the probable maximum flooding that would occur over a land area in a hypothetical worst-case scenario. In this scenario, the amount of storm or snow water runoff entering the reservoir behind Mackay Dam (located approximately 25 miles to the west of the INEL site boundary) greatly exceeds the dam's storage capacity and spills over the top of the dam. This quickly leads to a breach that continues to erode rapidly until the entire reservoir empties into the floodplain of the Big Lost River. This wave of floodwater then overflows the INEL diversion dam downstream, causing a breach there. Although the possibility of such an event occurring is unlikely, studies suggest that future building sites be located outside of the floodplain, particularly in the case of facilities containing hazardous materials.

Included in portions of the floodplain are natural settling areas and sinks, including the spreading areas and sinks of the Big Lost River, which are expected to flood frequently. The spreading areas are regions of controlled flooding in the southwest corner of the INEL site that are created by the diversion dam to reduce flood levels downstream. The sinks are in the northwest corner of the INEL site where the river ends by percolating into the ground and recharging the aquifer.

Numerous inactive volcanic vents are located in various portions of the Sitewide Area with the greatest concentration in the east. They are absent from the central portion of the Sitewide Area, where the prime development land is located. Volcanic vents vary in height from about 20 ft to over 100 ft. They are frequently as much as two to three miles in diameter. The areas adjacent to the vents consist of lava flows, volcanic ash, and cinders. Because of its low density, volcanic ash is an unstable material to build on.

Because of the elapsed time since the last occurrence and the location of the latest volcanic activity, there is essentially no chance of volcanic activity posing a hazard to any proposed or existing INEL facilities.

The Sitewide Area is relatively level. Slopes exceeding a 15% grade occur on less than 1% of the land area. These slopes are mainly located on the foothills of the Lemhi Range (northwest of the INEL) and wherever buttes exist.

Some Sitewide Area soils are relatively impermeable and present a problem for septic tanks. Some soils, such as loess, also present compaction problems. A thorough analysis of the soils at all proposed building sites is completed as early as possible in siting studies.

Seismic zones are areas that have been rated by the International Conference of Building Officials to constitute varying risks of earthquake damage. Zone 1 has the lowest risk, and Zone 4

has the highest risk. Zones 2 and 3 are the only zones located in the Sitewide Area. Zone 3 is located northwest of TAN, in an area where there is moderate risk of future earthquake activity capable of causing building damage. The remainder of the Sitewide Area is located in Seismic Zone 2.

Several other considerations are addressed when proposing future land use. These considerations include circulation of roads and railroads, utilities, security, safety, environmental issues, and functional locations.

Future Facility Locations and Construction Programs

Table 8-1 shows construction projects slated for the Sitewide Area. Buildings and structures affected by Sitewide Area modification and construction projects are spread over such a broad area that showing the projects on a map in this plan is impractical. However, Sitewide Area projects that construct new facilities within the boundaries of other primary areas of the INEL — for example, PBF — are shown on figures provided in sections that address those specific areas.

Table 8-1. Sitewide Area modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1991	Idaho Waste Processing Facility	440,000K	Line item construction project (LICP)	Program	FY 2009	This facility will be used to process transuranic waste and transuranic-contaminated low-level solid wastes in preparation for disposal. In addition, the facility will process and treat alpha-LL waste containing combustibles, noncombustibles, and cemented and uncemented sludges.
FY 1992	US 20 Fiber Optic Cable Reroute	626K	General plant project (GPP)	Landlord	FY 1995	Four miles of telecommunications fiber optic cable will be rerouted, because the State of Idaho will be widening US Highway 20. The reconstruction could damage the cable and/or render it inaccessible.
FY 1992	INEL Sewer Systems Upgrade	9,150K	LICP	Landlord	FY 1995	This project will provide sewage treatment plants at CFA and TRA, extend main sewer lines to new plant locations, replace damaged or inadequate sewer lines, and treat effluent streams before injection into the sewage treatment plants.
FY 1992	INEL Fire and Life Safety Improvements	29,000K	LICP	Landlord	FY 1997	This project is composed of eight subprojects that will correct fire protection and life safety code deficiencies in facilities controlled by the landlords at the INEL.
FY 1993	INEL Explosive Site Upgrade	162K	GPP	Landlord	FY 1994	This upgrade will provide grading and graveling of appropriate areas of the INEL Explosive Site. This site does not now meet requirements of the <i>DOE Explosive Safety Manual</i> for access control, fire breaks, and telephone communications.
FY 1993	INEL Electrical Upgrade	17,500K	LICP	Landlord	FY 1996	Key portions of the high-voltage power system at the INEL will be upgraded. The existing system has been reliable in the past, but it is aging and its dependability is expected to decrease rapidly unless upgraded.
FY 1994	Miscellaneous/Minor Projects	67K	GPP	Landlord	FY 1994	The intent of funding for GPP miscellaneous and minor projects is to respond to customer needs that are immediate and/or did not exist before current fiscal year (FY) planning, are less than \$50K, and have been determined to be non-complex in nature.

Table 8-2. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1994	INEL Emergency Response Facilities	13,500K	LICP	Landlord	FY 1997	This project will provide a new fire station and fire fighter training facility at CFA and a new fire station at Argonne National Laboratory-West. This project is necessary for compliance with DOE Orders and National Fire Protection Association codes.
FY 1994	INEL Medical Facilities	9,700K	LICP	Landlord	FY 1997	This project is composed of three subprojects that will provide a new CFA Medical Facility and upgrades to existing medical facilities at TRA and TAN.
FY 1995	Advanced Scientific Computer System Upgrade I	2,200K	General purpose capital equip- ment (GPCE)	Landlord	FY 1995	Scientific computer operations will be off loaded from the CRAY supercomputer to a distributed system.
FY 1995	Naval Reactor Facility Parking Lot Upgrade	1,300K	GPP	Landlord	FY 1995	About 40,000 ft ² of asphalt and subbase will be replaced, and a new two-inch top coat will be placed over the remaining 200,000 ft ² of the parking surface. This will correct improper drainage and deterioration of the surface and subsurface asphalt.
FY 1995	Van Buren Boulevard Upgrade	535K	GPP	Landlord	FY 1996	Van Buren Boulevard is the primary access road to the Radioactive Waste Management Complex (RWMC). Weather and increased traffic have severely deteriorated the road over the past several years. Repairs must be made to support the RWMC programmatic mission.
FY 1996	INEL Radio Communications Upgrade (Trunking System)	6,600K	LICP	Landlord	FY 1999	This upgrade will provide a radio transmitting facility, "trunked" radio and microwave equipment, and a facility to support the Life Safety System organization operations. The upgrades will provide secondary trunked radio transmission capability for the INEL radio communications system and improved facilities for the Life Safety Systems organization.

Table 8-2. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1996	INEL Communications System Upgrade	1,800K	GPCE	Landlord	FY 1996	This upgrade will tie together communications for the major operating areas of the INEL and the outside world. The upgrade will include engineering and providing equipment, control firmware, documentation, and installation support to convert and move existing T-carrier services to a synchronous optical network transport and synchronous transfer mode switching environment.
FY 1996	INEL Network Upgrade	5,300K	GPCE	Landlord	FY 1997	This project includes the acquisition and installation of equipment required to upgrade existing INEL data communications systems to a standard communications topology, which will deliver parity level service to the INEL community.
FY 1996	Business Computer System Upgrades IV through VII	2,800K	GPCE	Landlord	FY 1999	Work from the IBM 3090 mainframe will be off loaded to a distributed system in seven phases beginning in FY 1994 and ending in FY 1999. Included in each year's budget is a request to fund the purchase and installation of electronic mail server work stations, database servers, and software.
FY 1996	INEL Road, Sidewalk, and Curb Upgrades	1,600K	GPP	Landlord	FY 1997	This project will upgrade, modify, and/or construct culverts, gutters, and drains; replace deteriorated sidewalks, curbs, and stoops; and provide new paved foot paths.
FY 1996	Miscellaneous/Minor Projects	To be determined	GPP	Landlord	FY 1996	The intent of funding for GPP miscellaneous and minor projects is to respond to customer needs that are immediate and/or did not exist before current FY planning, are less than \$50K, and have been determined to be non-complex in nature.
FY 1996	INEL Electrical Distribution Upgrade	14,000K	LICP	Landlord	FY 1999	This upgrade will correct deficiencies in the INEL's electrical distribution system so it will comply with State and local electric codes. Old, obsolete, and high-maintenance equipment will be replaced.

Table 8-2. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1997	INEL Personnel Access Control and Security Enhancement System	7,600K	LICP	Landlord	FY 1999	The existing INEL access control system will be replaced by magnetic strip card readers, data entry control stations, distributed central process units, tamper-indicating devices, line supervision, and upgraded system wiring. This project will put the INEL access control system in compliance with the DOE Common Badge and Access Control System, as required by the Director of Safeguards and Security, DOE Headquarters.
FY 1998	INEL Road Rehabilitation	10,000K	LICP	Landlord	FY 2000	This project is necessary to continue to provide a safe and effective transportation infrastructure for all future INEL activities. This project directly supports the Sitewide-specific planning goal of providing roads that meet the State of Idaho road standard and the INEL Standard of Pavement Condition Index. Several of the heavy equipment storage yards and other high-use parking and vehicle staging areas will also be upgraded to maintain their usefulness and integrity.
FY 1998	Material Handling and Warehouse Upgrade	7,000K	LICP	Landlord	FY 2000	This project will allow for the renovation, remodeling, construction, or demolition of numerous INEL material-handling facilities. Processes at current material-handling facilities will be evaluated. Advanced inventory controls, automated project tracking, privatization, and just-in-time delivery are examples of technologies being researched for inclusion in the scope of this project. The project will consolidate and standardize the numerous INEL material-handling systems, which are in excess of their design life (40 plus years). Though current systems have been retrofitted many times, they nevertheless inhibit compliance with regulations.

Special Considerations

Sitewide Area resources are used to support multiprogram facilities, transportation systems, communications systems, maintenance, and utilities required to operate within functional, safe, environmentally sound, and cost-effective means.

To meet present and future Sitewide Area needs, ongoing emphasis must be placed on evaluating the capability and condition of existing facilities and on formulating construction, maintenance, and upgrade projects designed to ensure that facilities fulfill their intended missions.

Idaho National Engineering Laboratory

Site Development Plan

Idaho Chemical Processing Plant (ICPP)

September 1994

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SECTION 9

IDAHO CHEMICAL PROCESSING PLANT (ICPP)

SITE DEVELOPMENT PLAN

Existing Missions, Workload, and Site Population

Existing Missions

The mission of the ICPP is to receive and store spent nuclear fuels and radioactive wastes for disposition for the Department of Energy (DOE) in a cost-effective manner that protects the safety of Idaho National Engineering Laboratory (INEL) employees, the public, and the environment by:

- Developing advanced technologies to process spent nuclear fuel for permanent offsite disposition and to achieve waste minimization
- Receiving, storing, and processing Navy and other DOE-assigned spent nuclear fuels
- Managing all wastes in compliance with applicable laws and regulations
- Identifying and conducting site remediation consistent with facility transition activities
- Seeking out and implementing private sector technology transfer and cooperative development agreements.

Before April 1992, the ICPP mission also included fuel reprocessing. With the phaseout of fuel reprocessing, some parts of the ICPP mission have changed.

Workload

Fuel Reprocessing Phaseout. The decision was made on April 28, 1992, to cease all reprocessing of nuclear fuels at the ICPP. This decision will lead to a phaseout of all fuel dissolution, solvent extraction, Rare Gas Plant operations, and product denitration at the ICPP. The reprocessing facilities will be converted to a safe and stable shutdown condition for surveillance and maintenance (deactivation/compliance) awaiting future reuse or decontamination and dispositioning.

Fuel reprocessing phaseout is assumed to cover:

- Final process operations, including a final uranium sweepdown needed to convert in-process materials to a stable storage form
- Process system clean-out necessary to maintain an adequate level of safety to the public, the in-plant workforce, and the environment.

The Fuel Processing Restoration (FPR) project, a new separations facility under construction, was to be placed in a lay-up posture for preservation and possible future use. The structural subcontracts were 100% complete upon closeout, and the total project, including the systems and components, was over 50% complete upon closeout.

Fuel Receipt and Storage. The scope of the fuel receipt and storage function has increased to provide storage for a greater quantity of fuel in the future due to the cessation of reprocessing. The storage capability will be exceeded before newly developed fuel dispositioning technologies can be implemented. The fuel storage facilities are 57% full. The current fuel storage inventory at the ICPP was 990 metric tons total mass as of June 30, 1994. This spent fuel mass contains 50.4 metric tons of heavy metal (16.2 metric tons of highly enriched uranium and 34.2 metric tons of depleted uranium).

Fuel receipts have averaged 40 metric tons total mass per year for the past 10 years. The future fuel receipt forecasts show an average of 80 metric tons total mass per year for the next 36 years. The total inventory in 2014 is anticipated to be 2600 metric tons total mass (including 49 metric tons of highly enriched uranium).

A substantial inventory is expected to accumulate before any alternative disposal method can be established. To support the increase in storage requirements, the storage configuration must be changed or additional storage facilities must be built.

Waste Management. Waste management includes management of the high-level liquid waste left over from reprocessing spent nuclear fuel, sodium-bearing liquid waste from decontamination and maintenance of reprocessing equipment, conversion of these liquid wastes into calcine, storage of the calcine in the Calcine Solids Storage Facilities (CSSFs), and management of decontamination and decommissioning (D&D) activities and corresponding waste streams.

Technology Development. Technology development has expanded and accelerated into its own functional area. In April 1992, the DOE Idaho Operations Office released the draft *Spent Fuel and Waste Management Technology Development Plan*, which outlined the strategy for the management of spent fuels and wastes at the ICPP. In September 1993, the *Idaho Chemical Processing Plant Spent Fuel and Waste Management Technology Development Program Plan* was issued and updated the objectives of the technology development program. The specific efforts discussed included points for developing and implementing (a) spent nuclear fuel interim storage, (b) improved radioactive waste treatment technologies, (c) enhanced D&D techniques, (d) performance assessments of waste forms in national repository(y/ies), (e) a systems approach in decision making and resolution of programmatic issues, and (f) investigation of waste processing technologies application to production-scale operations. A subsequent Federal court order set the deadline for selecting the technology necessary to treat the sodium-bearing and high-level liquid waste and conversion of calcine into a final disposal form in conjunction with the Spent Nuclear Fuel and INEL Environmental Impact Statement Record of Decision scheduled for June 1, 1995. More information concerning the evaluation and selection of the technologies for the record of decision can be found in the *ICPP Radioactive Liquid and Calcine Waste Technologies Evaluation Interim Report*, June 1994.

Population

Westinghouse Idaho Nuclear Company, Inc., (WINCO) employs approximately 1,800 employees. During the day, the ICPP site population is approximately 1,200. Four rotating, 12-hour shift crews are assigned to operations.

About 40% of the daytime population is involved in operations activities. The remaining 60% of the population is engaged in support activities, including environmental compliance, safety, engineering, projects, technical support and development, quality assurance, finance, and human resources.

Site and Regional Information

The ICPP is located approximately three miles north of the Central Facilities Area (see Figure 9-1). The ICPP land area is about 200 acres. This area is sufficient for existing fuel receipt, storage, and conditioning for disposal.

Existing and Potential Conditions That Would Enhance/Deter From Accomplishing Existing Mission

The INEL's history of safe operation, and the large number of people in southeast Idaho who are associated with it, produce a strong reservoir of support near the INEL's home base. However, support in other regions of Idaho has eroded in recent years, creating an opportunity for improved relationships in areas like Twin Falls, Boise, and Moscow. This loss of confidence is evidenced by actions taken by the State of Idaho and is attributable to concerns of its governor and citizens over water quality in the Snake River Aquifer and indefinite storage of spent nuclear fuel and high-level radioactive waste (HLW).

Late in 1988, the governor of Idaho banned further shipments of defense-related transuranic waste from the Rocky Flats Plant and spent nuclear fuel from the Fort St. Vrain (FSV) commercial reactor, both located in Colorado, to the INEL. The Shoshone-Bannock Tribes at Fort Hall also opposed FSV shipments across their reservation. DOE agreed to stop importing transuranic waste and will not attempt more FSV shipments until an INEL-wide environmental impact statement is completed in 1995.

Currently, the ICPP is the nation's only interim storage facility for spent Navy reactor fuel. The governor of Idaho obtained a Federal court injunction banning more Navy fuel shipments until completion of the INEL's environmental impact statement, which also considers construction of new facilities at alternate sites for Navy fuel storage. However, the Navy and DOE appealed a portion of this injunction. The injunction was subsequently modified (and signed in March 1994) to allow limited shipments of spent nuclear fuel to the INEL. Whether the ICPP will continue to receive Government-owned fuels for interim storage after 1995 depends on the environmental impact statement record of decision.

The DOE nationwide complex is undergoing significant changes because of reductions in defense needs and increased focus on environmental restoration (cleanup). The DOE Office of Facility Transition, within DOE Environmental Restoration and Waste Management, has been formed to manage facilities that no longer have an identified mission and must transition to a new use or be decommissioned. The transition process, administered by this new office, covers the change from current missions to deactivation, decontamination, and disposition. Disposition may result in a new use by DOE, release to non-DOE users, or decommissioning.

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Figure 9-1. Location of ICPP (shaded area).

The future of the INEL will greatly influence the economic growth of southeast Idaho. Commerce and industry leaders clearly recognize the INEL's economic force and the impact of a substantial reduction in employment due to a change in mission. They will support new, environmentally conscious missions that will help the INEL transition from defense to civilian goals.

Condition of Facilities

The condition of the ICPP facilities generally corresponds to the age of the building or structure. Many structures and processes have been upgraded or replaced during the past 10 years, but several facilities designed and constructed in the 1950s do not meet the requirements imposed by current regulations for environmental compliance, seismic qualifications, or employee safety. Structural upgrades to many of these facilities are cost prohibitive; therefore, several new facilities are planned to correct known deficiencies. See the Special Considerations Section for more information.

When the phaseout is complete, the following facilities will have been placed in a safe, stable shutdown condition:

- CPP-601 [except the process equipment waste (PEW) collection tanks and parts of the process makeup area]
- CPP-602 (denitrator area only)
- CPP-627 (hot chemistry laboratory only)
- CPP-640 [Rover and headend process phaseout will continue beyond fiscal year (FY) 1997]
- CPP-666 (fluorinel dissolution process)
- CPP-604 (Rare Gas Plant only)
- CPP-1614 (Fuel Assembly Stability Test Acid Transfer Pumphouse)
- CPP-633 (Waste Calcining Facility).

Conditions That Would Enhance/Deter New or Expanded Missions

Existing, new, and proposed program assumptions and forecasts are based on several INEL long-range planning documents, such as the Environmental Restoration and Waste Management Activity Data Sheets, *INEL Institutional Plan*, and *INEL Site Specific Plan*. A review of these documents indicates that the existing capabilities at the ICPP will need enhancement to meet the expected program requirements. Some of the existing facilities and equipment are old and in need of replacement. Program requirements will be accomplished by constructing new buildings, expanding existing facilities, and upgrading ICPP utility systems.

An increased emphasis on safety and environmental issues will affect future project costs and schedules. WINCO is committed to comply with these laws, regulations, and requirements.

Factors That May Influence Future Use of the Area

WINCO executes DOE-assigned programs and complies with applicable State and Federal laws, regulations, and requirements as directed by DOE. Changes in the ICPP mission and future site development are in accordance with the overall needs and guidance received from DOE. Facilities necessary to accomplish the ICPP mission are planned and constructed based on DOE funding and approval. The most current presentation of WINCO's overall site plan is contained in the *Nuclear Fuel Reprocessing Phaseout Plan*. Additional planning details are contained in the most recent issue of the following documents:

- *INEL High-Level Waste Issues and Resolutions Document*
- *Capital Asset Management Plan*
- *WINCO Strategic Implementation Plan*
- *Materials Management Plan*
- Environmental Restoration and Waste Management Activity Data Sheets.

Future waste and spent nuclear fuel management activities will be addressed in an overall INEL environmental impact statement. The record of decision for this environmental impact statement is expected by June 1995. Future actions involving waste management are under consideration in the INEL Spent Nuclear Fuel and Environmental Restoration and Waste Management Environmental Impact Statement and will vary as a function of available funding levels and environmental exposure.

Program Mission Projections and Mission Resource Requirements

Mission Projections

The ICPP mission will continue to include fuel receipt, storage, and processing for disposition; waste processing for disposal in a repository; development and application of technologies to minimize waste generation and management of radioactive and hazardous wastes; and conducting site remediation work and facility D&D activities.

Mission Resource Requirements

Mission resource requirements are being extensively evaluated due to a DOE decision to discontinue reprocessing of nuclear fuel at the ICPP. New staffing levels are being developed based on the phaseout of fuel reprocessing and on the availability and timing of new programs and missions.

The *Idaho Chemical Processing Plant Spent Fuel and Waste Management Technology Development Plan*, September 1993, outlines the strategy for conducting a spent nuclear fuel/waste management technical development program at the ICPP. This program will produce the technology development and demonstration required to ensure that spent fuel, HLW, and other highly radioactive waste will be processed for disposal in a repository.

Projected production units for fuel receipt, liquid radioactive waste generation, calcine production, and the estimated number of immobilized waste canisters prepared for shipping are described annually in materials management plans and Integrated Data Base documents.

Future Workload

The most important activities and projected events during the next 20 years include:

- Improving and increasing fuel storage capacity (dependent upon the environmental impact statement record of decision by June 1995)
- Developing the next generation of fuel and waste management technologies (dependent upon the environmental impact statement record of decision by June 1995)
- Developing, constructing, and operating a waste immobilization process
- Developing technologies for conditioning and dispositioning spent fuel (dependent upon the environmental impact statement record of decision by June 1995)
- Developing capabilities to prepare special nuclear fuels, HLW, and other highly radioactive mixed wastes for disposal (dependent upon the environmental impact statement record of decision by June 1995)
- Providing Resource Conservation and Recovery Act (RCRA)-approved treatment, storage, and disposal (TSD) facilities
- Enhancing chemical analysis capabilities to support waste management and environmental sampling
- Increasing protection measures to reduce personnel radiation exposure
- Conducting environmental compliance and Occupational Safety and Health Act training
- Decommissioning targeted facilities
- Minimizing solid and liquid waste generation
- Improving hazardous waste management
- Remediating inactive waste sites
- Evaluating steam systems (a high priority)
- Providing adequate utility systems

- Building adequate operations support office space and improving warehouse capacity
- Enhancing U.S. competitiveness through technology transfer and business development.

Future Population

Increased emphasis on waste and spent nuclear fuel technology development, environmental and safety issues, training, and waste management will change the composition of the workforce. This, coupled with consolidation of the INEL contracts, will result in a redistribution of personnel. The projected population at the ICPP is 1,500 people by the year 2014.

Master Plan

Goals

The goals listed below will help make the ICPP more effective in accomplishing its scheduled mission(s) during the next 20 years:

- Conduct operations in a manner to minimize environmental and safety risks to employees, the public, and the environment; and fully comply with applicable regulations.
- Construct or upgrade facilities to support mission requirements.
- Upgrade utilities to adequately support existing and planned programs.

Facility and Land Requirements

Fifty-eight projects are planned at the ICPP during the 20-year planning period. Although no additional leasing or land acquisition is required for siting of these facilities, alteration of the secured area may occur.

Future Land Uses

Land at the ICPP will continue to be used to receive and store spent nuclear fuels and radioactive wastes.

Future Facility Locations and Construction Programs

Table 9-1 lists the construction activities slated for the ICPP. Figures 9-2 and 9-3 show existing facility locations, future facility locations, and construction projects at the ICPP.

Utility Sources, Loads, and Distribution/Collection System Configurations

The present utility systems will not supply projected utility demands. The utility tunnels and underground utilities have not been extended to areas designated for site development. As a result, new facilities are being located where utilities are available rather than in areas with other similar facilities that support efficient plant operations.

Numerous ICPP facilities are without sanitary sewer service connection to the sewage treatment plant. This situation conflicts with DOE and State of Idaho environmental compliance guidelines.

The electrical distribution system is outdated, overloaded, and out of compliance with DOE Orders and national codes and standards.

A line item project is planned for FY 1996 to enhance and upgrade present utility system capabilities. Numerous GPPs are planned to improve various other utility systems, including breathing air, potable water well, and sanitary waste lines.

Table 9-1. ICPP modifications through FY 2000 (as of August 31, 1994).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord/Program Funding	Estimated Completion Year	Scope
FY 1988	901 and 902 Load Indicating System	176K	General purpose capital equipment (GPCE)	Program	FY 1995	This system will replace pendant controls on the 901 and 902 cranes in CPP-666.
FY 1990	Laboratory Expansion and Upgrade Project	20,000K	Line item construction project (LICP)	Program	FY 2001	This upgrade will provide analytical support for the Waste Characterization Facility, which is under construction at the Radioactive Waste Management Complex.
FY 1990	New Waste Calcining Facility (NWCF) Transfer Valve Box	1,000K	General plant project (GPP)	Program	FY 1994	This project will replace existing valves in valve boxes B-10, B-11, C-21, C-22, C-24, and C-25. It will also provide leak detection instrumentation.
FY 1991	High-Level Waste Tank Farm Replacement Upgrades	52,000K	LICP	Program	FY 1996	This project will upgrade high-level liquid waste tank farm valve boxes, replace transfer lines having deficient secondary containment with new lines having adequate secondary containment, and replace existing high-level liquid waste tank relief piping.
FY 1991	Fuel Storage Area (FSA) Rack Reconfiguration	23,000K	GPCE	Program	FY 1997	This project will procure new racks for the FSA, providing additional storage space.
FY 1992	Filter Leach System Modifications	580K	GPCE	Program	FY 1995	A new system will be installed in CPP-659 to remove hazardous constituents from filters.
FY 1992	CPP-603 Breathing Air System	400K	GPCE	Program	FY 1994	This project will provide an independent breathing system, including compressors and tanks, for CPP-603.
FY 1992	Supply Emergency Power for Emergency Lighting	400K	GPCE	Landlord	FY 1995	This project will supply emergency power to exit lights in the CPP-601/602 complex.
FY 1992	Boiler Feedwater Reverse Osmosis	1,060K	GPCE	Landlord	FY 1995	A new boiler feedwater treatment reverse osmosis unit will be installed in CPP-606.
FY 1992	Replacement for WL-101	1,500K	GPCE	Program	FY 1994	This project will provide a backup to the existing VES-WL-101, which collects bottoms from the PEW systems prior to transfer to the tank farm.
FY 1992	NWCF Off-Gas Sampler	865K	GPCE	Program	FY 1996	This project will provide a continuous emissions monitoring system to monitor off-gas emissions from the NWCF.

Table 9-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1992	Main Stack Monitor Expansion (CPP-1692)	900K	GPP	Program	FY 1994	An isokinetic probe and a sampling system will be installed on the Main Stack (90-ft level), and CPP-692 will be extended to accommodate sampling equipment.
FY 1992	Plant Compressed Air Capacity Increase	950K	GPP	Landlord	FY 1995	This project will provide an independent plant breathing air system that complies with all safety and regulatory requirements for Grade E breathing air.
FY 1992	CPP-666 Replacement Fuel Storage Rack	2,020K	GPCE	Program	FY 1997	This project will replace existing racks with new aluminum racks.
FY 1993	Electrical Panel Replacements III (CPP-606)	650K	GPCE	Landlord	FY 1995	Electrical panels in CPP-606 that are old and deteriorated will be replaced.
FY 1993	PEW System Upgrade	650K	GPCE	Program	FY 1996	This upgrade will provide automatic controls and connection of process monitoring equipment for the PEW system to the existing distributed controls system.
FY 1993	CPP-692 Upgrade	800K	GPCE	Program	FY 1995	The existing platform at the 90-foot level will be replaced, and confirmatory sampling equipment and a new manlift on the main stack will be provided.
FY 1993	CPP-603 Waste Tank Upgrade	845K	GPP	Program	FY 1995	The solid waste collection tank, liquid waste collection tank, and associated piping and equipment will be upgraded to meet current environmental regulations and improve system operability.
FY 1993	Potable Water Storage Tank Upgrade	400K	GPP	Landlord	FY 1995	A second 10,000-gallon tank will be installed for the potable water system. Additional capacity is needed to provide a 30-minute chloride contact time per State regulations.
FY 1993	CPP-603 Corrosion Control Power Upgrade	1,100K	GPP	Program	FY 1995	This project will add double-ended switchgear to provide normal and standby power at CPP-603. The new system will operate with the existing ICPP utility control system.
FY 1993	CPP-666 Install Leak Detection FT-534 (Basin Sump)	249K	GPP	Program	FY 1994	The contaminated sump, FT-534, at the FSA will be upgraded by providing a primary containment liner and leak detection.

Table 9-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord/Program Funding	Estimated Completion Year	Scope
FY 1993	Dry Cask Storage Project [see same project in Section 4, Test Area North (TAN)]	EG&G Idaho funded/managed	LICP	Program	FY 1998	Although this project is primarily an EG&G Idaho project, there is a proposal to change the project to an EG&G Idaho TAN Operations and WINCO shared project. EG&G Idaho will provide the capability to remove, dry, and ship fuel canisters from the TAN-607 pool. Canisters will be transferred to, and stored at, the ICPP.
FY 1993	Plant Street Lighting Replacement and Upgrade	807K	GPP	Landlord	FY 1994	The existing street lighting system, which is inadequate and obsolete, will be replaced.
FY 1993	Isolate WL-102 (CPP-604)	1,100K	GPP	Program	FY 1995	This project will eliminate all process connections except for one inlet from a feed head tank and one connected to feed pumps. The project will help prepare the vessel, which is part of the PEW system, for formal RCRA closure.
FY 1993	Cathodic Protection System Upgrade	1,000K	GPP	Program	FY 1995	New anode strings will be installed to provide corrosion protection for existing underground piping.
FY 1993	Remote Analytical Laboratory (RAL) Turnaround Project	1,340K/1,200K	GPCE/Operating expense (OE)	Program	FY 1995	The GPCE portion of this project will modify the RAL to update glove boxes; modify the heating, ventilating, and air-conditioning system; and improve transfer cart performance. The OE portion of this project will repair and improve the RAL hot cell and make provisions for future hot cell work.
FY 1993	NWCF On-Line Particle Size Analyzer	250K	GPCE	Program	FY 1995	A new particle size analyzer will be installed at the NWCF.
FY 1994	CPP-659 Heating, Ventilating, and Air Conditioning Monitor Upgrade	250K	GPCE	Program	FY 1996	The CPP-659 stack monitoring instrumentation will be replaced by updated equipment.
FY 1994	Superprobe Area	FY 200K	GPCE	Program	FY 1994	A scanning electron microscope will be installed in CPP-637 (Rooms 125 and 126).
FY 1994	Fiber Distributed Data Interconnect Installation	475K	GPCE	Landlord	FY 1995	This project will provide extensions to the backbone fiber optic communication system.
FY 1994	Load Center #13	1,500K	GPCE	Landlord	FY 1995	A new double-ended load center will supply power to the CPP-604/605 complex.

Table 9-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1994	CPP-663 Second Floor Expansion	580K	GPP	Landlord	FY 1995	This expansion will include replacement of the bunkhouse facility. The existing bunkhouse is too small and is located in a trailer that does not fully comply with code requirements.
FY 1994	CPP-652 Health and Safety Upgrade for Cafeteria	1,100K	GPP	Landlord	FY 1994	This project will modify the ICPP cafeteria to correct health and safety deficiencies and provide additional seating.
FY 1994	Coal Storage Paving	550K	GPP	Landlord	FY 1994	A coal storage area with a uniform surface for unloading, storing, and loading coal for the boiler feed systems will be provided.
FY 1994	CPP-659 NWCF Feed System Modification	340K	GPP	Program	FY 1995	This project will add the capability to purge the NWCF feed tank drain line with air and decontamination solution during calcining operations.
FY 1994	Construction Management Change/Lunch Room (CPP-1677)	1,100K	GPP	Landlord	FY 1995	This project will provide construction management personnel with offices, a conference room, change rooms, showers, and a lunch room.
FY 1994	New Aboveground Kerosene Tanks	925K	GPP	Program	FY 1995	This project will replace the kerosene storage to support NWCF operations. Current tanks are more than 40 years old and show significant deterioration.
FY 1994	Minor GPP	129K	GPP	Program, Landlord	FY 1994	This project consists of GPPs with costs between \$5K and \$25K, such as a small structural addition to a building.
FY 1994	CPP-621 Secondary Containment Shelter	446K	GPP	Program	FY 1995	The existing aluminum nitrate and nitric acid storage tank area will be upgraded to improve the safety and operation facilities.
FY 1994	Technology Development Facility	1,380K	GPP	Program	FY 1995	This facility will support development work for the Waste Management Technology Development Program.
FY 1994	Plant Sewer Line Expansion	750K	GPP	Landlord	FY 1995	The sewer system will be expanded to provide a utilities sewer line for existing and planned facilities on the west side of the ICPP along Redwood Street.
FY 1994	CPP-649 Filter System Upgrade	950K	GPP	Program	FY 1995	The high-efficiency particulate air filter system for the atmospheric protection system will be upgraded.
FY 1994	CPP-679 Renovation	150K	GPP	Landlord	FY 1995	CPP-679 will be renovated to include restroom facilities.

Table 9-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1994	Mist Eliminator Mesh Replacement	450K	OE	Program	FY 1996	This project will replace corroded mist eliminator meshes in VES-MCC-110 with new hast alloy meshes.
FY 1994	CPP-603 Fuel Canning Station	8,000K	GPCE	Program	FY 1995	This project will provide the design and installation of a fuel canning station for the corroded fuel at CPP-603.
FY 1994	CPP-603 Sludge Removal	400K	OE	Program	FY 1995	Sludge will be removed from the south basin of CPP-603.
FY 1994	VES-106 Sludge Removal	400K	OE	Program	FY 1995	Sludge will be removed from VES-SFE-106.
FY 1994	Peach Bottom Storage Canisters	900K	GPCE	Program	FY 1996	This project will design and procure new canisters for Peach Bottom fuel.
FY 1995	PAR Manipulator Repair Facility	1,100K	GPP	Program	FY 1997	This project will provide an area for PAR manipulator repairs. It will include a clean work/repair area, a "hot" repair area with decontamination capability, and a storage area.
FY 1995	Security Facilities Consolidation	18,500K	LICP	Landlord	FY 1999	This project will provide an upgraded security alarm system control station and reduce the protected area at the ICPP.
FY 1995	Irradiated Fuel Storage Facility (IFSF) Monitoring System	500K	GPP	Program	FY 1997	A redundant, continuous, isokinetic monitoring system will be installed in the CPP-603 IFSF. The existing monitoring system does not provide representative sampling that will be required in order to use the IFSF for future fuel storage and canning operations.
FY 1995	Minor GPP	38K	GPP	Program, Landlord	FY 1995	This project consists of GPPs with costs between \$5K and \$25K, such as a small structural addition to a building.
FY 1995	New Control Room for Waste Operations	1,100K	GPP	Program	FY 1995	A new building will be constructed to house the control room now located in CPP-604. The current control room is used for various waste processes, including liquid effluent treatment and disposal (LET&D), PEW, and service waste.
FY 1995	CPP-603 Expended Core Facility (ECF) Dry Cell Cask Support Equipment	1,100K	GPCE	Program	FY 1996	This project will provide the capability for unloading larger ECF fuel casks.

Table 9-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord/Program Funding	Estimated Completion Year	Scope
FY 1995	ICPP Retrievable Records Storage Area (CPP-1679)	1,625K	GPP	Landlord	FY 1996	This facility will be used to centralize ICPP active records and manage records in accordance with DOE Orders, the American National Standards Institute, and the Code of Federal Regulations.
FY 1995	CPP-602 Environmental Laboratory Upgrade	1,100K	GPP	Landlord	FY 1996	CPP-602 Laboratories 222, 223, 224, and 229 will be renovated. The renovation will include lighting, electrical, walls, ceilings, floors, laboratory equipment, heating, ventilating, and air conditioning.
FY 1995	Replace CPP-621 Aluminum Nitrate Tanks	600K	GPCE	Program	FY 1996	This project will replace two aluminum nitrate tanks at CPP-621.
FY 1996	CPP-604/605 Electrical Switchgear	1,500K	GPCE	Program	FY 1997	This project will replace old, outdated switchgear in the CPP-604/605 complex.
FY 1996	Fluorinel Dissolution Process and Fuel Storage (FAST) Facility Office and Maintenance Facility	1,100K	GPP	Program	FY 1997	This project will provide a facility for operator training, storage, shop areas for dedicated maintenance crews, and offices for support staff.
FY 1996	Electrical and Utility Systems Upgrade	75,000K	LICP	Landlord	FY 2003	This upgrade will correct electrical and utility systems that do not meet Environment, Safety, and Health codes.
FY 1996	Contaminated Fuel Handling Equipment Storage Building	1,100K	GPP	Landlord	FY 1997	This building will be used to store contaminated fuel handling equipment (including racks) from FSA and CPP-603.
FY 1996	CPP-627 Analytical Laboratory Renovation	1,350K	GPP	Landlord	FY 1997	The analytical laboratory will be upgraded to accommodate modern instrumentation and equipment and to meet current fire codes.
FY 1996	South CPP-621 Pipe Trench and Transfer Line Upgrade	1,485K	GPP	Program	FY 1997	This upgrade will provide leak detection and secondary containment and will replace the deteriorating pipe trench. Chemical transfer lines from CPP-621 to the NWCF will also be replaced and will include leak detection and secondary containment.
FY 1996	Peach Bottom and FERMI Dry Vaults Renovation	1,450K	GPP	Program	FY 1997	The first generation dry storage vaults at CPP-749 will be renovated. The renovation will include moisture intrusion paths, purging and sampling capability, welded lids, and cover pavement.

Table 9-1. (continued).

Year Funded	Project	Total Estimated Cost	Funding Type	Landlord /Program Funding	Estimated Completion Year	Scope
FY 1996	Fuel Handling and Dissolution (FH&D) Paved Storage Area (CPP-603/666)	505K	GPP	Program	FY 1997	The area east of CPP-749 will be paved and fenced to create a consolidated fuel handling storage area.
FY 1996	CPP-601/602 Electrical Switchgear	2,000K	GPCE	Landlord	FY 1997	This project will replace old, outdated switchgear in the CPP-601/602 complex.
FY 1996	Upgrade Boiler Control System	300K	GPCE	Landlord	FY 1996	This project will add a distributed control system to the Coal Fired Generating Facility.
FY 1997	Tank Farm Heel Removal	34,000K	LICP	Program	FY 2010	This project will provide the capability to remove final HLW heels from tank farm tanks.
FY 1997	Calcine Recovery System for Bin Set 1	50,000K	LICP	Program	FY 2006	This project will provide facilities and equipment for safe retrieval and transport of HLW calcine from Bin Set 1.
FY 1998	Fuel Canning and Dry Modular Storage (CADMOST)	65,000K	LICP	Program	FY 2004	This project will provide the capability to safely store aluminum fuels on an interim basis. Aluminum fuels have been stored underwater for approximately 20 years.
FY 1998	Waste Immobilization Facility	1,200,000K	LICP	Landlord	FY 2009	This facility will furnish production-scale waste processing to convert sodium-bearing radioactive liquid waste and solid HLW into an acceptable form for permanent disposal.

ICPP

FIGURE 9-2. ICPP EXISTING LAND USE MAP

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ICPP

MAP KEY	FUNDING YEAR	PROJECT	ESTIMATED COMPLETION
1		LABORATORY EXPANSION AND UPGRADE PROJECT	
1A	FY 1990	RAL OFFICE AND CHANGE ROOM EXPANSION	FY 2001
1B	FY 1990	RAL TRU PREPARATION AND WARM LABORATORY	FY 2001
1C	FY 1990	RADIOCHEMISTRY COUNTING FACILITY	FY 2001
2	FY 1990	NWCF TRANSFER LINE VALVE BOX	FY 1994
3	FY 1991	FSA RACK RECONFIGURATION	FY 1997
4	FY 1992	MAIN STACK MONITOR EXPANSION	FY 1994
5	FY 1992	PLANT COMPRESSED AIR INCREASE	FY 1995
6	FY 1992	CPP-666 REPLACEMENT FUEL STORAGE RACKS	FY 1997
7	FY 1993	CPP-603 WASTE TANK UPGRADE	FY 1995
8	FY 1993	POTABLE WATER STORAGE TANK UPGRADE	FY 1995
9	FY 1993	CPP-603 CORROSION CONTROL POWER UPGRADE	FY 1995
10	FY 1993	INSTALL LEAK DETECTION FT-534	FY 1994
11	FY 1993	DRY CASK STORAGE PROJECT - ALSO SEE SECTION 4	FY 1998
12	FY 1993	ISOLATE WL-102	FY 1995
13	FY 1993	RAL TURNAROUND PROJECT	FY 1995
14	FY 1993	NWCF ON-LINE PARTICLE SIZE ANALYZER	FY 1995
15	FY 1994	CPP-663 SECOND FLOOR EXPANSION	FY 1995
16	FY 1994	HEALTH AND SAFETY UPGRADE FOR CAFETERIA	FY 1994
17	FY 1994	COAL PAVING STORAGE	FY 1994
18	FY 1994	NWCF FEED SYSTEM MODIFICATION	FY 1995
19	FY 1994	CONSTRUCTION MANAGEMENT CHANGE/ LUNCH ROOM FACILITY (CPP-1677)	FY 1995
20	FY 1994	NEW ABOVEGROUND KEROSENE TANKS	FY 1995
21	FY 1994	CPP-621 SECONDARY CONTAINMENT SHELTER	FY 1995
22	FY 1994	TECHNOLOGY DEVELOPMENT FACILITY	FY 1995
23	FY 1994	PLANT SEWER LINE EXPANSION	FY 1995
24	FY 1994	FILTER SYSTEM UPGRADE	FY 1995
25	FY 1994	CPP-678 RENOVATION	FY 1995
26	FY 1994	MIST ELIMINATOR MESH REPLACEMENT	FY 1996
27	FY 1994	CPP-603 FUEL CANNING STATION	FY 1995
28	FY 1994	CPP-603 SLUDGE REMOVAL	FY 1995
29	FY 1994	VES-106 SLUDGE REMOVAL	FY 1995
30	FY 1994	PEACH BOTTOM STORAGE CANISTERS	FY 1996
31	FY 1995	SECURITY FACILITIES CONSOLIDATION	FY 1999
32	FY 1995	IFSF MONITORING SYSTEM	FY 1997
33	FY 1995	NEW CONTROL ROOM FOR WASTE SYSTEMS OPERATIONS	FY 1995
34	FY 1995	ECF DRY CELL CASK SUPPORT EQUIPMENT	FY 1996
35	FY 1995	ICPP RETRIEVEABLE RECORDS STORAGE AREA	FY 1996
36	FY 1995	CPP-602 ENVIRONMENTAL LABORATORY UPGRADE	FY 1996
37	FY 1995	REPLACE CPP-621 ALUMINUM NITRATE TANK	FY 1996
38	FY 1996	FAST FACILITY OFFICE AND MAINTENANCE FACILITY UPGRADE	FY 1997
39	FY 1996	ELECTRICAL AND UTILITY SYSTEM UPGRADE	FY 2003
40	FY 1996	CONTAMINATED FUEL HANDLING/NONDESTRUCTIVE EXAMINATION EQUIPMENT STORAGE BUILDING	FY 1997
41	FY 1996	CPP-627 ANALYTICAL LABORATORY RENOVATION	FY 1997
42	FY 1996	SOUTH CPP-621 PIPE TRENCH AND TRANSFER LINE	FY 1997
43	FY 1996	PEACH BOTTOM AND FERMI DRY VAULTS RENOVATION	FY 1997
44	FY 1996	FH&D PAVED STORAGE AREA	FY 1997
45	FY 1996	CPP-601/602 ELECTRICAL SWITCHGEAR	FY 1997
46	FY 1996	UPGRADE BOILER CONTROL SYSTEM	FY 1996
47		CADMOST	
47A	FY 1998	FUEL CANNING FACILITY	FY 2004
47B	FY 1998	DRY MODULAR FUEL STORAGE	FY 2004
48		WASTE IMMOBILIZATION FACILITY	
48A	FY 1998	WASTE IMMOBILIZATION FACILITY - PRIMARY SITE	FY 2009
48B	FY 1998	WASTE IMMOBILIZATION FACILITY - ALTERNATE SITE	FY 2009
49	TBD	CALCINE BIN SET #8	TBD

PROJECTS WITH LOCATION TBD AND/OR MULTIPLE LOCATIONS

- PLANT STREET LIGHTING REPLACEMENT AND UPGRADE (FY 1993)
- CATHODIC PROTECTION SYSTEM UPGRADE (FY 1993)
- MINOR GPP (FY 1994)
- MINOR GPP (FY 1995)
- TANK FARM HEEL REMOVAL (FY 1997)
- CALCINE RECOVERY SYSTEM FOR BIN SET #1 (FY 1997)
- PAR MANIPULATOR REPAIR FACILITY (FY 1996)

FIGURE 9-3. ICPP MASTER PLAN MAP.

Special Considerations

Table 9-2 lists specific site planning issues. For each issue, the table lists a solution, resource requirements, and the impact anticipated if the issue remains unresolved.

Table 9-2. ICPP site planning issues.

Issue	Solution	Required Resources	Impact If Not Provided
The ICPP tank farm does not meet RCRA secondary containment compatibility, and some tanks do not meet DOE seismic resistancy.	Minimize waste generation and maximize NWCF operation in the short term, and design, construct, and operate the Waste Immobilization Facility in the long term.	Construct the Waste Immobilization Facility to process tank farm waste.	The ICPP would not meet the consent order with the State of Idaho and could be fined for improper waste storage and prohibitions on waste generation if this issue goes unresolved.
Several utilities are rapidly becoming inadequate; utility systems are inefficient and, in some cases, out of compliance.	Upgrade electrical and utility systems to enhance reliability and availability, correct deficiencies, and provide adequate sizing for existing and planned facilities.	Upgrade or extend utilities to accommodate existing and planned plant growth. LICP - <u>Electrical and Utilities Systems Upgrade</u>	Failure to implement these utility upgrades would significantly impact development at the ICPP and perpetuate noncompliant electrical and utility systems.
Spent fuel management process development and fuel characterization is incomplete and, in some cases, has not been initiated.	Proceed with development of a dry storage system for spent aluminum fuel. Develop fuel characterization capability.	Expand pilot plant facilities to accommodate increased research and development activities. Define characterization needs. Construct a spent fuel dry storage demonstration unit. Modify the current facility for characterization requirements.	Slow progress will jeopardize the State's confidence with DOE in addressing HLW and spent nuclear fuel issues, and delay progress on dry/fuel storage projects.
HLW storage is inadequate for spent fuel and immobilized waste.	Develop capabilities to repackage spent fuel for storage and disposal. Include interim storage in the design of the Waste Immobilization Facility.	Construct a facility to repackage spent nuclear fuel. LICP - <u>Fuel Canning and Dry Modular Storage Facility</u> Provide interim storage in the Waste Immobilization Facility for the glass-ceramic product.	Failure to implement acceptable treatment and storage will likely lead to improper storage and RCRA violations.

Table 9-2. (continued).

Issue	Solution	Required Resources	Impact If Not Provided
The current capability does not allow characterization of waste and environmental samples according to regulatory requirements.	Expand the existing ICPP RAL. Upgrade CPP-602 laboratories, and build two new radiochemistry counting facilities.	Expand and construct suitable facilities for characterization and laboratory work. <u>LICP - Laboratory Expansion and Upgrade Project</u>	Failure to complete the upgrades could result in noncompliance with RCRA waste characterization requirements for TSD facilities. The ICPP may not receive permits for units if waste characterization methodologies are inadequate.
CSSF #1 may not meet DOE seismic resistancy. A calcine retrieval concept is developed, but no operational system exists.	Develop, demonstrate, and construct an operational system for calcine retrieval.	Construct a calcine recovery system. <u>LICP - Calcine Recovery for Bin Set #1</u>	Corrective measures will not be available if another CSSF is not constructed and a retrieval system is not developed. This technology is also needed to transport calcine from all CSSFs to the Waste Immobilization Facility.
Recovery of isotope by-products from spent fuel has not been addressed.	Identify available uses and markets for isotope by-products. Determine the economic and safety implications of isotope usage.	Fund studies related to isotope recovery and use.	The loss of valuable isotope resources might be caused by inadequate evaluation of future applications.
Waste volumes for D&D and environmental restoration projects are not projected.	Develop plans for characterizing and projecting D&D waste volumes.	Define closure requirements.	Future TSD facilities may not have adequate capability to accommodate forecasted D&D projects.
Treatment options are not developed for HLW subject to RCRA land disposal restrictions.	Develop and implement processes to treat HLW to meet RCRA requirements.	Design and construct a facility suitable for immobilizing HLW and preparing it for storage in a repository. <u>LICP - Waste Immobilization Facility</u>	Failure to implement an acceptable HLW treatment process will likely lead to RCRA violations/fines.
RCRA hazardous waste must be removed from the tank farm tanks after cease of use.	Develop and implement a technology to clean the tanks.	<u>LICP - Project for Tank Farm Heel Removal</u>	Failure to implement this project could result in State of Idaho fines for failure to treat and dispose of RCRA waste.

Table 9-2. (continued).

Issue	Solution	Required Resources	Impact If Not Provided
The technology to vitrify HLW and grout low-level waste (LLW) as part of the Waste Immobilization Facility is not fully developed.	Develop the technology to ensure that HLW and LLW can be processed.	Construct a technology development facility.	Failure to construct a technology development facility prior to processing the HLW and LLW may jeopardize the processing of the waste and, therefore, be out of compliance with the State of Idaho consent order.
Sections of the ICPP steam distribution system are inadequately trapped, resulting in water hammers and increased corrosion and equipment failure.	Provide adequate trapping and condensate return systems.	Initiate GPP projects to correct condensate return problems in the following areas: Tank Farm, CPP-603, CPP-637, and the utility tunnel.	Water hammer and accelerated corrosion will continue to be a problem with the ICPP steam and condensate systems.