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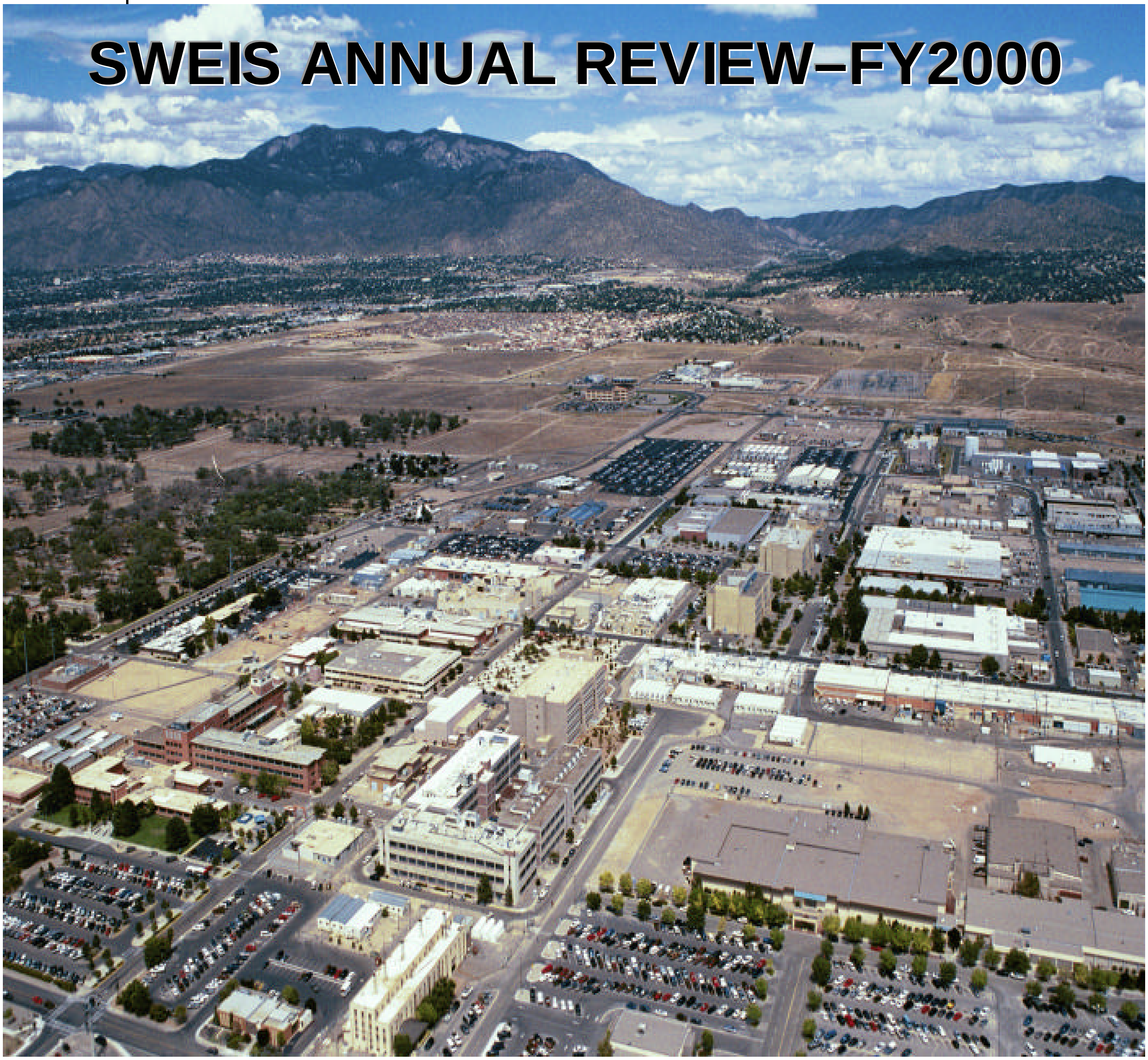

SWEIS ANNUAL REVIEW–FY2000

A Comparison of FY2000 Operations to Projections Included in the Site-Wide Environmental Impact Statement for Continued Operation of Sandia National Laboratories/New Mexico

Prepared by
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Title: SWEIS Annual Review—FY2000

A Comparison of FY2000 Operations
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Sandia National Laboratories/New Mexico

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ABSTRACT

The SNL/NM FY2000 SWEIS Annual Review discusses changes in facilities and facility operations that have occurred in selected and notable facilities since source data was collected for the SNL/NM SWEIS (DOE/EIS-0281). The following information is presented:

- An updated overview of SNL/NM selected and notable facilities and infrastructure capabilities.
- An overview of SNL/NM environment, health and safety programs, including summaries of the purpose, operations, activities, hazards, and hazard controls at relevant facilities and risk management methods for SNL/NM.
- Updated base year activities data, projections of FY2003 and FY2008 activities, together with related inventories, material consumption, emissions, waste, and resource consumption.
- Appendices summarizing activities and related hazards at SNL/NM individual special, general, and high-bay laboratories, and chemical purchases.

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SANDIA NATIONAL LABORATORIES/NEW MEXICO

SNL/NM FY2000 SWEIS Annual Review

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ACRONYMS AND ABBREVIATIONS

µCi – microcurie(s)

µug – microgram(s)

µm – micrometer(s)

ac – acre(s)

AC – alternating current

AD – anno domini (in the year of the Lord; used to designate centuries)

ACGIH – American Conference of Governmental Industrial Hygienists

ACRR – Annular Core Research Reactor

AEC – Atomic Energy Commission

AFWL – Air Force Weapons Laboratory

AHF – Advanced Hydrotest Facility

AHR – advanced hydrodynamic radiography

AICE – American Institute of Chemical Engineers

ALARA – as low as reasonably achievable

ALEC – advanced laser external cavity

AMPL – Advanced Manufacturing Processes Laboratory

ANSI – American National Standards Institute

APPRM – Advanced Pulsed-Power Research Module

ASME – American Society of Mechanical Engineers

AWN – Acid Waste Neutralization (plant)

B – billion(s)

BDBA – beyond design-basis accident

BST – building source term

BTU – British thermal unit

CAA – Clean Air Act

CAD – computer-aided design

CAM – computer-aided manufacturing

CEDE – committed effective dose equivalent

CFR – Code of Federal Regulations

CHEST – Conventional High Explosives & Simulation Test (Chestnut Site)

CHNO – carbon, hydrogen, nitrogen, and oxygen (explosives)

Ci – curie(s)

Ci/yr – curie(s) per year

cm – centimeter(s)

CNC – computer numerical control

CO – carbon monoxide

Co-60 – cobalt 60

CSPRA – Compact Short-Pulse Repetitive Accelerator

CSRL – Compound Semiconductor Research Lab

CTB – Cathode Test Bed

CTF – Coyote Test Field

CTTF-West – Containment Technology Test Facility-West

CWL – Chemical Waste Landfill

CY – calendar year(s)

DARHT – dual-axis radiographic hydrotest

DAS – data acquisition (system)

dB – decibel(s)

DBA – design basis accidents

DC – direct current

DCG – derived concentration guides

DIS – diagnostic instrumentation system

DoD – Department of Defense

DOE – Department of Energy

DOE/AL – Department of Energy/Albuquerque Operations Office

DOE/KAO – Department of Energy/Kirtland Area Office

DOT – Department of Transportation

DP – Defense Programs

dpm – disintegrations per minute

DU – depleted uranium

EA – environmental assessment

EBA – evaluation-basis accidents

ECL/ADM – environmental checklist/action description memorandum

ECF – Explosive Components Facility

EDE – effective dose equivalent

EID – Environmental Information Document

EOC – Emergency Operations Center

EPA – Environmental Protection Agency

ER – environmental restoration

ES&H – environment, safety, and health

eV – electron volt(s)

FAIT – Facilities Asbestos Implementation Team

FHA – fault hazard analysis

FMEA – failure modes and effects analysis

FONSI – finding of no significant impact

FPAC – firing pad access control

fpm – feet per minute

fps – feet per second

FREC – fuel ringed external cavity

FSID – Facilities and Safety Information Document

FSU – Former Soviet Union

ft – foot or feet

ft^3 – cubic foot

FTE – full-time equivalent

FY – fiscal year

G – unit of acceleration (equal to the acceleration caused by gravity at the earth's surface)

g – gram(s)

gal – gallon(s)

GIF – Gamma Irradiation Facility

GRUMP – General Repetitive Universal Multi-Purpose (pulser)

HA – hazards analysis

ha – hectare(s)

HARP – Hazard Aggregation Rollup Process

HC – hazard category

HCF – Hot Cell Facility

HCPI – Hazardous Chemicals Purchase Inventory

HEPA – high-efficiency particulate air (filter)

HERMES III – High-Energy Radiation Megavolt Electron Source III

HMX – octohydrotetranitrotetrazocine

HNAB – hexanitrostilbene

HPGe – high-purity germanium

HVAC – heating, ventilation, and air conditioning

HWMF – Hazardous Waste Management Facility

Hz – hertz

IBEST – ion beam surface treatment

ICF – inertial confinement fusion

ICS – instrumentation and control system

IEEE – Institute of Electrical and Electronics Engineers

IDLH – immediately dangerous to life and health

IMP – Intermediate Pulser

IMRL – Integrated Materials Research Laboratory

in. – inch(s)

ISMS – Integrated Safety Management System

IST – initial source terms

IWFO – Intelligence Work for Others

J – joule(s)

KAFB – Kirtland Air Force Base

kA – kiloampere(s)

kCi – kilocurie(s)

keV – kilo-electron volt(s)

kg – kilogram(s)

kJ – kilojoule(s)

km – kilometer(s)

kW – kilowatt(s)

kV – kilovolt(s)

ℓ– liter(s)

lb – pound(s)

LARPS – Large Aircraft Robotic Painting System

LENSTM – laser engineered net shaping

LEVIS – laser evaporation ionization source

LEWS – lightening early warning system

LIBORS – laser ionization based on resonant saturation (system)

LICA – low-intensity cobalt array

LIVA – linear induction voltage adder

LLMW – low-level mixed waste

LLW – low-level waste

LMPL – Liquid Metal Processing Laboratory

LPF – leak path factor

LTCC – low-temperature co-fired ceramic

LWDS – Liquid Waste Disposal System

m – meter(s)

µ - micro-(prefix for 10^{-6}, or one-millionth)

m^3 – cubic meter(s)

M – mega-(prefix for 10^6, a millionfold) or million

MA – mega-ampere(s)

MACCS – MELCOR Accident Consequence Code System

mCi – millicurie(s)

MCL – maximum contaminant levels

MCM –multi-chip modules

MDL – Microelectronics Development Laboratory

MEI – maximally exposed individual

MESA – Microsystems & Engineering Sciences Applications (Complex)

MeV – mega-electron volt(s)

mg – milligram(s)

mi – mile(s)

mi^2 – square mile(s)

MIPP – Medical Isotopes Production Program

MITE – magnetically insulated transmission experiment

MITL – magnetically insulated transmission line

ml – milliliter(s)

mm – millimeter(s)

MOCVD – metallorganic chemical vapor deposition

MPC – microsecond pulse compressor

mrem – millirem(s)

MSDS – material safety data sheet

MTA – Marx trigger amplifier

MTG – Marx trigger generator

MTRU – mixed transuranic

MUSE – multidimensional, user-oriented synthetic environment

MV – megavolt(s)

MW – megawatt(s)

MWL – Mixed Waste Landfill

NAGPRA - Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)

NASA – National Aeronautics and Space Administration

NEC – National Electrical Code

NEPA – National Environmental Policy Act

NESHAP – National Emission Standards for Hazardous Air Pollutants

NEST – Nuclear Emergency Search Team

NFA – no further action

NFPA – National Fire Protection Association

NG – nitroglycerin

NGF – Neutron Generator Facility

NHZ – nominal hazard zone

NIF – National Ignition Facility

NMAC – New Mexico Administrative Code

NO_x – nitrogen oxide(s)

NN – nonnuclear

NRU – neutron radiography unit

NSA – National Security Agency

NSTTF – National Solar Thermal Test Facility

ODMS – oxygen deficiency monitor system

OP – operating procedure

O&SHA – operating and support hazard analysis

OSHA – Occupational Safety and Health Administration

PADI – Professional Association of Diving Instructors

PBFA – Particle Beam Fusion Accelerator

PBX – plastic bonded explosives

PCB – polychlorinated biphenyl

PDFL – Photovolataic Device Fabrication Laboratory

Pe – probability of event occurring per year

PETL – Processing and Enviornmental Technology Laboratory

PETN – pentaerythritol tetranitrate

PFL – pulse-forming lines

PHS – primary hazard screening

pico – prefix for one-trilionth (10^{-12})

PKID – point kinetics, one-dimensional (thermal analysis code)

PMMA – polymethyl methacrylate

ppm – parts per million

PPS – plant protection system

psi – pounds per square inch

PV – photovoltaic

R – roentgen (unit of absorbed radiation dose exposure)

R&D – research and development

rad – radiation absorbed dose

RCF – refractory ceramic fiber

RCRA – Resource Conservation and Recovery Act of 1976

TCSC – Radiological and Criticality Safety Committee

RCT – radiological control technician

RDX – hexahydrotrinitrotriazine

RF – radio frequency

RGD – radiation-generating device

RHEPP – Repetitive High-Energy Pulsed Power

RITS – Radiographic Integrated Test Stand

RMMA – radioactive material management area

RMWMF – Radioactive and Mixed Waste Management Facility

RO/DI/UPW – reverse osmosis deionized ultra pure water

ROD – record of decision

RP – rapid prototyping

rpm – revolutions per minute

RTP – Repetitive Test Pulser

RTV – room-temperature vulcanize

SABRE – Sandia Accelerator and Beam Research Experiment

SAD – safety assessment documents

SAR – safety analysis report

SCB – steel confinement box

scf – standard cubic feet

SDI – Strategic Defense Initiative

SF_6 – sulfur hexafluoride

SGB – shielded glove box

SHA – system hazard analysis

SIH – standard industrial hazard

SL – stereolithography

SNL – Sandia National Laboratories

SNL/NM – Sandia National Laboratories/New Mexico

SNM – special nuclear material

SOP – standard operating procedure

SPHINX – Short-Pulse High Intensity Nanosecond X-Radiator

SPR – Sandia Pulsed Reactor

STAR – Shock Thermodynamics Applied Research Facility

STB – steel transfer box

STF – Subsystem Test Facility

STP – storage/transfer pool

SVOC – semi-volatile organic compounds

SWEIS – site-wide environmental impact statement

TA – Technical Area

TAG – Tijeras Arroyo Groundwater (Investigation)

TATB – triaminotrinitrobenzene

TCE – trichloroethene

TEDE – total effective dose equivalent

TESLA – Tera-Electron Volt Energy Superconductor Linear Accelerator

TNT – trinitrotoluene

TRU – transuranic

TSCA – Toxic Substances Control Act

TSPI – Time-space-position information

TTF – Thermal Treatment Facility

TW – terawatt(s)

UL – Underwriters Laboratory

UNO – United Nations Organization (hazard classification and compatibility group)

USAF – U.S. Air Force

USQ – unreviewed safety question

UV – ultraviolet

V – volt(s)

VDL – vacuum diode load

VIS – vacuum insulator stack

VMAS – virtual manufacturing applications system

VR – virtual reality

WFO – Work for Others (Program)

YAG – yttrium aluminum garnet

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CHAPTER 1.0
INTRODUCTION

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FIGURES

Figure 1-1. SNL/NM in Relation to Bernalillo County, New Mexico, the Albuquerque Region, and Adjacent Offsite Features 1-4

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SNL/NM FY2000 SWEIS ANNUAL REVIEW

1.0 INTRODUCTION

In late 1999, the U.S. Department of Energy (DOE) published the Sandia National Laboratories/New Mexico (SNL/NM) Site-Wide Environmental Impact Statement (SWEIS) examining the environment impacts of three alternatives for the continued operation of the facility (DOE, 1999). To complete the *National Environmental Policy Act* (NEPA) process, DOE issued a Record of Decision (ROD) identifying the expanded operations alternative as the preferred alternative for SNL/NM operations (DOE, 2000). To remain consistent with its NEPA compliance regulations, DOE shall evaluate the SWEIS at least every 5 years to determine whether it remains adequate, if a new SWEIS should be prepared, or if a supplement to the existing SWEIS is needed (10 CFR 1021.330).

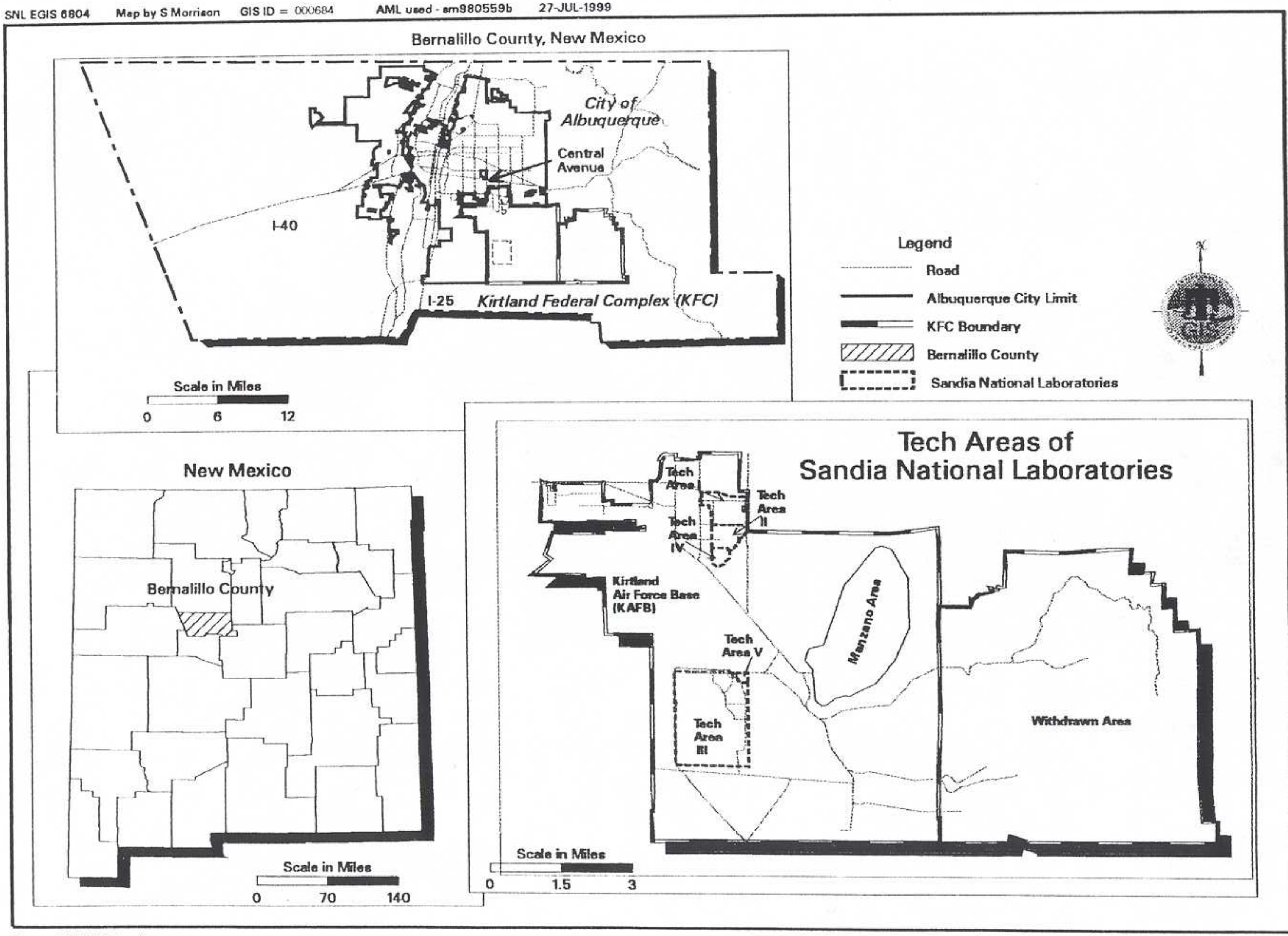
A majority of baseline information collected for the SWEIS (which began preparation in 1998) was representative of SNL/NM operations during fiscal years (FYs) 1996 and 1997, with estimates of projected operations for 5 years (2003) and 10 years (2008). In conjunction with DOE's release of the SWEIS, SNL/NM published much of the SWEIS source data and information in the SNL/NM Facilities and Safety Information Document (FSID) and the Environmental Information Document (EID) (SNL, 1999a, b). Figure 1-1 shows the overall site in relation to Bernalillo County, New Mexico, the Albuquerque region, and the adjacent offsite features.

The information on the environmental impacts of operating SNL/NM up to an expanded level of operations established a framework to compare future activities. A comparison of changes in FY2000 SNL/NM activities to the expanded alternative activities analyzed in the SWEIS is included in this FY2000 Annual Review. The comparison of FY2000 operations to the baseline and expanded operations alternative in the SWEIS is an effort to provide DOE with a partial measurement in determining whether SNL/NM operations continue to be addressed by the SWEIS impact analysis.

SNL/NM facilities designated as "Notable," together with the group of "Selected Facilities," collectively account for almost all of the program-related environmental impacts associated with:

- Risks of radioactive or hazardous substances to the environment.
- Hazards in the workplace.
- Potential for impacts on land not owned by DOE.

To identify the selected and notable facilities at SNL/NM, the following criteria were used to support the analysis in the SNL/NM SWEIS:



Source: SNL EGIS Database

Figure 1-1. SNL/NM in Relation to Bernalillo County, New Mexico, the Albuquerque Region, and Adjacent Offsite Features

- Criterion 1:
  - Nuclear or high-hazard nonnuclear facilities, which require safety analysis reports
  - Moderate-hazard nonnuclear facilities
  - Accelerator facilities, which require safety assessment documents
- Criterion 2: Facilities that require offsite emergency planning
- Criterion 3: Facilities that require environmental permits
- Criterion 4: Facilities with outdoor testing
- Criterion 5: Facilities located on non-DOE property

1.1 Goals of the SWEIS Annual Review

The primary goal of the SWEIS Annual Review is to track changes and related environmental impacts at SNL/NM. Subsequent to this goal, the Annual Review provides information on SNL/NM activities by:

- Compiling and reporting the major modifications of SNL/NM operations in the context of environmental impacts analyzed in the SWEIS.
- Providing SNL/NM and DOE with information on trends and issues related to changes in environmental impacts associated with SNL/NM operations.

1.2 SWEIS Annual Review Information

The SWEIS Annual Review includes the following FY2000 environmental information:

- Chapter 2 provides an update of FY2000 SNL/NM cumulative site-wide operations reported in the SWEIS, including aggregated data such as total SNL/NM workers, total payroll and expenditures, annual worker and public radiation doses, utility usage, air emissions, water consumption and wastewater discharge, and similar information that can be compared to the SWEIS and its ROD. Site maps are provided to show the general location of SNL/NM facilities.
- Chapter 3 provides a summary of additions and modifications in FY2000 SNL/NM operations, with an update of selected and notable facility activities during FY2000. This information is presented in an extended table, where types of operations refer to the facility capabilities described in the SWEIS and FSID, and levels of operation are expressed in units

of production, number of tests, number of accelerator shots, hours of operation, and similar descriptive units of measurement.

- Chapter 4 provides more specific reports of FY2000 operations data for selected facilities compared to projected data for the SWEIS expanded operations alternative. The data for each facility includes material usage, waste generated, air emissions, process requirements (i.e., process water, process electricity, and boiler needs), and number of workers.

- Chapter 5 provides more specific reports of FY2000 operations data for notable facilities compared to projected data collected for the SWEIS analysis. This information includes current operations and capacities and a summary of FY2000 operations.

- Appendix A provides a summary of activities and hazards associated with SNL/NM individual general, special, and highbay laboratories that have prepared Primary Hazard Screening forms since the publication of the FSID and the SWEIS.

- Appendix B provides a summary of SNL/NM chemical usage (chemicals of concern identified in the SWEIS), including changes in hazardous chemical use and quantities.

1.3 SWEIS Alternatives and Analysis

As described in the SWEIS and its ROD, DOE proposes to continue operating SNL/NM and managing its resources in a manner that meets evolving DOE missions and that responds to the concerns of affected and interested individuals and agencies (DOE, 1999, 2000). In the SWEIS, DOE identified three alternatives—Reduced Operations, No Action, and Expanded Operations (DOE's Preferred Alternative)—that would meet its purpose and need for agency action and would support existing and potential future program-related activities at SNL/NM.

Under the reduced operations alternative, DOE and interagency programs and activities at SNL/NM were analyzed at the minimum level of operations needed to maintain SNL/NM facilities and equipment in an operational readiness mode. Under the no action alternative, ongoing DOE and interagency programs and activities at SNL/NM were analyzed to continue the status quo, that is, operating at planned levels as reflected in current DOE management plans.

Under the expanded operations, or preferred, alternative, DOE and interagency programs and activities at SNL/NM were analyzed to increase to the highest reasonable activity levels that could be supported by current facilities, their potential expansion, and construction of new facilities for future actions specifically identified in the SWEIS.

1.4 The Scope of the SWEIS Annual Review

Information presented in the FY2000 SWEIS Annual Review is drawn primarily from available SNL/NM databases and reports collected yearly or according to established reporting schedules. This approach minimizes the burden to ongoing research and development activities and aids in controlling the costs associated with collecting, validating, and reporting data. Additional data required to support extensive, detailed environmental impact assessment and modeling, such as accident risk analysis and transportation, is best collected at the time DOE elects to prepare an analysis on the status of the SWEIS (possibly in 2004 or 2005).

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CHAPTER 2.0
FY2000 UPDATE OF
SITE-WIDE OPERATIONS AT SNL/NM

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2.0 REVIEW OF SNL/NM SITE-WIDE FY2000 OPERATIONS

The SNL/NM Site-Wide Environmental Impact Statement (SWEIS) analyzed the potential direct, indirect, and cumulative environmental impacts, or changes, to the SNL/NM affected environment (DOE, 1999). The site-wide analysis was generally limited to resource and issue areas that lend themselves to a site-wide laboratory operations rollup and analysis. In most cases, the consequences of potential site-wide impacts were associated with human health, air quality, water quality and quantity, and biological resources.

This chapter summarizes FY2000 operational data rolled up for all of SNL/NM. In some cases, this Annual Review reports impacts for very specific areas, e.g., worker doses and doses from radioactive air emissions. These impact assessments are routinely undertaken by SNL/NM, using standard methodologies that were also used in the SWEIS; hence, this information provides a base for future trend analysis. A number of operational parameters are not included in the Annual Review because these data are not routinely collected by SNL/NM.

This chapter of the Annual Review also compares actual operating data from FY2000 to SWEIS projected activities in eleven resource areas: land use, infrastructure, geology and soils, water resources and hydrology, biological/ecological resources, cultural resources, air quality, human health and worker safety, transportation, waste generation, and socioeconomics. Specific resource areas are presented in the following detail:

- Infrastructure includes information on water use, electrical consumption, and wastewater.
- Air quality includes information on criteria pollutants, hazardous air pollutants, and radiological emissions.
- Waste generation includes information on hazardous waste, mixed waste, and solid waste.
- Socioeconomics includes information on number of employees and total budget.

2.1 Land Use

In FY2000, SNL/NM land use designations within Kirtland Air Force Base (KAFB) remained essentially the same as those discussed in the SWEIS (see Table 2-1). During the year, negotiations continued on renewal of two buffer zones leased from the Pueblo of Isleta and the State of New Mexico for two areas, encompassing over 9,000 acres (ac) (3,642 hectares [ha]) near the southwestern boundaries of KAFB. The buffer zones provide margins of safety and sound buffers for SNL/NM testing activities at the 10,000-Foot (ft) Sled Track.

Table 2-1. Site-Wide Environmental Issues by Resource Area

Resource Area	Units	SWEIS Baseline[a]	SWEIS Expanded Operations Alternative[b]	FY2000 Operations[c]
Land Use				
SNL/NM Land Use w/in KAFB	ac (ha)	8,824 (3,571)	8,824 (3,571)	8,574 (3,470)
DOE Buffer Zones		9,093 (3,680)	9,093 (3,680)	9,093 (3,680)
Infrastructure				
Facilities (Floor Space)	ft^2 (m^2)	5.27M[d] (0.49M)	4.99M[e] (0.46M)	5.27M (0.49M)
Utilities (Annual Basis)				
Water Use	gal (ℓ)	440M (1.67B)	545M (2.06B)	416M (1.57B)
Water Capacity	gal (ℓ)	2.0B (7.8B)	2.0B (7.8B)	2.0B (7.8B)
Sanitary Sewer Discharge	gal (ℓ)	280M (1.06B)	354M (1.34B)	265M[f] (1B)
Sanitary Sewer Capacity	gal (ℓ)	850M (3.22B)	850M (3.22B)	850M (3.22B)
Natural Gas Use	scf (ℓ)	475M (13.5B)	522.5M (14.8B)	486M (1.84B)
Natural Gas Capacity	scf (ℓ)	2.3B (65B)	2.3B (65B)	2.3B (65B)
Electrical Use	kWh	197,000	218,000	202,000
Electrical Capacity	kWh	1.1M	1.1M	1.1M
Geology and Soils				
Potential Soil/Subsurface Contamination Sites Identified	ER Sites	182	182	202[g]
Active Environmental Restoration Sites	ER Sites	20	20	17
No Further Action Approvals	ER Sites	48[h]	NA	81
Water Resources and Hydrology				
SNL/NM Projected Groundwater Use, Through 2008	ft^3/10 yr (ℓ/10 yr)	575M (16.3B)	628M (17.8B)	571M[i] (16.2B)
Developed Area (for Runoff Projections)	mi^2 (km^2)	0.72 (1.8)	0.72 (1.8)	0.72[j] (1.8)
Biological/Ecological Resources				
Change in Habitat Area	NA	NA	No Change	No Change
Cultural Resources				
Cultural Resources Located in All Areas of Potential Effect	Number of Sites	192	192	192

Table 2-1. Site-Wide Environmental Issues by Resource Area (Continued)

Resource Area	Units	SWEIS Baseline[a]	SWEIS Expanded Operations Alternative[b]	FY2000 Operations[c]
Air Quality				
Nonradioactive Emissions				
Nitrogen Oxides	tons/yr	153.92	162.36	34
Carbon Monoxide (CO)				
Stationary Sources		15.21	18.36	29
Mobile Sources		4,087	3,838	3,403
Construction Activities		132	132	132
Total CO		4,234	3,988	3,564
Lurance Canyon Burn Site		0.78	4.5	0.04
Particulate Matter		3.65	7.46	2.6
Sulfur Dioxide		0.32	1.10	0.4
Radioactive Emissions (10 Primary Locations)				
Argon 41	Ci/yr	44.9	40.0	18.9
Tritium		4.52	161	10.1
Nitrogen 13		4.2×10^{-2}	0.16	4.58×10^{-4}
Oxygen 15		2.6×10^{-2}	3.60×10^{-4}	4.58×10^{-5}
Iodine 131		1.96×10^{-3}	3.90	0
Iodine 132		1.29×10^{-4}	10.0	0
Iodine 133		9.51×10^{-3}	18.0	0
Iodine 134		0	0.72	0
Iodine 135		1.32×10^{-3}	11.0	0
Krypton 83m		9.57×10^{-5}	660.0	0
Krypton 85		1.53×10^{-3}	0.63	0
Krypton 85m		0.587	970	0
Krypton 87		0.029	190	0
Krypton 88		0.527	1,600	0
Xenon 131m		3.45×10^{-4}	5.9	0
Xenon 133		17.5	7,200	0
Xenon 133m		0.768	340	0
Xenon 135		14.7	6,900	0
Xenon 135m		0.976	1,200	0
Chemicals Purchased[k,l]				
Hazardous Air Pollutants (HAPs)	tons/yr	2.4	4.3	2.7
Toxic Air Pollutants(TAPs)		13	34.2	16.0
Volatile Organic Compounds (VOCs)		16	37.7	12.1

Table 2-1. Site-Wide Environmental Issues by Resource Area (Continued)

Resource Area	Units	SWEIS Baseline[a]	SWEIS Expanded Operations Alternative[b]	FY2000 Operations[c]
Human Health and Worker Safety				
Annual Collective Dose	Person-rem/yr	12 (255 workers)	19 (400 workers)	7.6 (143 workers)
Average TEDE	mrem/yr	47	47	53.6
Injury/Illness Rate	cases/ 100 FTE	3.8	3.8	3.09
Transportation				
SNL/NM Commuters	Vehicles	13,582	14,940	13,250[m]
Waste Generation (Selected Facilities Plus Balance of Operations)				
Radioactive Waste				
Low-Level Waste	ft^3 (m^3)	3,322 (94)	9,897 (280)	1,747 (49)
Low-Level Mixed Waste		153 (4.33)	258 (7.31)	53 (1.5)
Transuranic Waste		0 (0)	26 (0.74)	0 (0)
Mixed Transuranic Waste		16 (0.45)	37 (1.05)	0 (0)
Total Radioactive Waste		3,493 (98.9)	10,220 (289.4)	1,800 (50.5)
Chemical Waste				
RCRA Hazardous Waste	kg (lb)	55,852 (122,874)	92,314 (203,091)	25,433 (55,953)
TSCA (PCBs and Asbestos)		147,055 (323,521)	122,000 (268,400)	56,839 (125,046)
Non-RCRA Chemicals		69,321 (152,506)	114,576 (252,067)	26,436 (58,159)
Biohazardous		2,463 (5,419)	4,071 (8,956)	273 (601)
Recyclable Materials (Hazardous)[n]		60,768 (133,690)	100,439 (220,966)	29,376 (58,752)
Total Chemical Waste		340,317 (738,010)	441,429 (953,480)	138,357 (298,511)
Solid Waste	kg (lb) m^3 (yd^3)	0.6M (1.3M) 2,022 (2,644)	0.6M (1.3M) 2,022 (2,644)	1M (2.2M) 3,370 (4,408)
Solid Waste Recyclable	kg (lb)	1.58M (3.48M)	Not Estimated	1.5M (3.3M)
Noise and Vibration				
SNL/NM Estimated Number of Noise/Vibration-Producing Tests	Tests/ day	4.1	15.6	<1[o]

Table 2-1. Site-wide Environmental Issues by Resource Area (Continued)

Resource Area	Units	SWEIS Baseline[a]	SWEIS Expanded Operations Alternative[b]	FY2000 Operations[c]
Socioeconomics				
Employment	FTEs	7,652	8,417	7,465
Payroll	Dollars	480M	530M	490M
Expenditures	Dollars	1.43B	1.57B	1.463B

[a]The SWEIS baseline represented annual operational activities in FY1996 or FY1997, depending on which year data were available.
[b]The SWEIS expanded operations alternative represents an estimate of SNL/NM operations increasing to the highest reasonable activity that could be supported by then-current facilities, their potential expansion, and construction of new facilities for future actions specifically identified in the SWEIS.
[c]FY2000 Operations are actual, reported SNL/NM activities and associated material use, waste generation, and other support for FY2000.
[d]See footnote in Table 5.4.2-1 of the SWEIS.
[e]GSF by 2008, see footnote in Table 5.4.2-1 of the SWEIS.
[f]Based on simple ratio (0.636 wastewater/water use).
[g]Includes sites and subsites related to *Hazardous and Solid Waste Amendments* permit.
[h]Page 5-18 of the SWEIS.
[i]Based on 416M gallons (see SWEIS Reduced Operations Alternative).
[j]Estimate based on no changes to undeveloped land.
[k]For reporting purposes, chemical purchases are assumed to equal emissions. The screening process groups chemical purchases into three categories.
[l]Quantities reported include emission factor corrections (see Appendix D of the SWEIS).
[m]Estimate based on employment.
[n]Added the term "hazardous" for clarification.
[o]In FY2000, a total of 163 tests (at Selected Facilities) were completed.
Sources: DOE, 1999; Jones, 2001; SNL 2000a, b; SNL 2001a-j; Rogers, 2001; URS Radian, 2001.

2.1.1 Mesa del Sol Buffer Zone

The Mesa del Sol is a 12,000-ac (4,860-ha) parcel of land held in trust by the State of New Mexico Land Office for the benefit of the University of New Mexico. A buffer zone is located adjacent to the west boundary of KAFB and south of the Albuquerque Sunport complex, and provides a safety zone and sound buffer for activities performed by SNL/NM in Technical Area III (TA-III). The buffer zone consists of ~2,750 ac (451 ha).

DOE, KAFB, and SNL/NM have encouraged the State Land Office to restrict development within the buffer zone to industrial uses to minimize impacts to future residential uses that would be exposed to the sounds, vibrations, and noise common to Sled Track operations.

(SNL, 2001a)

2.1.2 Isleta Pueblo Buffer Zone

The Isleta Pueblo is adjacent to the south boundary of KAFB. For many years, DOE has leased 6,346 ac (2,570 ha) from the Pueblo to provide a safety buffer zone for the 10,000-Ft Sled Track in TA-III. Negotiations were underway in FY2000 to renew the lease.

(SNL, 2001a)

2.1.3 Manzano Storage Site

SNL/NM has obtained land-use permits for numerous bunkers at the Manzano Storage Facility for a number of years. Although the storage bunkers are owned by KAFB, the U.S. Air Force (USAF) no longer maintains or provides security for the facilities. SNL/NM leased seven bunkers in FY2000, primarily for the storage of radioactive waste and hazardous material.

(SNL, 2001a)

2.1.4 Land Use Permits

In FY2000, SNL/NM submitted 11 land-use permit renewals to the KAFB. Ten of the eleven renewal requests were for 5 years, and the eleventh renewal request was for 25 years. The land-use permit (KAFB-R-OG-88-10) for the SNL/NM Model Validation and System Certification Test Center, located in TA-III, required an environmental assessment. Table 2-2 shows the permit renewals requested and identifies the permit, facility information, and facility designation (notable or selected).

Table 2-2. FY2000 Land Use Permit Renewals

Permit Number	Facility/Description	Notable or Selected Facility
PERM/O-KI-95-0003	Steam Plant, Fuel Oil Supply Line, and Tank Farm	Selected Facility
PERM/O-KI-95-0006	14-inch Waterline to SNL/NM TA-III and TA-V	Not Applicable
KAFB-R-OG-88-14 DACA 47-4-83-199	Coyote Canyon Schoolhouse (Bldg. 29071)	Not Applicable
KAFB-R-OG-88-10	Model Validation and System Certification Test Center[a]	Not Applicable, New Facility
PERM/O-KI-00-0011 DACA47-4-70-1	Explosive Machining and Assembly Complex	Notable Facility
PERM/O-KI-99-0005	Thunder Range Complex	Selected Facility
PERM/O-KI-00-0010	Explosive Test Facility	Notable Facility
PERM/O-KI-98-0004	Ninth Street Outfall[b]	Not Applicable

Table 2-2. FY2000 Land Use Permit Renewals (Continued)

Permit Number	Facility/Description	Notable or Selected Facility
PERM/O-KI-89-28 DACA47-4-79-123	Overhead Power Line to 28000 Igloo Area	Not Applicable
PERM/O-KI-00-0006	28000 Igloo Area	Notable Facility

[a]Renewal required completion of an Environmental Assessment.
[b]Twenty-five year permit renewal.
Source : SNL, 2000c.

2.2 Infrastructure

SNL/NM's infrastructure consists of facilities and systems for water, sanitary sewer, storm drain, steam, chilled water, electrical transmission, electrical distribution, communications, roads, and parking that support the TAs and other facilities located on properties permitted from KAFB. According to the FY2001-2010 Sites Comprehensive Plan, infrastructure-related systems capacities in FY2000, including maintenance, roads, communications, steam, natural gas, and facility decommissioning, remained well within expected SWEIS projections, including water use, wastewater, electricity, and natural gas (see Table 2-1) (SNL, 2001a).

(SNL, 2001a)

2.2.1 Natural Gas

There have been no changes in the natural gas distribution system since publication of the SWEIS. Table 2-1 presents natural gas usage by SNL/NM in FY2000, and steam generation continued to be the major use. The total gas consumption for FY2000 was 103 percent of the usage analyzed in the SWEIS baseline.

The Steam Plant was partially renovated in FY2000 with upgrades associated with flue gas control on several boilers, resulting in improved boiler efficiency and reduced nitrogen oxide (NOx) emissions by nearly 80 percent. The Steam Plant produced 517 million pounds (M lb) of steam in FY2000.

2.2.2 Electricity

SNL/NM is supplied with electrical power through a contract with the Public Service Company of New Mexico. Table 2-1 shows the SWEIS baseline and expanded use of electricity compared to the FY2000 electrical usage of 202,000 kilowatt-hours. This FY2000 total usage represents 93 percent of estimated total usage analyzed within the SWEIS expanded operations alternative.

2.2.3 Water

SNL/NM is supplied with water through KAFB wells, with additional supplies provided during peak demands by the City of Albuquerque. Table 2-1 shows the SWEIS baseline and expanded water use compared to the FY2000 water use of 416M gallons (gal) (1.57 billion liters [B ℓ]). This is 129M gal (488M ℓ) below the quantity analyzed in the SWEIS expanded operations alternative.

(SNL, 2001f, g)

2.3 Geology and Soils

For the Environmental Restoration (ER) Project, the SNL/NM SWEIS discussed 182 locations of potential soil contamination on DOE and KAFB properties resulting from past SNL/NM activities. Since publication of the SWEIS, 20 subsite locations were added to the original 182 locations, for a total of 202 locations. Of these, 122 have been proposed to the New Mexico Environment Department as requiring no further action (NFA) because no contamination was found, or contaminant levels were below risk- or regulatory-based criteria, or cleanup has been completed. For the SWEIS baseline year (1996) only 48 sites had received approved NFAs. By September 2000, the total of NFA approvals reached 81. Investigation or cleanup continues at the remaining 41 sites.

In FY2000, the ER Project began the transition from cleanup and disposal operations to long-term stewardship responsibilities for monitoring and maintenance operations. As stewardship begins, the number of NFA approvals is expected to decline because stewardship would involve long-term management activities. Completion of ER Project work is scheduled for 2004, but the final schedule is dependent upon funding and regulatory approval.

(SNL, 2001d, e, f)

2.4 Water Resources and Hydrology

Groundwater beneath KAFB occurs primarily in the Albuquerque-Belen Basin aquifer, currently the sole source of drinking water for Albuquerque and surrounding communities. At SNL/NM TAs, depth to groundwater ranges from 400 ft to 500 ft (122 m to 152 m). Basin-wide groundwater levels have been decreasing for more than 30 years, the result of groundwater withdrawal by municipal and private wells exceeding the rate of groundwater recharge. In 2000, KAFB withdrew 1.38B gal (5.2B ℓ) of groundwater, of which SNL/NM used 416M gal (1.57B ℓ) (Jones, 2001). Water levels in almost all regional wells across KAFB continued to decline in FY2000. A prominent water-level depression is present on the west side of KAFB, with water-level declines up to 1.6 ft (0.5 m) per year.

2.4.1 General Site Groundwater Sampling

During FY2000, groundwater samples were collected quarterly, biannually, or annually, depending on the project area. Third and fourth quarter sampling, however, was canceled at some ER Project areas due to budgetary constraints. SNL/NM sampled a few ER wells in each of these areas to make up for the data deficiency. Results from both groups were compared to maximum contaminant levels (MCLs) established by the U.S. Environmental Protection Agency (EPA), and derived concentration guides (DCGs) for radionuclides, established by DOE. In addition, results from two newly installed wells will be available in FY2001.

Annual Groundwater Sampling

Annual sampling was conducted in a total of 14 wells and one spring in FY2000, including six ER Project wells. Cadmium was detected slightly above the MCL of 0.005 milligrams per liter (mg/ℓ) in Coyote Springs, and uranium was found slightly elevated above the MCL of 20 picocuries per liter (pCi/ℓ) in two wells. The slightly elevated levels are likely due to contact of groundwater with the metamorphic/igneous bedrock, in which the radioactivity is slightly above background levels, and high in many trace metals.

There were no analytes detected above established MCLs in any Mixed Waste Landfill (MWL) ER site well, with the exception of nickel that was detected in two wells. Nickel in these wells results from corrosion of the well screen. A special resampling occurred in October to validate the presence of low levels of toluene (well below MCLs) that had been detected in two wells. No toluene was detected in the second sampling event. One well is a dually-completed well, with an inflatable packer element separating two completion zones. Toluene is used in the manufacturing of the packer, and the low levels of toluene occasionally found in this well likely derive from the packer.

Biannual Groundwater Sampling

Biannual sampling was conducted at ten Chemical Waste Landfill (CWL) monitoring wells. Nickel was found in two wells during both sampling periods, with the highest value being 1.50 mg/ℓ, as compared to the MCL of 0.1 mg/ℓ. Well #CWL-MW2A was also marginally elevated for chromium. Both chromium and nickel are well-screen corrosion products, and the presence of these metals is likely the result of the deteriorating well screen.

Quarterly Groundwater Sampling

Nine wells in TA-V were sampled in the first two quarters in FY2000. Trichloroethene (TCE) has consistently been detected in one well at levels up to four times the MCL of 5 micrograms per liter (µg/ℓ). The most likely source of the TCE is the drainfield for the Liquid Waste Disposal System (LWDS). Nitrate levels are also elevated in the LWDS monitoring well and two other wells. The highest levels of 16 mg/ℓ compares to an MCL of 10 mg/ℓ.

2.4.2 Tijeras Arroyo Groundwater (TAG) Investigation Area Sampling

The TAG Investigation area includes SNL/NM's present TA-I and TA-II, and has a long history of industrial tenants occupancy before SNL/NM. Past SNL/NM operations also may have potentially contaminated the groundwater. Currently, the source of contaminants, such as TCE, has not been identified. Due to the complex nature of potential past contaminant scenarios, the source of groundwater contaminants may never be definitively identified.

Twelve shallow (perched) wells and 11 regional monitoring wells in the TAG Investigation area were sampled in the first two quarters of FY2000. TCE has been identified in both shallow and regional wells at levels slightly above the MCL of 5.0 μg/ℓ. The highest level (9.20 μg/ℓ) was found during the May sampling event. Nitrate is also a contaminant of concern in the TAG Investigation area, and samples from six wells showed elevated nitrate levels. One well had nitrate levels of 44 mg/ℓ, as compared to the MCL of 10.0 mg/ℓ, in the December 1999 sampling period. Selenium was found in a shallow well at levels up to 58 μg/ℓ, as compared to the MCL to 50 μg/ℓ.

2.4.3 Coyote Canyon Test Area Groundwater Sampling

Groundwater sampling in the Coyote Canyon Test Area was conducted in three quarters of FY2000 in three monitoring wells and the production well onsite. This area includes the general vicinity associated with the active Burn Site Facility in Lurance Canyon. The Burn Site Facility conducts thermal tests using jet fuel, gasoline, and diesel. Low levels of petroleum products and other volatile organic compounds (VOCs) have been detected in two of the three monitoring wells onsite. Other analytes included semi-volatile organic compounds (SVOCs), explosives, metals, phenolics, and various anions, including nitrate. Nitrate has been detected consistently in two wells. The highest level found was 22 mg/ℓ, as compared to the MCL of 10 mg/ℓ. All petroleum products detected have been at trace levels, where established. Ethyl benzene was detected at less than 1 μg/ℓ, as compared to MCL of 700 μg/ℓ; toluene was detected at less than 1 μg/ℓ, as compared to MCL of 1,000 μg/ℓ; and xylene was detected at less than 2 μg/ℓ, as compared to the MCL of 10,000 μg/ℓ.

(SNL, 2001i)

2.5 Biological/Ecological Resources

Long-term restricted access and limiting planned development have generally provided protection, benefiting biological resources within the boundaries of KAFB. This benefit continued in FY2000, with no identified threatened and endangered (T&E) species issues at SNL/NM.

Grassland vegetation in open areas of KAFB, the Albuquerque International Sunport, and SNL/NM provides habitat for Gunnison's prairie dog (*Cynomys gunnisoni*) and subsequently for the western burrowing owl (*Athene cunicularia hypugea*). Although the western burrowing owl is not a T&E species, it is a migratory, nongame bird protected under the *Migratory Bird Treaty Act.*

Current management practice regarding prairie dogs is conservation of their habitat for later use by burrowing owls. Conservation efforts are also underway with the State of New Mexico to protect another prairie dog species, the black-tailed prairie dog (*Cynomys ludovicianus)* as a candidate for federal T&E listing. To date, routine surveys have not identified this species within the Kirtland Federal Complex (KFC).

In all areas where potential ground disturbance is proposed, i.e., construction, renovation, or decommissioning activities, SNL/NM performs surveys to detect resident prairie dogs, burrowing owls, and other migratory birds. For prairie dogs, efforts are made to stimulate relocation by a light grading of the ground surface prior to ground disturbance. Burrowing owl nests are avoided as much as possible, or if necessary, the birds are relocated to an undisturbed area.

In 2000 and preceding years, SNL/NM has conducted ecological monitoring studies at various SNL sites throughout the KFC for sensitive species, which has included 15 to 20 surveys per summer for the western burrowing owl.

For a summary of biological and ecological resources compiled in support of the SWEIS, refer to the SNL/NM Environmental Information Document (EID) (SNL, 1999b). The Annual Site Environmental Report (ASER) provides environmental compliance summaries (SNL, 2001b). Details on management of sensitive species and habitat are included in the SNL Environment, Safety & Health Manual (SNL, 2001k).

2.6 Cultural Resources

Cultural resources within KAFB boundaries include prehistoric archaeological sites, some of which date to before AD 1540 (the initiation of Spanish exploration of the area), and historic archaeological sites (sites, buildings, and structures from AD 1540 to 1948). Within the boundaries of KAFB and the leased buffer zones are 284 recorded prehistoric and historic archaeological sites.

Cultural resources in areas used by SNL/NM continue to benefit from the protection provided by restricted access, compliance with applicable regulations, and established procedures for the protection and conservation of cultural resources. There are no known cultural resource sites on DOE-owned land at KAFB. To date, no traditional cultural properties have been specifically identified at SNL/NM; however, several tribes have requested that they be consulted under the *Native American Graves Protection and Repatriation Act* of 1990 (NAGPRA) if human remains were to be discovered during excavations related to SNL/NM activities.

2.7 Air Quality

2.7.1 Radiological Air Quality

Radioactive airborne emissions from point sources (i.e., stacks) during FY2000 totaled ~28.71 curies (Ci), less than the 19,311 Ci analyzed in the SWEIS expanded operations alternative. The two largest contributors were the Neutron Generator Facility (NGF) and the Annular Core Research Reactor (ACRR). The NGF stack emissions totaled 9.45 Ci and accounted for ~33 percent of the SNL/NM total, but were less than the projected level for expanded operations of ~156 Ci for tritium. Emissions from the ACRR were ~18.33 Ci, which is ~235 percent of the projected level for expanded operations of ~7.8 Ci per year for this selected facility. The rise in the ACRR's estimated release is due to increased reactor operations for iodine production. Other sources of radioactive air emissions were present at 17 facilities located throughout SNL/NM. Several other facilities with periodic radiological emissions reported zero emissions.

(SNL, 2001b, j, l)

The calculated dose to the maximally exposed individual (MEI) by the air pathway during 2000 was $3.5x10^{-3}$ millirem (mrem), including contributions from stack emissions and non-point sources such as the MWL and the CWL. The calculated MEI dose attributable to SNL/NM operations was less than 0.7 percent of the 0.51 mrem projected by the SWEIS and its Record of Decision, and is well below the EPA emission standard of 10 mrem/yr (DOE, 1999, 2000). The calculated collective dose to the population within a 50-mile (mi) (80-kilometer [km]) radius of SNL/NM from the annual radiological air emissions due to SNL/NM operations was $8.0x10^{-2}$ person-rem and would be 15.8 person-rem per year under the expanded operations alternative.

(SNL, 2001l)

2.7.2 Nonradiological Air Quality

Major sources of nonradiological air emissions in the Albuquerque area are motor vehicles, wood-burning stoves and fireplaces, and open burning. Besides Albuquerque motor vehicle commuting, the largest contribution to air emissions at SNL/NM are the Steam Plant boilers which provide heat to a large number of SNL/NM facilities. The Steam Plant accounts for more than 90 percent of the total SNL/NM emission of pollutants from fixed facilities regulated by the *Clean Air Act*. All SNL/NM emissions are below regulatory permitted levels, and are below standards set to protect health, with an ample margin of safety. Actual emissions are only a fraction of permitted levels. Hazardous chemical air emissions related to SNL/NM activities are small enough not to require individual monitoring. SNL/NM continues to reduce and limit chemical air emissions through improved administrative and engineering controls.

Vehicle emissions, the dominant source of carbon monoxide (CO) from SNL/NM activities, are assessed because the Albuquerque/Bernalillo county area is an EPA-designated "maintenance" area for this emission. All other sources of CO at SNL/NM are small; the total CO emissions are an estimated 3 percent of the total CO emissions generated in the county.

A summary of emissions of criteria pollutants and other pollutants for FY2000 appears in Table 2-1. Compared to the quantities analyzed in the SWEIS expanded operations alternative, except for CO, all hazardous emissions were lower in FY2000. In fact, nitrogen oxides (NOx) are down significantly, from 153.92 tons/yr to 34 tons/yr. Mobile sources (vehicles) emissions declined as a result of the reduction in SNL/NM commuters, from 13,582 estimated in the baseline, to 13,250 in FY2000. Details on SNL/NM chemical purchases for FY2000 are included in Appendix B. Purchase estimates for chemicals of concern are presented in categories of air pollutants, including hazardous, toxic, and volatile organic compounds.

(URS Radian, 2001)

2.8 Human Health and Worker Safety

2.8.1 Human Health

The use of radiological or hazardous materials at SNL/NM can potentially affect human health for workers and the public. In New Mexico, the average background radiation dose per person is 360 mrem/yr, more than 80 percent from natural radiation sources such as radon in the soils. The major, nonnatural source of radiation is medical testing, which accounts for 15 percent of the total dose. In FY2000, the maximum dose estimate of radioactive air emissions from SNL/NM facilities for an individual in a publicly accessible area is $3.5x10^{-3}$ mrem/yr, which is 0.001 percent of the background radiation dose. The FY2000 collective dose to the population within 50 mi was $8.0x10^{-2}$ person-rem.

Nonradiological, chemical air pollutants are released from SNL/NM facilities that contain chemistry laboratories or chemical operations. These pollutant concentrations were below safety levels established for workers in industrial areas and diminished with increasing distance from the sources. Environmental monitoring data collected for FY2000 verify that no chemical contamination reached the public through surface water, soil, or groundwater.

(SNL, 2001l)

2.8.2 Worker Safety

Working conditions at SNL/NM are consistent with those identified in the SWEIS. Workers in some SNL/NM facilities receive an additional dose of radiation above background radiation, which is measured by personal radiation monitoring devices (dosimetry badges). Total dose for workers, however, must remain below the 10-mrem annual dosage limit established by DOE regulations.

Accidents and Injuries

Occupational injury and illness rates for workers at SNL/NM declined during FY2000 (see Table 2-1). These rates correlate to 3.09 reportable injuries and illnesses per 100 FTEs during the year, compared to 3.8 injuries and illnesses per 100 FTEs analyzed in the SWEIS.

(SNL, 2001g)

Ionizing Radiation and Worker Exposures

Occupational radiation exposures for workers at SNL/NM during FY2000 are summarized in Table 2-1. The collective total effective dose equivalent (TEDE) for the SNL/NM workforce during FY2000 was higher than the workforce dose of 47 mrem analyzed in the SWEIS. However, the FY2000 report of 143 workers with a collective effective dose equivalent (EDE) of 7.6 person-rem/yr was below the workforce doses for the SWEIS base year of 255 workers with an annual collective EDE of 12 person-rem/yr.

(DOE, 1999; SNL, 2001g)

The decrease in overall occupational exposure resulted from several causes, the more important of which included:

- The workload and types of work have changed from activities analyzed during the SWEIS base year, resulting in a decreased collective EDE; for example, the base year included testing at the ACRR and Hot Cell Facility of medical isotopes for U.S. medical needs. This project was expected to result in higher exposures for the workers. Because medical isotope production is currently suspended, the collective dose to workers in FY2000 was much less than projected in the SWEIS.

- The improved efforts to keep radiological exposures as low as reasonably achievable, such as the addition of shielding at SNL/NM workplaces, have also resulted in lower worker exposures, and consequently a reduced FY2000 collective EDE for the SNL/NM site.

(SNL, 2001g)

2.9 Traffic

The SWEIS estimated that, under the expanded operations alternative, 8,417 SNL/NM employees would result in 14,940 commuters. The term commuter includes all vehicles operated by SNL/NM employees, contractors, and visitors, DOE employees, and additional traffic, such as delivery vehicles. Since no traffic studies were conducted by SNL/NM or the USAF in FY2000, an estimate based on the methodology provided in the SWEIS was performed. Based on 7,465 SNL/NM employees, a projected 13,250 commuters were calculated for FY2000. The Air Force conducted a traffic study in the Spring of 2001; publication is forthcoming.

(DOE, 1999; SNL, 2000b)

Transportation activities at SNL/NM involve the receipt, shipment, and transfer of hazardous and nonhazardous material and waste. As discussed in Section 1.4, detailed information on the frequency of received hazardous material, number of chemical containers, and shipments is not routinely collected and, therefore, is not reported here.

2.10 Waste Generation

Waste management activities at SNL/NM consist of managing, storing, and preparing waste for offsite disposal in accordance with applicable federal and state regulations, permits, and DOE orders. SNL/NM generates nonradioactive, radioactive, and chemical waste from research operations, maintenance, construction, and environmental restoration activities. Comparisons of FY2000 waste quantities to projections made under the SWEIS expanded operations alternative include three types: radioactive waste, chemical waste, and other waste. No distinction has been made between routine waste (generated from ongoing operations) and nonroutine waste (generated from the accidental spills or decontamination and decommissioning of buildings). In FY2000, reported waste volumes were lower than those projected for the SWEIS expanded operations alternative. A summary of waste volume comparisons appears in Table 2-1.

2.10.1 Radioactive Waste

SNL/NM operations generate four categories of radioactive waste: low-level waste (LLW), low-level mixed waste (LLMW), transuranic waste (TRU), and mixed transuranic waste (MTRU). In FY2000, SNL/NM generated 1,747 cubic feet (ft^3) (49 cubic meters [m^3]) of LLW, or 17.7 percent of waste volumes analyzed in the SWEIS expanded operations alternative. During the same time, SNL/NM generated 53 ft^3 (1.5 m^3) of LLMW or 20.5 percent of the LLMW analyzed in the SWEIS expanded operations alternative. Table 2-1 shows no TRU and MTRU waste was generated in FY2000.

2.10.2 Chemical Waste

Chemical waste generation in FY2000 was less than the 441,429 kilograms (kg) (953,480 lb) of waste estimated under the SWEIS expanded operations alternative (excluding ER Project waste). In FY2000, SNL/NM operations generated 25,433 kg (56,839 lb) of hazardous waste. Other waste, classified as chemical waste, generated onsite under current operations includes biohazardous (medical) waste, asbestos, polychlorinated biphenyls (PCBs), nonhazardous solid waste, and process wastewater. Hazardous waste generated in FY2000 included 10,217 kg (22,477 lb) of PCBs and 46,622 kg (102,570 lb) of asbestos. The ER Project continued to clean up past contamination at many sites, generating an additional 6.35M kg (12.7M lb) of chemical waste. Table 2-1 presents waste quantities for all these waste types.

(SNL, 2001f, g)

As discussed in Section 4.6.1, the Hazardous Waste Management Facility continued to collect, characterize, manage, and ship waste to commercial facilities for treatment and disposal.

2.10.3 Solid Waste

In FY2000, SNL/NM operations generated 1M kg (2.2M lb) of solid waste, some 0.4M kg (0.9M lb) more than solid waste generation estimated for the SWEIS expanded operations alternative. Table 2-1 shows SNL/NM recycled 1.5M kg (3.3M lb) of solid waste.

(SNL, 2001f, g)

2.11 Socioeconomics

As shown in Table 2-1, the approximately 7,465 employees working at SNL/NM in FY2000 represent 89 percent of the employees estimated under the SWEIS expanded operations alternative, which included an estimated workforce of 8,417.

In FY2000, SNL/NM was the fifth-largest private employer in New Mexico, with a payroll of $490M. The total operating and capital budget for SNL/NM for FY2000 was approximately $1.46B (SNL, 2000b).

SNL/NM operations had a beneficial impact to the local economy in FY2000 of $4B. The SWEIS estimated that for every job at SNL/NM, another 2.46 jobs were created in the local economy.

(DOE, 1999)

2.12 Safety Documentation

In FY2000, SNL/NM revised three safety assessment documents (SADs) for operations at the High-Energy Radiation Megavolt Electron Source III (HERMES III), Z Accelerator, and Microelectronics Development Laboratory (MDL) and completed a safety analysis of the ACRR Safety Analysis Report (SAR). In addition, SNL/NM issued a new SAR for the New Gamma Irradiation Facility (New GIF) and a preliminary SAR for the Auxiliary Hot Cell Facility. Each year, several hundred Primary Hazard Screenings (PHSs) undergo review and updating. These PHSs cover a wide range of activities and facilities, including laboratories, machine shops, and test facilities. Appendix A of this document provides summaries of laboratories with PHSs added since publication of the SWEIS and the initial Facilities and Safety Information Document (FSID) (DOE, 1999; SNL, 1999a).

2.13 Other Key Areas, Maps, and Technical Area Descriptions

2.13.1 Facilities in TA-I

Figure 2-1 shows the locations of the notable and selected facilities in TA-I. Activities in TA-I are related to the following:

- Administration
- Technical support
- Defense programs
- Energy programs
- Technology transfer
- Exploratory systems
- Site support
- Basic research
- Component development
- Microelectronics
- Business outreach

The majority of SNL/NM personnel work in TA-I (SNL, 1997a).

2.13.2 Facilities in TA-II

Figure 2-2 shows the locations of the notable and selected facilities in TA-II. The principal activities in TA-II include explosives storage and testing and certain waste management activities. Several existing TA-II facilities have been scheduled for demolition, and the area is being converted to site-support functions.

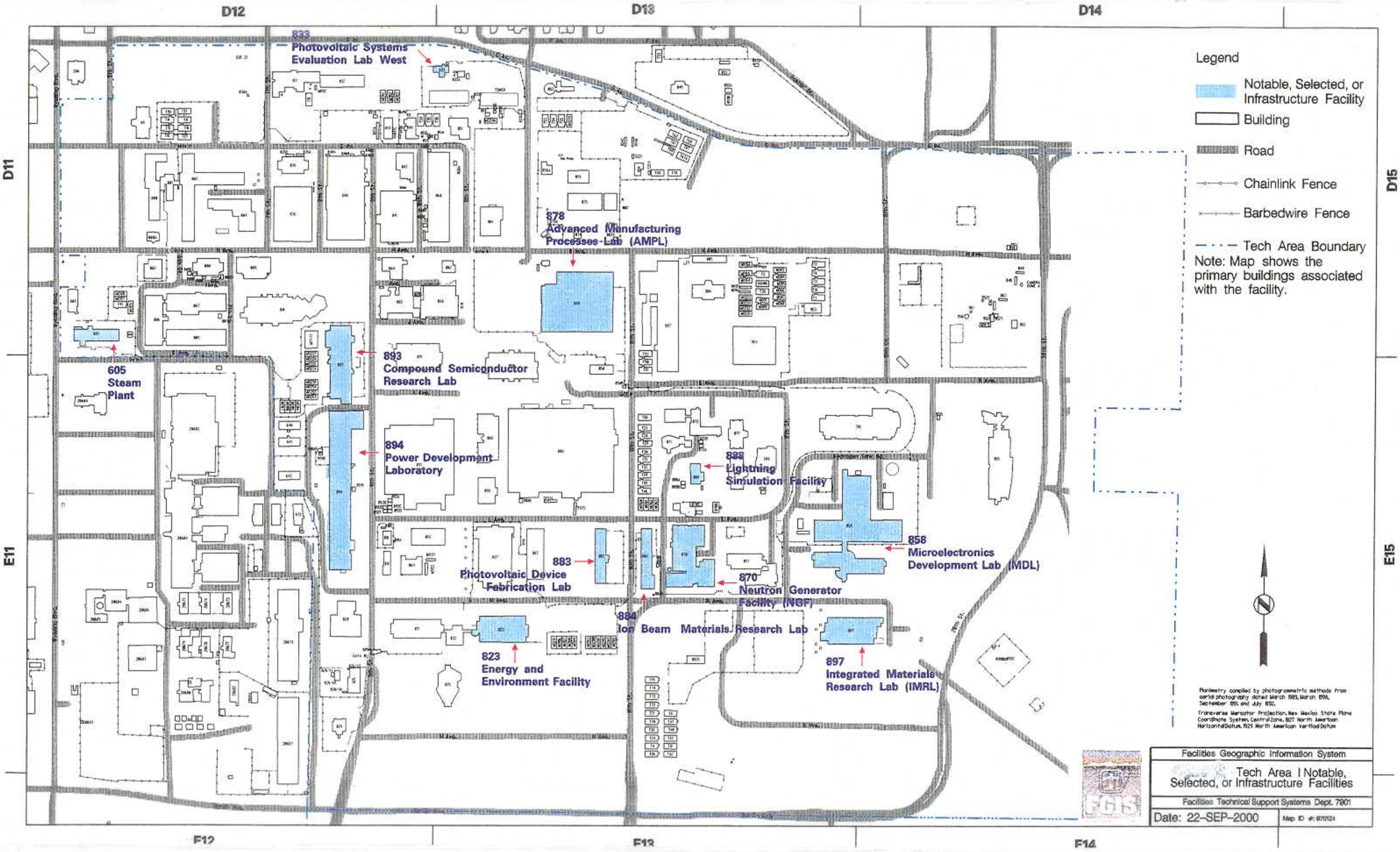

Figure 2-1. Tech Area I Notable, Selected, or Infrastructure Facilities

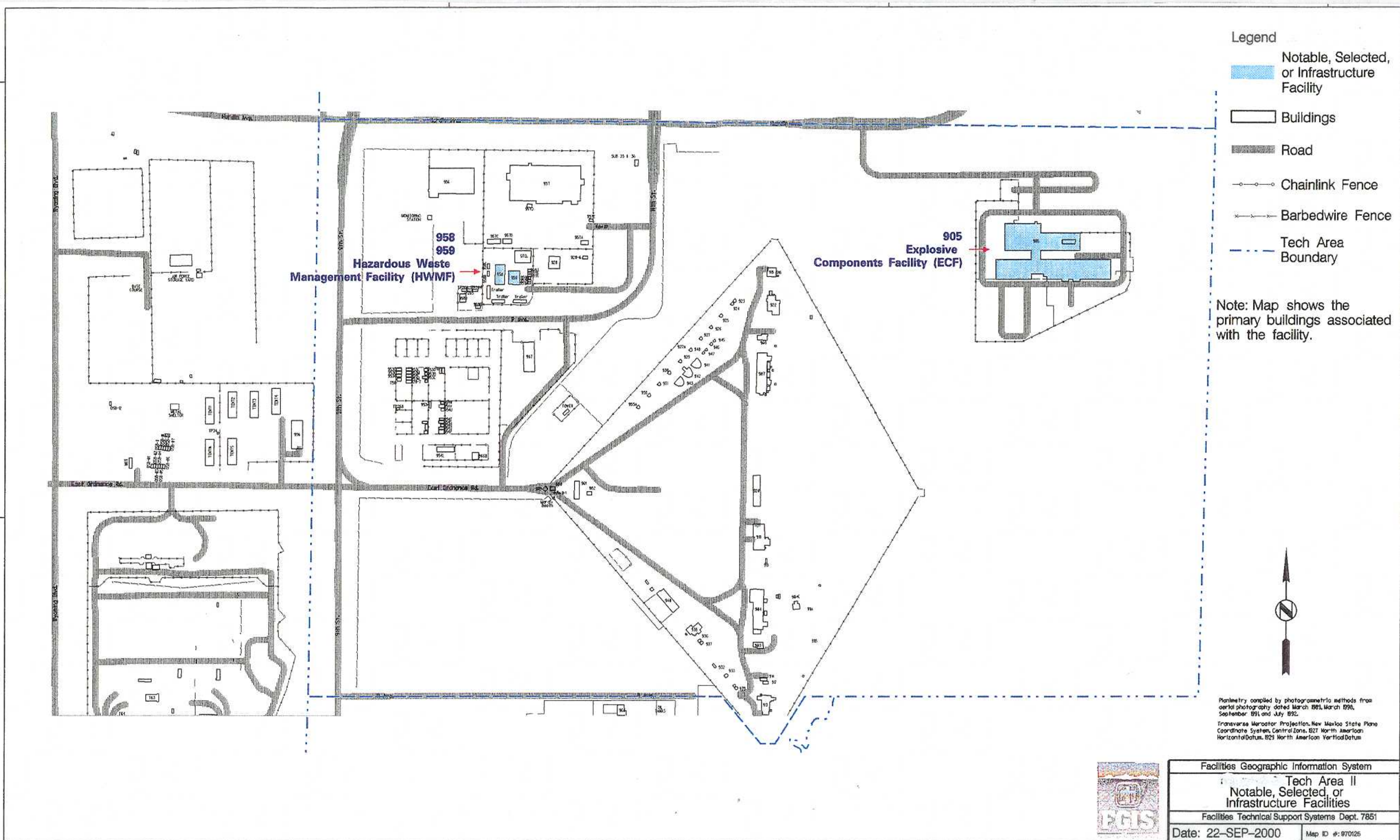

Figure 2-2. Tech Area II Notable, Selected, or Infrastructure Facilities

2.13.3 Facilities in TA-III

Figures 2-3 through 2-7 show the locations of notable and selected facilities in the four quadrants of TA-III. Activities in TA-III include violent physics testing and simulation of natural and induced environments.

2.13.4 Facilities in TA-IV

Figure 2-8 shows the locations of notable and selected facilities in TA-IV. Most activity in this area centers on the operation of several accelerator facilities to simulate nuclear weapons effects and to conduct research on inertial confinement fusion and particle-beam weapons.

2.13.5 Facilities in TA-V

Figure 2-9 shows the locations of notable and selected facilities in TA-V. Activities in this area include operation of experimental and engineering nuclear reactors and electron-beam accelerators.

2.13.6 Facilities in Coyote Test Field, Manzano Area, and Withdrawn Area

Figure 2-10 shows the locations of the notable SNL facilities in Coyote Test Field (CTF), Manzano Area, and Withdrawn Area. Activities at CTF include violent physics testing operations that require large land areas and unusual terrain. Activities at the Manzano Area include storage of low-level radioactive waste, mixed waste, and transuranic waste and storage of inert materials and records. Activities in the Withdrawn Area include impact tests, burn tests, and explosive component testing.

(SNL, 1997b)

DOE does not own the land in CTF and the Manzano Area. Most of the facilities listed for these areas operate under agreements with the USAF. See the *Sandia National Laboratories/New Mexico EID*, Chapter 2, "Land Use," for details regarding land ownership (SNL, 1999b).

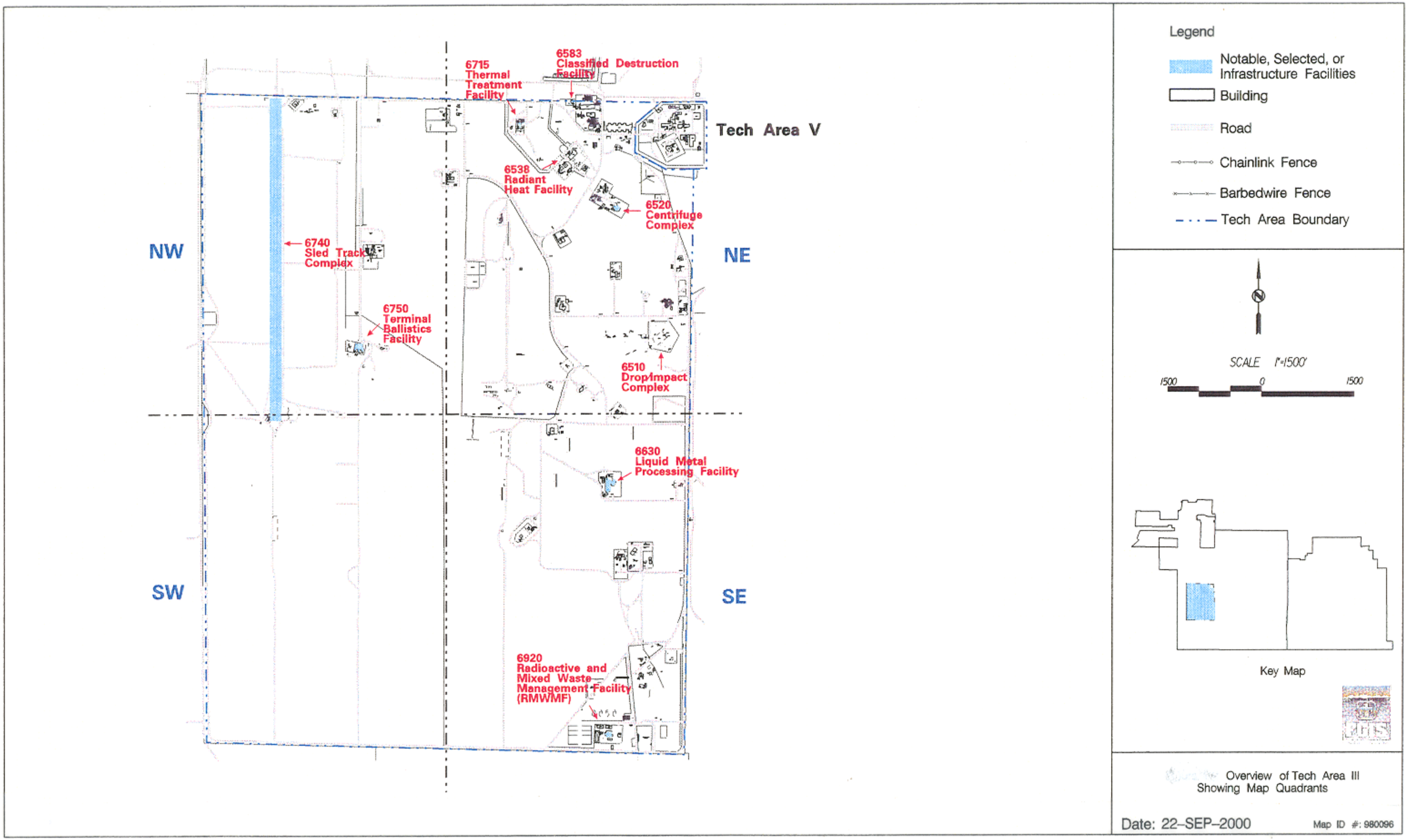

Figure 2-3. Overview of Tech Area III Showing Map Quadrants

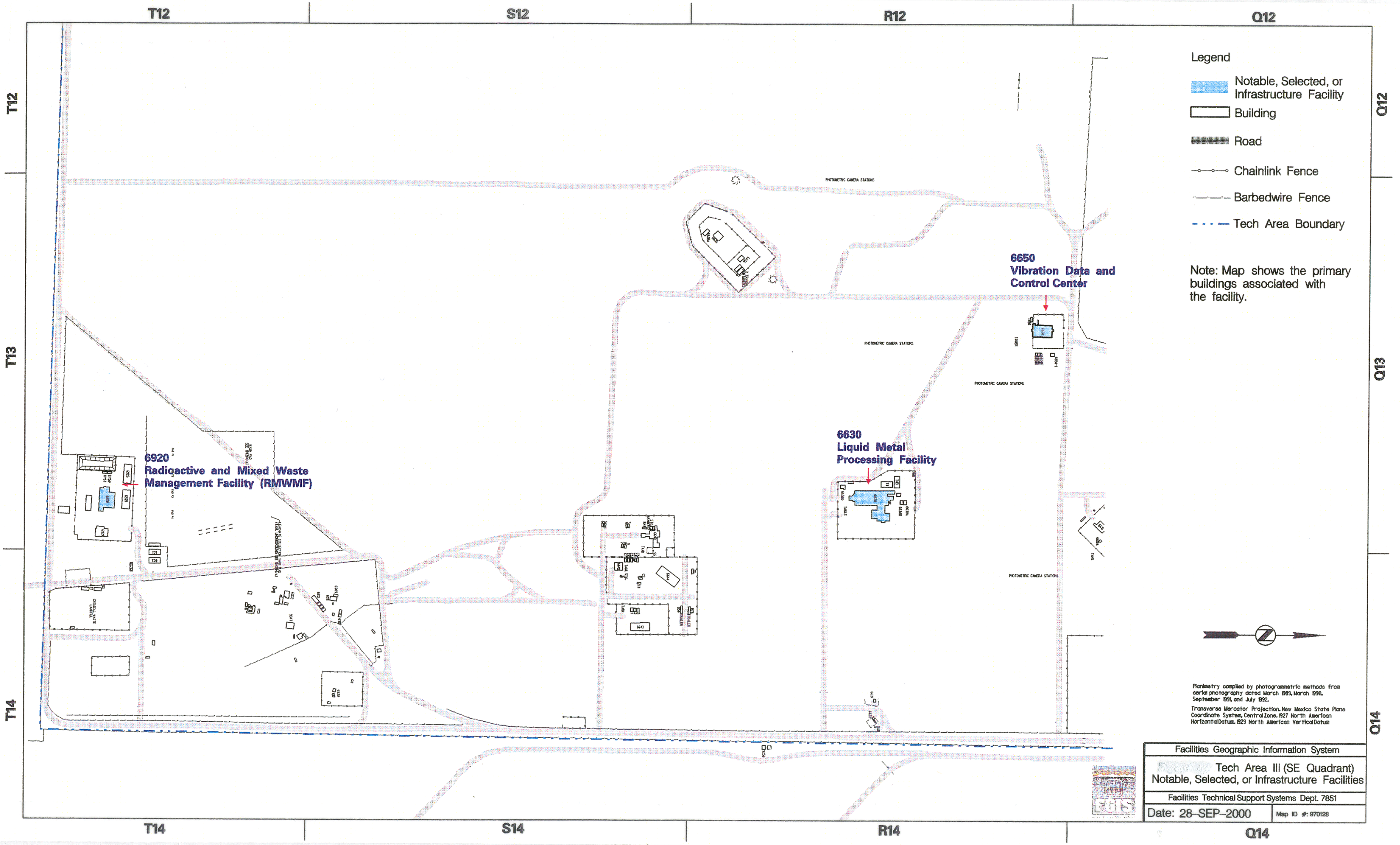

Figure 2-4. Tech Area III (SE Quadrant) Notable, Selected, or Infrastructure Facilities

Figure 2-5. Tech Area III (SW Quadrant) Notable, Selected, or Infrastructure Facilities

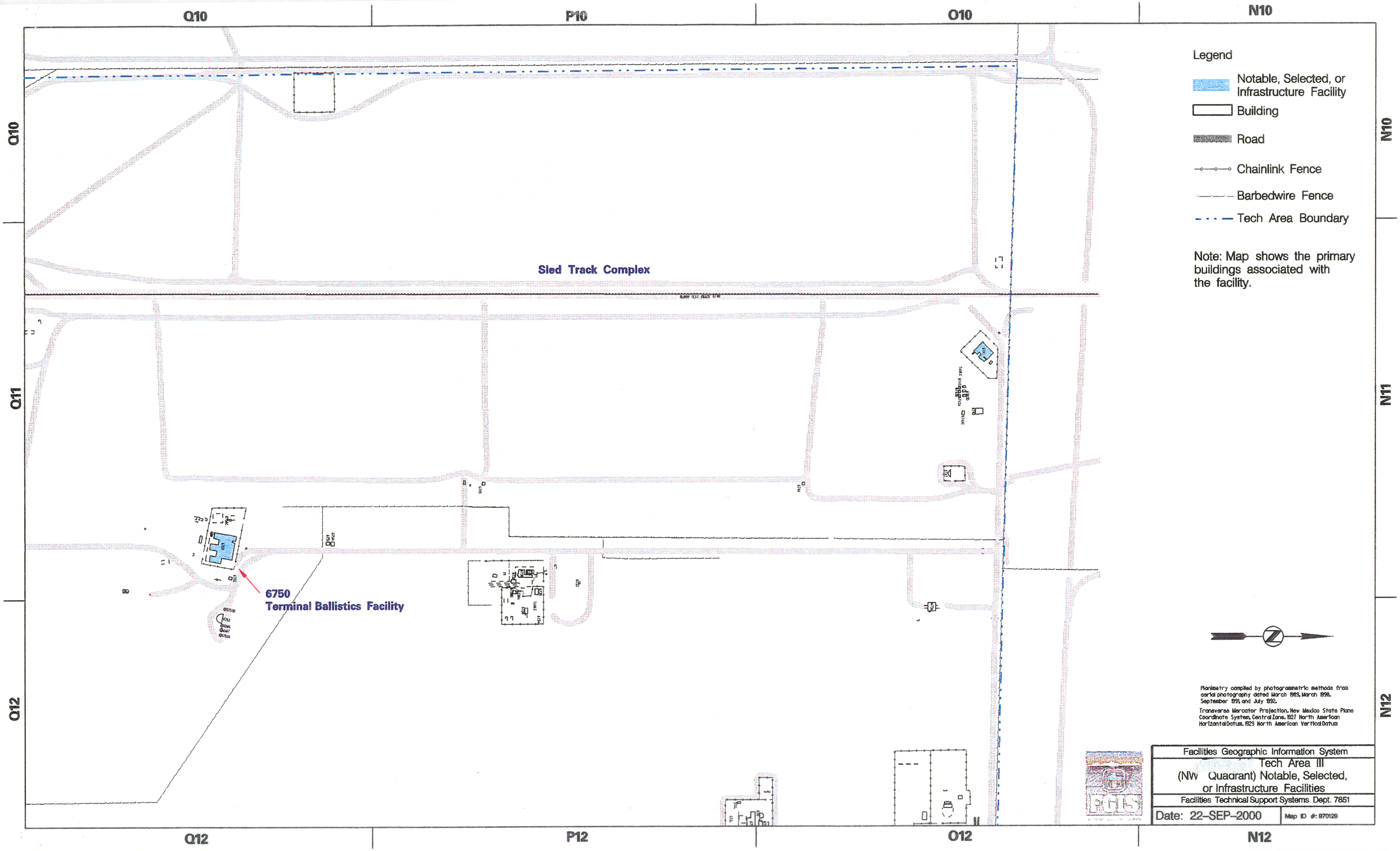

Figure 2-6. Tech Area III (NW Quadrant) Notable, Selected, or Infrastructure Facilities

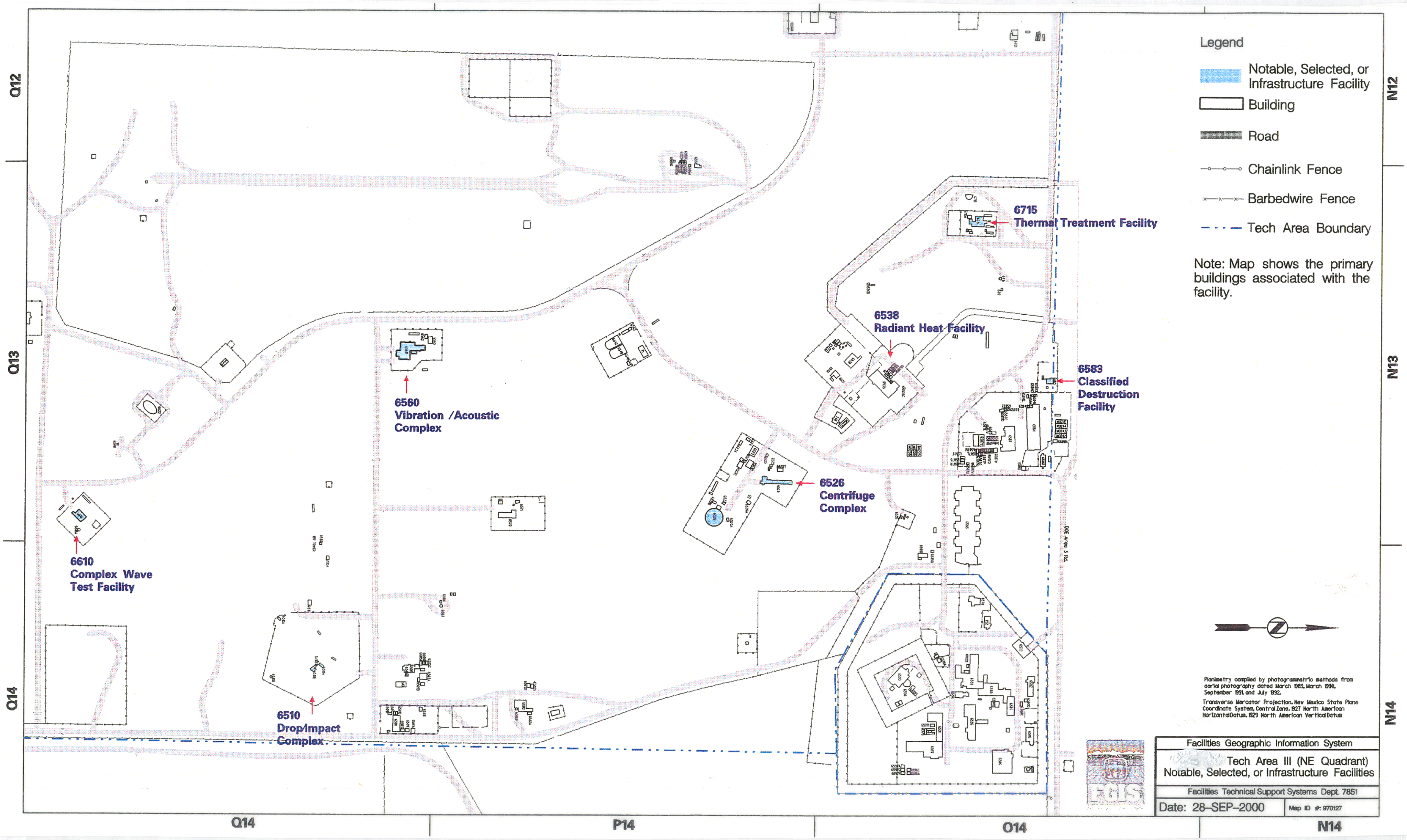

Figure 2-7. Tech Area III (NE Quadrant) Notable, Selected, or Infrastructure Facilities

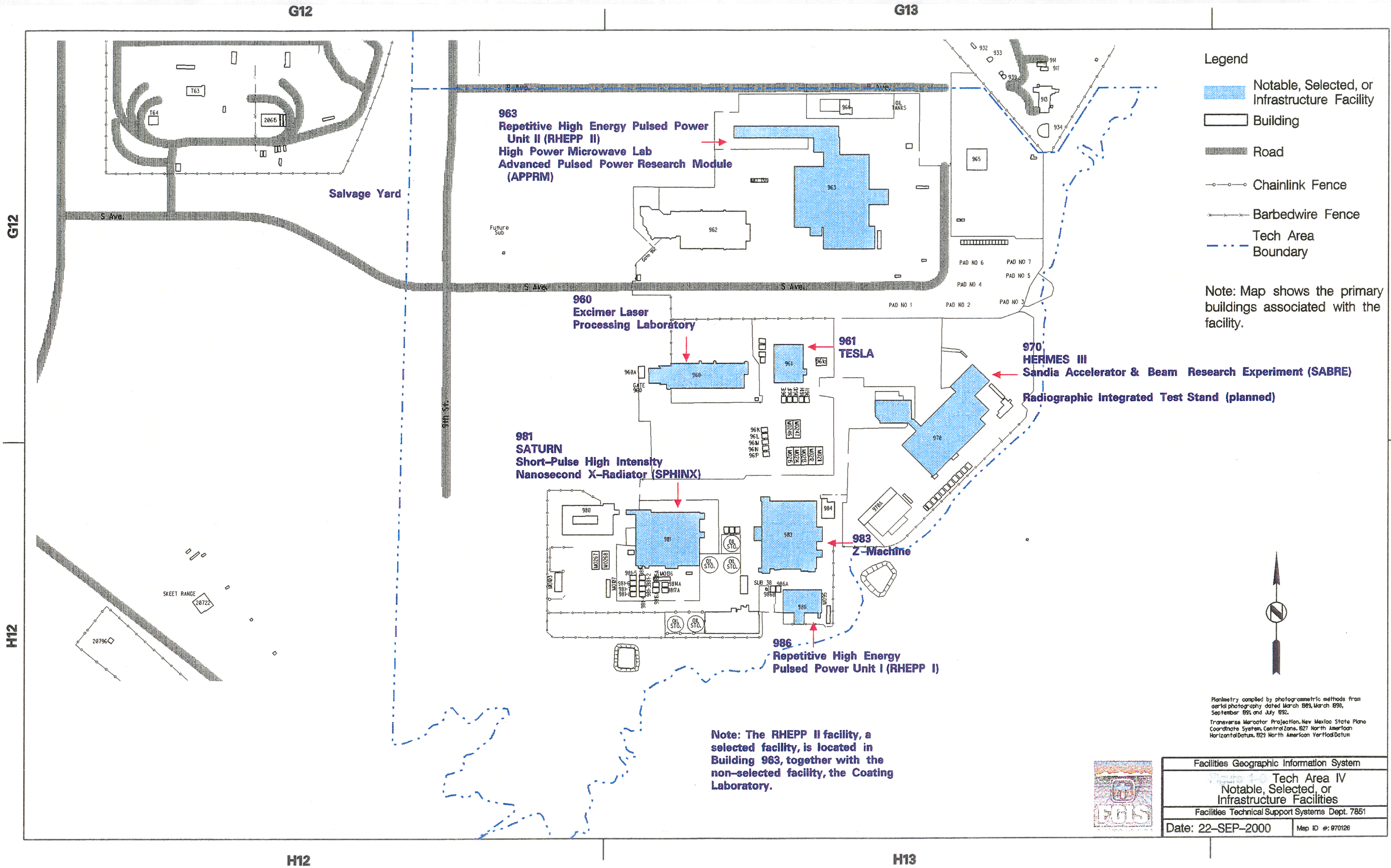

Figure 2-8. Tech Area IV Notable, Selected, or Infrastructure Facilities

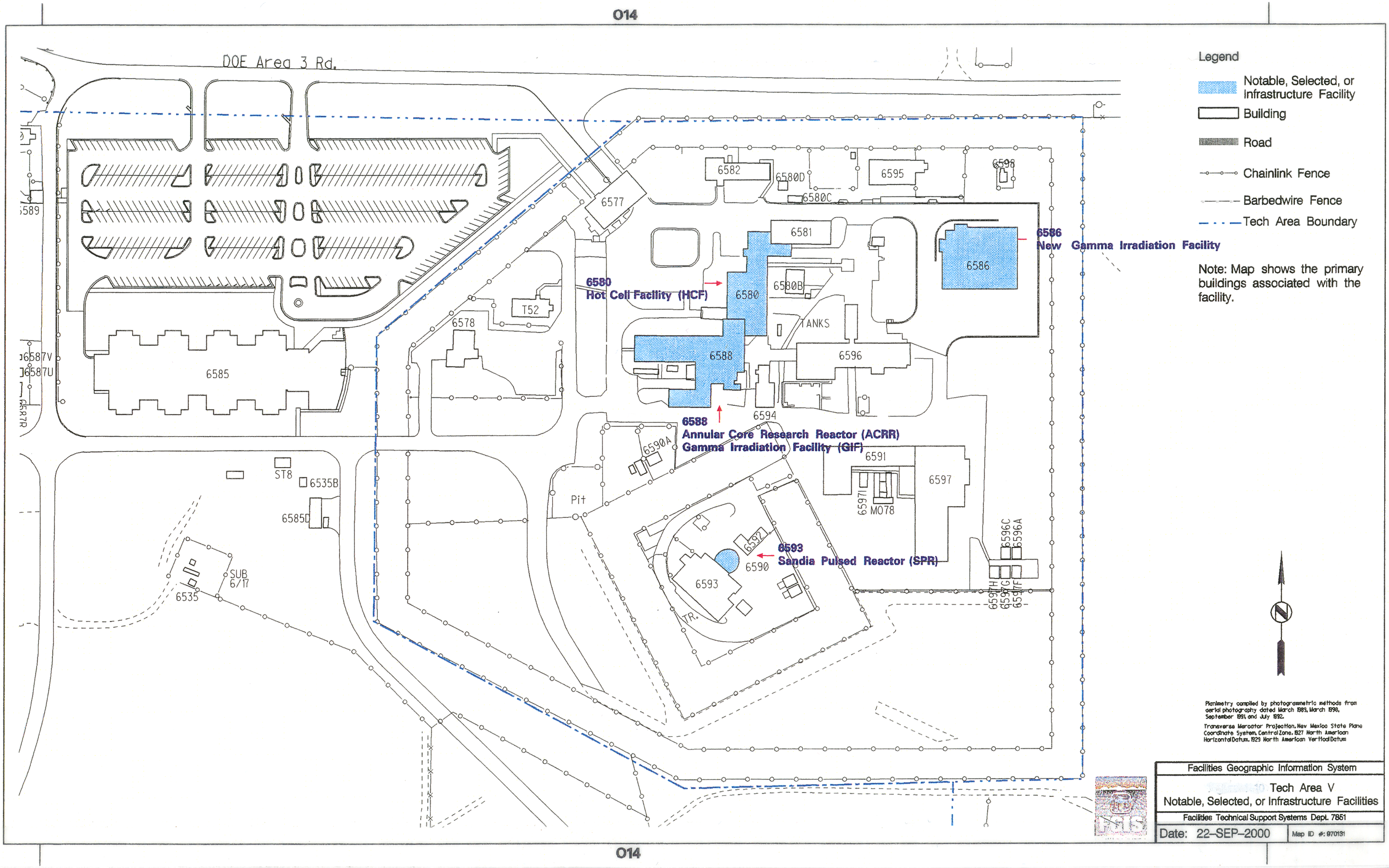

Figure 2-9. Tech Area V Notable, Selected, or Infrastructure Facilities

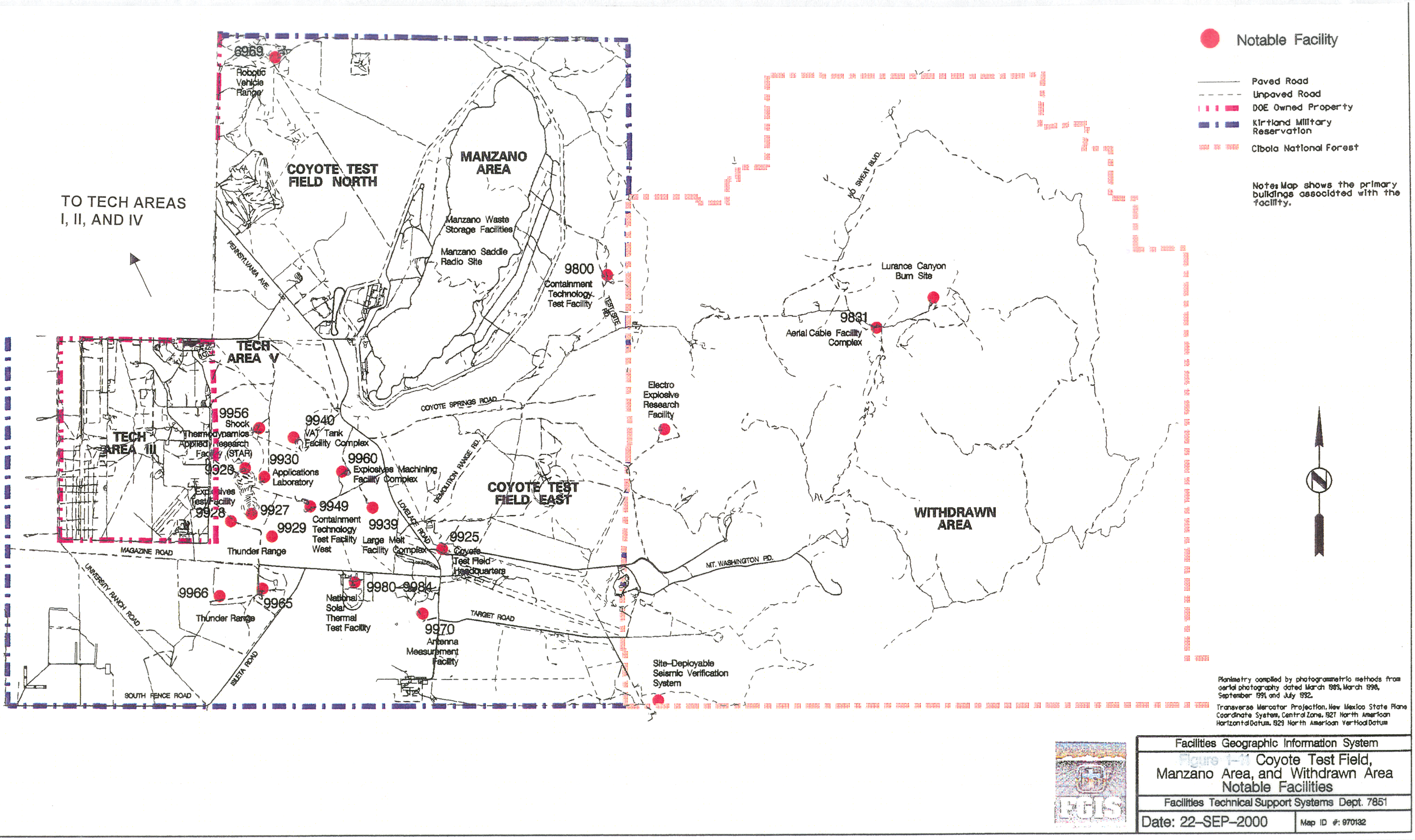

Figure 2-10. Coyote Test Field, Manzano Area, and Withdrawn Area Notable Facilities

CHAPTER 3.0
SUMMARY OF NEW AND MODIFIED FY2000 SNL/NM OPERATIONS

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3.0 SUMMARY OF NEW AND MODIFIED FY2000 SNL/NM OPERATIONS

3.1 FY2000 SNL/NM Facility Modifications and Additions

The Site-Wide Environmental Impact Statement (SWEIS) and its Record of Decision (ROD) discussed and assessed seven planned facility construction and modification projects (DOE, 1999, 2000). Specifically, the SWEIS expanded operations alternative discussed construction or modifications at the New Gamma Irradiation Facility (NGIF), the Steam Plant, the Neutron Generator Facility (NGF), the Microsystems and Engineering Science Applications (MESA) Complex, the Sandia Pulsed Reactor (SPR), the Radiographic Integrated Test Stand (RITS), and the Annular Core Research Reactor (ACRR). Construction or modifications were completed at the NGIF and the Steam Plant; another four started or continued construction or modifications in FY2000, and another was on hold. The two completed projects were:

- The NGIF became operational in FY2000.

- SNL/NM completed Steam Plant upgrades of several boilers, steam distributors, and natural gas supply systems. Future boiler upgrades would potentially include a technology change to cogeneration units.

Four facilities continued or started projects:

- Modifications to Buildings 870 (NGF), 872, and 878 were completed, along with an addition to Building 857 (95 percent completed). Equipment installations in Buildings 870 and 857 began and will continue. Building systems in the East Annex of Building 870 were upgraded.

- The MESA project continued early planning and development activities in FY2000, together with completion of a project environmental assessment (EA). The MESA project, if funded to full implementation, could include an estimated $300M state-of-the-art complex (260,000 gross square feet [ft^2], or 24,180 square meters [m^2]) of new facilities to integrate and leverage the scientific and technological capabilities existing in separate locations throughout SNL/NM. The project initiated some retooling of existing operations in FY2000.

- In FY2000, an in-ground storage vault was constructed in Technical Area V (TA-V) to store the SPR fuel.

- The proposed Radiographic Integrated Test Stand (RITS) accelerator included in the SWEIS analysis was anticipated to be constructed and to start operations in 1999; however, the schedule to begin construction of the RITS has been revised to FY2002. In FY2000, plans called for RITS to be built in a space currently occupied by the Proto II accelerator, which has been nonoperational since FY1999; however, these plans have been revised so that now

RITS would be built in the current location of the Sandia Accelerator and Beam Research Experiment (SABRE).

Operations for medical isotope production at the ACRR continued in suspension during FY2000. The reactor operated in the pulse mode for a limited number of defense-related tests and production of non-medical isotopes.

In FY2000, a number of other projects were completed. These projects were not specifically called out in the SWEIS but were part of the "balance of plant" operations including facility maintenance and refurbishment. Below are brief summaries of the changes that occurred in FY2000:

- The SNL cafeteria (Building 861) was renovated in late FY2000.
- Renovation continued in an area at the north end of Building 880.
- Construction continued near Buildings 986 (which houses the Repetitive High Energy Pulsed Power Unit I [RHEPP I]) and near and within 983 (which houses the Z Accelerator).
- The Power Sources Development Laboratory (Building 894) converted office space to laboratory space to relocate thermal battery operations from Building 643, which was subsequently demolished.
- Several infrastructure projects were completed involving road improvements and utility upgrades. Portions of the sanitary sewer system and domestic water system were rehabilitated.
- Modifications to the Auxiliary Hot Cell Facility (Building 6597) were completed.
- A Class 100 (M3.5) cleanroom was constructed in Building 867.
- Building 963 (which houses the Advanced Pulsed Power Research Module [APPRM]) was renovated to relocate the Test and Assembly Laboratory.
- Construction of the Processing and Environmental Technology Laboratory (PETL, Building 701) was completed.
- Construction began on an addition to the Explosives Component Facility (ECF).
- Demolition work in Building 6600 was completed, and remodeling began in Building 6584.
- Building 893 was one of several facilities where equipment upgrades were completed in FY2000.

(SNL, 2001a)

3.2 Comparison of FY2000 SNL/NM Selected Facility Operations to SWEIS/ROD Baseline and Expanded Operations Alternative

For the SWEIS analysis, operations of the selected and notable facilities together represented the majority of environmental impacts associated with continuing operations at SNL/NM. Operations of these facilities represent:

- Over 99 percent of all radiation doses to SNL/NM personnel.
- Over 99 percent of all radiation doses to the public.
- From 81 to 99 percent of stationary source criteria pollutants (nitrogen dioxide, carbon monoxide, particulate matter less than 10 microns in diameter [PM_{10}], and sulfur dioxide), depending on the alternative. This does not include hazardous air pollutants or toxic air pollutants, which instead are analyzed on a site-wide basis in the SWEIS. The remaining stationary source criteria pollutants are associated with backup generators.
- All waste volumes, including radioactive waste, Environmental Restoration (ER) Project waste, and hazardous waste, which are accounted for in analyses of infrastructure, radiological air quality, transportation, and waste generation.

(DOE, 1999)

This chapter provides a summary of updated facility operations information compared to the SWEIS baseline and projections for the expanded operations alternative.

3.2.1 Selected Facilities in TA-I and TA-II

In FY2000, operational activities for all five of the selected facilities in TA-I and TA-II were within operational parameters analyzed in the SWEIS expanded operations alternative (see Section 3.2.7). At the NGF, production of neutron generators continued to lag behind the projection of 2,000 per year established in the SWEIS; the lag in production of neutron generators resulted in an increase in the tritium inventory (see Chapter 4). The activities at the Microelectronics Development Laboratory (MDL), Advanced Manufacturing Processes Laboratory (AMPL), and Integrated Materials Research Laboratory (IMRL) remained at the levels established in the SWEIS baseline. None of the five facilities added new capabilities in FY2000.

(SNL, 2001j)

3.2.2 Physical Testing and Simulation Facilities (TA-III)

In FY2000, operational activities for all four of the physical testing and simulation facilities in TA-III were within operational parameters analyzed in the SWEIS expanded operations alternative (see Section 3.2.7). The Terminal Ballistics Complex was the most active of the facilities, completing 75 tests in FY2000. This was well within the total of 450 tests analyzed under the SWEIS expanded operations alternative. The Drop Impact Complex was the least active, having completed only two tests in FY2000. None of the four facilities added new capabilities in FY2000.

(SNL, 2001j)

3.2.3 Accelerator Facilities (TA-IV)

In FY2000, operational activities for all ten of the selected facility accelerators in TA-IV were within operational parameters analyzed in the SWEIS expanded operations alternative (see Section 3.2.7). Three facilities (RHEPP-I, RHEPP-II, and RITS) conducted no tests in FY2000. Of the seven facilities that did conduct tests in FY2000, the Short-Pulse High Intensity Nanosecond X-Radiator (SPHINX) was the most active, with 1,338 accelerator shots; the Tera-Electron Volt Energy Superconductor Linear Accelerator (TESLA) was the least active, with 37 shots. Testing in the Saturn, SABRE, SPHINX, Z Accelerator, and APPRM in FY2000 all fell within the SWEIS expanded operations alternative (see Section 3.2.7).

Changes to facilities included relocating existing operations from Building 981 (which houses the Saturn accelerator). Building 970 (which houses the High-Energy Radiation Megavolt Electron Source III [HERMES III] accelerator) also installed two new processes in the Materials Processing and Coating Laboratory–the single-point diamond-turning process and hydrogen/vacuum firing (see Chapter 4). APPRM installed a new tank. TESLA installed a second oil tank external to the existing tank to improve testing capabilities in FY2000.

SNL/NM also completed preparatory work on the Z Accelerator (Building 983) for a new series of experiments using depleted uranium and for restarting target cleaning activities, which require metal grinding of surfaces contaminated with beryllium (and potentially lead). To support this new series of experiments, SNL/NM began relocating existing operations from Building 983 (see Chapter 4).

(SNL, 2001j)

3.2.4 Reactor Facilities (TA-V)

In FY2000, operational activities for all five of the reactor facilities in TA-V were within operational parameters analyzed in the SWEIS expanded operations alternative (see Section 3.2.7). The Gamma Irradiation Facility (GIF), NGIF, and Hot Cell Facility (HCF) operational levels were zero in FY2000. Gamma irradiation operations at GIF were transferred to NGIF; the NGIF became operational in late FY2000. The HCF is in standby mode because of the suspension of the Medical Isotopes Production Program (MIPP). The MIPP was projected to produce and process 1,300 targets per year.

The SPR and ACRR were operational in FY2000. The SPR Facility completed 100 irradiation tests in FY2000 prior to shutting down in midyear. Currently, a new underground SPR Facility is being planned. In FY2000, the ACRR completed several test series and produced (non-medical) isotopes in support of Defense Programs. Activity levels at the ACRR are well within the SWEIS expanded operations alternative because of the cessation of MIPP. None of the five facilities added new capabilities in FY2000.

(SNL, 2001j)

3.2.5 Outdoor Test Facilities

Test activities at all five of the outdoor test facilities were within operational parameters analyzed in the SWEIS expanded operations alternative. The Explosives Application Laboratory, with 138 tests, was the most active; Thunder Range Complex was the least active, with no operations in FY2000. Activities at the Lurance Canyon Burn Site included a total of 95 tests completed in FY2000. None of the five facilities added new capabilities in FY2000.

(SNL, 2001j)

3.2.6 Infrastructure Facilities

In FY2000, infrastructure facilities activities for all four of these selected facilities remained essentially unchanged. The Steam Plant produced 517 million pounds (M lb) of steam, which is below the 544M lb projected under the SWEIS expanded operations alternative. Upgrades to the flue gas control system were completed in FY2000. The upgrades are expected to reduce nitrogen oxide emissions. The quantities of waste handled at the Hazardous Waste Management Facility (HWMF), Radioactive and Mixed Waste Management Facility (RMWMF), and the Thermal Treatment Facility continued a declining trend in FY2000 that began prior to FY1996 (see Section 3.2.7). None of the four facilities added new capabilities in FY2000.

(SNL, 2001j)

3.2.7 Summary for Selected Facilities

Table 3-1 summarizes FY2000 facility operations compared to the SWEIS baseline and projections for the expanded operations alternative.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations[a]

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
TA-I and TA-II	**Advanced Manufacturing Process Laboratory (AMPL)** Develop and apply advanced manufacturing techniques, including hardware manufacturing, emergency and prototype manufacturing, development of manufacturing processes, and design and fabrication of production equipment.	Operations of 248,000 hours per year.	Operations up to a maximum of 347,000 hours per year.	Operations of 248,000 hours for FY2000.
	Explosive Components Facility • Support to the Neutron Generator Facility. • Continued research and development on energetic components, including explosives, chemicals, and batteries.	Operations involving 200 neutron generator tests, 600 explosive tests, 900 chemical analyses, and 50 battery tests per year.	Expanded operations would support completion of 500 neutron generator tests, 900 explosive tests, 1,250 chemical analyses, and 100 battery tests per year.	Operations supported completion of 200 neutron generator tests, 600 explosive tests, 900 chemical analyses, and 50 battery tests in FY2000.
	Integrated Materials Research Laboratory (IMRL) Conduct research on materials and advanced components, including basic chemistry, physics, and energy technology.	Operations of 395,000 hours per year.	Operations up to 395,000 hours per year.	Operations of 395,000 hours for FY2000.
	Microelectronics Development Laboratory (MDL) • Conduct research and development on microelectronic devices for nuclear weapons. • Continue integrated circuit and wafer production. • Develop technologies and manufacturing processes to support production requirements.	Production of 4,000 wafers per year.	Production of up to 7,500 wafers per year.	Production of 4,000 wafers in FY2000.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations (Continued)

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
TA-I and TA-II (Cont'd.)	**Neutron Generator Facility (NGF)** • Fabrication of neutron generators and neutron tubes. • Construction of an addition to Bldg. 870 to meet increased production needs.	Production of 600 neutron generators and associated neutron and switch tubes per year.	Production of 2,000 neutron generators and associated neutron and switch tubes per year.	Production of 400 neutron generators and associated neutron and switch tubes in FY2000.
TA-III	**Centrifuge Complex** Continued testing objects weighing several tons at over 100 times the force of gravity.	Operations supporting 32 centrifuge tests and 0 impact tests per year.	Operations supporting 120 centrifuge tests and 100 impact tests per year.	Operations supporting 21 centrifuge tests and 0 impact tests in FY2000.
	Drop/Impact Complex • Continued testing to validate analytical modeling and weapons systems certification. • Research focused on water and underwater tests, design verification, and performance assessments.	Operations supporting 18 drop tests, 1 water impact test, 1 submersion test, and 0 underwater blasts per year.	Expanded operations would support up to a maximum of 50 drop tests, 20 water impact tests, 5 submersion tests, and 10 underwater blasts per year.	Operations supported 2 drop tests, 0 water impact tests, 0 submersion tests, and 0 underwater blasts for FY2000.
	Sled Track Complex • Testing to simulate high-speed impacts of weapons shapes, substructures, and components to verify design integrity, performance, and fusing functions. • Research testing of parachute systems, transportation equipment, and reactor safety.	Operations supporting 10 rocket sled tests, 12 explosive tests, 3 rocket launches, and 40 free-flight launches per year.	Expanded operations would support up to a maximum of 80 rocket sled tests, 239 explosive tests, 24 rocket launches, and 150 free-flight launches per year.	Operations supported 12 rocket sled tests, 10 explosive tests, 3 rocket launches, and 22 free-flight launches in FY2000.
	Terminal Ballistic Complex • Continued solid-fuel rocket motor tests and ballistic studies in areas of armor penetration, vulnerability, acceleration, flight dynamics, and accuracy. • Testing of projectile impacts (all calibers).	Operations supporting 50 projectile impact tests and 25 propellant tests per year.	Expanded operations would support up to a maximum of 350 projectile impact tests and 100 propellant tests per year.	Operations supported 50 projectile impact tests and 25 propellant tests for FY2000.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations (Continued)

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
TA-IV	**Advanced Pulsed Power Research Module (APPRM)** • Evaluation of the performance and reliability of components, including next-generation accelerators. • Activities included research and development in pulsed-power technologies (power storage, high-voltage switching, and power flow).	Operations supporting 40 shots per year.	Expanded operations would support a maximum of 2,000 shots per year.	Operations supported 234 shots in FY2000.
	High-Energy Radiation Megavolt Electron Source (HERMES) III Accelerator • Production of gamma-ray effects testing capabilities. • Testing includes electronic components and weapons systems for high-fidelity simulation over large areas in near-nuclear-explosion radiation environments.	Operations supporting 262 shots per year.	Expanded operations would support up to a maximum of 1,450 shots per year.	Operations supported 183 shots in FY2000.
	Radiographic Integrated Test Stand Accelerator (RITS) When operational, will develop and demonstrate capabilities for future accelerator facility design, focusing on demonstrating inductive voltage technology.	Operations estimated to support 500 shots per year. (Not constructed when the SWEIS was prepared.)	Expanded operations would support a maximum of 800 shots per year.	No shots-not yet operational during FY2000.
	Repetitive High Energy Pulsed Power I (RHEPP-I) Accelerator • Development of pulsed-power technology, including high-power energy tests. • Testing includes basic scientific research, development, and testing.	Operations supporting 500 shots per year.	Expanded operations would support up to a maximum of 10,000 tests per year in either single or repetitive modes.	No shots were completed in FY2000.
	Repetitive High Energy Pulsed Power II (RHEPP-II) Accelerator • Development of radiation-processing applications using powerful electron or x-ray beams. • Activities include testing of high-power magnetic switches and specialty transmission lines.	Operations supporting 80 shots per year.	Expanded operations would support a maximum of 800 shots per year.	No shots were completed in FY2000.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations (Continued)

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
TA-IV (Cont'd)	**Sandia Accelerator and Beam Research Experiment (SABRE) Accelerator** • Provide x-ray and gamma-ray testing capabilities. • Capabilities include testing of pulsed-power technologies, fusion systems, weapons systems, computer science, flight dynamics, satellite systems, and robotics.	Operations supporting 187 shots per year.	Expanded operations would support a maximum of 400 shots per year.	Operations supported 300 shots in FY2000.
	Saturn Accelerator • Production of x-rays to simulate the radiation effect of nuclear bursts on electronic and material components. • Research objects include satellite systems, weapons material and components, and reentry vehicle and missile systems.	Operations supporting up to a maximum of 65 shots per year.	Expanded operations would support up to a maximum of 500 shots per year.	Operations supported 137 shots in FY2000.
	Short-Pulse High Intensity Nanosecond X-Radiator (SPHINX) Accelerator • Production of high-voltage accelerations to measure x-ray-induced currents in integrated circuits and detect-response in materials. • Testing includes activities in radiation measurements for weapons components.	Operations supporting 1,185 shots per year.	Expanded operations would support a maximum of 6,000 shots per year.	Operations supported 1,338 shots in FY2000.
	Tera-Electron Volt Energy Superconductor Linear Accelerator (TESLA) • Test plasma opening switches for pulsed-power drivers. • Activities included basic research in science, material development, and material testing.	Operations supporting 150 shots per year.	Expanded operations would support a maximum of 6,000 shots per year.	Operations supported 37 shots in FY2000.
	Z Accelerator Continued to conduct pulse tests on targets to simulate special atmospheric conditions and fusion reaction conditions.	Operations supporting 150 shots per year.	Expanded operations would support a maximum of 350 shots per year.	Operations supported 153 shots in FY2000.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations (Continued)

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
TA-V	**Annular Core Research Reactor (ACRR)** • Produce medical isotopes. • Support Defense Programs activities.	Production of 8 targets and 0 defense-related test series.	Expanded operations would support up to a maximum 1,300 targets and 2 to 3 defense-related test series.	Three test series were completed in FY2000.
	Gamma Irradiation Facility (GIF) • Supplement the capabilities of the New Gamma Irradiation Facility. • Perform gamma-irradiation experiments.	Operations supporting 1,000 hours.	Expanded operations up to a maximum of 8,000 hours per year.	No test hours were completed in FY2000.
	Hot Cell Facility (HCF) • Support medical isotopes production, including extraction, purification, product packaging, and quality control. • Support Defense Programs by providing the capabilities for its short-term testing.	Production of 8 targets.	Expanded operations would support up to a maximum 1,300 targets and 2 to 3 defense-related test series.	Facility was in standby mode. No molybdenum-99 production during FY2000.
	New Gamma Irradiation Facility (NGIF) • Perform gamma-irradiation experiments under both dry and water-pool conditions. • Conduct studies in thermal and radiation effects, weapons component degradation, nuclear reactor material and components, and nonweapon applications.	Not constructed when the SWEIS was prepared.	Expanded operations up to a maximum of 24,000 hours per year.	No test hours were completed in FY2000.
	Sandia Pulsed Reactor (SPR) Facility • Provide multiple, fast-burst reactor, near-fusion spectrum radiation environments. • Testing activities included technologies that support both defense and nondefense projects.	Operations supporting 100 irradiation tests.	Expanded operations would support up to a maximum 200 irradiation tests.	Operations supported 100 irradiation tests in FY2000.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations (Continued)

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
With-drawn Area	**Aerial Cable Facility Complex** • Conduct impact tests involving weapon systems and aircraft components. • Capabilities include free-fall drop, rocket pull-down, and captive flight tests, data recording, and simulation technologies. • Maintain the capability for drop tests of joint test assemblies that contain depleted uranium, enriched uranium, and insensitive high explosives.	Operations supporting 21 drop/pull-down tests, 6 aerial target tests, and 0 (series of) scoring system tests.	Expanded operations would support up to a maximum 100 drop/pull-down tests, 30 aerial target tests, and 2 series of scoring system tests.	Operations supported 9 drop/pull-down tests; 2 aerial target tests; and 0 series of scoring system tests in FY2000.
	Lurance Canyon Burn Site • Test, certify, and validate material and system tolerances. • Burn test objects for short periods of time under controlled conditions.	Operations supporting 12 certification tests, 56 model validation tests, and 37 user tests.	Expanded operations would support up to a maximum 55 certification tests, 100 model validation tests, and 50 user tests.	Operations supported 10 certification tests, 50 model validation tests, and 35 user tests in FY2000.
CTF (Coyote Test Field)	**Containment Technology Test Facility-West** Conduct a series of successive experiments leading up to ultimate failure of test vessels.	Operations supporting 1 survivability test.	Expanded operations would support up to a maximum 2 survivability tests.	Operations supported 1 survivability test in FY2000.
	Explosives Applications Laboratory Design, assemble, and test explosive materials, components, and equipment. Work involves arming, fusing, and firing of explosives and testing of components.	Operations supporting 240 explosive tests.	Expanded operations would support up to a maximum 360 explosive tests.	Operations supported 138 explosive tests in FY2000.
	Thunder Range Complex • Activities involve disassembly and evaluation, and calibration and verification testing of special nuclear and nonnuclear systems. • Capabilities also involve cleaning, physical examination, measurement, sampling, photography, and data collection.	Operations supporting 60 days of equipment disassembly and 1 test series.	Expanded operations would support up to a maximum 144 days of equipment disassembly and 10 test series.	No operations were completed in FY2000.

Table 3-1. Comparison of FY2000 SNL/NM Selected Facility Activities to SWEIS/ROD Baseline and Expanded Operations (Continued)

SNL/NM Tech Areas	Selected Facility Capability Descriptions and FY2000 Modifications	SNL/NM SWEIS/ROD Baseline Operations Activities (FY1996-97)	SNL/NM SWEIS/ROD Expanded Operations Activities	SNL/NM FY2000 Operations Activities Update
Infra-structure	**Hazardous Waste Management Facility (HWMF)** • Handle, package, store, and ship hazardous, toxic, and nonhazardous chemical waste. • Prepare waste for offsite transportation for recycling, treatment, or disposal at licensed facilities.	Infrastructure rating was 203,000 kg per year, including 55,852 kg of RCRA hazardous waste.	Maximum infrastructure rating was 214,000 kg per year, including 92,314 kg of RCRA hazardous waste.	Infrastructure rating was unchanged; 24,433 kg of RCRA hazardous waste was managed in FY2000.
	Radioactive and Mixed Waste Management Facility (RMWMF) • Serve as a centralized facility for receipt, characterization, compaction, treatment, repackaging, certification, and storage of low-level waste (LLW), transuranic waste (TRU), low-level mixed waste (LLMW), and mixed transuranic waste (MTRU). • Prepare waste for offsite treatment and disposal at licensed facilities.	Infrastructure rating 1.6 million pounds per year, including 11,874 ft^3 of LLRW; 5,353 ft^3 of LLMW; 214 ft^3 of TRU; and 16 ft^3 of MTRU.	Infrastructure rating 2.7 million pounds per year, including 19,592 ft^3 of LLW; 8,833 ft^3 of LLMW; 353 ft^3 of TRU; and 37 ft^3 of MTRU.	Infrastructure rating .250 million pounds in FY2000, including 11,798 ft^3 of LLW; 394 ft^3 of LLMW; 0 ft^3 of TRU; and 0 ft^3 of MTRU.
	Steam Plant Produce and distribute steam to SNL/NM and Kirtland Air Force Base facilities.	Steam production was ~ 544 million pounds.	Maximum steam production was set at 544 million pounds.	Steam production was ~517 million pounds in FY2000.
	Thermal Treatment Facility Burn small quantities of explosive materials and explosives-contaminated water.	Treatment of a minimal amount of waste.	Treatment of a maximum of 1,200 pounds of waste.	Treatment of a minimal amount of waste in FY2000.

[a]Extensive descriptions of capabilities and activities, (e.g., hours per year) are provided in the SNL/NM Facilities and Safety Information Document (SNL, 1999).
Source: DOE, 1999, 2000; SNL, 2001.

3.3 Comparison of FY2000 SNL/NM Notable Facility Operations to Source Information Used to Support the SWEIS

This section compares FY2000 SNL/NM operations to source information published in the SNL/NM Facilities and Safety Information Document (FSID), that was incorporated by reference into the SNL/NM SWEIS (DOE, 1999; SNL, 1999a). Notable facility operations were included in the SWEIS analysis within the balance of operations.

3.3.1 Notable Facilities Operations at SNL/NM

Of the 15 notable facilities identified, none recorded increases in operational levels during FY2000 (see Chapter 5). Two facilities, the Sandia Lightning Facility and the Proto II accelerator, were nonoperational in FY2000. Three facilities made changes to their operations in FY2000.

The Compound Semiconductor Research Lab upgraded existing capabilities with new equipment designed to improve surface coating capabilities (see Chapter 4). The Power Sources Development Lab relocated an existing thermal battery-testing lab. The High Power Microwave Lab reconfigured the Cathode Test Bed accelerator to its original specifications and began operating about 3 hours per day, 2 to 3 days per week. None of the fifteen facilities added new capabilities in FY2000.

(SNL, 2001j)

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CHAPTER 4.0
FY2000 SELECTED FACILITIES OPERATIONS

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4.0 FY2000 SELECTED FACILITIES OPERATIONS

This chapter of the Annual Review provides more detailed information on each of the 34 "Selected Facilities" that DOE analyzed in the SNL/NM Site-Wide Environmental Impact Statement (SWEIS). This review includes facility descriptions and a summary of current operations, including changes to operations that occurred in FY2000. Comparative data from the SNL/NM SWEIS are also provided (DOE, 1999).

4.1 SNL/NM Technical Area I (TA-I) and TA-II Selected Facilities

The following sections provide brief descriptions of each selected facility in TA-I, including a summary of current operations and capabilities. Specific emphasis is given to operations conducted in FY2000.

4.1.1 Advanced Manufacturing Processes Laboratory (AMPL)

The AMPL (Building 878) is a one-story structure with a basement and is located on an area covering more than 2 acres (ac) (0.8 hectares [ha]). The AMPL includes 138,253 square feet (ft^2) (12,843 square meters [m^2]) of research and support space. Key laboratory functions occupy more than 52,899 ft^2 (4,914 m^2), with the remaining space primarily assigned to office areas. The 10,975-ft^2 (1,020-m^2) basement accommodates equipment for assorted building and environmental services and provides storage for some hazardous materials (SNL, 1998).

Current Operations and Capabilities

Capabilities at the AMPL include prototype creation and limited manufacturing of specialized components of nuclear weapons (including neutron generator components). Manufacturing technology development at the AMPL is focused on enhancing capabilities in engineering hardware manufacture, emergency and specialized production of weapon hardware, manufacturing processes, and design and fabrication of unique production equipment.

Activities at the AMPL are typically laboratory and small-scale operations involving materials technology, fabrication, prototyping, and process research. Operations include but are not limited to development of processes utilizing plastics and organics, nonexplosive powders, adhesives, potting compounds, ceramics, glass, laminates, microcircuits, lasers, machine shop equipment, electronic fabrication, multichip modules, thin-film brazing and deposition, and plating. Other activities include materials characterization, mechanical measurement, and calibration mechanical engineering.

(Kuzio, 2001; SNL, 1998, 1999c; Zich, 2000)

Summary of Advanced Manufacturing Processes Laboratory Operations in FY2000

In FY2000, operations at the AMPL, including advanced manufacturing techniques, totaled 248,000 hours and remained essentially unchanged since the SWEIS analyses. Section 4.7 shows that FY2000 material inventories, material consumption, emissions, and process requirements were unchanged compared to the SWEIS expanded operations alternative. Hazardous waste generation decreased to 15,700 lb (7,136 kg), a nearly 45-percent decrease from the estimate projected in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.1.2 Explosive Components Facility (ECF)

The ECF (Building 905), a low-hazard, nonnuclear facility located near TA-II, is a self-contained, secure site that affords maximum protection for adjacent facilities and the environment. The complex includes a main building of ~100,308 ft^2 (9,319 m^2), six explosive storage magazines, plus service drives and parking areas.

The ECF is divided into two wings, administrative (nonenergetic area) and laboratory/testing (energetic material testing areas), connected by a corridor. The nonenergetic material area (46,780 ft^2 [4,346 m^2]) consists of offices and light labs, mechanical, electrical, and penthouse areas, and support areas. The energetic material testing areas (48,600 ft^2 [4,515 m^2]) consist of energetic material labs and work areas. Approximately 11,860 ft^2 (1,100 m^2) comprise firing pads and associated assembly rooms, material aging area, propellant handling area, battery abuse test area, and receiving area. The remaining 36,580 ft^2 (3,400 m^2) consists of chemistry labs, pyrotechnical labs, physical testing labs, and support areas.

(Kuzio, 2001)

Current Operations and Capabilities

The ECF consolidates numerous ongoing activities relating to SNL/NM's mission in energetic component research, testing, development, and quality control. In operation, the ECF facilitates the coordination of these activities to enhance safety and productivity.

Specific activities at the ECF include physical and chemical testing of explosives, pyrotechnics, and propellants. The ECF also supports stockpile surveillance of these energetic materials. Research and development (R&D) at the ECF involves advanced explosive components, neutron devices, and batteries.

(SNL, 2001j)

Summary of Explosive Components Facility Operations in FY2000

During FY2000, the ECF continued to support work performed at the NGF and R&D performed on energetic components. Activities included research, testing, development, and quality control of neutron generators, explosives, chemicals, and batteries. FY2000 operations at the ECF included 200 neutron generator tests, 600 explosive tests, 900 chemical analyses, and 50 battery tests. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within the parameters analyzed for the SWEIS expanded operations alternative.

(SNL, 2001j)

4.1.3 Integrated Materials Research Laboratory (IMRL)

The IMRL (Building 897) is comprised of 93,667 ft^2 (8,702 m^2) of office space and 52,292 ft^2 (4,860 m^2) of laboratory space, for a total of 145,979 ft^2 (13,561 m^2) of net floor space. This four-story concrete building has a full basement and a mechanical penthouse. On the penthouse and roof, exhaust systems vent chemical vapors from the labs to the outdoors.

Located near TA-I, the IMRL has been built outside of Sandia's secure area to facilitate technical cooperation with researchers from industry and universities. This location, near the Microelectronics Development Laboratory (MDL) and the Robotics Manufacturing Science & Engineering Laboratory (RMSEL), also promotes materials research with advanced microelectronic component development.

(Kuzio, 2001; Swihart, 1996; SNL, 1999c)

Current Operations and Capabilities

The IMRL provides offices and laboratory space for conducting materials and advanced components research, including lab studies in chemistry, physics, and alternative energy technologies. Material studied at the IMRL includes ceramics, organic polymers, alloys, and electronic components.

Research at the IMRL enables development of new materials for government and industrial needs, and ranges from the atomic scale, through the development of electronic devices, to full-scale mechanical components. Work involves technology transfer in areas of operational hazards associated with energetic materials, advanced initiation and fuze development, munitions life-cycle engineering, hard target penetration, and computer simulation.

(Davis, 2000; SNL, 2001j)

Summary of Integrated Materials Research Laboratory Operations in FY2000

IMRL operations continued at its current capacity of ~395,000 hours per year and remained unchanged compared to the SWEIS analyses. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were at or within parameters analyzed for the SWEIS expanded operations alternative. However, hazardous waste generation increased to 7,336 lb (3,347 kg). This one-time increase resulted from disposal of excess chemicals and represented a 67-percent increase above the estimated amount for the SWEIS expanded operations alternative.

(SNL, 2001j)

4.1.4 Microelectronics Development Laboratory (MDL)

The MDL (Building 858 north), near TA-I, is a multifloor structure with a basement, comprised of 94,621 ft^2 (8,790 m^2) and includes more than 200 offices, numerous storage areas, and 77 laboratories. The numerous light labs provide work environments primarily for wafer test equipment, die packaging, scanning electron microscopy, device radioactive source exposure, and device inspection. The MDL also includes 12,500 ft^2 (1,100 m^2) of clean room. Water-processing support equipment at the MDL includes several chemical storage tanks: a 6,500-gallon (gal) (24,600-liter [ℓ]) tank of hydrochloric acid and another 6,500-gal (24,600-ℓ) tank of sodium hydroxide. A liquid hydrogen storage tank (4,500 gal) (17,000 ℓ) is located adjacent to the MDL. Other features at the MDL consist of a mechanical equipment room, a nitrogen plant, and acid waste neutralization equipment.

(Kuzio, 2001)

Current Operations and Capabilities

The MDL supports R&D in state-of-the-art microelectronics production methods. Projects performed in the MDL may combine manufacturing techniques currently available at the prototype level. These activities include R&D on microelectronic devices for nuclear weapon applications. MDL's limited production capability of radiation-hardened microelectronics could serve as backup to private industry.

The MDL also supports ongoing efforts between DOE and the U.S. Department of Defense (DoD) to transfer the technology base resident at the DOE national laboratories for the development of advanced, cost-effective, nonnuclear munitions.

MDL activities also entail fabrication (integrated circuits, microsensors/controllers, and micromachines), study and improvement of silicon semiconductor processing, product development for microelectronic systems, corrosion studies, and development of new processes and prototypes, including miniature fuel cells and fuel processors.

(SNL, 2001j)

Summary of MDL Operations in FY2000

In FY2000, the MDL continued R&D activities on silicon-based microelectronic devices for nuclear weapons. Microtechnology development and engineering activities included integrated circuit and wafer production; the MDL produced 4,000 wafers in FY2000. The total level of MDL activities, summarized in Section 4.7, shows that FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

DOE anticipates that new technologies and manufacturing processes will be required to meet future growth. In FY2000, DOE prepared an environmental assessment and associated finding of no significant impact (FONSI) for the proposed construction and operation of the Microsystems and Engineering Sciences Applications (MESA) Complex. Construction of MESA is needed to meet required expanded wafer production at MDL and replace the Compound Semiconductor Research Laboratory (CSRL) (Building 893). Proposed planning calls for the facility to begin operation in FY2005.

(SNL, 2001j)

4.1.5 Neutron Generator Facility (NGF)

The NGF (Building 870) is a low-hazard, nonnuclear facility located in a two-story structure with a basement in TA-I. Most processing and assembly operations take place in Building 870, although various support operations occur in other SNL/NM buildings, including Building 905, which houses the neutron generator timer-driver and mounting hardware attachment, and packaging and explosive functional testing of neutron generators (SNL, 1997a).

Current Operations and Capabilities

Operations at the NGF include fabrication of neutron generators and prototype switch tubes. A neutron generator consists of a neutron tube, a miniature accelerator, a power supply, and a timer. As a primary function, neutron tubes produce neutrons (when supplied with the proper external electrical impulse).

SNL-designed switch tubes are critical components required by all nuclear weapon-firing systems currently in the enduring stockpile. These components are arc-discharge devices, comprised of triggered vacuum switches and voltage threshold breakdown devices, and are used for precise initiation of weapon detonators.

SNL/NM provides experimental testing and production-lot sample testing of explosive neutron generators and 100-percent functional testing of electronic neutron generators. Electronic generators are reusable; when tested, they typically do not generate waste. Explosive generators are one-use items that are tested in a protective enclosure; testing results in the generation of classified mixed waste.

(Stiles, 2000; SNL, 2001j)

Summary of Neutron Generator Facility Operations in FY2000

During FY2000, the NGF continued to fabricate neutron generators and neutron tubes, manufacturing approximately 400 neutron generators. This total is well below the estimated 2,000 neutron generators per year (and associated neutron and switch tubes) included in the SWEIS expanded operations alternative. Support activities included manufacturing, testing, and product development techniques and processes. The total level of activities summarized in Section 4.7 shows that FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

An increase in the tritium inventory above the inventory identified in the SWEIS expanded operations alternative occurred in FY2000 due in part to the slower-than-expected production rate in FY1999 (600 neutron generators produced) and FY2000 (400 neutron generators produced). To meet future production needs, SNL/NM has completed extensive revisions to Building 870.

(SNL, 2001j)

4.2 Physical Testing and Simulation Facilities (TA-III)

4.2.1 Centrifuge Complex

The Centrifuge Complex in TA-III is a low-hazard, nonnuclear facility comprised of a 29-ft (8.8-m) indoor centrifuge (inside Building 6526) and a 35-ft (11-m) outdoor centrifuge (adjacent to Building 6526). Building 6526 is a one-story metal structure with two basement levels, totaling 11,283 gross ft^2 (1,050 m^2), of which 6,289 ft^2 (584 m^2) is lab space.

The 29-ft (8.8-m) centrifuge can subject test objects weighing up to 16,000 lb (7,237 kg) to an acceleration of 100 Gs; 300 Gs can be achieved with lighter test objects. Located in a below-ground, 80-ft (24-m)-diameter pit, this centrifuge is completely enclosed in Building 6526, which also includes a light lab for test preparations and a control room.

The 35-ft (11-m) centrifuge can subject test objects weighing up to 10,000 lb (4,545 kg) to an acceleration of 45 Gs; 240 Gs can be achieved with lighter test objects. This centrifuge is located within a reinforced concrete wall backed by an earthen barrier. Because the top of the 35-ft (11-m) centrifuge is open to the exterior, it is referred to as an “outdoor” centrifuge. Both centrifuges are hydraulically driven by motors located within each of their bases. The hydraulic fluid to drive the motors circulates from pumps in Building 6523B through a closed system of underground pipes. The fenced complex also includes Building 6523, used as office space and headquarters for the labor contractor personnel.

(DOE, 1997; Kuzio, 2001)

Current Operations and Capabilities

The Centrifuge Complex is used for acceleration testing of large objects—weapon systems, satellite systems, reentry vehicles, and rocket motors. It is also used by SNL Energy and Environment programs to certify designs in transportation technology.

For continuous acceleration tests, objects are attached to one end of a boom that rotates around a central shaft. Vibration and acceleration testing can be combined by mounting an electrodynamic shaker on the arm of the 29-ft (8.8-m) centrifuge. Items weighing up to 56 lb (25 kg) can be vibrated while at 50 Gs of acceleration.

(DOE, 1997; SNL, 2001j)

Summary of Centrifuge Complex Operations in FY2000

During FY2000, the Centrifuge Complex completed 21 centrifuge tests. This activity level is well within the number of tests (120 centrifuge tests and 100 impact tests) analyzed in the SWEIS expanded operations alternative. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.2.2 Drop/Impact Complex

The Drop Impact Complex, a low-hazard nonnuclear facility in TA-III, is comprised of two drop towers, a 185-ft (56-m) tower (next to a hard surface) and a 300-ft (91-m) tower (next to a water-filled pool that is 120 ft [37 m] wide, 188 ft [57 m] long, and 50 ft [15 m] deep). A 600-ft (182-m)-long rocket sled track is located at the end of the pool opposite the tower. The sled track supports rocket-accelerated impact tests into the pool.

Current Operations and Capabilities

The 185-ft (56-m) drop tower is used to drop test items weighing up to 9,000 lb (4,091 kg) onto prepared surfaces such as dirt, reinforced concrete, or steel plate. A cable stretched over the top of the tower to anchors on the ground allows test items weighing up to 2,000 lb (909 kg) to slide down a carriage and be released to fall onto a target.

A guidewire system on the 185-ft (56-m) drop tower is used to drop punch-type structural shapes to impact on shipping containers. Test items weighing up to 3,000 lb (1,364 kg) can be targeted into the water pool from the 300-ft (91-m) drop tower, and either dropped or accelerated by rocket-assisted pull-down to strike the water at velocities up to 600 ft per second (f/s) (182 meters per second [m/s]) and 30° to 90° angles. Submersion tests are conducted in the water pool. Explosive charges up to 1 lb (0.49 kg) may be detonated underwater to test blast effects (DOE, 1997; Kuzio, 2001). For underwater explosive-effects tests, explosives are detonated at specific distances from test items to determine underwater blast effects.

(DOE, 1997; SNL, 2001j)

Summary of Drop/Impact Complex Operations in FY2000

During FY2000, the Drop/Impact Complex activities focused on water and underwater tests, design verification, and performance assessments. The Drop/Impact Complex completed two drop tests, but no water impact, submersion, or underwater blast tests in FY2000. This activity level is well within the number of tests (50, 20, 5, and 10, respectively) analyzed in the SWEIS expanded operations alternative. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.2.3 Sled Track Complex

The Sled Track Complex consists of numerous buildings and structures in TA-III. The main building (Building 6741) is a total of 5,489 ft^2 (510 m^2) in size and is divided into three areas: a control room (912 ft^2 [85 m^2]), a workshop area (2,875 ft^2 [267 m^2]), and a highbay assembly area (936 ft^2 [87 m^2]). The Sprint Building (Building 6736) and the Explosives Assembly and Rocket Motor Conditioning Facility (Building 6743) provide support to activities in the main building.

Four bunkers (totaling 1,294 ft^2 [120 m^2]) are used for instrumentation equipment to record test data and for explosives storage. Four 50-ft (~15-m) towers located at the Complex provide observation and instrumentation platforms.

The main sled track is a 10,000-ft (3,048-m) concrete beam supporting two continuously-welded steel rails at a 22-in. (56-cm) gauge with a 1-ft^2 (0.09-m^2) trough (cast in the concrete beam between the rails). For recoverable sleds, scoops attached underneath drag against water in the trough, thus providing a controllable braking mechanism. The Complex also includes a rocket launcher with a 70-ft (21-m) launch rail. Located just southeast of the main sled track, the rail is used to launch test items into targets. A portable 10-ft (3-m) beam mounted on a trailer is also used at the Sled Track Complex to launch free-flight, rocket-powered, parachute test vehicles.

(DOE, 1997; Kuzio, 2001; West, 1997)

Current Operations and Capabilities

The Sled Track Complex provides a controlled environment for high-velocity impact, aerodynamic, and acceleration testing of small and large items, simulating high-speed impacts of weapon shapes, substructures, and components to verify design integrity, performance, and fuzing functions. The facility also is used to subject weapon parachute systems to aerodynamic loads to verify parachute design integrity and performance. The Complex provides capacity to verify designs in transportation technology, reactor safety, and Defense Programs (DP) transportation systems.

(DOE, 1997; SNL, 2001j; West, 1997)

Summary of Sled Track Complex Operations in FY2000

During FY2000, the Sled Track Complex performed 12 rocket sled tests, 10 explosive tests, 3 rocket launches, and 22 free-flight launches. This activity level is well within the number of tests (80, 239, 24, 150, respectively) analyzed in the SWEIS expanded operations alternative. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.2.4 Terminal Ballistics Facility

The Terminal Ballistics Facility in TA-III is a low-hazard facility that includes a main building (Building 6750), two smaller buildings (Buildings 6752 and 6753), and four explosive storage magazines. Building 6750 (2,748 ft^2 [255 m^2]) houses a small machine shop, office space, a control area, and an indoor firing range. Building 6753 is used for assembly of large propellant charges and temperature conditioning of propellants. The four magazines are used for long-term storage of propellants and explosives.

An outdoor, large-caliber gun range has a 155-millimeter (mm) "Long Tom" artillery permanently mounted in a revetment adjacent to Building 6750 and is aimed in a southerly direction.

(DOE, 1994b, 1997b; Kuzio, 2001)

Current Operations and Capabilities

The Terminal Ballistics Facility provides secure, remote, indoor and outdoor test facilities for ballistic studies and solid-fuel rocket motor tests. Indoor testing of firearms and projectiles is conducted from a fixed stand to provide controlled firing of ammunition (≤ 20 mm). Various guns may be used for projectile or penetration tests, with targets placed up to ~1,000 ft (~305 m) south of Building 6750.

For outdoor thrust tests, a rocket is oriented vertically on the static test stand, with the nose resting on a load cell (to measure thrust force during the propellant burn cycle). Spin rockets are tested using a horizontal fixture with a load cell. Munitions testing done outdoors in explosive-rated chambers may include both explosives and chemicals.

(DOE, 1994b, 1997b; SNL, 2001j)

Summary of Terminal Ballistics Facility Operations in FY2000

During FY2000, the Terminal Ballistics Facility completed 50 projectile impact tests and 25 propellant tests. This activity level is well within the number of tests (350 and 100, respectively) analyzed in the SWEIS expanded operations alternative. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.3 Accelerator Facilities (TA-IV)

4.3.1 Advanced Pulsed Power Research Module (APPRM)

The APPRM (southwest highbay of Building 963) is a single-pulse accelerator used to evaluate new pulsed-power components and component alignments to improve future accelerator performance. Building 963 in TA-IV is a multifloor facility with a basement and contains 87,541 ft^2 (8,133 m^2). The APPRM occupies 13,000 ft^2 (1,208 m^2) of floor space in the highbay. The APPRM is also a test bed for other projects and can be used for conducting general pulsed-power research.

The accelerator consists of a Marx generator bank of 56 capacitors within a 130,000-gal (492,050-ℓ) oil tank and two intermediate storage capacitors within a 4,000-gal (15,140-ℓ) tank of deionized water. Other equipment includes an intermediate storage, gas-insulated (sulfer hexaflouride, SF_6) switch, four gas switch-controlled pulse-forming lines (PFLs), a voltage adder cavity that is inductively isolated, and a magnetically insulated transmission line (MITL).

(DOE, 1996; Sullivan et al., 1996; Kuzio, 2001)

Current Operations and Capabilities

In FY2000, activities at the APPRM continued to involve the study of power storage, high-voltage switching, and power flow for advanced applications. Additionally, APPRM activities continued for the development of technologies to enhance current facility capabilities or support new designs. Work includes development of advanced pulsed-power sources for future incorporation into machines to be used for weapon effects and weapon physics experiments. Experiments on inertial confinement fusion are not being conducted at the facility presently. However, a breakthrough in gas switch design for the APPRM would eliminate the shock generated in the module and has validated the application of this technology for testing the design of a potential (future) pulsed-power facility, such as the X-1.

(SNL, 2001j)

Summary of APPRM Operations in FY2000

During FY2000, the APPRM operations involved 234 shots. The SWEIS expanded operations alternative analyzed up to 2,000 accelerator shots per year at the APPRM facility. Section 4.7 shows most FY2000 material inventories, material consumption, emissions, and process requirements were below parameters analyzed in the SWEIS expanded operations alternative.

In FY2000, SNL/NM installed a new 47,000-gal (17,800-ℓ) oil tank for the APPRM. Starting in FY2001, APPRM's name changes to APPR laboratory.

(SNL, 2001j)

4.3.2 High-Energy Radiation Megavolt Electron Source III (HERMES III)

The HERMES III is housed in the 55,000-ft^2 (5,110-m^2) Simulation Technology Lab (Building 970 in TA-IV). Building 970, a multifloor building with a basement, is 76,159 ft^2 (7,075 m^2) in size, accommodating 22 offices, two shop areas, four administrative areas, 16 storage areas, and 36,120 ft^2 (3,356 m^2) of lab space.

(Fine, 1996; Kuzio, 2001)

Current Operations and Capabilities

HERMES III is a high-energy, inductive voltage adder (IVA) accelerator, producing an intense electron beam which, when it interacts with a grounded bremsstrahlung converter, generates simulated gamma-ray output with an 18-mega-electron volt (MeV) endpoint voltage. HERMES III can provide high-fidelity simulation over very large areas, with applications including electronics testing for component and weapon system development to ensure operational reliability of weapon systems in radiation environments caused by nuclear explosions. HERMES III may also be operated in a reverse-polarity mode for experiments on extraction ion diodes, and radiography research and development. The accelerator is also used to study radiation transport through matter, radiation deposition in materials, component and circuit damage as they age past expected lifetimes, and damage mitigation.

(Fine, 1996; SNL, 2001j; Sullivan, 1995; Sullivan et al., 2000)

Summary of HERMES III Operations in FY2000

During FY2000, operations at HERMES III involved 183 shots, well within the 1,450 shots per year analyzed in the SWEIS expanded operations alternative. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.3.3 Radiographic Integrated Test Stand (RITS)

SNL/NM continues to plan for the development of a new accelerator called RITS, currently expected to be installed in place of the SABRE accelerator in the highbay area of Building 970 in TA-IV. As discussed in Sections 4.3.2, 4.3.4, and 4.3.6, Building 970 houses three other accelerators in its 76,159 ft^2 (7,075 m^2) of space. Installation of the RITS is planned to begin in late 2001; however, the facility is not expected to be fully operational until 2003 or later.

In its initial configuration, RITS would operate at 4 megavolt (MV), 175 kilo-ampere (kA), 50 nanosecond (ns), and expand to 16 MV in several phases. The RITS would be configured to provide various output options, including two sequential half-voltage pulses, a single full-voltage pulse, and twin-axis, half-voltage single pulses. The RITS would consist of a transformer oil-filled tank containing a high-voltage Marx generator and transfer capacitor, three water-filled pulse-forming lines, an oil-filled transmission line, and a vacuum transmission line that is magnetically insulated, terminating in an x-ray-generating diode load. The new accelerator would use the existing SABRE oil storage tank and piping to and from the tank.

(Harris, 2000; Kuzio, 2001)

<u>Current Operations and Capabilities</u>

The RITS is planned as an accelerator and intense electron-beam testbed to develop and demonstrate the capabilities required for Subcritical Experiment (SCE) radiography. The SCEs will provide experimental benchmarking for three-dimensional numerical models of nuclear weapon primaries. The result, weapons code validation, will be used to assess the performance and safety of the enduring stockpile and to qualify remanufacture technologies and life-cycle engineering.

RITS accelerator operations and capabilities would be similar to those of the SABRE accelerator and well within the scope of the nearby HERMES III accelerator. The possible future addition of a contained explosive firing capability will significantly modify facility operations and capabilities, and will be addressed at the time of such an upgrade proposal.

(SNL, 2001j)

<u>Summary of RITS Operations in FY2000</u>

The RITS remained in planning stages in FY2000. Once operational, RITS is expected to increase operations up to a maximum of 800 tests per year. Operational requirements are presented in Section 4.7 and are consistent with the SWEIS analyses.

(SNL, 2001j)

4.3.4 Repetitive High Energy Pulsed Power Unit I (RHEPP I)

The RHEPP I facility (Building 970 medium bay), includes a Marx generator, a PFL, a linear induction voltage adder (LIVA), and a vacuum diode load (VDL). As discussed in Section 4.3.2, Building 970 is 76,159 gross ft^2 (7,075 m^2) in size and also houses the HERMES III accelerator. The RHEPP I system consists of a 150-kilowatt (kW) power supply, four stages of linear induction voltage addition, and the vacuum diode.

(Kuzio, 2001; Weber, 1999)

Current Operations and Capabilities

RHEPP I, the first SNL/NM RHEPP-type accelerator, was used for basic technology development of the RHEPP technical concept and is now used for applications at lower energies. It is also still used for technology development and some experimental work with materials and organic sterilization processes. The RHEPP I facility currently functions to develop technology for continuous operation of pulsed-power systems that demonstrate high-average-power, ion-beam outputs at energies up to 1 MeV and power up to 45 kW, suitable for industrial applications (Weber, 1999). Activities at RHEPP I include development of pulsed-power materials-processing techniques for weapon applications and development of applications related to biological and chemical agent defeat.

(SNL, 2001j)

Summary of RHEPP I Operations in FY2000

During FY2000, RHEPP I completed 1,773 tests, in either the single or repetitive pulse modes. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.3.5 Repetitive High Energy Pulsed Power Unit II (RHEPP II)

The RHEPP II facility (Building 963) houses the RHEPP II accelerator, a 2.0-MeV, 25 kA, pulsed accelerator. Building 963 is a multifloor concrete building with a basement. The building contains 87,541 ft^2 (8,133 m^2). Approximately 73,422 ft^2 (6,821 m^2) is lab space, including a 58,088-ft^2 (5,396-m^2) highbay. RHEPP II components include the microsecond pulse compressor (MPC), a water-insulated PFL, LIVA, and a high-power electron beam diode. The system consists of a 750-kW power supply, seven stages of magnetic pulse compression, ten stages of linear induction voltage addition, and a vacuum diode.

(DOE, 1996; Kuzio, 2001; Weber and Zawadzkas, 1996a)

Current Operations and Capabilities

The RHEPP II supports the development of radiation-processing applications using high-dose-rate electron or x-ray beams. The RHEPP II accelerator is also a test bed for the continued development of high-power magnetic switches and repetitive, MITLs (DOE, 1996; Weber and Zawadzkas, 1996a).

The accelerator is also used to develop pulsed-power technology and applications, including developing advanced accelerators for biosterilization. RHEPP technology has been used for ion beam surface treatment (IBEST) to harden material surfaces and for advanced research that supports sterilization projects for organic materials (e.g., food products and lumber).

(Martinez, 1999; SNL, 2001j)

Summary of RHEPP II Operations in FY2000

During FY2000, activities included testing of high-power magnetic switches and specialty transmission lines. RHEPP II operations did not include any accelerator tests in FY2000. The SWEIS analyzed up to 800 tests per year at the RHEPP II facility. Section 4.7 shows FY2000 RHEPP II material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.3.6 Sandia Accelerator for Beam Research (SABRE)

SABRE was a pulsed accelerator located within the Simulation Technology Laboratory (Building 970), in TA-IV. SABRE was dismantled in FY2001, so the Annual Review describes only the configuration that existed in FY2000.

As discussed in Sections 4.3.2 and 4.3.4, Building 970 provides 76,159 gross ft^2 (7,075 m^2) and houses the HERMES III and RHEPP I accelerators.

The SABRE accelerator facility included an oil tank, two screen rooms, a lead- and concrete-shielded test cell, and several work areas. The 30,000-gal (114,000 ℓ) accelerator oil tank contained two Marx generators (3.6-MeV and 50-kV), a gas switch, an intermediate storage capacitor, and high-voltage distribution lines.

(Harris, 2000; Knowles and Zawadzkas, 1995; Kuzio, 2001)

Current Operations and Capabilities

The SABRE facility was a pulsed-power-driven IVA accelerator that supported extraction diode research, weapon component development (simulation of thermal-mechanical shock induced by x-ray deposition), and development and assessment of radiographic sources. Activities at SABRE involved survivability testing of nuclear weapon subsystems and components and technology development to provide radiographic characterization techniques. SABRE supported the light ion program in investigating extraction diodes and MITL coupling; testing surface and subsurface cleaning, improved vacuum conditions, and advanced ion sources; and studying lithium ion transport.

(Molina, 1999; SNL, 2001j)

Summary of SABRE Operations in FY2000

During FY 2000, SABRE performed 300 shots to provide x-ray and gamma-ray effects testing on pulsed-power technologies, fusion systems, weapons systems, computer science, flight dynamics, satellite systems, and robotics. The FY2000 activity level is within the 400 shots analyzed in the SWEIS expanded operations alternative. Hazardous waste generation was reduced to zero in FY2000, the continuation of a downward trend since 1996. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were basically unchanged since the SWEIS analyses.

(SNL, 2001j)

4.3.7 Saturn

The Saturn accelerator in TA-IV is housed in a multifloor facility (Building 981), nearly 42,087 ft^2 (3,910 m^2) in size. The facility is comprised of a laboratory building (highbay, office space, shop areas, light labs, a mechanical room, radiation exposure cell, and basement), storage tanks, and transfer systems for large quantities of transformer oil and deionized water. The highbay is approximately three stories high, with a 1,000-ft^2 (93-m^2) screen room.

The accelerator is a circumferentially symmetric, parallel-current driver consisting of 36 identical pulse-compression and power-flow modules. The 36 modules are arranged like wheel spokes and can easily be configured to drive either annular electron-beam bremsstrahlung diodes or z-pinch plasma loads. The pulsed-power components are housed in an open-air tank that is 96 ft (29 m) in diameter (covering 7,200 ft^2 [670 m^2] of floor space) and 14 ft (4.3 m) high. The tank is divided into energy storage, pulse compression, power flow, and power combination sections.

(Fine, 1988; Kuzio, 2001; Miller, 2000)

Current Operations and Capabilities

The Saturn accelerator produces x-rays to simulate the radiation effects of nuclear weapon detonation on electronic and material components, as a pulsed-power and radiation source, and as a diagnostic test bed. Areas of application include satellite systems, Strategic Defense Initiative space assets, and reentry vehicle and missile subsystems (Miller, 2000). Activities at Saturn support stockpile stewardship programs in the development and survivability testing of nuclear weapon subsystems and components by providing hostile radiation environmental testing, including simulating the x-rays produced by a nuclear weapon detonation. Saturn is used for demonstrating high-yield fusion in the laboratory.

(SNL, 2001j)

Summary of Saturn Operations in FY2000

During FY2000, Saturn performed 137 shots. The SWEIS expanded operations alternative analyzed up to 500 shots per year at the Saturn facility. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.3.8 Short-Pulse High Intensity Nanosecond X-Radiator (SPHINX)

The SPHINX accelerator facility (Building 981) is located in TA-IV a concrete-shielded enclosure adjacent to the Saturn accelerator. The accelerator occupies ~700 ft^2 (65 m^2) of the building and consists of an 18-stage, low-inductance Marx generator, two oil PFLs and a vacuum PFL, and radiation barriers. The radiation barrier is a concrete-shielded enclosure with a movable skyshine shield attached to the top of the transmission line/dioide.

(Kuzio, 2001; Miller, 1999)

Current Operations and Capabilities

SPHINX provides radiation environments for testing DOE components of nuclear weapons and for confirming codes used in the certification of nuclear weapons components. SPHINX can operate in two distinct modes—as a bremsstrahlung x-ray source and as an electron beam source. In the bremsstrahlung (x-ray) mode, researchers study the response of electronics to pulsed, high-energy, x-ray environments. The electron beam mode is used to study the thermostructural response of materials to pulsed radiation. Current activities at SPHINX involve R&D work associated with high-shot-rate, hot x-ray effects simulation to test components that require small-area exposure. The electron beam mode is used to support development work for tactical and strategic satellite systems.

(Nickerson et al., 1995; SNL, 2001j)

Summary of SPHINX Operations in FY2000

During FY2000, the SPHINX performed 1,338 shots, well within the analysis of the SWEIS expanded operations alternative of up to 6,000 shots per year. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements remained unchanged since the SWEIS analyses.

(SNL, 2001j)

4.3.9 Tera-Electron Volt Energy Superconductor Linear Accelerator (TESLA)

The TESLA accelerator facility in TA-IV, formerly known as the magnetically insulated transmission experiment (MITE) accelerator (Building 961), is an 11,526-ft^2 (1,071-m^2) single-story building divided into two sections, a highbay area and an office/lab area. The accelerator consists of an oil tank, a water tank, and a concrete-shielded test cell. The test cell includes a vacuum storage inductor, a magnetically controlled plasma opening switch, and an electron beam load. The oil tank contains 10,000 gal (37,850 ℓ) of transformer oil and a Marx generator, which can store a maximum of 740 kJ in 48 capacitors, and is equipped with a mechanical shorting system.

(Kuzio, 2001; Weber and Zawadzkas, 1996b)

Current Operations and Capabilities

The TESLA facility operates to test plasma opening switches for pulsed-power drivers (Weber and Zawadzkas, 1996b). The primary operating mode of TESLA produces a pulse that lasts ~40 ns, with 150 kJ of electrical energy and 700-kA peak diode current at a peak voltage of 5 MV or less. TESLA produces ionizing radiation in the vacuum chamber region in the form of intense prompt radiation (bremsstrahlung). In this primary operating mode, an ion beam is not produced, except incidentally in the plasma opening switch (Weber and Zawadzkas, 1996b).

(SNL, 2001j)

Summary of TESLA Operations in FY2000

During FY2000, the operating levels at the TESLA involved 37 shots. Section 4.7 shows most FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

In FY2000, insulator oil inventory and hazardous waste generation increased. A new 10,000-gal (37,850-ℓ) tank was added. Epoxy expiration, a one-time disposal, increased hazardous waste generation from zero in FY1999 to 330 lb (150 kg) in FY2000.

(SNL, 2001j)

4.3.10 Z Accelerator

The Z Accelerator (Building 983) is located in TA-IV. Building 983 is a multifloor, masonry building with a basement. The building provides 39,487 gross ft^2 (3,668 m^2) of which 35,429 ft^2 (3,291 m^2) is lab space. The facility includes the accelerator highbay (mezzanine, 0-ft level, 10-ft level, and 25-ft level), support area highbays 983B and 983C, laser and facility support systems (12-ft level), water and oil tank farms, lowbay light labs and the control room, and the gas house (Building 983A). The accelerator is located in a circular tank ~33 m (108 ft) in diameter and 6 m (20 ft) high.

(Harris and Sullivan, 1996, 2000; Kuzio, 2001)

<u>Current Operations and Capabilities</u>

The multi-use Z Accelerator supports the Inertial Confinement Fusion Program and the High-Energy/Density Physics Program for stockpile stewardship. Operating on the principle of pulsed power, the Z Accelerator stores electrical energy over a period of minutes, then releases that energy in a concentrated burst to produce a single, extremely short and powerful pulse that can be focused on a target (Harris and Sullivan, 1996).

Z Accelerator programs support studies of radiation transport, radiation drive symmetry, radiation hydrodynamics, hydrodynamic instabilities, shock physics, equations of state, opacity, and capsule implosion physics. These studies support both near-term stockpile stewardship and a DOE decision to achieve high yield for weapon physics tests and a warm x-ray environment for radiation-effects studies. For radiation-effects research, the Z Accelerator provides x-ray line radiation from imploding z-pinches that can simulate the materials response to the unshielded x-ray threat from a weapon.

(Harris and Sullivan, 1996; Harris, 2000; SNL, 1999c, 2001j)

<u>Summary of Z Accelerator Operations in FY2000</u>

During FY2000, the Z Accelerator performed 153 test shots. This activity level is well within the 350 firings analyzed in the SWEIS expanded operations alternative. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative. Nuclear materials were involved in only 5 percent of the shots; as a result, tritium air emissions were zero. The SWEIS analyzed up to 1,250 curies (Ci) of tritium emissions per year at the Z Accelerator.

In FY2000, SNL/NM made several changes to Building 983 and its associated operations. Grinding operations were resumed to remove heavy metals vaporized onto surfaces after each experiment. Also, preparatory changes were made to Building 983 for expanding depleted uranium (DU) experiments. During the DU experiments, potential airborne particles would be controlled through the accelerator vacuum chamber. Additionally, the amount of DU used during tests would increase from 200 milligrams (mg) to as much as 4.2 grams (g) per shot.

During the year, SNL/NM relocated several existing capabilities (physical vapor disposition processes and electro-chemical processes) to Building 970. These capacities are combined with two new capabilities (single-point diamond turning and a hydrogen/vacuum firing furnace). Additional information is provided in Section 4.3.2.

(SNL, 2001j)

4.4 Reactor Facilities (TA-V)

4.4.1 Annular Core Research Reactor Facility (Pulse Configuration)

The ACRR facility (Building 6588), located in TA-V, is part of a larger complex that includes two other major structures (Buildings 6580 and 6581). Building 6588 is a 13,640-ft^2 (1,267-m^2) structure and comprises the reactor room, lowbay, control room, building utilities, several small laboratories, and support staff offices. The reactor room is 2,002 ft^2 (~186 m^2) and 31 ft (9.4 m) high. Buildings 6580 and 6581 are 30,150 ft^2 (2,800 m^2) and 3,755 ft^2 (350 m^2) respectively. Important design features of the ACRR include a small pool-type reactor under ~18 ft (6.2 m) of water, cranes for remote handling of irradiated experiment packages, and a high-efficiency particulate air (HEPA)-filtered, ventilated highbay.

In the pulse configuration, the ACRR is a water-moderated and reflected low-power research reactor that uses enriched uranium dioxide-beryllium oxide (UO_2BeO) fuel elements arranged in a close-packed hexagonal lattice around a central experiment cavity. The highbay is constructed of concrete block walls reinforced by vertical steel columns that support a sheet-metal roof, and thus is a confinement structure rather than a containment structure.

(Kuzio, 2001; Naegeli, et al., 1999; SNL, 1996)

Current Operations and Capabilities

The ACRR facility (pulse configuration) provides neutron and sustained gamma environments for the evaluation of experiments, including those for Defense Programs (DP) testing of component electronics and reactor safety research.

The current DP mission priority for the ACRR pulse-mode is detailed in the SWEIS: "The ACRR would be reconfigured to pulse-mode operation for a limited-duration test period (12 to 18 months) following the ROD. This test campaign would be conducted in the existing ACRR facility, which would have to be temporarily reconfigured (from the steady-state configuration for use in production of molybdenum 99 [Mo-99]) to restore DP testing capability."

Reactor features include a dry cavity in the central core region and a radiography tube, and it is capable of producing high-energy neutrons in the dry cavity over a very short time period. Four

types of experiments can be conducted in the ACRR pulse configuration mode: (1) irradiation of solids within the radiography tube or other dry cavity, (2) radiography experiments,
(3) irradiation of solids or gases within the pool and within or adjacent to the core, and
(4) irradiation of solids or gases within the dry central cavity or other cavity.

The xenon 124/iodine 125 (Xe-124/I-125) irradiation process, one experiment conducted within the ACRR pool, involves the irradiation of liter quantities of natural xenon (Xe) gas or Xe gas enriched in Xe-124, and transfer to a processing fixture within a glovebox located in the highbay. After the transfer to the processing fixture decay vessel, the Xe-125 produced decays to I-125. Sodium hydroxide (NaOH) solution is used to wash the iodine from the decay vessel.

(SNL, 2001j)

Summary of ACRR Pulse Mode Operations in FY2000

In FY2000, the ACRR continued to provide neutron and sustained gamma environments for the completion of three test series. The ACRR was reconfigured for pulse mode when the medical isotope program was suspended. Section 4.7 shows most FY2000 material inventories, material consumption, and process requirements were within parameters analyzed in the SWEIS expanded operations alternative; however, radioactive air emissions (argon 41 [Ar-41]) increased to 30 Ci in FY2000. This increase was the result of I-125 isotope production and represents over three times the amount analyzed in SWEIS expanded operations alternative. Also, the radioisotope inventory increased to 3,500 Ci (from 0 Ci in FY1999). However, the FY2000 inventory was equal to the quantity analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.4.2 Annular Core Research Reactor Facility (Isotope Production Configuration)

See Section 4.4.1 for the facility description (Kuzio, 2001; Naegeli et al., 1999).

Current Operations and Capabilities

Although the ACRR facility can be used for the production of isotopes such as Mo-99, whose daughter, technetium-99 (Tc-99m), is used in nuclear medicine applications, the isotope production program was not operational in FY2000.

(SNL, 2001j)

Summary of ACRR Isotope Production Operations in FY2000

In FY2000, no medical isotopes were produced. Under original plans for medical isotope production, the ACRR would have produced medical and research radioactive isotopes. The ACRR would have been operated for 24 hours per day, 7 days per week, at a maximum power level of 4 megawatts (MW), (~35,000 MW-hours per year) to meet the entire U.S. demand for Mo-99 and other isotopes such as I-125, I-131, and Xe-133. This would have required the irradiation of about 25 highly enriched uranium targets per week (1,300 per year).

(SNL, 2001j)

4.4.3 Gamma Irradiation Facility (GIF)

The original GIF (Building 6588) shares the highbay with the ACRR in TA-V. Building 6588 is a multifloor facility with a basement. The building provides nearly 13,640 ft^2 (1,267 m^2) of space, including nearly 5,166 ft^2 (480 m^2) of lab space.

Main features of the GIF are the deep-water pool and two dry irradiation cells. The pool is a rectangular, reinforced-concrete structure with a stainless-steel liner. The pool's dimensions are 8 ft by 14.5 ft (2.4 m by 4.4 m), with a depth of 16 ft (4.9 m), mostly below ground, and a berm of ~3 ft (1 m) above floor level. It has an exposed surface area of 65 ft^2 (6 m^2) and a total water volume of ~13,000 gal (49,205 ℓ). The GIF pool has been used to store spare fuel elements for the ACRR. Valved pass-through ports, which are located ~8 ft (2.4 m) below the surface of the reactor and GIF pools, serve to transfer fuel elements between the two facilities.

(Boldt et al., 2000; Kuzio, 2001; SNL, 1999c)

Current Operations and Capabilities

Future use of the original GIF is being assessed by SNL/NM and DOE. In the past, the facility provided high-intensity gamma-ray sources to irradiate experiments. Since no experiments were irradiated, the radioactive sources were safely stored in the deep-water pool under the cell.

Summary of Gamma Irradiation Facility Operations in FY2000

No tests were performed in FY2000. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were essentially zero.

(SNL, 2001j)

4.4.4 Hot Cell Facility (HCF)

Located in TA-V, the HCF (Building 6580) is a category 3, nonreactor nuclear facility in an underground structure.

Current Operations and Capabilities

The HCF remains in a standby status. Work was begun to modify the HCF from its original mission of support for DP testing to support of the DOE Isotope Production and Distribution Program; however, this work was discontinued when the medical isotope production program was suspended. Future applications for the HCF are being assessed by SNL/NM and DOE.

(SNL, 2001j)

Summary of Hot Cell Facility Operations in FY2000

In FY2000, the HCF remained in standby mode, and no medical isotopes were produced. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were essentially zero.

(SNL, 2001j)

4.4.5 New Gamma Irradiation Facility (New GIF)

The New GIF (Building 6586) is a single-story, 12,450-ft^2 (1,157-m^2) structure located in the northeast quadrant of TA-V. The structure consists of a central highbay with an ancillary lowbay. The highbay houses three concrete test cells and a J-shaped water pool with a depth of 18 ft (5.5 m). The pool can store up to 1.5 MCi of cobalt 60 (Co-60) or equivalent gamma-ray thermal sources (25 kW) in the form of pins that can be shared between the in-cell irradiation facilities and the in-pool irradiation facilities.

The New GIF has three irradiation cells. Test cell 3 is a 18-ft by 30-ft (5.5-m by 9.1-m) experiment cell, with two source elevators and a 18-ft (5.5-m)-wide movable wall for large vehicle access; test cells 1 and 2 are 10-ft by 10-ft (3-m by 3-m) irradiation cells for use with a high-intensity, adjustable cobalt array. The design includes capability to add lead lining to reduce gamma backscatter and therefore, provide a high-fidelity cell.

(Kuzio, 2001; Mahn et al., 2000; Miller, 1998)

Current Operations and Capabilities

At the New GIF, gamma-irradiation experiments vary in test configuration, dose, and dose-rate level. The New GIF is divided so that two types of irradiation experiments (in-cell dry and in-pool wet) can be performed. General features and enhanced capabilities of the New GIF include up to 1.5 MCi of Co-60 inventory, configurable radiation sources, shielded windows for experiment observation during irradiation, and remote manipulators for experiment or source handling. Also, the New GIF provides in-pool irradiation fixtures to vary experiment configurations, a steam room for thermal cycling following radiation exposures, and overhead traveling cranes.

(Mahn et al., 2000; Miller, 1998)

Typically, irradiations performed in these facilities are at high dose rates (100 to 360 kilorads per hour) and short to intermediate durations lasting less than a day. At the in-pool facilities, radioactive sources are held in an irradiation fixture in deep water, where they remain stationary. Experiment canisters containing test units are immersed in the pool and positioned in preset locations in the irradiation fixture.

Summary of New GIF Operations in FY2000

With completion of construction, the New GIF began preparation to become operational in FY2001. Gamma-irradiation experiments may be performed under both dry and water-pool conditions. Capabilities would include studies in thermal and radiation effects, weapons component degradation, nuclear reactor material and components, and other nonweapon applications. Because, no test hours were completed in FY2000, there were no impacts from New GIF operations and material inventories, material consumption, emissions, and process requirements were essentially zero.

(SNL, 2001j)

4.4.6 Sandia Pulsed Reactor (SPR) Facility

The SPR Facility (Building 6590) in TA-V includes 3,000 ft^2 (279 m^2) of space consisting of a reactor control room, reactor building, and auxiliary equipment and buildings to support reactor operations. Several storage vaults, which are integral units in adjacent buildings, are available for storing the reactor and fissionable and radioactive materials. The reactor building (660 ft^2 [61 m^2]) is a large, thick-walled, steel-reinforced concrete structure in the shape of a cylinder, with an outside diameter of 39 ft (~12 m), covered with a hemispherical shell.

(Estes, 1995; Kuzio, 2001)

Current Operations and Capabilities

When operational, the SPR-II and SPR-III fast-burst reactors provide near-fission spectrum radiation environments for testing that supports defense and nondefense activities. The primary facility mission has been to produce high-neutron fluence or pulsed high-neutron doses for testing electronic subsystems and components. Critical experiments are also conducted in the facility to support other programs (Estes, 1995; Miller, 1998). Currently, the reactors and spare fuel materials will be stored in an underground vault (the In-Ground Storage Vault [IGSV]) pending plans for the new underground reactor facility.

Critical assemblies can be built in the SPR Facility for short-term experiments on nuclear energy. Safety elements incorporated into the operation of these small assemblies (typically less than 1 MW) are similar to those of the SPR. The assemblies are temporary, with a much lower power of operation, and lower potential for dispersion of radioactive material.

(Harms, 2000; SNL, 2001j)

Summary of Sandia Pulsed Reactor Operations in FY2000

During FY2000, SPR Facility operations involved 100 irradiation tests, which is half of the 200 irradiation tests analyzed in the SWEIS. Section 4.7 shows most FY2000 material inventories, material consumption, emissions, and process requirements were within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.5 Outdoor Test Facilities

4.5.1 Aerial Cable Facility Complex

The Aerial Cable Facility Complex consists of several cables stretched across Sol Se Mete Canyon, located in the eastern portion of KAFB on a 22,500-ac (9,100-ha) area of the Cibola National Forest withdrawn from public domain for the exclusive use of KAFB and DOE. The original aerial cable, installed in 1970, was a 1-3/8-in. (3.5-cm) wire rope that spanned the 5,000-ft (1,524-m) canyon. Test objects released from the maximum height of 600 ft (183 m) above the valley floor could achieve gravitationally accelerated velocities of up to 190 ft/s (58 m/s).

Initial construction also included a sled track to employ a rocket pull-down technique that could achieve impact velocities up to 800 ft/s (24 m/s). The pull-down technique uses towing cables to transmit accelerating forces from rocket sleds, through turning sheaves at the impact point, to the test items suspended from the overhead cable. In 1985, an unyielding target was constructed in the test arena under the cable to provide impact characteristics that simulate worst-case scenarios for shipping container accidents.

For captive flight testing, a second, smooth-track cable was installed in 1974 to eliminate the vibration from the trolley sheaves rolling over the original braided cable. Located parallel to the original cable (~100 ft [31 m] to the south), this cable was later replaced with a 2.5-in. (6.4-cm) Kevlar rope as a prototype of the White Sands Aerial Cable. A second arena, with two aerial cables, was installed in the canyon ~500 ft (152 m) north of the original test arena. Anti-tank submunitions are tested in this arena to preclude the target tanks from compromising other tests in the original arena.

(Stibick, 2000; West, 1995)

Current Operations and Capabilities

Capabilities of the Aerial Cable Facility Complex include precision testing of full-scale, air-deliverable weapon systems, verification of design integrity and performance, and impact testing for container compliance (10 CFR 71). The complex supports SNL/NM Energy Programs for transportation package certification and design verification of transportation technology.

The aerial cable is used to test missile warning receivers, decoys, and jammers. Test hardware installed in trolleys traverses the cable in captive flight. Threat missiles, launched at various ranges from the cable, are tracked by laser while the warning receiver, decoy, or jammer responses are recorded relative to the missile's position.

(Stibick, 2000)

Summary of Aerial Cable Facility Operations in FY2000

During FY2000, the Aerial Cable Facility maintained the capability to include drop tests of joint test assemblies that contain a maximum of 45 lb (~20 kg) of DU, 120 lb (54.5 kg) of enriched uranium, and 104 lb (47.3 kg) of insensitive high explosives (IHE) (plastic-bonded explosive [PBX]-9502 or press-moldable explosive LX-17). The number of tests using articles (containing DU, enriched uranium, and IHE) were estimated not to exceed five per year. The total number of drop/pull-down tests involved nine experiments in FY2000. In FY2000, two aerial target tests were completed, and no scoring system tests were conducted. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.5.2 Containment Technology Test Facility-West (CTTF-West)

The CTTF-West, located in Coyote Test Field (CTF), includes one scale-model reactor containment building. The model is a 1:4 scale representation of a two-buttress, prestressed concrete containment structure with a flat concrete basemat, cylindrical sides, and hemispheric dome; model dimensions are 25 ft (7.6 m) in diameter by 43 ft (13.1 m) high. Previously, a 1:10 scale steel-containment structure fabricated in Japan and shipped to SNL was tested; model dimensions are ~10 ft (3 m) in diameter by 21 ft (6.4 m). This model has been destroyed, and except for some samples, all fixtures associated with this test have been removed from the site.

(DOE, 1992; Emerson, 1992; Hessheimer, 2000)

Current Operations and Capabilities

Containment model testing at CTTF-West has been conducted for the U.S. Nuclear Regulatory Commission (NRC) and the Nuclear Power Engineering Corporation, Tokyo, Japan, to support reactor containment R&D (DOE, 1992a; Emerson, 1992). Both containment models were constructed to be tested to failure by pneumatic overpressurization with nitrogen gas (SNL, 1997). All tests specified in the original test program have been completed. A final hydrostatic test of the prestressed concrete containment model is planned for October 2001, after which the facility will be decommissioned and decontaminated. All support facilities are temporary and portable. Following the conclusion of the test program, the site will be restored and returned to the U.S. Air Force (USAF).

(SNL, 2001j)

Summary of CTTF-West Operations in FY2000

In FY2000, the CTTF-West concluded one of a series of successive experiments leading to ultimate failure of test vessels. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative, with one exception. Estimated expenditures increased to $3M in FY2000, over $1M more than estimated in the SWEIS.

(SNL, 2001j)

4.5.3 Explosives Applications Laboratory

The Explosives Applications Laboratory is located within a complex near Building 9930 in the CTF. Building 9930 consists of 2,634 ft^2 (245 m^2) with 1,167 ft^2 (108 m^2) of lab space. Four explosives storage bunkers are available at the laboratory.

(Kuzio, 2001)

Current Operations and Capabilities

The Explosives Applications Laboratory is used for the design, assembly, and testing of explosive experiments in support of SNL-wide programs. The Explosives Applications Laboratory supports the Nuclear Emergency Search Team (NEST), field test arming and firing (A&F), warhead development, development of emergency destruct systems, and the development of explosive components and systems. The laboratory is also used to maintain A&F systems readiness for the Underground Test (UGT) Program. Work at the facility involves arming, fuzing, and firing of explosives and the testing of explosive systems components.

(Tachau, 2000; USAF, 2000)

Summary of Explosives Applications Laboratory Operations in FY2000

During FY2000, the Explosives Applications Laboratory completed 138 explosive tests. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative, with one exception. The Explosives Applications Laboratory consumed 8.36 lb (3,860 g) of Bare United Nations Organization (UNO) category 1.2 explosives. This amount represents an increase of 5.2 lb (2,360 g) over the amount estimated in the SWEIS.

In FY2000, SNL/NM made several modifications at Building 9930. A concrete pad 96 ft (30 m) by 24 ft (8 m) was installed immediately adjacent to the south side of Building 9930. In addition, a chainlink fence was installed to provide physical security for storage transportainers and equipment located south of Building 9930. A 27,000-ft^2 (2,508-m^2) equipment storage area located northeast of Building 9930 was resurfaced. These modifications improve efficiency in the use of the facility area, reduce potential erosion, and suppress dust.

(SNL, 2001j)

4.5.4 Lurance Canyon Burn Site

Lurance Canyon Burn Site includes facilities within an area of ~220 ac (89 ha) in the easternmost part of CTF. The terrain is foothills to mountainous, with an elevation of ~6,400 ft (1,951 m) and high-desert vegetation.

Several concrete pools are used at the site for conducting open burn tests. A 30-ft by 60-ft (9-m by 18-m) concrete pool is used for fire-testing large objects. This reinforced concrete pool, 36 in. (91 cm) deep, can support objects weighing up to 140 tons (127 metric tons) and accommodate objects as large as railroad cars. A 20-ft (6.1-m) square steel pool, used for fire-testing intermediate-sized objects, has a metal test stand in the center flanked by two instrumentation towers. Smaller pools have been built to meet specific test requirements. A 6-ft by 18-ft (1.8-m by 5.5-m) stainless-steel pool is used in tests where only one side of an object is exposed to fire. The facility also includes a 10-ft (3-m)-diameter pool and a 15-ft (4.6-m) square pool.

Two enclosed fire test facilities, the Small Wind Shield (SWISH) and the Fire Laboratory for the Authentication of Models and Experiments (FLAME), are also at the site. These facilities, unique in the United States, were designed to meet Albuquerque/Bernalillo County Air Quality Regulation (20 NMAC 11.05), “Visible Air Contaminants.”

Lurance Canyon Burn Site has two double-walled, aboveground, enclosed 25,000-gal (94,625-ℓ) tanks; one contains water for open pool tests, and the other contains a water/propylene glycol mixture that circulates within the walls of FLAME for cooling during tests. Additional water is stored in two underground, 5,000-gal (18,925-ℓ) nonpotable water tanks. Jet fuel for open pool tests is stored in another aboveground, enclosed 30,000-gal (113,550-ℓ) fuel tank located in an earthen containment berm.

(DOE, 1994a, 1995; Stibick, 2000)

Current Operations and Capabilities

The Lurance Canyon Burn Site is the SNL/NM test facility for fire-testing weapons, weapon components, and shipping containers in aviation fuel fires, propellant fires, and wood fires for verification of design integrity and performance.

Open pool fires are used to simulate transportation accidents, which may involve pooling of spilled motor oil or gasoline. Because of its volatility, gasoline is not used as a test fuel at the site. Aviation fuel produces the same test results, with less danger to site personnel; the majority of tests use JP-8 aviation fuel, a distillate produced by blending gasoline and kerosene stocks, with an average molecular weight of 125.

Some fire tests can include rocket propellant to evaluate the vulnerability of weapons and satellites to accident scenarios, such as a missile fire on a launch pad. Propellants are ignited on a steel plate on the ground, and test objects are supported above the propellants. Rocket propellant fires last up to 10 minutes, with up to 3,000 lb (1,364 kg) of propellant consumed, depending upon the test object size.

Fuel-air mixture tests are conducted to qualify electronic equipment to National Electrical Code standards. Electronic equipment is operated in an explosive atmosphere to evaluate whether the equipment will cause a spark that could ignite fuel vapors. Wood fire or crib tests are conducted to meet U.S Department of Transportation (DOT) requirements for explosive component shipping containers.

(DOE, 1994, 1995; SNL, 2001j; Stibick, 2000; Tieszen, 1996)

Summary of Lurance Canyon Burn Site Operations in FY2000

During FY2000, approximately 10 certification tests were conducted at the Lurance Canyon Burn Site. Model validation tests and user tests involved 50 and 35 tests in FY2000, respectively. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were well within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j)

4.5.5 Thunder Range Complex

The Thunder Range Complex was used from 1969 through 1993 to support development, safety, reliability, and certification tests of Atomic Energy Commission (AEC)/DOE weapon systems.

Located southeast of TA-III, the Thunder Range Complex is generally bounded on the north by Magazine Road, although a triangular area north of this road (North Thunder Range) is also part of the permitted parcel. The complex is bounded on the southeast by a fence along Isleta Road. The portion of the Thunder Range Complex closest to the Isleta Pueblo is about half a mile north of that boundary (see SNL [1999b], Figures 2-1, 2-6, 2-13, and 2-16.) The site is flat, open terrain covered with shrub grassland.

Only three structures (Buildings 9967, 9968, and 9969) are currently being used by SNL/NM. These are located on the northeastern side of Thunder Range Complex, south of Magazine Road. Building 9967 provides 1,524 ft^2 (142 m^2) of space.

Located southwest of the Thunder Range Complex is the Conventional High Explosives & Simulation Test (CHEST) Site, which is also shown on maps as Chestnut Site or Range. The Chestnut Range is used for explosive tests. Although SNL/NM explosive testing activities have ceased at the Thunder Range Complex, Chestnut Range continues to be used as an active explosives testing site by the USAF and its contractors. (See SNL [1999b], Figure 2-6. The Air Force Research Laboratory was formerly known as Phillips Laboratory, and before that as the Air Force Weapons Laboratory.)

(Dunbar, 1998; Garcia-Sanchez, 1998; SNL, 1995-1997)

Current Operations and Capabilities

Previously, SNL has used portions of Thunder Range Complex for ground-truthing activities, such as radar return collection studies. This involves the use of "targets" such as vehicles or passive calibration sources (corner reflectors) placed on the ground surface. SNL/NM personnel have used optical instruments in the past to observe explosive tests done by the USAF at the Chestnut Range. Project plans call for continued observation of some future tests on a nonparticipatory basis. The amount and scope of these observations will be determined by funding. Observation locations could be on the Thunder Range Complex, but normally take place from a higher elevation, such as the hill northeast of the Complex.

(DOE, 1997; Dunbar, 1998; Kerschen, 2000; SNL, 1995-1997, 2001j)

Summary of Thunder Range Complex Operations in FY2000

During FY2000, no SNL-sponsored outdoor explosive or shock-tube testing occurred at the Thunder Range Complex. Continuing activities on the site are primarily associated with disassembly, inspection, and documentation of special items, such as special nonnuclear munitions, in Building 9967. No new construction is anticipated.

Test capabilities at the Thunder Range Complex include disassembly and evaluation, and calibration and verification of special nuclear and nonnuclear systems. Capabilities also involve cleaning, physical examination, measurement, sampling, photography, and data collection. Operations at the Thunder Range Complex involved no tests in FY2000. No equipment disassembly operations were completed in FY2000. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements remained unchanged from the SWEIS expanded operations alternative.

In FY2000, the USAF land-use permit was renewed for another 5 years. Although no test activities are planned for the next 5 years, SNL/NM is expected to maintain the test capability at the facility.

(SNL, 2001j)

4.6 Infrastructure Facilities

4.6.1 Hazardous Waste Management Facility (HWMF)

The HWMF, south of TA-I, is a low-hazard facility that consists of two permanent buildings, the Waste Packaging Building (Building 959) and the Waste Storage Building (Building 958), which are located within a single 8-ft (2.4 m) fenced enclosure. The two storage facilities are ~3,500 ft^2 (325 m^2) and 1,800 ft^2 (167 m^2), respectively. The facility includes six supply sheds, a covered and bermed waste storage area, a catchment pond, offices, and two self-contained storage structures.

(Kuzio, 2001; SNL, 1992)

Current Operations and Capabilities

The HWMF is responsible for the safe handling, packaging, short-term storing, and shipment (for recycling, treatment, or disposal) of all nonradioactive waste regulated by the *Resource Conservation and Recovery Act* (RCRA), except explosive waste and other hazardous and toxic waste (SNL, 1992).

Nonradioactive, hazardous chemical waste that is generated at SNL/NM and its associated satellite facilities (e.g., the Advanced Materials Laboratory located at the University of New Mexico, Albuquerque) is collected and transported to the HWMF for packing and short-term storage prior to offsite transportation for recycling, treatment, or disposal at a licensed facility. The waste is typically not stored for more than 365 days. No radioactive material or explosive material is managed at the HWMF.

(SNL, 2001j)

Summary of Hazardous Waste Management Facility Operations in FY2000

During FY2000, the HWMF also continued to prepare waste for offsite transportation for recycling, treatment, or disposal at licensed facilities. Operations at the HWMF remained at one shift. Quantities of RCRA hazardous waste managed were 162,568 lb (73,560 kg) in FY2000 (well within the permitted capacity). Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were within the SWEIS expanded operations alternative analyses.

(SNL, 2001j)

4.6.2 Radioactive and Mixed Waste Management Facility (RMWMF)

The RMWMF compound (Buildings 6920, 6921, 6925, and 6926) is located in the fenced southeastern portion of TA-III. Building 6920 consists of 8,507 ft^2 (790 m^2) and provides most of the waste-handling capacity at the facility. The RMWMF compound includes a storage building for reactive waste, a storage building for flammable waste, a building for compressed gas cylinder storage, both paved and unpaved outdoor, low-level waste and mixed waste storage areas, and a synthetic-lined retention pond to hold site surface-water runoff. The RMWMF is designed as a centralized area for receipt, characterization, treatment, repackaging, storage, and shipment of mixed and low-level radioactive waste and hazardous waste regulated by RCRA.

The maximum storage capacity at the RMWMF compound is ~285,000 ft^3 (8,071 m^3). In addition to the storage at the RMWMF compound, nine other storage areas are used, including the High Bay Waste Storage Facility, and seven of the Manzano storage bunkers (Bunkers 37118, 37045, 37078, 37063, 37034, 37055, and 37057). On average, the earth-covered bunkers provide 2,000 ft^2 (186 m^2) of storage space. The retention pond is located west of the RMWMF compound. The pond also collects water from fire-control activities and storm-water runoff.

(Kuzio, 2001; Massey, 1991; SNL, 1996)

Current Operations and Capabilities

SNL/NM operates the RMWMF for receipt, characterization, compaction, treatment (if necessary), repackaging, certification, and storage of low-level waste (LLW), transuranic (TRU) waste, and mixed waste. The RMWMF treats and stores waste until disposal or treatment sites are identified that can accept the waste. The volume of waste varies, depending on the storage time before the waste is shipped for disposal. This facility enables SNL/NM to handle and store the waste in compliance with applicable requirements of federal, state, and local environmental regulations, DOE directives, and offsite waste acceptance criteria. In addition, the facility, which opened in 1996, allows SNL/NM to prepare the waste for shipment, treatment, and disposal in accordance with specific requirements regarding waste certification, packaging, and transport.

(Jassy, 2000; Peters, 1996; SNL, 2001j)

Summary of RMWMF Operations in FY2000

During FY2000, the RMWMF continued to prepare waste for offsite treatment and disposal at licensed facilities. Operations at the RMWMF remained at one shift. FY2000 quantities of radioactive waste managed (including newly generated and legacy waste) were ~11,798 ft^3 (334 m^3) for LLW.

In FY2000, for low-level mixed waste (LLMW), TRU waste, and mixed transuranic (MTRU) waste, the quantities generated and managed are approximately as follows: 394 ft^3 (11 m^3) LLMW, 48 ft^3 (1.4 m^3) TRU, and 24 ft^3 (7.3 m^3) MTRU waste. The infrastructure-processing rate remained at 2.7M lb (823,171 kg) per year. To improve flexibility and operational efficiency, a new prefabricated building was constructed to replace an existing waste storage building. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were unchanged since the SWEIS expanded operations alternative analysis.

(SNL, 2001j)

4.6.3 Steam Plant

The Steam Plant (Building 605), provides 18,307 ft^2 (1,700 m^2) for five operational boilers with supporting systems that supply steam to SNL/NM TA-I and KAFB buildings from Eubank to Pennsylvania, and from Hardin Avenue to the Wyoming Boulevard base gate. The steam is used primarily for heating purposes, freeze protection, domestic hot water, and humidification. For most TA-I buildings, steam is the only heating source; thus, during the winter, the plant operation is critical to the missions of these facilities.

(Kuzio, 2001; SNL, 1994a)

Current Operations and Capabilities

In addition to providing the steam supply system to all of SNL/NM TA-I and eastern KAFB, the Steam Plant has several other functions. Steam is also essential to other programmatic missions, such as those at the Standards Lab and the Microelectronics Development Laboratory (MDL). During nonstandard hours at SNL/NM, the Steam Plant provides monitoring for building-critical alarms to all major buildings, and services (as Telecon) for emergency maintenance problems at all SNL/NM (and SNL/CA) facilities and utility distribution systems.

(Chavez, 2000; SNL Facilities Management and Operations Center, 2000)

The plant currently has three 10,000-gal (37,850-ℓ) tanks for diesel fuel (located on the building's east end) and one 500-gal (1,893-ℓ) diesel tank (on the northwest corner) that are used for the emergency generator. Two 300-gal (1,136-ℓ) propane tanks, located on the plant's north side, are used for emergency lighting of the boilers during natural gas interruptions. Three of the five boilers, specifically the 50,000-lb (22,680-kg)-per-hour boilers, have reached or exceeded their design life.

(SNL Facilities Management and Operations Center, 2000; SNL, 1994a, 2001j)

Summary of Steam Plant Operations in FY2000

The Steam Plant continued to produce and distribute steam to SNL/NM and KAFB facilities. Steam production was ~517 million pounds (M lb) (233M kg) in FY2000. This represents a decrease of 5 percent below the expanded operations alternative. The Steam Plant added flue gas recirculation to Boiler #5. Overall boiler efficiency has improved; future upgrades may include a technology change for continued improvements in boiler efficiency. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were within parameters analyzed in the SWEIS expanded operations alternative.

(SNL, 2001j; Wrons, 2001)

4.6.4 Thermal Treatment Facility (TTF)

The TTF (south of Building 6715), located in the northeast corner of TA-III, consists of a square burn pan of 0.375-in. (1-cm) steel, 29.25 in. (75 cm) on each side and 5.12 in. (13 cm) deep. A remotely operated metal lid can be raised or lowered to cover the burn pan. The burn pan is enclosed by a grated metal cage that is open to the air and is ~4 ft (1.2 m) on each side, and 8 ft (2.4 m) tall.

The cage is centered on a steel-lined concrete pad ~13 ft (4 m) on each side, with a 4-in. (10-cm)-high curb at the perimeter. The concrete pad is surrounded on the west, south, and east sides by an 8-ft (2.4-m)-tall earthen berm. An 8-ft (2.4-m)-high chainlink security fence surrounds the entire TTF.

(SNL, 1994b)

Current Operations and Capabilities

The TTF was originally built to support the Light-Initiated High Explosive (LIHE) Facility to provide onsite treatment for the facility's explosive-contaminated waste stream that did not comply with transportation requirements. The LIHE Facility was mothballed in 1992, with the possibility of eventual restart.

Currently, the TTF thermally treats (burns) small quantities of waste explosive substances, waste liquids (e.g., water and solvents) contaminated with explosive substances, and waste items (e.g., rags, wipes, and swabs) contaminated with explosive substances. No radioactive waste is treated at the TTF.

(SNL, 1994b; Conway, 2000)

Although ash from a treatment event is not usually hazardous waste (waste from LIHE Facility may contain silver), it is collected and managed as hazardous waste and sent to the HWMF for disposal at an approved offsite landfill.

(SNL, 1994b, 2001j)

Summary of Thermal Treatment Facility Operations in FY2000

During FY2000, the quantities of waste treated at the TTF included only several pounds of waste. Section 4.7 shows FY2000 material inventories, material consumption, emissions, and process requirements were unchanged since the SWEIS expanded operations alternative analysis.

(SNL, 2001j)

4.7 Summary of Selected Facility Operations in FY2000

Table 4-1 summarizes operational data from the selected facilities for FY1999, FY2000, and the SWEIS expanded operations alternative. The selected facilities are listed in the order that they appear in the preceding text of Chapter 4. The following table of contents is provided for ease in locating specific facility operational data.

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Table 4-1. Summary of Operational Data from Selected Facilities

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Advanced Manufacturing Processes Lab (AMPL) (TA-I) FY2000 Update (Section 4.1.1)						
Major Facility Activities	Development or Production of Devices, Processes, and Systems	Materials, Ceramics/Glass Electronics, Processes, and Systems	Operational Hours	347,000	248,000	248,000
Material Inventories	Nuclear Material Inventory	NA	Ci	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	kg	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	kg	0	0	0
	Mixed Waste	LLMW	kg	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	12,980	9,272	7,136
Emissions	Radioactive Air Emissions	Tritium	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	M ft^3	0	0	0
	Facility Personnel	NA	FTEs	204	150	150
	Expenditures	NA	M dollars	45	33	28
Explosive Components Facility (ECF, near TA-II) FY2000 Update (Section 4.1.2)						
Major Facility Activities	Test Activities	Neutron Generator Tests	Tests	500	200	200
		Explosive Testing	Tests	900	600	600
		Chemical Analysis	Analyses	1,250	900	900
		Battery Tests	Tests	100	50	50

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Explosive Components Facility (ECF, near TA-II) FY2000 Update (Section 4.1.2) (Cont'd)						
Material Inventories	Nuclear Material Inventory	Tritium	Ci	49	49	49
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	kg	150	130	150
		Bare UNO 1.2	kg	30	20	30
		Bare UNO 1.3	kg	30	23	25
		Bare UNO 1.4	kg	3	2	3
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	kg	18	15	15
		Bare UNO 1.2	kg	4	2	3
		Bare UNO 1.3	kg	5	3	4
		Bare UNO 1.4	kg	14	10	14
Waste Generation	Low-Level Waste	NA	ft^3	190	95	110
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	kg	1,000	1,000	1,000
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	500	360	400
Emissions	Radioactive Air Emissions	Tritium	Ci	$2x10^{-3}$	$1x10^{-3}$	$1x10^{-3}$
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	6.4	4.8	5.4
	Water Consumption	NA	M gal	7.0	6.0	6.0
	Electricity Consumption	NA	kWh	3,400,000	2,900,000	2,900,000
	Boiler Energy	NA	M ft^3	29	24	24
	Facility Personnel	NA	FTEs	102	81	86
	Expenditures	NA	M Dollars	2.5	1.7	1.9

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Integrated Materials Research Laboratory (IMRL) (TA-I) FY2000 Update (Section 4.1.3)						
Major Facility Activities	Other	Research and Development of Materials	Operational Hours	395,454	395,454	395,454
Material Inventories	Nuclear Material Inventory	Depleted Uranium	µCi	1.0	0.93	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	kg	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	kg	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	2,000	2,100	3,347
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	250	250	250
	Expenditures	NA	M Dollars	62	50	55
Microelectronics Development Laboratory (TA-I) FY2000 Update (Section 4.1.4)						
Major Facility Activities	Development or Production of Devices, Processes, and Systems	Microelectronic Devices and Systems	Wafers	7,500	4,000	4,000

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Microelectronics Development Laboratory (TA-I) FY2000 Update (Section 4.1.4) (Cont'd)						
Material Inventories	Nuclear Material Inventory	NA	Ci	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	kg	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	kg	0	0	0
	Transuranic Waste	NA	kg	0	0	0
	Mixed Waste	LLMW	kg	0	0	0
		Mixed TRU	kg	0	0	0
	Hazardous Waste	NA	kg	12,135	2,520	3,484
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	79.0	79.8	79.8
	Water Consumption	NA	M gal	99	77.9	77.9
	Electricity Consumption	NA	kWh	35,000,000	28,640,059	28,640,059
	Boiler Energy	NA	ft^3	40,500,000	34,346,000	34,346,000
	Facility Personnel	NA	FTEs	294	133	133
	Expenditures	NA	M Dollars	73	35	35
Neutron Generator Facility (NGF) (TA-I) FY2000 Update (Section 4.1.5)						
Major Facility Activities	Development or Production of Devices, Processes, and Systems	Neutron Generators	Neutron Generators	2,000	600	400

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Neutron Generator Facility (NGF) (TA-I) FY2000 Update (Section 4.1.5) (Cont'd)						
Material Inventories	Nuclear Material Inventory	Tritium	Ci	836	1,500	1,040
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	kg	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	Tritium	Ci	836	652	282
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	kg	4,000	2,700	2,500
	Transuranic Waste	NA	kg	0	0	0
	Mixed Waste	LLMW	kg	300	180	100
		Mixed TRU	kg	0	0	0
	Hazardous Waste	NA	kg	3,680	3,300	3,000
Emissions	Radioactive Air Emissions	Tritium	Ci	156	94	41
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	5	3	3
	Water Consumption	NA	M gal	5	3	3
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	280	180	262
	Expenditures	NA	M Dollars	55	30	25
Centrifuge Complex (TA-III) FY2000 Update (Section 4.2.1)						
Major Facility Activities	Test Activities	Centrifuge	Tests	120	32	21
		Impact	Tests	100	0	0
Material Inventories	Nuclear Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Centrifuge Complex (TA-III) FY2000 Update (Section 4.2.1) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	kg	7	0	0
		Bare UNO 1.3	kg	2,272	0	0
		Bare UNO 1.4	g	890	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste		kg	15	10	3
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	10	3.5	2
	Expenditures	NA	M Dollars	0.75	0.4	0.2
Drop/Impact Complex (TA-III) FY2000 Update (Section 4.2.2)						
Major Facility Activities	Test Activities	Drop Test	Tests	50	18	2
		Water Impact	Tests	20	1	0
		Submersion	Tests	5	1	0
		Underwater Blast	Tests	10	0	0
Material Inventories	Nuclear Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Drop/Impact Complex (TA-III) FY2000 Update (Section 4.2.2) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	kg	6.8	0	0
		Bare UNO 1.3	kg	1,100	55	6
		Bare UNO 1.4	g	1,157	196	17
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	Minimal	Minimal	Minimal
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	8	2.5	1.5
	Expenditures	NA	Dollars	146,000	50,000	50,000
Sled Track Complex (TA-III) FY2000 Update (Section 4.2.3)						
Major Facility Activities	Test Activities	Rocket Sled Test	Tests	80	10	12
		Explosive Testing	Tests	239	12	10
		Rocket Launcher	Tests	24	3	3
		Free-Flight Launch	Tests	150	40	22
Material Inventories	Nuclear Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Sled Track Complex (TA-III) FY2000 Update (Section 4.2.3) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	kg	2,761	0	0
		Bare UNO 1.3	kg	36,170	3,354	3,116
		Bare UNO 1.4	g	214	27	27
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	50	15	12
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	Explosives	kg	1,670	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	3.5	3.3
	Boiler Energy	NA	ft^3	0	0.4	0.4
	Facility Personnel	NA	FTEs	40	8	9
	Expenditures	NA	M Dollars	1.95	0.334	.367
Terminal Ballistics Facility (TA-III) FY2000 Update (Section 4.2.4)						
Major Facility Activities	Test Activities	Projectile Impact Testing	Tests	350	50	50
		Propellant Testing	Tests	100	25	25
Material Inventories	Nuclear Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	kg	25	19	19
		Bare UNO 1.2	kg	10	8	8
		Bare UNO 1.3	g	25,000	20,000	20,000
		Bare UNO 1.4	g	24,000	20,000	20,000
	Other Hazardous Material Inventory	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Terminal Ballistics Facility (TA-III) FY2000 Update (Section 4.2.4) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	kg	14	2	2
		Bare UNO 1.2	kg	21	3	3
		Bare UNO 1.3	kg	14	2	2
		Bare UNO 1.4	kg	14	2	2
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	0.75	0.25	0.25
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	2	0.3	0.3
	Expenditures	NA	dollars	12,000	8,500	8,500
APPRM (TA-IV) FY2000 Update (Section 4.3.1)						
Major Facility Activities	Test Activities	Accelerator Shots	Shots	2,000	400	234
Material Inventories	Nuclear Inventory	NA	µg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gal	130,000	130,000	134,700
Material Consumption	Nuclear Material Consumption	NA	µg	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
APPRM (TA-IV) FY2000 Update (Section 4.3.1) (Cont'd)						
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	200	75	110
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	7	5	5
	Expenditures	NA	M Dollars	5	1.6	1.4
HERMES III (TA-IV) FY2000 Update (Section 4.3.2)						
Major Facility Activities	Test Activities	Irradiation of Components or Materials	Shots	1,450	256	183
Material Inventories	Nuclear Inventory	NA	Ci	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gal	160,000	160,000	160,000
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	1.38	0.25	0.25
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	915	160	893
Emissions	Radioactive Air Emissions	Nitrogen 13	Ci	$36.03x10^{-4}$	$6.4x10^{-4}$	$6.4x10^{-4}$
		Oxygen 15	Ci	$36.03x10^{-5}$	$6.4x10^{-5}$	$6.4x10^{-5}$
	Open Burning	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
HERMES III (TA-IV) FY2000 Update (Section 4.3.2) (Cont'd)						
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	15	4	4
	Expenditures	NA	M Dollars	4.4	0.8	1.12
RITS (TA-IV) FY2000 Update (Section 4.3.3)						
Major Facility Activities	Test Activities	Accelerator Shots	Shots	800	0	0
Material Inventories	Nuclear Inventory	NA	µg	0	0	0
	Radioactive Material Inventory	Hardware	kg	500	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	kg	300	0	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	40,000	0	0
Material Consumption	Nuclear Material Consumption	NA	µg	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	300	0	0
Waste Generation	Low-Level Waste	NA	ft^3	120	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	272	0	0
Emissions	Radioactive Air Emissions	Nitrogen	Ci	0.16	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	6	0	0
	Expenditures	NA	M Dollars	4	2.25	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
RHEPP I (TA-IV) FY2000 Update (Section 4.3.4)						
Major Facility Activities	Test Activities	Accelerator Tests	Tests	10,000	1,957	1,773
Material Inventories	Nuclear Inventory	Depleted Uranium	µg	100	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	6,000	6,000	6,000
Material Consumption	Nuclear Material Consumption	Depleted Uranium	µg	100	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	10	0	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	10	1.2	1.8
	Expenditures	NA	M Dollars	5.5	0.8	1.2
RHEPP II (TA-IV) FY2000 Update (Section 4.3.5)						
Major Facility Activities	Test Activities	Radiation Production	Tests	800	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
RHEPP II (TA-IV) FY2000 Update (Section 4.3.5) (Cont'd)						
Material Inventories	Nuclear Inventory	NA	µg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	5,000	5,000	5,000
		Food Products	lb	100	0	0
Material Consumption	Nuclear Material Consumption	NA	µg	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	1	0	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	3	0.25	0.25
	Expenditures	NA	M Dollars	0.754	0	0
SABRE (TA-IV) FY2000 Update (Section 4.3.6)						
Major Facility Activities	Test Activities	Irradiation of Components or Materials	Shots	400	250	300
Material Inventories	Nuclear Inventory	NA	µg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	30,000	30,000	30,000

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
SABRE (TA-IV) FY2000 Update (Section 4.3.6) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	µg	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	132	63	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	6	0.2	4
	Expenditures	NA	M Dollars	0.96	0.64	1
Saturn (TA-IV) FY2000 Update (Section 4.3.7)						
Major Facility Activities	Test Activities	Irradiation of Components or Materials	Shots	500	152	137
Material Inventories	Nuclear Inventory	NA	Ci	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	300,000	300,000	300,000
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Saturn (TA-IV) FY2000 Update (Section 4.3.7) (Cont'd)						
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	1,286	384	480
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	27	14	14
	Expenditures	NA	M Dollars	5.4	2.8	2.8
SPHINX (TA-IV) FY2000 Update (Section 4.3.8)						
Major Facility Activities	Test Activities	Irradiation of Components or Materials	Shots	6,000	3,500	1,338
Material Inventories	Nuclear Inventory	NA	µg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	1,000	1,000	1,000
Material Consumption	Nuclear Material Consumption	NA	µg	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	107	63	94

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
SPHINX (TA-IV) FY2000 Update (Section 4.3.8) (Cont'd)						
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	kg	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	5	2	2
	Expenditures	NA	M Dollars	0.71	0.4	0.45
TESLA (TA-IV) FY2000 Update (Section 4.3.9)						
Major Facility Activities	Test Activities	Accelerator Shots	shots	1,300	0	37
Material Inventories	Nuclear Inventory	NA	µg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Insulator Oil	gal	10,000	10,000	20,000
Material Consumption	Nuclear Material Consumption	NA	µg	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	65	0	150
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
TESLA (TA-IV) FY2000 Update (Section 4.3.9) (Cont'd)						
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	5	1	2
	Expenditures	NA	M Dollars	1.6	0.05	0.5
Z Accelerator (TA-IV) FY2000 Update (Section 4.3.10)						
Major Facility Activities	Test Activities	Tritium	Shots	75	Not Reported	0
		Deuterium	Shots	100	Not Reported	8
		Plutonium 239	Shots	50	Not Reported	0
		Depleted Uranium	Shots	50	Not Reported	0
		Other	Shots	75	Not Reported	145
		NA	Total	350	160	153
Material Inventories	Nuclear Inventory	Tritium	Ci	50,000	0	0
		Deuterium	ℓ	5,000	100	350
		Plutonium 239	mg	200	0	0
		Depleted Uranium	mg	200	0	0
	Radioactive Material Inventory	Activated Hardware	kg	10,000	2,000	2,000
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	g	1,500	225	0
	Other Hazardous Material Inventory	Insulator Oil	gallon	700,000	700,000	700,000
Material Consumption	Nuclear Material Consumption	Tritium	Ci	7,500	0	0
		Deuterium	ℓ	5,000	100	350
		Plutonium 239	mg	2,000	0	0
		Depleted Uranium	mg	2,000	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	g	37,500	225	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Z Accelerator (TA-IV) FY2000 Update (Section 4.3.10) (Cont'd)						
Waste Generation	Low-Level Waste	NA	ft^3	28	7.5	5
	Transuranic Waste	NA	ft^3	16	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	1,250	750	1,000
Emissions	Radioactive Air Emissions	Tritium	Ci	0	7.2×10^{-9}	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	115	50	50
	Expenditures	NA	M Dollars	4	1.2	1.8
ACRR Pulse Mode (TA-V) FY2000 Update (Section 4.4.1)						
Major Facility Activities	Test Activities	Irradiation Tests	Test Series	2 to 3	0	3
Material Inventories	Inventory Nuclear Material	Enriched Uranium	kg	85	12	12
		Plutonium 239	g	8,800	148	8,800
	Radioactive Material Inventory	Cobalt-60	Ci	33.6	33.6	33.6
		Radioisotopes	Ci	0	0	3,500
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.2	g	500	0	500
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	Enriched Uranium	g	2	0	2
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	170	0	0
	Transuranic Waste	NA	ft^3	5	0	5
	Mixed Waste	LLMW	ft^3	5	0	5
		Mixed TRU	ft^3	5	0	0
	Hazardous Waste	NA	ft^3	14	0	14

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
ACRR Pulse Mode (TA-V) FY2000 Update (Section 4.4.1) (Cont'd)						
Emissions	Radioactive Air Emissions	Argon-41	Ci	7.8	0	30
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	50,000	0	50,000
	Water Consumption	NA	M gal	100,000	0	100,000
	Electricity Consumption	NA	kWh	0	0	1,000
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	8	1	4
	Expenditures	NA	M Dollars	8	0.2	4
GIF (TA-V) FY2000 Update (Section 4.4.3)						
Major Facility Activities	Test Activities	Tests	Hours	8,000	0	0
Material Inventories	Nuclear Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	g	500	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	126	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	ft^3	14	0	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
GIF (TA-V) FY2000 Update (Section 4.4.3) (Cont'd)						
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	17,000	17,000	17,000
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	3	2	0
	Expenditures	NA	M Dollars	0	0	0
Hot Cell Facility (TA-V) FY2000 Update (Section 4.4.4)						
Major Facility Activities	Test Activities	Processing	Targets	1,300	0	0
Material Inventories	Nuclear Material Inventory	Enriched Uranium	g	125	0	0
	Radioactive Material Inventory	NA	Ci	3.9	0	0
	Spent Fuel Inventory	Spent Fuel	kg	399	0	0
	Explosives Inventory	Bare UNO 1.2	g	500	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	Enriched Uranium	kg	32.5	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	5,000	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	40	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	ft^3	22	0	0
Emissions	Radioactive Air Emissions	Tritium	Ci	2.2	0	0
		Argon 41	Ci	2.2	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	55	0	0
	Expenditures	NA	M Dollars	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
New GIF (TA-V) FY2000 Update (Section 4.4.5)						
Major Facility Activities	Test Activities	Tests	hrs	24,000	0	0
Material Inventories	Nuclear Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	g	500	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	126	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	ft^3	14	0	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	255,000	0	200,000
	Electricity Consumption	NA	kWh	0	0	20
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	4	0	2
	Expenditures	NA	M Dollars	1	0	1
Sandia Pulsed Reactor (SPR) (TA-V) FY2000 Update (Section 4.4.6)						
Major Facility Activities	Test Activities	Irradiation Tests	Tests	200	100	100

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Sandia Pulsed Reactor (SPR) Information FY2000 Update (Section 4.4.6) (Cont'd)						
Material Inventories	Nuclear Inventory	Plutonium 239	g	10,000	53	10,000
		Enriched Uranium	kg	1,000	600	600
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	g	1,000	1,000	1,000
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	Ci	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	kg	900	440	440
	Transuranic Waste	NA	ft^3	5	0	0
	Mixed Waste	LLMW	ft^3	14	4	4
		Mixed TRU	ft^3	5	0	0
	Hazardous Waste	NA	ft^3	30	7	7
Emissions	Radioactive Air Emissions	Argon 41	Ci	30.0	9.5	9.5
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	17	10	10
	Expenditures	NA	M Dollars	6	0	4
Aerial Cable Facility (Sol Se Mete Canyon) FY2000 Update (Section 4.5.1)						
Major Facility Activities	Test Activities	Drop/Pull-Down	Tests	100	21	9
		Aerial Target	Tests	30	6	2
		Scoring System Tests	Series	2	0	0
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Aerial Cable Facility (Sol Se Mete Canyon) FY2000 Update (Section 4.5.1) (Cont'd)						
Material Inventories (Cont'd)	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	kg	78.8	18.9	9.5
		Bare UNO 1.3 (Rocket Motors)	kg	22,930	1,514	1,112
		Bare UNO 1.4	g	2,314	410	205
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	9	5	4.3
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	24	8	8
	Expenditures	NA	M Dollars	0.75	0.25	0.20
CTTF-West (in Coyote Test Field) FY2000 Update (Section 4.5.2)						
Major Facility Activities	Survivability Testing	Test Series	Test Series	2	0	1
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Sealed Source Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
CTTF-West (in Coyote Test Field) FY2000 Update (Section 4.5.2) (Cont'd)						
Material Inventories (Cont'd)	Other Hazardous Material Inventory	Adhesives	g	500	500	500
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	g	100	100	100
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	12	12	12
	Expenditures	NA	M Dollars	2	2	3
Explosives Applications Laboratory (in Coyote Test Field) FY2000 Update (Section 4.5.3)						
Major Facility Activities	Explosive Testing	Tests	Tests	275 to 360	240	138
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	g	490,000	327,000	266,000
		Bare UNO 1.2	g	98,250	65,000	1,289
		Bare UNO 1.3	g	3,210,000	2,140,000	2,366
		Bare UNO 1.4	g	4,050,000	2,700,000	54
	Other Hazardous Material Inventory	Film Developer/Fixer	gallon	20	10	20

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Explosives Applications Laboratory (in Coyote Test Field) FY2000 Update (Section 4.5.3) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	Bare UNO 1.1	g	263,000	175,000	18,113
		Bare UNO 1.2	g	1,500	1,000	3,860
		Bare UNO 1.3	g	15,000	10,000	0
		Bare UNO 1.4	g	1,500	1,000	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	5	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	1.5 to 2	1	1.5
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	6	3	4
	Expenditures	NA	M Dollars	0.975	0.65	.80
Lurance Canyon Burn Site FY2000 Update (Section 4.5.4)						
Major Facility Activities	Test Activities	Certification	Tests	55	12	10
		Model Validation	Tests	100	56	50
		User Testing	Tests	50	37	35
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	NA	kg	0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Lurance Canyon Burn Site FY2000 Update (Section 4.5.4) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste		kg	900	900	900
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	JP-8	gal/burns	25,000/50	5,000/15	5,000/15
		Wood	kg/burns	5,000/10	1,000/2	1,000/2
		Rocket Propellant	kg/burns	7,500/5	0/0	0/0
Process Support	Wastewater Effluent	NA	gal	25,000	25,000	25,000
	Water Consumption	NA	gal	0	0	10,000
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	11	4.5	4.5
	Expenditures	NA	M Dollars	0.65	0.25	0.25
Thunder Range Complex FY2000 Update (Section 4.5.5)						
Major Facility Activities	Other	Equipment Disassembly And Evaluation	Days	144	42	42
	Other	Ground Truthing Tests	Test Series	10	1	1
Material Inventories	Nuclear Material Inventory	Plutonium 238	Ci	0.62	0.62	0.62
		Plutonium 239	Ci	0.52	0.52	0.52
		Americium 241	Ci	0.52	0.52	0.52
		Americium 243	Ci	0.52	0.52	0.52
		Normal Uranium	Ci	4.2	4.2	4.2
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.1	g	436	436	436
	Other Hazardous Material Inventory	NA		0	0	0

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Thunder Range Complex FY2000 Update (Section 4.5.5) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	g	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	0	0	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gallon	0	0	0
Process Support	Wastewater Effluent	NA	gallon	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	2.6	0.8	0.8
	Expenditures	NA	dollars	300,000	25,000	25,000
HWMF (South of TA-I) FY2000 Update (Section 4.6.1)						
Major Facility Activities	Infrastructure	Collection, Packaging, Handling, and Short-Term Storage of Hazardous and Other Toxic Waste	kg	214,000	203,000	73,560
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Sealed Source Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Propane	Pounds	1,188	396	924

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
HWMF (South of TA-I) FY2000 Update (Section 4.6.1) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	860	800	485
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	35	13	11
	Expenditures	NA	M Dollars	2.7	0.9	1.2
RMWMF (TA-III) FY2000 Update (Section 4.6.2)						
Major Facility Activities	Infrastructure	Receipt, Packaging, and Shipping of Radioactive Waste	lb	2.7 M	0.250 M	0.250 M
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO 1.2	g	0	9	9
	Other Hazardous Material Inventory	Propane	gallons	6,630	6,630	6,630
		Liquid Nitrogen	ℓ	8,320	8,320	8,320

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
RMWMF (TA-III) FY2000 Update (Section 4.6.2) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	19,592	11,798	11,798
	Transuranic Waste	NA	ft^3	353	48	48
	Mixed Waste	LLMW	ft^3	8,833	394	394
		Mixed TRU	ft^3	27	24	24
	Hazardous Waste	NA	kg	0	0	0
Emissions	Radioactive Air Emissions	Tritium	Ci	2.203	2.203	2.203
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	49	39	39
	Expenditures	NA	M Dollars	0.528	8	8
Steam Plant (TA-I) FY2000 Update (Section 4.6.3)						
Major Facility Activities	Infrastructure	Generate and Distribute Steam to DOE, TA-I, KAFB East, Coronado Club	lb	544 M	544 M	517 M
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	NA	g	0	0	0
	Other Hazardous Material Inventory	Diesel Fuel	M gal	1.5	1.5	1.5
		Propane	gallons	300	300	0
		Water Treatment Chemicals	gallons	1,752	1,752	1,752

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Steam Plant (TA-I) FY2000 Update (Section 4.6.3) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	9	9	9
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	NA	gal/burns	0	0	0
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	18	18	0
	Electricity Consumption	NA	kWh	1.2 M	1.2 M	1.2 M
	Boiler Energy	NA	ft^3	779 M	779 M	806 M
	Facility Personnel	NA	FTEs	17	17	14
	Expenditures	NA	M dollars	2.87	2.8	2.8
Thermal Treatment Facility (TTF) (TA-III) FY2000 Update (Section 4.6.4)						
Major Facility Activities	Infrastructure	Treatment of Waste	lb	1,200	2.95	2.95
Material Inventories	Nuclear Material Inventory	NA	kg	0	0	0
	Radioactive Material Inventory	NA	Ci	0	0	0
	Spent Fuel Inventory	NA	kg	0	0	0
	Explosives Inventory	Bare UNO1.1	g	10,366	5.05	5.05
		Bare UNO1.3	g	165.7	0	0
	Other Hazardous Material Inventory	Propane	gallons	500	500	500

Table 4-1. Summary of Operational Data from Selected Facilities (Continued)

Category	Description	Activity Type or Material	Units (per Year)	SWEIS Expanded Alternative	Data Reported for FY1999	FY2000
Thermal Treatment Facility (TTF) (TA-III) FY2000 Update (Section 4.6.4) (Cont'd)						
Material Consumption	Nuclear Material Consumption	NA	g	0	0	0
	Radioactive Material Consumption	NA	Ci	0	0	0
	Explosives Consumption	NA	kg	0	0	0
Waste Generation	Low-Level Waste	NA	ft^3	0	0	0
	Transuranic Waste	NA	ft^3	0	0	0
	Mixed Waste	LLMW	ft^3	0	0	0
		Mixed TRU	ft^3	0	0	0
	Hazardous Waste	NA	kg	272	0	0
Emissions	Radioactive Air Emissions	NA	Ci	0	0	0
	Open Burning	Propane	gallons	120	8	8
Process Support	Wastewater Effluent	NA	M gal	0	0	0
	Water Consumption	NA	M gal	0	0	0
	Electricity Consumption	NA	kWh	0	0	0
	Boiler Energy	NA	ft^3	0	0	0
	Facility Personnel	NA	FTEs	1	0.1	0.1
	Expenditures	NA	Dollars	100,000	10,000	10,000

Source: SNL, 2001j.

4.8 Storage Tanks at SNL/NM

Table 4-2 shows information on aboveground oil and fuel storage tanks at SNL/NM TA-I, including descriptions, locations, contents, capacities, containment, and other information. Table 4-3 shows information on other storage tanks at SNL/NM, including those that store chemicals.

Table 4-2. Oil and Fuel Storage Tanks at SNL/NM TA-I

Building	Location	Capacity (gal)	Containment	Contents	Description
605	Outside, east	10,000	Metallic	Diesel #2	Aboveground fuel storage tank
605	Tank from outside, south	209,421	Earthen	Diesel #2	Aboveground fuel storage tank
605	Outside, east	10,000	Metallic	Diesel #2	Aboveground fuel storage tank
605	Tank from outside, south	45,490	Earthen	Diesel #2	Aboveground fuel storage tank
605	Outside, east	10,000	Metallic	Diesel #2	Aboveground fuel storage tank
605	Tank from outside, south	44,129	Earthen	Diesel #2	Aboveground fuel storage tank
605	Tank from outside, south	213,898	Earthen	Diesel #2, empty, not in use	Aboveground fuel storage tank
605	Tank from outside, south	508,000	Earthen	Diesel #2, in service	Aboveground fuel storage tank
605	Tank from outside, south	1,024,000	Earthen	Diesel #2, in service	Aboveground fuel storage tank
841	Highbay 2	830	Metallic	Dielectric oil (Shell Diala Ax)	Electric transformer
862	Outside, east	10,000	Double walled	Diesel #2	Underground fuel storage tank

Source: Fink, 2000.

Table 4-3. Other Storage Tanks at SNL/NM

Material	Capacity	Location
Argon, liquid	900 gal	878/1-LAR
	4,000 gal	870B/1-LAR
	500 gal	840/1-LAR
	33,000 ft^3	9940/1-AR
	900 gal	805/1-LAR
Helium, liquid	9,420 lb	6505/1-HE
Hydrochloric acid	6,500 gal	858/1-HCL
Hydrogen, compressed gas	38,000 ft^3	TA3/H2
	96,000 ft^3	893/1-H2
	38,000 ft^3	TA3/H2
	38,000 ft^3	878/1-H2
Nitrogen (cryogenic liquid)	1,500 gal	905/2-LN2
	11,000 gal	890/1-LN2
	1,500 gal	883/1-LN2
	1,500 gal	983/1-LN2
	500 gal	905/1-LN2
	6,000 gal	878/1-LN2
	500 gal	6921/1-LN2
	11,000 gal	878/2-LN2
	500 gal	960/1-LN2
	300 gal	840/1-LN2
	6,000 gal	897/1-LN2
	1,500 gal	970/1-LN2
	162,000 lb	858/2-LN2
	4,400 gal	6588/1-LN2
	4,400 gal	6580/1-LN2
	1,500 gal	6594/1-LN2
	6,000 gal	6591/1-LN2
	13,000 gal	893/4-LN2
	3,000 gal	893/3-LN2
	1,500 gal	893/2-LN2
	1,500 gal	893/1-LN2
	1,500 gal	884/1-LN2
	1,500 gal	806/1-LN2
	1,500 gal	981/1-LN2
	9,000 gal	891/1-LN2
	11,000 gal	6560/1-LN2
	6,000 gal	865/1-LN2
	6,000 gal	858/1-LN2
Propane	1,000 gal	6560/1-PRO
	1,000 gal	6536/1-PRO
	1,000 gal	6715/1-PRO
	1,000 gal	6712/1-PRO
	500 gal	6525/1-PRO
	18,000 gal	TA-III

Source: Fink, 2000.

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CHAPTER 5.0
FY2000 NOTABLE FACILITIES OPERATIONS

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5.0 FY2000 NOTABLE FACILITIES OPERATIONS

5.1 Introduction

Chapter 4 summarized and compared the activities of selected facilities against the SNL/NM Site-Wide Environmental Impact Statement (SWEIS) (DOE, 1999). This chapter summarizes information for 15 notable facilities located in three Technical Areas (TAs), the Coyote Test Field (CTF), and the Manzano Area of Kirtland Air Force Base (KAFB).

The information recorded here is derived from personal communication and questionnaires submitted to facility managers or other cognizant facility staff. Descriptions of facilities come from safety documentation or facility representative information and has been refined as changes occurred.

5.2 TA-I Notable Facilities

5.2.1 Ion Beam Materials Research Laboratory

The Ion Beam Materials Research Laboratory (Building 884) is a low-hazard, nonnuclear facility built on a concrete slab with structural steel framing, stucco exterior, and a corrugated metal roof. Building 884 is a single-floor structure of ~15,061 square feet (ft^2) (1,400 square meters [m^2]), of which 10,369 ft^2 (963 m^2) is lab space. The building contains 16 office areas, one shop area, one storage area, one administrative area, and 18 labs.

The Ion Beam Materials Research Laboratory houses several supporting laboratories, including the Ion Implantation Physics Lab, the Electron Cyclotron Resonance Lab, the Ion Implantation and Ion Beam Analysis Lab, the Double Crystal Diffractometry Lab, and the Materials Modification Lab. Major equipment in the facility includes two Van de Graaff accelerators and a 400-kilovolt (kV) ion implanter. The 6 mega-electron volt (MeV) Tandem Van de Graaff generator is part of the facility's equipment.

(Kuzio, 2001)

<u>Current Operations and Capabilities</u>

The Ion Beam Materials Research Laboratory performs basic and applied research, provides advanced ion beam capabilities, and is used to establish theories and validate models in materials science, solid-state physics, and accelerator physics. The work of the Ion Beam Materials Research Laboratory supports research and development (R&D) for Defense Programs, Energy and Environment Programs, and work for others through laboratory-directed research and development and cooperative research and development agreements.

Summary of Ion Beam Materials Research Laboratory Operations in FY2000

During FY2000, operational levels at the Ion Beam Materials Research Laboratory were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced in FY2000. Hazards and hazard controls remain typical of laboratory and industrial environments.

(SNL, 2001j)

5.2.2 Sandia Lightning Simulator

The Sandia Lightning Simulator (Building 888), a low-hazard, nonnuclear facility, is a prefabricated, single-floor, reinforced concrete structure with basement that covers ~12,742 gross ft^2 (1,184 m^2). The facility is divided into office space and a highbay laboratory with a screen room, laser room, pump room, and machine shop. The highbay is ~10,360 ft^2 (962 m^2) and houses four Marx generators contained in two 30,000-gallon (gal) tanks (two Marx banks per tank).

(Kuzio, 2001)

Current Operations and Capabilities

When in operation, the Sandia Lightning Simulator generates simulated lightning to test nuclear weapon designs and safety-critical components for conformance to nuclear safety requirements. Other duties include supporting studies of the interaction of lightning with materials and structures, and testing electronic components, military missiles, aircraft, and communications equipment.

Summary of Sandia Lightning Simulator Operations in FY2000

During FY2000, operational capability of the Sandia Lightning Simulator was maintained but it has been in mothball status since 1996. The facility is slated to be refurbished during FY2001 to support weapons validation tests scheduled to start in FY2003. No major additions or modifications to the facility occurred. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.2.3 Energy and Environment Building

The Energy and Environment Building (Building 823), a low-hazard, nonnuclear facility, is a 145,321-gross-ft^2 (13,500-m^2) building with 19,471 ft^2 (1,809 m^2) of lab space. The four-story building includes 434 offices and 52 laboratory areas that support energy-related and material science research programs.

(Kuzio, 2001)

Current Operations and Capabilities

Operations in the Energy and Environment Building include R&D and testing of scientifically tailored materials, catalysts, and separations materials, processes, and devices. Areas of research and testing include geophysics, electronics, water quality, and various fields of chemistry.

Summary of Energy and Environment Building Operations in FY2000

During FY2000, operational levels at the Energy and Environment Building were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.2.4 Compound Semiconductor Research Lab (CSRL)

The CSRL (Building 893), a low-hazard, nonnuclear facility, is a 127,578-ft^2 (11,852-m^2) single-story building with an equipment penthouse. Current planning calls for combining the existing capabilities of the CSRL with elements of the Microelectronics Development Laboratory (MDL) into new facilities that would be called the Microsystems and Engineering Science Applications (MESA) Complex, proposed to begin development in the FY2001-FY2003 timeframe. Additional discussion on the MESA Complex is included in Chapter 3.0.

(Kuzio, 2001)

Current Operations and Capabilities

The CSRL supports the investigation of the physics of compound semiconductors and device structures. The facility also fabricates optoelectronic and digital compound semiconductor devices for both research and prototyping purposes. Specific activities at the CSRL include R&D of microelectronic devices for nuclear weapon applications, fabrication of microelectronic and photonic devices based on compound semiconductors, and study and refinement of techniques for processing compound semiconductors. Other activities include development of new processes and prototypes, fabrication of new, artificially structured materials through advanced growth or processing techniques, and fabrication of microchannels, integrated micro-optics, and other sensors.

Summary of Compound Semiconductor Research Lab Operations in FY2000

During FY2000, operational levels at the CSRL were similar to FY1999, with no major additions or modifications to the facility. Hazards and hazard controls remained typical of laboratory and industrial environments.

In FY2000, CSRL installed a metallorganic chemical vapor deposition (MOCVD) system along with a scrubber. The new system enhances the existing research capabilities by providing greater control of thin-film material deposition. MOCVD applications range from fabrication to protective coatings deposition.

(SNL, 2001j)

5.2.5 Power Sources Development Laboratory

The Power Sources Development Laboratory (Building 894) is 100,458 gross ft^2 (9,332 m^2) with 32,860 ft^2 (3,052 m^2) of lab space. This two-story building with a mezzanine contains eight laboratories and one chemical storage building, including the Lithium Ambient Battery Fabrication Laboratory, Materials Processing Laboratory, Thermal Battery Test Laboratory, Electrochemical Research Laboratory, Thermal Battery Research Laboratory, Ambient Battery Test Laboratory, Chemical Laboratory, and Microscopy Laboratory.

Current Operations and Capabilities

The Power Sources Development Laboratory serves as a R&D facility for the design and prototyping of thermal and lithium batteries. Within the facility, the Thermal Battery Test Laboratory is used to fabricate and test thermal battery cells and modules. Other work includes synthesis of inorganic compounds, testing the sensitivity of heat pellets with a portable laser, and development of new processes, prototypes, and energy storage systems.

Summary of Power Sources Development Laboratory Operations in FY2000

During FY2000, operational levels at the Power Sources Development Laboratory were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.2.6 Photovoltaic Systems Evaluation Laboratory West

The Photovoltaic Systems Evaluation Laboratory West (Building 833) is a single-story building with 2,945 gross ft^2 (274 m^2) containing 1,690 ft^2 (157 m^2) of lab space. The facility is made up of light electrical and mechanical labs and photovoltaic arrays that are located between F Street and the NCO Bypass.

Current Operations and Capabilities

The Photovoltaic Systems Evaluation Laboratory West is a multipurpose research and testing laboratory that supports the DOE Conservation and Renewable Energy National Photovoltaics Program. Photovoltaic arrays tested at the Photovoltaic Systems Evaluation Laboratory West convert solar energy to direct current electricity to demonstrate commercially available systems and to evaluate their performance.

Researchers at the Photovoltaic Systems Evaluation Laboratory West develop new processes and perform evaluations, perform indoor and outdoor testing on photovoltaic cells, modules, arrays, and systems, and use batteries and diesel generators in hybrid system testing.

Summary of Photovoltaic Systems Evaluation Laboratory West Operations in FY2000

During FY2000, operational levels at the Photovoltaic Systems Evaluation Laboratory West were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.3 TA-III Notable Facilities

5.3.1 Radiant Heat Facility

The Radiant Heat Facility (Building 6536) is a low-hazard, nonnuclear facility that includes an adjacent concrete bunker and a large array of electrically powered heat lamps. Building 6536 is a single-floor building of ~8,804 gross ft^2 (818 m^2) that contains an office area and six lab areas.

Current Operations and Capabilities

The Radiant Heat Facility provides the capability to study or prove the ability of a test item, such as a satellite component or a transportation container (e.g., radioactive material packaging), to withstand an accident involving a fire. Test items are exposed to a large array of electrically powered heat lamps that create a high-temperature heat environment similar to that of transportation accident fires.

Other activities at the Radiant Heat Facility include environmental, safety, and survivability testing for nuclear weapon applications, small-scale testing to support reactor vessel annealing research, and model validation of thermally driven transport through foam encapsulants to assess nuclear weapon response in abnormal environments.

Summary of Radiant Heat Facility Operations in FY2000

During FY2000, operational levels at the Radiant Heat Facility were similar to FY1999. In FY2000, the heating, ventilation, and air conditioning system was renovated. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.3.2 Liquid Metal Processing Laboratory

The Liquid Metal Processing Laboratory (Building 6630), a low-hazard, nonnuclear facility, is a 14,993-gross-ft^2 (1,392-m^2) one-story building with an 8,918-ft^2 (828-m^2) highbay and attached office buildings. Liquid Metal Processing Laboratory operations involve nine specialized furnaces and a chemical etching operation. Each of these operations provides metal and metal-alloy melting or ceramic casting capabilities. The operations are highly specialized and provide support in R&D and production for weapons research.

(Kuzio, 2001)

Current Operations and Capabilities

Specific activities in the Liquid Metal Processing Laboratory include environmental, safety, and survivability testing for nuclear weapon applications and development of metallurgical processing techniques to fabricate weapon components (e.g., housings). Other activities include evaluation of material samples provided by Former Soviet Union (FSU) researchers and materials R&D.

Summary of Liquid Metal Processing Laboratory Operations in FY2000

During FY2000, operational levels at the Liquid Metal Processing Laboratory were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments. In FY2000, operational reviews resulted in improved hazard controls for several furnaces and additional worker training requirements. These reviews were part of a continuing effort to improve existing operations at SNL/NM.

(SNL, 2001j)

5.3.3 Classified Destruction Facility

The Classified Destruction Facility (Building 6585) houses equipment necessary to perform its information destruction function, including the Hammermill and Micro DoD (Department of Defense) shredder.

Current Operations and Capabilities

During operation, the Hammermill conveyor feeds classified wastepaper into the document destructor, converting the paper to a residue that travels through the duct system to the cyclone separator, which includes a bag system. Compacted residue is transferred to the dumpster. The Micro DoD shredder operates by manual feed and destroys classified film and plastics; the cutting chamber transfers the residue to a container. When film contains silver, the residue is segregated for proper recycling or disposal.

The Hammermill can process up to 700 pounds (315 kilograms) of paper per hour. The Hammermill and Micro DoD shredder normally operate four hours per day, three days per week, 50 weeks per year.

Summary of Classified Destruction Facility Operations in FY2000

During FY2000, operational levels at the Classified Destruction Facility were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.3.4 Vibration/Acoustic Complex

The Vibration/Acoustic Complex includes Building 6560, a single-floor, metal building with a basement that contains electrodynamic exciters, electrohydraulic exciters, electropneumatic acoustic drivers, and several arrays of electrodynamic acoustic drivers. Building 6560 provides 8,034 gross ft^2 (746 m^2) of which 6,678 ft^2 (620 m^2) is lab space. Associated equipment includes a 180-kVA power amplifier, a 3,000-pounds-per-square-inch (psi) hydraulic power supply, and an 11,000-gal nitrogen storage tank and vaporizer. The Complex also includes Buildings 6610 and 6650, single-story concrete buildings that contain electrodynamic power amplifiers with all associated power supplies and instrumentation, and a main control room, respectively.

(Kuzio, 2001)

Current Operations and Capabilities

SNL/NM researchers use the Vibration/Acoustic Complex to conduct vibration, shock, and acoustic simulations for components and systems such as electronic packages to full-sized weapons components. These simulations serve to determine how items respond to controlled vibration and acoustic stimuli, to define failure levels, to prove system integrity, to determine modes of vibration, or to verify theoretical computer models. Many types of systems are tested, but the primary function is the simulation of dynamic environments for weapons systems.

Summary of Vibration/Acoustic Complex Operations in FY2000

During FY2000, operational levels at the Vibration/Acoustic Complex were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.4 TA-IV Notable Facilities

5.4.1 High Power Microwave Laboratory

The High Power Microwave Laboratory (Building 963) is 87,566 gross ft^2 (8,135 m^2) in size, of which 58,887 ft^2 (5,471 m^2) is lab space. The multifloor facility with basement includes two data acquisition screen rooms, the microwave control/monitor systems, a light laboratory, an attached anechoic chamber, and a large experimental cell that contains the Intermediate Pulser (IMP), the Cathode Test Bed (CTB), and General Repetitive Universal Multi-Purpose (GRUMP) Pulser.

(Kuzio, 2001)

<u>Current Operations and Capabilities</u>

The High Power Microwave Laboratory provides a large, high-quality, electromagnetic test facility capable of supporting DOE and U.S. Air Force (USAF) vulnerability and susceptibility testing requirements. Experiments in the High Power Microwave Laboratory involve the production of microwave energy by various sources (pulsed-power accelerators) that are under development.

Currently, the IMP is a single-shot accelerator capable of five shots per day that produce bremsstrahlung radiation. The CTB is a single-shot microwave accelerator capable of repetitive pulsed operations that produce x-rays as an intermediate step in testing cathode materials. The GRUMP Pulser is a CTB used to develop and test different types of cathode materials and configurations.

<u>Summary of High Power Microwave Laboratory Operations in FY2000</u>

During FY2000, operational levels at the High Power Microwave Laboratory were similar to FY1999, with no major facility additions. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

In FY2000, the CTB was reconfigured to its original specifications and renamed Repetitive Test Pulser (RTP). The RTP has a shot limit of 72,000 shots per hour, and operated ~3 hours per day for 2 to 3 days per week.

(SNL, 2001j)

5.4.2 Proto II

The Proto II (Building 970) is an eight-module, radially converging, pulsed x-ray simulator. The multifloor building with a basement provides 76,159 ft^2 (7,075 m^2) of which 36,120 ft^2

($3,356 m^2$) is laboratory space. The building contains 22 offices, several shops and storage areas, and 22 lab areas.

Current Operations and Capabilities

During FY2000, the Proto II remained nonoperational, with all fluids drained and energy sources locked out (Harris, 2000). Proto II was originally designed and constructed as a prototype for driving inertially confined fusion targets. In 1986, it was converted into an x-ray simulator. Currently, there are no plans to bring this accelerator back into operation.

Summary of Proto II Operations in FY2000

The Proto II did not operate in FY2000. No major additions or modifications to the facility occurred.

(Sandia National Laboratories, 2001j)

5.5 Coyote Test Field and Manzano Area

5.5.1 Manzano Storage Facility

The Manzano Storage Facility is comprised of reinforced concrete bunkers that are one-story structures tunneled into the mountain. The walls/roof are roughly half cylinders. The floors in the main chambers are slightly sloped. Most of the bunkers have a set of double-steel doors, a breezeway, and a second set of double doors into the main chamber. The floor areas of the main chambers vary, but are ~2,000 ft^2 ($186 m^2$) (SNL, 1997).

The DoD constructed the Manzano bunkers in the 1940s to store explosives. The bunkers are owned by the USAF, which until recently had also maintained and operated them. The Manzano bunkers are located in the southeast portion of KAFB in the western Manzanita Mountains. To provide access, a paved road encircles the mountain that houses the bunkers.

(Conway, 2000)

Current Operations and Capabilities

Currently, DOE leases 13 bunkers from the Air Force for SNL/NM to manage and store *Resource Conservation and Recovery Act (RCRA)* mixed waste, low-level radioactive waste, and transuranic waste. The Manzano bunkers, listed on a RCRA Part A permit application, are operating under RCRA interim status, and are required to comply with RCRA regulations for hazardous and mixed waste storage. Periodically, waste management personnel inspect, handle, and move containers at the facility and may open the outer containers of multiple-container packages; however, the inner containers of packages are not opened at the facility, and no process operations are performed there.

Typical waste stored in the bunkers includes tritium-contaminated equipment and cleanup material, and experimental test units. The bunkers can also store restricted-access waste (classified information, high activity levels, or other criteria) as approved by waste management personnel.

Summary of Manzano Storage Facility Operations in FY2000

During FY2000, operational levels at the Manzano Storage Facility were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.5.2 National Solar Thermal Test Facility

The National Solar Thermal Test Facility (situated within CTF) is a fenced and developed area of ~115 ac (46.5 ha) that includes solar furnaces, parabolic dishes, parabolic troughs, and a field of 218 computer-controlled heliostats which reflect concentrated solar energy onto the 200-ft (61-m) receiving tower. The support building is a multistory structure with a basement. The 8,179-gross-ft^2 (760-m^2) concrete and metal building contains two shop areas and two labs (3,898 ft^2 [362 m^2]).

(Kuzio, 2001)

Current Operations and Capabilities

Test operations at the National Solar Thermal Test Facility provide high temperature and high thermal flux for solar applications, investigation of the thermophysical properties of materials, measurement of the thermal performance of components, systems, and materials, measurement of the effects of aerodynamic heating on radar transmission, and simulation of nuclear thermal flash. The facility also provides large-scale optics for astronomical observations and atmospheric sounding.

Summary of National Solar Thermal Test Facility Operations in FY2000

During FY2000, operational levels at the National Solar Thermal Test Facility were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.5.3 Exterior Sensor Field

The Exterior Sensor Field facility includes several mobile offices, support trailers (Building 6600A), a parking lot, and a sensor test area. Some facility areas are fenced. Toward the eastern and northern facility boundaries, underground lines interconnect pole-mounted sensors for testing.

Current Operations and Capabilities

The Exterior Sensor Field provides the capability to test various intrusion detection sensors that are used by DOE, DoD, and the private sector. Routine operations at the Exterior Sensor Field include tests and evaluations of equipment and techniques for intrusion detection and field modifications (trenching, installation of sensors, installation and removal of camera towers, or installation of fencing) to meet test specifications.

Summary of Exterior Sensor Field Operations in FY2000

During FY2000, operational levels at the Exterior Sensor Field were similar to FY1999, with no major additions or modifications to the facility. No new capabilities were introduced. Hazards and hazard controls remained typical of laboratory and industrial environments.

(SNL, 2001j)

5.5.4 Other Notable Facilities in Permitted Areas

Table 5-1 lists notable SNL/NM facilities other than those discussed in this chapter that are on land permitted from the USAF. Generally, these facilities do not present hazards that require safety analysis or emergency planning documentation.

Table 5-1. Other Facilities on Land Permitted from the U.S. Air Force

Facility Name	Facility Location
Salvage Reapplication Yard	West of Technical Area IV
Explosives Storage Igloos	
Explosives Machining Test Facility Complex	Coyote Test Field
Vat Tank Facility Complex	
Shock Thermodynamics Applied Research Facility	
Coyote Canyon Headquarters	
Large Melt Facility Complex (remained inactive during FY2000)	
Antenna Measurement Facility	
Earth Strain Meter Facility	
Electro Explosive Research Facility	
Radar Cross Section Measurement Facility	
Autonomous Land Vehicle Test Area (now includes some outdoor testing)	
Video Technology Lab	
Site-Deployable Seismic Verification System	
Manzano Saddle Radio Site	Manzano Area

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6.1 Regulations, Orders, and Laws

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Migratory Bird Treaty Act, 16 U.S.C. § 703 et seq

National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. § 4321 et seq.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), 25 U.S.C. § 3001 et seq.

New Mexico Administrative Code (NMAC) Title 20, Chapter 11, Part 05, *Visible Air Contaminants.*

Resource Conservation and Recovery Act of 1976 (RCRA), 42 U.S.C. § 6901 et seq.

Toxic Substances Control Act (TSCA), 15 U.S.C. § 2601 et seq.

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APPENDIX A
SUMMARY OF ACTIVITIES AT SNL/NM INDIVIDUAL LABORATORIES

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***Key to Hazard Class and Type:** **B** - Biohazard; **COTM** - Use of chemicals or toxic materials; **E** - Electrical; **EN** - Environmental (e.g., air, discharge, hazardous or radioactive waste); **EX** - Explosives; **H** - High voltage pulsed power circuits; **K** - Equipment or machines that could generate kinetic energy; **L** - Use of lasers; **Low/NN** - Low Nonnuclear; **M** - Mechanical; **N** - Noise; **NCA** - Not commercially available equipment; **NR** - Nonionizing radiation; **P** - Pressure; **R** - Radiation; **RF** - Microwave/RF energy sources; **RGD** - Radiation-generating devices; **SIH** - Standard industrial hazard; **T** - Thermal; **THM** - Transportation of hazardous material.

A.1 Introduction

This appendix provides updated information on the activities of individual, general, special, and highbay laboratories at SNL/NM, including laboratories in facilities designated as “Notable Facilities” and “Selected Facilities” in the Site-Wide Environmental Impact Statement (SWEIS) (DOE, 1999).

The information compiled in this appendix was obtained from the Primary Hazard Screening (PHS) program, an element of SNL/NM’s Integrated Safety Management System (ISMS), and from existing, unclassified, SNL/NM facility databases and information resources. It represents SNL/NM laboratories that have prepared PHSs since publication of the SNL/NM Facilities and Safety Information Document in 1999 (SNL, 1999). The PHS program provides a documented output of a hazards analysis process, in which one or more qualified individuals familiar with an operation identifies the hazards, the major requirements for hazard controls, and the laboratory’s or operation’s hazard category.

All the laboratories included in this appendix are categorized as having either standard industrial hazards (SIH) or low (nonnuclear) hazards (Low/NN). These categories apply to the activities taking place in the laboratories located within each of the buildings identified and represent the lowest hazard categories at SNL/NM. For security reasons, the appendix does not include information about laboratories in classified buildings or areas. For the same reason, some PHS titles have been retitled.

Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 701, Processing and Environmental Technology Laboratory (PETL) **151,055 gross square feet/41,244 square feet of lab space** Bldg. 701 is a multifloor building with a basement, located in Tech Area I, north of Bldg. 858. The building is of masonry construction, and contains 180 office areas, 61 lab areas, and 10 storage areas.					
1	MPS-Gas Chromatograph Laboratory PHS No. SNL0A00384-001 (10/02/00)	Low/NN (COTM, E, H, P, R, T)	• Defense Programs • Work for Others	This lab supports SNL/NM with analyses on solids, liquids, head space, and gas mixtures from various engineering and research activities.	DOE/EA-0945, PETL EA
2	MPS-Analytical Preparation Laboratory PHS No. SNL0A00385-001 (11/14/00)	Low (COTM, E, H, P, T)	• Defense Programs • Work for Others	This lab supports SNL/NM with sample preparation and general analytical chemistry on solids and liquids from various engineering and research activities.	DOE/EA-0945, PETL EA
3	MPS-Liquid Chromatograph Laboratory PHS No. SNL0A00387-001 (10/05/00)	Low/NN (COTM, E, EN, H, P, T)	• Defense Programs • Work for Others	This lab supports SNL/NM with sample preparation and analysis of solids, liquids, and gases from various engineering and research activities.	DOE/EA-0945, PETL EA
4	MPS-Analytical Instrumentation Laboratory PHS No. SNL0A00388-001 (11/14/00)	Low/NN (COTM, E, H, L, NR, P, RF)	• Defense Programs • Work for Others	This lab supports SNL/NM with sample analysis on solids and liquids from various engineering and research activities.	DOE/EA-0945, PETL EA
5	MPS-Materials Development Laboratory PHS No. SNL0A00425-001 (10/18/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0945, PETL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 701, Processing and Environmental Technology Laboratory (PETL) (Continued)					**151,055 gross square feet/41,244 square feet of lab space**
6	MPS-Hybrid Organic-Inorganic Materials Laboratory PHS No. SNL0A00426-002 (10/05/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0945, PETL EA
7	MPS-Hybrid Organic-Inorganic Materials Laboratory PHS No. SNL9A00048-004 (11/20/00)	Low/NN (COTM, E, H)	• Defense Programs • Work for Others	This lab's capabilities include synthesizing monomers, polymers and materials, developing new membranes, and conducting basic chemical operations.	DOE/EA-0945, PETL EA
8	MPS-Jamison PETL Laboratory PHS No. SNL9A00053-005 (12/04/00)	Low/NN (COTM, E, H)	• Defense Programs • Work for Others	This lab's capabilities include synthesizing monomers, polymers and materials, and conducting basic chemical operations.	DOE/EA-0945, PETL EA
9	MPS-Thermal Processing Lab PHS No. SNL0A00391-004 (10/10/00)	Low/NN (COTM, T)	• Defense Programs • Work for Others	This lab provides thermal processing of ceramic materials and supports SNL/NM with sample preparation.	DOE/EA-0945, PETL EA
10	MPS-Sample Preparation and Microscopy Lab PHS No. SNL0A00392-001 (10/08/00)	Low/NN (COTM, E, H)	• Defense Programs • Work for Others	This lab provides sample preparation of specimens for microscopy.	DOE/EA-0945, PETL EA
11	MPS-Encapsulants and Foam Development Laboratory PHS No. SNL0A00400-001 (10/09/00)	Low/NN (COTM, E, H, P, T)	• Defense Programs • Work for Others	This lab supports SNL/NM with sample analysis on encapsulants and foams from various engineering and research activities.	DOE/EA-0945, PETL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 701, Processing and Environmental Technology Laboratory (PETL) (Continued)					**151,055 gross square feet/41,244 square feet of lab space**
12	MPS-Mass Spectrometry Laboratory PHS No. SNL0A00403-001 (11/17/00)	Low/NN (COTM, E, H, P)	• Defense Programs • Work for Others	This lab supports SNL/NM with analyses on solids, liquids, and gas mixtures from various disciplines.	DOE/EA-0945, PETL EA
13	MPS-Focused Ion Beam/Scanning Electron Microscope Lab PHS No. SNL0A00404-001 (09/26/00)	Low/NN (E, H, NR, RGD)	• Defense Programs • Work for Others	This lab provides SNL/NM with the dual-beam Focused Ion Beam/Scanning Electron Microscope (FIB/SEM) capability for materials characterization. This laboratory is used to prepare samples for FIB/SEM examination and to perform the actual FIB/SEM analyses on various materials.	DOE/EA-0945, PETL EA
14	MPS-Welding Process Laboratory PHS No. SNL0A00405-001 (09/19/00)	Low/NN (COTM, E, H, P, T)	• Defense Programs • Work for Others	This lab provides SNL/NM with the capability to conduct welding process materials research and development.	DOE/EA-0945, PETL EA
15	MPS-NMR Lab PHS No. SNL0A00430-002 (12/04/00)	Low/NN (E, H, RF)	• Defense Programs • Work for Others	This lab supports SNL/NM with analyses of both solid and solution samples.	DOE/EA-0945, PETL EA
16	MPS-Surface Preparation Laboratory PHS No. SNL0A00457-001 (12/06/00)	Low/NN (COTM, E, H, P, T)	• Defense Programs • Work for Others	This laboratory cleans and prepares samples for surface analysis in support of weapons development and internal research. Instrumentation in this laboratory is also used to perform surface profiles, surface photography, and measure surface adhesion.	DOE/EA-0945, PETL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 701, Processing and Environmental Technology Laboratory (PETL) (Continued)					**151,055 gross square feet/41,244 square feet of lab space**
17	MPS-TEM Lab PHS No. SNL0A00460-001 (11/14/00)	Low/NN (COTM, E, H, NR, RGD)	• Defense Programs • Work for Others	This laboratory supports SNL/NM with an electron microscope facility and an adjacent dark room.	DOE/EA-0945, PETL EA
18	MPS-Micro-systems Laser Process Laboratory PHS No. SNL0A00463-001 (12/04/00)	Low/NN (COTM, E, H, L, NR)	• Defense Programs • Work for Others	This lab provides SNL/NM with the capability to research and develop welding process materials.	DOE/EA-0945, PETL EA
19	MPS-Building 701 Laboratory PHS No. SNL0A00466-001 (03/20/00)	Low/NN (E, H, L, P, NR, T)	• Defense Programs • Work for Others	This lab provides SNL/NM with the capability to conduct material analysis with a laser and infrared spectroscopy.	DOE/EA-0945, PETL EA
20	MPS-Biosensor Development Lab PHS No. SNL0A00476-001 (11/10/00)	Low/NN (B, E, H, L, P, NR, T)	• Defense Programs • Work for Others	This lab provides SNL/NM with the capability to develop and characterize biological sensors for biological warfare agent detection and biomedical applications.	DOE/EA-0945, PETL EA
21	Building 701 Laboratory PHS No. SNL0A00496-001 (11/30/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0945, PETL EA
22	Chemical Deprocessing and SEM Laboratory PHS No. SNL0A00503-001 (02/01/01)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0945, PETL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 805, Research – Standards Labs and Offices					**75,335 gross square feet/37,631 square feet of lab space**
Bldg. 805 is a multifloor building with a basement, located in Tech Area I, south of Gate 1 and Bldg. 807. The building is of masonry construction, and contains 75 office areas and 65 lab areas.					
23	MPS-Dew Point Laboratory PHS No. SNL9A00309-001 (11/17/99)	SIH	• Defense Programs • Work for Others	Equipment includes field portable gas analyzers for sampling gas from a container and simultaneously measuring the gas dew point.	ECL/ADM SNA 95-119, Laboratory Operations Materials and Process Sciences Center
24	MPS-Encapsulant Synthesis Laboratory PHS No. SNL9A00319-001 (11/19/99)	SIH	• Defense Programs • Work for Others	This lab is used for synthesis, formulation, and testing of encapsulants, including removable encapsulants and sticky foams.	ECL/ADM SNA 95-119, Laboratory Operations Materials and Process Sciences Center
25	Organic Materials Synthesis Lab PHS No. SNL9A00324-001 (11/22/99)	Low/NN (COTM, M)	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	ECL/ADM SNA 95-119, Laboratory Operations Materials and Process Sciences Center
Tech Area I: Bldg. 807, Research and Development Labs and Offices					**91,701 gross square feet/23,503 square feet of lab space**
Bldg. 807 is a multifloor building with a basement, located in Tech Area I, south of Gate 1 and Bldg. 808. The building is of masonry construction, and contains 3 shop areas, 154 office areas, 10 administrative areas, 6 computer areas, 1 storage area, and 51 lab areas.					
26	Tflops Repair Facility (Light Electrical Lab) PHS No. SNL0A00437-002 (10/17/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	The Intel Tflops Repair Facility is a light electrical lab. Activities involve the use of equipment necessary to determine, diagnose, and repair problems with the tflops power supplies and processor node boards.	DOE/EIS-0281-064, Tflops Repair Facility

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 823, Energy and Environment Building (Systems Research and Development) 145,321 gross square feet/19,471 square feet of lab space Bldg. 823 is a multifloor building with a basement, located outside of the Tech Area I fence, south of M Avenue, northeast of Bldg. 825. The building is of concrete construction, and contains 434 office areas, 15 administrative areas, 12 computer areas, 5 storage areas, and 52 lab areas.					
27	Light/Computer Lab PHS No. SNL9A00276-002 (10/03/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281
28	Light Lab PHS No. SNL9A00277-001 (10/11/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281
29	Evaporation Control PHS No. SNL0A00297-001 (04/20/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281
30	Water Chemistry Lab PHS No. SNL9A00132-003 (08/23/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This lab activity includes determining the effects of the addition of small quantities of nontoxic chemicals to bodies of water on the rate of evaporation. The chemicals used are both commercially available and produced in small-scale biological reactors which utilize nonpathogenic, naturally-occurring bacteria and fungi.	DOE/EIS-0281
31	Light Lab PHS No. SNL9A00278-004 (08/08/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281
32	Bldg. 823 HARP PHS No. SNL9A00346-001 (12/06/99)	Low/NN (COTM, E, H, NR, RGD)	This PHS is a rollup of program information for Building 823.	This PHS is a rollup of information for Building 823.	DOE/EIS-0281

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 823, Energy and Environment Building (Systems Research and Development) (Continued)					**145,321 gross square feet/19,471 square feet of lab space**
33	ECI X-Ray Diffraction Laboratory PHS No. SNL9A00296-002 (08/23/00)	Low/NN (COTM, E, H, R, RGD)	• Basic Energy Sciences • Critical infrastructure	This lab supports SNL/NM's catalysis work covering design and simulation, synthesis, characterization, testing and process control. The lab also supports the development of novel catalysts and catalytic processes, including nanocatalysts, biomimetic catalysts, chiral catalysts, fuel cell catalysts, and membrane reactors.	DOE/EIS-0281
Tech Area I: Bldg. 841, Development Shops					**39,885 gross square feet/3,501 square feet of lab space**
Bldg. 841 is a single-floor building without a basement, located in Tech Area I on H Avenue, between 9th and 10th Streets. The building is of masonry construction, and contains 9 office areas, 2 administrative areas, 25 shop areas, 11 storage areas, and 10 lab areas.					
34	High Energy Density Welding/Precision Metal, Metal Preparation, Welding and CMI PHS No. SNL0A00361-001 (06/28/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-1264, Rapid Reactivation Project EA
Tech Area I: Bldg. 857, CRM Office Building					**23,413 gross square feet/6,587 square feet of lab space**
Bldg. 857 is a single-floor building without a basement, located outside Tech Area I on M Avenue, west of Bldg. 858 and east of Bldg. 870. The building is of framed stucco construction, and contains 79 office areas, 11 administrative areas, 1 storage area, and 4 lab areas.					
35	Neutron Generator Fabrication Wing PHS No. SNL0A00440-001 (10/13/00)	Low/NN (COTM, E, EX, H, R, RGD, T)	Defense Programs	Facility operations involve the manufacture of neutron generator (NG) subassembly components and the final assembly and test operations for NG components and assemblies.	DOE/EA-1264, Rapid Reactivation Project EA; DOE/EA-0879, Neutron Generator/Switch Tube Prototyping Relocation EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 857, CRM Office Building (Continued)					**23,413 gross square feet/6,587 square feet of lab space**
36	Neutron Generator Fabrication Wing PHS No. SNL9A00235-004 (04/19/01)	Low/NN (COTM, E, EX, H, R, RGD, T)	Defense Programs	Facility operations involve the manufacture of NG subassembly components and the final assembly and test operations for NG components and assemblies.	DOE/EA-1264, Rapid Reactivation Project EA; DOE/EA-0879, Neutron Generator/Switch Tube Prototyping Relocation EA
Tech Area I: Bldg. 858, Microelectronics Development Lab Bldg. 858 is a multifloor building with a basement, located in Tech Area I, between K and M Avenues, and 17th and 20th Streets. The building is of framed construction, and contains 205 office areas, 8 administrative areas, 13 storage areas, 8 computer areas, and 77 lab areas.					**94,010 gross square feet/33,201 square feet of lab space**
37	MDL Electrical Test PHS No. SNL9A00028-002 (06/20/00)	Low/NN (E)	Defense Programs	This lab provides both automatic and manual wafer electrical testing.	DOE/EIS-0281
38	MDL MEMS Release and Dry Processing PHS No. SNL9A00331-001 (08/02/00)	Low/NN (COTM, P)	Defense Programs	Activities involve exposing fullsize wafers or wafer pieces to acids, oxidizers, bases, and solvents. Other activities involve drying, applying coatings to the parts within a glove box, using the super-critical carbon dioxide drying system, or a combination of these methods. Wet-etching trenches into silicon is also performed.	DOE/EIS-0281
39	MDL Electronic Lab (retitled) PHS No. SNL0A00351-001 (10/27/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This lab supports SNL/NM with process development and assembly of optoelectronic transceivers.	DOE/EIS-0281-058, Micro-transmitter
40	Gamma Cell (retitled) PHS No. SNL0A00353-001 (10/27/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	ECL/ADM SNA 99-056-006, Gamma Cell

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 865, Aerothermodynamics Laboratory **19,473 gross square feet/14,232 square feet of lab space** Bldg. 865 is a single-floor building without a basement, located in Tech Area I on 9th Street, between I and J Avenues. The building is of masonry construction, and contains 8 office areas, 4 administrative areas, 1 shop area, 3 storage areas, 1 computer area, and 18 lab areas.					
41	Small Scale Fire Experiments PHS No. SNL0A00270-002 (03/15/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	ECL/ADM SNA 0-032, Small Scale Fire Experiments
Tech Area I: Bldg. 870, Micro Electronics Labs and Offices (Neutron Generator Facility) **29,943 gross square feet/8,918 square feet of lab space** Bldg. 870 is a multifloor building with a basement, located on M Avenue, southeast of Building 880, and east of Building 858. The building is of framed stucco construction and contains 88 office areas, 1 shop area, 16 storage areas, 1 computer area, 15 administrative areas, and 54 lab areas.					
42	Electronic Neutron Generator Assembly PHS No. SNL9A00242-002 (08/20/99)	Low/NN (COTM, E, EX, H, R, RGD, T)	Defense Programs	Facility operations involve the manufacture of NG subassembly components and the final assembly and test operations for NG components and assemblies.	DOE/EA-1264, Rapid Reactivation Project
Tech Area I: Bldg. 872, Radio Frequency Facility **15,855 gross square feet/7,473 square feet of lab space** Bldg. 872 is a multifloor building without a basement, located in Tech Area I, on K Avenue and 16th Street. The building is framed stucco construction, and contains 33 office areas, 6 lab areas, and 2 storage areas.					
43	872 Highbay-Bonded Storage PHS No. SNL0A00043-001 (02/25/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-1264-001, Relocation of Bonded Storage

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 877, Independent Vulnerability Assessment Facility **9,609 gross square feet/ 1,188 square feet of lab space** Bldg. 877 is a single-floor building without a basement, located in Tech Area I, south of K Avenue and 17th Street, east of Bldg. 880. The building is of masonry construction and contains office, conference, and lab space. There are 38 office areas, 1 conference area, and 8 lab areas within this facility.					
44	Light Electrical Lab PHS No. SNL0A00051-002 (04/06/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281-042, Research, Development, and Testing
45	Environmental VTR Test Lab PHS No. SNL0A00422-001 (09/25/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281-019, Automatic Target Recognition
Tech Area I: Bldg. 883, Reclamation Warehouse and Office **13,493 gross square feet/9,237 square feet of lab space** Bldg. 883 is a single-floor building without a basement, located south of Building 880, between L and M Avenues. The building is of metal construction and contains 6 office areas, 1 storage area, 2 administrative areas, and 10 lab areas.					
46	Seal Test Lab PHS No. SNL0A00365-001 (08/11/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	Normal test activities include verifying seal performance, leak-testing seals and containers, and measuring the physical properties.	DOE/EIS-0281
Tech Area I: Bldg. 890, Instrumentation Systems Laboratory **147,090 gross square feet/44,754 square feet of lab space** Bldg. 890 is a multifloor building with a basement, located in Tech Area I, near Gate 8, west of 14th Street. The building is of concrete construction and contains administrative, lab, and manufacturing/industrial space. There are 344 office areas, 4 storage areas, 1 shop area, 2 computer areas, and 92 lab areas within this facility.					
47	Light Electronics Laboratory PHS No. SNL0A00292-002 (04/21/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	Activities at this light electronic lab include software development; development, assembly, and testing of custom electronics hardware; and small mechanical part assembly.	DOE/EIS-0281-042, Research, Development, and Testing
48	Light Mechanical Laboratory PHS No. SNL9A00211-002 (09/02/99)	SIH	Defense Programs	This lab is used to assemble, test, and repair prototype flight hardware.	DOE/EIS-0281-051, Fiber Optic Control Module

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 891, Energy Technology Office and Building **140,216 gross square feet/45,723 square feet of lab space** Bldg. 891 is a multifloor building with a basement, located in Tech Area I, on 9th Street between J and K Avenues. The building is of concrete construction with a stucco exterior, and contains 229 office areas, 7 computer areas, 2 storage areas, 3 shop areas, and 86 lab areas.					
49	Ground Based SAR Applications Testbed PHS No. SNL9A00186-001 (08/02/99)	SIH	Defense Programs	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281-055, SAR Equipment
50	Ground Based SAR Applications Testbed PHS No. SNL9A00187-001 (08/02/99)	SIH	Defense Programs	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281-055, SAR Equipment
51	Ground Based SAR Applications Testbed PHS No. SNL9A00188-001 (08/02/99)	SIH	Defense Programs	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281-055, SAR Equipment
52	Light Electrical Lab PHS No. SNL9A00283-002 (08/02/99)	Low/NN (E)	Defense Programs	The laboratory is used to design, assemble, test, and repair prototype flight electronic equipment.	DOE/EIS-0281-035, Predator UAV
53	Test Lab PHS No. SNL0A00359-001 (06/28/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This lab performs mechanical assembly and software testing.	DOE/EIS-0281-035, Predator UAV
54	Optoelectronics Lab PHS No. SNL0A00504-001 (12/20/00)	SIH	Defense Programs	This lab supports the characterization of optoelectronic equipment and components.	DOE/EIS-0281-035, Predator UAV

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 893, Compound Semiconductor Research Laboratory **39,657 gross square feet/27,600 square feet of lab space** Bldg. 893 is a single-floor building without a basement, located in Tech Area I, on 9th Street, south of J Avenue. The building is of concrete and block construction and contains 1 administrative area, 2 storage areas, 2 shop areas, and 36 lab areas.					
55	CSRL PHS No. SNL0A00401-001 (12/20/00)	SIH	• Defense Programs • Nonproliferation and Material Control • Emerging Threats • Energy and Critical Infrastructure	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281-001, MicroSensor R&D ECL/ADM SNA 0-035, EmCore System
Tech Area I: Bldg. 894, Mail Services, Inspection, & Power Development Lab **100,458 gross square feet/32,860 square feet of lab space** Bldg. 894 is a multifloor building without a basement, located in Tech Area I, on the west side of 9th Street, between K and M Avenues. The building is of masonry construction and contains 77 offices, 21 administrative areas, 1 shop area, 9 storage areas, 4 computer areas, and 59 lab areas.					
56	Lithium/Ambient Cell/Battery Test Lab PHS No. SNL9A00356-002 (05/22/00)	Low/NN (COTM, E)	• Defense Programs • Basic Energy Sciences	This lab supports SNL/NM with testing of lithium ambient cell/batteries.	DOE/EIS-0281-025, Battery Development DOE/EIS-0281-046, Rechargeable Batteries
57	Lithium Ion Cell Materials PHS No. SNL0A00429-001 (10/12/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This lab manufactures materials for lithium ion cells.	DOE/EIS-0281-025, Battery Development DOE/EIS-0281-046, Rechargeable Batteries
58	Ultrasonic Testing PHS No. SNL0A00449-001 (10/17/00)	Low/NN (COTM, E, T)	Defense Programs	Several labs provide space for testing materials, joints, and subsystems for imperfections using eddy current, ultrasonics, and other techniques. Development and staging work is also done.	DOE/EIS-0281-025, Battery Development DOE/EIS-0281-046, Rechargeable Batteries

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 895, Robotics Manufacturing Science and Engineering Lab (RMSEL) **85,758 gross square feet/17,421 square feet of lab space** Bldg. 895 is a multifloor building with a basement, located on 20th Street and K Avenue, east of Bldg. 858. The building is constructed of masonry, framed stucco, and concrete and contains office, manufacturing/industrial, and lab space. There are 89 office areas, 1 computer area, 9 storage areas, 2 shop areas, and 32 lab areas within this facility.					
59	Pilot Plant (retitled) PHS No. SNL0A00301-004 (05/01/00)	SIH	• Defense Programs • DOE Integrated Activities • LDRD • Work for Others	This lab performs research and development in robotics for disassembling conventional munitions (e.g., artillery shells).	DOE/EA-0885, RMSEL EA
60	Light Electrical Lab PHS No. SNL0A00061-002 (03/08/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
61	Light Electrical Lab PHS No. SNL0A00062-001 (01/21/01)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This is a light electrical lab for sensor development work. Activities include soldering and light fabrication.	DOE/EA-0885, RMSEL EA
62	Motion Lab (retitled) PHS No. SNL9A00284-002 (10/05/00)	Low/NN (K)	• LDRD • DOE Integrated Activities • Work for Others	This lab is a testbed for evaluation of certain prototype parts, which are tested to determine the bearing coefficient of friction and a universal joint assembly.	DOE/EA-0885, RMSEL EA
63	Dextrous Manipulator Laboratory PHS No. SNL0A00037-001 (2/21/00)	SIH	• DOE Integrated Activities • LDRD • Work for Others	This laboratory is used to develop dextrous manipulator applications for bomb disposal involving motor vehicles.	DOE/EA-0885, RMSEL EA
64	Light Electrical Sensors Lab PHS No. SNL0A00058-001 (2/21/00)	Low	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 895, Robotics Manufacturing Science and Engineering Lab (RMSEL) (Continued)					**85,271 gross square feet/17,421 square feet of lab space**
65	Mega-Lab Robotic Plasma Torch PHS No. SNL9A00108-001 (09/01/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
66	Robocal Lab PHS No. SNL9A00281-001 (11/15/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
67	Electrical Projects Lab PHS No. SNL0A00278-002 (04/03/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
68	Water Technology PHS No. SNL0A00005-001 (02/10/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
69	Department Projects (retitled) PHS No. SNL0A00041-002 (02/24/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
70	Glovebox Operations (retitled) PHS No. SNL9A00282-001 (11/19/99)	Low/NN (L, M, P, T)	• Work for Others • DOE Integrated Activities	Glovebox research and development operations are performed.	DOE/EA-0885, RMSEL EA
71	Networked Robots (retitled) PHS No. SNL0A00272-002 (03/27/00)	Low/NN (NCA)	• Integrated DOE Activities • Work for Others	Activities involve the use of robots or robotic systems, rapid prototyping and systems analysis, and development of sensors and sensor utilization software.	DOE/EA-0885, RMSEL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 895, Robotics Manufacturing Science and Engineering Lab (RMSEL) (Continued)					**85,271 gross square feet/17,421 square feet of lab space**
72	Sensor Laboratory (retitled) PHS No. SNL0A00058-001 (03/02/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
73	Sensors Project (retitled) PHS No. SNL0A00121-001 (03/15/00)	Low/NN (NCA)	Work for Others	Activities include development and use of robots or robotic systems.	DOE/EA-0885, RMSEL EA
74	Paradex System PHS No. SNL0A00409-001 (10/03/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
75	Paradex I System PHS No. SNL0A00410-001 (10/02/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
76	Paradex II System PHS No. SNL0A00406-001 (10/03/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0885, RMSEL EA
77	IEDD Lab PHS No. SNL0A00415-001 (09/05/00)	Low/NN (K)	• Integrated DOE Activities • Work for Others	This lab supports SNL/NM in mobile robotics that have been modified or developed to assist military agencies or civil police groups in bomb disposal and anti-terrorist activities.	DOE/EA-0885, RMSEL EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 897, Integrated Materials Research Lab					**146,332 gross square feet/51,614 square feet of lab space**
Bldg. 897 is a multifloor building with a basement, located on M Avenue, north of Hardin Avenue and east of 20th Street, outside the Tech Area I fence. The building is constructed of concrete and contains 216 office areas, 16 administrative areas, 9 storage areas, 1 shop area, and 103 lab areas.					
78	MPS Research Bay (retitled) PHS No. SNL9A00047-002 (06/01/00)	Low/NN (COTM, EN, M, P, T, THM)	Defense Programs	Studies include synthetic chemistry using organic and inorganic chemicals (solids, flammables, and nonflammables).	DOE/EIS-0281
79	Surface Analysis Lab PHS No. SNL0A00065-002 (10/30/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281
80	Laboratory PHS No. SNL9A00270-001 (06/01/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EIS-0281
81	MPS-IFM PHS No. SNL0A00446-001 (10/17/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This lab performs research on interfacial force. Small samples of solid materials (typically 1 cc) of rubbers, metals, composites etc. are probed with a 1-micron-radius tip to generate force, creep and relaxation data on a sub-nanometer (dl) and micro-Newton (F) scale.	DOE/EIS-0281
Tech Area I: Bldg. 905, Explosive Components Facility					**100,308 gross square feet/41,495 square feet of lab space**
Bldg. 905 is a multifloor building with a basement, located south of Hardin Avenue and 20th Street. The building is constructed of concrete and contains 1 shop area, 57 office areas, 13 administrative areas, 1 computer area, 5 storage areas, and 107 lab areas.					
82	Scanning Electron Microscope (SEM)/MET Lab (retitled) PHS No. 9713955763-004 (04/04/00)	Low/NN (E, EN, EX, M, P, RGD, T)	• Defense Programs • Work for Others	Features include the SEM and metallographic preparation lab.	DOE/EA-1264, Rapid Reactivation Project Environmental Assessment DOE/EIS-0281

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Bldg. 905, Explosive Components Facility (Continued)					**100,308 gross square feet/41,495 square feet of lab space**
83	GC/MS Lab PHS No. 9713952727-004 (03/07/00)	Low/NN (E, EN, EX, M, P, T)	• Defense Programs • Work for Others	This lab contains a gas chromatograph/mass spectrometer.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment
84	Characterization Lab (retitled) PHS No. 9713949631-004 (03/29/00)	Low/NN (E, EN, EX, P, R, T)	• Defense Programs • Work for Others	This is an explosives characterization lab; activities generate hazardous waste.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment
85	Dynamics Lab (retitled) PHS No. 9714152886-004 (03/22/00)	Low/NN (B, E, EN, EX, M, NCA, P, T, THM)	• Defense Programs • Work for Others	Research involves material dynamics.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment
86	Component Testing (retitled) PHS No. 972033649-004 (05/03/00)	Low/NN (E, EN, EX, L, N, NCA, P, THM)	• Defense Programs • Work for Others	Activities include component testing and equipment development.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment
87	Thermal Testing Lab (retitled) PHS No. 9714151446-004 (04/26/00)	Low/NN (CR, E, EN, EX, L, M, P, T, THM)	• Defense Programs • Work for Others	Activities include optical diagnostic work.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment
88	Hydrocompactor (retitled) PHS No. 9715656626-004 (05/03/00)	Low/NN (COTM, E, EN, EX, M, N, P, THM)	• Defense Programs • Work for Others	Activities include materials research and development.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment
89	Production Test Lab PHS No. SNL9A00320-003 (03/21/00)	Low/NN (COTM, E, EX, L, M, P)	• Defense Programs • Work for Others	This is a production test lab.	DOE/EIS-0281 DOE/EA-1264, Rapid Reactivation Project Environmental Assessment

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area I: Microsystems and Engineering Sciences Applications (MESA) Complex					**100,308 gross square feet/41,495 square feet of lab space**
90	Microfab (retitled) PHS No. SNL0A00016-001 (01/20/00)	Moderate (COTM, M, P)	Defense Programs	The Microfab provides a cleanroom facility capable of war reserve (WR) component production, as well as the integration of research, prototyping, and production functions.	DOE/EA-1335, MESA EA
91	HARP (Microfab & Transition Area) PHS No. SNL0A00313-002 (09/21/00)	Low/NN (COTM, M, P)	Defense Programs	The MicroFab provides a cleanroom area for microsystems component post-processing and packaging. The MicroFab will be capable of war reserve (WR) production of microsystems in support of the Stockpile Lifetime Extension Process (SLEP). Silicon-based microsystem components will be fabricated in the Silicon Laboratory; photonic and sensor components will be fabricated in the Flexible Laboratory; and components from both laboratories will be processed and packaged in the Post-Processing and Packaging Laboratory.	DOE/EA-1335, MESA EA
92	HARP (retitled)	Low/NN (COTM, E, L, P)	Defense Programs	The laboratories and workspaces will facilitate design, system integration, and the qualification of weapons systems. This facility will provide for electrical and laser light laboratories that will form the infrastructure needed to develop and prototype subsystems for nuclear weapon refurbishment.	DOE/EA-1335, MESA EA

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area III: Albuquerque Full-Scale Experimental Complex (AFSEC) Test Facilities AFSEC is a collective designation for 12 main facilities, located throughout Tech Area III and the Coyote Test Field (CTF). AFSEC can provide a broad range of engineering environments.					
93	HARP AFSEC Test Facilities PHS No. SNL9A00344-002 (04/20/01)	Moderate	• Defense Programs • Work for Others	This PHS is intended to assimilate the hazards of AFSEC TA-III facilities to determine whether any two or more together could constitute a hazard not already considered in individual facility PHSs. The assimilation of these hazards will be used to support the AFSEC line item.	DOE/EIS-0281
Tech Area III: Bldg. 6530, Plasma Materials Test Facility **4,724 gross square feet/3,717 square feet of lab space** Bldg. 6530 is a single-floor building without a basement, located in the northeast quadrant of Tech Area III. The building is of concrete construction, and contains 2 office areas, 4 lab areas, and 1 storage area.					
94	Liquid Surface Experiment PHS No. SNL0A00345-001 (08/19/98)	SIH	Fusion Technology	This lab activity involves the Liquid Surface Experiment–liquid lithium and a tin/lithium alloy in a vacuum chamber using the EBTS electron gun.	• ECL/ADM SNA 96-038, Radiant Heat Facility • DOE/EA-1195, TA III EA (DETT-C)
Tech Area III: Bldg. 6630, Liquid Metal Processing Lab 14,993 gross square feet/8,918 square feet of lab space Bldg. 6630 is a single-floor building without a basement, located in the southeast quadrant of Tech Area III. The building is of masonry construction and contains 2 office areas, 1 shop area, 6 storage areas, and 4 lab areas.					
95	Large Aircraft Robotic Painting System (LARPS) Coating System PHS No. SNL0A00328-001 (01/07/99)	SIH	Work for Others	The lab supports the LARPS robot which is designed for paint stripping and will be modified to do painting.	DOE/EIS-0281

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area III: Bldg. 6750, Terminal Ballistics Facility **2,748 gross square feet/2,007 square feet of lab space** Bldg. 6750 is a single-floor building without a basement, located in Tech Area III. The building is concrete construction, and contains 1 office area and 3 lab areas.					
96	Terminal Ballistics Facility PHS No. SNL9A00192-001 (07/18/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	ECL/ADM SNA 99-014, Target Preparation and Outdoor Ordnance Firing at the Terminal Ballistics Facility
97	TBF-Indoor Testing and Outdoor Non-Directional Testing PHS No. SNL9A00193-001 (07/18/00)	Low/NN (COTM, EX, K, N)	• Defense Programs • Work for Others	Activities include using the indoor firing range and outdoor testing such as land mine detonations, explosive charges, and shape charges.	ECL/ADM SNA 99-014, Target Preparation and Outdoor Ordnance Firing at the Terminal Ballistics Facility
98	TBF-Indoor Testing and Outdoor Non-Directional Testing PHS No. SNL9A00195-001 (08/02/00)	Low/NN (COTM, EX, K, N)	• Defense Programs • Work for Others	Activities include using the indoor firing range and outdoor testing such as land mine detonations, explosive charges, and shape charges.	ECL/ADM SNA 99-014, Target Preparation and Outdoor Ordnance Firing at the Terminal Ballistics Facility
99	Terminal Ballistics Facility Outdoor Directional Testing PHS No. SNL9A00223-001 (12/14/99)	Moderate (COTM, EX, K, N)	• Defense Programs • Work for Others	Activities include using the indoor firing range and outdoor testing of projectiles.	ECL/ADM SNA 99-014, Target Preparation and Outdoor Ordnance Firing at the Terminal Ballistics Facility
Tech Area IV: Bldg. 960, Office/Lab Bldg. – Reactor Support Facility **48,491 gross square feet/10,802 square feet of lab space** Bldg. 960 is a multifloor building with a basement, located off of 9th Street in Tech Area IV. The building is constructed of masonry, and contains 2 administrative areas, 4 computer areas, 93 offices, and 34 lab areas.					
100	Laboratory (retitled) PHS No. SNL9A00214-003 (11/03/00)	Low/NN (L, T)	• Work for Others • Defense Programs	Activities involve propagation of a laser from a laboratory to a target shed on the facility.	ECL/ADM SNA 99-045, Advanced Laser Imaging Test

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area IV: Bldg. 962, Strategic Defense Facility Office/Lab **152,553 gross square feet/26,015 square feet of lab space** Bldg. 962 is a 4-floor building with a basement, located off of 9th Street in Tech Area IV. The building is constructed of concrete, and contains 314 office areas, 7 computer areas, 6 storage areas, 1 shop area, and 42 lab areas.					
101	Wrobel Lab PHS No. SNL0A00316-001 (05/15/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0352
Tech Area IV: Bldg. 963, Strategic Defenses Facility – Heavy Lab **87,566 gross square feet/58,887 square feet of lab space** Bldg. 963 is a multifloor building with a basement, located off of 9th Street in Tech Area IV. The building is constructed of concrete, and contains 3 offices, 2 storage areas, and 39 lab areas.					
102	Stronglink Unit Tests PHS No. SNL9A00291-001 (07/12/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	DOE/EA-0352
Tech Area IV: Bldg. 970, Simulation Technology Lab **76,159 gross square feet/36,120 square feet of lab space** Bldg. 970 is a multifloor building with a basement, located off of 9th Street in Tech Area IV. The building is constructed of masonry, and contains 22 offices, 2 shop areas, 4 administrative areas, 16 storage areas, and 22 lab areas.					
103	Materials Processing and Coatings Lab PHS No. SNL0A00314-002 (05/22/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	SNA 0-021, Relocation and Coordination of Material Processing and Coatings Laboratory
104	Seraphim Motor Demonstration Testbed PHS No. SNL0A00017-001 (01/21/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	SNA 96-089, NIF Prototype Test Bed

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area IV: Bldg. 981, Saturn Facility					**42,047 gross square feet/32,352 square feet of lab space**
Bldg. 981 is a multifloor building with a basement, located in the southern portion of Tech Area IV. The building is constructed on concrete, and contains 3 office areas, 26 lab areas, and 6 storage areas.					
105	Materials Processing and Coatings Lab PHS No. SNL9A00189-001 (07/19/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	SNA 0-021, Relocation and Coordination of Material Processing and Coatings Laboratory
Tech Area IV: Bldg. 986, Components Development Lab					**10,032 gross square feet/5,780 square feet of lab space**
Bldg. 986 is a single-floor building without a basement, located off of 9th Street in Tech Area IV. The building is constructed of concrete, and contains 2 storage areas, and 9 lab areas.					
106	Beamlet Operations (retitled) PHS No. SNL9A00185-005 (11/05/99)	Low/NN (COTM, E, EN, H, L, M, N, NCA, P, T)	Pulsed Power Applications	Diagnostic operations support Z facility activities.	SNA 98-080, Backlighter Laser
Tech Area V: Bldg. 6580, Reactor Facility					**27,358 gross square feet/16,783 square feet of lab space**
Bldg. 6580 is a single-floor building with a basement, located in Tech Area V. The building is of concrete construction, and contains 2 storage areas, 2 office areas, and 37 lab areas.					
107	Hot Cell Facility PHS No. SNL9A00349-002 (12/09/00)	Low/NN (E, M, P, R)	• Defense Programs • Work for Others	Low dose-rate irradiation activities use sealed cobalt and cesium sources.	ECL/ADM SNA 98-040, Component Irradiation Projects CY 98-99 Tech Area V
Tech Area V: Bldg. 6581, Security Services Building					**3,755 gross square feet/1,269 square feet of lab space**
Bldg. 6581 is a single-floor building without a basement, located in Tech Area V. The building is of masonry construction, and contains 1 storage area and 4 lab areas.					
108	Video Lab PHS No. SNL0A00477-001 (11/15/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area V: Bldg. 6585, Technology Support Center **99,579 gross square feet/10,734 square feet of lab space** Bldg. 6585 is a multifloor building with a basement, located in Tech Area V. The building is of masonry and concrete construction, and contains 18 administrative areas, 172 office areas, 5 computer areas, 9 storage areas, 1 shop area, and 23 lab areas.					
109	Dosimetry Light Lab PHS No. SNL9A00226-002 (08/29/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	This lab provides measurement services and experimental support to the accelerator, reactor, and gamma facilities at SNL/NM. The light lab is used for staging of equipment and for special projects involving small quantities of chemicals and radioactive materials.	

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area V: Bldg. 6586, New Gamma Irradiation Facility **12,491 gross square feet/9,546 square feet of lab space** Bldg. 6585 is a multifloor building with a basement, located in Tech Area V. The building is of masonry and concrete construction, and contains 18 administrative areas, 172 office areas, 5 computer areas, 9 storage areas, 1 shop area, and 23 lab areas.					
110	GIF PHS No. SNL0A00042-002 (07/17/00)	Category 3 (EX, NR, R, RGD)	Defense Programs	The new GIF provides SNL/NM with 3 concrete-shielded irradiation cells and an 18-foot-deep pool of water in which the stainless-steel-clad cobalt 60 (Co-60) pins (sealed sources) are stored. The irradiation cells permit dry irradiation operations in which Co-60 sources are raised from the bottom of the pool into the cells on elevators. Typical irradiations performed in the cells are at very high dose rates (100 to 1,000 kilorads/hour) and for short to intermediate durations (less than a day). In-pool irradiations are performed with the sources held in various fixtures in the bottom of the pool. Typical in-pool irradiations are at moderate and low dose rates (<10 kilorads/hr) and for long durations lasting days, weeks, and months.	DOE/EIS-0281

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area V: Sandia Pulsed Reactor (SPR) Facility, Bldg. 6593 **6,447 gross square feet/4,450 square feet of lab space** Bldg. 6593 is a multifloor building, located in Tech Area V. The building is of concrete construction, and contains 1 office area, 3 lab areas, and 3 storage areas.					
111	Small Portable X-Ray Machines PHS No. SNL0A00357-001 (06/28/00)	Low/NN (COTM, NR, R, RGD)	Defense Programs	This facility uses a portable x-ray system to generate a cone of x-rays with a dose rate of 300 R/minute at 1 meter from the source. Projected across the SPR reactor room, this x-ray system generates 180-R/hr fields against the far wall. The 48-inch-thick wall is sufficient to attenuate this field to less than 0.5 mR/hr at the outer surface of the SPR.	DOE/EIS-0281-052, X-ray of Test Object
Tech Area V: Bldg. 6594, Low Level Counting Lab **2,023 gross square feet/1,390 square feet of lab space** Bldg. 6594 is a single-floor building with a basement, located in the center of Tech Area V. The building is masonry construction, and contains 1 computer area and 3 lab areas.					
112	Radiation Metrology Laboratory (RML) Tech Area V PHS No. SNL9A00225-003 (12/07/00)	Low/NN (COTM, E EN, P, R, T)	Defense Programs	This lab provides measurement services and experimental support.	

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
Tech Area V: Bldg. 6597, Auxiliary Hot Cell Facility **13,982 gross square feet/3,977square feet of lab space** Bldg. 6597 houses the Auxiliary Hot Cell Facility, located in Tech Area V. The building is of concrete construction, and contains 2 lab areas and 4 storage areas.					
113	AHCF PHS No. SNL0A00280-001 (12/13/00)	Category 3 (COTM, EN, R, RGD)	Defense Programs	The Auxiliary Hot Cell Facility characterizes, treats (if required), and repackages radioactive and mixed material and waste for reuse, recycling, or ultimate disposal.	ECL/ADM SNA, 98-063, Modification of Auxiliary Hot Cell Facility
114	AHCF PHS No. SNL9A00221-001 (08/03/99)	Category 3 (COTM, EN, R, RGD)	Defense Programs	The Auxiliary Hot Cell Facility characterizes, treats (if required), and repackages radioactive and mixed material and waste for reuse, recycling, or ultimate disposal.	ECL/ADM SNA, 98-063, Modification of Auxiliary Hot Cell Facility
115	Building 6597/Northside Activities PHS No. SNL9A00220-001 (11/02/99)	Low (COTM, EN, R, RGD)	Defense Programs	The Auxiliary Hot Cell Facility characterizes, treats (if required), and repackages radioactive and mixed material and waste for reuse, recycling, or ultimate disposal.	ECL/ADM SNA, 98-063, Modification of Auxiliary Hot Cell Facility
Coyote Canyon Complex: Bldg. 6970, Robotic Vehicle Range (RVR) Development Labs **1,231 gross square feet/1,157 square feet of lab space** Bldg. 6970 is a single-floor building without a basement, located in the RVR, off of Poleline Road and east of Tech Area II. The building is of metal construction and contains 1 lab area.					
116	Bowsled (retitled) PHS No. SNL0A00333-001 (06/14/00)	Low/NN (M, NCA)	Defense Programs	A modified crossbow is used to accelerate test packages into a reaction mass for shock testing.	
CTF: Bldg. 9980Z, National Solar Thermal Testing Facility **8,179 gross square feet/3,898 square feet of lab space** Bldg. 9980Z is a multifloor building with a basement, located off of Lovelace Road at the National Solar Thermal Test Facility in the Coyote Test Field. The building is of concrete and metal construction, and contains 2 shop areas and 2 lab areas.					
117	Fiber Optics Testing at Solar Power Tower PHS No. SNL9A00111-001 (08/09/99)	SIH	**A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).**	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	ECL/ADM SNA 99-028, FY99 Ecological Program SNA 0-012, FY00 Ecological Program AF 99-014 (AF813) Environmental Assessment SNL/NM FY1999-2000 Ecological Program

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
CTF: Bldg. 9980Z, National Solar Thermal Testing Facility (Continued)					**8,179 gross square feet/3,898 square feet of lab space**
118	Dish Test Area and Enclosures PHS No. SNL9A00202-001 (09/20/99)	SIH	**A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).**	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	ECL/ADM SNA 99-028, FY99 Ecological Program SNA 0-012, FY00 Ecological Program AF 99-014 (AF813) Environmental Assessment SNL/NM FY1999-2000 Ecological Program
Eubank Research Park: Bldg. 10510 The Eubank Research Park is a series of single-floor masonry buildings forming an office complex located east of Kirtland Air Force Base across Eubank Boulevard.					**36,167 gross square feet/7,151 square feet of lab space**
119	Lite Model Lab PHS No. SNL0A00018-001 (01/25/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	
120	Monitoring Systems Light Lab PHS No. SNL0A00019-001 (01/25/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	
121	Hardwire Lab PHS No. SNL9A00107-001 (04/23/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	
122	Building 10500 Light Labs PHS No. SNL0A00372-001 (07/19/00)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	

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Item No.	PHS Name and No. (Date Completed)	Haz. Class and Type*	Representative Programs	Representative Activities	Recent NEPA Reviews
UNM: Advanced Materials Laboratory (AML) **29,400 gross square feet/12,699 square feet of lab space** The AML building is a commercial lab/office building, located in the Science and Technology Park at the University of New Mexico (UNM), just north of the Albuquerque International Sunport. The building contains 40 office areas, 24 lab areas, and 1 shop area.					
123	MPS – Surface Science Laboratory (retitled) PHS No. SNL9A00298-001 (12/21/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	• ECL/ADM SNA 99-025, Five-Year Lease Renewal for the Advanced Materials Lab • ECL/ADM SNA 95-119, Laboratory Operations Materials
124	MPS-Ceramics Processing Lab PHS No. SNL9A00312-001 (11/18/99)	SIH	A wide variety of SNL/NM program work is classified as standard industrial hazards (SIH).	SIH activities are consistent with operational hazards in general industrial settings and adequately controlled by OSHA regulations.	• ECL/ADM SNA 99-025, Five-Year Lease Renewal for the Advanced Materials Lab • ECL/ADM SNA 95-119, Laboratory Operations Materials

Sources: DOE, 1994a, b, 1995, 1997, 1999a, b, 2000; SNL, 2001.

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APPENDIX B
CHEMICAL USAGE

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B.1 Introduction

This appendix provides summary information on the chemicals purchased by SNL/NM during FY2000 for use in selected and notable facilities analyzed in the SNL/NM Site-Wide Environmental Impact Statement (SWEIS). Selected and notable facilities are discussed in more detail in the SNL/NM Facilities and Safety Information Document (DOE, 1999; SNL, 1999).

To establish a baseline, SNL/NM chemical usage information included in the SWEIS was based on chemical purchase information for the year 1996. For recent information, SNL/NM Air Quality Group reports provide chemical purchase information for the years 1999 and 2000 (SNL, 2000, 2001). Chemical purchase information is derived from the Sandia Chemical Information System (CIS), a comprehensive database containing over 90 percent of the chemicals handled at SNL/NM.

The chemicals summarized in this appendix are those reported in the SWEIS and subsequent SNL/NM Air Quality Group reports with a total quantity greater than 100 pounds. These are the chemicals that typically pose the greatest risk to human health and the environment. Chemicals purchased infrequently in small quantities are not individually reported, except where their cumulative amounts total more than 100 pounds. This approach focuses information on those chemical quantities of greatest concern and the total quantities purchased.

All the chemicals included in this appendix are categorized as hazardous air pollutants (HAPs), volatile organic compounds (VOCs), or toxic air pollutants (TAPs). In some cases, a chemical may fall into two or more categories (e.g., methanol is listed in all three). Summaries of the chemical usage methodologies used in the SWEIS analysis are discussed here. (See Appendix D of the SWEIS and the SNL/NM Air Quality Group reports for more detail regarding methodologies on chemical purchase and estimated usage information.)

B.2 SWEIS Methodology

The SWEIS used three sources of chemical data: the CIS, Hazardous Chemical Purchases Inventory (HCPI), and CheMaster in identifying potential chemical emissions from facility operations. Each chemical database was developed for different purposes and has some specific or unique information.

Because the CIS compiles annual purchases by building number and tracks 90 percent of all chemical purchases made by SNL/NM, the SWEIS identified the CIS as the most current source of information. Of the 25,000 chemicals of concern originally identified from several SNL/NM databases, the SWEIS presented information on ~465 chemicals, which were identified as the potential sources of routine chemical air emissions from SNL/NM's normal operations. This screening process was designed to capture the major sources of routine chemical air emissions.

B.3 FY2000 SWEIS Annual Review Chemical Usage Methodology

Information in the FY2000 chemical appendix was drawn from the SNL/NM Chemical Purchase Inventory Reports for 1999 and 2000 for the SNL/NM Air Quality Group (SNL, 2000, 2001). These reports summarize the chemical purchases for SNL/NM documented by the CIS and include information for chemicals that are HAPs, VOCs, and TAPs.

As stated, the SWEIS used the CIS as the most current and complete information about chemical use at SNL/NM. The source of chemical usage information for this annual review, the Air Quality Group reports, uses the same approach as the SWEIS.

The SWEIS screening resulted in a list of ~465 chemicals of concern from a list of some 25,000 chemicals originally identified. The screened list of chemicals of concern that were identified as the potential sources of routine chemical air emissions from SNL/NM's normal operations were then analyzed to assess potential impacts to worker and public human health. This information can readily be compared to the Air Quality Group reports. In the SWEIS analysis, these chemical emissions were assumed to be released from a prototypical stack located in Technical Area I. Specific locations of the chemical emissions, therefore, were not a determining factor in the SWEIS analysis.

The chemical emission information included in the FY2000 SWEIS Annual Review is consistent with the SWEIS data, since both the Air Quality Group reports and the Annual Review rely on the CIS as the best available data source.

B.4 Compiled Data

Summary chemical emissions data is included in Tables B-1, B-2, and B-3, which contain information on VOCs, HAPs, and TAPs, respectively. Tables B-1, B-2, and B-3 include ~34 chemicals, 26 chemicals, and 51 chemicals, respectively. Usage of many of these chemicals is small, less than 1,000 pounds (lb) (454 kilograms [kg]).

As shown in Tables B-1, B-2, and B-3, the total quantities of chemicals in FY1999 and FY2000 were below both the SWEIS baseline (FY1996) and the SWEIS expanded operations alternative. However, individual chemicals purchased in FY1999 or FY2000 may have quantities larger than the SWEIS baseline (FY1996), the SWEIS expanded operations, or both. The vast majority of chemicals reported in these tables are specialty chemicals found in most laboratories. As a result, SNL/NM chemical purchases (quantity and type) fluctuate greatly from year to year.

It is difficult to draw conclusions about the effects of the large fluctuations (type and quantity) in chemical purchases on a year-by-year basis as it relates to the SWEIS analysis. The SWEIS analysis considered a conservative screening level (occupational exposure limit [OEL] divided by 100) as a basis for impact analysis. Therefore, even if a purchase quantity exceeds the quantity reported in the SWEIS expanded operations alternative, it is unlikely to exceed the OEL/100 screen. In addition, even if a chemical purchase quantity exceeded the OEL/100 screening level, it is probable (based on the analysis presented in Appendix D of the SWEIS) that an engineering control is in place to mitigate or reduce any potential emissions.

Several conclusions, however, may be drawn from the compiled data. Overall quantities of chemicals purchased since 1996 are decreasing. In CY1996, chemical usage was estimated at 55,282 lb. According to the SNL/NM Air Quality Group chemical purchase information reports, in CY1998 and CY2000, the usage decreased to 50,792 lb and 50,093 lb, respectively. The reports also show, since CY1998, chemical purchases associated with HAP and VOC emissions declined from 14,000 lb and 35,000 lb to 7,200 lb and 22,000 lb, respectively, in CY2000. In many cases, it appears that chemical substitution is occurring, as chlorinated solvents are replaced by increasing purchases of methanol, ethanol, and other alcohols. However, without detailed analysis of end-use information, which is outside the scope of this document, this cannot be confirmed.

Table B-1. Chemical Purchases Potentially Resulting in Volatile Organic Compounds (VOC) Emissions (Fiscal Years 1996, 1999, and 2000 and SWEIS Expanded Operations Alternative) in Pounds

Chemical Abstract Services (CAS) #	Chemical	SWEIS (FY1996) in Pounds	SWEIS (EOA) in Pounds	FY1999 in Pounds	FY2000 in Pounds
156-60-5	1,2-Dichloroethylene	<1	224.4	95.75	111.13
540-84-1	2,2,4-Trimethylpentane	<1	<1	337.15	192.23
112-34-5	2-Butyl oxyethanol dipropylene glycol	86.88	173.14	33.69	145.27
64-19-7	Acetic acid	369.56	784.2	1,396.98	1,158.93
67-64-1	Acetone	6,870.3	18,435	<1	4,594.21
75-05-8	Acetonitrile	42.34	69.96	178.49	195.31
100-51-6	Alcohol, benzyl	610	1,792	50.53	82.7
71-43-2	benzene	52.47	176	78.48	69.46
75-63-8	Bromotrifluoromethane	<1	<1	150.00	<1
67-66-3	Chloroform	243.68	52.14	68.02	216.39
64742-53-6	Distillate	<1	<1	363.48	46.69
64-17-5	Ethanol	22,929.02	440.5	5,503.44	4,575.16
141-78-6	Ethyl acetate	48.26	57.15	161.29	82.79
60-29-7	Ethyl ether (diethyl ether)	48.07	48	109.67	248.45
78-10-4	Ethyl silicate	2.44	11.67	54.90	205.44
74-85-1	Ethylene	114	226.6	1.00	44
107-21-1	Ethylene glycol	174.17	421.5	931.95	966.25
64-18-6	Formic acid	12.52	25.08	<1	128.84
123-92-2	Isoamyl acetate	584.33	<1	410.46	243.33
78-83-1	Isobutyl alcohol	<1	1,994	7.91	49.51
67-63-0	Isopropyl alcohol	1,251.08	574.2	3,438.59	3,079.54
67-56-1	Methanol	1,762	3,652	2,027.96	1,732.24
108-65-6	Methoxy acetate	150.23	282.6	1,566.05	1,053.35
108-10-1	Methyl isobutyl ketone	45.017	150.5	14.39	6.43
68-12-2	n,n-Dimethylformamide	<1	<1	43.94	101.26
8030-30-6	Naphtha	<1	<1	84.83	144.33
110-54-3	n-Hexane	34.4	40.4	166.58	347.37
872-50-4	n-Methyl-2-pyrrolidone	110.69	268.66	233.11	307.62
71-23-8	Propyl alcohol	74.66	83.4	2,457.05	2,079.04
57-55-6	Propylene glycol	<1	<1	135.58	1,774.76
127-18-4	Tetrachloroethylene	2,227.05	<1	17.91	<1
109-99-9	Tetrahydrofuran	34.1	58	528.96	724.42

Table B-1. Chemical Purchases Potentially Resulting in Volatile Organic Compounds (VOC) Emissions (Fiscal Years 1996, 1999, and 2000 and SWEIS Expanded Operations Alternative) in Pounds (Continued)

Chemical Abstract Services (CAS) #	Chemical	SWEIS (FY1996) in Pounds	SWEIS (EOA) in Pounds	FY1999 in Pounds	FY2000 in Pounds
108-88-3	Toluene	51.76	111.36	456.58	449.74
79-01-6	Trichloroethylene	1,716.37	3,364	95.85	91.26
TOTAL QUANTITIES		**39,953.40**	**33,526.46**	**21,202.57**	**25,249.45**

EOA = Expanded Operations Alternative.
Sources: DOE, 1999a; SNL, 2000, 2001.
Note: For simplicity purposes, the “<1” may include zero.

Table B-2. Chemical Purchases Potentially Resulting in Hazardous Air Pollutants (HAP) Emissions (Fiscal Years 1996, 1999, and 2000 and SWEIS Expanded Operations Alternative) in Pounds

Chemical Abstract Services (CAS) #	Chemical	SWEIS (FY1996) in Pounds	SWEIS (EOA) in Pounds	FY1999 in Pounds	FY2000 in Pounds
71-55-6	1,1,1-Trichloroethane	198.01	369.6	2.95	<1
540-84-1	2,2,4-Trimethylpentane	<1	<1	337.15	192.23
101-77-9	4,4'-Methylene dianiline (37%)	123.04	369.6	<1	<1
65-73-97	4-Nitrophenol	<1	<1	<1	1,234.13
75-05-8	Acetonitrile	42.34	69.96	178.49	195.31
7784-42-1	Arsine	125.29	374	35.33	68
71-43-2	Benzene	52.47	176	78.48	69.46
7782-50-5	Chlorine	<1	554.4	10.00	<1
67-66-3	Chloroform (trichloromethane)	243.68	52.14	68.02	216.39
7440-47-3	Chromium	52.55	115.9	3.07	1.92
7440-48-4	Cobalt	52.55	111.8	<1	<1
75-09-02	Dichloromethane	501.2	965.8	571.05	558.34
111-42-2	Diethanolamine	239.22	699.6	36.00	22.96
107-21-1	Ethylene glycol	174.17	421.5	931.95	966.25
7664-39-3	Hydrogen fluoride	291.88	437.4	499.95	255.28
7439-97-6	Mercury	59.98	119.68	10.67	5.01
67-56-1	Methanol	1,762	3,652	2,027.96	1,732.24
108-10-1	Methyl iso- butyl ketone	45.02	150.5	14.39	6.43
68-12-2	n, n-Dimethylformamide	<1	<1	43.94	101.26
110-54-3	n-Hexane	34.4	40.4	166.58	347.37
7440-02-0	Nickel	47.72	107.8	127.30	39.1
7718-54-9	Nickel Chloride	586.53	1,755.6	<1	<1
7786-81-4	Nickel Sulfate	586.53	1,755.6	<1	<1
7803-51-2	Phosphine	<1	128.74	<1	<1
127-18-4	Tetrachloroethylene	2,227.05	<1	17.91	<1
108-88-3	Toluene	51.76	111.36	456.58	449.74
79-01-6	Trichloroethylene	1,716.37	3,364	95.85	91.26
51-79-6	Urethane	<1	<1	1.03	411.38
TOTAL QUANTITIES		9,219.78	15,908.38	5,720.65	6,972.06

Sources: DOE, 1999; SNL, 2000, 2001.
Notes: For simplicity purposes, the "<1" may include zero. Hydrogen Chloride was excluded due to differences in reporting methodologies between the SWEIS and the annual reports. Hydrogen Chloride is used as an industrial chemical in water treatment processes.

Table B-3. Chemical Purchases Potentially Resulting in Toxic Air Pollutants (TAP) Emissions (Fiscal Years 1996, 1999, and 2000 and SWEIS Expanded Operations Alternative) in Pounds

Chemical Abstract Services (CAS) #	Chemical	SWEIS (FY1996) in Pounds	SWEIS (EOA) in Pounds	FY1999 in Pounds	FY2000 in Pounds
65-76-97	4-Nitrophenol	<1	<1	<1	1,234.13
64-19-7	Acetic acid	369.56	784.2	1,396.98	1,158.93
67-64-1	Acetone	6,870.3	18,435	<1	8,532.72
75-05-8	Acetonitrile	42.34	69.96	178.49	195.31
67-63-0	Alcohol, isopropyl	1,251.08	574.2	3,438.59	3,079.54
7429-90-5	Aluminum	464.6	1510	<1	<1
1344-28-1	Aluminum oxide	3,906	793.2	<1	537.41
7664-41-7	Ammonia	59.98	4,324	<1	694.2
12125-02-9	Ammonium chloride	220.28	44	<1	<1
1336-21-6	Ammonium hydroxide	2,579.85	7,744	<1	<1
7784-42-1	Arsine	125.29	374	35.33	68
71-43-2	Benzene	52.47	176	78.48	69.46
1113-50-1	Boric acid	87.98	264	<1	<1
67-66-3	Chloroform	243.68	52.14	68.02	216.39
7440-47-3	Chromium	52.55	115.9	3.07	1.92
7440-50-8	Copper	608.62	1,497	<1	72.39
75-09-02	Dichloromethane	501.2	965.8	571.05	558.34
106-42-4	Di-p-xylene	602	1,995.4	<1	<1
141-78-6	Ethyl acetate	48.26	57.15	161.29	82.79
60-29-7	Ethyl ether	48.07	48	109.67	248.45
78-10-4	Ethyl silicate	2.44	11.67	54.90	205.44
107-21-1	Ethylene glycol	174.17	421.5	931.95	966.25
64-18-6	Formic acid	12.52	25.08	<1	128.84
7664-39-3	Hydrogen fluoride	291.88	437.4	499.95	255.28
7722-84-1	Hydrogen peroxide	4,002	7,581	<1	<1
1309-37-1	Iron	45.6	150.3	<1	<1
123-92-2	Iso amyl acetate	584.3	1,746.8	410.46	<1
67-63-0	Isopropyl alcohol	1,251.08	574.2	3,438.59	3,079.54
8008-20-6	Kerosene	6.64	6.62	198.26	41.77
67-56-1	Methanol	1,762	3,652	2,027.96	1,732.24
108-10-1	Methyl isobutyl ketone	45.02	150.5	14.39	6.43
75-09-2	Methylene chloride	501.2	965.8	571.05	558.34
68-12-2	n, n-dimethylformamide	<1	<1	43.97	101.26
71-23-8	n-Butyl alcohol	89.87	30.0	16.07	43.91

Table B-3. Chemical Purchases Potentially Resulting in Toxic Air Pollutants (TAP) Emissions (Fiscal Years 1996, 1999, and 2000 and SWEIS Expanded Operations Alternative) in Pounds (Continued)

Chemical Abstract Services (CAS) #	Chemical	SWEIS (FY1996) in Pounds	SWEIS (EOA) in Pounds	FY1999 in Pounds	FY2000 in Pounds
110-54-3	n-Hexane	34.4	40.4	166.58	347.37
7440-02-0	Nickel	47.7	107.8	127.30	39.1
7697-37-2	Nitric acid	5,309.9	10,275	<1	2,907.28
872-50-4	n-Methyl-2-pyrrolidone	110.69	268.66	233.11	307.62
127-18-4	Perchloroethylene	2,227	2,222	17.91	<1
7664-38-2	Phosphoric acid	191.4	455	<1	499.16
71-23-8	Propyl alcohol	74.66	83.4	2,457.05	2,079.04
7803-62-5	Silane (silicon tetrahydride)	224.91	430.4	<1	<1
7631-86-9	Silica	611.8	2,017	<1	<1
7664-93-9	Sulfuric acid	432.78	1,904.9	673	391.2
109-99-9	Tetrahydrofuran	34.1	58	528.96	724.42
108-88-3	Toluene	51.76	111.36	456.58	449.74
79-01-6	Trichloroethylene	1,716.37	3,364	95.85	91.26
7440-33-7	Tungsten as Wolfram	60.42	120.8	<1	<1
51-79-6	Urethane	<1	<1	1.03	411.38
7440-66-6	Zinc	2.23	4.9	<1	121.7
TOTAL QUANTITIES		**38,241.90**	**77,661.64**	**19,025.89**	**32,251.55**

Sources: DOE, 1999; SNL, 2000, 2001.
Notes: For simplicity purposes, the "<1" may include zero. Hydrogen chloride and sodium hydroxide were excluded due to differences in reporting methodologies between the SWEIS and the annual reports. Both chemicals are used as industrial chemicals in water treatment processes. The following 12 chemicals were excluded because no Chemical Abstract Number was assigned in the SWEIS: 2,6-Diethylaniline curing agent, Carboxyl terminated acrylonitrile butadiene, Cerric ammonium nitrate, Citridet Cleaner, Curing agent Z, Diala oil, Fluorinert, Glass microballoons filler, Hexylene glycol, Mold release, Sulfur hexafluoride, and Ultima Gold-Packard. None of the 12 chemicals were purchased in 1999 or 2000.

B.5 References

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