Office of
Fissile Materials Disposition

United States Department of Energy

Surplus Plutonium Disposition Final Environmental Impact Statement

Volume II

November 1999

For Further Information Contact:
U.S. Department of Energy
Office of Fissile Materials Disposition, P.O. Box 23786, Washington, DC 20026-3786

DOE/EIS-0283

Surplus Plutonium Disposition Final Environmental Impact Statement

Volume II

United States Department of Energy
Office of Fissile Materials Disposition

November 1999

Cover Sheet

Responsible Agency: United States Department of Energy (DOE)

Title: *Surplus Plutonium Disposition Final Environmental Impact Statement* (SPD EIS) (DOE/EIS-0283)

Locations of Candidate Sites: California, Idaho, New Mexico, North Carolina, South Carolina, Tennessee, Texas, Virginia, and Washington

Contacts:

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Abstract: On May 22, 1997, DOE published a Notice of Intent in the Federal Register (62 Federal Register 28009) announcing its decision to prepare an environmental impact statement (EIS) that would tier from the analysis and decisions reached in connection with the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic EIS*. At that time, the U.S. Environmental Protection Agency decided to be a cooperating agency. The *Surplus Plutonium Disposition Draft Environmental Impact Statement* (SPD Draft EIS) (DOE/EIS-0283-D) was prepared in accordance with NEPA and issued in July 1998. It identified the potential environmental impacts of reasonable alternatives for the proposed siting, construction, and operation of three facilities for the disposition of up to 50 metric tons (55 tons) of surplus plutonium, as well as a No Action Alternative. These three facilities would accomplish pit disassembly and conversion, plutonium conversion and immobilization, and mixed oxide (MOX) fuel fabrication.

For the alternatives that included MOX fuel fabrication, the SPD Draft EIS described the potential environmental impacts of using from three to eight commercial nuclear reactors to irradiate MOX fuel. The potential impacts were based on a generic reactor analysis that used actual reactor data and a range of potential site conditions. In May 1998, DOE initiated a procurement process to obtain MOX fuel fabrication and reactor irradiation services. In March 1999, DOE awarded a contract to Duke Engineering & Services, COGEMA Inc., and Stone & Webster (known as DCS) to provide the requested services. A *Supplement to the SPD Draft EIS* was issued in April 1999, which analyzed the potential environmental impacts of using MOX fuel in six specific reactors named in the DCS proposal. Those reactors are Catawba Nuclear Station Units 1 and 2 in South Carolina, McGuire Nuclear Station Units 1 and 2 in North Carolina, and North Anna Power Station Units 1 and 2 in Virginia.

DOE has identified the hybrid approach as its Preferred Alternative for the disposition of surplus plutonium. This approach allows for the immobilization of 17 metric tons (19 tons) of surplus plutonium and the use of 33 metric tons (36 tons) as MOX fuel. DOE has identified the Savannah River Site near Aiken, South Carolina, as the preferred site for all three disposition facilities (Alternative 3). DOE has also identified Los Alamos National

Laboratory in New Mexico as the preferred site for lead assembly fabrication, and Oak Ridge National Laboratory in Tennessee as the preferred site for postirradiation examination of lead assemblies.

Public Involvement: In preparing the SPD Final EIS, DOE considered comments on the SPD Draft EIS and the *Supplement to the SPD Draft EIS* received via mail, fax, and email, and comments recorded by phone and transcribed from videotapes. In addition, comments were captured by notetakers during interactive public meetings held on the SPD Draft EIS in August 1998 in Amarillo, Texas; Idaho Falls, Idaho; North Augusta, South Carolina; Portland, Oregon; and Richland, Washington, as well as during a public meeting on the *Supplement to the SPD Draft EIS* held in June 1999 in Washington, D.C. Comments received and DOE's responses to these comments are found in Volume III, the Comment Response Document, of the SPD Final EIS. Information on the surplus plutonium disposition program can be obtained by visiting the Office of Fissile Materials Disposition Web site at http://www.doe-md.com.

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List of Acronyms

AEA	Atomic Energy Act of 1954
AECL	Atomic Energy of Canada Limited
AED	aerodynamic equivalent diameter
AIRFA	American Indian Religious Freedom Act
ALARA	as low as is reasonably achievable
AMWTP	Advanced Mixed Waste Treatment Project
ANL–W	Argonne National Laboratory–West
APSF	Actinide Packaging and Storage Facility
AQCR	Air Quality Control Region
ARF	airborne release fraction
ARIES	Advanced Recovery Integrated Extraction System
AVLIS	Atomic Vapor Laser Isotope Separation
BEA	Bureau of Economic Analysis
BEIR V	Report V of the Committee on the Biological Effects of Ionizing Radiations
BIO	Basis for Interim Operation
BLM	Bureau of Land Management
BNFL	British Nuclear Fuels
BWR	boiling water reactor
CAA	Clean Air Act
CAB	Citizens Advisory Board
CANDU	Canadian Deuterium Uranium (reactors)
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CPP	Chemical Processing Plant
CWA	Clean Water Act of 1972, 1987
D&D	decontamination and decommissioning
DBA	design basis accident
DCS	Duke Engineering & Services, COGEMA Inc., and Stone & Webster
DNFSB	Defense Nuclear Facilities Safety Board
DOC	U.S. Department of Commerce
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOL	U.S. Department of Labor
DOT	U.S. Department of Transportation
DR	damage ratio
DU PEIS	*Final Programmatic Environmental Impact Statement for Alternative Strategies for Long-Term Management and Use of Depleted Uranium Hexafluoride*
DWPF	Defense Waste Processing Facility
EA	environmental assessment
EBR	Experimental Breeder Reactor (I or II)
EIS	environmental impact statement
EPA	Environmental Protection Agency

ES&H environment, safety, and health
ESTEEM Education in Science, Technology, Energy, Engineering, and Math
ETB Engineering Test Bay
ETTP East Tennessee Technology Park

FAA Federal Aviation Administration
FDP fluorinel dissolution process
FEMA Federal Emergency Management Agency
FFCA Federal Facility Compliance Agreement
FFF Uranium Fuel Fabrication Facility
FFTF Fast Flux Test Facility
FI field investigation
FM Farm-to-Market (road)
FMF Fuel Manufacturing Facility
FMEA failure modes and effects analysis
FMEF Fuels and Materials Examination Facility
FONSI finding of no significant impact
FPF Fuel Processing Facility
FPPA Farmland Protection Policy Act
FR Federal Register

GAO General Accounting Office
GDP gaseous diffusion plant
GE General Electric Company
GENII Generation II, Hanford environmental radiation dosimetry software system
GPS global positioning satellite

HE high explosive
HEPA high-efficiency particulate air (filter)
HEU highly enriched uranium
HFEF Hot Fuel Examination Facility
HHS Department of Health and Human Services
HIGHWAY (computer code for distances and populations along U.S. highways)
HLW high-level waste
HLWVF high-level-waste vitrification facility
HMIS Hazardous Materials Information System
HWTPF Hazardous Waste Treatment and Processing Facility
HYDOX hydride oxidation

IAEA International Atomic Energy Agency
ICPP Idaho Chemical Processing Plant
ICRP International Commission on Radiological Protection
ID DHW Idaho Department of Health and Welfare
INEEL Idaho National Engineering and Environmental Laboratory
INRAD Intrinsic Radiation
INTEC Idaho Nuclear Technology and Engineering Center
IPE Individual Plant Examination
ISC Industrial Source Complex Model
ISC3 Industrial Source Complex Model, Version 3
ISCST3 Industrial Source Complex Model, Short-Term, Version 3
ISLOCA interfacing systems loss-of-coolant accident
ITP In-Tank Precipitation Process

LANL	Los Alamos National Laboratory
LCF	latent cancer fatality
LDR	Land Disposal Restrictions
LEU	low-enriched uranium
LLNL	Lawrence Livermore National Laboratory
LLW	low-level waste
LOCA	loss-of-coolant accident
LPF	leak path factor
LWR	light water reactor
M&H	Mason & Hanger Corporation
MACCS2	Melcor Accident Consequence Code System (computer code)
MAR	material at risk
MD	Office of Fissile Materials Disposition
MEI	maximally exposed individual
MIMAS	Micronized Master
MMI	Modified Mercalli Intensity
MOX	mixed oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	National Academy of Science
NCRP	National Council on Radiation Protection and Measurements
NDA	nondestructive analysis
NEPA	National Environmental Policy Act of 1969
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPH	natural phenomena hazard
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRU	National Research Universal
NTS	Nevada Test Site
NWCF	New Waste Calcining Facility
NWPA	Nuclear Waste Policy Act
NWS	National Weather Service
ORIGEN	ORNL Isotope Generation and Depletion Code
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
OSHA	Occupational Safety and Health Administration
PBF	Power Burst Facility
PEIS	programmatic environmental impact statement
PFP	Plutonium Finishing Plant
PIE	postirradiation examination
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to 10 microns
PNNL	Pacific Northwest National Laboratory
PRA	probabilistic risk assessment
PSD	prevention of significant deterioration
PUREX	Plutonium-Uranium Extraction (Facility)
PWR	pressurized water reactor
R&D	research and development

RADTRAN 4	(computer code: risks and consequences of radiological materials transport)
RANT	Radioactive Assay and Nondestructive Test
RAMROD	Radioactive Materials Research, Operations and Demonstration
RCRA	Resource Conservation and Recovery Act, as amended
REA	regional economic area
RF	respirable fraction
RfC	reference concentration
RfD	reference dose
RFETS	Rocky Flats Environmental Technology Site
RFP	Request for Proposal
RIA	Reactivity Insertion Accidents
RIMS II	Regional Input-Output Modeling System II (computer code)
RISKIND	(computer code: risks and consequences of radiological materials transport)
ROD	Record of Decision
ROI	region of influence
RMF	Radiation Measurements Facility
RWMC	Radioactive Waste Management Complex
S/A	Similarity of Appearance (provision of Endangered Species Act)
SAR	safety analysis report
SARA	Superfund Amendments and Reauthorization Act of 1986
SCDHEC	South Carolina Department of Health and Environmental Control
SCE&G	South Carolina Electric & Gas Company
SCSHPO	South Carolina State Historic Preservation Officer
SDWA	Safe Drinking Water Act, as amended
SEIS	supplemental environmental impact statement
SHPO	State Historic Preservation Officer
SI	sealed insert
SMC	Specific Manufacturing Complex
SNF	spent nuclear fuel
SNM	special nuclear material
SPD	surplus plutonium disposition
SPD EIS	*Surplus Plutonium Disposition Environmental Impact Statement*
SPERT	Special Power Excursion Reactor Test
SRS	Savannah River Site
SSM PEIS	*Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management*
SST/SGT	safe, secure trailer/SafeGuards Transport
SWMU	solid waste management unit
SWP 1	Service Waste Percolation Pond 1
TA	Technical Area
TCE	trichloroethylene
TNRCC	Texas Natural Resource Conservation Commission
TPBAR-LTA	tritium-producing burnable absorber rod lead test assembly
TRA	technical risk assessment
TRANSCOM	transportation tracking and communications system
TRU	transuranic
TRUPACT	TRU waste package transporter
TSCA	Toxic Substances Control Act
TSP	total suspended particulates

TVA	Tennessee Valley Authority
TWRS	tank waste remediation system
TWRS EIS	*Tank Waste Remediation System Final Environmental Impact Statement*
UC	Regents of the University of California
UFSAR	updated final safety analysis report
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEC	United States Enrichment Corporation
USFWS	U.S. Fish and Wildlife Service
UV	ultraviolet
VOC	volatile organic compounds
VORTAC	very high frequency omnidirectional range/tactical air navigation (facility)
VRM	Visual Resource Management
WAG 3	Waste Area Grouping 3
WERF	Waste Experimental Reduction Facility
WIPP	Waste Isolation Pilot Plant
WM PEIS	*Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*
WNP–1	Washington Nuclear Plant–1
WNP–2	Washington Nuclear Plant–2
WPPSS	Washington Public Power Supply System
WROC	Waste Reduction Operations Complex
WSRC	Westinghouse Savannah River Company
ZPPR	Zero Power Physics Reactor

Chemicals and Units of Measure

°C	degrees Celsius (Centigrade)
°F	degrees Fahrenheit
μCi	microcurie
μg	microgram
μm	micrometer (micron)
46°26'07"	46 degrees, 26 minutes, 7 seconds
Ci	curie
cm	centimeter
CO	carbon monoxide
CO_2	carbon dioxide
dB	decibel
dBA	decibel, A-weighted
DUF_6	depleted uranium hexafluoride
eH	oxidation reduction potential
ft	foot
ft^2	square foot
ft^3	cubic foot
g	gram
g	gravitational acceleration
gal	gallon
GWD	gigawatt days (per ton)
ha	hectare
hr	hour (in compound units)
in	inch
kg	kilogram
km	kilometer
km^2	square kilometers
kV	kilovolt
l	liter
lb	pound
m	meter
m^2	square meter
m^3	cubic meter
mg	milligram
mi	mile
min	minute
mph	miles per hour
mrem	millirem
MTHM	metric tons of heavy metal
MVA	megavolt-ampere
MW	megawatt
MWe	megawatt electric
MWh	megawatt-hour
N_2	nitrogen
nCi	nanocurie
NO_2	nitrogen dioxide
pCi	picocurie
pcm/F	percent mille/Farenheit
pH	hydrogen ion concentration
$PM_{2.5}$	particulate matter less than or equal to 2.5 μm in diameter
PM_{10}	particulate matter less than or equal to 10 μm in diameter
ppm	parts per million
PuO_2	plutonium dioxide
rad	radiation absorbed dose
rem	roentgen equivalent man
s	second
SO_2	sulfur dioxide
t	metric ton
ton	short ton
UF_6	uranium hexafluoride
UO_2	uranium dioxide
yd	yard
yd^3	cubic yard
yr	year (in compound units)
wt %	weight percent

Metric Conversion Chart

To Convert Into Metric			To Convert Out of Metric		
If You Know	**Multiply By**	**To Get**	**If You Know**	**Multiply By**	**To Get**
Length					
inches	2.54	centimeters	centimeters	0.3937	inches
feet	30.48	centimeters	centimeters	0.0328	feet
feet	0.3048	meters	meters	3.281	feet
yards	0.9144	meters	meters	1.0936	yards
miles	1.60934	kilometers	kilometers	0.6214	miles
Area					
sq. inches	6.4516	sq. centimeters	sq. centimeters	0.155	sq. inches
sq. feet	0.092903	sq. meters	sq. meters	10.7639	sq. feet
sq. yards	0.8361	sq. meters	sq. meters	1.196	sq. yards
acres	0.40469	hectares	hectares	2.471	acres
sq. miles	2.58999	sq. kilometers	sq. kilometers	0.3861	sq. miles
Volume					
fluid ounces	29.574	milliliters	milliliters	0.0338	fluid ounces
gallons	3.7854	liters	liters	0.26417	gallons
cubic feet	0.028317	cubic meters	cubic meters	35.315	cubic feet
cubic yards	0.76455	cubic meters	cubic meters	1.308	cubic yards
Weight					
ounces	28.3495	grams	grams	0.03527	ounces
pounds	0.45360	kilograms	kilograms	2.2046	pounds
short tons	0.90718	metric tons	metric tons	1.1023	short tons
Temperature					
Fahrenheit	Subtract 32 then multiply by 5/9ths	Celsius	Celsius	Multiply by 9/5ths, then add 32	Fahrenheit

Metric Prefixes

Prefix	Symbol	Multiplication Factor
exa-	E	1 000 000 000 000 000 000 = 10^{18}
peta-	P	1 000 000 000 000 000 = 10^{15}
tera-	T	1 000 000 000 000 = 10^{12}
giga-	G	1 000 000 000 = 10^{9}
mega-	M	1 000 000 = 10^{6}
kilo-	k	1 000 = 10^{3}
hecto-	h	100 = 10^{2}
deka-	da	10 = 10^{1}
deci-	d	0.1 = 10^{-1}
centi-	c	0.01 = 10^{-2}
milli-	m	0.001 = 10^{-3}
micro-	μ	0.000 001 = 10^{-6}
nano-	n	0.000 000 001 = 10^{-9}
pico-	p	0.000 000 000 001= 10^{-12}
femto-	f	0.000 000 000 000 001 = 10^{-15}
atto-	a	0.000 000 000 000 000 001= 10^{-18}

Appendix A
Federal Register Notices
and
Joint Statement

A.1 RECORD OF DECISION FOR THE STORAGE AND DISPOSITION OF WEAPONS-USABLE FISSILE MATERIALS FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Responses: 18,620 Burden Hours: 64,310.

Abstract: The LESCP is being conducted in response to the legislative requirement in P.L. 103–382, Section 1501 to assess the implementation of Title I and related education reforms. The information will be used to examine changes—over a 3-year period—that are occurring in schools and classrooms. Teachers and teacher aides will complete a mail survey, and district Title I administrators, principals, school-based staff, and parents will be interviewed during on-site field work.

[FR Doc. 97–1307 Filed 1–17–97; 8:45 am]

BILLING CODE 4000–01–P

DEPARTMENT OF ENERGY

Record of decision for the Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement

AGENCY: Department of Energy.

ACTION: Record of Decision.

SUMMARY: The Department of Energy (DOE) has decided to implement a program to provide for safe and secure storage of weapons-usable fissile materials (plutonium and highly enriched uranium [HEU]) and a strategy for the disposition of surplus weapons-usable plutonium, as specified in the Preferred Alternative in the Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement (S&D Final PEIS, DOE/EIS–0229, December 1996). The fundamental purpose of the program is to maintain a high standard of security and accounting for these materials while in storage, and to ensure that plutonium produced for nuclear weapons and declared excess to national security needs (now, or in the future) is never again used for nuclear weapons.

DOE will consolidate the storage of weapons-usable plutonium by upgrading and expanding existing and planned facilities at the Pantex Plant in Texas and the Savannah River Site (SRS) in South Carolina, and continue the storage of weapons-usable HEU at DOE's Y–12 Plant at the Oak Ridge Reservation (ORR) in Tennessee, in upgraded and, as HEU is dispositioned, consolidated facilities. After certain conditions are met, most plutonium now stored at the Rocky Flats Environmental Technology Site (RFETS) in Colorado will be moved to Pantex and SRS. Plutonium currently stored at the Hanford Site (Hanford), the Idaho National Engineering Laboratory (INEL), and the Los Alamos National Laboratory (LANL) will remain at those sites until disposition (or movement to lag storage at the disposition facilities).

DOE's strategy for disposition of surplus plutonium is to pursue an approach that allows immobilization of surplus plutonium in glass or ceramic material for disposal in a geologic repository pursuant to the Nuclear Waste Policy Act, and burning of some of the surplus plutonium as mixed oxide (MOX) fuel in existing, domestic, commercial reactors, with subsequent disposal of the spent fuel in a geologic repository pursuant to the Nuclear Waste Policy Act. DOE may also burn MOX fuel in Canadian Deuterium Uranium [CANDU] reactors in the event of an appropriate agreement among Russia, Canada, and the United States, as discussed below. The timing and extent to which either or both of these disposition approaches (immobilization or MOX) are ultimately deployed will depend upon the results of future technology development and demonstrations, follow-on (tiered) site-specific environmental review, contract negotiations, and detailed cost reviews, as well as nonproliferation considerations, and agreements with Russia and other nations. DOE's program will be subject to the highest standards of safeguards and security throughout all aspects of storage, transportation, and processing, and will include appropriate International Atomic Energy Agency verification.

Due to technology, complexity, timing, cost, and other factors that would be involved in purifying certain plutonium materials to make them suitable for potential use in MOX fuel, approximately 30 percent of the total quantity of plutonium (that has or may be declared surplus to defense needs) would require extensive purification to use in MOX fuel, and therefore will likely be immobilized. DOE will immobilize at least 8 metric tons (MT) of currently declared surplus plutonium materials that DOE has already determined are not suitable for use in MOX fuel. DOE reserves the option of using the immobilization approach for all of the surplus plutonium.

The exact locations for disposition facilities will be determined pursuant to a follow-on, site-specific disposition environmental impact statement (EIS) as well as cost, technical and nonproliferation studies. However, DOE has decided to narrow the field of candidate disposition sites. DOE has decided that a vitrification or immobilization facility (collocated with a plutonium conversion facility) will be located at either Hanford or SRS, that a potential MOX fuel fabrication facility will be located at Hanford, INEL, Pantex, or SRS (only one site), and that a "pit" disassembly and conversion facility will be located at Hanford, INEL, Pantex, or SRS (only one site). ("Pits" are weapons components containing plutonium.) The specific reactors, and their locations, that may be used to burn the MOX fuel will depend on contract negotiations, licensing, and environmental reviews. Because there are a number of technology variations that could be used for immobilization, DOE will also determine the specific immobilization technology based on the follow-on EIS, technology developments, cost information, and nonproliferation considerations. Based on current technological and cost information, DOE anticipates that the follow-on EIS will identify, as part of the proposed action, immobilizing a portion of the surplus plutonium using the "can-in-canister" technology at the Defense Waste Processing Facility (DWPF) at the Savannah River Site.

The use of MOX fuel in existing reactors would be undertaken in a manner that is consistent with the United States' policy objective on the irreversibility of the nuclear disarmament process and the United States' policy discouraging the civilian use of plutonium. To this end, implementing the MOX alternative would include government ownership and control of the MOX fuel fabrication facility at a DOE site, and use of the facility only for the surplus plutonium disposition program. There would be no reprocessing or subsequent reuse of spent MOX fuel. The MOX fuel would be used in a once-through fuel cycle in existing reactors, with appropriate arrangements, including contractual or licensing provisions, limiting use of MOX fuel to surplus plutonium disposition.

The Department of Energy also retains the option of using MOX fuel in Canadian Deuterium Uranium (CANDU) reactors in Canada in the event a multilateral agreement is negotiated among Russia, Canada, and the United States to use CANDU reactors for surplus United States' and Russian plutonium. DOE will engage in a test and demonstration program for CANDU MOX fuel as appropriate and consistent with future cooperative efforts with Russia and Canada.

These efforts will provide the basis and flexibility for the United States to initiate disposition efforts either multilaterally or bilaterally through negotiations with other nations, or unilaterally as an example to Russia and

other nations. Disposition of the surplus plutonium will serve as a nonproliferation and disarmament example, encourage similar actions by Russia and other nations, and foster multilateral or bilateral disposition efforts and agreements.

EFFECTIVE DATE: The decisions set forth in this Record of Decision (ROD) are effective upon issuance of this document, in accordance with DOE's National Environmental Policy Act (NEPA) Implementing Procedures and Guidelines (10 CFR Part 1021) and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR Parts 1500-1508).

ADDRESSES: Copies of the S&D Final PEIS, the Technical Summary Report For Long-Term Storage of Weapons-Usable Fissile Materials, the Technical Summary Report for Surplus Weapons-Usable Plutonium Disposition, the Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Plutonium Disposition, and this ROD may be obtained by writing to the U.S. Department of Energy, Office of Fissile Materials Disposition, MD–4, 1000 Independence Avenue, SW., Washington, DC 20585, or by calling (202) 586–4513. The 56-page Summary of the S&D Final PEIS, the other documents noted above (other than the full PEIS), and this ROD are also available on the Fissile Materials Disposition World Wide Web Page at: http://web.fie.com/htdoc/fed/DOE/fsl/pub/menu/any/

FOR FURTHER INFORMATION CONTACT: For information on the storage and disposition of weapons-usable fissile materials program or this ROD contact: Mr. J. David Nulton, Director, NEPA Compliance and Outreach, Office of Fissile Materials Disposition (MD–4), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585, telephone (202) 586–4513.

For information on the DOE NEPA process, contact: Carol M. Borgstrom, Director, Office of NEPA Policy and Assistance (EH–42), U.S. Department of Energy, 1000 Independence Ave., SW, Washington, DC 20585, telephone (202) 586–4600 or leave a message at (800) 472–2756.

SUPPLEMENTARY INFORMATION:

I. Background

The end of the Cold War has created a legacy of surplus weapons-usable fissile materials both in the United States and the former Soviet Union. Further agreements on disarmament may increase the surplus quantities of these materials. The global stockpiles of weapons-usable fissile materials pose a danger to national and international security in the form of potential proliferation of nuclear weapons and the potential for environmental, safety, and health consequences if the materials are not properly safeguarded and managed.

In September 1993, President Clinton issued a Nonproliferation and Export Control Policy in response to the growing threat of nuclear proliferation. Further, in January 1994, President Clinton and Russia's President Yeltsin issued a Joint Statement Between the United States and Russia on Nonproliferation of Weapons of Mass Destruction and the Means of Their Delivery. In accordance with these policies, the focus of the U.S. nonproliferation efforts in this regard is five-fold: (i) To secure nuclear materials in the former Soviet Union; (ii) to assure safe, secure, long-term storage and disposition of surplus weapons-usable fissile materials; (iii) to establish transparent and irreversible nuclear arms reductions; (iv) to strengthen the nuclear nonproliferation regime; and (v) to control nuclear exports. The policy also states that the United States will not encourage the civil use of plutonium and that the United States does not engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes.

To demonstrate the United States' commitment to these objectives, President Clinton announced on March 1, 1995, that approximately 200 metric tons of U.S.-origin weapons-usable fissile materials, of which 165 metric tons are HEU and 38 metric tons are weapons-grade plutonium, had been declared surplus to the United States' defense needs.[1] The safe and secure storage of weapons-usable plutonium and HEU, and the disposition of surplus weapons-usable plutonium, consistent with the Preferred Alternative in the S&D Final PEIS and the decisions described in section V of this ROD, are consistent with the President's nonproliferation policy.

[1] The Secretary of Energy's Openness Initiative announcement of February 6, 1996, announced that the United States has about 213 metric tons of surplus fissile materials, including the 200 metric tons the President announced in March, 1995. Of the 213 metric tons of surplus materials, the Openness Initiative announcement indicated that about 174.3 metric tons are HEU and about 38.2 metric tons are weapons-grade plutonium. Additional quantities of plutonium may be declared surplus in the future; therefore, the S&D Final PEIS analyzes the disposition of a nominal 50 metric tons of plutonium, as well as the storage of 89 metric tons of plutonium and 994 metric tons of HEU.

II. Decisions Made in This ROD

This ROD encompasses two categories of decisions: (1) The sites and facilities for storage of non-surplus weapons-usable plutonium and HEU, and storage of surplus plutonium and HEU pending disposition; and (2) the programmatic strategy for disposition of surplus weapons-usable plutonium. This ROD does not encompass the final selection of sites for plutonium disposition facilities, nor the extent to which the two plutonium disposition approaches (immobilization or MOX) will ultimately be implemented. Those decisions will be made pursuant to a follow-on EIS. However, DOE does announce in this ROD that the slate of candidate sites for plutonium disposition has been narrowed. This ROD does not include decisions about the disposition of surplus HEU, which were made in July 1996 in the separate ROD for the Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement, 61 FR 40619 (Aug. 5, 1996).[2]

III. NEPA Process

A. S&D Draft PEIS

On June 21, 1994, DOE published a Notice of Intent (NOI) in the Federal Register (59 FR 31985) to prepare a Storage and Disposition of Weapons-Usable Fissile Materials Programmatic Environmental Impact Statement (S&D PEIS), which was originally to address the storage and disposition of both plutonium and HEU. DOE subsequently concluded that a separate EIS on surplus HEU disposition would be appropriate. Accordingly, DOE published a notice in the Federal Register (60 FR 17344) on April 5, 1995, to inform the public of the proposed plan to prepare a separate EIS for the disposition of surplus HEU.

DOE published an implementation plan (IP) for the S&D PEIS in March 1995 (DOE/EIS–0229–IP). The IP recorded the issues identified during the scoping process, indicated how they would be addressed in the S&D PEIS, and provided guidance for the preparation of the S&D PEIS. DOE issued the Storage and Disposition of Weapons-Usable Fissile Materials Draft Programmatic Environmental Impact Statement (S&D Draft PEIS, DOE/EIS–0229–D) for public comment in February 1996. On March 8, 1996, both DOE and the Environmental Protection

[2] The material considered in the S&D Final PEIS, and covered by the decisions in this ROD, does not include spent nuclear fuel, irradiated targets, uranium-233, plutonium-238, plutonium residues of less than 50-percent plutonium by weight, or weapons program materials-in-use.

Agency (EPA) published Notices of Availability of the S&D Draft PEIS in the Federal Register (61 FR 9443 and 61 9450), announcing a public comment period from March 8 until May 7, 1996. In response to requests from the public, DOE on May 13, 1996 published another Notice in the Federal Register (61 FR 22038) announcing an extension of the comment period until June 7, 1996. Eight public meetings on the S&D Draft PEIS were held during March and April 1996 in Washington, DC and in the vicinity of the DOE sites under consideration for the proposed actions.

During the 92-day public comment period, the public was encouraged to provide comments via mail, toll-free fax, electronic bulletin board (Internet), and toll-free telephone recording device. By these means, DOE received 8,442 comments from 6,543 individuals and organizations for consideration. In addition, 250 oral comments were recorded from some of the 734 individuals who attended the eight public meetings. All of the comments received, and the Department's responses to them, are presented in Volume IV (the Comment Response Document) of the S&D Final PEIS. All of the comments were considered in preparation of the S&D Final PEIS, and in many cases resulted in changes to the document. The Notice of Availability for the S&D Final PEIS was published by EPA in the Federal Register on December 13, 1996 (61 FR 65572). DOE published its own Notice of Availability for the S&D Final PEIS in the Federal Register on December 19, 1996 (61 FR 67001).

B. Alternatives Considered

The S&D PEIS analyzes the reasonable action alternatives in addition to the Preferred Alternative and the No Action Alternative. The Preferred Alternative, which is described below in section V, Decisions, and which DOE has decided to implement, represents a combination of alternatives for both storage and disposition.

1. The Proposed Action

The proposed action, as described in the S&D PEIS, would involve the following actions for U.S. weapons-usable fissile materials:

• Storage—provide a long-term storage system (for up to 50 years) for nonsurplus plutonium and HEU that meets the Stored Weapons Standard [3] and applicable environmental, safety, and health standards while reducing storage and infrastructure costs.

• Storage Pending Disposition—provide storage that meets the Stored Weapons Standard for inventories of weapons-usable plutonium and HEU [4] that have been or may be declared surplus.

• Disposition—convert surplus plutonium and plutonium that may be declared surplus in the future to forms that meet the Spent Fuel Standard,[5] thereby providing evidence of irreversible disarmament and setting a model for proliferation resistance.

2. Long-Term Storage Alternatives and Related Activities

a. No Action. Under the No Action Alternative, all weapons-usable fissile materials would remain at existing storage sites. Maintenance at existing storage facilities would be done as required to ensure safe operation for the balance of the facility's useful life. Sites covered under the No Action Alternative included Hanford, INEL, Pantex, the ORR, SRS, RFETS, and LANL. Although there are no weapons-usable fissile materials within the scope of the S&D PEIS stored currently at Nevada Test Site (NTS), it was also analyzed under No Action to provide an environmental baseline against which impacts of the storage and disposition action alternatives were analyzed.

b. Upgrade at Multiple Sites. Under this alternative for storage, DOE would either modify certain existing facilities or build new facilities, depending on the site's ability to meet standards for nuclear material storage facilities, and would utilize existing site infrastructure to the extent possible. These modified or new facilities would be designed to operate for up to 50 years. Plutonium materials currently stored at Hanford, INEL, Pantex, and SRS would remain at those four sites (in upgraded or new facilities), and HEU would remain at ORR (in upgraded, consolidated facilities). This alternative does not apply to NTS because NTS does not currently store weapons-usable fissile materials.

A sub-alternative of relocating portions of the plutonium inventory (a total of 14.4 metric tons according to DOE's Openness Initiative announcements of December 7, 1993, and February 6, 1996, respectively) from RFETS and LANL to one or more of the four existing plutonium storage sites is analyzed. Storage of surplus materials without strategic reserve and weapons research and development (R&D) materials is also included as a sub-alternative. Within some of the five candidate storage sites under this alternative, there are also multiple storage options.

c. Consolidation of Plutonium. Under this alternative, plutonium materials at existing sites would be removed, and the entire DOE inventory of plutonium would be consolidated at one site, while the HEU inventory would remain at ORR. Again, Hanford, INEL, Pantex and SRS would be candidate sites for plutonium consolidation. In addition, NTS would be a candidate site for this alternative. Consolidation of plutonium at ORR would result in a situation in which inventories of plutonium and HEU were collocated at one site; this alternative was therefore analyzed as one option under the Collocation Alternative (see below). A sub-alternative to account for the separate storage of surplus materials without strategic reserve and weapons R&D materials was also included.

d. Collocation of Plutonium and Highly Enriched Uranium. Under the Collocation Alternative, the entire DOE inventory of plutonium and HEU would be consolidated and collocated at the same site. The six candidate sites would be Hanford, NTS, INEL, Pantex, ORR, and SRS. A sub-alternative for the separate storage of surplus materials without strategic reserve and weapons R&D materials was also included.

3. Plutonium Disposition Alternatives and Related Activities

The disposition technologies analyzed in the S&D PEIS were those that would convert surplus plutonium into a form that would meet the Spent Fuel Standard. For the purpose of environmental impact analyses of the various disposition alternatives, both generic and specific sites were used to provide perspective on these

[3] The "Stored Weapons Standard" for weapons-usable fissile materials storage was initially defined in Management and Disposition of Excess Weapons Plutonium, National Academy of Sciences, 1994. DOE defines the Stored Weapons Standard as follows: The high standards of security and accounting for the storage of intact nuclear weapons should be maintained, to the extent practical, for weapons-usable fissile materials throughout dismantlement, storage, and disposition.

[4] The S&D PEIS covers long-term storage of nonsurplus HEU and storage of surplus HEU pending disposition. Until storage decisions are implemented, surplus HEU that has not gone to disposition will continue to be stored pursuant to, and not to exceed the 10-year interim storage time period evaluated in, the Environmental Assessment for the Proposed Interim Storage of Enriched Uranium Above the Maximum Historical Storage Level at the Y-12 Plant, Oak Ridge, Tennessee (Y-12 EA) (DOE/EA-0929, September 1994) and Finding of No Significant Impact (FONSI).

[5] The "Spent Fuel Standard" for disposition was also initially defined in Management and Disposition of Excess Weapons Plutonium, National Academy of Sciences, 1994. DOE defines the Spent Fuel Standard as follows: The surplus weapons-usable plutonium should be made as inaccessible and unattractive for weapons use as the much larger and growing quantity of plutonium that exists in spent nuclear fuel from commercial power reactors.

alternatives. Under each alternative, there are various ways to implement the alternative. These "variants" (such as the can-in-canister[6] approach) are shown in Table 1 to provide a range of available options for consideration.

TABLE 1.—DESCRIPTION OF VARIANTS UNDER PLUTONIUM DISPOSITION ALTERNATIVES

Alternatives analyzed	Possible variants
• Deep Borehole Direct Disposition • Deep Borehole Immobilized Disposition	• Arrangement of plutonium in different types of emplacement canisters. • Emplacement of pellet-group mix. • Pumped emplacement of pellet-grout mix. • Plutonium concentration loading, size and shape of ceramic pellets.
• New Vitrification Facilities	• Collocated pit disassembly/conversion, plutonium conversion, and immobilization facilities. • Use of either Cs–137 from capsules or HLW as a radiation barrier. • Wet or dry feed preparation technologies. • An adjunct melter adjacent to the DWPF at SRS, in which borosilicate glass frit with plutonium (without highly radioactive radionuclides) is added to borosilicate glass containing HLW from the DWPF. • A can-in-canister approach at SRS in which cans of plutonium glass (without highly radioactive radionuclides) are plaed in DWPF canisters which are then filled with borosilicate glass containing HLW in the DWPF (see Appendix O of the Final PEIS). • A can-in-canister approach similar to above but using new facilities at sites other than SRS.
• New Ceramic Immobilization Facilities	• Collocated pit disassembly/plutonium conversion, and immobilization facilities. • Use of either Cs–137 from capsules or HLW as a radiation barrier. • Wet or dry feed preparation technologies. • A can-in-canister approach at SRS in which the plutonium is immobilized without highly radioactive radionuclides in a ceramic matrix and then placed in the DWPF canisters that are then filled with borosilicate glass containing HLW (See Appendix O of the Final PEIS). • A can-in-canister approach similar to above but using new facilities at sites other than SRS.
• Electrometallurgical Treatment (glass-bonded zeolite form)	• Immobilize plutonium into metal ingot form. • Locate at DOE sites other than ANL–W at INEL.
• Existing LWR With New MOX Facilities	• Pressurized or Boiling Water Reactors. • Different numbers of reactors. • European MOX fuel fabrication. • Modification/completion of existing facilities for MOX fabrication. • Collocated pit disassembly/conversion, plutonium conversion, and MOX facilities. • Reactors with different core management schemes (plutonium loadings, refueling intervals).
• Partially Completed LWR With New MOX Facilities	• Same as for existing LWR (except that MOX fuel would not be fabricated in Europe).
• Evolutionary LWR With New MOX Facilities	• Same as for partially completed LWR.
• Existing CANDU Reactor With New MOX Facilities	• Different numbers of reactors. • Modification/completion of existing facilities for MOX fabrication. • Collocated pit disassembly/conversion, plutonium conversion, and MOX facilities. • Reactors with different core management schemes (plutonium loadings, refueling intervals).

Note: ANL–W=Argonne National Laboratory-West; Cs–137=cesium-137; HLW=high-level waste; LWR=light water reactor

The first step in plutonium disposition is to remove the surplus plutonium from storage, then process this material in a pit disassembly/conversion facility (for pits) or in a plutonium conversion facility (for non-pit materials). The processing would convert the plutonium material into a form suitable for each of the disposition alternatives described in the following sections. The pit disassembly/conversion facility and the plutonium conversion facility would be built at a DOE site. The six candidate sites for long-term storage were evaluated for the potential environmental impacts of constructing and operating these facilities.

a. *No Disposition Action.* A "No Plutonium Disposition" action means disposition would not occur, and surplus plutonium-bearing weapon components (pits) and other forms, such as metal and oxide, would remain in storage in accordance with decisions on the long-term storage of weapons-usable fissile materials.

b. *Deep Borehole Category.* Under this category of alternatives, surplus weapons-usable plutonium would be disposed of in deep boreholes that would be drilled at least 4 kilometers (km) (2.5 miles [mi]) into ancient, geologically stable rock formations beneath the water table. The deep borehole would provide a geologic barrier against potential proliferation. A generic site was evaluated for the construction and operation of a borehole complex where the surplus plutonium would be prepared for emplacement in the borehole. This complex would consist of five major facilities: Processing; drilling; emplacing/sealing; waste management; and support (security, maintenance, and utilities).

(1) Direct Disposition (Borehole). Under the Direct Disposition Alternative, surplus plutonium would be removed from storage, processed as necessary, converted to a form suitable for emplacement, packaged, and placed in a deep borehole. The deep borehole would be sealed to isolate the

[6] In the can-in-canister variant, cans of plutonium in a glass or ceramic matrix would be placed in a canister. This canister would then be filled with borosilicate glass containing high-level radioactive waste (HLW) or highly radioactive material such as cesium. This variant, at an existing facility (the Defense Waste Processing Facility [DWPF] at SRS), is described in Appendix O of the S&D Final PEIS.

plutonium from the accessible environment. Long-term performance of the deep borehole would depend on the stability of the geologic system. A generic site was used for the borehole complex to analyze the environmental impact of this alternative.

(2) Immobilized Disposition (Borehole). Under the Immobilized Disposition Alternative, the surplus plutonium would be removed from storage, processed, and converted to a suitable form for shipment to a ceramic immobilization facility. The output of this facility would be spherical ceramic pellets containing plutonium, facilitating handling during transportation and emplacement. The ceramic pellets (about 2.54 centimeters [cm] [1 inch {in}] in diameter and containing 1 percent plutonium by weight) would then be placed in drums and shipped to the borehole complex. At the deep borehole site, the ceramic pellets would be mixed with non-plutonium ceramic pellets and fixed with grout during emplacement. The deep borehole would be sealed to isolate the plutonium from the accessible environment. Long-term performance of the deep borehole would depend on the stability of the geologic system.

Although a generic site was used for analyses of the borehole complex in this alternative, the ceramic immobilization facility would be built at a DOE site. Therefore, the six candidate sites for long-term storage were used to evaluate the environmental impacts of the borehole immobilization facility.

c. Immobilization Category. Under this category of alternatives, surplus plutonium would be immobilized to create a chemically stable form for disposal in a geologic repository pursuant to the Nuclear Waste Policy Act (NWPA).[7] The plutonium material would be mixed with or surrounded by high-level waste (HLW) or other radioactive isotopes and immobilized to create a radiation field that could serve as a proliferation deterrent, along with safeguards and security comparable to those of commercial spent nuclear fuel, thereby achieving the Spent Fuel Standard. All immobilized plutonium would be encased in stainless steel canisters and would remain in onsite vault-type storage until a geologic repository pursuant to the NWPA is operational.

(1) Vitrification. Under the Vitrification Alternative, surplus plutonium would be removed from storage, processed, packaged, and transported to the vitrification facility. In this facility, the plutonium would be mixed with glass frit and highly radioactive cesium-137 (Cs-137) or HLW to produce borosilicate glass logs (a slightly different process, using HLW, would be used for the can-in-canister variant, as discussed in Appendix O of the S&D Final PEIS). The Cs-137 isotope could come from the cesium chloride (CsCl) capsules currently stored at Hanford or from existing HLW if the site selected for vitrification already manages HLW. Each glass log produced from the vitrification facility would contain about 84 kilograms (kg) (185 pounds [lb]) of plutonium. The vitrification facility would be built at a DOE site. The six candidate sites for long-term storage were analyzed for this alternative.

(2) Ceramic Immobilization. Under the Ceramic Immobilization Alternative, surplus plutonium would be removed from storage, processed, packaged, and transported to a ceramic immobilization facility. In this facility, the plutonium would be mixed with nonradioactive ceramic materials and Cs-137 or HLW to produce ceramic disks (a slightly different process, using HLW, would be used for the can-in-canister variant, as discussed in Appendix O of the S&D Final PEIS). Each disk would be approximately 30 cm (12 in) in diameter and 10 cm (4 in) thick, and would contain approximately 4 kg (9 lb) of plutonium. The Cs-137 or HLW would be provided as previously described. The ceramic immobilization facility would be built at a DOE site. The six candidate sites for long-term storage were analyzed for this alternative.

(3) Electrometallurgical Treatment. Under the Electrometallurgical Treatment Alternative, surplus plutonium would be removed from storage, processed, packaged, and transported to new or modified facilities for electrometallurgical treatment. This process could immobilize surplus fissile materials into a glass-bonded zeolite (GBZ) form. With the GBZ material, the plutonium would be in the form of a stable, leach-resistant mineral that is incorporated in durable glass materials.[8] Existing electrometallurgical facilities at INEL were used as a representative site for analysis of potential environmental impacts.

d. Reactor Category. Under the reactor alternatives considered in the S&D PEIS, DOE would fabricate surplus plutonium into MOX fuel for use in reactors. The irradiated MOX fuel would reduce the proliferation risks of the plutonium material, and the reactors would also generate electricity. MOX fuel would be used in a once-through fuel cycle, with no reprocessing or subsequent reuse of spent fuel. The spent nuclear fuel generated by the reactors would then be sent to a geologic repository pursuant to the NWPA.

Because the United States does not have a MOX fuel fabrication facility or capability, a new dedicated MOX fuel fabrication facility would be built at a DOE or commercial site.[9] The surplus plutonium from storage would be processed, converted to plutonium dioxide (PuO_2), and transferred to the MOX fuel fabrication facility. In this facility, PuO_2 and uranium dioxide (UO_2) (from existing domestic sources) would be blended and fabricated into MOX pellets, loaded into fuel rods, and assembled into fuel bundles suitable for use in the reactor alternatives under consideration.

(1) Existing Light Water Reactors. Under the Existing Light Water Reactor (LWR) Alternative, the MOX fuel containing surplus plutonium would be fabricated and transported to existing commercial LWRs in the United States, where the MOX fuel would be used instead of conventional UO_2 fuel. The LWRs employed for domestic electric power generation are pressurized water reactors (PWRs) and boiling water reactors (BWRs). Both types of reactors use the heat produced from nuclear fission reactions to generate steam that drives turbines and generates electricity. Three to five reactor units would be needed.[10]

[7] Also referred to as a permanent, or HLW repository. Pursuant to the Nuclear Waste Policy Act, DOE is currently characterizing the Yucca Mountain Site in Nevada as a potential repository for spent nuclear fuel and HLW. Legislative clarification, or a determination by the Nuclear Regulatory Commission that the immobilized plutonium should be isolated as HLW, may be required before the material could be placed in Yucca Mountain should DOE and the President recommend, and Congress approve, its operation. No Resource Conservation and Recovery Act (RCRA) wastes would be immobilized unless the immobilization would constitute adequate treatment under RCRA. The immobilized product would be consistent with the repository's waste acceptance criteria.

[8] In May 1996, the Department issued a Finding of No Significant Impact (FONSI) (61 Fed. Reg. 25647) and decision to proceed with the limited demonstration of the electrometallurgical treatment process at Argonne National Laboratory-West (ANL–W) at INEL for processing up to 125 spent fuel assemblies from the Experimental Breeder Reactor II (100 drivers and 25 blanket assemblies). Although this alternative could be conducted at other DOE sites, ANL–W is described in the S&D PEIS as the representative site for analysis.

[9] Although a generic commercial site was evaluated in the S&D PEIS, it is not part of the Preferred Alternative or the decisions in this ROD.

[10] It is possible that an existing LWR can be configured to produce tritium, consume plutonium as fuel, and generate revenue through the production of electricity. This configuration is called a multipurpose reactor. Environmental

(2) Partially Completed Light Water Reactors. Under the Partially Completed LWR Alternative, commercial LWRs on which construction has been halted would be completed. The completed reactors would use MOX fuel containing surplus plutonium. The characteristics of these LWRs would be the same as those of the existing LWRs discussed in the Existing LWR Alternative. The Bellefonte Nuclear Plant located along the west bank of the Tennessee River in Alabama was used as a representative site for the environmental analysis of this alternative. Two reactor units (such as those at the Bellefonte Nuclear Plant) would be needed to implement this alternative.

(3) Evolutionary Light Water Reactors. The evolutionary LWRs are improved versions of existing commercial LWRs. Two design approaches were considered in the S&D PEIS. The first is a large PWR or BWR similar to the size of the existing PWR and BWR. The second is a small PWR approximately one-half the size of the large PWR. Two large or four small evolutionary LWRs would be needed to implement this alternative.

Under each design approach for this alternative, evolutionary LWRs would be built at a DOE site. Therefore, the six candidate sites for long-term storage were used to evaluate the environmental impacts of this alternative.

(4) Canadian Deuterium Uranium Reactor. Under the CANDU Reactor Alternative, the MOX fuel containing surplus plutonium would be fabricated in a U.S. facility, then transported for use in one or more commercial heavy water reactors in Canada. The Ontario Hydro Bruce-A Nuclear Generating Station identified by the Government of Canada was used as a representative site for evaluation of this alternative. This station is located on Lake Huron about 300 km (186 mi) northeast of Detroit, Michigan. Environmental analysis of domestic activities up to the U.S./Canadian border is presented in the S&D PEIS. The use of CANDU reactors would be subject to the policies, regulations, and approval of the Federal and Provincial Canadian Governments. Pursuant to Section 123 of the Atomic Energy Act, any export of MOX fuel from the United States to Canada must be made under the agreement for cooperation between the two countries. Spent fuel generated by a CANDU reactor would be disposed under the Canadian spent fuel program.

C. Preferred Alternative

The S&D Final PEIS presented the Department's Preferred Alternative for both storage and disposition. DOE has decided to implement the Preferred Alternative as described in the S&D Final PEIS. Thus, the Preferred Alternative is described in Section V of this ROD, Decisions.

D. Environmental Impacts

Chapter 4 and the appendices of the S&D Final PEIS analyzed the potential environmental impacts of the storage and disposition alternatives in detail. The S&D Final PEIS also evaluated the maximum site impacts that would result at Hanford, INEL, Pantex, and SRS from combining the Preferred Alternative for storage with the Preferred Alternative for disposition. Consistent with the Preferred Alternative, Hanford, INEL, Pantex, and SRS are each a possible location for all or some plutonium disposition activities. The siting, construction, and operation of disposition facilities will be covered in a separate, follow-on EIS. The S&D Final PEIS described the total life cycle impacts that would result from the Preferred Alternative at the DOE sites identified for potential placement of the disposition facilities.

Based on analyses in the S&D Final PEIS, the areas where impacts might be significant are as follows:

- The use of groundwater at the Pantex Plant for storage and disposition facilities could contribute to the overall declining water levels of the Ogallala Aquifer. The projected No Action Alternative water usage at Pantex in the year 2005 reflects a reduction from current usage due to planned downsizing over the next few years. The Preferred Alternative would require a 72-percent increase in the projected No Action Alternative water use; the total amount (428 million liters per year) is considerably less than what is currently being withdrawn (836 million liters per year) at Pantex.
- A set of postulated accidents was used for each plutonium disposition alternative over the life of the campaign to obtain potential radiological impacts at the four DOE sites where disposition facilities could be built. The PEIS analyzes the risk of latent cancer fatalities (reflecting the probability of accident occurrence and the latent cancer fatalities potentially caused by the accident) for accidents that have low probabilities of occurrence and severe consequences, as well as those that have higher probabilities and low consequences. For potential severe accidents, the risk of latent cancer fatalities to the population located within 80 kilometers (50 miles) of the accident for the "front-end" disposition process campaign would range from 4.5×10^{-16} (that is, approximately 1 chance in 2 quadrillion) to 1.7×10^{-4} (approximately 1 chance in 6,000) for the pit disassembly/conversion facility, and from 1.5×10^{-16} to 1.3×10^{-4} for the plutonium conversion facility. This risk would range from 2.8×10^{-14} to 1.8×10^{-5} for the vitrification facility, from 7.0×10^{-16} to 1.9×10^{-7} for the ceramic immobilization facility, and from 4.6×10^{-16} to 4.3×10^{-4} for the MOX fuel fabrication facility. To estimate the change in risk associated with using MOX fuel instead of uranium fuel in existing LWRs, the severe accident scenarios assumed a large population distribution near a generic existing LWR and extreme meteorological conditions for dispersal, leading to large doses that were not necessarily reflective of actual site conditions. The resultant change in risk of cancer fatalities to a generic population located within 80 km (50 mi) of the severe accidents was estimated to range from -2.0×10^{-4} to 3.0×10^{-5} per year [11], reflecting a postulated risk of using MOX fuel that ranges from seven percent lower to eight percent higher than the risk of using uranium fuel. Under the Preferred Alternative, the estimated risk of cancer fatalities under severe accident conditions using MOX fuel in existing LWRs ranges from 0.01 to 0.098 for an 11-year campaign.
- Under the Preferred Alternative, HEU would continue to be stored at the Y–12 Plant at ORR in existing facilities that would be upgraded to meet requirements for withstanding natural phenomena, including earthquakes and tornadoes. This upgrade would reduce the expected risk for the design basis accidents analyzed in the Y–12 EA (for example, Building 9212) by approximately 80 percent, resulting in a latent cancer fatality risk of 7.4×10^{-6} (approximately 7 in a million) to the maximally exposed individual, 5.7×10^{-8} (approximately 6 in 100

analysis of the multipurpose reactor is included in Chapter 4 of the Final Programmatic Environmental Impact Statement for Tritium Supply and Recycling (TSR PEIS) (DOE/EIS–0161, October 1995) and Appendix N of the S&D PEIS. In the TSR PEIS ROD (December 1995), the multipurpose reactor was preserved as an option for future consideration. The Fast Flux Test Facility (FFTF) at Hanford has been under consideration for tritium production, and could also use surplus plutonium as reactor fuel if it were shown to be useful for tritium production. This ROD does not preclude use of the FFTF for tritium production or the potential use of surplus plutonium as fuel for the FFTF.

[11] Accidents severe enough to cause a release of plutonium involved combinations of events that are highly unlikely. Estimates and analyses presented in Chapter 4 and summarized in Table 2.5–3 of the PEIS indicate a range of latent cancer fatalities of 5,900 to 7,300 and a risk of 0.016 to 0.15 of a fatality in the population for the 17-year campaign analyzed under the Existing LWR Alternative.

million) to a non-involved worker, and 5.1×10^{-7} (approximately 5 in 10 million) to the 80-km offsite population.

- Under the Preferred Alternative, safe, secure storage would continue for materials at Hanford, INEL, and ORR, pending disposition. Therefore, there would be no transportation impact at these sites until disposition. The storage transportation impact would come from movement of the RFETS materials to Pantex and SRS. If, following the EIS for construction and operation of plutonium disposition facilities, potential plutonium disposition activities were added to Hanford, INEL, Pantex, and SRS, the estimated total health effects for the life of the project from transportation of surplus plutonium (including transportation of those materials from RFETS to Pantex and SRS) would range from 0.193 fatalities for transportation to Pantex, to 1.87 fatalities for transportation to SRS (primarily from normal expected traffic accidents, not from radiological releases). In addition to the disposition activities at DOE sites, there would be transportation of the MOX fuel from the DOE fuel fabrication site to existing LWRs. The location of the LWRs and the destination of the MOX fuel could be either the eastern or western United States. For 4,000 km (2,486 mi) of such transportation, there could be up to an additional 3.61 potential fatalities (primarily from normal expected traffic accidents, not from radiological releases) for the life of the campaign, assuming 100 percent of the surplus plutonium would be used in commercial reactors. The actual amount would be smaller, and therefore potential fatalities would be lower, under the Preferred Alternative.
- At Hanford, INEL, Pantex, and SRS the Preferred Alternative would slightly increase regional employment and income. At RFETS, phaseout of plutonium storage would result in the loss of approximately 2,200 direct jobs. Compared to the total employment in the area, the loss of these jobs and the impacts to the regional economy would not be severe.

DOE has fully considered all of the environmental analyses in the S&D Final PEIS in reaching the decisions set forth in Section V, below.

E. Avoidance/Minimization of Environmental Harm

For the long-term storage of fissile material, there are four sites (Hanford, NTS, INEL, and LANL) where the Preferred Alternative is "no action"; that is, no plutonium would be stored at NTS, and at Hanford, INEL, and LANL, DOE would continue storage at existing facilities, using proven nuclear materials safeguards and security procedures, until disposition. These existing facilities would be maintained to ensure their safe operation and compliance with applicable environmental, safety and health requirements. At RFETS, the Preferred Alternative is to phase out storage of weapons-usable fissile materials, thus mitigating environmental impacts at RFETS. There are three sites (Pantex, ORR, and SRS) where the Preferred Alternative is to upgrade existing and planned new facilities. Site-specific mitigation measures for storage at these sites have been described in the S&D Final PEIS, and are summarized as follows:

- At Pantex, to alleviate the effects from using groundwater from the Ogallala Aquifer, the city of Amarillo is considering supplying treated wastewater to Pantex from the Hollywood Road Wastewater Treatment Plant for industrial use; the Department will use such treated wastewater to the extent possible. Radiation doses to individual workers will be kept low by maintaining comprehensive badged monitoring and programs to keep worker exposures "as low as reasonably achievable" (ALARA).
- At ORR, radiation doses to individual workers will be kept low by maintaining comprehensive badged monitoring and ALARA programs, including worker rotations. Upgrades for HEU storage to meet performance requirements will include seismic structural modifications as documented in Natural Phenomena Upgrade of the Downsized/Consolidated Oak Ridge Uranium/Lithium Plant Facilities. These modifications will reduce the risk of accidents to workers and the public.
- At SRS, to minimize soil erosion impacts during construction, storm water management and erosion control measures will be employed. Mitigation measures for potential Native American resources will be identified through consultation with the potentially affected tribes. Radiation doses to individual workers will be kept low by maintaining comprehensive badged monitoring and ALARA programs including worker rotations. The modified Actinide Packaging and Storage Facility (APSF) will be designed and operated in accordance with contemporary DOE Orders and regulations to reduce risks to workers and the public.

From a nonproliferation standpoint, the highest standards for safeguards and security will be employed during transportation, storage, and disposition. With respect to transportation, DOE will coordinate the transport of plutonium and HEU with State officials, consistent with current policy. Although the actual routes will be classified, they will be selected to circumvent populated areas, maximize the use of interstate highways, and avoid bad weather. DOE will continue to coordinate emergency preparedness plans and responses with involved states through a liaison program. The packaging, vehicles, and transport procedures being used are specifically designed and tested to prevent a radiological release under all credible accident scenarios.

For the Preferred Alternative for disposition, site-specific mitigation measures will be addressed in the follow-on, site-specific EIS. In the Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Plutonium Disposition Alternatives, measures are proposed to reduce the possibility of the theft or loss of material. For both immobilization and MOX fuel fabrication, bulk processing is the point in the disposition process when the material is most vulnerable to covert attempts to steal or divert it. A variety of opportunities for improving safeguards, some of which are already implemented at large, modern facilities, include near real-time accounting, increased automation in the process design, and improved containment and surveillance.

The security risks posed by transportation can be reduced by minimizing the amount of transportation required (for example, putting the plutonium processing and MOX fabrication operations at the same site), minimizing the number of sites to which material has to be shipped, and minimizing the distance between those sites.

F. Environmentally Preferable Alternatives

The environmental analyses in Chapter 4 of the S&D Final PEIS indicate that the environmentally preferable alternative (the alternative with the lowest environmental impacts over the 50 years considered in the PEIS) for storage of weapons-usable fissile materials would be the Preferred Alternative, which consists of No Action at Hanford, NTS, INEL, and LANL pending disposition, phaseout of storage at RFETS, and upgrades that would ultimately reduce environmental vulnerabilities at ORR, SRS, and Pantex.

For disposition of surplus plutonium, the environmentally preferable alternative would be the No Disposition Action alternative, because the

plutonium would remain in storage in accordance with decisions on the long-term storage of weapons-usable fissile materials, and there would be no new Federal actions that could impact the environment. For normal operations, analyses show that immobilization would be somewhat preferable to the existing LWR and preferred alternatives, although these alternatives, with the exception of waste generated, would be essentially environmentally comparable.[12]

Severe facility accident considerations indicate that immobilization options would be environmentally preferable to the existing reactor and preferred alternatives, although the likelihood of occurrence of severe accidents and the risk to the public are expected to be fairly low. Although No Disposition Action would be environmentally preferable, it would not satisfy the purpose and need for the Proposed Action, because the stockpile of surplus plutonium would not be reduced, and the Nonproliferation and Export Control Policy would not be implemented.

The hybrid approach (pursuing both reactors/MOX and immobilization) is being chosen over immobilization alone because of the increased flexibility it will provide by ensuring that plutonium disposition can be initiated promptly should one of the approaches ultimately fail or be delayed. Establishing the means for expeditious plutonium disposition will also help provide the basis for an international cooperative effort that can result in reciprocal, irreversible plutonium disposition actions by Russia. (See discussion in sections IV and V, below.)

IV. Non-Environmental Considerations

A. Technical Summary Reports

To assist in the preparation of this ROD, DOE's Office of Fissile Materials Disposition prepared and in July 1996 issued a *Technical Summary Report for Surplus Weapons-Usable Plutonium Disposition and a Technical Summary Report for Long-Term Storage of Weapons-Usable Fissile Materials.* These Technical Summary Reports (TSRs) summarize technical, cost, and schedule data for the storage and disposition alternatives that are considered in the S&D PEIS. After receiving comments on each of the TSRs, DOE issued revised versions of the reports in October and November, 1996, respectively.

1. Storage Technical Summary Report

This report provides technical, cost and schedule information for long-term storage alternatives analyzed in the S&D PEIS. The cost information for each alternative is presented in constant 1996 dollars and also discounted or present value dollars. It identifies both capital costs and life cycle costs. The following costs are in 1996 dollars.

The cost analyses show that the combination (preferred) alternative for the storage of plutonium would provide advantages to the Department with respect to implementing disposition technologies and would be the least expensive compared to other storage alternatives. The cost of the combination (preferred) alternative would be approximately $30 million in investment and $360 million in operating costs from inception until disposition occurs. The cost of the upgrade at multiple sites alternative would be approximately $380 million in investment and $3.2 billion in operating costs for 50 years. The costs for the consolidation alternative could range from approximately $40 million to $360 million in investment and $600 million to $1.1 billion for operating costs for 50 years, depending on the extent to which existing facilities and capabilities can be shared with other programs at the sites.

The schedule analysis shows that the upgraded storage facilities for plutonium under the combination (preferred) alternative could be operational by 2004 at Pantex (Zone 12), and by 2001 at SRS. The upgrade for the storage of HEU could be completed by 2004 (or earlier). RFETS pits could be received at Pantex beginning in 1997 in Zone 4 on a temporary basis until Zone 12 upgrades are completed. The other analyzed alternatives (upgrade and consolidation) would require about six years to complete.

2. Disposition Technical Summary Report

This report provides technical viability, cost, and schedule information for plutonium disposition alternatives and variants analyzed in the S&D PEIS. The variants analyzed in the report are based on pre-conceptual design information in most cases.

a. Technical Viability Estimates. The report indicates that each of the alternatives appears to be technically viable, although each is currently at a different level of technical maturity. There is high confidence that the technologies are sufficiently mature to allow procurement and/or construction of facilities and equipment to meet plutonium disposition technical requirements and to begin disposition in about a decade.[13]

Reactor Alternatives—Light water reactors (LWRs) can be readily converted to enable the use of MOX fuels. Many European LWRs currently operate on MOX fuel cycles. Although some technical risks exist, they are all amenable to engineering resolution. Sufficient existing domestic reactor capacity exists, unless significant delays occur in the disposition mission. CANDU reactors appear to be capable of operating on MOX fuel cycles, but this has never been demonstrated on any industrial scale. Therefore, additional development would be required to achieve the level of maturity for the CANDU reactors that exists for light water reactors. Partially complete and evolutionary LWRs would involve increased technical risk relative to existing LWRs, as well as the need to complete or build (and license) new reactor facilities. The spent MOX fuel waste form that results from reactor disposition of surplus plutonium will have to satisfy waste acceptance criteria for the geologic repository.

Immobilization Alternatives—All vitrification alternatives require additional research and development prior to implementation of immobilization of weapons-usable plutonium. However, a growing experience base exists relating to the vitrification of high-level waste. These existing technologies can be adapted to the plutonium disposition mission, though different equipment designs and glass formulations will generally be necessary due to criticality considerations and chemical differences between plutonium and HLW that may affect the stability of the glass matrix. Vitrification and ceramic immobilization alternatives are similar with regard to the technical maturity of incorporating plutonium in their respective matrices. The technical viability of electrometallurgical treatment has not yet been established for the plutonium disposition mission. The experimental data base for this alternative is limited, and critical questions on waste form performance are not yet resolved. This alternative is considered practical only if the underlying technology is further

[12] The potential risk of latent cancer fatality for a maximally exposed individual of the public from lifetime accident-free operation under the various alternatives are: 1.2×10^{-9} to 1.2×10^{-7} for boreholes, 1.2×10^{-9} to 1.2×10^{-7} for immobilization (vitrification or ceramic immobilization), 1.3×10^{-6} to 2.6×10^{-6} for existing LWRs, and 9.0×10^{-7} to 1.7×10^{-6} for the Preferred Alternative.

[13] Actual timing would depend on technical demonstrations, follow-on site-specific environmental review, detailed cost estimates, and international agreements.

developed for spent nuclear fuels.[14] All of the immobilization alternatives will require qualification (to meet acceptance criteria) of the waste form for the geologic repository, and may require legislative clarification or NRC rulemaking.

Deep Borehole Alternatives—Uncertainties for the deep borehole alternatives relate to selecting and qualifying a site; additional legislation and regulations, or legislative and regulatory clarification, may be required. The front-end feed processing operations for the deep borehole alternatives are much simpler than for other alternatives because no highly radioactive materials are processed, thus avoiding the need for remote handling operations. Emplacement technologies are comprised of largely low-technology operations which would be adaptations from existing hardware and processes used in the oil and gas industry.

Hybrid Approaches—Two hybrid approaches that combine technologies were considered as illustrative examples, using existing LWR or CANDU reactors in conjunction with a can-in-canister (immobilization) approach. Hybrids provide insurance against technical or institutional hurdles which could arise for a single technology approach for disposition. If any significant roadblock is encountered in any one area of a hybrid, it would be possible to simply divert the feed material to the more viable technology. In the case of a single technology, such roadblocks would be more problematic.

b. Cost Estimates. The following discussion is in constant 1996 dollars unless otherwise stated.

(1) Investment Costs.

- The investment costs for existing reactor variants tends to be about $1 billion; completing or building new reactors increases the investment cost to between $2 billion and $6 billion.
- The investment cost for the immobilization alternatives ranges from approximately $0.6 billion for the can-in-canister variants to approximately $2 billion for new greenfield variants.[15]
- Hybrid alternatives (combining both immobilization and reactor alternatives) require approximately $200 million additional investment over the existing light water reactor stand-alone alternatives.
- Investment costs for the deep borehole alternatives range from about $1.1 billion for direct emplacement to about $1.4 billion for immobilized emplacement.
- Alternatives that utilize existing facilities for plutonium processing, immobilization, or fuel fabrication would realize significant investment cost savings over building new facilities for the same function.
- Large uncertainties in the cost estimates exist, relating to both engineering and institutional factors.
- A significant fraction of the investment cost for an alternative/variant is related to the front-end facilities for the extraction of the plutonium from pits and other plutonium-bearing materials and for other functions that are common to all alternatives.

(2) Life Cycle Costs.

- The life cycle costs for hybrid alternatives are similar to the stand-alone reactor alternatives. For the existing LWR/immobilization hybrid alternative (preferred alternative), the cost is $260 million higher than the stand-alone reactor alternative; for the CANDU/immobilization hybrid alternative, the cost is $70 million higher.
- The combined investment and net operating costs for MOX fuel are higher than for commercial uranium fuel; thus, the cost of MOX fuel cannot compete economically with low-enriched uranium fuel for LWRs or natural uranium fuel for CANDU reactors.
- The can-in-canister approaches are the most attractive variants for immobilization based on cost considerations.
- The deep borehole alternatives are more expensive than the can-in-canister and existing reactor alternatives. The immobilized borehole alternative life cycle cost is $1 billion greater than that for the direct emplacement alternative ($3.6 billion vs. $2.6 billion).
- Large uncertainties in the cost estimates exist, relating to engineering, regulatory, and policy considerations.

c. Schedule Estimates. The key conclusions of the Disposition Technical Summary Report with respect to schedules are as follows:

- Significant schedule uncertainties exist, relating to both engineering and institutional factors.
- Opportunities for compressing or expanding schedules exist.

(1) Reactor Alternatives. • The rate at which MOX fuel is consumed in reactors will depend on the rate that MOX fuel is provided and fabricated, and the rate that plutonium oxide is provided to the MOX fuel fabrication facility.

- The time to attain production scale operation in existing LWRs and CANDU reactors could be about 8–12 years, depending on the need for and source of test assemblies that might be required.
- The time to complete the disposition mission is a function of the number of reactors committed to the mission, among other factors. For the variants considered, the time to complete varies from about 24 to 31 years.

(2) Immobilization Alternatives.

- The time to start the disposition mission ranges from 7 to 13 years, depending on the technology used and whether existing facilities are used.
- The operating campaign for the immobilization alternatives at full-scale operation would be about 10 years; it is possible to compress or expand the operating schedule by several years, if desired, by resizing the immobilization facility designs selected for analysis in this study. The overall mission duration (including research and development, construction, and operation) is expected to be about 18 to 24 years.
- Potential delays for start-up of the immobilization alternatives involve completing process development and demonstration, and qualifying the waste form for a geologic repository.

(3) Deep Borehole Alternatives. • The time to start-up is expected to be 10 years.

- The operating duration of the mission would be about 10 years, although completing all burial operations at the borehole site in 3 years is possible. Therefore, the overall mission duration is estimated to be 20 years with accelerated emplacement reducing the duration by about 7 years.
- The schedule for the deep borehole alternatives would depend in part on selecting and qualifying a site, and obtaining legislative and regulatory clarification as well as any necessary permits.

(4) Hybrid Approaches. • In general, the schedule data that apply to the component technologies apply to the hybrid alternatives as well.

- Confidence in an early start-up and an earlier completion can both be improved with a hybrid approach, relative to stand-alone alternatives.
- Hybrid alternatives provide an inherent back-up technology approach to enhance confidence in attaining schedule goals.

[14] A recent study by the National Research Council concludes that the electrometallurgical treatment technology is not sufficiently mature to provide a reliable basis for timely plutonium disposition. "An Evaluation of the Electrometallurgical Approach for Treatment of Excess Weapons Plutonium" (National Academy Press, Washington, D.C., 1996).

[15] "Greenfield" means a variant involving a new facility, with no existing plutonium-handling infrastructure.

B. Nonproliferation Assessment

To assist in the development of this ROD, DOE's Office of Arms Control and Nonproliferation, with support from the Office of Fissile Materials Disposition, prepared a report, Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Plutonium Disposition Alternatives. The report was issued in draft form in October 1996, and following a public comment period, was issued in final form in January 1997. It analyzes the nonproliferation and arms reduction implications of the alternatives for storage of plutonium and HEU, and disposition of excess plutonium. It is based in part on a Proliferation Vulnerability Red Team Report prepared for the Office of Fissile Materials Disposition by Sandia National Laboratory. The assessment describes the benefits and risks associated with each option. Some of the "options" and "alternatives" discussed in the Nonproliferation Assessment are listed as "variants" (such as can-in-canister) in the S&D Final PEIS. The key conclusions of the report, as presented in its Executive Summary, are reproduced below.

1. Storage. • Each of the options under consideration for storage of U.S. weapons-usable fissile materials has the potential to support U.S. nonproliferation and arms reduction goals, if implemented appropriately.

• Each of the storage options could provide high levels of security to prevent theft of nuclear materials, and could provide access to excess materials for international monitoring.

• Making excess plutonium and HEU available for bilateral U.S.-Russian monitoring and International Atomic Energy Agency (IAEA) safeguards, while protecting proliferation-sensitive information, would help demonstrate the U.S. commitment never to return this material to nuclear weapons, providing substantial arms reduction and nonproliferation benefits in the near-term.

2. Disposition of U.S. Excess Plutonium

a. In General. • Each of the options for disposition of excess weapons plutonium that meets the Spent Fuel Standard would, if implemented appropriately, offer major nonproliferation and arms reduction benefits compared to leaving the material in storage in directly weapons-usable form. Taking into account the likely impact on Russian disposition activities, the no-action alternative appears to be by far the least desirable of the plutonium disposition options from a nonproliferation and arms reduction perspective.

• Carrying out disposition of excess U.S. weapons plutonium, using options that ensured effective nonproliferation controls and resulted in forms meeting the Spent Fuel Standard, would:

• reduce the likelihood that current arms reductions would be reversed, by significantly increasing the difficulty, cost, and observability of returning this plutonium to weapons;

• increase international confidence in the arms reduction process, strengthening political support for the nonproliferation regime and providing a base for additional arms reductions, if desired;

• reduce long-term proliferation risks posed by this material by further helping to ensure that weapons-usable material does not fall into the hands of rogue states or terrorist groups; and

• lay the essential foundation for parallel disposition of excess Russian plutonium, reducing the risks that Russia might threaten U.S. security by rebuilding its Cold War nuclear weapons arsenal, or that this material might be stolen for use by potential proliferators.

• Choosing the "no-action alternative" of leaving U.S. excess plutonium in storage in weapons-usable form indefinitely, rather than carrying out disposition:

• would represent a clear reversal of the U.S. position seeking to reduce excess stockpiles of weapons-usable materials worldwide;

• would make it impossible to achieve disposition of Russian excess plutonium;

• could undermine international political support for nonproliferation efforts by leaving open the question of whether the United States was maintaining an option for rapid reversal of current arms reductions; and

• could undermine progress in nuclear arms reductions.

• The benefits of placing U.S. excess plutonium under international monitoring and then transforming it into forms that met the Spent Fuel Standard would be greatly increased, and the risks of these steps significantly decreased, if Russia took comparable steps with its own excess plutonium on a parallel track. The two countries need not use the same plutonium disposition technologies, however.

• As the 1994 NAS committee report[16] concluded, options for disposition of U.S. excess weapons plutonium will provide maximum nonproliferation and arms control benefits if they:

• minimize the time during which the excess plutonium is stored in forms readily usable for nuclear weapons;

• preserve material safeguards and security during the disposition process, seeking to maintain to the extent possible the same high standards of security and accounting applied to stored nuclear weapons (the Stored Weapons Standard);

• result in a form from which the plutonium would be as inaccessible and unattractive for weapons use as the larger and growing quantity of plutonium in commercial spent fuel (the Spent Fuel Standard).

• In order to achieve the benefits of plutonium disposition as rapidly as possible, and to minimize the risks and negative signals resulting from leaving the excess plutonium in storage, it is important for disposition options to begin, and to complete the mission as soon as practicable taking into account nonproliferation, environment, safety, and health, and economic constraints. Timing should be a key criterion in judging disposition options. Beginning the disposition quickly is particularly important to establishing the credibility of the process, domestically and internationally.

• Each of the options under consideration for plutonium disposition has its own advantages and disadvantages with respect to nonproliferation and arms control, but none is clearly superior to the others.

• Each of the options under consideration for plutonium disposition can potentially provide high levels of security and safeguards for nuclear materials during the disposition process, mitigating the risk of theft of nuclear materials.

• Each of the options under consideration for plutonium disposition can potentially provide for effective international monitoring of the disposition process.

• Plutonium disposition can only reduce, not eliminate, the security risks posed by the existence of excess plutonium, and will involve some risks of its own:

• Because all plutonium disposition options would take decades to complete, disposition is not a near-term solution to the problem of nuclear theft and smuggling. While disposition will make a long-term contribution, the near-term problem must be addressed through programs to improve security and safeguarding for nuclear materials, and to ensure adequate police, customs, and intelligence capabilities to interdict nuclear smuggling.

[16] See footnote 3, above.

• All plutonium disposition options under consideration would involve processing and transport of plutonium, which will involve more risk of theft in the short term than if the material had remained in heavily guarded storage, in return for the long-term benefit of converting the material to more proliferation-resistant forms.

• Both the United States and Russia will still retain substantial stockpiles of nuclear weapons and weapons-usable fissile materials even after disposition of the fissile materials currently considered excess is complete. These weapons and materials will continue to pose a security challenge regardless of what is done with excess plutonium.

• None of the disposition options under consideration would make it impossible to recover the plutonium for use in nuclear weapons, or make it impossible to use other plutonium to rebuild a nuclear arsenal. Therefore, disposition will only reduce, not eliminate, the risk of reversal of current nuclear arms reductions.

• A U.S. decision to choose reactor alternatives for plutonium disposition could offer additional arguments and justifications to those advocating plutonium reprocessing and recycle in other countries. This could increase the proliferation risk if it in fact led to significant additional separation and handling of weapons-usable plutonium. On the other hand, if appropriately implemented, plutonium disposition might also offer an opportunity to develop improved procedures and technologies for protecting and safeguarding plutonium, which could reduce proliferation risks and would strengthen U.S. efforts to reduce the stockpiles of separated plutonium in other countries.

• Large-scale bulk processing of plutonium, including processes to convert plutonium pits to oxide and prepare other forms for disposition, as well as fuel fabrication or immobilization processes, represents the stage of the disposition process when material is most vulnerable to covert theft by insiders or covert diversion by the host state. Such bulk processing is required for all options, however; in particular, initial processing of plutonium pits and other forms is among the most proliferation-sensitive stages of the disposition process, but is largely common to all the options. More information about the specific process designs is needed to determine whether there are significant differences between the various immobilization and reactor options in the overall difficulty of providing effective assurance against theft or diversion during the different types of bulk processing involved, and if so, which approach is superior in this respect.

• Transport of plutonium is the point in the disposition process when the material is most vulnerable to overt armed attacks designed to steal plutonium. With sufficient resources devoted to security, however, high levels of protection against such overt attacks can be provided. International, and particularly overseas, shipments would involve greater transportation concerns than domestic shipments. [17]

b. Conclusions Relating to Specific Disposition Options.

• The reactor options, homogeneous immobilization [18] options, and deep borehole immobilized emplacement option can all meet the Spent Fuel Standard. The can-in-canister options are being refined to increase the resistance to separation of the plutonium cans from the surrounding glass, with the goal of meeting the Spent Fuel Standard. The deep borehole direct emplacement option substantially exceeds the Spent Fuel Standard with respect to recovery by sub-national groups, but could be more accessible and attractive for recovery by the host state than spent fuel.

• The reactor options have some advantage over the immobilization options with respect to perceived irreversibility, in that the plutonium would be converted from weapons-grade to reactor-grade, even though it is possible to produce nuclear weapons with both weapons and reactor-grade plutonium. The immobilization and deep borehole options have some advantage over the reactor options in avoiding the perception that they could potentially encourage additional separation and civilian use of plutonium, which itself poses proliferation risks.

• Options that result in accountable "items" (for purposes of international safeguards) whose plutonium content can be accurately measured (such as fuel assemblies or immobilized cans without fission products in the "can-in-canister" option) offer some advantage in accounting to ensure that the output plutonium matches the input plutonium from the process. Other options (such as homogeneous immobilization or immobilized emplacement in deep boreholes) would require greater reliance on containment and surveillance to provide assurance that no material was stolen or diverted—but in some cases could involve simpler processing, easing the task of providing such assurance.

• The principal uncertainty with respect to using excess weapons plutonium as MOX in U.S. LWRs relates to the potential difficulty of gaining political and regulatory approvals for the various operations required.

• Compared to the LWR option, the CANDU option would involve more transport and more safeguarding issues at the reactor sites themselves (because of the small size of the CANDU fuel bundles and the on-line refueling of the CANDU reactors). Demonstrating the use of MOX in CANDU reactors by carrying out this option for excess weapons plutonium disposition could somewhat detract from U.S. efforts to convince nations operating CANDU reactors in regions of proliferation concern not to pursue MOX fuel cycles, but these nations are likely to base their fuel cycle decisions primarily on factors independent of disposition of this material. Disposing of excess weapons plutonium in another country long identified with disarmament could have significant symbolic advantages, particularly if carried out in parallel with Russia. Disposition of Russian plutonium in CANDU reactors, however, would require resolving additional transportation issues and additional questions relating to the likely Russian desire for compensation for the energy value of the plutonium.

• The immobilization options have the potential to be implemented more quickly than the reactor options. They face somewhat less political uncertainty but somewhat more technical uncertainty than the reactor options.

• The likelihood of very long delays in gaining approval for siting and construction of deep borehole sites represents a very serious arms reduction and nonproliferation disadvantage of the borehole option, in either of its variants. While the deep borehole direct-emplacement option requires substantially less bulk processing than the other disposition options, that option may not meet the Spent Fuel Standard for retrievability by the host state, as mentioned above. Any potential

[17] International shipments would be involved (from the United States to Canada) if the CANDU option were pursued as a result of international agreements among the U.S., Canada, and Russia. Overseas shipments would be involved if European MOX fuel fabrication were utilized in the interim before a domestic MOX fabrication facility were completed. The Preferred Alternative and the decisions in this ROD do not involve European MOX fuel fabrication.

[18] The term "homogeneous immobilization" refers to mixing of solutions of plutonium and either HLW or cesium in liquid form, followed by solidification of the mixture in either glass or ceramic matrices. This contrasts with the "can-in-canister" variant, in which the plutonium and HLW or cesium materials are never actually mixed together.

advantage from the reduced processing is small compared to the large timing uncertainty and the potential retrievability disadvantage.

• Similarly, the electrometallurgical treatment option, because it is less developed than the other immobilization options, involves more uncertainty in when it could be implemented, which represents a significant arms reduction and nonproliferation disadvantage. It does not appear to have major compensating advantages compared to the other immobilization options.

• The "can-in-canister" immobilization options have a timing advantage over the homogeneous immobilization options, in that, by potentially relying on existing facilities, they could begin several years sooner. As noted above, however, modified systems intended to allow this option to meet the Spent Fuel Standard are still being designed.

C. Comments on the S&D Final PEIS

After issuing the Final PEIS, DOE received approximately 100 letters from organizations and individuals commenting on the alternatives addressed in the PEIS. Many of these letters expressed opposition to the MOX fuel approach for surplus plutonium disposition. The major concern raised in these letters was the contention that the use of MOX fuel is associated with proliferation risk as well as additional delays, costs, and safety and environmental risks. One of these letters was from a coalition of 14 national organizations recommending that the Department decide to utilize immobilization for the disposition of all surplus plutonium and that MOX be retained for use, if at all, only as an "insurance policy" if immobilization should prove infeasible. Several of those 14 organizations also wrote separately making similar points. Conversely, many of the letters provided comments in support of the use of MOX fuel and/or a dual path, while a few expressed opposition to the immobilization alternatives.

Seven of the letters received suggested the use of disposition approaches that were not analyzed in the PEIS. Three of these approaches (dropping plutonium into volcanoes, burying it in the sea at the base of a volcano, and storing it in large granite or marble structures) are similar to options that were either considered (but found to be unreasonable) in a screening process that preceded the PEIS, or were addressed in the PEIS Comment Response Document. These approaches were considered to be potentially damaging to the environment, among other things, and were therefore dismissed as unreasonable. Three other alternatives (plasma technology, binding and neutralizing plutonium with a new organic material, and use in rocket engines) recommended in these letters would require a substantial amount of development and could not be accomplished in the same time frame as alternatives analyzed in the PEIS. One commentor suggested adding the plutonium to the radioactive sludge being stored at Hanford for eventual disposal. The Department views this as unreasonable because of delays and increased costs that would be incurred in the program to manage the wastes in the Hanford tanks. One commentor was opposed to the utilization of Hanford's Fuels and Materials Examination Facility for MOX fuel fabrication and the Fast Flux Test Facility for MOX fuel burning.

All of the issues raised in these letters are covered in the body of the Final PEIS, in the Comment Response Document, the Summary Report of the Screening Process (DOE/MD-0002, March 19, 1995), the Technical Summary Report for Surplus Weapons-Usable Plutonium Disposition, or the Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Plutonium Disposition Alternatives, which have each been considered in reaching this ROD.

The Department's decision for surplus plutonium disposition is to pursue both the existing LWR (MOX fuel) and immobilization approaches. DOE recognizes that the estimated life-cycle cost of immobilization alone would be less than that of the hybrid approach (pursuing both), but the additional expense would be warranted by the increased flexibility should one of the approaches ultimately fail, and the increased ability to influence Russian plutonium disposition actions. (The lowest cost approach would be the No Disposition Action alternative; however, as noted in section III.F, above, that option would not satisfy the purpose and need for this program.) DOE also recognizes that analyses in the PEIS indicated that, for normal operation, the environmental and health impacts would be somewhat lower for immobilization, although, with the exception of waste generation, impacts for the preferred, immobilization, and existing LWR (MOX) alternatives would be essentially comparable (see prior discussion).

Potential latent cancer fatalities for members of the public under the MOX approach would be significantly higher than under the immobilization approach only under highly unlikely facility accident scenarios; the risk (taking into account accident probabilities) to the public of latent cancer fatalities from accidents would be fairly low for both approaches.

From the nonproliferation standpoint, results of the Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Plutonium Disposition Alternatives (see section IV.B) indicated that each of the options under consideration for plutonium disposition has its own advantages and disadvantages, and each can potentially provide high levels of security and safeguards for nuclear materials during the disposition process, mitigating the risk of theft of nuclear materials. Initial processing of plutonium pits and other forms is among the most proliferation-sensitive stages of the disposition process, but is largely common to all the options. Although the Assessment also concluded that none of the approaches is clearly superior to the others, both the Nonproliferation Assessment and a letter from the Secretary of Energy Advisory Board Task Force on the Non-proliferation and Arms Control Implications of Weapons-Usable Fissile Materials Disposition Alternatives (included as Appendix B to the Nonproliferation Assessment) concluded that the hybrid approach (both reactors/MOX and immobilization) is preferable because of uncertainties in each approach and because it would minimize potential delays should problems develop with either approach. Numerous comment letters have made similar points.

One such letter was received from five individuals who were the U.S. participants on the U.S.-Russian Independent Scientific Commission on Disposition of Excess Weapons Plutonium. This letter supported the dual-track approach on the grounds that "ruling out reactors and thus depending solely on vitrification as the only approach to plutonium disposition that might be implementable anytime soon, would have far bigger nonproliferation liabilities then would the two-track approach." These commentors argued that designating only immobilization as the preferred approach, with MOX as a back-up, would have essentially all the nonproliferation and arms reduction liabilities of a one-track approach, which would weaken the U.S. position and have severe consequences for the likely success of programs to carry out permanent disposition of weapons plutonium in Russia, and therefore jeopardize the success of programs to

carry out U.S. disposition. These commentors stated that without the dual-track approach, the U.S. will lose any leverage it might have over the conditions and safeguards accompanying the use of Russian plutonium in their reactors. They also pointed out that pursuing both the MOX option and immobilization in the U.S. may be the best way to convince Russia, which currently favors converting its own plutonium to MOX fuel, of the value of immobilization for a portion of its excess plutonium. These commentors argued that the dual-track approach would not undermine U.S. nonproliferation policy, would not increase the risk of nuclear theft and terrorism, and would not lead to a new domestic plutonium recycle industry since it would not significantly affect the huge economic barriers to using MOX fuel on a commercial basis.

Two commentors expressed opposition to plutonium recycling (reprocessing), citing the Final Generic Environmental Statement on the Use of Recycle Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors (GESMO), NUREG–0002, which was issued by the NRC in 1976, and President Carter's decision to ban plutonium recycling. DOE notes that plutonium recycling is not part of the plutonium disposition program or the decisions in this ROD; on the contrary, this ROD includes conditions on the use of MOX fuel that are intended to prevent the use of recycled plutonium.

The use of MOX fuel in existing reactors would be undertaken in a manner that is consistent with the United States' policy objective on the irreversibility of the nuclear disarmament process and the United States' policy discouraging the use of plutonium for civil purposes. To this end, implementing the MOX alternative would include government ownership and control of the MOX fuel fabrication facility at a DOE site, and use of the facility only for the surplus plutonium disposition program. There would be no reprocessing or subsequent reuse of spent MOX fuel. The MOX fuel would be used in a once-through fuel cycle in existing reactors, with appropriate arrangements, including contractual or licensing provisions, limiting use of MOX fuel to surplus plutonium disposition.

One commentor, who opposed MOX fuel use, urged DOE not to use European MOX fuel fabrication capability if the MOX approach is pursued. In this ROD, DOE has not decided to use European MOX fuel fabrication.

V. Decisions

A. Storage of Weapons-Usable Fissile Materials

Consistent with the Preferred Alternative in the S&D Final PEIS, the Department has decided to reduce, over time, the number of locations where the various forms of plutonium are stored, through a combination of storage alternatives in conjunction with a combination of disposition alternatives. DOE will begin implementing this decision by moving surplus plutonium from RFETS as soon as possible, transporting the pits to Pantex beginning in 1997, and non-pit plutonium materials to SRS upon completion of the expanded Actinide Packing and Storage Facility (APSF), anticipated in 2001. Over time, DOE will store this plutonium in upgraded facilities at Pantex and in the expanded APSF. Surplus and non-surplus HEU will be stored in upgraded facilities at ORR. Storage facilities for the surplus HEU will also be modified, as needed, to accommodate international inspection requirements consistent with the President's Nonproliferation and Export Control Policy. Accordingly, DOE has decided to pursue the following actions for storage:

- Phase out storage of all weapons-usable plutonium at RFETS beginning in 1997; move pits to Pantex, and non-pit materials to SRS upon completion of the expanded APSF. At Pantex, DOE will repackage pits from RFETS in Zone 12, then place them in existing storage facilities in Zone 4, pending completion of facility upgrades in Zone 12. At SRS, DOE will expand the planned new APSF, and move separated and stabilized non-pit plutonium materials from RFETS to the expanded APSF upon completion. The small number of pits currently at RFETS that are not in shippable form will be placed in a shippable condition in accordance with existing procedures prior to shipment to Pantex. Additionally, some pits and non-pit plutonium materials from RFETS could be used at SRS, LANL, and Lawrence Livermore National Laboratory (LLNL) for tests and demonstrations of aspects of disposition technologies (see disposition decision, below). All non-pit weapons-usable plutonium materials currently stored at RFETS are surplus.

The Department's decision to remove plutonium from RFETS is based on the cleanup agreement among DOE, EPA, and the State of Colorado for RFETS, the proximity of RFETS to the Denver metropolitan area, and the fact that some of the RFETS plutonium is currently stored in buildings 371 and 376, two of the most vulnerable facilities as defined by and identified in DOE's Plutonium Working Group Report on Environmental, Safety, and Health Vulnerabilities Associated With the Department's Plutonium Storage (DOE/EH–0414, November, 1994).

- Upgrade storage facilities at Zone 12 South (to be completed by 2004) at Pantex to store those surplus pits currently stored at Pantex, and surplus pits from RFETS, pending disposition. Storage facilities at Zone 4 will continue to be used for these pits prior to completion of the upgrade.
- In accordance with the preferred alternative in the Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (Stockpile Stewardship and Management PEIS), store Strategic Reserve pits at Pantex in other upgraded facilities in Zone 12.

The Department's decision to consolidate pit storage at Pantex places the pits at a central location where most of the pits already reside and where the expertise and infrastructure are already in place to accommodate pit storage.[19] Pantex has more than 40 years of experience with the handling of pits. Zone 12 facilities would be modified for long-term storage of the Pantex plutonium inventory and the small number of pits transferred from RFETS and SRS for a modest cost (about $10 million capital cost). Pursuant to the Final EIS for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components (DOE/EIS–0225), DOE is proposing to continue nuclear weapons stockpile management operations and related activities at the Pantex Plant, including interim storage of up to 20,000 pits.[20] Consequently, the storage of surplus pits at Pantex would offer the opportunity to share trained people and other resources, and a decreased cost could be realized over other sites without similar experience. Using the Pantex Plant for pit storage would also involve the lowest cost and the least new construction relative to other sites.

- Expand the planned APSF at SRS (Upgrade Alternative) to store those surplus, non-pit plutonium materials currently at SRS and surplus non-pit plutonium materials from RFETS, pending disposition (see disposition decision, below). DOE analyzed the

[19] A small number of research and development pits located at RFETS that have been and will continue to be packaged and returned to LANL and LLNL are outside the scope of the S&D PEIS and this ROD.

[20] The pits that are to be moved to Pantex pursuant to this ROD fall within the 20,000 pit limit.

potential impacts of constructing and operating the APSF in the Final Environmental Impact Statement, Interim Management of Nuclear Materials (DOE/EIS–0220) and announced the decision to build the facility in the associated ROD (60 FR 65300, December 19, 1995). DOE, pursuant to the decisions announced here to store surplus non-pit plutonium at SRS, will likely design and build the APSF and the expanded space to accommodate the RFETS material as one building,[21] which DOE plans to complete in 2001. The RFETS surplus non-pit plutonium materials[22] will be moved to SRS after stabilization is performed at RFETS under corrective actions in response to Defense Nuclear Facilities Safety Board Recommendation 94–1; and after the material is packaged in DOE-approved storage and shipping containers pursuant to existing procedures. The surplus plutonium already on-site at SRS and the movement of separated and stabilized non-pit plutonium from RFETS would result in the storage of a maximum of 10 metric tons of surplus plutonium in the new, expanded APSF at SRS. In addition, shipment of the non-pit plutonium from RFETS to SRS, after stabilization, would only be implemented if the subsequent ROD for a plutonium disposition site (see Section V.B., below) calls for immobilization of plutonium at SRS. Placement of surplus, non-pit plutonium materials in a new storage facility at SRS will allow utilization of existing expertise and plutonium handling capabilities in a location where disposition activities could occur (see disposition decision, below). The decision to store non-pit plutonium from RFETS at SRS places most non-pit material at a plutonium-competent site with the most modern, state-of-the-art storage and processing facilities, and at a site with the only remaining large-scale chemical separation and processing capability in the DOE complex.[23] Pits currently located at SRS will be moved to Pantex for storage consistent with the Preferred Alternative in the Stockpile Stewardship and Management PEIS. There are no strategic non-pit materials currently located at SRS.

- Continue current storage (No Action) of surplus plutonium at Hanford and INEL, pending disposition (or movement to lag storage[24] at disposition facilities when selected).[25] This action will allow surplus plutonium to remain at the sites with existing expertise and plutonium handling capabilities, and where potential disposition activities could occur (see disposition decision, below). There are no non-surplus weapons-usable plutonium materials currently stored at either site.
- Continue current storage (No Action) of plutonium at LANL, pending disposition (or movement to lag storage at the disposition facilities). This plutonium will be stored in stabilized form with the non-surplus plutonium in the upgraded Nuclear Material Storage Facility pursuant to the No Action alternative for the site.
- Take No Action at the NTS. DOE will not introduce plutonium to sites that do not currently have plutonium in storage.
- Upgrade storage facilities at the Y–12 Plant (Y–12) (to be completed by 2004 or earlier) at ORR to store non-surplus HEU and surplus HEU pending disposition. Existing storage facilities at Y–12 will be modified to meet natural phenomena requirements, as documented in Natural Phenomena Upgrade of the Downsized/Consolidated Oak Ridge Uranium/Lithium Plant Facilities (Y/EN–5080, 1994). Storage facilities will be consolidated, and the storage footprint will be reduced, as surplus HEU is dispositioned and blended to low-enriched uranium, pursuant to the ROD for the Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement (61 FR 40619, August 5, 1996). Consistent with the Preferred Alternative in the Stockpile Stewardship and Management PEIS, HEU strategic reserves will be stored at the Y–12 Plant.

B. Plutonium Disposition

Consistent with the Preferred Alternative in the S&D Final PEIS, DOE has decided to pursue a strategy for plutonium disposition that allows for immobilization of surplus weapons plutonium in glass or ceramic forms and burning of the surplus plutonium as mixed oxide fuel (MOX) in existing reactors. The decision to pursue disposition of the surplus plutonium using these approaches is supported by the analyses in the Disposition Technical Summary Report (section IV.A.2 above) and the Nonproliferation Assessment (section IV.B above), as well as the S&D Final PEIS. The results of additional technology development and demonstrations, site-specific environmental review, detailed cost proposals, nonproliferation considerations, and negotiations with Russia and other nations will ultimately determine the timing and extent to which MOX as well as immobilization is deployed. These efforts will provide the basis and flexibility for the United States to initiate disposition efforts either multilaterally or bilaterally through negotiations with other nations, or unilaterally as an example to Russia and other nations.

Pursuant to this decision, the United States policy not to encourage the civil use of plutonium and, accordingly, not to itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes, does not change. Although under this decision some plutonium may ultimately be burned in existing reactors, extensive measures will be pursued (see below) to ensure that federal support for this unique disposition mission does not encourage other civil uses of plutonium or plutonium reprocessing. The United States will maintain its commitments regarding the use of plutonium in civil nuclear programs in western Europe and Japan.

The Disposition Technical Summary Report (section IV.A.2 above) concluded that the lowest cost option for plutonium disposition would be immobilization using the can-in-canister variant and existing facilities to the maximum extent possible, with a net life-cycle cost of about $1.8 billion. The Disposition Technical Summary Report also estimated that the net life-cycle cost of the hybrid immobilization/MOX approach would be about $2.2 billion. The additional expense of pursuing the hybrid approach would be warranted by

[21] Building the APSF in this way, rather than as originally configured plus an expansion, will not increase the potential impacts of constructing and operating the facility beyond those analyzed in the S&D Final PEIS in conjunction with the analyses in the Final Environmental Impact Statement, Interim Management of Nuclear Materials.

[22] This decision does not include residues at RFETS that are less than 50-percent plutonium by weight, or scrub alloys. The management and disposition of those materials has been or is being considered in separate NEPA reviews. See Environmental Assessment for Solid Residue Treatment, Repackaging, and Storage (DOE/EA–1120, April 1996); Notice of Intent to Prepare an EIS on the Management of Certain Plutonium Residues and Scrub Alloy Stored at the Rocky Flats Environmental Technology Site (61 FR 58866, November 19, 1996).

[23] SRS is one of the preferred candidate sites for plutonium disposition facilities, including the potential for the early start of disposition by immobilization using the can-in-canister option at the DWPF.

[24] Lag storage is temporary storage at the applicable disposition facility.

[25] Lawrence Livermore National Laboratory (LLNL) currently stores 0.3 metric tons of plutonium, which are primarily research and development and operational feedstock materials not surplus to government needs. Adequate storage facilities for this material currently exist at LLNL, where it will be stored and used for research and development activities. None of the plutonium stored at LLNL falls within the scope of the disposition alternatives in the S&D Final PEIS or the disposition decisions in this ROD.

the increased flexibility it would provide, as noted in the Nonproliferation Assessment, to ensure that plutonium disposition could be initiated promptly should one of the approaches ultimately fail or be delayed. Establishing the means for expeditious plutonium disposition will also help provide the basis for an international cooperative effort that can result in reciprocal, irreversible plutonium disposition actions by Russia. This disposition strategy signals a strong U.S. commitment to reducing its stockpile of surplus plutonium, thereby effectively meeting the purpose of and need for the Proposed Action.

To accomplish the plutonium disposition mission, DOE will use, to the extent practical, new as well as modified existing buildings and facilities for portions of the disposition mission. DOE will analyze and compare existing and new buildings and facilities, and technology variations, in a subsequent, site-specific EIS. In addition, all disposition facilities will be designed or modified, as needed, to accommodate international inspection requirements consistent with the President's Nonproliferation and Export Control Policy. Accordingly, DOE has decided to pursue the following strategy and supporting actions for plutonium disposition:

- Immobilize plutonium materials using vitrification or ceramic immobilization at either Hanford or SRS, in new or existing facilities. Immobilization could be used for pure or impure forms of plutonium. In the subsequent EIS (referenced above), DOE anticipates that the preferred alternative for vitrification or ceramic immobilization will include the can-in-canister variant, utilizing the existing HLW and the DWPF at SRS (see below). Alternatively, new immobilization facilities could be built at Hanford or SRS. The immobilized material would be disposed of in a geologic repository. Pursuant to appropriate NEPA review, DOE will continue the research and development leading to the demonstration of the can-in-canister variant at the DWPF using surplus plutonium and the development of vitrification and ceramic formulations.
- Convert surplus plutonium materials into mixed oxide (MOX) fuel for use in existing reactors. Pure surplus plutonium materials including pits, pure metal, and oxides could be converted without extensive processing into MOX fuel for use in existing commercial reactors. Other, already separated forms of surplus plutonium would require additional purification. (This purification would not involve reprocessing of spent nuclear fuel.) The Government-produced MOX fuel (from plutonium declared surplus to defense needs) would be used in existing LWRs with a once-through fuel cycle, with no reprocessing or subsequent reuse of the spent fuel. In addition, DOE will explore appropriate contractual limits to ensure that any reactor license modification for use of the MOX fuel is limited to governmental purposes involving the disposition of surplus, weapons-usable plutonium, so as to discourage general civil use of plutonium-based fuel. The spent MOX fuel would be disposed of in a geologic repository. If partially completed LWRs were to be completed by other parties, they would be considered for this mission. The MOX fuel would be fabricated in a domestic, government-owned facility at one of four DOE sites (SRS, Hanford, INEL, or Pantex).

The Department reserves as an option the potential use of some MOX fuel in CANDU reactors in Canada in the event that a multilateral agreement to deploy this option is negotiated among Russia, Canada, and the United States. DOE will engage in a test and demonstration program for CANDU MOX fuel consistent with ongoing and potential future cooperative efforts with Russia and Canada.

The test and demonstration activities could occur at LANL and at sites in Canada, potentially beginning in 1997, and will be based on appropriate NEPA review. Fabrication of MOX fuel for CANDU reactors would occur in a DOE facility, as would be true in the case of domestic LWRs. Strict security and safeguards would be employed in the fabrication and transport of MOX fuel to CANDU reactors, as well as domestic reactors. Whether, and the extent to which, the CANDU option is implemented will depend on multi-national agreements and the results of the test and demonstration activities.

Due to technology, complexity, timing, cost, and other factors that would be involved in purifying certain plutonium materials to make them suitable for potential use in MOX fuel, approximately 30 percent of the total quantity of plutonium that has been or may be declared surplus to defense needs would require extensive purification for use in MOX fuel, and therefore will likely be immobilized. Of the plutonium that is currently surplus, DOE will immobilize at least 8 metric tons that it has determined are not suitable for use in MOX fuel.[26] DOE reserves the option of using the immobilization approach for all of the surplus plutonium.

The timing and extent to which either option is ultimately utilized will depend on the results of international agreements, future technology development and demonstrations, site-specific environmental review, detailed cost proposals, and negotiations with Russia and other nations. In the event both technologies are utilized, because the time required for plutonium disposition using reactors would be longer than that for immobilization, it is probable that some surplus plutonium would be immobilized initially, prior to completion of reactor irradiation for other surplus plutonium. Implementation of this strategy will involve some or all of the following supporting actions:

- Construct and operate a plutonium vitrification facility or ceramic immobilization facility at either Hanford or SRS. DOE will analyze alternative locations at these two sites for constructing new buildings or using modified existing buildings in subsequent, site-specific NEPA review. SRS has existing facilities (the DWPF) and infrastructure to support an immobilization mission, and at Hanford, DOE has proposed constructing and operating immobilization facilities for the wastes in Hanford tanks.[27] DOE will not create new infrastructure for immobilizing plutonium with HLW or cesium at INEL, NTS, ORR, or Pantex. Due to the substantial timing and cost advantages associated with the can-in-canister option, as discussed in the Technical Summary Report For Surplus Weapons-Usable Plutonium Disposition and summarized in section IV.A.2, above, DOE anticipates that the proposed action for immobilization in the follow-on plutonium disposition EIS will include the use of the can-in-canister option at the DWPF at SRS for immobilizing a portion of the surplus, non-pit plutonium material.[28]

[26] The S&D Final PEIS, for purposes of analysis of impacts of the preferred alternative (using both reactors and immobilization), assumed that about 30 percent (approximately 17 MT) of the surplus plutonium materials might be immobilized because they are impure. DOE's decision here that immobilization will be used for at least 8 MT currently located at SRS and RFETS is based on DOE's current assessment that that quantity of material is so low in quality that its purification for use in MOX fuel would not be cost-effective. This decision does not preclude immobilizing all of the surplus plutonium, but it does preclude using the MOX/reactor approach for all of the material.

[27] See Final Environmental Impact Statement for the Tank Waste Remediation System, Hanford Site, Richland, Washington (DOE/EIS-0189, August 1996); ROD expected early in 1997.

[28] DOE expects to issue a Notice of Intent to prepare the follow-on EIS shortly following this ROD. Reasonable alternatives for the proposed

• Construct and operate a plutonium conversion facility for non-pit plutonium materials at either Hanford or SRS. DOE will collocate the plutonium conversion facility with the vitrification or ceramic immobilization facility discussed above. In subsequent, site-specific NEPA review, DOE will analyze alternative locations at Hanford and SRS for constructing new buildings or using modified existing buildings for the plutonium conversion facility.

• Construct and operate a pit disassembly/conversion facility at Hanford, INEL, Pantex, or SRS (only one site). DOE will not introduce plutonium to sites that do not currently have plutonium in storage. Therefore, two sites analyzed in the S&D PEIS, NTS and ORR, will not be considered further for plutonium disposition activities. DOE will analyze alternative locations at Hanford, INEL, Pantex, and SRS for constructing new buildings or using modified existing buildings in subsequent, site-specific NEPA review. Based on appropriate NEPA review, DOE anticipates demonstrating the Advanced Recovery and Integrated Extraction System (ARIES) concept at LANL for pit disassembly/conversion beginning in fiscal year 1997.

• Construct and operate a domestic, government-owned, limited-purpose MOX fuel fabrication facility at Hanford, INEL, Pantex, or SRS (only one site). As noted above, NTS and ORR will not be considered further for plutonium disposition activities. In follow-on NEPA review, DOE will analyze alternative locations at Hanford, INEL, Pantex, and SRS, for constructing new buildings or using modified existing buildings. The MOX fuel fabrication facility will serve only the limited mission of fabricating MOX fuel from plutonium declared surplus to U.S. defense needs, with shut-down and decontamination and decommissioning of the facility upon completion of this mission.[29]

DOE's program for surplus plutonium disposition will be subject to the highest standards of safeguards and security for storage, transportation, and processing (particularly during operations that involve the greatest proliferation vulnerability, such as during MOX fuel preparation and transportation), and will include International Atomic Energy Agency verification as appropriate. Transportation of all plutonium-bearing materials under this program, including the transportation of prepared MOX fuel to reactors, will be accomplished using the DOE Transportation Safeguards Division's "Safe Secure Transports" (SSTs), which affords these materials the same level of transportation safety, security, and safeguards as is used for nuclear weapons.

Pursuant to appropriate NEPA review(s), DOE will continue research and development and engage in further testing and demonstrations of plutonium disposition technologies which may include: dissolution of small quantities of plutonium in both glass and ceramic formulation; experiments with immobilization equipment and systems; fabrication of MOX fuel pellets for demonstrations of reactor irradiation at INEL; mechanical milling and mixing of plutonium and uranium feed; and testing of shipping and storage containers for certification, in addition to the testing and demonstrations previously described for the can-in-canister immobilization variant, the ARIES system, and other plutonium processes.

DOE has decided not to pursue several disposition alternatives that were evaluated in the S&D PEIS: two deep borehole alternatives, electrometallurgical treatment, evolutionary reactors, and partially-completed reactors (unless they were completed by others, in which case they would qualify as existing reactors). Although the deep borehole options are technically attractive, the institutional uncertainties associated with siting of borehole facilities make timely implementation of this alternative unlikely. To implement the borehole alternatives, new legislation and regulations, or clarification of existing regulations, may be necessary. DOE has decided not to pursue the electrometallurgical treatment option for immobilization because its technology is less mature than vitrification or ceramic immobilization.[30] DOE has decided not to pursue evolutionary reactors or partially-completed reactors because they offer no advantages over existing reactors for plutonium disposition and would involve higher costs, greater regulatory uncertainties, higher environmental impacts from construction, and less timely commencement of disposition actions.

VI. Conclusion

DOE has decided to implement a program to provide for safe and secure storage of weapons-usable fissile materials and for disposition of weapons-usable plutonium that is declared excess to national security needs (now or in the future), as specified in the Preferred Alternative in the S&D Final PEIS. DOE will consolidate the storage of weapons-usable plutonium by upgrading and expanding existing facilities at the Pantex Plant in Texas and SRS in South Carolina, continuing storage of surplus plutonium currently onsite at Hanford, LANL, and INEL pending disposition, and continuing storage of weapons-usable HEU at DOE's Y–12 Plant in Tennessee, in upgraded and, as surplus HEU is down-blended under the ROD for Disposition of Surplus Highly Enriched Uranium Final Environmental Impact Statement, consolidated facilities. DOE will provide for disposition of surplus plutonium by pursuing a strategy that allows: (1) Immobilization of surplus plutonium for disposal in a repository pursuant to the Nuclear Waste Policy Act, and (2) fabrication of surplus plutonium into MOX fuel, for use in existing domestic commercial reactors (and potentially CANDU reactors, depending on future agreements with Russia and Canada). The timing and extent to which each of these disposition technologies is deployed will depend upon the results of future technology development and demonstrations, site-specific environmental review, detailed cost proposals, and the results of negotiations with Russia, Canada, and other nations. This programmatic decision is effective upon being made public, in accordance with DOE's regulations implementing NEPA (10 CFR 1021.315). The goals of this program are to support U.S. nuclear weapons nonproliferation policy by reducing global stockpiles of excess fissile materials so that they may never be used in weapons again. This program will demonstrate the United States" commitment to its nonproliferation goals, as specified in the President's Nonproliferation and Export Control Policy of 1993, and provide an example for other nations, where stockpiles of surplus weapons-usable fissile materials may be less secure from potential theft or diversion than those in the United

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action will be considered in the follow-on disposition EIS.

[29] DOE supports external regulation of its facilities, and in the Report of Department of Energy Working Group on External Regulation (DOE/UF–0001, December 1996), DOE proposed to seek legislation that would generally require NRC licenses for new DOE facilities. Therefore, DOE anticipates seeking an NRC license for the MOX fuel fabrication facility, which would be limited to a license to fabricate MOX fuel from plutonium declared surplus to defense needs. DOE may also seek legislation that would by statute limit the MOX fuel fabrication facility to disposition of surplus plutonium.

[30] An evaluation by the National Research Council in a recent report (see footnote 12, above) concluded that the electrometallurgical treatment process is not sufficiently mature to provide a reliable basis for timely plutonium disposition.

States, to encourage them to take similar actions.

The decision process reflected in this Notice complies with the requirements of the National Environmental Policy Act (42 U.S.C. § 4321 et seq.) and its implementing regulations at 40 CFR Parts 1500–1508 and 10 CFR Part 1021.

Issued in Washington, D.C., January 14, 1997.

Hazel R. O'Leary,

Secretary.

[FR Doc. 97–1355 Filed 1–17–97; 8:45 am]

BILLING CODE 6450–01–P

Energy Information Administration

Agency Information Collection Activities: Proposed Collection; Comment Request

SUMMARY: The Energy Information Administration (EIA) is soliciting comments concerning the proposed three-year extension of existing form DOE–887, "Department of Energy Customer Surveys."

DATES: Written comments must be submitted on or before March 24, 1997. If you anticipate that you will be submitting comments, but find it difficult to do so within the period of time allowed by this notice, you should advise the contact listed below of your intention to do so as soon as possible.

ADDRESSES: Send comments to Herbert T. Miller, Office of Statistical Standards, EI–73, Forrestal Building, U.S. Department of Energy, Washington, D.C. 20585, (Phone 202–426–1103, FAX 202-426–1081, or e-mail hmiller@eia.doe.gov).

FOR FURTHER INFORMATION: Requests for additional information should be directed to Herbert Miller at the address listed above.

SUPPLEMENTARY INFORMATION:

I. Background
II. Current Actions
III. Request for Comments

I. Background

In order to fulfill its responsibilities under the Federal Energy Administration Act of 1974 (Pub. L. No. 93–275) and the Department of Energy Organization Act (Pub. L. No. 95–91), the Energy Information Administration is obliged to carry out a central, comprehensive, and unified energy data and information program. As part of this program, EIA collects, evaluates, assembles, analyzes, and disseminates data and information related to energy resource reserves, production, demand, and technology, and related economic and statistical information relevant to the adequacy of energy resources to meet demands in the near and longer term future for the Nation's economic and social needs.

The Energy Information Administration, as part of its continuing effort to reduce paperwork and respondent burden (required by the Paperwork Reduction Act of 1995 (Pub. L. 104–13)), conducts a presurvey consultation program to provide the general public and other Federal agencies with an opportunity to comment on proposed and/or continuing reporting forms. This program helps to ensure that requested data can be provided in the desired format, reporting burden is minimized, reporting forms are clearly understood, and the impact of collection requirements on respondents can be properly assessed. Also, EIA will later seek approval by the Office of Management and Budget (OMB) for the collections under Section 3507(h) of the Paperwork Reduction Act of 1995 (Pub. L. No. 104–13, Title 44, U.S.C. Chapter 35).

On September 11, 1993, the President signed Executive Order No. 12862 aimed at "* * * ensuring the Federal government provides the highest quality service possible to the American people." The Order discusses surveys as a means for determining the kinds and qualities of service desired by Federal Government customers and for determining satisfaction levels for existing services. These voluntary customer surveys will be used to ascertain customer satisfaction with the Department of Energy in terms of services and products. Respondents will be individuals and organizations that are the recipients of the Department's services and products. Previous customer surveys have provided useful information to the Department for assessing how well the Department is delivering its services and products and for making improvements. The results are used internally and summaries are provided to the Office of Management and Budget on an annual basis, and are used to satisfy the requirements and the spirit of Executive Order No. 12862.

II. Current Actions

The request to OMB will be for a three-year extension of the expiration date of approval for DOE to conduct customer surveys. During the past clearance cycle, over 20 customer surveys have been conducted by telephone and mail. (Examples of previously conducted customer surveys are available upon request.) Our planned activities in the next 3 fiscal years reflect our increased emphasis on and expansion of these activities, including an increased use of electronic means for obtaining customer input (CD–ROM and World Wide Web).

III. Request for Comments

Prospective respondents and other interested parties should comment on the actions discussed in item II. The following guidelines are provided to assist in the preparation of responses.

General Issues

A. Is the proposed collection of information necessary, taking into account its accuracy, adequacy, and reliability, and the agency's ability to process the information it collects in a useful and timely fashion?

B. What enhancements can EIA make to the quality, utility, and clarity of the information to be collected?

As a Potential Respondent

A. Average public reporting burden for a customer survey is estimated to be .25 hours per response (8,333 respondents per year x 15 minutes per response = 2,083 hours annually). Burden includes the total time, effort, or financial resources expended to generate, maintain, retain, or disclose or provide the information including: (1) reviewing instructions; (2) developing, acquiring, installing, and utilizing technology and systems for the purposes of collecting, validating, verifying, processing, maintaining, disclosing and providing information; (3) adjusting the existing ways to comply with any previously applicable instructions and requirements; (4) training personnel to respond to a collection of information; (5) searching data sources; (6) completing and reviewing the collection of information; and (7) transmitting, or otherwise disclosing the information.

Please comment on (1) the accuracy of our estimate and (2) how the agency could minimize the burden of the collection of information, including the use of automated collection techniques or other forms of information technology.

B. EIA estimates that respondents will incur no additional costs for reporting other than the hours required to complete the collection. What is the estimated (1) total dollar amount annualized for capital and start-up costs and (2) recurring annual dollar amount of operation and maintenance and purchase of services costs associated with this data collection? The estimates should take into account the costs associated with generating, maintaining, and disclosing or providing the information.

A.2 NOTICE OF INTENT—SURPLUS PLUTONIUM DISPOSITION ENVIRONMENTAL IMPACT STATEMENT

collection on the respondents, including through the use of information technology.

Dated: May 16, 1997.

Gloria Parker,

Director, Information Resources Management Group.

Office of Management

Type of Review: New.

Title: Department of Education Federal Cash Award Certification Statement and Department of Education Federal Cash Quarterly Confirmation Statement.

Frequency: Annually.

Affected Public: Business or other for-profit; Not for Profit institutions; Federal Government; State, Local or Tribal Government, SEAs or LEAs.

Annual Reporting and Recordkeeping Hour Burden:

Responses: 12,000.

Burden Hours: 38,160.

Abstract: The collection of the Federal Cash Award Statement is necessary for the Agency to monitor cash advanced to grantees and to obtain expenditure information for each grant from grantees. Information collection is used to report total outlays to the Office of Management and Budget and the Department of the Treasury and is used to project the Federal government's and the Department's financial condition. This information collection also enables the Department to provide Treasury with outlay information to facilitate Treasury's estimation of future borrowing requirements. Respondents include over 12,000 State, local, college, university, proprietary school and non-profit grantees who draw funds from the Department.

The collection of Federal cash quarterly confirmation statement enables grantees to identify discrepancies in grant authorizations, and funds drawn and funds refunded. Action is required only if a grantee's records do not agree with the information contained on the statement. This information will be used to help grantees report and initiate resolution of discrepancies. Respondents include over 12,000 State, local, college, university, proprietary school and non-profit grantees who draw funds from the Department.

Office of Special Education and Rehabilitative Services

Type of Review: New.

Title: Grantee Reporting Form.

Frequency: Annually.

Affected Public: Business or other for-profit; Not-for-profit institutions; State, local or Tribal Gov't, SEAs or LEAs.

Annual Reporting and Recordkeeping Hour Burden:

Responses: 165.

Burden Hours: 330.

Abstract: Rehabilitation Services Administration (RSA) training grants provide stipends to "RSA Scholars" in order to train skilled rehabilitation personnel. Grantees are required to "track" scholars, relative to the "payback" provision in the Rehabilitation Act. Data collection is reported annually to RSA in order to monitor performance and report progress to Congress.

[FR Doc. 97–13413 Filed 5–21–97; 8:45 am]

BILLING CODE 4000–01–M

DEPARTMENT OF ENERGY

Surplus Plutonium Disposition Environmental Impact Statement

AGENCY: Department of Energy

ACTION: Notice of intent

SUMMARY: The Department of Energy (DOE) announces its intent to prepare an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA) on the disposition of United States' weapons-usable surplus plutonium. This EIS is tiered from the Storage and Disposition of Weapons-Usable Fissile Materials Programmatic Environmental Impact Statement (Storage and Disposition PEIS) (DOE/EIS–0229), issued in December 1996, and the associated Record of Decision (62 FR 3014), issued on January 14, 1997.

The EIS will examine reasonable alternatives and potential environmental impacts for the proposed siting, construction, and operation of three types of facilities for plutonium disposition. The first is a facility to disassemble and convert pits (a nuclear weapons component) into plutonium oxide suitable for disposition. As explained in the January 1997 Record of Decision, this pit disassembly and conversion facility will be located at either DOE's Hanford Site, Idaho National Engineering and Environmental Laboratory (INEEL), Pantex Plant, or Savannah River Site (SRS). The second is a facility to immobilize surplus plutonium in a glass or ceramic form for disposition in a geologic repository pursuant to the Nuclear Waste Policy Act. This second facility will be located at either Hanford or SRS, and include a collocated capability to convert non-pit plutonium materials into a form suitable for immobilization. The EIS will discuss various technologies for immobilization. The third type of facility would fabricate plutonium oxide into mixed oxide (MOX) fuel. The MOX fuel fabrication facility would be located at either Hanford, INEEL, Pantex or SRS. MOX fuel would be used in existing commercial light water reactors in the United States, with subsequent disposal of the spent fuel in accordance with the Nuclear Waste Policy Act. Some MOX fuel could also be used in Canadian deuterium uranium (CANDU) reactors depending upon negotiation of a future international agreement between Canada, Russia, and the United States. The EIS will also discuss decommissioning and decontamination (D&D) of the three facilities.

This Notice of Intent describes the Department's proposed action, solicits public input, and announces the schedule for the public scoping meetings.

DATES: Comments on the proposed scope of the Surplus Plutonium Disposition EIS (SPD EIS) are invited from the public. To ensure consideration in the draft EIS, written comments should be postmarked by July 18, 1997. Comments received after that date will be considered to the extent practicable. DOE will hold interactive scoping meetings near sites that may be affected by the proposed action to discuss issues and receive oral and written comments on the scope of the EIS. The locations, dates and times for these public meetings are included in the Supplementary Information section of this notice and will be announced by additional appropriate means.

ADDRESSES: Comments and questions concerning the plutonium disposition program can be submitted by calling (answering machine) or faxing them to the toll free number 1–800–820–5156, or by mailing them to: Bert Stevenson, NEPA Compliance Officer, Office of Fissile Materials Disposition, U.S. Department of Energy, Post Office Box 23786, Washington, DC 20026–3786.

Comments may also be submitted electronically by using the Office of Fissile Materials Disposition's web site. The address is http://web.fie.com/fedix/fisl.html.

FOR FURTHER INFORMATION CONTACT: For general information on the DOE NEPA process, please contact: Carol Borgstrom, Director, Office of NEPA Policy and Assistance, U.S. Department of Energy 1000, Independence Avenue, S.W., Washington, DC 20585, 202–586–4600 or 1–800–472–2756.

SUPPLEMENTARY INFORMATION:

Background

The Storage and Disposition Programmatic Environmental Impact Statement (PEIS) analyzed the potential environmental consequences of alternatives for the long-term storage (up to 50 years) of weapons-usable fissile materials and the disposition of surplus plutonium. Surplus plutonium for disposition refers to that weapons-usable plutonium that the President has declared surplus to national security needs, as well as such plutonium that may be declared surplus in the future. As stated in the Record of Decision for the Storage and Disposition PEIS, the Department decided to pursue a hybrid approach that allows immobilization of surplus plutonium in glass or ceramic form and burning of some of the surplus plutonium as MOX fuel in existing, commercial light water reactors in the United States (and potentially in Canadian Deuterium Uranium (CANDU) reactors in Canada depending on future international agreement). The Department decided that the extent to which either or both of these disposition approaches would ultimately be deployed would depend in part upon future NEPA review, although the Department committed to immobilize at least 8 metric tons (tonnes) of currently declared surplus plutonium and reserved the option of immobilizing all surplus weapons plutonium. In the Record of Decision for the Storage and Disposition PEIS, the Department further decided to: (1) locate the immobilization facility (collocated with a plutonium conversion facility) at either Hanford or SRS; (2) locate a potential MOX fuel fabrication facility at either Hanford, INEEL, Pantex, or SRS; (3) locate a pit disassembly and conversion facility at either Hanford, INEEL, Pantex, or SRS; and (4) determine the specific technology for immobilization based in part on this follow-on disposition EIS.

The processes, materials and technologies involved in surplus plutonium disposition are depicted in Figure 1.

BILLING CODE 6450-01-P

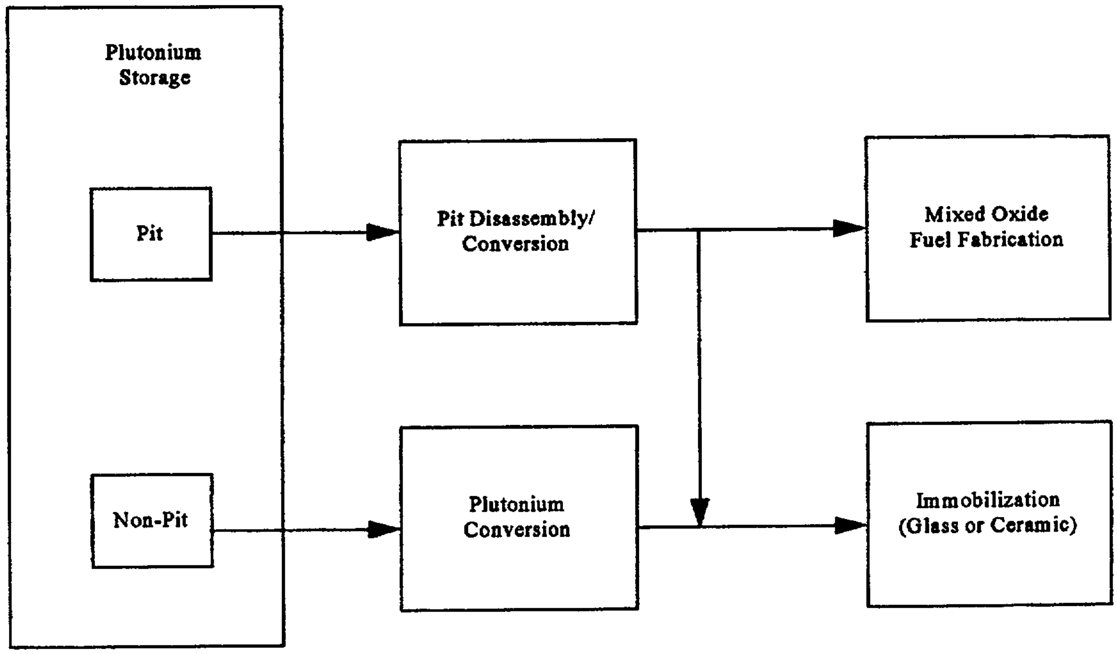

Figure 1. Plutonium Disposition Processes in DOE's Proposed Action

BILLING CODE 6450-01-C

Proposed Action

The Department proposes to determine whether to continue with both the immobilization and MOX approaches for surplus plutonium disposition and if so, to site, construct, and operate and ultimately D&D three types of facilities for plutonium disposition at one or more of four DOE sites, as follows:

- A collocated non-pit plutonium conversion and immobilization facility at either Hanford, near Richland, Washington, or SRS, near Aiken, South Carolina, with sub-alternatives for the technology and facilities used to form the immobilized plutonium.
- A pit disassembly/conversion facility at either Hanford; SRS; INEEL, near Idaho Falls, Idaho; or the Pantex Plant, near Amarillo, Texas.
- A MOX fuel fabrication facility at either Hanford, INEEL, Pantex, or SRS, with sub-alternatives for fabrication of Lead Test Assemblies for use in fuel qualification demonstrations.

Construction of these facilities would be on previously disturbed land and could include the modification of existing facilities where practicable, to reduce local environmental impacts, reduce costs, and shorten schedules. In the pit disassembly and conversion facility, the Department proposes to disassemble surplus pits and convert the plutonium in them to an unclassified oxide form suitable for disposition. The Department also proposes to convert most non-pit plutonium materials to plutonium oxide at the plutonium conversion facility, which will be collocated with the immobilization facility.

Plutonium Disposition Decisions

The Department expects to make the following decisions based upon the results of this EIS and other information and considerations:

- Whether to construct and operate collocated plutonium conversion and immobilization facilities, and if so, where (including selection of the specific immobilization technology).
- Whether to construct and operate a pit disassembly/conversion facility, and if so, where.
- Whether to construct and operate a MOX fuel fabrication facility, and if so, where (including selection of the site for fabrication of Lead Test Assemblies).

The exact extent to which the MOX approach would ultimately be deployed will depend on a number of factors, in addition to environmental impacts. These are likely to include cost, contract negotiations, and international agreements.

Alternatives

No Action

A No Action alternative will be analyzed (Alternative 1) in the SPD EIS. Implementation of the No Action alternative would mean that disposition would not occur, and surplus weapons-usable plutonium, including pits, metals and oxides, would remain in storage in accordance with the Storage and Disposition PEIS Record of Decision.

Plutonium Disposition Alternatives

The SPD EIS will analyze alternatives for the siting, construction and operation of the three facilities at various candidate sites as described in the Proposed Action. These facilities would be designed so that they could collectively disposition surplus plutonium (existing and future) over their operating lives. Although the exact quantity of plutonium that may be declared surplus over time is not known, for purposes of analysis a nominal 50 tonnes of surplus plutonium will be used for assessing the environmental impacts of plutonium disposition activities at the various candidate sites. Under alternatives involving the "hybrid" (immobilization and MOX) approach selected in the Storage and Disposition Record of Decision, the SPD EIS will analyze the same distribution of surplus plutonium that was analyzed in the Storage and Disposition PEIS, which is fabrication of pits and pure plutonium metal or oxide (approximately 33 tonnes) into MOX fuel, and immobilization of the remaining non-pit plutonium (approximately 17 tonnes). The Record of Decision on the Storage and Disposition PEIS states, "DOE will immobilize at least eight tonnes of currently declared surplus plutonium materials that DOE has already determined are not suitable for use in MOX fuel." Since the issuance of that decision, the Department has further determined that a total of about 17 tonnes of surplus plutonium is not suitable for use in MOX fuel without extensive processing. Thus, an alternative for fabricating all surplus plutonium into MOX fuel will not be analyzed. However, converting the full 50 tonnes of surplus plutonium into an immobilized form will be analyzed as a reasonable alternative.

Under each disposition approach, DOE could in principle locate one, two, or all three facilities at a candidate site. However, locating one facility at each of three sites would mean conducting disposition activities at three widely separated locations around the country. This would substantially increase transportation cost, unnecessarily increase exposure of workers and the public, and increase transportation risks, without any apparent compensating benefit. Therefore, the Department is proposing to consider only alternatives that locate two or more facilities at one site, with the possibility of one facility at a separate site. Further, certain combinations of facilities and sites are not being considered as reasonable alternatives, because they would also substantially increase transportation cost, unnecessarily increase exposure to workers and the public, and increase transportation risks, without any apparent compensating benefit.

Based on the above considerations and the candidate site selections in the Storage and Disposition Record of Decision, the following alternatives have been developed in addition to the No Action alternative. Table 1 summarizes the alternatives by site. Alternatives 2 through 10 (see Table 1) would involve immobilization of approximately 17 tonnes of low purity (non-pit) plutonium, and fabrication of approximately 33 tonnes of high purity plutonium (pits and plutonium metal) into MOX fuel. The differences among alternatives 2 through 10 are the locations of the proposed facilities. Alternatives 11 and 12 would involve immobilization of all 50 tonnes of plutonium at either Hanford or SRS.

The Department has identified existing facilities that can be modified for use in plutonium disposition at various candidate sites. A summary of the existing and new facilities (shown in the parentheses in Table 1) to be used in the SPD EIS analyses is given in Table 1, where FMEF is the Fuel and Materials Examination Facility, FPF is the Fuel Processing Facility, and DWPF is the Defense Waste Processing Facility.

Lead Test Assemblies

With respect to the MOX alternatives, the Department would qualify MOX fuel forms for use in existing commercial reactors. DOE will analyze two sub-alternatives for the fabrication of the lead test assemblies needed to qualify the fuel. In one sub-alternative, the lead test assemblies would be fabricated in the United States. Fabrication in the United States would involve constructing a pilot capability in conjunction with the fuel fabrication facility. Therefore, the potential sites include the candidate sites for the fuel fabrication facility (i.e., Hanford, INEEL, Pantex, and SRS). The pilot capability could also be located in an existing small facility at the Los Alamos National Laboratory (LANL). The

second alternative would be for fabrication in existing European facilities; three potential fabrication sites exist (Belgium, France, and the United Kingdom) that would allow fabrication of the Lead Test Assemblies sooner than with any facility under the United States alternative.

TABLE 1.—DISPOSITION ALTERNATIVES

Alternative/Site/Disposition Facility				
Alt. No.	Pit disassembly	MOX plant	Plutonium conversion and immobilization	Amounts of plutonium
1			No Action	
2	Hanford (FMEF)	Hanford (FMEF)	Hanford (FMEF)	17t Immobilization / 33t MOX.
3	SRS (New)	SRS (New)	SRS (New, or Bldg 221F, and DWPF)	17t Immobilization / 33t MOX.
4	Pantex (New)	Hanford (FMEF)	Hanford (FMEF)	17t Immobilization / 33t MOX.
5	Pantex (New)	SRS (New)	SRS (New, or Bldg 221F, and DWPF)	17t Immobilization / 33t MOX.
6	Hanford (FMEF)	Hanford (FMEF)	SRS (New, or Bldg 221F, and DWPF)	17t Immobilization / 33t MOX.
7	INEEL (FPF)	INEEL (New)	SRS (New, or Bldg 221F, and DWPF)	17t Immobilization / 33t MOX.
8	INEEL (FPF)	INEEL (New)	Hanford (FMEF)	17t Immobilization / 33t MOX.
9	Pantex (New)	Pantex (New)	SRS (New, or Bldg 221F, and DWPF)	17t Immobilization / 33t MOX.
10	Pantex (New)	Pantex (New)	Hanford (FMEF)	17t Immobilization / 33t MOX.
11	Hanford (FMEF)	N/A	Hanford (FMEF)	50t Immobilization / 0t MOX.
12	SRS (New)	N/A	SRS (New, or Bldg 221F, and DWPF)	50t Immobilization / 0t MOX.

Immobilization Technology

The Record of Decision on the Storage and Disposition PEIS stated, "Because there are a number of technology variations that could be used for immobilization, DOE will also determine the specific immobilization technology based upon the follow-on EIS * * *" (i.e., the SPD EIS). The technologies to be considered are those identified as variants in the Storage and Disposition PEIS.

Preferred Alternative

For immobilization, the Department prefers to use the "can-in-canister" technology at the DWPF at SRS. Under the can-in-canister approach, cans containing plutonium in glass or ceramic form would be placed in DWPF canisters, which would be filled with borosilicate glass containing high-level waste.

Classified Information

The Department plans to prepare the SPD EIS as an unclassified document with a classified appendix. The classified information in the SPD EIS will not be available for public review. However, the classified information will be considered by DOE in reaching a decision on the disposition of surplus plutonium. DOE will provide as much information as possible in unclassified form to assist public understanding and comment.

Research and Development Activities

The Department recently announced its intent to prepare two environmental assessments (EAs) for proposed research and development activities that DOE would conduct prior to completion of the SPD EIS and ROD. One EA will analyze the potential environmental impacts of a proposed pit disassembly and conversion integrated systems test at LANL. In addition, to further the purposes of NEPA, this EA will describe other research and development activities currently on-going at various sites, including work related to immobilization and to MOX fuel fabrication. The other EA will be prepared for the proposed shipment of special MOX fuel to Canada for an experiment involving the use of United States and Russian fuel in a Canadian test reactor, for development of fuel for the CANDU reactors. This EA will analyze the prior and future fabrication and proposed shipment of the fuel pellets needed for the experiment.

Relationships With Other DOE NEPA Activities

In addition to the SPD EIS and the EAs discussed above, the Department is currently conducting NEPA reviews of other activities that have a potential relationship with the SPD EIS. They include:

1. *Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage and Disposal of Radioactive and Hazardous Waste* (DOE/EIS–0200D) (Draft issued: September 22, 1995; 60 FR 49264).

2. *Management of Certain Plutonium Residues and Scrub Alloy Stored at the Rocky Flats Environmental Technology Site EIS* (Notice of Intent to Prepare an Environmental Impact Statement: November 19, 1996; 61 FR 58866).

Invitation To Comment

DOE invites comments on the scope of this EIS from all interested parties, including potentially affected Federal, State, and local agencies, and Indian tribes. Comments can be provided by any of the means listed in the Address Section of this notice and by providing oral and written comments at the scoping meetings.

The Department is requesting, by separate correspondence, that Federal agencies [1] desiring to be designated as cooperating agencies on the SPD EIS inform DOE by July 18, 1997.

Scoping Meetings

Public scoping meetings will be held near each site that may be affected by the proposed action. The interactive scoping meetings will provide the public with the opportunity to present comments, ask questions, and discuss concerns regarding plutonium disposition activities with DOE officials, and for the Department to receive oral and written comments on the scope of the EIS. Written and oral comments will be given equal weight in the scoping process. Input from the scoping meetings along with comments received by other means (phone, mail, fax, web-site) will be used by the Department in refining the scope of the EIS. The locations and dates for these public meetings are as shown below. All meetings will consist of two sessions (1:00 pm to 4:00 pm and 6:00 pm to 9:00 pm).

Hanford Site:

July 1, 1997
Shilo Inn
50 Comstock
Richland, WA 99352
509–946–4661

[1] Arms Control and Disarmament Agency; Department of Defense; Department of State; Environmental Protection Agency; and Nuclear Regulatory Commission.

Idaho National Engineering and Environmental Laboratory

June 10, 1997
Shilo Inn
780 Lindsay Boulevard
Idaho Fall, ID 83402
208–523–0088

Pantex Plant

June 12, 1997
Radisson Inn Airport
7909 I–40 East at Lakeside
Amarillo, TX 79104
806–373–3303

Savannah River Site

June 19, 1997
North Augusta Community Center
495 Brookside Avenue
North Augusta, SC 29841
803–441–4290

Advanced registration for the public meetings is requested but not required. Please call 1–800–820–5134 and leave your name and the location of the meeting(s) you plan to attend. This information will be used to determine the size and number of rooms needed for the meeting.

Scoping Meeting Format:

The Department intends to hold a plenary session at the beginning of each scoping meeting in which DOE officials will more fully explain the framework for the plutonium disposition program, the proposed action, preliminary alternatives for accomplishing the proposed action and public participation in the NEPA process. Following the plenary session, the Department intends to discuss relevant issues in more detail, answer questions, and receive comments. Each scoping meeting for the Surplus Plutonium Disposition EIS will have two sessions, with each session lasting approximately three to four hours.

Issued in Washington, DC this 16 day of May, 1997, for the United States Department of Energy.

Peter N. Brush,
Principal Deputy Assistant Secretary, Environment, Safety and Health.

[FR Doc. 97–13494 Filed 5–21–97; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. RP97–165–003]

Alabama-Tennessee Natural Gas Company; Notice of Compliance Filing

May 16, 1997.

Take notice that on May 12, 1997, Alabama-Tennessee Natural Gas Company (Alabama-Tennessee) tendered for filing the tariff sheets listed in Appendix A to the filing, to be effective June 1, 1997.

Alabama-Tennessee states that the tariff sheets are submitted in compliance with Order No. 587 and the Commission's order issued on May 1, 1997 FERC ¶61,117).

Any person desiring to protest said filing should file a protest with the Federal Energy Regulatory Commission, 888 First Street, NE., Washington, DC 20426, in accordance with Section 385.211 of the Commission's Regulations. All such protests must be filed as provided in Section 154.210 of the Commission's Regulations. Protests will be considered by the Commission in determining appropriate action to be taken, but will not serve to make protestants parties to the proceedings. Copies of this filing are on file with the Commission and are available for public inspection.

Lois D. Cashell,
Secretary.

[FR Doc. 97–13441 Filed 5–21–97; 8:45 am]

BILLING CODE 6717–01–M

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. ES97–32–000]

Citizens Utilities Company; Notice of Application

May 16, 1997.

Take notice that on May 9, 1997, Citizens Utilities Company (Applicant) filed an application with the Federal Energy Regulatory Commission under § 204 of the Federal Power Act requesting orders (a) extending the effectiveness of the order in Docket No. ES95–34–000 until the close of business on June 30, 1997, and (b) authorizing the issuance, from time to time, of up to 50,000,000 shares of common stock as stock dividends on shares of its outstanding common stock during a two-year period ending July 1, 1999.

Any person desiring to be heard or to protest said application should file a motion to intervene or protest with the Federal Energy Regulatory Commission, 888 1st Street, NE, Washington, D.C. 20426 in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). All such motions or protests should be filed on or before May 20, 1997. Protests will be considered by the Commission in determining the appropriate action to be taken, but will not serve to make the protestants parties to the proceeding. Any person wishing to become a party must file a motion to intervene. Copies of this filing are on file with the Commission and are available for public inspection.

Lois D. Cashell,
Secretary.

[FR Doc. 97–13437 Filed 5–21–97; 8:45 am]

BILLING CODE 6717–01–M

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. CP96–712–000]

Discovery Gas Transmission LLC; Notice of Site Visit

May 16, 1997.

On May 22, 1997, beginning at 9:30 a.m., the Office of Pipeline Regulation (OPR) staff will conduct a compliance inspection of the onshore facilities of the Discovery Gas Transmission LLC Pipeline Construction Project in Lafourche Parish, Louisiana, beginning at the Larose Gas Processing Plant site (off state highway 24) in Larose.

All parties may attend. Those planning to attend must provide their own transportation (an air boat is required for most of the pipeline route).

For further information, please contact Paul McKee at (202) 208–1088.

Warren C. Edmunds,
Acting Director, Office of Pipeline Regulation.

[FR Doc. 97–13434 Filed 5–21–97; 8:45 am]

BILLING CODE 6717–01–M

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. ER97–2846–000]

Florida Power Corporation; Notice of Filing

May 16, 1997.

Take notice that on May 5, 1997, Florida Power Corporation (Florida Power) filed an Application for an Order Approving Market-Based Rates for Sales Outside of Florida. In its Application, Florida Power requests authorization to engage in wholesale, bulk power sales outside of Florida at market-determined prices, including sales not involving Florida Power's generation or transmission. Florida Power requests an effective date of 60 days after this filing, or the date on which the Commission issues an order approving Florida Power's application for market-based rates, whichever is earlier.

A.3 AMENDED NOTICE OF AVAILABILITY—SURPLUS PLUTONIUM DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT, 45-DAY NEPA REVIEW PERIOD

Dated: July 16, 1998.

Richard D. Wilson,

Acting Assistant Administrator.

[FR Doc. 98-19832 Filed 7-23-98; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-5494-1]

Environmental Impact Statements and Regulations; Availability of EPA Comments

Availability of EPA comments prepared July 6, 1998 Through July 10, 1998 pursuant to the Environmental Review Process (ERP), under Section 309 of the Clean Air Act and Section 102(2)(c) of the National Environmental Policy Act as amended. Requests for copies of EPA comments can be directed to the Office of Federal Activities AT (202) 564-5076. An explanation of the ratings assigned to draft environmental impact statements (EISs) was published in FR dated April 10, 1998 (63 FR 17856).

Draft EISs

ERP No. D-FRC-J05078-MT Rating EO2, Missouri-Madison Hydroelectric (FERC No. 2188) Project, Issuing a New licence (Relicense) for Nine Dams and Associated Facilities, MT.

Summary: EPA expressed environmental objections regarding FERC's rejection of Section 10 (j) recommendations; inadequacies in the analysis of thermal issues; the potential for impairment to the beneficial uses; and the rejection of some State Clean Water Act 401 conditions. EPA believes FERC should ensure license conditions that require hydropower operations be done in the best practicable manner to minimize harm to beneficial uses. License conditions also need to incorporate thermal success criteria and appropriate language to reopen the license if success criteria are not adequately attained by proposed mitigation. EPA believes additional information is needed to fully assess and mitigate all potential impacts of the management actions.

ERP No. D-IBR-J28020-UT Rating EO2, Narrows Dam and Reservoir Project, Construction of Supplemental Water Supply for Agricultural and Municipal Water Use, Gooseberry Creek, Sanpete and Carbon Counties, UT.

Summary: EPA expressed environmental objections to the proposed project, and stated that it believes additional, less damaging alternatives are available which would reduce the project related impacts. EPA requested additional detail on mitigation, project impacts, and alternatives.

ERP No. D-IBR-K39045-CA Rating EC2, Programmatic EIS—Central Valley Project Improvement Act (CVPIA) of 1992 Implementation, Central Valley, Trinity, Contra Costa, Alameda, Santa Clara and San Benito Counties, CA.

Summary: EPA expressed strong support for the overall intent of CVPIA implementation; alternatives which provide a strong two-pronged commitment to ecosystem restoration and flexible, efficient use of developed water supplies; and use of CVPIA tools to provide efficient management of existing, developed water supplies. EPA requested additional information and explanation on the range of implementation, relationship between PEIS and subsequent rules and regulations, and to the relationship of the PEIS to interim implementation programs and the "Garamendi process"

ERP No. DR-DOI-K40222-TT Rating EO2, Palau Compact Road Construction, Revision to Major Transportation and Communication Link on the Island of Babeldaob, Implementation, Funding, Republic of Palau, Babeldaob Island, Trust Territory of the Pacific Islands.

Summary: EPA expressed environmental objections because the RDEIS did not provide sufficient documentation that all practicable means have been undertaken by the Corps and the Republic of Palau to avoid and minimize adverse impacts associated with placing dredged or fill material in wetlands and other aquatic resources protected under CWA Section 404.

Final EISs

ERP No. F-AFS-L65285-AK, Chasina Timber Sale, Harvesting Timber and Road Construction, Tongass National Forest, Craig Ranger District, Ketchikan Administrative Area, AK.

Summary: Review of the Final EIS was not deemed necessary. No formal comment letter was sent to the preparing agency.

ERP No. F-AFS-L65300-AK, Canal Hoya Timber Sale, Implementation, Stikine Area, Tongass National Forest, Value Comparison Unit (VCU), AK.

Summary: Review of the Final EIS was not deemed necessary. No formal comment letter was sent to the preparing agency.

Dated: July 21, 1998.

William D. Dickerson,

Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. 98-19884 Filed 7-23-98; 8:45 am]

BILLING CODE 6560-50-U

ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-5493-9]

Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information (202) 564-7167 OR (202) 564-7153.

Weekly receipt of Environmental Impact Statements

Filed July 13, 1998 Through July 17, 1998

Pursuant to 40 CFR 1506.9

EIS No. 980269, Draft EIS, AFS, ID, Eagle Bird Project Area, Timber Harvesting and Road Construction, Idaho Panhandle National Forests, St. Joe Ranger District, Shoshone County, ID, Due: September 07, 1998, Contact: Cameo Flood (208) 245-4517.

EIS No. 980270, Final EIS, FHW, NC, US 70 Improvements Project, I-40 to the Intersection of US 70 and US 70 Business, Funding and COE Section 404 Permit, Wake and Johnston Counties, NC, Due: August 24, 1998, Contact: Nicholas L. Graf, P.E. (919) 733-7842 ext. 260.

EIS No. 980271, Draft EIS, FHW, IN, US 231 Transportation Project, New Construction from CR-200 N to CR-1150'1, Funding, Right-of-Way Permit and COE Section 404 Permit, Spencer and Dubois Counties, IN, Due: October 15, 1998, Contact: Douglas N. Head (317) 226-7487.

EIS No. 980272, Draft EIS, NOA, MS, Grand Bay National Estuarine Research Reserve (NERR), Designation, To Conduct Research, Educational Project and Construction, East of the City of Biloxi, Jackson County, MS, Due: September 07, 1998, Contact: Stephanie Thornton (301) 713-3125 ext. 110

EIS No. 980273, Draft Supplement, FTA, PR, Tren Urbano Transit Project, Updated Information for the Minillas Extension, Construction and Operation, San Juan Metropolitan Area, Funding, NPDES Permit, US Coast Guard Bridge Permit and COE Section 10 and 404 Permits, PR, Due: September 07, 1998, Contact: Alex McNeil (404) 562-3511.

EIS No. 980274, Final EIS, FRC, NB, Kingsley Dam Project (FERC. No. 1417) and North Platte/Keystone Diversion Dam (FERC. No. 1835) Hydroelectric Project, Application for Licenses, Near the confluence of the North/South Platte Rivers, Keith, Lincoln, Garden, Dawson and Gasper Counties, NB, August 24, 1998, Contact: Frankie Green (202) 501-7704.

EIS No. 980275, Draft EIS, FAA, NC, Charlotte/Douglas International Airport, Construction and Operation, New Runway 17/35 (Future 18L/36R Associated Taxiway Improvements, Master Plan Development, Approval Airport Layout Plan (ALP) and COE Section 404 Permit, Mecklenburg County, NC, Due: September 07, 1998, Contact: Thomas M. Roberts (404) 305–7153.

EIS No. 980276, Draft EIS, BOP, PA, Greater Scranton Area, United States Penitentiary (USP) Construction and Operation, Site Selection, Lackawanna and Wayne Counties, PA, Due: September 8, 1998, Contact: David J. Dorworth (202) 514–6470.

EIS No. 980277, Draft EIS, DOE, ID, Advanced Mixed Waste Treatment Project, Construction and Operation, Site Selected, Idaho National Engineering and Environmental Laboratory (INEEL), Eastern Snake River Plain, ID, Due: September 11, 1998, Contact: John Medema (208) 526–1407.

EIS No. 980278, Final EIS, AFS, ID, North Round Valley Timber Sales and Road Construction, Implementation, Payette National Forest, New Meadows Ranger District, Adams County, ID, Due: August 24, 1998, Contact: Kimberly Brandel (208) 347–0300.

Amended Notices

EIS No. 980171, Draft EIS, COE, TX, Dallas Floodway Extension, Implementation, Trinity River Basin, Flood Damage Reduction and Environmental Restoration, Dallas County, TX, Due: August 14, 1998, Contact: Gene T. Rice, Jr. (817) 978–2110. Published FR 05–15–98—Review Period extended.

EIS No. 980267, Draft EIS, DOE, CA, NM, TX, ID, C, WA, Surplus Plutonium Disposition (DOE/EIS–0283) for Siting, Construction and Operation of three facilities for Plutonium Disposition, Possible Sites Hanford, Idaho National Engineering and Environmental Laboratory, Pantex Plant and Savannah River, CA, ID, NM, SC, TX and WA, Due: September 16, 1998, Contact: G. Bert Stevenson (202) 586–5368. This EIS was inadvertently omitted from the 07–17–98 Federal Register. The official 45 days NEPA review period is calculated from 07–17–98.

Dated: July 21, 1998.

William D. Dickerson,

Director, NEPA Compliance Division, Office of Federal Activities.

[FR Doc. 98–19885 Filed 7–23–98; 8:45 am]

BILLING CODE 6560–50–P

FEDERAL COMMUNICATIONS COMMISSION

Notice of Public Information Collection(s) Submitted to OMB for Review and Approval

July 17, 1998.

SUMMARY: The Federal Communications Commissions, as part of its continuing effort to reduce paperwork burden invites the general public and other Federal agencies to take this opportunity to comment on the following information collection, as required by the Paperwork Reduction Act of 1995, Public Law 104–13. An agency may not conduct or sponsor a collection of information unless it displays a currently valid control number. No person shall be subject to any penalty for failing to comply with a collection of information subject to the Paperwork Reduction Act (PRA) that does not display a valid control number. Comments are requested concerning (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimate; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

DATES: Written comments should be submitted on or before August 24, 1998. If you anticipate that you will be submitting comments, but find it difficult to do so within the period of time allowed by this notice, you should advise the contact listed below as soon as possible.

ADDRESSES: Direct all comments to Les Smith, Federal Communications Commissions, Room 234, 1919 M St., N.W., Washington, DC 20554 or via internet to lesmith@fcc.gov.

FOR FURTHER INFORMATION CONTACT: For additional information or copies of the information collections contact Les Smith at 202–418–0217 or via internet at lesmith@fcc.gov.

SUPPLEMENTARY INFORMATION:

OMB Approval Number: 3060–0089.

Title: Application for Land Radio Station Authorization in the Maritime Services.

Form No.: FCC 503.

Type of Review: Revision of a currently approved collection.

Respondents: Individuals or households; Businesses or other for-profit entities; Not-for-profit institutions; State, Local or Tribal Government.

Number of Respondents: 700.

Estimated Time Per Response: 45 minutes.

Frequency of Response: On occasion reporting requirements.

Cost to Respondents: $76,224 ($115 application fee for a new station; $90 application fee to modify an existing land station; postage).

Total Annual Burden: 525 hours.

Needs and Uses: FCC Rules require that applicants file FCC Form 503 when applying for a new station or when modifying an existing land radio station in the Maritime Mobile Service or an Alaska Public Fixed Station. This form is required by the Communications Act of 1934, as amended, International Treaties, and FCC Rules—47 CFR Parts 1.922, 80.19, and 80.29. The data collected are necessary to evaluate a request for station authorization in the Maritime Services or an Alaska Public Fixed Station, to issue licenses, and to update the database to allow proper management of the frequency spectrum. FCC Form 503 is being revised to collect Antenna Structure Registration Number/ or FCC Form 854 File Number, and Internet or E-mail address of the applicant. Due to changes in the antenna clearance procedures, we no longer need to collect certain antenna information, such as the name of the nearest aircraft landing area and the distance and the direction to the nearest runway. The instructions are being edited accordingly.

Federal Communications Commission.

Magalie Roman Salas,

Secretary.

[FR Doc. 98–19715 Filed 7–23–98; 8:45 am]

BILLING CODE 6712–01–P

FEDERAL COMMUNICATIONS COMMISSION

Notice of Public Information Collection(s) Submitted to OMB for Review and Approval

July 18, 1998.

SUMMARY: The Federal Communications Commission, as part of its continuing effort to reduce paperwork burden invites the general public and other Federal agencies to take this opportunity to comment on the following information collection, as required by the Paperwork Reduction Act of 1995, Pub. L. 104–13. An agency may not conduct or sponsor a collection of information unless it displays a currently valid control number. No person shall be subject to any penalty

A.4 AMENDED NOTICE OF AVAILABILITY—SURPLUS PLUTONIUM DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT, 60-DAY NEPA REVIEW PERIOD

Burden Statement: The annual burden for this collection of information is estimated to average fourteen work weeks of professional effort at $840 per week, and seven work weeks of clerical support at $360 per week for the government. Approximately 210 requests may be made annually with an average of one hour spent on each request by both entities. The total costs are attributed to labor hours and overhead since there is no capital investment required for this collection of information. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instruction; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instruction and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection information; and transmit or otherwise disclose the information.

Dated: August 3, 1998.

Robert Perciasepe,

Assistant Administrator for Air and Radiation.

[FR Doc. 98-21210 Filed 8-6-98; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[FRL-6139-8]

Agency Information Collection Activities: Comment Request Up for Renewal

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: In compliance with the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), this document announces that EPA is planning to submit the following continuing Information Collection Request (ICR) to the Office of Management and Budget (OMB): EPA Worker Protection Standard for Hazardous Waste Operations and Emergency Response, EPA ICR #1426.03, OMB Control #2050-0105, Expiration 1/31/99. Before submitting ICR to OMB and Budget (OMB) for review and approval, EPA is soliciting comments on specific aspects of the collection as described below.

DATES: Comments must be submitted on or before October 3, 1998.

ADDRESSES: Office of Solid Waste and Emergency Response, 401 M. Street, SW, MS 5101, Washington, DC 20460.

Remit Comments to: Sella M. Burchette, S EPA/ERT, 2890 Woodbridge Ave., Blg 18, MS 101, Edison, NJ 08837-3679.

To obtain a copy at no charge, please contact Sella Burchette at (732) 321-6726/FAX: (732) 321-6724/or electronically at burchette.sella@epamail.epa.gov.

SUPPLEMENTARY INFORMATION:

Affected entities: Entities affected by this action are those State and local employees engaged in hazardous waste operations and emergency response in the 27 States that do not have Occupational Safety and Health Administration (OSHA) approved State plans.

Title: EPA Worker Protection Standard for Hazardous Waste Operations and Emergency Response, EPA ICR #1426.03, OMB Control #2050-0105, Expiration 1-31-99. This is a request for renewal, without change, of a currently approved collection.

Abstract: Section 126 (f) of the Superfund Amendments and Reauthorization Act of 1986 (SARA) require EPA to set worker protection standards for State and local employees engaged in hazardous waste operations and emergency response in the 27 States that do not have Occupational Safety and Health Administration approved State plans. The EPA coverage, required to be identical to the OSHA standards, extends to three categories of employees: those in clean-ups at uncontrolled hazardous waste sites, including corrective actions at Treatment, Storage and Disposal (TSD) facilities regulated under the Resource Conservation and Recovery Act (RCRA); employees working at routine hazardous waste operations at RCRA TSD facilities; and employees involved in emergency response operations without regard to location. This ICR renews the existing mandatory recordkeeping collection of ongoing activities including monitoring of any potential employee exposure at uncontrolled hazardous waste site, maintaining records of employee training, refresher training, medical exams, and reviewing emergency response plans.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9 and 48 CFR Chapter 15.

The EPA would like to solicit comments to:

(i) evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;

(ii) evaluate the accuracy of the agency's estimates of the burden of the proposed collection of information;

(iii) enhance the quality, utility and clarity of the information to be collected; and

(iv) minimize the burden of the collection of information on those who are to respond, including though the use of appropriate automated electronic, mechanical, or other technology collection techniques or other forms of information technology, e.g. permitting electronic submission of responses.

Burden Statement: The annual recordkeeping burden for this collection is estimated to average 10.64 hours per site or event. The estimated number of respondents is approximated at 100 RCRA regulated TSD facilities or uncontrolled hazardous waste sites; 23,900 State and local police departments, fire departments or hazardous materials response teams. The estimated total burden hours on respondents: 255,427. The frequency of collection: continuous maintenance or records.

Send comments regarding these matters, or any other aspect of the information collection, including suggestions for reducing the burden, to the address listed above.

Dated: July 30, 1998.

Larry Reed,

Acting Office Director, Office of Emergency and Remedial Response.

[FR Doc. 98-21211 Filed 8-6-98; 8:45 am]

BILLING CODE 6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-5494-3]

Environmental Impact Statements; Notice of Availability

RESPONSIBLE AGENCY: Office of Federal Activities, General Information (202) 564-7167 OR (202) 564-7153.

Weekly receipt of Environmental Impact Statements, Filed July 27, 1998 Through July 31, 1998, Pursuant to 40 CFR 1506.9.

EIS No. 980287, DRAFT EIS, COE, CA, Los Angeles County Drainage Area

(LACDA) Water Conservation and Supply and Santa Fe-Whittier Narrows Dams Feasibility Study, Implementation, Los Angeles County, CA, Due: September 21, 1998, Contact: Ms. Debbie Lamb (213) 452-3798.

EIS No. 980288, FINAL EIS, AFS, CA, Eight Eastside Rivers, Wild and Scenic River Study, Suitability or Nonsuitability, Tahoe National Forest and Lake Tahoe Management Unit, Land and Resource Management Plans, Alpine, El Dorado, Placer, Nevada and Sierra Counties, CA, Due: September 8, 1998, Contact: Phil Horning (530) 478-6210.

EIS No. 980289, FINAL EIS, FHW, TX, Loop 49 Southern Section Construction, TX-155 to TX-110, Funding, Tyler, Smith County, TX, Due: September 8, 1998, Contact: Walter C. Waidelich (512) 916-5988.

EIS No. 980290, DRAFT EIS, NPS, CA, Redwood National and State Parks General Management Plan, Implementation, Humboldt and Del Norte Counties, CA, Due: October 9, 1998, Contact: Alan Schmierer (414) 427-1441.

EIS No. 980291, DRAFT EIS, FHW, MN, TH-23 Reconstruction, MN-TH-22 in Richmond extending through the Cities of Richmond, Cold Spring and Rockville to I-94, Funding, Stearns County, MN, Due: September 22, 1998, Contact: Cheryl Martin (612) 291-6120.

EIS No. 980292, DRAFT EIS, FHW, MO, MO-63 Corridor Project, Transportation Improvement extending from south of the Phelps/Maries County Line and South of Route W near Vida, Funding and COE Section 404 Permit, City of Rolla, Phelps and Maries Counties, MO, Due: October 3, 1998, Contact: Don Neumann (573) 636-7104.

EIS No. 980293, FINAL EIS, FHW, TN, Shelby Avenue/Demonbreum Street Corridor, from I-65 North to I-40 West in Downtown Nashville, Funding, U.S. Coast Guard Permit and COE Section 404 Permit, Davidson County, TN, Due: September 8, 1998, Contact: James E. Scapellato (615) 736-5394.

EIS No. 980294, DRAFT EIS, NOA, MN, Minnesota's Lake Superior Costal Program, Approval and Implementation, St. Louis and Cook Counties, MN, Due: September 21, 1998, Contact: Joseph A. Uravitch (301) 713-3155.

EIS No. 980295, DRAFT EIS, BLM, WY, Carbon Basin Coal Project Area, Coal Lease Application for Elk Mountain/Saddleback Hills, Carbon County, WY, Due: October 6, 1998, Contact: Jon Johnson (307) 775-6116.

EIS No. 980296, FINAL EIS, BLM, AK, Northeast National Petroleum Reserve-Alaska (NPR-A), Integrate Activity Plan, Multiple-Use Management, for Land within the North Slope Borough, AK, Due: September 8, 1998, Contact: Gene Terland (907) 271-3344.

EIS No. 980297, FINAL SUPPLEMENT, AFS, MT, Helena National Forest and Elkhorn Mountain portion of the Deerlodge National Forest Land and Resource Management Plan, Updated Information on Oil and Gas Leasing, Implementation several counties, MT, Due: September 08, 1998, Contact: Tom Andersen (Ext 277) (406) 446-5201.

EIS No. 980298, FINAL EIS, COE, CA, Montezuma Wetlands Project, Use of Cover and Non-cover Dredged Materials to restore Wetland, Implementation, Conditional-Use-Permit, NPDES and COE Section 10 and 404 Permit, Suisum Marsh in Collinsville, Solano County, CA, Due: September 08, 1998, Contact: Liz Varnhagen (415) 977-8451.

EIS No. 980299, FINAL EIS, USA, MD, Aberdeen Proving Ground, Pilot Testing of Neutralization/Biotreatment of Mustard Agent (HD), Design, Construction and Operation, NPDES and COE Section 404 Permit, Harford County, MD, Due: September 08, 1998, Contact: Mr. Matt Hurlburt (410) 612-7027.

EIS No. 980300, DRAFT EIS, COE, AR, Grand Prairie Area Demonstration Project, Implementation, Water Conservation, Groundwater Management and Irrigation Water Supply, Prairie, Arkansas, Monroe and Lonoke Counties, AR, Due: September 21, 1998, Contact: Edward P. Lambert (901) 544-0707.

Amended Notices

EIS No. 980267, DRAFT EIS, DOE, CA, NM, TX, ID, SC, WA, Surplus Plutonium Disposition (DOE/EIS-0283) for Siting, Construction and Operation of three facilities for Plutonium Disposition, Possible Sites Hanford, Idaho National Engineering and Environmental Laboratory, Pantex Plant and Savannah River, CA, ID, NM, SC, TX and WA, Due: September 16, 1998, Contact: G. Bert Stevenson (202) 586-5368. The DOE granted a 60-Day review period for the above project.

EIS No. 980269, DRAFT EIS, AFS, ID, Eagle Bird Project Area, Timber Harvesting and Road Construction, Idaho Panhandle National Forests, St. Joe Ranger District, Shoshone County, ID, Due: September 07, 1998, Contact: Cameo Flood (208) 245-4517. Published FR-07-24-98—Due Date Correction.

Dated: August 4, 1998.

Joseph C. Montgomery,

Environmental Specialist, Office of Federal Activities.

[FR Doc. 98-21235 Filed 8-7-98; 8:45 am]

BILLING CODE 6560-50-U

ENVIRONMENTAL PROTECTION AGENCY

[FRL-6139-5]

Notice of Proposed CERCLA Section 122(h)(1) Administrative Cost Recovery Settlement

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposal of CERCLA section 106 abatement action and section 122(h)(1) administrative cost recovery settlement for the Cecil's Transmission Repair site.

SUMMARY: U.S. EPA proposes to address the potential liability of Buhl and Laura Smith ("Settling Parties") under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. 9601 *et seq.*, by providing for performance of removal actions to abate an imminent and substantial endangerment to the public health, welfare or the environment resulting from the actual or threatened release of hazardous substances at or from the Cecil's Transmission Repair Site ("the Site"), located at 197 and 209 Collier Road, Doylestown, Wayne County, Ohio. U.S. EPA proposes to address the potential liability of the Settling Parties by execution of a CERCLA section 122(h)(1) Administrative Order on Consent ("AOC"), prepared pursuant to 42 U.S.C. 9622(h)(1). The key terms and conditions of the AOC may be briefly summarized as follows: (1) The Settling Parties agree to remove and dispose of all hazardous waste located on the portion of the Site they own, including drums; (2) U.S. EPA provides the Settling Parties a covenant not to sue for recovery of response costs (past and oversight costs) pursuant to section 107(a) of CERCLA, 42 U.S.C. 9607(a), and contribution protection as provided by CERCLA sections 113(f)(2) and 122(h)(4), 42 U.S.C. 9613(f)(2) and 9622(h)(4), conditioned upon satisfactory completion of obligations under the AOC. The Site is not on the NPL, and no further response activities at the Site are anticipated at this time. The total response costs connected with

A.5 NOTICE OF AN AMENDED RECORD OF DECISION FOR THE STORAGE AND DISPOSITION OF WEAPONS-USABLE FISSILE MATERIALS

responsibilities are to (1) evaluate the standards of accreditation applied to applicant foreign medical schools; and (2) determine the comparability of those standards to standards for accreditation applied to United States medical schools.

For Further Information Contact: Bonnie LeBold, Executive Director, National Committee on Foreign Medical Education and Accreditation, 7th and D Streets, S.W., Room 3082, ROB #3, Washington, D.C. 20202-7563. Telephone: (202) 260-3636. Beginning September 28, 1998, you may call to obtain the identity of the countries whose standards are to be evaluated during this meeting.

Dated: August 6, 1998.

David A. Longanecker,

Assistant Secretary for Postsecondary Education.

[FR Doc. 98-21757 Filed 8-12-98; 8:45 am]

BILLING CODE 4000-01-M

DEPARTMENT OF ENERGY

Storage and Disposition of Weapons-Usable Fissile Materials

AGENCY: Department of Energy.

ACTION: Notice of an amended Record of Decision.

SUMMARY: The U.S. Department of Energy (DOE) prepared a final programmatic environmental impact statement, Storage and Disposition of Weapons-Usable Fissile Materials (Storage and Disposition PEIS) (DOE/EIS-0229, December 1996) in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA implementing regulations, and DOE implementing procedures. The Storage and Disposition PEIS, among other things, assesses the potential environmental impacts of alternatives and locations for storing weapons-usable fissile materials (plutonium and highly enriched uranium).

On January 14, 1997, DOE issued a Record of Decision (Storage and Disposition ROD), 62 FR 3014, (January 21, 1997), selecting weapons-usable fissile materials storage and surplus plutonium disposition strategies. For plutonium storage, DOE decided to consolidate part of its weapons-usable plutonium storage by upgrading and expanding existing and planned facilities at the Pantex Plant (Pantex) near Amarillo, Texas and the Savannah River Site (SRS) near Aiken, South Carolina. For plutonium currently stored at the Hanford Site (Hanford) near Richland, Washington, and other DOE sites, DOE decided that surplus weapons-usable plutonium would remain at these sites until disposition (or move to lag storage at a disposition facility). The weapons-usable plutonium stored at the Rocky Flats Environmental Technology Site (RFETS), near Golden, Colorado, would be moved to Pantex and the SRS. However, the plutonium destined for the SRS, i.e., non-pit, weapons-usable surplus plutonium, would be moved only if: (1) the plutonium had been stabilized under corrective actions in response to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 94-1 and packaged to meet the DOE storage Standard 3013-96, Criteria for Safe Storage of Plutonium Metals and Oxides, (2) the construction and expansion of the Actinide Packaging and Storage Facility (APSF) at the SRS had been completed, and (3) the SRS had been selected in the upcoming Record of Decision for the Surplus Plutonium Disposition Environmental Impact Statement as the immobilization disposition site for surplus weapons-usable plutonium.

In order to support the early closure of the RFETS and the early deactivation of plutonium storage facilities at the Hanford site, DOE is modifying, contingent upon the satisfaction of certain conditions, some of the decisions made in its Storage and Disposition ROD associated with surplus plutonium storage pending disposition. Namely, DOE will take steps that allow: (1) the accelerated shipment of all non-pit surplus weapons-usable plutonium from the RFETS (about 7 metric tons) to the SRS beginning in about 2000, in advance of completion of the APSF in 2001, and (2) the relocation of all Hanford surplus weapons-usable plutonium (about 4.6 metric tons) to the SRS, between about 2002 and 2005, pending disposition. However, consistent with the Storage and Disposition PEIS ROD, DOE will only implement the movement of RFETS and Hanford non-pit, surplus weapons-usable plutonium inventories to the SRS if the SRS is selected as the immobilization disposition site. DOE is preparing the Surplus Plutonium Disposition Environmental Impact Statement (SPD EIS), draft issued July 1998, as part of the decision making process for determining an immobilization site.[1]

To accommodate the storage of Hanford surplus weapons-usable plutonium, DOE will expand the APSF as planned in the Storage and Disposition ROD. In addition, to accommodate the early receipt and storage of the RFETS surplus plutonium, the Department will prepare additional suitable storage space in Building 105-K (i.e., K-Reactor) in the K-Area at the SRS. Portions of Building 105-K will be modified to provide safe and secure plutonium storage. Safeguards and security features will be upgraded, criticality monitoring devices will be installed, structural features will be inspected and repaired, roof vents will be added, and doors will be modified. Several areas in the facility will be decontaminated and excess equipment will be removed to provide additional floor space.

Modifications will also include dismantling and removing unused process equipment in four building areas: Stack Area, Crane Maintenance Area, Crane Wash Area, and Process Room.

Security systems in the four building areas will be reactivated and upgraded to support using them for plutonium storage. Existing systems including the K-Area security perimeter, security control system and building water/power ventilation support systems will be used. Building modifications will provide for truck loading and unloading, material conformation, shipping accountability measurements, and storage. The Department will also declassify (process the metal to produce unclassified "buttons") some of the RFETS plutonium materials using SRS's FB-Line (in the F-Area) and after declassification, package this material in the APSF to meet the DOE storage Standard 3013-96, Criteria for Safe Storage of Plutonium Metals and Oxides.

All plutonium materials shipped to SRS will be stable and, except for classified metal and/or parts, will be packaged to meet the requirements of the DOE Standard 3013-96, Criteria for Safe Storage of Plutonium Metals and Oxides, before shipment. All shipments of plutonium to SRS will be by Safe Secure Transport (SST) in accordance with applicable DOE, U.S. Department of Transportation and U.S. Nuclear Regulatory Commission requirements and regulations. Some of the RFETS plutonium material packaged and shipped will be less than 50% plutonium by weight; as a result, there will be approximately 3% more total weight of material and a corresponding increase in the number of shipments than considered in the Storage and Disposition PEIS, although the total amount of plutonium in the material will remain about the same.

Under the previous ROD, a maximum of 10 metric tons of surplus plutonium, including plutonium from RFETS and existing onsite plutonium, would be

[1] SRS has been identified by DOE as the preferred site for the immobilization disposition facility.

stored at SRS in the APSF, pending disposition, provided that SRS is selected as the immobilization site following completion of the Surplus Plutonium Disposition EIS. Transfer of plutonium from RFETS to SRS would begin when the APSF is completed in 2001.

With this amended ROD, a total of approximately 11.6 metric tons of surplus weapons-usable plutonium from Hanford and RFETS (in addition to existing onsite SRS surplus plutonium, for a total of approximately 14 metric tons of surplus plutonium) could be stored at SRS in the APSF and Building 105–K, pending disposition, provided that SRS is selected as the immobilization site. Transfer of plutonium from RFETS to SRS would begin when the modifications to Building 105–K are completed, i.e., in about 2000; shipments of plutonium from Hanford to SRS would begin in about 2002.

This amended ROD only alters DOE's previous decision (Storage and Disposition ROD) for the storage of non-pit, surplus weapons-usable plutonium currently located at the RFETS and Hanford sites. No changes are being made to other storage decisions or any decisions associated with surplus fissile material disposition.

In accordance with 10 CFR 1021.314, DOE has prepared a Supplement Analysis to determine if these changes require a supplement to the Storage and Disposition PEIS under the Council on Environmental Quality Regulations at 40 CFR 1502.9(c). The Supplement Analysis shows that the new proposed action does not result in a substantial change to environmental concerns evaluated in the Storage and Disposition PEIS. Also, the Supplement Analysis shows that the proposed action does not present significant new circumstances or information relevant to the environmental concerns evaluated in the Storage and Disposition PEIS. Therefore, based on the Supplement Analysis, DOE has determined that a supplement to the Storage and Disposition PEIS is not required, and DOE has decided not to prepare such a supplement.

FOR FURTHER INFORMATION CONTACT: For further information on the long-term storage or the disposition of weapons-usable fissile materials, or to receive a copy of the final Storage and Disposition PEIS, the Storage and Disposition EIS ROD or the Supplement Analysis, contact: G. Bert Stevenson, NEPA Compliance Officer, Office of Fissile Materials Disposition (MD–4), U.S. Department of Energy, 1000 Independence Avenue, SW., 1Washington, DC 20585, (202) 586–5368.

For further information on the DOE NEPA process, contact: Carol M. Borgstrom, Director, Office of NEPA Policy and Assistance (EH–42), U.S. Department of Energy, 1000 Independence Avenue, SW., Washington, DC 20585, (202) 586–4600, or leave a message at (800) 472–2756.

SUPPLEMENTARY INFORMATION:

I. Background

A. Current Storage Program and Original Decision for Surplus Weapons-Usable Plutonium

DOE is currently phasing out the storage of all weapons-usable plutonium at RFETS. The phaseout involves shipping all RFETS pits to Pantex, and shipping all RFETS surplus non-pit, weapons-usable plutonium to the SRS (subject to certain conditions) starting in about 2001. As decided in the January 1997 Storage and Disposition PEIS ROD, the stabilized non-pit, surplus weapons-usable plutonium would not be moved unless and until: expansion of the APSF [2] at the SRS had been completed; the RFETS material had been stabilized and packaged to meet the Criteria for Safe Storage of Plutonium Metals and Oxides for long-term storage under corrective actions in response to the Defense Nuclear Facilities Safety Board Recommendation 94–1; and DOE had decided to immobilize plutonium at the SRS. The Department also decided to continue the current storage of surplus plutonium at Hanford, the Idaho National Engineering and Environmental Laboratory (INEEL), and Los Alamos National Laboratory (LANL) pending disposition (or movement to lag storage); and to pursue a strategy for plutonium disposition that would immobilize surplus weapons-usable plutonium in glass or ceramic forms and would allow the burning of some of the surplus weapons-usable plutonium (mostly from pits) as mixed oxide fuel in existing commercial light-water reactors.

B. Need to Change Storage Program

Recently, DOE has estimated that accelerating the closure of RFETS from 2010 to 2006 could save as much as $1.3 billion. Integral to achieving an accelerated closure of the site would be removal of the non-pit, surplus weapons-usable plutonium to SRS two years earlier than the current plan. Removal of the surplus plutonium at RFETS is only one of several steps to realize the savings. Other steps are proposed or ongoing pursuant to separate NEPA review. DOE also expects that the transfer of non-pit, surplus weapons-useable plutonium from Hanford to Savannah River could save as much as $150 million in upgrade and operating costs for plutonium storage facilities at the Hanford Site. As with the RFETS plutonium, the transfer would not be accomplished unless DOE decided to locate the plutonium immobilization facility at the Savannah River Site. The implementation cost for the proposed action is estimated to be approximately $93 million.

Closing RFETS by 2006 would, among other things, require the removal of non-pit, surplus weapons-usable plutonium metal and oxide from RFETS by 2002. In order to remove all the non-pit, surplus weapons-usable plutonium from RFETS by 2002, DOE would have to begin transferring the material to the SRS by January 2000, prior to completing the construction of the APSF.

DOE has also reevaluated plutonium storage operations at Hanford and determined that transferring all (about 4.6 metric tons) non-pit, surplus weapons-usable plutonium from that site for storage could save the Department as much as $150 million by avoiding upgrade and operating costs for plutonium storage facilities at the Hanford Site. DOE is considering the early transfer of plutonium from Hanford to the SRS as a means of achieving this savings.

These transfers would not occur unless DOE decides to immobilize plutonium at the SRS. A ROD to select the immobilization site is anticipated in early 1999 in the SPD EIS.

C. Proposed Action

The Department of Energy is proposing to accelerate the movement of all (about 7 metric tons) of non-pit, surplus weapons-usable plutonium at the RFETS and to move all (about 4.6 metric tons) of the surplus weapons-usable plutonium at Hanford to the SRS for storage pending disposition. The RFETS plutonium would be shipped to the SRS from about January 2000 through 2002. The Hanford plutonium would be shipped to the SRS from about 2002 through 2005.

The plutonium would not be moved to SRS unless the Department decides to disposition (immobilize) the non-pit,

[2] The APSF has been designed but not built. Construction is scheduled to start in October 1998 and the facility is scheduled to be in operation by October 2001. Expansion of the APSF refers to increasing the vault capacity of the facility to the current design of 5,000 storage positions (sufficient storage space for current SRS materials and RFETS materials).

surplus weapons-usable plutonium at SRS, after completion of the final Surplus Plutonium Disposition Environmental Impact Statement. In addition, the plutonium would not be shipped until it were stabilized and packaged to meet DOE Standard 3013–96, *Criteria for Safe Storage of Plutonium Metals and Oxides* in response to Defense Nuclear Facilities Safety Board Recommendation 94–1. This proposed action is consistent with DOE's objective, as explained in the ROD for the Storage and Disposition PEIS, to reduce over time the number of locations where plutonium is stored in the DOE complex.

Starting in about January 2000, all non-pit, surplus weapons-usable plutonium (except for classified plutonium) would be shipped to Building 105-K. At Building 105-K, the shipping containers[3] would be unloaded using a battery powered fork-lift truck. Material control and accountability measurements would be made at Building 105-K. The shipping containers would then be loaded onto metal pallets and transferred to a storage location in the building. DOE would not open any of the shipping containers in Building 105-K. While in storage, the containers would be inspected on a regular basis to assure external container integrity.[3] DOE has successfully used (and continues to use) shipping containers for plutonium storage at the SRS. No problems with a loss of material confinement have been experienced to date.

Portions of Building 105-K will be modified to facilitate plutonium storage. Safeguards and security features will be upgraded, criticality monitoring devices will be installed, structural features will be inspected and repaired, and roof vents will be added and doors will be modified. Several areas in the facility will be decontaminated and excess equipment will be removed to provide additional floor space.[4]

Modifications will include dismantling and removing unused process equipment in four building areas: Stack Area, Crane Maintenance Area, Crane Wash Area, and Process Room. These areas total approximately 30,000 square feet, are within the security areas that existed for reactor operations, and are adjacent to a currently active highly enriched uranium storage area. Security systems in the four building areas will be reactivated and upgraded to support using them for plutonium storage. Existing systems including the K-Area security perimeter, security control system and building water/power ventilation support systems will be used. Building modifications will provide for truck loading and unloading, material conformation, shipping accountability measurements, and storage.

Some of the RFETS plutonium is in a classified form, which would restrict the International Atomic Energy Agency (IAEA) from access to the material. DOE intends to make the APSF vault, and potentially Building 105-K, available for IAEA inspection. As a result, the RFETS plutonium needs to be declassified. To accomplish this objective, DOE would transfer the classified RFETS plutonium to F-Area for processing (declassifying) in the FB-Line facility at SRS. In the FB-Line facility, the plutonium would be melted using existing facilities and equipment that are part of the plutonium metal production process for which the FB-Line facility was designed. The declassification work would not be done on a continuous basis, but rather whenever processing capabilities were available. The RFETS plutonium would be fashioned into metal "buttons" that are the traditional FB-Line product. After the "buttons" are fabricated, the material would be transferred to the APSF and packaged to meet the requirements of DOE's plutonium storage standard. Then, the material would be placed in type B shipping containers and transported to Building 105-K for storage. Alternatively, the material could remain in the APSF vault, if space is available to allow for operational flexibility.

Some of the RFETS plutonium materials would be less than 50% plutonium by weight and would involve approximately 3% more total weight of material and a corresponding increase in the number of shipments than considered in the S&D PEIS.

Beginning in about 2002, SRS would begin to receive from Hanford stabilized plutonium packaged to meet DOE's long-term standard for placement in the APSF. Once APSF is operating, DOE could transfer a portion of the RFETS material from Building 105-K to the APSF in order to provide for operational flexibility. The plutonium from RFETS and Hanford would remain in storage at the APSF and Building 105-K pending disposition along with existing SRS surplus plutonium.

The plutonium would be transferred in type B shipping containers by truck using methods and routes described in the Storage and Disposition PEIS (i.e., the Department of Energy's Safe Secure Transport System).

If DOE decides to pursue the No Action alternative for the disposition of surplus plutonium in the SPD EIS Record of Decision, the SRS, RFETS, and Hanford materials would remain in storage at their current sites in accordance with the No Action alternative. If the DOE decides to immobilize surplus plutonium at Hanford, the SRS and RFETS materials would be shipped to Hanford in accordance with the decisions reached in the SPD EIS Record of Decision.

II. NEPA Process for Amending ROD

A. Supplement Analysis

Pursuant to DOE regulations in 10 CFR 1021.314, DOE has prepared a Supplement Analysis, Supplement Analysis for Storing Plutonium in the Actinide Packaging and Storage Facility and Building 105-K at the Savannah River Site (July 1998), to help determine whether a supplement to the Storage and Disposition PEIS is required under the Council on Environmental Quality Regulations, 40 CFR 1502.9(c). The Supplement Analysis compares the potential impacts of the new proposed action to the impacts discussed for the plutonium storage alternatives in the Storage and Disposition PEIS. The Supplement Analysis shows that the new proposed action does not make a substantial change to environmental concerns evaluated in the Storage and Disposition PEIS. Furthermore, the Supplement Analysis shows that there are no new significant circumstances or information relevant to environmental concerns and bearing on the proposed action or its impact.

B. Comparison of Potential Impacts

The facilities involved (i.e, Building 105-K and the APSF) are or will be located in existing industrial areas at the SRS.

- Land Resources, Site Infrastructure, Geology and Soils, Biology Resources and Cultural and Paleontological Resources. There are no aquatic habitats or wetlands in these areas nor are there any threatened or endangered species. None of the affected facilities have been nominated for inclusion in the National Register of Historic Places, and there are no plans for such nominations.

Based on evaluations in the Storage and Disposition PEIS and information

[3] To support the proposed action, DOE would purchase additional Type 9975 shipping containers, which are Type B containers and would also be used for storage. This would be done so that storing the RFETS materials in shipping containers pending disposition will not impact the Department's supply of Type B shipping containers.

[4] A portion of these activities could be completed as part of maintenance, clean-up, and decontamination activities at SRS that DOE has determined are categorically excluded from further NEPA review.

incorporated in the Supplement Analysis from the Final Environmental Impact Statements on the Interim Management of Nuclear Materials (DOE/EIS–0220, October, 1995)(IMNMS EIS) there would be little or no impact to land resources, site infrastructure, geology and soils, biology resources and cultural and Paleontological resources by the construction, operation and expansion of the APSF. This is equally true for Building 105-K since all storage operations would occur within the existing Building 105-K structure.

• It is expected that declassification of the RFETS material would require 100 Mw hrs/yr of electricity. This work would not require modification to the FB-line's electrical system and is well within the capacity of the facility and the site.

• Packaging and Transportation. The transportation routes to the SRS would be the same as those assumed in the Storage and Disposition PEIS (i.e., overland truck routes on interstate highways and state roads). Transportation operations would not change. DOE estimates that the total inter-site transportation impact associated with transferring plutonium from the RFETS and Hanford to the SRS would be 0.07 potential latent cancer fatalities, which would be approximately the same as for the Preferred Alternative in the Storage and Disposition PEIS.[5] DOE estimates that the intra-site transportation activities could add an additional 0.01 latent cancer fatalities to the worker population.[6]

• Air Quality and Noise. Storage: Accomplishing the proposed action, including the modifications to Building 105-K, would add no significant air quality and noise impacts above the existing site baseline. Therefore, air quality and noise impacts from the plutonium storage aspects of the proposed action would be essentially the same as the air quality and noise impacts from the Preferred Alternative of the Storage and Disposition PEIS (i.e., the Upgrade With RFETS Non-Pit Material alternative).

Declassification/Repackaging: DOE estimates there would be a small increase in non-radiological air emissions for declassification operations (i.e., metal conversion operations in FB-Line) above the non-radiological air emissions estimated for the No Action and the Upgrade alternatives in the Storage and Disposition PEIS. Non-radiological air emissions would be well within State and Federal regulatory limits. Repackaging activities are not expected to involve the use of chemicals, beyond a very small amount of decontamination liquid.

• Water Resources. *Storage:* The maximum impact to water resources, above existing site baseline usage and discharges, expected from plutonium storage aspects of DOE's proposed action would be about the same as presented in the Upgrade With RFETS and LANL Material alternative of the Storage and Disposition PEIS,[7] i.e., there would be a 0.01% increase in water use and a 0.1% increase in waste water discharges. The water impacts from the proposed action would have a negligible effect on site water or waste treatment capacity.

The impacts of radiological liquid discharges from Building 105-K are included as part of the No Action alternative in the Storage and Disposition PEIS. DOE expects there would be no significant increase above the No Action alternative discharge levels since, during normal operations, water is not in contact with plutonium storage containers.

Declassification/Repackaging: DOE estimates declassification operations would cause a small and insignificant increase in water usage beyond the water requirement estimated for other site operations.

Repackaging activities in the APSF are expected to have essentially no impact to water resources beyond the site base line operations presented in the No Action alternative of the Storage and Disposition PEIS.[8] Repackaging operations would not significantly increase the use of water resources beyond that required to operate the industrial systems associated with the APSF, e.g., chillers for air conditioning, sanitary sewer, potable water, etc., because additional water is not used in repackaging operations.

• Socioeconomics. *Storage:* The socioeconomic impact of operating Building 105–K for plutonium storage would be essentially the same as the impact described for the Preferred Alternative of the Storage and Disposition PEIS. The socioeconomic impact of modifying Building 105–K and operating both APSF and Building 105–K would be well within the impacts described for the Consolidation alternative of the Storage and Disposition PEIS.

The socioeconomic impacts at RFETS and Hanford of moving surplus plutonium to SRS were analyzed in the Storage and Disposition PEIS. The analysis concluded that this action would phase out plutonium storage at RFETS and Hanford. Approximately 200 direct job losses at Hanford, in addition to the 2000 at RFETS, would result. Compared to the total employment in those areas, the loss of these jobs and the impacts to the regional economies would not be significant. The proposed action would not change the magnitude of these impacts at RFETS, but cause them to occur sooner.

Declassification/Repackaging: DOE estimates there would be negligible additional socioeconomic effects due to operating the APSF for repackaging of RFETS plutonium or operating FB-Line for declassification purposes because the existing site workforce would be used.

• Public and Occupational Health and Safety (normal operations). *Storage. Public and Non-Involved Workers:* Plutonium storage operations in Building 105–K would not result in any additional air or water radiological impacts (beyond those currently associated with other operations in Building 105–K) because no shipping containers or storage containers would be opened in Building 105–K. Since air and water emissions create impacts that affect the non-involved workers and the public, there would be no significant additional radiological impact to the public or non-involved workers from normal operations in Building 105–K. Therefore, the impact from the proposed action to the public and non-involved workers would be essentially the same as the impact from the Preferred Alternative in the Storage and Disposition PEIS.

Involved Workers: DOE estimated that the potential health impact from 50 years of APSF storage to individual involved workers for the Preferred Alternative in the Storage and Disposition PEIS was a latent cancer fatality risk of 5×10^{-3} and that 1.5×10^{-1} latent cancer fatalities could occur in the involved worker population. DOE estimates that the potential health impacts from 10 years of operating Building 105–K to store plutonium could result in a risk of latent cancer

[5] The impact is the sum of the impact of transportation of RFETS non-pit plutonium under the Preferred Alternative in the Storage and Disposition PEIS and the incremental impact for shipping the Hanford plutonium.

[6] In inter-site transportation analyses, non-radiological accidents would be the greatest contributor to fatalities. In the case of intra-site transportation, impacts would be due primarily to radiation doses received from normal transportation operations. Effects from intra-site accidents, if any, would likely be negligible. Historically, certified containers maintain their integrity in accident situations.

[7] Table 4.2.6.4–1 of the Storage and Disposition PEIS.

[8] Table 4.2.6.4–1 of the Storage and Disposition PEIS.

fatality for the average Building 105–K involved worker of $1.5x10^{-3}$ and $2.6x10^{-2}$ latent cancer fatalities in the Building 105–K involved worker population. Since the Storage and Disposition PEIS bases health impacts on 50 years of storage, for comparison purposes, the impacts from 50 years of plutonium storage in the APSF are added to the impacts from 10 years of plutonium storage in Building 105–K. Using this approach, the health impacts from storing plutonium in the APSF and in Building 105–K would be 0.18 latent cancer fatalities in the involved worker population of both facilities.

Health impacts to involved workers for the plutonium storage aspects of the proposed action in this Supplement Analysis (0.18 latent cancer fatalities) would be essentially the same as the health impact estimated in the Preferred Alternative of the Storage and Disposition PEIS (0.15 latent cancer fatalities).

Declassification/Repackaging Radiological Impacts. Public, Non-involved Workers, Involved Workers: For declassification operations the potential health effect from the postulated radiation dose to the maximally exposed member of the public at the Site boundary would be $1.7x10^{-6}$ latent cancer fatalities. The potential health effect from the postulated radiation dose to the population surrounding the SRS and to workers would be 0.068 latent cancer fatalities and 0.078 latent cancer fatalities, respectively, above those predicted in the Preferred Alternative in the Storage and Disposition PEIS.

For repackaging operations (i.e., repackaging all plutonium from the RFETS in the APSF for 2 years) the potential health effect from the postulated radiation dose to the maximally exposed member of the public at the site boundary would be $7.5x10^{-12}$ latent cancer fatalities. The potential health effect from the postulated radiation dose to the population surrounding the SRS and to workers would be $1.5x10^{-7}$ latent cancer fatalities and $2.5x10^{-2}$ latent cancer fatalities, respectively, above those predicted in the Preferred Alternative in the Storage and Disposition PEIS. The impacts from repackaging, only the RFETS plutonium that would be declassified in the FB-Line would be less.

Building 105–K Modification. Public, Non-Involved Workers, Involved Workers: No impacts to non-involved workers or the public would be expected from the decontamination, modification, removal, and construction work because this work is not expected to generate significant air or water emissions. Work activities are confined to the interior of Building 105–K and airborne radioactivity levels are routinely monitored during work. Liquid sources would not be released from the building during normal decontamination, removal, or construction work. The potential health impact to workers, in the form of the risk of latent cancer fatality, would be $4x10^{-4}$ for 18 months of decontamination and construction work and the number of latent cancer fatalities that could be expected in the worker population was estimated to be $2x10^{-2}$. The risks associated with the modification of Building 105–K are approximately ten percent of the risks estimated for storage of the plutonium in the Preferred Alternative of the Storage and Disposition PEIS.

Summary

Public: In the Storage and Disposition PEIS, DOE estimated the potential health impact to the population surrounding the SRS from existing site operations and for the Upgrade Alternative over 50 years was 1.1 latent cancer fatalities. Accomplishing the new proposed action would slightly increase that potential health impact to about 1.2 latent cancer fatalities. Emissions would remain within the limits of the National Emission Standards for Hazardous Air Pollutants permits for the APSF and Building 105–K.

Workers: In the Storage and Disposition PEIS, DOE estimated that the potential health impact to the total site workforce from existing site operations over 50 years would be 5.3 latent cancer fatalities. Accomplishing the proposed action would increase the potential health impact to the site workforce by 0.3 to 5.6 latent cancer fatalities. This new estimate in total site workforce health impact is slightly greater than the health impact of 5.3 latent cancer fatalities estimated for the Preferred Alternative in the Storage and Disposition PEIS and is slightly lower than the health impact of 5.7 latent cancer fatalities that DOE estimated for the Consolidation alternative in the Storage and Disposition PEIS.

Storage Chemical Impacts. There would be no significant impact to the public or workers from hazardous chemicals due to plutonium storage operations in Building 105–K. There are no industrial systems or other operations involved in the plutonium storage operations that would add to existing Building 105–K chemical impacts.

• Waste Management. Modifications to Building 105–K: DOE estimates that decontamination and removal activities which would make Building 105–K available for storage operations would generate 750 cubic meters of low level waste, which is less than 1% of the low-level waste DOE expects to be generated by SRS activities as described in the No Action alternative of the Storage and Disposition PEIS. DOE does not expect to generate any significant quantities of other wastes in order to modify Building 105–K. No high-level radioactive waste would be generated.

Storage: DOE estimated that storing plutonium in the APSF, as described in the Preferred Alternative of the Storage and Disposition PEIS, would not generate any of the following radioactive wastes: high-level, transuranic, mixed transuranic, low-level, mixed low-level or hazardous (other than minor quantities). DOE estimates that storing plutonium in Building 105–K would not significantly change the estimate for the Preferred Alternative in the Storage and Disposition PEIS.

Declassification/Repackaging: DOE estimates that declassifying RFETS plutonium would generate about: 88 m^3 of transuranic waste; 4 m^3 of mixed waste; and 44 m^3 of low-level radioactive waste. No high-level waste is expected. These additional amounts of waste represent a small fraction of these types of waste that are generated at the site by other operations. The site has sufficient capacity to accommodate this increase in waste volume.

• Accidents. *Storage:* For the Building 105–K design basis accidents, DOE estimated that the maximum impact to the population surrounding the SRS could be 0.34 latent cancer fatalities in the unlikely event that plutonium were released to the 105–K Building as a result of corrosion of a storage container. This risk is greater than the risk estimated for storage of plutonium in the Preferred Alternative and other alternatives of the S&D PEIS; however, the risk would be comparable to the same type of accident for the storage of plutonium at SRS in existing storage vaults as analyzed in the Continuing Storage Alternative for the Storage of Plutonium and Uranium in the IMNM EIS. (The IMNM accident analysis showed 0.31 latent cancer fatalities for the population surrounding SRS.) DOE will implement administrative controls (including scheduled surveillances) to limit actions or conditions that might lead to a release of radioactive materials under accident conditions. The risk to the maximally exposed member of the public and non-involved worker would also be greater than the risk for storage

of plutonium estimated in the Preferred Alternative and other alternatives of the Storage and Disposition PEIS but would be low (less than $3x10^{-3}$ latent cancer fatalities).

For the postulated beyond design basis accidents, DOE estimated that the maximum impact to the population could be $2.7x10^{-4}$ latent cancer fatalities in the event of a vault fire. This risk is greater than the risk estimated for storage of plutonium in the Preferred Alternative of the Storage and Disposition PEIS, but low. The risks to the maximally exposed public and the non-involved worker would also be greater than the risks for the storage of plutonium estimated in the Preferred Alternative of the Storage and Disposition PEIS but would be extremely small (less than $2x10^{-8}$ latent cancer fatalities). DOE estimated that the involved worker may be subject to injury and, in some cases, fatality as a result of potential beyond design basis accidents.

Declassification/Repackaging: DOE estimates that for declassification operation in the FB-Line, the risk to the public would be $1.2x10^{-3}$ latent cancer fatalities, $2.6x10^{-4}$ latent cancer fatalities to the maximally exposed off-site individual and $4.5x10^{-3}$ latent cancer fatalities/yr to the non-involved worker. These risks are slightly greater than the risks for storage of plutonium estimated in the Upgrade Alternative of the Storage and Disposition PEIS, but are low. For repackaging operations in the APSF, the risks are low and similar to the impacts presented for storage of plutonium in the Preferred Alternative of the Storage and Disposition PEIS (less than $2x10^{-4}$ latent cancer fatalities).

• *Environmental Justice.* For environmental justice impacts to occur, there must be significant and adverse human health or environmental impacts that disproportionately affect minority populations and/or low-income populations. The Supplement Analysis shows that accomplishing the proposed action would be within regulatory limits and the impacts would be very low during routine operations.

The same Supplement Analyses also shows that accidents would not result in a significant risk of adverse human health or environmental impacts to the population who reside within 80 kilometers of the SRS. Therefore, such accidents would not have disproportionately high or adverse risk of impacts on minority or low-income populations.

Based on the analysis in this supplement analysis, no disproportionate, high or adverse impact would be expected on minority or low-income populations.

C. Environmentally Preferable Alternative

The environmental analyses in Chapter 4 of the Storage and Disposition PEIS indicate that the environmentally preferable alternative (the alternative with the lowest environmental impacts over the 50 years considered in the PEIS) for storage of weapons-usable fissile materials would be the Storage and Disposition PEIS Preferred Alternative, which consists of No Action at Hanford, Idaho National Engineering and Environmental Laboratory, Los Alamos National Laboratory, Argonne National Laboratory, and Nevada Test Site (NTS) (no fissile materials are or would be stored at the NTS) pending disposition, phaseout of storage at RFETS, and upgrades at the Oak Ridge Reservation, SRS, and Pantex. The proposed action as modified by this amended decision is still the environmentally preferred alternative.

III. Non-Environmental Considerations

A. Economic Analysis

DOE has estimated that accelerating the closure of RFETS from 2010 to 2006 in accordance with the DOE Closure 2006 Rocky Flats Closure Project Management Plan could save as much as $1.3 billion. Closing RFETS by 2006 would require the removal of non-pit, surplus weapons-usable plutonium metal and oxide from RFETS by 2002. The early removal of the RFETS non-pit, surplus weapons-usable plutonium supports the early deactivation, decontamination, and decommissioning of the RFETS plutonium storage and packaging facilities.

DOE also expects that the transfer of non-pit, surplus weapons-usable plutonium from Hanford to the SRS, could save as much as $150 million in upgrade and operating costs for plutonium storage facilities at the Hanford Site. As with the RFETS plutonium, the transfer would not be accomplished unless DOE decided to locate the plutonium immobilization disposition facility at the SRS.

The implementation cost for the proposed action is estimated to be approximately $93 million.

B. Nonproliferation

From a nonproliferation standpoint, the highest standards for safeguards and security will be employed during transportation and storage. There is no change in this regard from the original PEIS ROD.

IV. Amended Decision

Consistent with the Preferred Alternative in the Storage and Disposition PEIS, and the Supplement Analysis, Storing Plutonium in the Actinide Packaging and Storage Facility and Building 105–K at the Savannah River Site (July 1998), the Department has decided to reduce, over time, the number of locations where the various forms of plutonium are stored, through a combination of storage alternatives in conjunction with a combination of disposition alternatives.

The Department has decided to modify those aspects of the Storage and Disposition ROD (62 FR 3014) concerning the storage of weapons-usable plutonium at RFETS and Hanford, pending disposition. Other aspects of the Storage and Disposition ROD remain unaltered. DOE has decided to:

• Modify an existing building (105–K) at SRS to allow the receipt and storage of RFETS non-pit, surplus weapons-usable plutonium.

If the Department decides to select SRS as the immobilization site in the SPD EIS ROD, then the Department will:

• Ship all RFETS non-pit, surplus weapons-usable plutonium (about 7 MT) to SRS beginning in about 2000 through about 2002;

• Store RFETS non-classified plutonium metal and/or parts in shipping containers in Building 105–K at SRS beginning in about 2000;

• For RFETS classified surplus metal and/or parts, declassify the material in the FB-Line facility and repackage the material in the APSF (after construction of the APSF in about 2001). In the FB-Line, the plutonium will be melted using existing facilities and equipment that are part of the plutonium metal production process for which FB-Line was designed;

• Store the declassified material in Building 105–K in shipping containers or the APSF vault if space is available;

• Ship all Hanford non-pit, surplus weapons-usable plutonium (approximately 4.6 metric tons) from about 2002 through 2005 and store this material in the APSF;

• Before shipment, all plutonium transported from RFETS (except for the classified metal and/or parts) and Hanford will be stabilized[9] and packaged in accordance with DOE Standard-3013-96, Criteria for Safe Storage of Plutonium Metals and Oxides for long-term storage. All shipments of plutonium, including the classified metal and parts, will be by SST in

[9] Hanford plutonium fuel that is stable would not need to be stabilized.

accordance with applicable DOE, U.S. Department of Transportation and U.S. Nuclear Regulatory Commission requirements and regulations. Plutonium will be packaged in certified Type B accident resistant packages for transport; and

• The RFETS and Hanford Material stored at SRS may be moved between Building 105–K and the APSF to allow for operational flexibility.

Some of the surplus plutonium at RFETS and Hanford, approximately 1 metric ton at each site, is currently under International Atomic Energy Agency (IAEA) safeguards as a component of the United States nonproliferation policy to remove weapons-usable fissile materials from use for defense purposes. DOE has designed the APSF for IAEA safeguards and intends that plutonium stored in the APSF will be available for IAEA safeguards. Surplus plutonium under IAEA safeguards at RFETS and Hanford that may be shipped to the SRS, will remain available for IAEA safeguards in the APSF. Since plutonium that may be stored in Building 105-K will remain in shipping containers and not be accessible for full IAEA safeguards controls (e.g., physical sampling, destructive analyses), DOE is considering, with the IAEA, the application of IAEA verification controls to ensure the plutonium stored in Building 105–K is not diverted for defense purposes. In addition, DOE intends, as indicated in the Storage and Disposition ROD, that DOE's program for surplus plutonium disposition will include IAEA verification as appropriate.

If the DOE decides to pursue the No Action alternative for the disposition of surplus plutonium, the SRS, RFETS, and Hanford materials would remain in storage at their current sites in accordance with the No Action alternative in the Storage and Disposition PEIS ROD. If the DOE decides to immobilize surplus plutonium at Hanford, the SRS and RFETS materials would be shipped to Hanford in accordance with the decisions reached in the SPD EIS ROD.

V. Conclusion

Under the previous ROD, a maximum of 10 metric tons of surplus plutonium, including plutonium from RFETS and existing onsite plutonium, would be stored at SRS in the APSF, pending disposition, provided that SRS is selected as the immobilization site following completion of the SPD EIS. Transfer of plutonium from RFETS to SRS would begin when the APSF is completed in 2001.

With this amended ROD, a total of approximately 11.6 metric tons of surplus plutonium from both Hanford and RFETS (in addition to existing onsite SRS surplus plutonium, for a total of approximately 14 metric tons of surplus plutonium) would be stored at SRS in the APSF and Building 105–K, pending disposition, provided SRS is selected as the immobilization site. Transfer of plutonium from RFETS to SRS would begin when the modifications to Building 105–K are completed, i.e., in about 2000; shipments of plutonium from Hanford to SRS would begin in about 2002.

DOE has decided to implement a revised program to provide for safe and secure storage of weapons-usable fissile materials. DOE will prepare to advance the consolidation of the storage of weapons-usable plutonium by modifying existing facilities at the SRS in South Carolina, and phasing out surplus plutonium storage at RFETS in Colorado and Hanford in Washington. Consistent with the Storage and Disposition PEIS ROD, this Amended ROD supports the Department's objectives to phase out the storage of all weapons-usable plutonium at the RFETS and Hanford as soon as possible and to reduce the number of sites where surplus weapons-usable plutonium is stored.

The decision process reflected in this Notice complies with the requirements of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 *et seq.*) and its implementing regulations in 40 CFR Parts 1500–1508 and 10 CFR Part 1021.

Issued in Washington, D.C., August 6, 1998.

Laura S. H. Holgate,

Director, Office of Fissile Materials Disposition.

[FR Doc. 98–21744 Filed 8–12–98; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Environmental Management Site-Specific Advisory Board, Pantex Plant, Amarillo, Texas

AGENCY: Department of Energy.

ACTION: Notice of open meeting.

SUMMARY: Pursuant to the provisions of the Federal Advisory Committee Act (Pub. L. No. 92–463, 86 Stat. 770) notice is hereby given of the following Advisory Committee meeting: Environmental Management Site-Specific Advisory Board (EM SSAB), Pantex Plant, Amarillo, Texas.

DATE AND TIME: Tuesday, August 25, 1998: 1:30 p.m.–5:30 p.m.

ADDRESSES: Amarillo Association of Realtors, Amarillo, Texas.

FOR FURTHER INFORMATION CONTACT: Jerry S. Johnson, Assistant Area Manager, Department of Energy, Amarillo Area Office, P.O. Box 30030, Amarillo, TX 79120 (806) 477–3125.

SUPPLEMENTARY INFORMATION: *Purpose of the Committee:* The Board provides input to the Department of Energy on Environmental Management strategic decisions that impact future use, risk management, economic development, and budget prioritization activities.

Tentative Agenda

1:30 p.m. Welcome—Agenda Review—Approval of Minutes
1:45 p.m. Co-Chair Comments
2:00 p.m. Immobilization
3:00 p.m. Break
3:15 p.m. Updates—Occurrence Reports—DOE
3:45 p.m. Ex-Officio Reports
4:00 p.m. Low-Level Waste Seminar Update
5:00 p.m. Task Force/Subcommittee Minutes
5:30 p.m. Closing Remarks/Adjourn

Public Participation: The meeting is open to the public, and public comment will be invited throughout the meeting. Written statements may be filed with the Committee either before or after the meeting. Written comments will be accepted at the address above for 15 days after the date of the meeting. Individuals who wish to make oral statements pertaining to agenda items should contact Jerry Johnson's office at the address or telephone number listed above. Requests must be received 5 days prior to the meeting and reasonable provision will be made to include the presentation in the agenda. The Designated Federal Official is empowered to conduct the meeting in a fashion that will facilitate the orderly conduct of business. Each individual wishing to make public comment will be provided a maximum of 5 minutes to present their comments at any time throughout the meeting.

Minutes: The minutes of this meeting will be available for public review and copying at the Pantex Public Reading Rooms located at the Amarillo College Lynn Library and Learning Center, 2201 South Washington, Amarillo, TX phone (806) 371–5400. Hours of operation are from 7:45 am to 10:00 pm, Monday through Thursday; 7:45 am to 5:00 pm on Friday; 8:30 am to 12:00 noon on Saturday; and 2:00 pm to 6:00 pm on Sunday, except for Federal holidays. Additionally, there is a Public Reading Room located at the Carson County Public Library, 401 Main Street,

A.6 NOTICE OF INTENT—SUPPLEMENT TO THE DRAFT SURPLUS PLUTONIUM DISPOSITION ENVIRONMENTAL IMPACT STATEMENT

Dated: March 30, 1999.

Judith Johnson,

Acting Assistant Secretary, Elementary and Secondary Education.

[FR Doc. 99-8394 Filed 4-5-99; 8:45 am]

BILLING CODE 4000-01-P

DEPARTMENT OF ENERGY

Office of Arms Control and Nonproliferation Policy; Proposed Subsequent Arrangement

AGENCY: Department of Energy.

ACTION: Subsequent arrangement.

SUMMARY: This notice is being issued under the authority of Section 131 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2160). The Department is providing notice of a "subsequent arrangement" under the Agreement for Cooperation in the Peaceful Uses of Nuclear Energy Between the United States of America and the European Atomic Energy Community (EURATOM) and the Agreement for Cooperation Between the Government of the United States of America and the Government of Canada Concerning the Civil Uses of Atomic Energy.

This subsequent arrangement concerns the transfer of 90,552,300 grams of natural uranium in the form of hexafluoride from Cameco Corporation in Canada to Urenco Limited in the United Kingdom for toll enrichment. The enrichment will not exceed 20%. The material will then be transferred to Northern States Power in Minneapolis, MN for use in their commercial power reactor.

In accordance with Section 131 of the Atomic Energy Act of 1954, as amended, we have determined that this subsequent arrangement will not be inimical to the common defense and security.

This subsequent arrangement will take effect no sooner than fifteen days after the date of publication of this notice.

Dated: March 30, 1999.

For the Department of Energy.

Edward T. Fei,

Deputy Director, International Policy and Analysis Division, Office of Arms Control and Nonproliferation.

[FR Doc. 99-8451 Filed 4-5-99; 8:45 am]

BILLING CODE 6450-01-P

DEPARTMENT OF ENERGY

Office of Arms Control and Nonproliferation Policy; Proposed Subsequent Arrangement

AGENCY: Department of Energy.

ACTION: Subsequent Arrangement.

SUMMARY: This notice is being issued under the authority of Section 131 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2160). The Department is providing notice of a "subsequent arrangement" under the Agreement for Cooperation in the Peaceful Uses of Nuclear Energy Between the United States of America and the European Atomic Energy Community (EURATOM) and the Agreement for Cooperation Between the Government of the United States of America and the Government of Canada Concerning the Civil Uses of Atomic Energy.

This subsequent arrangement concerns the transfer of 3,078,600 grams of natural uranium in the form of hexafluoride from Cameco Corporation in Canada to Urenco Limited in the United Kingdom for toll enrichment. The enrichment will not exceed 20%. The material will then be transferred to Wolf Creek Nulcear Operation Corporation in Burlington, KS for use in their commercial power reactor.

In accordance with Section 131 of the Atomic Energy Act of 1954, as amended, we have determined that this subsequent arrangement will not be inimical to the common defense and security.

This subsequent arrangement will take effect no sooner than fifteen days after the date of publication of this notice.

Dated: March 30, 1999.

For the Department of Energy.

Edward T. Fei,

Deputy Director, International Policy and Analysis Division Office of Arms Control and Nonproliferation.

[FR Doc. 99-8452 Filed 4-5-99; 8:45 am]

BILLING CODE 6450-01-P

DEPARTMENT OF ENERGY

Supplement to the Draft Surplus Plutonium Disposition Environmental Impact Statement

AGENCY: Department of Energy.

ACTION: Notice of Intent.

SUMMARY: The Department of Energy (DOE) announces its intent to prepare a supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement (SPD EIS) pursuant to the National Environmental Policy Act (NEPA). The SPD Draft EIS (DOE/EIS-0283D) was issued for public comment in July 1998. The Supplement will update the SPD Draft EIS by examining the potential environmental impacts of using mixed oxide (MOX) fuel in six specific commercial nuclear reactors at three sites for the disposition of surplus weapons-grade plutonium. DOE identified these reactors through a competitive procurement process. The Department is planning to issue the Supplement to the SPD Draft EIS in April 1999. DOE will publish a separate Notice of Availability in the Federal Register at that time. This Notice of Intent describes the content of the Supplement to the SPD Draft EIS, solicits public comment on the Supplement, and announces DOE's intention to conduct a public hearing. Consistent with 40 CFR 1502.9(c)(4) and 10 CFR 1021.314(d), DOE has determined not to conduct scoping for the Supplement.

ADDRESSES: Requests for information concerning the plutonium disposition program can be submitted by calling (answering machine) or faxing them to the toll free number 1-800-820-5156, or by mailing them to: Bert Stevenson, NEPA Compliance Officer, Office of Fissile Materials Disposition, U.S. Department of Energy, Post Office Box 23786, Washington, DC 20026-3786.

FOR FURTHER INFORMATION CONTACT: For general information on the DOE NEPA process, please contact: Carol Borgstrom, Director, Office of NEPA Policy and Assistance, U.S. Department of Energy, 1000 Independence Avenue, S.W., Washington, DC 20585, 202-586-4600 or leave a message at 1-800-472-2756.

Additional information regarding the DOE NEPA process and activities is available on the Internet through the NEPA Home Page at http://www.eh.doe.gov/nepa.

SUPPLEMENTARY INFORMATION:

Background

In October 1994, the Secretary of Energy and the Congress created the Office of Fissile Materials Disposition (MD) within the Department of Energy (DOE) to focus on the elimination of surplus highly enriched uranium (HEU) and plutonium surplus to national defense needs. As one of its major responsibilities, MD is tasked with determining how to disposition surplus weapons—usable plutonium. In January 1997, DOE issued a Record of Decision (ROD) for the Storage and Disposition of Weapons—Usable Fissile Materials Final Programmatic Environmental Impact Statement (S&D PEIS) (DOE/EIS-

0229; December 1996). In that ROD, DOE decided to pursue a strategy that would allow for the possibility of both the immobilization of surplus plutonium and the use of surplus plutonium as mixed oxide (MOX) fuel in existing domestic, commercial reactors. DOE is in the process of completing the Surplus Plutonium Disposition Environmental Impact Statement (SPD Draft EIS) (DOE/EIS–0283D; July 1998) to choose a site(s) for plutonium disposition activities and to determine the technology(ies) that will be used to support this effort.

Related Procurement Action

To support the timely undertaking of the surplus plutonium disposition program, DOE initiated a procurement action to contract for MOX fuel fabrication and reactor irradiation services. The services requested in this procurement process include design, licensing, construction, operation, and eventual deactivation of a MOX facility, as well as irradiation of the MOX fuel in three to eight existing domestic, commercial reactors, should the decision be made by DOE to go forward with the MOX program.

On May 19, 1998, DOE issued a Request for Proposal (RFP) (Solicitation Number DE–RP02–98CH10888) that defined limited activities that may be performed prior to issuance of the SPD EIS ROD. These activities include non-site-specific work primarily associated with the development of the initial conceptual design for the fuel fabrication facility, and plans (paper studies) for outreach, long lead-time procurements, regulatory management, facility quality assurance, safeguards, security, fuel qualifications, and deactivation. No construction would be started on a MOX fuel fabrication facility until the SPD EIS ROD is issued. The MOX facility, if built, would be DOE-owned, licensed by the Nuclear Regulatory Commission, and located at one of four candidate DOE sites. DOE has designated the Savannah River Site as the preferred alternative for the MOX fuel fabrication facility.

Based on a review of proposals received in response to the RFP, DOE determined in January 1999 that one proposal was in the competitive range. Under this proposal, MOX fuel would be fabricated at a DOE site and then irradiated in one of six domestic commercial nuclear reactors.

Environmental Review During Procurement Action

An environmental critique was prepared in accordance with DOE's National Environmental Policy Act (NEPA) regulations at 10 CFR 1021.216. Because an EIS is in progress on this action, DOE required offerors to submit reasonably available environmental data and analyses as a part of their proposals. DOE independently evaluated and verified the accuracy of the data provided by the offeror in the competitive range, and prepared an environmental critique for consideration before the selection was made. The Environmental Critique was used by DOE to determine:

(1) if there are any important environmental issues in the offeror's proposal that may affect the selection process; and

(2) if the potential environmental impacts of the offeror's proposal were bounded by impacts presented in the S&D PEIS and SPD Draft EIS or whether additional analysis was required in the SPD Final EIS.

As required by Section 216, the Environmental Critique included a discussion of the purpose of the procurement; the salient characteristics of the offeror's proposal; any licenses, permits or approvals needed to support the program; and an evaluation of the potential environmental impacts of the offer. The Environmental Critique is a procurement-sensitive document and subject to all associated restrictions. DOE then prepared a synopsis, which summarizes the Environmental Critique and reduces business-sensitive information to a level that will not compromise the procurement process. The Synopsis will be filed with the Environmental Protection Agency and made available to the public.

Contract Award

As a result of the procurement process described above, in March 1999, the Department of Energy contracted with Duke Engineering & Services, COGEMA, Inc., and Stone & Webster to provide mixed oxide fuel fabrication and reactor irradiation services. The team, known as DUKE COGEMA STONE & WEBSTER or DCS, has its corporate headquarters in Charlotte, NC. Subcontractors to DCS include Duke Power Company, Charlotte, NC and Virginia Power Company, Richmond, VA, who will provide the reactor facilities in which mixed oxide fuel will be used upon receipt of Nuclear Regulatory Commission license amendments. Other major subcontractors include Nuclear Fuel Services, Inc., Erwin, TN; Belgonucleaire, Brussels, Belgium; and Framatome Cogema Fuels of Lynchburg, VA. Under the contract, the team will also modify six existing U.S. commercial light water reactors at three sites to irradiate mixed oxide fuel assemblies. These reactors sites are Catawba in York, SC; McGuire in Huntersville, NC; and North Anna in Mineral, VA. The team will be responsible for obtaining a license to operate the fuel fabrication facility and the license modifications for the reactors from the Nuclear Regulatory Commission. Full execution of this contract is contingent on DOE's completion of the SPD EIS, as provided by 40 CFR 1021.216(i).

Supplement to the Surplus Plutonium Disposition Draft Environmental Impact Statement

The purpose of the Supplement to the SPD Draft EIS is to update the Draft by including specific information available as a result of the award of the DCS contract. The Supplement to the SPD Draft EIS will contain background information on the SPD Draft EIS; changes made to the SPD Draft EIS (Section 1.7.2); a description of the reactor sites (Section 3.7); impacts of irradiating mixed oxide fuel in existing light water reactors (Section 4.28); Facility Accidents (Appendix K); Analysis of Environmental Justice (Appendix M); and the Environmental Synopsis (Appendix O).

DOE anticipates that the Supplement to the SPD Draft EIS will be available in April. DOE intends to hold an interactive hearing in Washington, DC in May 1999 to discuss issues and receive oral and written comments on the Supplement to the Draft SPD EIS. The Notice of Availability will provide specific information concerning the date, time and location for the public hearing.

Issued in Washington, DC this 31st day of March 1999, for the United States Department of Energy.

David Michaels,

Assistant Secretary, Environment, Safety and Health.

[FR Doc. 99–8455 Filed 4–5–99; 8:45 am]

BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

Office of Science; Biological and Environmental Research Advisory Committee

AGENCY: Department of Energy.

ACTION: Notice of open meeting.

SUMMARY: This notice announces a meeting of the Biological and Environmental Research Advisory Committee. Federal Advisory Committee Act (Public Law 92–463, 86 Stat. 770) requires that public notice of

A.7 NOTICE OF AVAILABILITY—SUPPLEMENT TO THE SURPLUS PLUTONIUM DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT

technological collection techniques or other forms of information technology, e.g., permitting electronic submission of responses.

Burden Statement: The annual public reporting and recordkeeping burden for this collection of information is estimated to average 3.03 hours per response. It is estimated that any individual may respond to synopses or market research questions 5 times per year. EPA anticipates publicizing approximately 260 contract actions per year, and conducting 3790 market research inquiries. Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

Dated: May 7, 1999.

Lawrence G. Wyborski,

Acting Manager, Policy Service Center.

[FR Doc. 99-12249 Filed 5-13-99; 8:45 am]

BILLING CODE 6560-50-U

ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-6242-6]

Environmental Impact Statements and Regulations; Availability of EPA Comments

Availability of EPA comments prepared April 19, 1999 Through April 23, 1999 pursuant to the Environmental Review Process (ERP), under Section 309 of the Clean Air Act and Section 102(2)(c) of the National Environmental Policy Act as amended. Requests for copies of EPA comments can be directed to the Office of FEDERAL ACTIVITIES AT (202) 564-7167.

An explanation of the ratings assigned to draft environmental impact statements (EISs) was published in FR dated April 09, 1999 (64 FR 17362).

Draft EISs

ERP No. D-AFS-L65207-OR Rating *LO, Young'n Timber Sales, Implementation, Willamette National Forest Land and Resource Management Plan, Middle Fork Ranger District, Lane County, OR.

Summary: EPA used a screening tool to conduct a limited review of this action. Based upon the screen, EPA does not foresee having any environmental objections to the proposed project. Therefore, EPA will not be conducting a detailed review.

ERP No. D-AFS-L65304-OR Rating EC2, Moose Subwatershed Timber Harvest and Other Vegetation Management Actions, Central Cascade Adaptive Management (CCAMA), Willamette National Forest, Sweet Home Ranger District, Linn County, OR.

Summary: EPA expressed environmental concerns with the proposed timber harvest due to entry into roadless area and the potential for impact to water quality and recommended that the Forest Service continue to monitor for water quality impacts.

ERP No. D-COE-J36050-ND Rating EO2, Maple River Dam and Reservoir, Construction and Operation, Flood Control, Cass County Joint Water Resource District, Cass County, ND.

Summary: EPA expressed environmental objections to the project on the basis of: (1) the lack of adequate provisions to identify and protect aquatic habitats, (2) exceedances of water quality standards, (3) the uncertainty of the mitigation, restoration and conservation efforts, (4) the lack of information on future flood control activities, (5) future growth and development impacts in the lower watershed area, (6) a cumulative impacts analysis that was limited to water chemistry, (7) a substantial need to address the watershed as a unit.

Final EISs

ERP No. F-AFS-L65255-AK, Control Lake Timber Sale, Implementation, Prince of Wales Island, Tongass National Forest, AK.

Summary: Review of the Final EIS was not deemed necessary. No formal comment letter was sent to the preparing agency.

ERP No. F-BLM-L65294-OR, Beaty Butte Allotment Management Plan, Implementation, Lakeview District, Hart Mountain National Antelope Refuge, Lake and Harney Counties, OR.

Summary: The Final EIS has addressed the issues EPA raised in the draft EIS.

ERP No. FS-COE-G32054-00, Red River Waterway, Louisiana, Texas, Arkansas and Oklahoma and Related Projects, New and Updated Information, Red River Below Denison Dam Levee Rehabilition, Implementation, Hempstead, Lafayette and Miller Counties, AR.

Summary: EPA has no objection to the selection of the preferred alternative described in the FSEIS.

Dated: May 11, 1999.

William D. Dickerson,

Director, Office of Federal Activities.

[FR Doc. 99-12265 Filed 5-13-99; 8:45 am]

BILLING CODE 6560-50-U

ENVIRONMENTAL PROTECTION AGENCY

[ER-FRL-6242-5]

Environmental Impact Statements; Notice of Availability

Responsible Agency: Office of Federal Activities, General Information (202) 564-7167 or (202) 564-7153.

Weekly receipt of Environmental Impact Statements

Filed May 03, 1999 Through May 07, 1999.

Pursuant to 40 CFR 1506.9.

EIS No. 990148, Final Supplement, AFS, CO, Lakewood Raw Water Pipeline for Continued Operation, Maintenance, Reconstruction and/or Replacement, Application for Easement, Roosevelt National Forest, Boulder Ranger District, in the City of Boulder, CO, Due: June 07, 1999, Contact: Jean Thomas (970) 498-1267. The above DOA EIS should have appeared in the 05/07/99 Federal Register. The 30-day Comment Period is Calculated from 05/07/99.

EIS No. 990149, Draft EIS, AFS, MT, Bridger Bowl Ski Area, Permit Renewal and Master Development Plan Update, Implementation, Special Use Permit and COE Section 404 Permit, Gallatin National Forest, in the City of Bozeman, MT, Due: June 28, 1999, Contact: Nancy Halstom (406) 587-6920.

EIS No. 990150, Final EIS, NPS, TX, Lyndon B. Johnson National Historical Park, Package 227, General Management Plan, Implementation, Blanco and Gillespie Counties, TX, Due: June 14, 1999, Contact: Leslie Starhart (830) 868-7128.

EIS No. 990151, Final EIS, FHW, MO, IA, US 61, US 218 and IA-394 Highway Improvements, Construction, Funding, US Army COE Section 404 Permit, Lewis and Clark Counties, MO and Lee and Henry Counties, IA , Due: June 14, 1999, Contact: Donald Neumann (573) 636-7104.

EIS No. 990152, Draft EIS, FTA, VA, Norfolk-Virginia Beach Light Rail Transit System East/West Corridor

Project, Transportation Improvements, Tidewater Transportation District Commission, COE Section 404 Permit, City of Norfolk and City of Virginia Beach, VA, Due: June 28, 1999, Contact: Michael McCollum (215) 656–7100.

EIS No. 990153, Legislative Final EIS, USA, AK, Alaska Army Lands Withdrawal Renewal for Fort Wainwright and Fort Greely West Training Area, Approval of Permits and Licenses, City of Fairbanks, City of North Pole and City of Delta Junction, North Star Borough, AK , Due: June 14, 1999, Contact: Cindy Herdrich (970) 491–5347.

EIS No. 990154, Draft Supplement, DOE, CA, NM, TX, ID, SC, WA, Surplus Plutonium Disposition (DOE/EIS–0283–S) for Siting, New and Revised Information, Construction and Operation of three facilities for Plutonium Disposition, Possible Sites Hanford, Idaho National Engineering and Environmental Laboratory, Pantex Plant and Savannah River, CA, ID, NM, SC, TX and WA, Due: June 28, 1999, Contact: G. Bert Stevenson (202) 586–5368.

EIS No. 990155, Draft EIS, BLM, WY, Wyodak Coal Bed Methane Project, Road Construction, Drilling Operation, Electrical Distribution Line, Powder River Basin, Campbell and Converse Counties, WY, Due: June 28, 1999, Contact: Richard Zander (307) 684–1161.

EIS No. 990156, Final EIS, UAF, ND, Minuteman III Missile System Dismantlement, Intercontinental Ballistic Missile (ICBM) Launch Facilities (LFs) and Missile Alert Facilities (MAFs), Deployment Areas, Grand Forks Air Forces Base, ND , Due: June 14, 1999, Contact: Jonathan D. Farthing (210) 536–3069.

Amended Notices

EIS No. 990103, Draft Supplement, FHW, CA, CA–125 South Route Location, Adoption and Construction, between CA–905 on Otay Mesa to CA–54 in Spring Valley, Updated and Additional Information, Funding and COE Section 404 Permit, San Diego County, CA, Due: May 24, 1999, Contact: C. Glenn Clinton (916) 498–5037. Published FR–04–09–99—Due Date Correction.

EIS No. 990108, Draft Supplement EIS, AFS, ID, Grade-Dukes Timber Sale, Proposal to Harvest and Regenerate Timber, Implementation, Cuddy Mountain Roadless Area, Payette National Forest, Weiser Ranger District, Washington County, Idaho, Due: June 01, 1999, Contact: Dautis Pearson (208) 253–0134. Published FR 04–09–99 Review Period Extended.

EIS No. 990143, Draft EIS, TPT, CA, Presidio of San Francisco General Management Plan, Implementation, New Development and Uses within the Letterman Complex, Golden Gate National Recreation Area, City and County of San Francisco, CA, Due: June 14, 1999, Contact: John Pelka (415) 561–5300. Published FR–04–30–99—Correction to Document Status from a Draft Supplement to Draft.

Dated: May 11, 1999.

William D. Dickerson,

Director, Office of Federal Activities.

[FR Doc. 99–12264 Filed 5–13–99; 8:45 am]

BILLING CODE 6560–50–U

ENVIRONMENTAL PROTECTION AGENCY

[FRL–6342–1]

RIN 2060–AH52

Public Meetings To Discuss Air Quality Modeling and Infrastructure Issues Associated With Alternative-Fueled Vehicles

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of public meetings.

SUMMARY: The Environmental Protection Agency intends to hold two public workshops to discuss issues associated with alternative fuel vehicles (AFVs) (i.e., vehicles powered by fuels other than gasoline). The first workshop (which EPA will hold May 26, 1999, in Louisville, Kentucky), will focus on issues associated with air quality modeling of AFVs. The purpose of this workshop is to facilitate an exchange of information that will help EPA determine which areas of its modeling, if any, should be enhanced to better estimate the air quality impacts of alternative-fueled vehicles. The second workshop will focus on issues related to infrastructure development and creating a sustainable market for AFVs.

DATES: The first workshop (on modeling and AFVs) will be held on May 26, 1999, in Louisville, Kentucky, following the Department of Energy's National Clean Cities Conference. The date for the second workshop (on infrastructure development and creating a sustainable market for AFVs) will be announced later. Members of the public are invited to attend as observers.

ADDRESSES: Questions about the workshop should be addressed to: Barry Garelick (202–564–9028; garelick.barry@epa.gov) or Christine Hawk (202–564–9672; hawk.christine@epa.gov), 401 M Street, S.W. (6406J), Washington, D.C. (20460). The workshop will be held at the Sellbach Hilton Hotel, 500 4th St, Louisville, Kentucky 40202, 800 333–3399 or 502–585–3200.

FOR FURTHER INFORMATION CONTACT: Barry Garelick (202) 564–9028.

SUPPLEMENTARY INFORMATION: As this Administration has long recognized, one of the keys to moving forward environmentally is moving forward technologically. Progress towards sustainable reductions in emissions from the mobile source sector is inextricably linked to technological advancement. Motor vehicles are significant contributors to ground-level ozone, the principal harmful ingredient in smog. They also emit other pollutants, including particulate matter and air toxics. Motor vehicle emissions contribute to public health problems such as asthma and other respiratory problems, especially in children.

History has shown that the rise in vehicle sales and vehicle miles traveled every year has consistently led to increases in the aggregate emissions from the mobile source sector, despite progress in reducing emissions from gasoline-powered, conventional motor vehicles. This places increasing importance on technological developments, including vehicles powered by fuels other than gasoline. There is particular interest in the creation of vehicles whose emissions do not increase as the vehicle ages. There are a number of types of alternative fuel vehicles (AFVs) in production and under development. In the United States, manufacturers are already selling various types of AFVs, including vehicles powered by electricity, compressed natural gas, methanol, and ethanol. The last year has also seen dramatic developments in hybrid-electric vehicle and fuel cell technology.

Congress and the Administration have already recognized that they have an important role to play regarding AFVs. As part of the 1990 Amendments to the Clean Air Act, Congress included sections promoting increased numbers of clean fuel fleet vehicles. The Clean Fuel Fleet program, which began on September 1, 1998, requires certain nonattainment areas to adopt and implement a program requiring certain centrally-fueled fleets to include a specified percentage of clean-fuel vehicles in their new fleet vehicle purchases. Additionally, Congress passed the Energy Policy Act of 1992 (EPAct), which includes numerous provisions designed to increase the

A.8 JOINT STATEMENT OF PRINCIPLES FOR MANAGEMENT AND DISPOSITION OF PLUTONIUM DESIGNATED AS NO LONGER REQUIRED FOR DEFENSE PURPOSES

AGREEMENT BETWEEN THE GOVERNMENT OF THE UNITED STATES OF AMERICA AND THE GOVERNMENT OF THE RUSSIAN FEDERATION ON SCIENTIFIC AND TECHNICAL COOPERATION IN THE MANAGEMENT OF PLUTONIUM THAT HAS BEEN WITHDRAWN FROM NUCLEAR MILITARY PROGRAMS

The Government of the United States of America and the Government of the Russian Federation, hereafter referred to as the Parties,

Taking into account:

- The January 14, 1994, Declaration of the Presidents of the United States and the Russian Federation on "Nonproliferation of Weapons of Mass Destruction and the Means of Their Delivery";
- The Declaration of the April 19-20, 1996, Summit on Nuclear Safety and Security in Moscow;
- The Conclusions of the International Meeting of Experts in Paris, on October 28-31, 1996, concerning the safe and efficient management of fissile materials designated as no longer required for defense purposes;
- The statement regarding fissile materials in the June 22, 1997, Final Communiqué of the Denver Summit of the Eight;
- The statement of the President of the United States on March 1, 1995, that 200 tons of fissile material will be withdrawn from the U.S. nuclear stockpile and directing that these materials will never again be used to build a nuclear weapon; and
- The message of the President of the Russian Federation to the participants of the 41st General Conference of the IAEA, September 26, 1997, on step by step removal from nuclear defense programs of up to 500 tonnes of highly enriched uranium and up to 50 tonnes of plutonium released in the process of nuclear disarmament;

Have agreed as follows:

ARTICLE 1

The purposes of this Agreement are to:

a) Provide the scientific and technical basis for decisions on how plutonium, subject to this Agreement, shall be managed; and

b) Establish a framework for continued and expanded scientific and technical cooperation for the accomplishment of the objective in paragraph a.

ARTICLE 2

For purposes of this Agreement:

1. "Plutonium" means plutonium that has been withdrawn from nuclear military programs and is no longer required for defense purposes.

2. "Management of plutonium" means the transformation of plutonium into spent fuel or other forms equally unusable for nuclear weapons or other nuclear explosive devices, and may include conversion of plutonium and its manufacture into MOX fuel, use of MOX fuel in nuclear reactors, and immobilization of plutonium in various forms.

ARTICLE 3

1. The Parties shall:

   a) Continue to cooperate with small-scale tests and demonstrations relating to management of plutonium; and

   b) As soon as is practicable, also proceed to pilot-scale demonstrations of technologies for plutonium management.

2. The principal subject areas for the Parties' cooperative efforts shall be:

   a) Conversion of metallic plutonium into oxide suitable for the manufacture of MOX fuel for nuclear power reactors of various types;

   b) Stabilization of unstable forms of plutonium;

   c) Use of plutonium in the form of MOX fuel in various types of nuclear power reactors;

   d) Immobilization of plutonium, including wastes and hard-to-process forms; and

   e) Disposal of immobilized forms of materials containing plutonium in deep geological formations.

ARTICLE 4

1. The Parties shall designate Executive Agents to carry out the provisions of this Agreement. The Executive Agent for the United States of America shall be the U.S. Department of Energy and the Executive Agent for the Russian Federation shall be the Russian Ministry for Atomic Energy.

2. The Parties shall have the right, consistent with their respective laws and regulations, and following written notification to the other Party, to obtain participation, as necessary, in the implementation of this Agreement, by other agencies, departments, and units of their respective governments.

3. To accomplish the objectives of this Agreement, the Parties shall establish a U.S.-Russian Joint Steering Committee on Plutonium Management, which shall coordinate and agree upon work undertaken under this Agreement. Each Party shall designate its members on the Joint Steering Committee. Decisions of the Joint Steering Committee shall be taken by consensus.

4. The tasks of the Joint Steering Committee shall include:

   a) Development of overall work programs and areas of cooperation within the scope of this Agreement;

   b) Prioritization, coordination, review and approval of the cooperative projects under this Agreement within the resources made available by the Parties;

   c) Resolution of any disputes that may arise with respect to the scientific and technical work performed under this Agreement; and

   d) Such other matters, as the Parties may agree, that are within the scope of this Agreement.

5. When agreement is reached on the performance of joint research, projects, or experiments under this Agreement, detailed procedures for performing the activities involved shall be officially drawn up in the form of implementing arrangements, to be reviewed and approved by the Joint Steering Committee.

ARTICLE 5

Cooperation between the Parties within the framework of this Agreement may include the following:

   a) Sharing of scientific and technical information;

   b) Development of conceptual approaches;

   c) Research, experiments and small-scale demonstrations of technological solutions;

   d) Design, construction, and operation of pilot-scale facilities for demonstrating and testing technological solutions obtained as a result of research;

   e) Transfer of equipment and non-nuclear materials;

   f) Meetings, seminars, conferences, personnel assignments, and workshops for the sharing of information;

   g) Feasibility studies; and

   h) Such other forms of cooperation within the scope of this Agreement as the Executive Agents may agree upon in writing.

ARTICLE 6

1. In the implementation of this Agreement, only unclassified information shall be exchanged.

2. In order to prevent access to it by people and organizations not participating in the implementation of this Agreement, information provided by the Parties pursuant to, or produced as a result of, this Agreement which is considered sensitive by the Parties is to be held in confidence and must be clearly designated and marked. The Party transmitting the information will designate information as sensitive in accordance with its internal laws and regulations. The Party receiving this information shall assign it a designation that provides a degree of protection at least equivalent to that required by the Party that furnished the information.

3. Sensitive information shall be handled in accordance with the laws and regulations of the Party receiving the information, and shall not be disclosed or transmitted to a third party not participating in implementation of this Agreement without the written consent of the Party transmitting the information. According to the regulations of the United States, such information shall be treated as foreign government information provided in confidence and shall be protected appropriately. According to the norms and regulations of the Russian Federation, such information shall be treated as official information with limited distribution and shall be protected appropriately.

4. The Parties shall assure effective protection and allocation of rights to intellectual property transmitted or created under this Agreement, as set forth in this Article and in the Annex to this Agreement, which forms an integral part of this Agreement.

5. Information transmitted under this Agreement must be used solely in accordance with this Agreement.

6. The number of people having access to sensitive information must be limited to the number necessary to implement this Agreement and other programs associated with this Agreement, and shall be determined by the Parties' Executive Agents.

ARTICLE 7

1. Materials, equipment and technologies, transferred under the terms of this Agreement, shall not be used for the production of nuclear weapons, any nuclear explosive devices, or for research or development of such devices or for the furtherance of any military purpose.

2. Materials, equipment and technologies, transferred under the terms of this Agreement, shall not be exported, re-exported, or transferred from the jurisdiction of the recipient without the written consent of the Parties.

3. Prior to the export under the terms of this Agreement to a third party of any equipment, materials or technologies, the Parties by mutual agreement in writing shall define the conditions in accordance with which such items shall be exported, re-exported, or transferred from the jurisdiction of the third party.

4. The Parties' Executive Agents shall take all measures necessary to ensure adequate physical protection of nuclear materials, equipment, installations, and nuclear technologies in its jurisdiction, and shall apply criteria and levels of physical

protection not lower than those identified in the Convention on the Physical Protection of Nuclear Material and in recommendations of the IAEA.

ARTICLE 8

Equipment, supplies, materials, services and activities provided or acquired by the United States of America, its contractors, subcontractors, and their personnel for the implementation of this Agreement are free technical assistance and are thus exempt from customs duties and taxes. The Russian Federation shall take all necessary measures to exempt this equipment, shipments, materials, services, and work from all taxes, tariffs, customs duties, and levies of the Russian Federation and its instrumentalities.

ARTICLE 9

1. With the exception of claims for damage or injury against individuals arising from their premeditated actions, the Government of the Russian Federation shall bring no claims or other legal proceedings against the Government of the United States of America and its personnel or its contractors, sub-contractors, consultants, suppliers or subsuppliers of equipment or services at any tier and their personnel, in any court or forum, for any damage, including indirect, direct or consequential damage, arising from activities undertaken pursuant to this Agreement, to property owned by the Russian Federation. This paragraph shall not apply to legal actions brought by the Government of the Russian Federation to enforce the provisions of contracts to which it or a Russian national or other legal entity is a party.

2. With the exception of claims for damage or injury against individuals arising from their premeditated actions, the Government of the Russian Federation shall provide for the adequate defense of, shall indemnify, and shall bring no claims or other legal proceedings against, the Government of the United States of America and its personnel or its contractors, sub-contractors, consultants, suppliers or subsuppliers of equipment or services at any tier and their personnel, in connection with third-party claims, in any court or forum, for any injury or damage, including indirect, direct, or consequential injury or damage, arising from activities undertaken pursuant to this Agreement, occurring within or outside the territory of the Russian Federation. Nothing in this paragraph shall be construed as acknowledging the jurisdiction of any court or forum over third-party claims to which this paragraph applies, nor shall it be construed as waiving the sovereign immunity of either Party with respect to third-party claims that may be brought against it.

3. The Parties may, as necessary, conduct consultations regarding claims and legal proceedings concerning this Article.

4. The provisions of this Article shall not prevent the Parties from providing compensation in accordance with their national laws.

5. Nothing in this Article shall be interpreted to prevent legal proceedings or claims against nationals of the Russian Federation or permanent residents of the Russian Federation.

ARTICLE 10

1. Joint activities under this Agreement shall be supported by funds and in-kind contributions of equipment, material, and labor provided on a non-reimbursable basis for these purposes by the United States of America and the Russian Federation.

Joint activities may also be supported, in whole or in part, from funds directly from other sources, including non-government funds and funds from the private sector.

2. In all cases, the activities of, and financial support provided by, the United States of America under this Agreement are subject to the availability of appropriated funds. In all cases, the activities of, and financial support provided by, the Russian Federation under this Agreement are subject to the availability of appropriated funds.

ARTICLE 11

In the event that a Party awards contracts for the acquisition of articles and services, including construction, to implement this Agreement, such contracts shall be awarded in accordance with the laws and regulations of that Party.

ARTICLE 12

1. Representatives of the U.S. Department of Energy shall have the right upon reasonable notice to examine and audit the use of any support or assistance provided by the U.S. Government in connection with cooperation under this Agreement during the life of this Agreement and for three years thereafter. Such examinations may be conducted at sites or locations as agreed to by the Parties' Executive Agents.

2. The Parties' Executive Agents shall develop appropriate arrangements for conducting audits and examinations for all work performed within the framework of this Agreement.

ARTICLE 13

All questions regarding the interpretation or application of this Agreement shall be resolved by means of consultation between the Parties.

ARTICLE 14

1. This Agreement shall enter into force on the date of signature, and shall remain in force for five years. The Agreement may be extended for successive five-year periods with the written consent of both Parties after joint review before the end of each five-year period. The Agreement may be amended by written agreement of the Parties.

2. This Agreement may be terminated by either Party by sending written notice through diplomatic channels of its intent to terminate the Agreement, in which case the Agreement shall terminate six months from the date of the notification.

3. In the event that either Party exercises its right to terminate this Agreement, the Parties may agree upon the implementation of existing contracts and projects until their completion, and will settle any outstanding costs by mutual agreement. If this Agreement is terminated or expires, the Parties agree that all sensitive information and intellectual property that was made available in the course of the Agreement shall continue to be treated in conformance with Article 6 of this Agreement, unless other arrangements are made by written agreement of the Parties.

Done at Moscow this twenty-fourth day of July, 1998, in duplicate in the English and Russian languages, both texts being equally authentic.

FOR THE GOVERNMENT OF THE UNITED STATES OF AMERICA:

FOR THE GOVERNMENT OF THE RUSSIAN FEDERATION:

ANNEX
TO THE
AGREEMENT
BETWEEN
THE GOVERNMENT
OF THE UNITED STATES OF AMERICA
AND
THE GOVERNMENT
OF THE RUSSIAN FEDERATION
ON SCIENTIFIC AND TECHNICAL COOPERATION
IN THE MANAGEMENT OF PLUTONIUM
THAT HAS BEEN WITHDRAWN
FROM NUCLEAR MILITARY PROGRAMS

INTELLECTUAL PROPERTY

Pursuant to Article 6 of this Agreement:

The Parties shall ensure adequate and effective protection of intellectual property created or furnished under this Agreement and relevant implementing agreements. The Parties agree to notify one another in a timely fashion of any inventions or copyrighted works resulting from scientific and technological work performed under this Agreement and to seek protection for such intellectual property in a timely fashion. Rights to such intellectual property shall be allocated as provided in this Annex.

I. Scope

A. This Annex is applicable to all cooperative activities undertaken pursuant to this Agreement, except as otherwise specifically agreed by the Parties or their Executive Agents.

B. For purposes of this Agreement, "intellectual property" shall have the meaning found in Article 2 of the Convention Establishing the World Intellectual Property Organization, done at Stockholm, July 14, 1967.

C. This Annex addresses the allocation of rights and interests between the Parties. Each Party shall ensure that the other Party can obtain the rights to intellectual property allocated in accordance with this Annex, by obtaining those rights from its own participants through contracts, license agreements or other legal documents, if necessary. This Annex does not otherwise alter or prejudice the allocation between a Party and its nationals or other legal entities, which shall be determined by that Party's laws and practices.

D. Disputes concerning intellectual property arising under this Agreement should be resolved through discussions between the concerned participating institutions, or, if necessary, the Parties or their Executive Agents. Upon mutual agreement of the Parties, a dispute shall be submitted to an arbitral tribunal for binding arbitration in accordance with the Agreement and with the applicable rules of international law.

E. Termination or expiration of this Agreement shall not affect rights or obligations under this Annex.

II. Allocation of Rights

A. Each Party shall be entitled to a non-exclusive, irrevocable, royalty-free license in all countries to translate, reproduce, and publicly distribute scientific and technical journal articles, papers, reports, and books directly arising from cooperation under this Agreement. All publicly distributed copies of a copyrighted work prepared under this provision shall indicate the names of the authors of the work unless an author explicitly declines to be named.

B. Rights to all forms of intellectual property, other than those rights described in Paragraph II.A above, shall be allocated as follows:

(1) Visiting researchers shall receive intellectual property rights under the policies of the host institution. In addition, each visiting researcher named as an inventor or author shall be entitled to awards, bonuses, benefits, or any other rewards in accordance with the policies of the host institution.

(2) (a) For intellectual property created during joint research, for example, when the Parties, participating institutions, or participating personnel have agreed in advance on the scope of work, each Party shall be entitled to obtain all rights and interests in its own country. Rights and interests in third countries will be determined in implementing agreements. If research is not designated as "joint research" in the relevant implementing agreement, rights to intellectual property arising from the research will be allocated in accordance with paragraph II.B.(1) above. In addition, each person named as an inventor or author shall be entitled to receive awards in accordance with the policies of the participating institutions.

(b) Notwithstanding paragraph II.B.(2)(a) above, if a type of intellectual property is available under the laws of one Party but not the other Party, the Party whose laws provide for this type of protection shall be entitled to all rights and interests worldwide. Persons named as inventors or authors of the property shall nonetheless be entitled to awards, bonuses, benefits, or any other rewards in accordance with the policies of the participating institution of the Party obtaining rights.

III. Business Confidential Information

In the event that information identified in a timely fashion as business-confidential is furnished or created under this Agreement, each Party and its participants shall protect such information in accordance with applicable laws, regulations, and administrative practices. Information may be identified as "business-confidential" if a person having the information may derive an economic benefit from it or may obtain a competitive advantage over those who do not have it, the information is not generally known or publicly available from other sources, and the owner has not previously made the information available without imposing in a timely manner an obligation to keep it confidential.

СОГЛАШЕНИЕ

между Правительством Соединенных Штатов Америки и Правительством Российской Федерации о научно-техническом сотрудничестве в области обращения с плутонием, изъятым из ядерных военных программ

Правительство Соединенных Штатов Америки и Правительство Российской Федерации, именуемые в дальнейшем Сторонами,

Принимая во внимание:

Заявление Президентов Соединенных Штатов Америки и Российской Федерации от 14 января 1994 года « О нераспространении оружия массового уничтожения и средств его доставки»;

Декларацию встречи на высшем уровне в Москве по ядерной безопасности 19-20 апреля 1996 года;

Заключения Международной встречи экспертов в Париже 28-31 октября 1996 года о безопасном и эффективном обращении с делящимися материалами, определенными как более не требующиеся для военных целей;

Положение, касающееся делящихся материалов, Заключительного Коммюнике Встречи на высшем уровне в Денвере стран Большой Восьмерки от 22 июня 1997 года;

Заявление Президента Соединенных Штатов Америки от 1 марта 1995 года о том, что 200 тонн делящихся материалов будут выведены из ядерного арсенала США и никогда более не будут использованы для создания ядерного оружия; и

Обращение Президента Российской Федерации к участникам 41-ой сессии Генеральной конференции МАГАТЭ 26 сентября 1997 года о поэтапном изъятии из ядерных военных программ до 500 тонн высокообогащенного урана и до 50 тонн плутония, высвобождаемых в процессе ядерного разоружения;

Согласились о нижеследующем:

Статья 1

Целью настоящего Соглашения является:

а). выработка научно-технического обоснования для принятия решения об использовании плутония, являющегося предметом данного Соглашения.

б). определение основных направлений продолжения и расширения научно-технического сотрудничества для выполнения положения параграфа а).

Статья 2

Для целей настоящего Соглашения:

1. Термин «плутоний» означает плутоний, изъятый из ядерных военных программ и более не требуемый для военных целей,
2. Термин «обращение с плутонием» означает перевод плутония в отработавшее топливо или в другие формы, в равной степени не пригодные для использования в ядерном оружии или других ядерных взрывных устройствах и может включать конверсию плутония, производство из плутония смешанного оксидного топлива (МОКС-топлива), использование МОКС-топлива в ядерных реакторах и иммобилизацию плутония в различных формах.

Статья 3

1. Стороны будут:

а) продолжать сотрудничество в области маломасштабных испытаний и демонстраций в области обращения с плутонием; а также

б) так скоро, как это представляется практически возможным, переходить к опытно-промышленным демонстрациям технологий по обращению с плутонием.

2. Основными направлениями сотрудничества Сторон будут:

а) конверсия металлического плутония в оксид, пригодный для изготовления МОКС-топлива для энергетических ядерных реакторов различных типов;

б) стабилизация нестабильных форм плутония;

в) использование плутония в виде МОКС-топлива в энергетических ядерных реакторах различных типов;

г) иммобилизация плутония, включая отходы и трудно перерабатываемые формы; и

д) захоронение иммобилизованных материалов, содержащих плутоний, в глубоких геологических формациях.

Статья 4

1. Для выполнения положений настоящего Соглашения Стороны назначают исполнительные органы. От Соединенных Штатов Америки - Министерство энергетики Соединенных Штатов Америки, в Российской Федерации исполнительным органом является Министерство Российской Федерации по атомной энергии.

2. В соответствии с законодательством и правилами Сторон и после письменного уведомления другой Стороны, каждая Сторона при необходимости имеет право привлекать к осуществлению данного Соглашения другие правительственные агентства, департаменты и организации своей страны.

3. Для выполнения целей настоящего Соглашения Стороны создают российско-американский Объединенный Координационный Комитет по обращению с плутонием, который координирует и согласовывает работы, проводимые в рамках настоящего Соглашения. Каждая Сторона назначает своих представителей в Объединенном Координационном Комитете. Решения Объединенного Координационного Комитета принимаются на основе консенсуса.

4. Задачами Объединенного Координационного Комитета являются:

а) Определение областей сотрудничества и разработка общего плана работ в рамках настоящего Соглашения;

б) Определение приоритетов, координация, рассмотрение и одобрение совместных проектов, осуществляемых в рамках настоящего Соглашения и в пределах ресурсов, предоставленных Сторонами;

в) Разрешение любых споров, которые могут возникнуть в процессе научно-технической работы в рамках настоящего Соглашения; и

г) Рассмотрение иных вопросов по согласию Сторон, находящихся в рамках настоящего Соглашения.

5. При достижении договоренности о проведении совместных исследований, проектов или экспериментов в рамках настоящего Соглашения, детальный план выполнения этих работ официально составляется в виде исполнительных договоренностей, подлежащих рассмотрению и одобрению Объединенным Координационным Комитетом.

Статья 5

Сотрудничество Сторон в рамках настоящего Соглашения может включать следующие направления:

а) Обмен научной и технической информацией;

б) Разработка концептуальных подходов;

в) Исследовательские, экспериментальные работы и маломасштабные демонстрации технологических решений;

г) Проектирование, создание и эксплуатация опытно-промышленных установок с целью демонстрации и проверки технологических решений, полученных в результате исследований;

д) Передачу оборудования и неядерных материалов;

е) Встречи, семинары, конференции, командировки и рабочие совещания с целью обмена информацией;

ж) Технико-экономические обоснования;

з) Другие формы сотрудничества в рамках настоящего Соглашения по совместному согласию исполнительных органов, выраженному в письменном виде.

Статья 6

1.В рамках настоящего Соглашения осуществляется обмен только несекретной информацией.

2. С целью предотвращения доступа лиц и организаций, не участвующих в выполнении настоящего Соглашения, к информации, передаваемой Сторонами в рамках настоящего Соглашения или полученной в результате его осуществления, и считающейся Сторонами конфиденциальной, с этой информацией следует обращаться как с конфиденциальной информацией. Такая информация должна быть четко определена и обозначена. Определение информации в качестве конфиденциальной осуществляется Стороной, передающей информацию, в соответствии с ее законами и правилами. Сторона, принимающая эту информацию, присваивает ей классификацию, обеспечивающую ей такую степень защищенности, которая, по крайней мере, равноценна защищенности, требуемой Стороной, которая предоставила эту информацию.

3.Обращение с конфиденциальной информацией осуществляется в соответствии с законами и правилами Стороны, получающей информацию, причем эта информация не разглашается и не передается третьей стороне, не участвующей в реализации настоящего Соглашения, без письменного согласия Стороны, передавшей информацию. В соответствии с нормами и правилами Соединенных Штатов Америки, с такой информацией обращаются как с информацией, принадлежащей иностранному правительству, переданной конфиденциально. Эта информация обеспечивается соответствующей защитой. В соответствии с нормами и правилами Российской Федерации с этой информацией обращаются как со служебной информацией ограниченного распространения, и эта информация обеспечивается соответствующей защитой.

4.Стороны обеспечивают эффективную защиту интеллектуальной собственности и распределение прав на интеллектуальную собственность, переданную или созданную в рамках настоящего Соглашения, как это указано в настоящей Статье и в Приложении к настоящему Соглашению, которое является неотъемлемой частью настоящего Соглашения.

5.Информация, передаваемая в рамках настоящего Соглашения, должна использоваться исключительно в целях, установленных настоящим Соглашением.

6.Число лиц, имеющих доступ к конфиденциальной информации, должно быть ограничено числом, необходимым для реализации настоящего Соглашения и других связанных с ним программ и определяется исполнительными органами Сторон.

Статья 7

1. Материалы, оборудование и технологии, передаваемые по настоящему Соглашению, не будут использоваться для производства ядерного оружия, любых ядерных взрывных устройств или для исследований или разработки таких устройств, а также для использования в военных целях.

2. Материалы, оборудование и технологии, передаваемые по настоящему Соглашению, не являются предметом экспорта, реэкспорта или передачи из-под юрисдикции получателя без письменного согласия Сторон.

3. До начала экспортных поставок третьей стороне какого-либо оборудования, материалов или технологий в рамках настоящего Соглашения, Стороны по взаимному согласию в письменном виде определяют условия, в соответствии с которыми эти предметы экспорта могут экспортироваться, реэкспортироваться или передаваться из-под юрисдикции третьей стороны.

4. Исполнительные органы Сторон должны предпринимать все необходимые меры для обеспечения соответствующей физической защиты ядерных материалов, оборудования, установок и ядерных технологий, находящихся под их юрисдикцией, а также применяют такие критерии и уровни физической защиты, которые не ниже критериев и уровней,

определенных в Конвенции по физической защите ядерных материалов и в рекомендациях МАГАТЭ.

Статья 8

Оборудование, поставки, материалы, услуги и работы, предоставляемые или приобретаемые Соединенными Штатами Америки, их подрядчиками, субподрядчиками и их персоналом в целях реализации настоящего Соглашения, являются безвозмездной технической помощью, в отношении которых применяется освобождение от уплаты таможенных пошлин и налогов. Российская Федерация предпринимает все необходимые меры для освобождения такого оборудования, поставок, материалов, услуг и работ от всех налогов, тарифов, таможенных пошлин и сборов Российской Федерации и ее органов.

Статья 9

1.За исключением претензий к отдельным лицам за ущерб или телесное повреждение, явившихся результатом их преднамеренных действий, Правительство Российской Федерации не предъявляет претензий и не возбуждает судебных разбирательств в связи с деятельностью, осуществляемой во исполнение настоящего Соглашения, против Правительства Соединенных Штатов Америки и его персонала или его подрядчиков, субподрядчиков, консультантов, поставщиков или субпоставщиков оборудования или услуг на любом уровне и их персонала за любой ущерб, включая косвенный, прямой или вторичный ущерб имуществу, принадлежащему Российской Федерации. Настоящий пункт не применяется к правовым действиям, осуществляемым Правительством Российской Федерации для обеспечения выполнения положений контрактов, стороной которых является оно, российский гражданин или юридическое лицо.

2.За исключением претензий к отдельным лицам за ущерб или телесное повреждение, явившихся результатом их преднамеренных действий, Правительство Российской Федерации обеспечивает надлежащую защиту, освобождает от материальной ответственности, не предъявляет

претензий и не возбуждает судебных разбирательств против Правительства Соединенных Штатов Америки и его персонала, подрядчиков, субподрядчиков, консультантов, поставщиков или субпоставщиков оборудования или услуг на любом уровне и их персоналу по претензиям третьих сторон в связи с деятельностью во исполнение настоящего Соглашения в любом суде за телесное повреждение или ущерб, включая косвенное, прямое или вторичное телесное повреждение или ущерб, причиненные в пределах и за пределами территории Российской Федерации. Ничто в настоящем пункте не истолковывается как признание юрисдикции любого суда над претензиями третьих сторон, к которым применяется настоящий пункт, ни как отказ от иммунитета государства любой из Сторон в отношении возможных претензий к ним третьих сторон.

3. Стороны могут в случае необходимости проводить консультации в связи с претензиями и судебными разбирательствами, касающимися настоящей Статьи.

4. Положения настоящей Статьи не исключают возможности предоставления Сторонами компенсации в соответствии с их национальным законодательством.

5. Ничто в настоящей Статье не истолковывается как препятствующее судебным разбирательствам или претензиям к гражданам Российской Федерации или лицам, постоянно проживающим на территории Российской Федерации.

Статья 10

1. Совместная деятельность в рамках данного Соглашения финансируется из фондов, выделенных на эти цели Соединенными Штатами Америки и Российской Федерацией и в виде предоставления ими материалов, оборудования и услуг экспертов на безвозмездной основе. Совместная деятельность также может быть профинансирована частично или полностью непосредственно из других источников, включая неправительственные фонды и частный сектор.

2. . Во всех случаях деятельность в рамках настоящего соглашения и ее финансовая поддержка Соединенными Штатами Америки зависит от наличия ассигнованных средств. Во всех случаях деятельность в рамках

настоящего Соглашения и ее финансовая поддержка Российской Федерацией зависит от наличия ассигнованных средств

Статья 11

В случае заключения контракта со Стороной на приобретение предметов и услуг, включая строительство, с целью выполнения настоящего Соглашения, эти контракты заключаются в соответствии с законами и правилами этой Стороны.

Статья 12

1. Представители Министерства энергетики США имеют право при уведомлении в разумные сроки проводить проверки и ревизию использования любой помощи и содействия, представленной Правительством Соединенных Штатов Америки в рамках сотрудничества, предусмотренного настоящим Соглашением, в течение всего срока действия настоящего Соглашения и трех лет по истечении его срока действия. Подобные проверки могут проводиться на территории или местах Сторон, определенных по взаимной договоренности между исполнительными органами Сторон.

3. Исполнительные органы сторон разрабатывают соответствующие процедуры для проведения проверок и ревизий всех работ, выполняемых в рамках настоящего Соглашения.

Статья 13

Все вопросы, относящиеся к толкованию или применению положений данного Соглашения, решаются путем проведения консультаций между Сторонами.

Статья 14

1. Настоящее Соглашение вступает в силу с даты подписания и действует в течение 5 лет. Срок его действия может быть продлен на очередные 5-летние периоды с письменного согласия обеих Сторон после совместного рассмотрения до окончания каждого 5-летнего периода. Настоящее Соглашение может быть изменено по взаимному согласию Сторон в письменном виде.

2. Действие настоящего Соглашения может быть прекращено любой из Сторон путем направления письменного уведомления о таком намерении по дипломатическим каналам. В этом случае настоящее Соглашение прекращает действие по истечении шести месяцев со дня направления уведомления.

3.В случае прекращения действия данного Соглашения по инициативе одной из Сторон, Стороны могут договориться о выполнении существующих контрактов и проектов в полном объеме и по взаимной договоренности урегулировать вопрос о неоплаченных счетах. Стороны согласны, что в случае прекращения или окончания срока действия настоящего Соглашения, обращение со всей конфиденциальной информацией и интеллектуальной собственностью, полученной в ходе осуществления настоящего Соглашения, будет и впредь осуществляться в соответствии со Статьей 6 настоящего Соглашения, если Сторонами не будет достигнуто иных договоренностей в письменной форме.

СОВЕРШЕНО в____________________________199 г., в двух экземплярах, каждый на английском и русском языках, причем оба текста имеют одинаковую силу.

ЗА ПРАВИТЕЛЬСТВО СОЕДИНЕННЫХ ШТАТОВ АМЕРИКИ

ЗА ПРАВИТЕЛЬСТВО РОССИЙСКОЙ ФЕДЕРАЦИИ

ПРИЛОЖЕНИЕ

**к Соглашению
между Правительством Соединенных Штатов Америки и
Правительством Российской Федерации о научно-техническом
сотрудничестве в области обращения с плутонием, изъятым из ядерных
военных программ**

Интеллектуальная собственность

В соответствии со Статьей 6 настоящего Соглашения:

Стороны обеспечивают адекватную и эффективную защиту интеллектуальной собственности, создаваемой или предоставленной в рамках настоящего Соглашения и соответствующих исполнительных соглашений.

Стороны договорились своевременно уведомлять друг друга о всех изобретениях, результатах научно-технической, научно-информационной деятельности и работах, выполняемых в рамках настоящего Соглашения, на которые распространяются авторские права, а также стремиться к своевременной защите объектов интеллектуальной собственности. Распределение прав на такую интеллектуальную собственность осуществляется в соответствии с положениями настоящего Приложения.

I. Область применения

А. Настоящее Приложение распространяется на всю совместную деятельность, осуществляемую в соответствии с Соглашением, если Стороны или их исполнительные органы не договорились иначе.

Б. Для целей настоящего Соглашения "интеллектуальная собственность" имеет значение, определенное в Статье 2 Конвенции, учреждающей Всемирную организацию интеллектуальной собственности, заключенной в Стокгольме 14 июля 1967 г.

В. Настоящее Приложение касается распределения прав и учета интересов Сторон. Каждая Сторона обеспечивает получение другой Стороной прав на интеллектуальную собственность, переданную в соответствии с настоящим Приложением, путем приобретения этих прав от

ее собственных участников посредством заключения контрактов, лицензионных договоров или составления при необходимости иных юридических документов. Настоящее Приложение никоим иным образом не изменяет и не наносит ущерба порядку в распределении прав на интеллектуальную собственность между Стороной и ее гражданами или юридическими лицами, который определяется законами и практикой этой Стороны.

Г. Спорные вопросы относительно интеллектуальной собственности, возникающие в рамках настоящего Соглашения, должны разрешаться путем проведения обсуждений между соответствующими участвующими в его выполнении учреждениями либо, если это необходимо, между Сторонами или их исполнительными органами. По взаимному согласию Сторон спорный вопрос передается на рассмотрение арбитражного суда для его разрешения, обязательного для Сторон, в соответствии с Соглашением и применяемыми положениями международного права.

Д. Прекращение или окончание срока действия настоящего Соглашения не влияет на права или обязательства, вытекающие из настоящего Приложения.

II. Распределение прав

А. Каждой Стороне предоставляется неисключительная, безотзывная, безвозмездная лицензия во всех странах на перевод, воспроизведение и публичное распространение научных и технических журнальных статей, докладов, отчетов и книг, непосредственно подготовленных в результате совместной работы в рамках настоящего Соглашения. Во всех публично распространяемых экземплярах охраняемых авторским правом работ, подготовленных в соответствии с настоящим положением, указываются имена их авторов, за исключением тех случаев, когда автор определенно выразил желание остаться анонимным.

Б. Права на все виды интеллектуальной собственности, помимо тех прав, которые изложены выше в параграфе II.А, распределяются следующим образом:

(1) Приглашенные исследователи получают права на интеллектуальную собственность в соответствии с правилами принимающей их организации. В дополнение к этому, каждый приглашенный

исследователь, признанный как изобретатель или автор, имеет право на получение вознаграждений, премий, прибыли или любых иных вознаграждений в соответствии с правилами принимающей организации.

(2) (а) В отношении интеллектуальной собственности, созданной в ходе совместных исследований, если Стороны, участвующие организации или сотрудники предварительно согласовали объем работ, каждой Стороне предоставляются права и выгоды в ее стране. Права и выгоды в третьих странах определяются в исполнительных соглашениях. Если исследовательская работа не определена как "совместные исследования" в соответствующем исполнительном соглашении, то права на интеллектуальную собственность, созданную в рамках такой исследовательской работы, распределяются в соответствии с приведенным выше параграфом II.Б (1). В дополнение к этому, каждое лицо, признанное как изобретатель или автор, имеет право на вознаграждения в соответствии с правилами участвующих организаций.

(б) Несмотря на положения приведенного выше параграфа 2а), если право на какой-либо вид интеллектуальной собственности действительно согласно законодательству государства одной Стороны, но не действительно согласно законодательству государства другой Стороны, то Сторона, законодательство которой обеспечивает такую защиту, получает все права и выгоды во всех странах мира. Тем не менее, лица, признанные как изобретатели или авторы интеллектуальной собственности, имеют право на получение вознаграждений, премий, прибыли или любых иных вознаграждений в соответствии с правилами участвующих организаций.

III. Деловая конфиденциальная информация

В том случае, если в рамках настоящего Соглашения предоставляется или создается информация, своевременно определенная как деловая конфиденциальная, то каждая Сторона и ее участники осуществляют защиту такой информации в соответствии с применимыми законами, правилами и административной практикой. Информация может определяться как "деловая конфиденциальная", если какое-либо лицо, располагающее информацией, может извлечь из нее экономическую выгоду или получить конкурентные преимущества перед теми, кто такой информацией не обладает, если информация широко не известна либо не доступна из других источников и если владелец ранее не предоставлял эту информацию без своевременного введения обязательства сохранять ее конфиденциальность.

Appendix B
CONTRACTOR DISCLOSURE STATEMENT

NEPA DISCLOSURE STATEMENT FOR PREPARATION OF EIS FOR DOE SURPLUS PLUTONIUM DISPOSITION

The Council on Environmental Quality (CEQ) Regulations at 40 CFR 1506.5(c), which have been adopted by the the U.S. Department of Energy (DOE) (10 CFR 1021), require contractors who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial interest or other interest in the outcome of the project" for purposes of this disclosure is defined in the March 23, 1981, guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Question 17a and b.

"Financial or other interest in the outcome of the project" includes "any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)." 46 FR 18026-18038 at 18031.

In accordance with these requirements, the offerer and any proposed subcontractors hereby certify as follows: (check either (a) or (b) to assure of your proposal).

(a) X Offerer and any proposed subcontractors have no financial or other interest in the outcome of the project.

(b) ___ Offerer and any proposed subcontractor have the following financial or other interest in the outcome of the project and hereby agree to divest themselves of such interest prior to award of this contract.

Financial or Other Interests

1.
2.
3.

Certified by:

____
Signature

Casey Koontz
Name

Contract Representative
Title

Science Applications International Corporation
Company

August 14, 1997
Date

Appendix C
Adjunct Melter Vitrification Process

C.1 ADJUNCT MELTER AS AN IMMOBILIZATION TECHNOLOGY VARIANT

The adjunct melter vitrification process was identified in the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement (Storage and Disposition PEIS)* (DOE 1996) as a possible technology variant for immobilizing surplus plutonium. It is a homogenous immobilization approach similar to the new, stand-alone vitrification facility evaluated in the *Storage and Disposition PEIS,* except that the approach would use some existing facilities and infrastructure at the Savannah River Site (SRS).

In the adjunct melter approach, plutonium would be immobilized, using modified facilities in Building 221–F, into a borosilicate glass frit that would be temporarily stored in individual cans. This frit would be mixed in the new adjunct melter facility with high-level waste (HLW) supplied from the Defense Waste Processing Facility (DWPF). The blended feed would be melted and poured into DWPF canisters to produce a radiation field in the final product that would meet the Spent Fuel Standard (UC 1996).

C.2 EVALUATION OF IMMOBILIZATION TECHNOLOGY VARIANTS

The U.S. Department of Energy (DOE) examined six immobilization technology variants to determine the more promising variants for further development. The six variants were divided into two categories—the external radiation barrier approach and internal radiation barrier approach—as follows:

I. External barrier (Can-in-canister variants)	1. Ceramic immobilization in existing facilities 2. Glass immobilization in existing facilities
II. Internal barrier (Homogenous variants)	3. Vitrification in new, stand-alone facilities 4. Vitrification with an adjunct melter in existing (DWPF at SRS) and new facilities 5. Ceramic immobilization in new, stand-alone facilities 6. Electrometallurgical treatment in existing and new facilities

Nine evaluation criteria, similar to those used in the screening of alternatives for analysis in the *Storage and Disposition PEIS*, were used to qualitatively evaluate the six immobilization technology variants:

1. Resistance to theft and diversion by unauthorized parties
2. Resistance to retrieval, extraction, and reuse by host nation
3. Technical viability
4. Environmental, safety, and health compliance
5. Cost effectiveness
6. Timeliness
7. Fostering progress and cooperation with Russia and other countries
8. Public and institutional acceptance
9. Additional benefits

The evaluation concluded that the external barrier variants would be superior to the internal barrier variants in terms of timeliness, higher technical viability, much lower costs, and, to a lesser extent, slightly lower

environmental and health risks (UC 1997). As a result of this evaluation, the can-in-canister variants (1 and 2) were considered reasonable alternatives for analysis in the *Surplus Plutonium Disposition Environmental Impact Statement* (SPD EIS) and are compared with the homogenous vitrification and ceramic immobilization facilities (3 and 5) evaluated in the *Storage and Disposition PEIS*. DOE decided, in the Record of Decision for the *Storage and Disposition PEIS*, not to pursue the electrometallurgical treatment option (6) because its technology is less mature than vitrification or ceramic immobilization. Although use of the adjunct melter (4) may be viable from a technical standpoint, it would cost twice as much as the can-in-canister approach and would take 1 to 5 years longer to implement. Based on the relative sizes of the facilities, their use of existing facilities and infrastructure, and the processing steps associated with their operation, specific environmental impacts associated with the adjunct melter approach would be expected to result in environmental impacts ranging between those of the new facility (homogenous) variants and the two can-in-canister variants. The adjunct melter's lack of an environmental advantage combined with its timeliness, cost, and technical shortcomings make it less reasonable than the can-in-canister approach. Thus, it is not included as a reasonable alternative for detailed environmental analysis in the SPD EIS. For completeness, a description of the vitrification process using the adjunct melter with DWPF at SRS is provided below.

C.3 ADJUNCT MELTER VITRIFICATION PROCESS

A simplified flow diagram using a new adjunct melter at SRS is shown in Figure C–1. The disposition process would begin with the conversion of feed materials to plutonium oxide at Building 221–F. This oxide would be blended by a dry feed preparation process to prepare a consistent feedstock and fed into a melter along with glass frit to initiate the first stage of vitrification. The first-stage melter would dissolve the plutonium oxide into the borosilicate glass and convert the mixture to a frit containing about 10 percent plutonium by weight. The assumed nominal feed of plutonium over the life of the adjunct melter vitrification process would be 50 t (55 tons) over a 10-year period.

The plutonium glass frit would then be stored in small steel cans and transported as needed to the new adjunct melter facility adjacent to DWPF. Standard DWPF operations receive two main feedlines from the SRS HLW tank farms to be vitrified—a washed tank sludge and an aqueous HLW precipitate that contains highly radioactive cesium 137. In the adjunct melter process, some of the aqueous HLW precipitate would be diverted from the DWPF, via an interarea pipeline, to the adjunct melter facility. At the adjunct melter facility, the plutonium glass frit would be mixed with DWPF frit and the aqueous HLW precipitate in a melter feed tank, and slurry fed to the melter, producing a homogenous glass melt that would then be poured into DWPF canisters. The surplus plutonium contained in the canisters would be dissolved in the glass and uniformly integrated with fission products. The canisters would then be stored on the site awaiting final disposal at a geologic repository pursuant to the Nuclear Waste Policy Act.

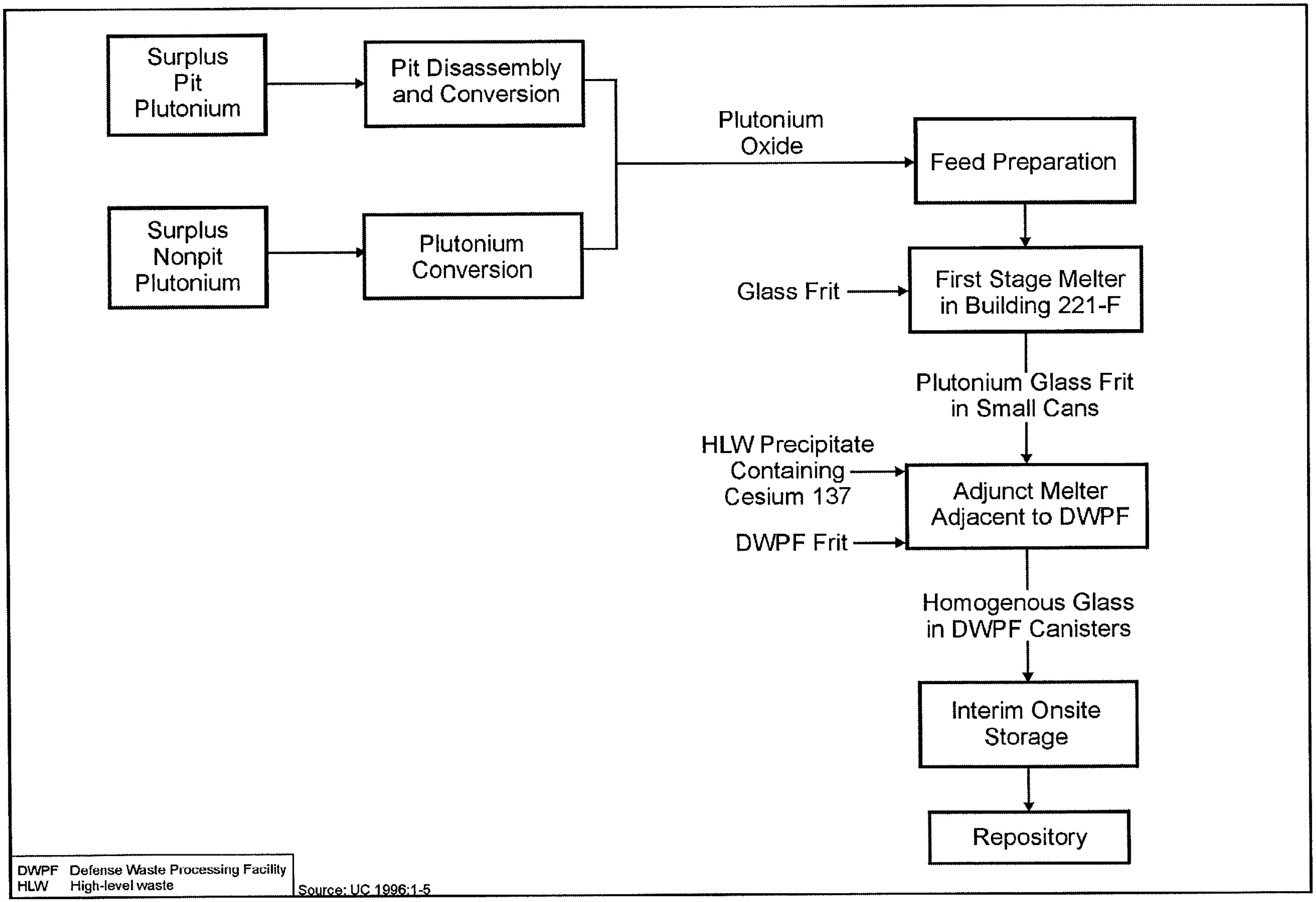

Figure C–1. Adjunct Melter Vitrification Process

C.4 REFERENCES

DOE (U.S. Department of Energy), 1996, *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement*, DOE/EIS-0229, Office of Fissile Materials Disposition, Washington, DC, December.

UC (Regents of the University of California), 1996, *Alternative Technical Summary Report: Vitrification Adjunct Melter to DWPF Variant*, UCRL-ID-122660, L-120217-1, Lawrence Livermore National Laboratory, Livermore, CA, August 26.

UC (Regents of the University of California), 1997, *Immobilization Technology Down-Selection Radiation Barrier Approach*, UCRL-ID-127320, Lawrence Livermore National Laboratory, Livermore, CA, May 23.

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Appendix E
Facility Data

This appendix presents predesign data on the construction and operations requirements for the proposed surplus plutonium disposition facilities. Tables E–1 through E–24 present data on schedule, construction area requirements, operation area requirements, construction employment requirements, major construction resource requirements, operation employment requirements, and operation resource requirements for each of the four candidate U.S. Department of Energy sites (the Hanford Site [Hanford], Idaho National Engineering and Environmental Laboratory [INEEL], the Pantex Plant [Pantex], and the Savannah River Site [SRS]). For the candidate lead assembly fabrication facilities at Argonne National Laboratory–West, Hanford, Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and SRS, the schedule, operation employment requirements, and operation resource requirements are presented in Tables E–25 through E–28.

The alternatives addressed in the *Surplus Plutonium Disposition Environmental Impact Statement* (SPD EIS) provide options for the collocation of facilities at Hanford in the Fuels and Materials Examination Facility. Resource requirements for the pit conversion facility are the same whether the facility is collocated with the other facilities or is installed alone. There are differences, however, in such requirements for the immobilization and mixed oxide (MOX) facilities as indicated in Tables E–8 through E–24.

E.1 PIT CONVERSION FACILITY

Table E–1. Pit Conversion Facility Schedule

Activity	Calendar Year
Research and development	1995–2002
Integrated-process demonstrations	1998–2002
Facility design	1999–2001
Construction	2001–2003
Permitting and licensing	1999–2004
Startup and operation	2004–2014
Deactivation and stabilization	2015–2017

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: UC 1998a–d.

Table E–2. Pit Conversion Facility Construction Area Requirements

Function	Hanford	INEEL	Pantex	SRS
Laydown area, ha (acres) (including spoils, topsoils, etc.)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)
Warehouse area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Staging area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Temporary parking, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
New roads, km (mi)	0.13 (0.08)	1.3 (0.81)	3.1 (1.93)	1.8 (1.12)

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998a–d.

Table E–3. Pit Conversion Facility Operation Area Requirements

Land-Use Area	Hanford	INEEL	Pantex	SRS
New process facilities, ha (acres)	0 (0)	0 (0)	1.1 (2.72)	1.1 (2.72)
New support facilities, ha (acres)	0.09 (0.22)	0.09 (0.22)	1.5 (3.71)	1.5 (3.71)
Security area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
New parking lots, ha (acres)	0.4 (0.99)	0.4 (0.99)	0.4 (0.99)	0.4 (0.99)

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998a–d.

Table E–4. Pit Conversion Facility Construction Employment Requirements (2001–2003)

Employees	Hanford	INEEL	Pantex	SRS
Craft workers	220	290	853	853
Management and administrative	44	58	171	171
Total employment	264	348	1,024	1,024

Note: Includes construction staff data provided in the data reports.
Source: UC 1998a–d.

Table E–5. Pit Conversion Facility Major Construction Resource Requirements (2001–2003)

Resource Requirements	Hanford	INEEL	Pantex	SRS
Electricity (MWh)	5,100	5,100	5,100	5,100
Fuel, l (gal)	260,000 (68,684)	330,000 (87,176)	990,000 (261,528)	990,000 (261,528)
Water, l (gal)	6,000,000 (1,585,020)	12,000,000 (3,170,040)	36,000,000 (9,510,120)	36,000,000 (9,510,120)
Concrete, m^3 (yd^3)	4,200 (5,494)	5,700 (7,456)	18,000 (23,544)	18,000 (23,544)
Steel, t (tons)	140 (154)	190 (209)	1,900 (2,094)	1,900 (2,094)

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998a–d.

Table E–6. Pit Conversion Facility Annual Employment Operation Requirements

Employees	Hanford	INEEL	Pantex	SRS
Officials and managers	6	6	6	6
Professionals	65	65	65	65
Technicians	179	179	179	179
Office and clerical	14	14	14	14
Craft workers	42	42	42	42
Operatives	22	22	22	22
Laborers	5	5	5	5
Service workers	67	25	67	67
Total employment	400	358	400	400

Source: UC 1998a–d.

Table E–7. Pit Conversion Facility Annual Operation Resource Requirements

Resource Requirements	Hanford	INEEL	Pantex	SRS
Electricity (MWh)	28,000	15,000	16,000	16,000
Coal, t (tons)	NA	2,100 (2,315)	NA	2,400 (2,646)
Natural gas, m^3 (ft^3)	NA	NA	1,300,000 (45,909,500)	NA
Fuel oil,[a] l (gal)	38,000 (10,038)	38,000 (10,038)	38,000 (10,038)	38,000 (10,038)
Water, l (gal)	62,000,000 (16,378,540)	49,000,000 (12,944,330)	48,000,000 (12,680,160)	48,000,000 (12,680,160)
Hydrogen, m^3 (ft^3)	450 (15,892)	450 (15,892)	450 (15,892)	450 (15,892)
Nitrogen, m^3 (ft^3)	2,200 (77,693)	2,200 (77,693)	2,200 (77,693)	2,200 (77,693)
Oxygen, m^3 (ft^3)	330 (11,654)	330 (11,654)	330 (11,654)	330 (11,654)
Argon, m^3 (ft^3)	14,000 (494,410)	14,000 (494,410)	14,000 (494,410)	14,000 (494,410)
Chlorine, m^3 (ft^3)	62 (2,190)	63 (2,225)	62 (2,190)	62 (2,190)
Helium, m^3 (ft^3)	4,800 (169,512)	4,800 (169,512)	4,800 (169,512)	4,800 (169,512)
Sulfuric acid, kg (lb)	570 (1,257)	100 (220)	470 (1,036)	470 (1,036)
Phosphoric acid, kg (lb)	240 (529)	240 (529)	240 (529)	240 (529)
Oils and lubricants, kg (lb)	1,600 (3,527)	1,600 (3,527)	1,600 (3,527)	1,600 (3,527)
Cleaning solvents, kg (lb)	140 (309)	140 (309)	140 (309)	140 (309)
Polyphosphate, kg (lb)	67 (148)	0 (0)	70 (154)	0 (0)
Polyelectrolyte, kg (lb)	240 (529)	240 (529)	240 (529)	240 (529)
Liquid nitrogen, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Aluminum sulfate, kg (lb)	940 (2,072)	970 (2,138)	960 (2,116)	960 (2,116)
Bentonite, kg (lb)	470 (1,036)	490 (1,080)	480 (1,058)	480 (1,058)

[a] Fuel oil includes gasoline, diesel, and lube oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed.

Source: UC 1998a–d.

E.2 IMMOBILIZATION FACILITY

Table E–8. Ceramic or Glass Immobilization Facility Schedule

Activity	Calendar Year
Research and development	1995–2002
Integrated-process demonstrations	1997–2003
Design and construction	1999–2005
Permitting and licensing	1999–2005
Startup and operation	2005–2016
Deactivation and stabilization	2016–2019

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: UC 1999a–d.

Table E–9. Ceramic or Glass Immobilization Facility Construction Area Requirements

	Hanford			SRS
		Collocation		
Function	Alone	with PDCF	with MOX	New
Laydown area, ha (acres) (including spoils, topsoils, etc.)	1.8 (4.45)	4.5 (11.1)	4.5 (11.1)	9.7 (24.0)
Warehouse area, ha (acres)	2.6 (6.4)	2.6 (6.4)	2.6 (6.4)	2.6 (6.4)
Staging area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Temporary parking, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
Waste storage area, ha (acres)	0.1 (0.25)	0.1 (0.25)	0.1 (0.25)	0.1 (0.25)
New roads, km (mi)	0 (0)	0.25 (0.16)	0.3 (0.19)	0.6 (0.37)

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1999a–d.

Table E–10. Ceramic or Glass Immobilization Facility Operation Area Requirements

Land-Use Area	Hanford			SRS
		Collocation		
	Alone	with PDCF	with MOX	New
New process facilities, ha (acres)	0 (0)	0 (0)	0 (0)	0.55 (1.36)
New support facilities, ha (acres)	0 (0)	0.23 (0.57)	0.34 (0.84)	0.16 (0.40)
Security area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)
New parking, ha (acres)	0 (0)	0.6 (1.5)	0.72 (1.8)	2 (4.94)

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1999a–d.

Table E–11. Ceramic or Glass Immobilization Facility Construction Employment Requirements (2001–2005)

Employees	Hanford			SRS
		Collocation		
	Alone	with PDCF	with MOX	New
Craft workers	1,049	1,063	1,306	2,564
Management and administrative	174	176	218	428
Total employment	1,223	1,239	1,524	2,992

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Source: UC 1999a–d.

Table E–12. Ceramic or Glass Immobilization Facility Major Construction Resource Requirements (2001–2005)

Resource Requirements	Hanford Alone	Hanford Collocation with PDCF	Hanford Collocation with MOX	SRS New
Electricity (MWh)	91,000	74,000	77,000	32,000
Fuel, l (gal)	290,000 (76,609)	750,000 (198,128)	960,000 (253,603)	4,700,000 (1,241,599)
Coal, t (tons)	NA	NA	NA	1,800 (1,984)
Water, l (gal)	220,000,000 (58,117,400)	230,000,000 (60,759,100)	250,000,000 (66,042,500)	330,000,000 (87,176,100)
Concrete, m^3 (yd^3)	1,900 (2,485)	17,000 (22,236)	22,000 (28,776)	77,000 (100,716)
Steel, t (tons)	420 (463)	3,100 (3,417)	4,000 (4,409)	25,000 (27,558)

Key: MOX, mixed oxide fuel fabrication facility; NA, not applicable; PDCF, pit disassembly and conversion facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1999a–d.

Table E–13. Ceramic or Glass Immobilization Facility Annual Employment Operation Requirements

Employees	Hanford Alone 17 t	Hanford Alone 50 t	Hanford Collocation with PDCF 17 t	Hanford Collocation with PDCF 50 t	Hanford Collocation with MOX 17 t	SRS New 17 t	SRS New 50 t
Officials and managers	14	14	16	16	16	14	14
Professionals	29	29	33	33	33	29	29
Technicians	188	220	200	232	200	196	212
Office and clerical	12	12	15	15	15	12	12
Craft workers	32	32	36	36	36	32	32
Service workers	60	60	80	80	80	52	52
Total employment	335	367	380	412	380	335	351

Key: MOX, mixed oxide fuel fabrication facility; PDCF, pit disassembly and conversion facility.
Source: UC 1999a–d.

Table E–14. Immobilization Facility Annual Operation Resource Requirements at Hanford

Resource Requirements	Ceramic 17 t	Ceramic 50 t	Glass 17 t	Glass 50 t
Electricity (MWh)	28,000	29,000	28,000	29,000
Coal, t (tons)	NA	NA	NA	NA
Natural gas, m^3 (ft^3)	NA	NA	NA	NA
Fuel oil,[a] l (gal)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)
Water, l (gal)	58,000,000 (15,321,860)	62,000,000 (16,378,540)	55,000,000 (14,529,350)	60,000,000 (15,850,200)
Hydrogen, m^3 (ft^3)	290 (10,241)	320 (11,301)	290 (10,241)	320 (11,301)
Oxygen, m^3 (ft^3)	350 (12,360)	400 (14,126)	350 (12,360)	400 (14,126)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	1,400,000 (49,441,000)	990,000 (34,961,850)	1,400,000 (49,441,000)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	330,000 (11,653,950)	130,000 (4,590,950)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	10,000 (353,150)	8,600 (303,709)	10,000 (353,150)
[Text deleted.]				
Process water, l (gal)	110 (29)	110 (29)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	31,000 (68,343)	NA	NA
Binder, kg (lb)	350 (772)	960 (2,116)	NA	NA
[Text deleted.]				
Frit, kg (lb)	NA	NA	29,000 (63,933)	55,000 (121,253)
Stainless steel canisters, kg (lb)	50,000 (110,230)	140,000 (308,644)	62,000 (136,685)	170,000 (374,782)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	57 (126)	57 (126)	57 (126)	57 (126)
Polyphosphate, kg (lb)	84 (185)	84 (185)	84 (185)	84 (185)
Corrosion inhibitor, kg (lb)	100 (220)	100 (220)	100 (220)	100 (220)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.

Key: NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.

Source: UC 1999a, 1999b.

Table E–15. Immobilization Facility Annual Operation Resource Requirements Collocated With Pit Conversion Facility at Hanford

Resource Requirements	Ceramic		Glass	
	17 t	50 t	17 t	50 t
Electricity (MWh)	23,000	24,000	23,000	24,000
Coal, t (tons)	NA	NA	NA	NA
Natural gas, m^3 (ft^3)	NA	NA	NA	NA
Fuel oil,[a] l (gal)	100,000 (26,417)	100,000 (26,417)	100,000 (26,417)	100,000 (26,417)
Water, l (gal)	68,000,000 (17,963,560)	72,000,000 (19,020,240)	68,000,000 (17,963,560)	72,000,000 (19,020,240)
Hydrogen, m^3 (ft^3)	290 (10,241)	320 (11,301)	290 (10,241)	320 (11,301)
Oxygen, m^3 (ft^3)	350 (12,360)	400 (14,126)	350 (12,360)	400 (14,126)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	1,400,000 (49,441,000)	990,000 (34,961,850)	1,400,000 (49,441,000)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	330,000 (11,653,950)	130,000 (4,590,950)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	10,000 (353,150)	8,600 (303,709)	10,000 (353,150)
[Text deleted.]				
Process water, l (gal)	110 (29)	110 (29)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	31,000 (68,343)	NA	NA
Binder, kg (lb)	350 (772)	960 (2,116)	NA	NA
[Text deleted.]				
Frit, kg (lb)	NA	NA	29,000 (63,933)	55,000 (121,253)
Stainless steel canisters, kg (lb)	50,000 (110,230)	140,000 (308,644)	62,000 (136,685)	170,000 (374,782)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	74 (163)	74 (163)	74 (63)	74 (63)
Polyphosphate, kg (lb)	110 (243)	110 (243)	110 (243)	110 (243)
Corrosion inhibitor, kg (lb)	130 (287)	130 (287)	130 (287)	130 (287)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.
Key: NA, not applicable.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.
Source: UC 1999a, 1999b.

Table E–16. Immobilization Facility Annual Operation Resource Requirements Collocated With MOX Facility at Hanford

Resource Requirements	17 t	
	Ceramic	Glass
Electricity (MWh)	24,000	24,000
Coal, t (tons)	NA	NA
Natural gas, m^3 (ft^3)	NA	NA
Fuel oil,[a] l (gal)	100,000 (26,417)	100,000 (26,417)
Water, l (gal)	70,000,000 (18,491,900)	70,000,000 (18,491,900)
Hydrogen, m^3 (ft^3)	290 (10,241)	290 (10,241)
Oxygen, m^3 (ft^3)	350 (12,360)	350 (12,360)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	990,000 (34,961,850)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	8,600 (303,709)
[Text deleted.]		
Process water, l (gal)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	NA
Binder, kg (lb)	350 (772)	NA
[Text deleted.]		
Frit, kg (lb)	NA	29,000 (63,933)
Stainless steel canisters, kg (lb)	50,000 (110,230)	62,000 (136,685)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	81 (179)	81 (179)
Polyphosphate, kg (lb)	120 (265)	120 (265)
Corrosion inhibitor, kg (lb)	140 (309)	140 (309)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.
Key: NA, not applicable.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.
Source: UC 1999a, 1999b.

Table E–17. Immobilization Facility Annual Operation Resource Requirements at SRS

	Ceramic		Glass	
Resource Requirements	**17 t**	**50 t**	**17 t**	**50 t**
Electricity (MWh)	23,000	24,000	23,000	23,000
Coal, t (tons)	1,200 (1,323)	1,200 (1,323)	1,200 (1,323)	1,200 (1,323)
Natural gas, m^3 (ft^3)	NA	NA	NA	NA
Fuel oil,[a] l (gal)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)	69,000 (18,228)
Water, l (gal)	100,000,000 (26,417,000)	110,000,000 (29,058,700)	100,000,000 (26,417,000)	110,000,000 (29,058,700)
Hydrogen, m^3 (ft^3)	290 (10,241)	320 (11,301)	290 (10,241)	320 (11,301)
Oxygen, m^3 (ft^3)	350 (12,360)	400 (14,126)	350 (2,360)	400 (14,126)
Nitrogen,[b] m^3 (ft^3)	990,000 (34,961,850)	1,400,000 (49,441,000)	990,000 (34,961,850)	1,400,000 (49,441,000)
Argon,[b] m^3 (ft^3)	200,000 (7,063,000)	330,000 (11,653,950)	130,000 (4,590,950)	130,000 (4,590,950)
Helium,[b] m^3 (ft^3)	8,600 (303,709)	10,000 (353,150)	8,600 (303,709)	10,000 (353,150)
[Text deleted.]				
Process water, l (gal)	110 (29)	110 (29)	110 (29)	110 (29)
Precursor, kg (lb)	11,000 (24,251)	31,000 (68,343)	NA	NA
Binder, kg (lb)	350 (772)	960 (2,116)	NA	NA
[Text deleted.]				
Frit, kg (lb)	NA	NA	29,000 (63,933)	55,000 (121,253)
Stainless steel canisters, kg (lb)	50,000 (110,230)	140,000 (308,644)	62,000 (136,685)	174,000 (383,600)
Absorbents, kg (lb)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)	1,100 (2,425)
Hydraulic fluid, l (gal)	400 (106)	400 (106)	400 (106)	400 (106)
Oil,[c] l (gal)	1,400 (370)	1,400 (370)	1,400 (370)	1,400 (370)
Sodium hypochlorite, kg (lb)	130 (287)	130 (287)	130 (287)	130 (287)
Polyphosphate, kg (lb)	190 (419)	190 (419)	190 (419)	190 (419)
Corrosion inhibitor, kg (lb)	230 (507)	230 (507)	230 (507)	230 (507)

[a] Fuel oil includes gasoline, diesel, and oil.
[b] Includes process and nonprocess chemicals.
[c] Includes cutting oil and lubricating oil.
Key: NA, not applicable.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed, except for lubricants.
Source: UC 1999c, 1999d.

E.3 MOX FACILITY

Table E–18. MOX Facility Schedule

Activity	Calendar Year
MOX team selection and contract negotiation	1999
Design	2000–2001
Permitting and licensing	2000–2006
Construction	2002–2004
Cold startup	2005
Hot startup	2006
Operation	2006–2015
Deactivation and stabilization	2015–2019 (nominal 3 years)

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: UC 1998e–h.

Table E–19. MOX Facility Construction Area Requirements

	Hanford				
Function	**FMEF**	**New**	**INEEL**	**Pantex**	**SRS**
Laydown area, ha (acres) (including spoils, topsoils, etc.)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)
Warehouse area, ha (acres)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Staging area, ha (acres)	0.65 (1.61)	0.65 (1.61)	0.65 (1.61)	0.65 (1.61)	0.65 (1.61)
Temporary parking, ha (acres)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)	2 (4.94)
Waste storage area, ha (acres)	1 (2.47)	1 (2.47)	1 (2.47)	1 (2.47)	1 (2.47)
New roads, km (mi)	1 (0.62)	1 (0.62)	1 (0.62)	2 (1.24)	2 (1.24)

Key: FMEF, Fuels and Materials Examination Facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: UC 1998e–h.

Table E–20. MOX Facility Operation Area Requirements

	Hanford				
Land-Use Area	**FMEF**	**New**	**INEEL**	**Pantex**	**SRS**
New process facilities, ha (acres)	0 (0)	1.0 (2.47)	1.0 (2.47)	1.0 (2.47)	1.0 (2.47)
New support facilities, ha (acres)	0.47 (1.16)	0.24 (0.59)	0.24 (0.59)	0.24 (0.59)	0.24 (0.59)
Security area, ha (acres)	3 (7.41)	3 (7.41)	3 (7.41)	3 (7.41)	3 (7.41)
New parking, ha (acres)	2 (4.94)	2(4.94)	2 (4.94)	2 (4.94)	2 (4.94)

Key: FMEF, Fuels and Materials Examination Facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.
Source: DOE 1999; UC 1998e–h.

Table E–21. MOX Facility Construction Employment Requirements (2002–2004)

Employees	Hanford FMEF	Hanford New	INEEL	Pantex	SRS
Craft workers	1,263	1,471	1,471	1,471	1,471
Management and administrative	641	679	679	679	679
Total employment	1,904	2,150	2,150	2,150	2,150

Key: FMEF, Fuels and Materials Examination Facility.
Note: Total employment includes construction workers during cold and hot startup years.
Source: DOE 1999; ORNL 1998.

Table E–22. MOX Facility Major Construction Resource Requirements (2002–2004)

Resource Requirements	Hanford FMEF	Hanford New	INEEL	Pantex	SRS
Electricity (MWh)	74,000	6,000	6,000	6,000	6,000
[Text deleted.]					
Fuel, l (gal)	330,000 (87,176)	1,000,000 (264,170)	1,000,000 (264,170)	1,000,000 (264,170)	1,000,000 (264,170)
Water, l (gal)	50,000,000 (13,208,500)	69,000,000 (18,227,730)	69,000,000 (18,227,730)	69,000,000 (18,227,730)	69,000,000 (18,227,730)
Concrete, m^3 (yd^3)	6,300 (8,240)	15,000 (19,620)	15,000 (19,620)	15,000 (19,620)	15,000 (19,620)
Steel, t (tons)	2,400 (2,646)	6,100 (6,724)	6,100 (6,724)	6,100 (6,724)	6,100 (6,724)

[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed.
Source: DOE 1999; ORNL 1998.

Table E–23. MOX Facility Annual Employment Operation Requirements

Employees	Hanford FMEF	Hanford New	INEEL	Pantex	SRS
Office managers and professionals	86	86	86	86	86
Technicians, operatives, laborers, and service workers	268	268	268	268	268
Office and clerical	12	12	12	12	12
Craft workers	19	19	19	19	19
Total employment	385	385	385	385	385

Key: FMEF, Fuels and Materials Examination Facility.
Note: Total employment during normal operations, after cold and hot startup years.
Source: DOE 1999; ORNL 1998; UC 1998e–h.

Table E–24. MOX Facility Annual Operation Resource Requirements

Resource Requirements	Hanford FMEF	Hanford New	INEEL	Pantex	SRS
Electricity (MWh)	46,000	46,000	30,000	30,000	30,000
Coal, t (tons)	NA	NA	2,100 (2,315)	NA	890 (983)
Natural gas, m^3 (ft^3)	NA	NA	NA	1,100,000 (38,846,500)	NA
Fuel oil,[a] l (gal)	63,000 (16,643)	63,000 (16,643)	63,000 (16,643)	63,000 (16,643)	63,000 (16,643)
Water, l (gal)	68,000,000 (17,963,560)	68,000,000 (17,963,560)	68,000,000 (17,963,560)	68,000,000 (17,963,560)	68,000,000 (17,963,560)
Hydrogen, m^3 (ft^3)	23,000 (812,245)	23,000 (812,245)	23,000 (812,245)	23,000 (812,245)	23,000 (812,245)
Nitrogen, m^3 (ft^3)	10,000,000 (353,150,000)	10,000,000 (353,150,000)	10,000,000 (353,150,000)	10,000,000 (353,150,000)	10,000,000 (353,150,000)
Oxygen, m^3 (ft^3)	74 (2,613)	74 (2,613)	74 (2,613)	74 (2,613)	74 (2,613)
Argon, m^3 (ft^3)	500,000 (17,657,500)	500,000 (17,657,500)	500,000 (17,657,500)	500,000 (17,657,500)	500,000 (17,657,500)
Helium, m^3 (ft^3)	21,000 (741,615)	21,000 (741,615)	21,000 (741,615)	21,000 (741,615)	21,000 (741,615)
Phosphoric acid, kg (lb)	100 (220)	100 (220)	100 (220)	100 (220)	100 (220)
Sodium nitrate, kg (lb)	500 (1,102)	500 (1,102)	500 (1,102)	500 (1,102)	500 (1,102)
Sodium hydroxide, kg (lb)	76 (168)	76 (168)	76 (168)	76 (168)	76 (168)
Ethylene glycol, kg (lb)	300 (661)	300 (661)	300 (661)	300 (661)	300 (661)
Lubricant zinc stearate, kg (lb)	300 (661)	300 (661)	300 (661)	300 (661)	300 (661)
[Text deleted.]					
Nitric acid, m^3 (ft^3)	180 (6,357)	180 (6,357)	180 (6,357)	180 (6,357)	180 (6,357)
Silver nitrate kg (lb)	140 (309)	140 (309)	140 (309)	140 (309)	140 (309)
Solvent, l (gal)	15 (3.97)	15 (3.97)	15 (3.97)	15 (3.97)	15 (3.97)
[Text deleted.]					
Hydroxylamine nitrate, kg (lb)	660 (1,455)	660 (1,455)	660 (1,455)	660 (1,455)	660 (1,455)
[Text deleted.]					
Oxalic acid dihydrate, kg (lb)	7,000 (15,432)	7,000 (15,432)	7,000 (15,432)	7,000 (15,432)	7,000 (15,432)
Reillex HPG resin (wet basis), kg (lb)	160 (353)	160 (353)	160 (353)	160 (353)	160 (353)

[a] Fuel oil includes gasoline and oil.

Key: FMEF, Fuels and Materials Examination Facility; NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values.

Source: DOE 1999; ORNL 1998; UC 1998e–h.

E.4 LEAD ASSEMBLY FABRICATION FACILITY

Table E–25. Lead Assembly Fabrication Facility Schedule

Activity	Calendar Year
Equipment procured	2000–2001
Facility design	1999–2001
Facility permitting	2000–2002
Facility modification	2001–2002
Lead assembly fabrication (operation)	2003–2006
Deactivation and stabilization	2010–2013

Note: Schedule dates are approximate based on latest information. Actual timing may cause some activities to start later in the reference year and end sometime past the end year shown here.
Source: O'Connor et al. 1998a–e.

Table E–26. Lead Assembly Fabrication Annual Employment Operation Requirements

Employees	Number of Employees
Officials and managers	1
Professionals	4
Technicians	31
Office and clerical	2
Craft workers	5
Operatives	8
Service workers	9
Total employment	60

Source: O'Connor et al. 1998a–e.

Table E–27. Lead Assembly Fabrication Construction Resource Requirements

Resource Requirement	ANL–W	Hanford	LLNL	LANL	SRS
Electricity (MWh)	NR	NR	NR	NR	2,800
Fuel oil,[a] l (gal)	NR	NR	NR	NR	45,000 (11,888)
Water, l (gal)	NR	NR	NR	NR	15,000,000 (3,962,550)
Industrial gases, m^3 (ft^3)	NR	NR	NR	NR	57 (2,013)
Concrete, m^3 (yd^3)	NR	NR	NR	NR	19 (25)
Steel, t (tons)	NR	NR	NR	NR	45 (50)

[a] Fuel oil includes gasoline, diesel, and oil.
Key: ANL–W, Argonne National Laboratory–West; LANL, Los Alamos National Laboratory; LLNL, Lawrence Livermore National Laboratory; NR, not reported.
Note: ANL–W, Hanford, LLNL, and LANL require minor modifications to existing buildings; therefore, no significant construction resource requirements are expected.
Source: O'Connor et al. 1998a–e.

Table E–28. Lead Assembly Fabrication Annual Operation Resource Requirements

Resource Requirement	ANL–W	Hanford	LLNL	LANL	SRS
Electricity (MWh)	720	1,200	720	720	720
Coal, t (tons)	NA	NA	NA	NA	60 (66)
Natural gas, m^3 (ft^3)	NA	NA	55,000 (1,942,325)	55,000 (1,942,325)	NA
Fuel oil,[a] l (gal)	61,000 (16,114)	12,000 (3,170)	12,000 (3,170)	12,000 (3,170)	12,000 (3,170)
Water, l (gal)	1,600,000 (422,672)	1,600,000 (422,672)	1,600,000 (422,672)	1,600,000 (422,672)	1,600,000 (422,672)
Argon, m^3 (ft^3)	16,000 (565,040)	16,000 (565,040)	16,000 (565,040)	16,000 (565,040)	16,000 (565,040)
Helium, m^3 (ft^3)	10 (353)	10 (353)	10 (353)	10 (353)	10 (353)
Hydrogen, m^3 (ft^3)	1,000 (35,315)	1,000 (35,315)	1,000 (35,315)	1,000 (35,315)	1,000 (35,315)
Nitrogen, m^3 (ft^3)	5,300 (187,170)	5,300 (187,170)	5,300 (187,170)	5,300 (187,170)	5,300 (187,170)
Oxygen, m^3 (ft^3)	5,000 (176,575)	5,000 (176,575)	5,000 (176,575)	5,000 (176,575)	5,000 (176,575)
Sodium nitrate, kg (lb)	85 (187)	85 (187)	85 (187)	85 (187)	85 (187)
Alcohol, l (gal)	230 (61)	230 (61)	230 (61)	230 (61)	230 (61)
General cleaning fluids, l (gal)	230 (61)	230 (61)	230 (61)	230 (61)	230 (61)

[a] Fuel oil includes gasoline, diesel, and oil.

Key: ANL–W, Argonne National Laboratory–West; LANL, Los Alamos National Laboratory; LLNL, Lawrence Livermore National Laboratory; NA, not applicable.

Note: For purposes of the SPD EIS, metric values provided in the data reports were rounded to two significant figures and converted to the English values. Resource requirements less than 50 kg/yr (110 lb/yr) are not listed.

Source: O'Connor et al. 1998a–e.

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Appendix F
Impact Assessment Methods

This appendix briefly describes the methods used to evaluate the potential direct, indirect, and cumulative effects of the alternatives for surplus plutonium disposition. The same methodologies were also applied to the assessment of impacts at each of the proposed lead assembly and postirradiation examination sites. Included are impact assessment methods for air quality and noise, geology and soils, water resources, ecological resources, cultural and paleontological resources, land use and visual resources, infrastructure, waste management, socioeconomics, human health risk and hazardous chemicals, facility accidents, transportation, environmental justice, and cumulative impacts. Each section is organized so that first the affected resource is described and then the impact assessment method is presented. Detailed descriptions of the methods for facility accident and transportation impact analyses are presented as Appendixes K and L, respectively.

Although impacts were generally described as either major or minor, this assignment was made in different ways, depending on the resource. For air quality, for example, estimated pollutant emissions from the proposed surplus plutonium disposition facilities were compared with the appropriate regulatory standards or guidelines. For human health risk, estimated radionuclide exposure to humans from the proposed facilities were compared with applicable dose limits. Comparison with regulatory standards is a commonly used method for benchmarking environmental impact and is done here to provide perspective on the magnitude of identified impacts.

Other indicators of impact were also established to focus the analysis on impacts that could be major. The analysis of waste management impacts, for example, focused on alternatives where additional waste generation would be a large percentage of current site waste generation, although a major impact was suggested only where waste generation would exceed the capacity of existing waste management facilities. Cumulative impacts were also evaluated with a view to ensuring that actions with minor impacts individually could not have major impacts collectively.

Impacts in all resource areas were analyzed consistently; that is, the impact values were estimated using a consistent set of input variables and computations. Moreover, efforts were made to ensure that calculations in all areas used accepted protocols and up-to-date models. Finally, like presentations were developed to facilitate the comparison of alternatives.

The impact assessment methods used to evaluate the effects of irradiating mixed oxide (MOX) fuel at the proposed domestic, commercial reactor sites (see Section 4.28) are generally the same as those applied to assess the impacts of the surplus plutonium disposition alternatives at each of the candidate U.S. Department of Energy (DOE) sites. Where there is a difference in the impact assessment method, the nature of the deviation and a discussion of the impact assessment methods used for the reactor sites are provided. Otherwise, if no specific exception is noted, the impact assessment methods applied to the candidate DOE sites were also applied to the proposed reactor sites.

F.1 AIR QUALITY AND NOISE

F.1.1 Description of Affected Resources

F.1.1.1 Air Quality

Air pollution refers to any substance in the air that could harm human or animal populations, vegetation, or structures, or that unreasonably interferes with the comfortable enjoyment of life and property. For purposes of the *Surplus Plutonium Disposition Environmental Impact Statement* (SPD EIS), only outdoor air pollutants were addressed. They may be in the form of solid particles, liquid droplets, gases, or a combination of these

forms. Generally, they can be categorized as primary pollutants (those emitted directly from identifiable sources) and secondary pollutants (those produced in the air by interaction between two or more primary pollutants or by reaction with normal atmospheric constituents, which may be influenced by sunlight). Air pollutants are transported, dispersed, or concentrated by meteorological and topographical conditions. Thus, air quality is affected by air pollutant emission characteristics, meteorology, and topography.

Ambient air quality in a given location can be described by comparing the concentrations of various pollutants in the atmosphere with the appropriate standards. Ambient air quality standards have been established by Federal and State agencies, allowing an adequate margin of safety for protection of public health and welfare from the adverse effects of pollutants in the ambient air. Pollutant concentrations higher than the corresponding standards are considered unhealthy; those below such standards, acceptable.

The pollutants of concern are primarily those for which Federal and State ambient air quality standards have been established, including criteria air pollutants, hazardous air pollutants, and other toxic air compounds. Criteria air pollutants are those listed in 40 CFR 50, *National Primary and Secondary Ambient Air Quality Standards* (EPA 1997a). Hazardous air pollutants and other toxic compounds are those listed in Title I of the 1990 Clean Air Act (CAA) as amended, those regulated by the National Emissions Standards for Hazardous Air Pollutants (NESHAPs), and those that have been proposed or adopted for regulation by the respective State or are listed in State guidelines. Also of concern are air pollutant emissions that may contribute to the depletion of stratospheric ozone or global warming. Construction activities, particularly those that involve modification of existing facilities, may be subject to certain NESHAPs requirements, for example, the reporting, training, and work practice requirements for asbestos renovation (EPA 1997b). Provisions of other NESHAPs requirements, such as those for benzene (EPA 1997c), would likely not apply because the amounts stored and used for construction and operation of these facilities would be small. Provisions of NESHAPs for radionuclides are discussed in Chapter 5 and Appendix F.10.

Areas with air quality better than the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants are designated as being in attainment; areas with air quality worse than the NAAQS for such pollutants, as nonattainment areas. Areas may be designated as unclassified when sufficient data for attainment status designation are lacking. Attainment status designations are assigned by county, metropolitan statistical area, consolidated metropolitan statistical area, or portions thereof. Air Quality Control Regions designated by the U.S. Environmental Protection Agency (EPA) are listed in 40 CFR 81, *Designation of Areas for Air Quality Planning Purposes*.

For locations that are in an attainment area for criteria air pollutants, prevention of significant deterioration (PSD) regulations limit pollutant emissions from new sources and establish allowable increments of pollutant concentrations. Three PSD classifications are specified with the criteria established in the CAA amendments. Class I areas include national wilderness areas, memorial parks larger than 2,020 ha (5,000 acres), and national parks larger than 2,430 ha (6,000 acres), and areas that have been redesignated as Class I. Class II areas are all areas not designated as Class I. No Class III areas have been designated.

Designation as a nonattainment area for criteria air pollutants triggers control requirements designated to achieve attainment status by specified dates. In addition, facilities that constitute major new emission sources cannot be constructed in a nonattainment area without permits that impose stringent pollution control requirements to ensure progress toward compliance.

The region of influence (ROI) for air quality is that area around a site potentially affected by air pollutant emissions caused by the surplus plutonium disposition alternatives. The air quality impact area normally evaluated is the area in which concentrations of criteria air pollutants would increase more than a significant amount in a Class II area. Significance varies according to the averaging period: 2,000 $\mu g/m^3$ for 1 hr for carbon

monoxide; 25 $\mu g/m^3$ for 3 hr for sulfur dioxide; 5 $\mu g/m^3$ for 24 hr for sulfur dioxide and particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}); and 1 $\mu g/m^3$ annually for sulfur dioxide, PM_{10}, and nitrogen dioxide (EPA 1997d). Generally, this covers a few kilometers downwind from the source. For sources within 100 km (62 mi) of a Class I area, the air quality impact area evaluated would include the Class I area if the average 24-hr increase in concentration were greater than 1$\mu g/m^3$. The size of the ROI depends on emission source characteristics, pollutant types, emission rates, and meteorological and topographical conditions. For purposes of this analysis, where most of the sites are large, impacts were evaluated at the site boundary, along roads within the sites to which the public has access, and anywhere else the contributions to pollutant concentrations could exceed the established significance levels.

Baseline air quality is typically described in terms of pollutant concentrations modeled for existing sources at each site and background air pollutant concentrations measured near the sites. For this analysis, concentrations for existing sources were obtained from existing source documents or by modeling recent emissions data. Data from the *Storage and Disposition PEIS* (DOE 1996a) were incorporated where appropriate.

The maximum concentrations of toxic air pollutants at or beyond the site boundary were compared with Federal and State regulations or limits. To determine human health risk (see Appendix F.10), modeling outputs on chemical concentrations in air were weighed against chemical-specific toxicity values. Emissions of radionuclides to the air (see Appendix F.10) were evaluated in terms of a total dosage standard.

F.1.1.2 Noise

Sound results from the compression and expansion of air or some other medium when an impulse is transmitted through it. Sound requires a source of energy and a medium for transmitting the sound wave. Propagation of sound is affected by various factors, including meteorology, topography, and barriers. Noise is undesirable sound that interferes or interacts negatively with the human or natural environment. Noise may disrupt normal activities (e.g., hearing, sleep), damage hearing, or diminish the quality of the environment.

Sound-level measurements used to evaluate the effects of nonimpulsive sound on humans are compensated by an A-weighting scale that accounts for the hearing response characteristics (i.e., frequency) of the human ear. Sound levels are expressed in decibels, or in the case of A-weighted measurements, decibels A-weighted. The EPA has developed noise-level guidelines for different land-use classifications. Some States and localities have established noise control regulations or zoning ordinances that specify acceptable noise levels by land-use category.

Noise from facility operations and associated traffic could affect human and animal populations. Because most nontraffic noise associated with construction and operation of the proposed facilities would be distant from offsite noise-sensitive receptors, the contribution to offsite noise levels should be small. Impacts associated with transportation access routes, including noise from increased traffic, could result in small increases in noise along these routes. The ROI for each of the sites includes the site and surrounding areas, including transportation corridors, where proposed activities might increase noise levels. Transportation corridors most likely to experience increased noise levels are those roads within a few miles of the site boundary that carry most of the site's employee and shipping traffic.

Sound-level data representative of site environs were obtained from existing reports and from calculations of the sound levels typical of prevailing traffic volumes along the transportation corridors. The acoustic environment was further described in terms of existing noise sources for each site.

F.1.2 Description of Impact Assessment

F.1.2.1 Air Quality

Potential air quality impacts of pollutant emissions from construction and normal operations were evaluated for each alternative (see Table F–1). That assessment included a comparison of effects of each alternative with applicable Federal and State ambient air quality standards and concentration limits. The more stringent standards, EPA or State, served as the assessment criteria. Criteria for hazardous and toxic air pollutants include those listed in Title III of the 1990 CAA Amendments, NESHAPs, and standards and guidelines adopted by the respective states. The State ambient standards are the same as or more stringent than the Federal ambient standards. The Federal primary ambient standards define levels of air quality that EPA "judges are necessary with an adequate margin of safety, to protect the public health" (EPA 1997a). The Federal secondary ambient standards define levels of air quality that EPA "judges are necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant" (EPA 1997a). The surplus plutonium disposition incremental change in concentrations of pollutants was compared with the PSD Class II allowable increments. Impacts on Class I PSD areas were evaluated where there was a Class I area within 100 km (62 mi) of the site.

Operational air pollutant emissions data for each alternative (other than No Action) were based on engineering design reports; construction emissions data for each alternative, on engineering design reports, emission factors for construction equipment listed in *Compilation of Air Pollutant Emission Factors: Mobile Sources* (EPA 1991:vol. II, 7-1–7-7), and emission factors for fugitive dust from construction listed in *Compilation of Air Pollutant Emission Factors* (EPA 1996a:13.2-1; 13.2-2; 13.2.2-1–13.2.2-8; 13.2.3-1–13.2.3-7; 13.2.4-1–13.2.4-9; 13.2.5-1–13.2.5-21). Traffic emissions were estimated using EPA's MOBILE5b and PART 5 emissions calculation models.

For each alternative, contributions to offsite air pollutant concentrations were modeled on the basis of guidance presented in the *Guideline on Air Quality Models* (EPA 1997e). The EPA-recommended Industrial Source Complex Model, Version 3 (ISC3), was selected as the most appropriate model to perform the air dispersion modeling, because it is designed to support the EPA regulatory modeling program and is capable of handling multiple sources and source types. The short-term version of ISC3, ISCST3, was used to calculate concentrations with averaging times of 1 to 24 hours and annual average concentrations. Concentrations for the No Action Alternative were based on information provided in the *Storage and Disposition PEIS* (DOE 1996a).

For each reactor site proposed for irradiation of MOX fuel, the contributions to offsite air pollutant concentrations were modeled using the EPA long-term version of the ISC3 model, ISCLT3, for annual average concentrations, and the SCREEN3 model, for short-term average concentrations. Emissions were based on information provided by Duke Engineering and Services, COGEMA Inc., and Stone and Webster as summarized in the *MOX Fuel Fabrication Facility and Nuclear Power Reactor Data Report* (DOE 1999).

The modeling analysis incorporated conservative assumptions, which tend to overestimate the pollutant concentrations. The "highest-high" concentration for each pollutant and averaging time was selected for comparison with the applicable assessment criterion, instead of the less conservative EPA-recommended "highest-high" and "highest second-highest" concentration for long-term and short-term averaging times, respectively. The concentrations evaluated were the maximum occurring at or beyond the site boundary or a public access road, and included the contribution of the alternative and that of existing onsite sources. Available monitoring data, which reflect both onsite and offsite sources, were also taken into consideration. Concentrations of the criteria air pollutants, hazardous air pollutants, and toxic air compounds were presented for each alternative. Construction equipment activity emissions were evaluated as a volume source for each

Table F–1. Impact Assessment Protocol for Air Quality and Noise

Resource	Required Data		Measure of Impact
	Affected Environment	Facility Design	
Air quality			
Criteria air pollutants and other regulated pollutants[a]	Ambient concentration ($\mu g/m^3$) of air pollutants, and concentrations of pollutants from existing sources at site	Emission (kg/yr) of air pollutants from facility and facility construction or modification; source characteristics (e.g., stack height and diameter, exit temperature and velocity); shipments and workforce estimates	Contribution of proposed alternative to concentrations of each pollutant at or beyond site boundary; total concentration of each pollutant at or beyond site boundary; percent of applicable standard
Toxic/hazardous air pollutants[b]	Ambient concentrations ($\mu g/m^3$) of toxic air pollutants; concentrations of pollutants from existing sources at site	Emission rate (kg/yr) of toxic air pollutants from facility; source characteristics (e.g., stack height and diameter, exit temperature and velocity)	Contribution of proposed alternative to concentrations of each pollutant at or beyond the site boundary; total concentration of each pollutant at or beyond site boundary; percent of applicable standard
Noise	Sound levels at sensitive offsite receptors (e.g., at nearby residences, along major access routes); sound levels at noise-sensitive wildlife habitat (nearby threatened and endangered wildlife habitat)	Descriptions of major construction and operation sources; shipment and workforce estimates	Increase in day/night average sound level at sensitive receptors

[a] Carbon monoxide; hydrogen fluoride; lead; nitrogen oxides; ozone; particulate matter with an aerodynamic diameter less than or equal to 10 μg; sulfur dioxide; total suspended particulates.

[b] Title III pollutants, pollutants regulated under the National Emissions Standard for Hazardous Air Pollutants, and other State-regulated pollutants.

alternative using the ISC3 model. The total concentration, including the contribution from each alternative and the percent of the applicable standard, were presented. This percentage reflects the variability of the No Action concentrations, the standards and guidelines among sites and the differences among the alternatives.

The effects of traffic related to construction and operation for each alternative were evaluated by calculating the emissions of criteria pollutants from worker vehicles and shipping activities.

One year of sequential hourly onsite meteorological data from the sites and upper-air data for appropriate locations from the National Climactic Data Center were used in the air quality modeling. For consistency, the data were for the same year considered in the *Storage and Disposition PEIS* (DOE 1996a).

Additional assumptions were incorporated in the air quality modeling at each site. For example, to model emissions from a generic process stack for MOX fuel fabrication, a single source within the facility was used, assuming a stack height of 8 m (26 ft), a stack diameter of 0.3 m (1 ft), a stack exit temperature equal to the

ambient temperature, and a stack exit velocity of 0.03 m/s (0.1 ft/s). Where they could be obtained, however, actual stack locations and stack parameters were used to model pollutant concentrations.

The analysis tends to overestimate pollutant concentrations, since the location of the maximum site boundary concentrations due to surplus plutonium disposition facilities was assumed to be the same as the location of maximum concentrations of other pollutant sources at the site.

Ozone is typically formed as a secondary pollutant in the ambient air (troposphere). It is formed from such primary pollutants as nitrogen oxides and volatile organic compounds, which emanate from vehicular (mobile), natural, and other stationary sources. It is not emitted directly as a pollutant from the sites. Although ozone may thus be regarded appropriately as a regional issue, specific ozone precursors, notably nitrogen dioxide and volatile organic compounds, were analyzed as applicable to the alternatives under consideration.

The CAA, as amended, required that Federal actions conform to the host State's "State Implementation Plan." A State Implementation Plan provides for the implementation, maintenance, and enforcement of NAAQS for the six criteria pollutants: sulfur dioxide; PM_{10}; carbon monoxide; ozone; nitrogen dioxide; and lead. Its purpose is to eliminate or reduce the severity and number of violations of NAAQS and to expedite the attainment of these standards. No department, agency, or instrumentality of the Federal Government shall engage in or support in any way (i.e., provide financial assistance for, license or permit, or approve) any activity that does not conform to an applicable implementation plan. The final rule for *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (EPA 1993) took effect on January 31, 1994. Hanford, Pantex, the Idaho National Engineering and Environmental Laboratory, the Savannah River Site, and Los Alamos National Laboratory are within areas currently designated as attainment for criteria air pollutants. Therefore, the surplus plutonium disposition alternatives being considered at these sites are not affected by the provisions of the conformity rule. Rocky Flats Environmental Technology Site (RFETS) is in an area designated nonattainment for ozone, PM_{10}, and carbon monoxide. Lawrence Livermore National Laboratory is in an area designated nonattaining for ozone. Applicability of the conformity rule to the RFETS is discussed in Section 4.2.1.7 on No Action.

Emissions of potential stratospheric ozone-depleting compounds such as chlorofluorocarbons were not evaluated because no emissions of these pollutants were identified in the engineering design reports.

Emissions of pollutants that are potential contributors to global warming (e.g., carbon dioxide, nitrous oxide chlorofluorocarbons, and methane) were evaluated using emission data in the engineering design reports. These emissions were compared with annual releases of these pollutants from other sources (EPA 1997f).

F.1.2.2 Noise

Also addressed in the SPD EIS assessment were the onsite and offsite acoustic impacts of construction and operation of the proposed facilities (see Table F–1). That analysis drew from available information (e.g., engineering design reports) on the types of noise sources and the locations of the proposed facilities relative to the site boundary and noise-sensitive locations. Its focus was the degree of change in noise levels at sensitive receptors (e.g., residences near the site boundary and along access routes, and schools along access routes) with respect to ambient conditions. (A change in noise level of less than 3 decibels is generally not detectable by the human ear. An increase of 10 decibels is roughly equivalent to a doubling of the perceived sound.) Most nontraffic noise sources associated with construction and operation of the surplus plutonium disposition facilities are far enough from offsite noise-sensitive receptors that the contribution to offsite noise levels should be small. Projections of traffic noise during construction and operations were based on the employment and shipment projections provided in the engineering design reports.

F.2 GEOLOGY AND SOILS

F.2.1 Description of Affected Resources

Geologic resources include consolidated and unconsolidated earth materials, including mineral assets such as ore and aggregate materials, and fossil fuels such as coal, oil, and natural gas. Geologic conditions include hazards such as earthquakes, faults, volcanoes, landslides, and land subsidence. Soil resources include the loose surface materials of the earth in which plants grow, usually consisting of mineral particles from disintegrating rock, organic matter, and soluble salts.

The ROI for geology and soils includes all areas subject to disturbance by construction and operation of surplus plutonium disposition facilities, and those areas beneath these facilities that would remain inaccessible for the life of the facilities.

Geology and soils were considered with respect to natural conditions that could affect the alternative, as well as those portions of the resource that could be affected by the alternative. Geology and soil conditions that could affect the integrity and safety of the surplus plutonium disposition alternatives include large-scale geologic hazards and attributes of the soil beneath the proposed facility. Geology and soil resources that could be affected by the surplus plutonium disposition alternatives include economically valuable mineral resources and prime farmland soils.

F.2.2 Description of Impact Assessment

Facility construction and operations for the surplus plutonium disposition alternatives were considered from the perspective of impacts on specific geologic resources and soil attributes. Construction impacts would predominate in effects on geologic and soil resources; hence, key factors in the analysis were the land area to be disturbed during construction and occupied during operations (see Table F–2). The main objective was avoidance of the siting of facilities over unstable soils (i.e., soils prone to liquefaction, shrink-swell, or erosion).

Table F–2. Impact Assessment Protocol for Geology and Soils

	Required Data		
Resource	**Affected Environment**	**Facility Design**	**Measure of Impact**
Soil attributes	Presence of any unstable soils at proposed facility location	Location of proposed facility on the site	Location of facility on unstable soils
Valuable mineral and energy resources	Presence of any valuable mineral or energy resources at proposed facility location	Location of proposed facility on the site	Destruction or rendering inaccessible of valuable mineral or energy resources
Prime farmland soils	Presence of prime farmland soils at proposed facility location	Location of proposed facility on the site	Conversion of prime farmland soils to nonagricultural use

Included in the geology and soil impact analysis was consideration of the risks to the proposed facilities of large-scale geologic hazards such as faulting and earthquakes, lava extrusions and other volcanic activity, landslides, sinkholes, and salt dissolution (i.e., conditions that tend to affect broad expanses of land). In the *Storage and Disposition PEIS* (DOE 1996a:4-45–47, 4-148–150, 4-204–206, 4-309–311), hazards from the large-scale geologic conditions at each candidate site were assessed for proposed long-term storage facilities. The

supporting data and findings of that analysis, which focused on the presence of the hazard and the distance of the facilities from it, were reviewed and accepted as generally applicable to the surplus plutonium disposition facilities and therefore are incorporated by reference. Efforts were also made to determine if locating the surplus plutonium disposition facilities at a specific site could destroy, or preclude the use of, valuable mineral or energy resources.

Pursuant to the Farmland Protection Policy Act (FPPA) (7 USC 4201 et seq.), and the regulations (7 CFR 658) promulgated as result thereof, the presence of prime farmland was also evaluated. This act requires agencies to make FPPA evaluations part of the National Environmental Policy Act (NEPA) process, the main purpose being to reduce the conversion of farmland to nonagricultural uses by Federal projects and programs. Prime farmland, as defined in 7 CFR 657, is land that contains the best combination of physical and chemical characteristics for producing crops. It includes cropland, pasture land, rangeland, and forest land. Potential prime farmlands not acquired prior to June 22, 1982, the effective date of the FPPA, are exempt from its provisions (DOE 1996b:4-22).

F.3 WATER RESOURCES

F.3.1 Description of Affected Resources

Water resources are the surface and subsurface waters that are suitable for human consumption, agricultural purposes, or irrigation or industrial/commercial purposes, and that could be impacted by the proposed action. This analysis involved the review of engineering estimates of expected water use and effluent discharges from proposed construction, operation, maintenance, and decontamination and decommissioning (D&D) of the proposed facilities, and ultimately the impacts of the activities on the local surface water and groundwater.

F.3.2 Description of Impact Assessment

The water resources evaluation for the SPD EIS tiers from the corresponding analysis presented in the *Storage and Disposition PEIS* (DOE 1996a). Its purpose was to evaluate the differences in the impacts where changes would be incurred in the assumed water usage to accommodate the facilities involved in the planned disposition activities. Determination of the impacts of the alternatives on water resources (see Table F–3) consisted of a comparison of field-generated data with regulatory standards, design parameters commonly used in the water and wastewater design industry, and accepted industry standards.

Certain assumptions were integral to this analysis: (1) that all water and sewage treatment facilities would be approved by the appropriate permitting authority, and thus that the impacts of project-specific withdrawals from the water treatment plants and effluent discharges from the sewage treatment plant would be in accordance with established standards; (2) that the sewage treatment facilities would meet the effluent limitations imposed by their respective National Pollutant Discharge Elimination System (NPDES) permits; and (3) that any storm-water runoff from construction or operation activities would be handled in accordance with the regulations of the appropriate permitting authority. It was also assumed that, during construction, siltation fencing or other erosion control devices would be used to mitigate short-term adverse impacts from siltation, and that, as appropriate, storm-water holding ponds would be constructed to lessen the impacts of rainfall events on the receiving streams.

Table F–3. Impact Assessment Protocol for Water Resources[a]

Resource	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Surface water quality	Surface waters near the facilities in terms of stream classifications and changes in water quality	Anticipated effluent quantity and quality	Noncompliance of surface water quality with relevant standards of Clean Water Act or with State regulations
Groundwater quality	Groundwater near the facilities in terms of classification, presence of designated sole source aquifers, and changes in quality of groundwater	Quantity and quality of anticipated withdrawals from, or discharges to, groundwater	Concentrations of contaminants in groundwater exceeding standards established in accordance with Safe Drinking Water Act or State regulations
Surface water availability	Surface waters near the facilities, including average flow; 7-day, 10-year low flow; and numbers of downstream users	Volume of withdrawals from, and discharges to, surface waters	Changes in availability to downstream users of water for drinking, irrigation, or animal feeding[b]
Groundwater availability	Groundwater near the facilities, including numbers of all groundwater users, existing water rights for major water users, and contractual agreements for water supply use within impacted area	Volume of withdrawals and discharges to groundwater	Changes in availability of groundwater for human consumption, irrigation, or animal feeding
Flooding impacts	Locations of 100- and 500-year floodplains	Facility location on the site	Construction of facilities in a floodplain[c]

[a] For flows above the design capacity of existing water and sewage treatment systems.
[b] An impact is assumed if withdrawals exceed 10 percent of the 7-day, 10-year low flow of the receiving stream.
[c] A floodplain assessment is a prerequisite to construction on a floodplain.

Further assumptions regarding water resources impacts were based in part on results of the analysis. The first step in the analysis was to determine whether any revisions in project water and wastewater flows had occurred between the time of the *Storage and Disposition PEIS* (DOE 1996a) and the collection of data for the SPD EIS. If no revisions were necessary, and if no evidence of an impact on water resources was presented in the *Storage and Disposition PEIS* (DOE 1996a), then it was assumed that no such impact would be incurred. If the analysis reflected a revision downward in the assumed water use for a proposed activity, and there was no impact for that activity in the *Storage and Disposition PEIS* (DOE 1996a), then no impact was attributed to that activity. If the analysis reflected an increase in water use, then an evaluation of the design capacity of the water and wastewater treatment facilities was made to determine whether their design capacity would be exceeded by the additional flows. If the combined flow (i.e., the existing flow plus those from the proposed activities) were less than the design capacity of the water and sewage treatment plants, then it was assumed that there would be no impact on water availability for local users or on the receiving stream from sewage treatment plant effluent discharges. If the flows from the proposed facilities were found to exceed the design capacity of the existing water or sewage treatment facilities, then the following extensive analyses of the impact of these flows were conducted.

Surface Water Availability. The analysis of the potential impacts on water availability entailed comparing the rate of surface water use for the specific alternative, the associated effluent discharges, and the use and classification of water in downstream waterways. For facilities intending to use surface water, an evaluation was

made of the total use and the 7-day, 10-year low-flow conditions of the receiving stream. Discharges of effluent back into the receiving stream were included in the evaluation. If net losses were found to exceed 10 percent of the 7-day, 10-year low flow, an impact was assumed. Where groundwater was the source of water, discharges to surface water were interpreted as adding to the flow in the receiving stream. If the increases exceeded 200 percent of the 7-day, 10-year low flow, then an impact was assumed.

Surface Water Quality. The evaluation of the surface water quality impacts focused on the quality and quantity of the effluent to be discharged and the quality of the receiving stream upstream and downstream from the proposed facilities. The evaluation of effluent quality featured review of the expected design parameters, such as the design average and maximum flows, as well as the effluent parameters reflected in the existing or expected NPDES permit. Those parameters include biochemical oxygen demand, total suspended solids, metals, coliform bacteria, organic and inorganic chemicals, radionuclides, and any other parameters that affect the local environment. Water quality management practices were reviewed to ensure that NPDES permit limitations would be met. Factors that currently degrade water quality were also identified.

During construction, the receiving stream could be affected by construction site runoff and sedimentation. Such impacts relate to the amount of land disturbed, the type of soil at the site, the topography, and weather conditions. They would be minimized by application of standard management practices for storm-water and erosion control.

During operations, receiving waters could be affected by increased runoff from parking lots, buildings, or other cleared areas. Storm water from these areas could be contaminated with materials deposited by airborne pollutants, automobile exhaust and residues, and process effluents. Impacts of storm-water discharges could be highly specific, and mitigation would depend on management practices, the design of holding facilities, the topography, and adjacent land use. Data from the existing water quality database were compared with expected flows from the new facilities to determine the relative impacts on the quality of the water in the receiving stream.

Groundwater Availability. Effects of the proposed action on groundwater supplies were determined by analyzing potential withdrawal rates for the construction and operation phases of the action. Estimates of withdrawal from the affected aquifers were provided. Additionally, instances in which groundwater use could exceed a large portion of the locally developed groundwater supplies were identified.

Groundwater Quality. Potential groundwater quality impacts associated with effluent discharges during the construction and operation phases were examined. The groundwater quality projections were then weighed against Federal and State groundwater quality standards, effluent limitations, and drinking water standards to determine the impacts of each alternative. Also evaluated were the effects of construction and operation activities on the movement of existing groundwater contamination plumes, and the consequences thereof for groundwater use in the area.

Floodplain Impacts. Once the regional 100- and 500-year floodplains were identified from maps and other existing documents, the likely impacts of proposed surplus plutonium disposition facility construction and operation activities were analyzed. For any facilities proposed for location in a floodplain, a floodplain assessment would be prepared, as necessary. Where possible, the surplus plutonium disposition facilities were sited to ensure compliance with Executive Order 11988, *Floodplain Management*, and 10 CFR 1022, *Compliance With Floodplain/Wetlands Environmental Review Requirements*.

F.4 ECOLOGICAL RESOURCES

F.4.1 Description of Affected Resources

Ecological resources include terrestrial and aquatic resources (plants and animals), wetlands, and threatened and endangered species that could be affected by proposed construction and operations at the proposed surplus plutonium disposition sites. In accordance with the *Storage and Disposition PEIS* (DOE 1996a), the ROI for habitat impacts from facility construction and operations is the area within a 1.6-km (1-mi) radius of the proposed facilities.

F.4.2 Description of Impact Assessment

The proposed alternatives would involve, at a minimum, land disturbance during modifications to existing facilities and may require site clearing for construction of new facilities (see Table F–4). Accordingly, ecological impacts were assessed in terms of potential disturbances or loss of nonsensitive terrestrial and aquatic habitats and the potential effects on nearby sensitive habitats. For purposes of the SPD EIS, sensitive habitats include those areas occupied by threatened and endangered species, State-protected species, and wetlands.

Table F–4. Impact Assessment Protocol for Ecological Resources

Resource	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Nonsensitive terrestrial and aquatic habitats	Vegetation and wildlife within a 1.6-km (1-mi) radius of proposed facility locations	Area disturbed by construction of proposed facility	Decrease in acreage of undisturbed local and regional nonsensitive habitats
Sensitive terrestrial and aquatic habitats, including wetlands	Sensitive species habitats within a 1.6-km (1-mi) radius of proposed facility locations	Area disturbed by construction of proposed facility	Decrease in extent of sensitive habitats in ROI Determination by USFWS and State agencies that facility construction could disturb sensitive habitats

Key: ROI, region of influence; USFWS, U.S. Fish and Wildlife Service.

F.4.2.1 Nonsensitive Habitat Impacts

During the construction phase, ecological resources could be affected through disturbance or loss of habitat resulting from site clearing, land disturbance, human intrusion, and noise. Terrestrial resources could be directly affected through changes in vegetative cover important to individual animals of certain species with limited home ranges, such as small mammals and songbirds. Likely impacts include increased direct mortality and susceptibility to predation. Activities associated with the construction and operation of facilities (e.g., human intrusion and noise) could also compel the migration of the wildlife to adjacent areas with similar habitat. If the receiving areas were already supporting the maximum sustainable wildlife, competition for limited resources and habitat degradation could be fatal to some species. Therefore, the analysis of impacts on terrestrial wildlife was based largely on the extent of plant community loss or modification.

Construction or modification of facilities, and the operation thereof, could directly affect aquatic resources through increased runoff and sedimentation, increased flows, and the introduction of thermal and chemical changes to the water. However, various mitigation techniques should minimize construction impacts, and discharges of contaminants to surface waters from routine operations are expected to be limited by engineering control practices. Therefore, impacts are expected to be minimal.

F.4.2.2 Sensitive Habitat Impacts

Impacts on threatened and endangered species, State-protected species, and their habitats during construction of the proposed surplus plutonium disposition facilities were determined in a manner similar to that for nonsensitive habitats. A list of sensitive species that could be present at each site was compiled. Informal consultations were initiated with the appropriate U.S. Fish and Wildlife Service (USFWS) offices and State-equivalent agencies as part of the impacts assessment for sensitive species. Plans were developed for preconstruction surveys, as necessary, to determine the presence of any Federal- or State-listed species within the ROI. Those plans call for consulting the USFWS and various State agencies to confirm that potential impacts on sensitive habitats are acceptable or can be mitigated.

Most construction impacts on wetlands are related to the displacement of wetlands by filling, draining, or dredging activities. Operational impacts thereon could result from effluents, surface water or groundwater withdrawals, or the creation of new wetlands. Loss of wetlands resulting from construction and operation of the surplus plutonium disposition facilities was addressed by comparing data on the location and areal extent of wetlands in the ROI with the land area requirements for the proposed facilities.

F.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

F.5.1 Description of Affected Resources

Cultural resources are the indications of human occupation and use of the landscape as defined and protected by a series of Federal laws, regulations, and guidelines. For the SPD EIS, the potential impacts of proposed surplus plutonium disposition activities were assessed separately for each of the three general categories of cultural resources: prehistoric, historic, and Native American. Paleontological resources are the physical remains, impressions, or traces of plants or animals from a former geological age, and may be sources of information on paleoenvironments and the evolutionary development of plants and animals. Although not governed by the same historic preservation laws as cultural resources, they could be affected by the proposed surplus plutonium disposition activities in much the same manner.

Prehistoric resources are physical remains of human activities that predate written records; they generally consist of artifacts that may alone or collectively yield otherwise inaccessible information about the past. Historic resources consist of physical remains that postdate the emergence of written records; in the United States, they are architectural structures or districts, archaeological objects, and archaeological features dating from 1492 and later. Ordinarily, sites less than 50 years old are not considered historic, but exceptions can be made for such properties if they are of particular importance, such as structures associated with Cold War themes. Native American resources are sites, areas, and materials important to Native Americans for religious or heritage reasons. Such resources may include geographical features, plants, animals, cemeteries, battlefields, trails, and environmental features.

The primary ROI used for the cultural and paleontological resource analyses encompasses the land areas directly disturbed by construction and operation of the proposed facilities. The natural setting of those resources was considered a contextual component thereof.

F.5.2 Description of Impact Assessment

The SPD EIS study addressed the potential direct and indirect impacts on cultural resources at each of the candidate sites from the proposed action and alternatives (see Table F–5). The assessment of direct impacts focused on ground-disturbing activities and alterations to existing resources, particularly those listed or eligible for listing on the National Register of Historic Places (National Register), and those considered important to

Table F–5. Impact Assessment Protocol for Cultural and Paleontological Resources

Resource	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Prehistoric resources	Site cultural resource inventory/management plan reflecting listing or eligibility for listing on National Register Existing programmatic agreements	Location of proposed facility on the site Areas to be disturbed	Potential for physical destruction, damage, or alteration; isolation or alteration of the character of the property; introduction of visual, audible, or atmospheric elements out of character; and neglect of resources listed or eligible for listing on the National Register Noncompliance with existing laws, regulations, and programmatic agreements
Historic resources	Site cultural resource inventory/management plan reflecting listing or eligibility for listing on National Register Existing programmatic agreements	Location of proposed facility on the site Areas to be disturbed	Potential for physical destruction, damage, or alteration; isolation or alteration of the character of the property; introduction of visual, audible, or atmospheric elements out of character; and neglect of resources listed or eligible for listing on the National Register Noncompliance with existing laws, regulations, and programmatic agreements
Native American resources	Site cultural resource inventory/management plan reflecting listing or eligibility for listing on National Register Existing programmatic agreements Resources identified through consultations with Native American tribal governments	Location of proposed facility on the site Areas to be disturbed	Potential for disturbance of Native American resources as determined through consultations with potentially affected Native American tribal governments (per DOE Order 1230.2) Noncompliance with existing laws, regulations, and programmatic agreements
Paleontological resources	Site cultural resource inventory/management plan Existing programmatic agreements	Location of proposed facility on the site Areas to be disturbed	Potential for appropriation, excavation, injury, or destruction of resources without permission (per Antiquities Act of 1906) Noncompliance with existing laws, regulations, and programmatic agreements

Native Americans. Potential indirect impacts of surplus plutonium disposition activities were also assessed—impacts associated with reduced access to a resource site, as well as impacts associated with increased traffic and visitation in sensitive areas.

For specific sites, depending on the alternative, more detailed information was required (e.g., file investigations, Native American consultations, implementation of the Native American policy of DOE, predictive modeling) to determine the types, numbers, and locations, as well as the National Register eligibility or importance in other respects of resources in the proposed project area.

Plans were drawn up for consultation with each State Historic Preservation Officer and reviews of existing DOE site cultural resource surveys and management plans to determine the National Register eligibility and importance of the resources, and to assess measures designed to mitigate the impacts of the proposed actions.

The measure of impact on a particular resource will depend largely on specific cultural resource management agreements with the candidate sites, the consultations with State Historic Preservation Officers and affected Native American tribes, and overall compliance with Section 106 of the National Historic Preservation Act.

F.6 LAND RESOURCES

F.6.1 Description of Affected Resources

Land resources include the land on and contiguous to each candidate site; the physical features that influence current or proposed uses; local urban and rural population density; pertinent State, county, and municipal land-use plans and regulations; land ownership and availability; and the aesthetic characteristics of the site and surrounding areas.

Land resources analysis for the SPD EIS determined the potential beneficial or adverse impacts on land use and visual resources for the defined ROI. The ROI for land use at each candidate site varies due to disparities in population density and growth trends, the extent of Federal land ownership, adjacent land-use patterns and trends, and other geographic or safety considerations. The ROI for visual resources includes those lands within the viewshed of the proposed action and alternatives.

F.6.2 Description of Impact Assessment

F.6.2.1 Land-Use Analysis

Requirements for the SPD EIS included estimating the impacts of the alternatives on land use within each DOE site, adjacent Federal or State lands, adjacent communities, and wildlife or resource areas. At issue were the net land area affected; its relationship to conforming and nonconforming land uses; current growth trends, land values, and other socioeconomic factors pertaining to land use; and the projected modifications to other facility activities and missions consistent with the proposed alternatives (see Table F–6). Land-use impacts could vary considerably from site to site, depending on existing facility land-use configurations, adjoining land uses, plans for transportation security, proximity to residential areas, and other environmental and containment factors.

Evaluation of existing land uses at each of the potentially affected sites required review of existing and future facility land-use plans. Where land adjacent to the proposed site is managed by local government, applicable community general plans, zoning ordinances, and population growth trend data were reviewed. Where such land is managed or under the jurisdiction of a Federal or State land management agency, the respective agency resource management plans and policies were reviewed. Total land area requirements include those areas to be occupied by the footprint of each building and nonbuilding support area in conjunction with all paved roads, parking areas, graveled areas, and construction laydown areas, and any land graded and cleared of vegetation. Land area requirements were identified using proposed facility data reports.

Table F–6. Impact Assessment Protocol for Land Resources

Resource	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Land use; area used	Total site acreage; available acreage	Location of proposed facility on the site; total land area requirements	Facility land requirements greater than 30% of available acreage
Compatibility with existing or future land-use plans, policies, or regulations	Existing facility and regional land-use configurations; applicable plans, policies, or regulations	Location of proposed facility on the site; facility D&D procedures; expected modifications of other facility activities and missions to accommodate proposed alternatives	Incompatibility with existing facility or adjacent land use; encroachment by disturbed area onto sensitive lands protected by existing management plans or policies; significant long-term or permanent loss of land use resulting from facility construction, operation, or D&D
Visual resources	Delineation of nearby visual resources and viewsheds, including Class I areas	Location of proposed facility on the site; facility dimensions and appearance	Significant reduction of assigned VRM classification for a notable viewshed

Key: D&D, decontamination and decommissioning; VRM, Visual Resource Management.

F.6.2.2 Visual Resources Analysis

Visual resource impacts are changes in the physical features of the landscape attributable to the proposed action. Visual resource assessment was based on the Bureau of Land Management Visual Resource Management (VRM) classification scheme (DOI 1986a, 1986b). Impacts on scenic or visual resources were analyzed by identifying existing VRM classifications and documenting any potential reductions therein at each of the alternative locations as a result of the proposed action or alternatives (see Table F–6). Existing class designation was derived from an inventory of scenic qualities, sensitivity levels, and distance zones for particular areas. The elements of scenic quality are landforms, vegetation, water, color, adjacent scenery, scarcity, and cultural modification. Scenic value is determined by the variety and harmonious composition of the elements of scenic quality. Sensitivity levels are determined by user volumes and user attention. Distance zones concern the visibility from travel routes or observation points.

Important concerns of the visual resources analysis were the degree of contrast between the proposed action and the surrounding landscape, the location and sensitivity levels of public vantage points, and the visibility of the proposed action from the vantage points. The distance from a vantage point to the affected area and atmospheric conditions were also taken into consideration, as distance and haze can diminish the degree of contrast and visibility. A qualitative assessment of the degree of contrast between the proposed facilities or activities and the existing visual landscape was also presented. Reduction of an assigned VRM classification could result if the affected area could be seen from the vantage point with a high sensitivity level.

F.7 INFRASTRUCTURE

F.7.1 Description of Affected Resources

Site infrastructure includes physical resources required to support the construction and operation of facilities. It includes the capacities of the onsite road and rail transportation networks; electric power and electrical load capacities; natural gas, coal, and fuel oil capacities; and water supply system capacities.

The ROI is generally limited to the boundaries of DOE sites. However, should infrastructure requirements exceed site capacities, the ROI would be expanded (for analysis) to include the sources of additional supply. For example, if electrical demand (with added facilities) exceeded site availability, then the ROI would be expanded to include the likely source of additional power: the power pool currently supplying the site.

F.7.2 Description of Impact Assessment

In general, infrastructure impacts were assessed by evaluating the requirements of each alternative against the site capacities. An impact assessment was made for each resource (road networks, rail interfaces, electricity, fuel, and water) for the various alternatives (see Table F–7). Tables reflecting site availability and infrastructure requirements were developed for each alternative. Data for these tables were obtained from reports describing the existing infrastructure at the sites, and from the data reports for each facility. If necessary, design mitigation considerations conducive to reduction of the infrastructure demand were also identified.

Table F–7. Impact Assessment Protocol for Infrastructure

Resource	Required Data		Measure of Impact
	Affected Environment	**Facility Design**	
Transportation Roads (km) Railroads (km)	Site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding site capacity
Electricity Energy consumption (MWh/yr) Peak load (MW)	Site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding site capacity
Fuel Natural gas (m^3/yr) Oil (l/yr) Coal (t/yr)	Site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding site capacity
Water (l/yr)	Site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding site capacity

Any projected demand for infrastructure resources exceeding site availability can be regarded as an indicator of environmental impact. Whenever projected demand approaches or exceeds capacity, further analysis for that resource is warranted. Often, design changes can mitigate the impact of additional demand for a given resource. For example, substituting fuel oil for natural gas (or vice versa) for heating or industrial processes can be accomplished at little cost during the design of a facility, provided the potential for impact is identified early. Similarly, a dramatic "spike" in peak demand for electricity can sometimes be mitigated by changes to operational procedures or parameters.

F.8 WASTE MANAGEMENT

F.8.1 Description of Affected Resources

The operation of surplus plutonium disposition support facilities would generate several types of waste, depending on the alternative. Such wastes include the following:

- **Transuranic:** Waste containing more than 100 nCi of alpha-emitting transuranic (TRU) isotopes with half-lives greater than 20 year per gram of waste, except for (1) high-level waste; (2) waste that DOE has determined, with the concurrence of EPA, does not need the degree of isolation required by 40 CFR 191, and (3) waste that the U.S. Nuclear Regulatory Commission (NRC) has approved for

disposal, case by case in accordance with 10 CFR 61. Mixed transuranic waste contains hazardous components regulated under the Resource Conservation and Recovery Act (RCRA).

- **Low-level:** Waste that contains radioactivity and is not classified as high-level waste, TRU waste, or spent nuclear fuel,[1] or the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the TRU concentration is less than 100 nCi/g of waste.

- **Mixed low-level:** Low-level waste that also contains hazardous components regulated under RCRA.

- **Hazardous:** Under RCRA, a solid waste that, because of its characteristics, may (1) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness, or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous wastes appear on special EPA lists or possess at least one of the following characteristics: ignitability, corrosivity, reactivity, or toxicity. This category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act.

- **Nonhazardous:** Discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. This category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act.

The alternatives for surplus plutonium disposition could have an impact on existing site facilities devoted to the treatment, storage, and disposal of these categories of waste.

For new facilities, construction wastes would be similar to those generated by any construction project of comparable scale. Wastes generated during the modification of existing nuclear facilities, however, could produce additional radioactive or hazardous demolition debris.

For all but nonhazardous wastes, DOE chose to combine the liquid and solid waste generation estimates into one waste generation rate for ease of comparison to site waste generation rates. Liquid waste was converted from liters to cubic meters using a conversion factor of 1,000 liters per cubic meter. This is likely to be conservative because it includes the volume of the liquid waste before treatment.

Waste management activities in support of the disposition of surplus plutonium would be contingent on Records of Decision (RODs) issued for the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE 1997a). Depending on future waste-type-specific RODs, in accordance with that EIS, wastes could be treated and disposed of on the site or at regionally or centrally located waste management centers. The ROD for hazardous waste issued on August 5, 1998, states that most DOE sites will continue to use offsite facilities for the treatment and disposal of major portions of nonwastewater hazardous waste, with the Oak Ridge Reservation and SRS continuing to treat some of their own hazardous waste on the site in existing facilities where this is economically favorable. According to the TRU Waste ROD issued on January 20, 1998, TRU and TRU mixed waste would be treated on the site according to the current planning-basis Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria and shipped to WIPP for disposal. The impacts of disposing of TRU waste at WIPP are

[1] Fuel withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

described in the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* (DOE 1997b). Current schedules for shipment of TRU waste to WIPP would accommodate shipment of contact-handled TRU waste from surplus plutonium disposition facilities beginning in 2016 (DOE 1997c:17). Therefore, it is assumed TRU waste would be stored on the site until 2016.

F.8.2 Description of Impact Assessment

As shown in Table F–8, impacts were assessed by comparing the projected waste stream volumes generated from the proposed activities at each site with current site waste generation rates and storage volumes.[2] Furthermore, projected waste generation rates for the proposed activities were compared with processing rates and capacities of those existing treatment, storage, and disposal facilities likely to be involved in managing the additional waste. Most likely, each waste type would be managed at many different facilities; for simplicity, however, it was assumed that the entire waste volume would be managed at one treatment facility, one storage facility, and one disposal facility.

Table F–8. Impact Assessment Protocol for Waste Management

Resource	Required Data		Measure of Impact
	Affected Environment	Facility Design	
Waste management capacity TRU waste Low-level waste Mixed low-level waste Hazardous waste Nonhazardous waste	Site generation rates (m^3/yr) for each waste type Site management capacities (m^3) or rates (m^3/yr) for potentially affected treatment, storage, and disposal facilities for each waste type	Construction and operation generation rates (m^3/yr) for each waste type	SPD facility waste generation rates are a large percentage of existing site generation rates and a large percentage of capacities of applicable waste management facilities
Disposal capacity for transuranic waste (including mixed TRU waste)	TRU waste volume (m^3) expected to be disposed of at WIPP Capacity at WIPP (m^3)	Total TRU waste generated (m^3) for SPD facilities	Combination of SPD facility TRU waste generation and existing TRU waste generation exceeds capacity of WIPP

Key: SPD, surplus plutonium disposition; TRU, transuranic; WIPP, Waste Isolation Pilot Plant.

F.9 SOCIOECONOMICS

F.9.1 Description of Affected Resources

Socioeconomic impacts may be defined as the environmental consequences of a proposed action in terms of demographic and economic changes. Two types of jobs would be created as a result of DOE's adopting any of the surplus plutonium disposition alternatives: (1) construction-related jobs, transient in nature and short in duration, and thus less likely to impact public services; and (2) jobs related to plant operations, required for a decade or more and thus possibly creating additional service requirements in the ROI.

[2] For the SPD EIS, only the impacts relative to the capacities of waste management facilities were considered. Environmental impacts of waste management facility operation are evaluated in other facility-specific or sitewide NEPA documents.

F.9.2 Description of Impact Assessment

Before the socioeconomic analyses could begin, the socioeconomic environment had to be defined for two geographic regions, the regional economic area (REA) and ROI. The REA is used to assess potential effects of an action on the regional economy. REAs are the broad markets defined by the economic linkages among and between the regional industrial and service sectors and the communities within a region. These linkages determine the nature and magnitude of any multiplier effect associated with a change in economic activity.

For example, as work expands at a given site, the money spent on accomplishing this work flows into the local economy; it is spent on additional jobs, goods, and services within the REA. Using the Regional Input-Output Modeling System developed by the Bureau of Economic Analysis of the U.S. Department of Commerce, the regional economic impacts of a proposed project can be estimated over the life of the project.

Similarly, potential demographic impacts were assessed for the ROI. The ROI could represent a smaller geographic area—one in which only the housing market and local community services would be significantly affected by a given alternative. Site-specific ROIs were identified as those counties in which at least 90 percent of the site's workforce reside. This distribution reflects existing residential preferences for people currently employed at the sites and was used to estimate the distribution of new workers required to support the alternatives.

For each REA, data were compiled on the current socioeconomic conditions, including unemployment rates, economic sector activities, and the civilian labor force. For each ROI, statistics were compiled on the housing demand and community services. These data were combined with population forecasts developed using Census Bureau data to project changes to reflect the various siting alternatives being considered. Site-specific data were then used to help determine whether the overall workforce would be increased by the alternatives being considered (see Table F–9).

In some cases, a site's overall workforce was projected to decrease at the same time additional workers would be needed to support an alternative under consideration in the SPD EIS. In these cases, there would be little change in the site's overall workforce from current levels, and thus very little change in requirements for community services would be expected from a particular alternative. In the alternative, where the projected increases in the site workforce were greater than current levels, the impacts on community services were assessed by determining the increase in community services required to maintain the current status.

F.10 HUMAN HEALTH RISK DURING NORMAL OPERATIONS

F.10.1 Description of Affected Resources

Assessments for the SPD EIS aimed in part at enhancing public understanding of the potential impacts of each of the alternatives on their own health and that of workers. Included was a description of the radiological and chemical releases resulting from construction activities and normal operations for each alternative, including No Action, and the impacts on public and occupational health.

The risks from radiation were not added to those from hazardous chemicals, given the considerable uncertainty as to their combined effects. Impacts of some chemicals are enhanced by radiation, while those of others are not affected or can even be reduced. The reverse also holds true: chemicals can increase, decrease, or not influence radiological effects.

For the public, impacts on individuals (maximally exposed and average exposed) and on the population within 80 km (50 mi) of the site were evaluated; for workers, the focus was impacts on individuals and on the total

Table F–9. Impact Assessment Protocol for Socioeconomics

Resource	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Workforce requirements	Site workforce projections from DOE sites	Estimated construction and operating staff requirements and timeframes	Workforce requirements added to sites' workforce projections
REA civilian labor force	Labor force projections based on State population projections	Estimated construction and operating staff requirements and timeframes	Workforce requirements as a percentage of the civilian labor force
Unemployment rate	1996 unemployment rates in counties surrounding sites and in host States	Estimated construction and operating staff requirements	Projected change in unemployment rates
Health care services Number of hospital beds per 100,000 residents	Latest available rates based on telephone interviews with area hospitals and State hospital associations	Estimated influx of new health care facilities to meet construction and operating staff requirements	Projected change in numbers to maintain current rates
Number of physicians per 100,000 residents	Latest available rates based on AMA data	Estimated influx of new health care employees to meet construction and operating staff requirements	Projected change in numbers to maintain current rates
Housing—Percent of occupied housing units	Latest available rates from the Census Bureau	Estimated influx of new housing units needed for influx of construction and operating staff requirements	Projected change in numbers to maintain current rates
Schools Percent operating capacity for school districts in ROI	Latest available rates based on telephone interviews with school districts	Estimated influx of new students generated by movement of employees and their families into ROI	Projected change in operating capacity for school districts in ROI
Teacher-to-student ratio	Latest available rates based on telephone interviews with school districts	Estimated influx of new students generated by movement of employees and their families into ROI	Projected change in number of teachers to maintain current teacher-to-student ratio
Community services Ratio of police to 100,000 residents	Latest number of sworn officers based on telephone interviews with police departments	Estimated influx of new officers to meet construction and operating staff requirements	Projected change in number of officers to maintain current police-to-resident ratio
Ratio of firefighters to 100,000 residents	Latest number of firefighters based on telephone interviews with fire departments	Estimated influx of new firefighters to meet construction and operating requirements	Projected change in number of firefighters to maintain current firefighter-to-resident ratio

Key: AMA, American Medical Association; REA, regional economic area; ROI, region of influence.

facility workforce. The basic health risk issue addressed was whether any of the alternatives would result in undue numbers of health effects (e.g., cancers among workers or the public). Because protection of human health is regulated by DOE, EPA, NRC, and the Occupational Safety and Health Administration (OSHA), estimates

of public and worker doses and associated health risks are also necessary to demonstrate that surplus plutonium disposition facilities are being designed in compliance with the applicable standards issued by these agencies.

F.10.2 Description of Impact Assessment

F.10.2.1 Public Health Risks

The health risks to the general public were determined in the following ways: (1) for present operations, doses stated in the most recent environmental or safety reports were used to calculate health risks; and (2) for operations of the proposed facilities, incremental radiological and chemical doses were modeled using specific facility data and site-dependent parameters and converted into their associated health risks.

Radiological and chemical impacts associated with the No Action Alternative were estimated from projected releases from all site facilities that are expected to be operating at the time the actions assessed in the SPD EIS are under way. For each of the other alternatives, radiological and chemical effluents were obtained from facility data reports specific to each surplus plutonium disposition process.

F.10.2.1.1 Radiological Risks

Public health risk assessments from radiological releases during normal operations of the proposed facilities at the candidate sites were performed using the Generation II computer code, to calculate doses from inhalation, ingestion of terrestrial foods, drinking water, fish, and direct exposure to radiation in plumes or on the ground. This type of assessment uses site-dependent factors, including meteorology, population distributions, agricultural production, and facility locations on a given site. As reflected in Table F–10, doses were calculated for the maximally exposed individual (MEI) member of the public, for the average exposed member of the public, and for the total population living within 80 km (50 mi) of a given release location (NRC 1977:1.109.30).

Total site doses were compared with regulatory limits and, for perspective, with background radiation levels in the vicinity of the site. These doses were also converted into a projected number of fatal cancers using a risk estimator of 500 fatal cancers per 1 million person-rem derived from data prepared by the National Research Council's Committees on the Biological Effects of Ionizing Radiations and by the International Commission on Radiological Protection (ICRP 1991). The calculated health effects were compared with those arising among the same population groups from other causes.

[Text deleted.]

F.10.2.1.2 Chemical Risks

The potential impacts on the offsite public from exposure to hazardous chemicals released to the atmosphere as a result of the construction or routine operation of the proposed facilities were evaluated. The receptor considered in these evaluations was the MEI member of the offsite population at each candidate site. The MEI is the hypothetical individual in the population who has the highest potential exposure.

Table F–10. Impact Assessment Protocol for Human Health Risk

Risk	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Radiation: public			
Offsite MEI dose via airborne pathways	Current annual dose (mrem) to MEI via all airborne pathways at site	Annual radionuclide release rates (Ci) to air from proposed facility. Stack height. Location of proposed facility on the site.	Annual dose greater than 10 mrem via airborne releases (NESHAPs limit), and 5 mrem (airborne external [10 CFR 50]).
Offsite MEI dose via liquid pathways	Current annual dose (mrem) to MEI via all liquid pathways at site	Annual radionuclide release rates (Ci) to liquid pathways.	Annual dose via liquid releases greater than 4 mrem (SDWA) and 3 mrem (10 CFR 50).
Offsite MEI dose via all pathways, including air, water, and others (e.g., direct radiation)	Current annual dose (mrem) to MEI via all pathways at site Annual radionuclide release rates to air and water from site release locations Joint frequency meteorological data Water dilution factors Distances from radionuclide release points to site boundary for 16 cardinal directions Exposure information associated with other potential pathways (e.g., direct radiation from each site area)	Annual radionuclide releases to air and via any other pathway (e.g., direct radiation) from proposed facility. Stack height. Location of proposed facility on the site. Exposure information associated with other potential pathways (e.g., direct radiation).	Annual dose greater than 100 mrem via all pathways (DOE 5400.5 and 10 CFR 20)
Dose to population within 80 km (50 mi) of site via all pathways	Current annual population dose (person-rem) via all pathways at site Projected population distribution within an 80-km (50-mi) radius from radionuclide release points Latest available milk, meat, and vegetable distributions within an 80-km (50-mi) radius from radionuclide release points Joint frequency meteorological data Water usage values (e.g., fish harvest, number of water drinkers) Water dilution factors	Annual radionuclide release rates (Ci) to air and liquid from proposed facility. Stack height. Location of proposed facility on the site.	Annual population dose greater than 100 person-rem via all pathways (proposed 10 CFR 834).

Table F–10. Impact Assessment Protocol for Human Health Risk (Continued)

Risk	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Radiation: occupational			
Average dose to involved (facility) worker[a]	Not applicable	Annual average dose (mrem) to the facility worker.	Annual dose of more than 750 mrem. This value represents 15% of 10 CFR 835 and 10 CFR 20 limit of 5,000 mrem/yr and 37.5% of DOE administrative control level of 2,000 mrem/yr, and has been chosen to ensure that dose received by average worker is well below dose limits and administrative control level. Annual dose of more than 5,000 mrem/yr for commercial plants (10 CFR 20).
Average dose to noninvolved (site) worker[a]	Current annual average dose (mrem) among all noninvolved workers at site	Not applicable.	Annual dose of more than 250 mrem. This value represents 5% of 10 CFR 835 limit of 5,000 mrem/yr and 12.5% of the DOE administrative control level of 2,000 mrem/yr, and has been chosen to ensure that dose received by average worker is well below dose limits and administrative control level.
Total dose to involved (facility) workers	Not applicable	Annual total dose (person-rem) among all facility workers. Number of facility workers.	Annual dose of more than 750 mrem times number of involved workers. Annual dose of more than 5,000 mrem/yr for commercial plants (10 CFR 20).
Total dose to noninvolved (site) workers	Current annual total dose (person-rem) among all workers at site Number of noninvolved workers	Not applicable.	Annual dose of more than 250 mrem times number of noninvolved workers at site.
Radiation: construction workers			
Average dose to construction worker[a]	Level of existing contamination and dose expected from working in that area of site	Annual average and total dose to construction worker.	For average worker, 50% of values given above for public's MEI. This is based on interpretation of a construction worker as a member of the public and application of a reduction factor of 2 in going to an average rather than a maximally exposed worker.
Total dose to construction workers		Numbers of construction workers.	For total workforce, number of workers in workforce times doses for an average worker.

Table F–10. Impact Assessment Protocol for Human Health Risk (Continued)

Risk	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Hazardous chemicals: public			
Offsite MEI latent cancer incidence risk	Distribution of population in ROI Joint frequency meteorological data	Airborne release (kg/yr) of hazardous chemicals.	Probability of latent cancer incidence for MEI.

[Text deleted.]

[a] More meaningful in determining health risk than dose to maximally exposed worker, which varies significantly each year. Monitoring, however, will ensure that dose to the maximally exposed worker remains within regulatory limits.

Key: CFR, Code of Federal Regulations; MEI, maximally exposed individual; NESHAPs, National Emission Standards for Hazardous Air Pollutants; ROI, region of influence; SDWA, Safe Drinking Water Act.

As a result of releases from construction and routine operation of facilities, receptors are expected to be potentially exposed to concentrations of hazardous chemicals that are below those that could cause acutely toxic health effects. Acutely toxic health effects result from short-term exposure to relatively high concentrations of contaminants, such as those that may be encountered during facility accidents. Long-term exposure to relatively lower concentrations of hazardous chemicals can produce adverse chronic health effects that may include both carcinogenic and noncarcinogenic effects. However, the health effect endpoint evaluated in this analysis is limited to the probability of an excess latent cancer incidence for the offsite population MEI because only carcinogenic chemicals are expected to be released from the proposed actions.

Estimates of airborne concentrations of hazardous chemicals were developed using the ISC air dispersion model. This model was developed by EPA for regulatory air-dispersion-modeling applications (EPA 1996b). ISC3 is the most recent version of the model and is approved for use for a wide variety of emission sources and conditions. The ISC model estimates atmospheric concentrations based on the airborne emissions from the facility for each block in a circular grid comprising 16 directional sectors (e.g., north, north-northeast, northeast) at radial distances out to 80 km (50 mi) from the point of release, producing a distribution of atmospheric concentrations. The offsite population MEI is located in the block with the highest estimated concentration.

For carcinogenic chemicals, risk is estimated by the following equation:

$$\text{Risk} = \text{CA} \times \text{URF}$$

where

Risk = unitless probability of cancer incidence
CA = contaminant concentration in air (in $\mu g/m^3$)
URF = cancer inhalation unit risk factor (in units of cancers per $\mu g/m^3$)

Cancer unit risk factors are used in risk assessments to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular concentration of a potential carcinogen.

For the proposed actions, benzene is the only potential carcinogen that may be released to the atmosphere during facility construction activities (UC 1998a, 1998b, 1998c, and 1998d). EPA considers benzene to be a human carcinogen based on several studies that show increased incidence of nonlymphocytic leukemia from occupational exposure, increased incidence of neoplasia in rats and mice exposed by inhalation and gavage, and increases in chromosomal aberrations of bone marrow cells and peripheral lymphocytes in workers exposed to benzene and in laboratory studies with rabbits and rats (EPA 1997g).

F.10.2.2 Occupational Health Risks

F.10.2.2.1 Radiological Risks

Health risks from radiological exposure were determined for two types of workers: the facility worker, (i.e., the worker inside one of the plutonium-processing facilities or one of the commercial plants); and the site worker (i.e., the worker elsewhere on the site but not involved in plutonium processing). Health risks to individual workers and to total workforces were assessed.

The facility worker's dose was based on data from design reports on specific surplus plutonium disposition facilities or from the commercial plant historical data. It was assumed that the noninvolved site worker only receives a dose that results from his or her primary onsite activities. No additional dose to these workers would be expected from surplus plutonium disposition facility operation.

Worker doses were converted into the number of projected fatal cancers using the risk estimator of 400 fatal cancers per 1 million person-rem given in the International Commission on Radiological Protection Publication 60 (ICRP 1991). This risk estimator, compared with that for members of the public, reflects the absence of the most radiosensitive age groups (i.e., infants and children) in the workforce.

F.10.2.2.2 Hazardous Chemical Risks

Impacts of exposures to hazardous chemicals for workers directly involved in the proposed actions were not quantitatively evaluated. The use of personal protective equipment by the workers, as well as the use of engineering process controls, will limit worker exposure to levels within OSHA *Permissible Exposure Limits* (in 29 CFR 1910) or American Conference of Governmental Industrial Hygienists *Threshold Limit Values.*

F.11 FACILITY ACCIDENTS

F.11.1 Description of Affected Resources

Processing any hazardous material poses a risk of accidents impacting involved workers (workers directly involved in facility processes), noninvolved workers (workers on the site but not directly involved in facility processes), and members of the public. The consequences of such accidents could involve the release of radioactive or chemical material or the release of hazardous (e.g., explosive) energy, beyond the intended confines of the process. Risk is determined by the development of a representative spectrum of accidents, each of which is conservatively characterized by a likelihood (i.e., expected frequency of occurrence) and a consequence.

For the purpose of this analysis, involved workers were defined as workers in the immediate vicinity of the process involved in the accident; noninvolved workers, as workers located at the closer of 1,000 m (3,281 ft) from the accident (emission) source or the site boundary; and members of the public, as persons residing outside the site boundary and within 80 km (50 mi) of the facility.

F.11.2 Description of Impact Assessment

To avoid duplication, the analysis of potential accidents performed for the SPD EIS took full cognizance of the corresponding analyses in the *Storage and Disposition PEIS* (DOE 1996a), including accident sequence development, source term definition, and consequence analysis. The analysis focused on the likelihoods and consequences of a variety of a bounding spectrum of accidents postulated for each alternative, from high-consequence, low-frequency accidents to low-consequence, high-frequency accidents.

One objective of the accident analysis, a follow-on to a hazard analysis, was to translate each source term into a probabilistic distribution of consequences based on site-specific modeling of meteorological dispersion of the hazardous material and resulting uptake of that material by members of the human population. To predict the impacts of postulated accidents on the health of workers and the public, source terms were translated into consequences using the Melcor Accident Consequence Code System (MACCS2).

Metrics used to measure the impact of each accident include the accident frequency, the mean and 95th percentile doses for the noninvolved worker at the closer of 1,000 m (3,281 ft) or the site boundary, the mean and 95th percentile doses for the MEI at the site boundary, and the mean and 95th percentile doses for members of the general public within 80 km (50 mi) of the facility. Additionally, the individual doses were translated into the probability of latent cancer fatality, and the dose to the general public into the expected number of latent cancer fatalities (see Table F–11). Additional information on the development of accident sequences, source term definition, and consequence analysis can be found in Appendix K.

Table F–11. Impact Assessment Protocol for Facility Accidents

Accident	Required Data		Measure of Impact
	Affected Environment	**Facility Design**	
Operational events External events NPH events	Meteorological data Data on population within 80 km (50 mi) of facility Site boundary data	Accident source terms Accident frequencies Facility location	Radiological dose at 1,000 m (3,281 ft) from accident source Probability of latent cancer fatality given dose at 1,000 m (3,281 ft) Radiological dose to offsite MEI Probability of latent cancer fatality given dose at site boundary Dose to general public within 80 km (50 mi) of facility Latent cancer fatalities among general public within 80 km (50 mi) of facility

Key: MEI, maximally exposed individual; NPH, natural phenomena hazard.

F.12 TRANSPORTATION

F.12.1 Description of Affected Resources

Overland transportation of any commodity involves a risk to both transportation crew members and members of the public. This risk results directly from transportation-related accidents and indirectly from the increased levels of pollution from vehicle emissions, regardless of cargo. The transportation of plutonium, radioactive waste, or other nuclear materials can pose additional risks owing to the unique properties of the material.

Accordingly, DOE, NRC, and the U.S. Department of Transportation have instituted strict policies and regulations governing the transport of such materials. The requirements are applicable throughout a shipment's ROI, which encompasses the onsite roadways, as well as the public roads between DOE sites and between DOE sites and commercial sites. For site-to-site transport, for example, shippers are required to use interstate highways predominantly.

F.12.2 Description of Impact Assessment

The risk from incident-free transportation was assessed for persons living within 0.8 km (0.5 mi) of the route; the risk from hypothetical accidents, for persons living within 80 km (50 mi) of the route. Assessment of the

human health risks of overland transportation is crucial to a complete appraisal of the environment impacts of transportation associated with the surplus plutonium disposition alternatives.

The impacts associated with overland transportation were calculated per shipment, and then multiplied by the number of shipments. This approach allowed for maximum flexibility in determining the risk for a variety of alternatives (see Table F–12).

Fundamental assumptions of this analysis were consistent with those of the *Storage and Disposition PEIS* (DOE 1996a), and the same computer codes, release data, and accident scenarios were used. The HIGHWAY computer program was used for selecting highway routes for transporting radioactive materials by truck. The HIGHWAY database is a computerized road atlas that currently describes approximately 386,242 km (240,000 mi) of roads. A complete description of the interstate system and all U.S. highways is included in the database. Most of the principal State highways and many local and community roadways are also identified. The code is updated periodically to reflect current road conditions, and has been benchmarked against the reported mileages and observations of commercial trucking firms.

The first analytic step in the ground transportation analysis was to determine the incident-free and accident risk factors per shipment for transportation of the various types of hazardous materials. As with any risk estimate, the risk factors were calculated as the product of the probability and the magnitude of the exposure. Accident risk factors were calculated for radiological and nonradiological traffic accidents. The probabilities (much lower than unity [i.e., 1]) and the magnitudes of exposure were multiplied, yielding risk numbers. Incident-free risk factors were calculated for crew and public exposure to radiation emanating from the package and for public exposure to the chemical toxicity of the transportation vehicle exhaust. The probability of incident-free exposure is unity.

The RADTRAN 4 computer code (Neuhauser and Kanipe 1995) was used for the incident-free and accident risk assessments to estimate the impacts on collective populations. RADTRAN 4 was developed by Sandia National Laboratories to calculate population risk associated with the transportation of radioactive materials by a variety of modes: truck, rail, air, ship, and barge. Calculations are in terms of the probabilities and consequences of potential exposure events.

The RISKIND computer code (Yuan et al. 1995) was used to estimate the incident-free doses to MEIs and to develop impact estimates for use in the accident consequence assessment. This code was developed for DOE's Office of Civilian Radioactive Waste Management to analyze the exposure of individuals during incident-free transportation. It also allows for a detailed assessment of the consequences for individuals and population subgroups of severe transportation accidents in various environmental settings.

RISKIND calculations supplemented the collective risk results achieved with RADTRAN 4; they addressed areas of specific concern to individuals and population subgroups. Essentially, the RISKIND analyses answered the "what if" questions, such as, "What if I live next to a site access road?" or "What if an accident happens near my town?"

Radiological doses, expressed in units of rem, were multiplied by the ICRP 60 (ICRP 1991) conversion factors and the estimated numbers of shipments to produce risk estimates in units of latent cancer fatalities. The vehicle emission risk factors were calculated in terms of latent fatalities; the vehicle accident risk factors, in fatalities. The nonradiological risk factors were multiplied by the number of shipments.

For each alternative, risks of both incident-free and accident conditions were assessed. For the incident-free assessment, risks were calculated for "collective populations" of potentially exposed individuals and for MEIs. (The collective population risk is a measure of the radiological risk posed to society as a whole by the

Table F–12. Impact Assessment Protocol for Transportation

Risk	Required Data: Affected Environment	Required Data: Facility Design	Measure of Impact
Incident-free transportation			
Radiation dose to crew		Origin and destination of shipments Characterization of vehicles and material shipped	Dose and latent cancer fatalities to crew
Radiation dose to public On-link Off-link During stops	Population within 0.8 km (0.5 mi) of route Number of persons using a highway Traffic conditions along route	Origin and destination of shipments Characterization of vehicles and material shipped	Dose and latent cancer fatalities to public
Maximally exposed crew member		Origin and destination of shipments Characterization of vehicles and material shipped Location of workers	Radiation doses compared with 10 CFR 20 limits (2 mrem/hr and 100 mrem/yr)
Maximally exposed member of public		Origin and destination of shipments Characterization of vehicles and material shipped	Radiation doses compared with 10 CFR 20 limits (2 mrem/hr and 100 mrem/yr)
Health risks from vehicle emissions		Origin and destination of shipments Characterization of vehicles	Fatalities
Transportation accidents			
Radiological risk to public	Population within 80 km (50 mi) of route	Origin and destination of shipments Characterization of vehicles and material shipped	Doses and latent cancer fatalities
Nonradiological risk to public (nonradiological)	Traffic conditions along route	Origin and destination of shipments	Fatalities
Maximally exposed individual		Origin and destination of shipments Characterization of vehicles and material shipped	Doses and latent cancer fatalities

Key: CFR, Code of Federal Regulations.

alternative being considered. It was the primary means of comparing the various alternatives.) The accident assessment had two components: (1) a probabilistic risk assessment, which addressed the probabilities and consequences of a range of possible transportation accident environments, including low-probability accidents with high consequences and high-probability accidents with low consequences; and (2) an accident consequence assessment, which concerned only the consequences of the most severe transportation accidents postulated.

F.13 ENVIRONMENTAL JUSTICE

F.13.1 Description of Affected Resources

Constituting the affected environment are the low-income and minority populations residing in the potentially affected area. For the analysis of environmental justice relative to incident-free transportation, that area was defined as a corridor 1.6 km (1 mi) wide centered on rail or truck routes. For analyses pertaining to transportation accidents and evaluations of environmental justice in facility environs, it consisted of the geographical area within an 80 km (50 mi) distance of the accident site or facility.

Minority populations were split among four groups: Asians, Blacks, Hispanics, and Native Americans. The population group designated as Hispanic includes all persons who identified themselves as having Hispanic origins, regardless of race. For example, a person self-identified as Asian and of Hispanic origin was included among Hispanics. Persons self-identified as Asian and not of Hispanic origin were included in the Asian population.

Block group spatial resolution was used throughout the analysis (see Table F–13). The Census Bureau defines block group to include 250–500 housing units with 400 being typical. The minority population residing in the affected area was determined from data contained in Table P12 of Standard Tape File 3A published by the Census Bureau (DOC 1992). Low-income populations were estimated from data in Table P121 (DOC 1992:B-28, B-29), which provides statistical data characterizing income status relative to the poverty threshold for each block group.

F.13.2 Description of Impact Assessment

Formal requirements for inclusion of environmental justice concerns in environmental documentation were initiated by Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, issued in February 1994. The Council on Environmental Quality has oversight responsibility for implementation of the Executive order in documentation prepared under the provisions of NEPA. The Council issued draft guidance for environmental justice in May 1996 (CEQ 1997). These guidelines provide the foundation for evaluation of environmental justice in the SPD EIS.

Analysis of environmental justice for the SPD EIS focused on the "block group," one of the geographical aggregations of demographic data typically provided by the Census Bureau (DOC 1992). Block groups provide the finest spatial resolution available for evaluation of low-income populations. It is rare, however, that the boundaries of block groups coincide with those of affected areas. Uniform population distribution within block groups is also uncommon. Such uniformity was assumed, however, for purposes of SPD EIS population estimates. Thus, for each block group, the percentage of the population included in the population count equaled the percentage of the geographical area of the block group that lay within the affected area. An upper bound for the potentially affected population was obtained by including the total population of partially included block groups in the population count; a lower bound, by excluding the total population of such block groups from the count.

The following definitions were used in the evaluation:

- **Minority individuals:** Persons who are members of any of the following population groups: Asian or Pacific Islander, Black, Hispanic, or Native Americans (American Indian, Eskimo, or Aleut). This definition includes all persons except those self-designated as not of Hispanic origin and as either White or "Other Race" (one of the classifications used by the Census Bureau in the 1990 census).

Table F–13. Impact Assessment Protocol for Environmental Justice

Resource	Required Data: Affected Environment	Required Data: Health Effects	Measure of Impact
Minority population	Minority population data at block group spatial resolution from Table P12 of STF3A (DOC 1992)		Disproportionately high annual population dose to minority population (CEQ 1997:app. A)
	Distribution within 80 km (50 mi) of each candidate site	Population dose for sectors within 80-km (50-mi) radius of candidate site	
	Distribution within 1.6 km (1 mi) of transportation corridors	Population dose for areas within 1.6-km (1-mi) radius of transportation corridor	
Low-income population	Low-income population data at block group spatial resolution from Table P121 of STF3A (DOC 1992)		Disproportionately high annual population dose to low-income population (CEQ 1997:app. A)
	Distribution within 80 km (50 mi) of each candidate site	Population dose for sectors within 80-km (50-mi) radius of candidate site	
	Distribution within 1.6 km (1 mi) of transportation corridor	Population dose for areas within 1.6-km (1-mi) radius of transportation corridor	

Key: CEQ, Council on Environmental Quality; DOC, U.S. Department of Commerce; STF, Standard Tape File.

- **Minority population:** The total number of minority individuals residing within a potentially affected area.
- **Low-income individuals:** All persons whose self-reported income is below the poverty threshold as adopted by the Census Bureau (DOC 1992:app. B, B-28).
- **Low-income population:** The total number of low-income individuals residing within a potentially affected area.

If the analysis of health or other environmental effects showed that the actions consistent with the proposed alternatives would have significant impacts on the general population, then additional analysis of impacts on the minority and low-income populations was conducted. The analysis method was identical to that described for the evaluation of radiological impacts on the general population. Given the impracticality of extrapolating block level population and income data, minority and low-income populations within each block group were assumed to increase in direct proportion to the increase in general population from the year 1990 to the year of interest.

F.14 CUMULATIVE IMPACTS

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The cumulative impact analysis for the SPD EIS involved combining the impacts of the SPD EIS alternatives (including No Action) with the impacts of other past, present, and reasonably foreseeable activities.

[Text deleted.]

In general, cumulative impacts were calculated by adding the values for the baseline,[3] the maximum impacts from the proposed activities at the candidate sites, and other future actions. This cumulative value was then weighed against the appropriate impact indicators to determine the potential for impact. Table F–14 shows the selected indicators of cumulative impacts evaluated in the SPD EIS. The analysis focused on the potential for cumulative impacts at each candidate site from DOE actions under detailed consideration at the time of the SPD EIS (see Table F–15). Non-DOE actions were also considered where information was readily available. Public documents prepared by agencies of Federal, State, and local government were the primary sources of information for the non-DOE actions.

Table F–14. Selected Indicators of Cumulative Impact

Category	Indicator
Resource use	Land occupied Electricity use Water use Workers required
[Text deleted.]	
Air quality	Percent of NAAQS for criteria pollutants
Human health	Offsite population MEI dose Total dose Latent cancer fatalities Workers Average dose Total dose Latent cancer fatalities
Waste generation	Site waste generation rate versus capacity TRU waste LLW Mixed LLW Hazardous waste Nonhazardous waste
Transportation	Number of offsite trips MEI dose Risk of latent cancer fatality

Key: LLW, low-level waste; MEI, maximally exposed individual; NAAQS, National Ambient Air Quality Standards; TRU, transuranic.

It is assumed that construction impacts would not be cumulative because such construction is typically of short duration and construction impacts are generally temporary. However, waste created during construction as well as any radiation doses received by construction workers have been added to the cumulative totals for all

[3] The conditions attributable to actions, past and present, by DOE and other public and private entities.

Table F–15. Other Past, Present, and Reasonably Foreseeable Actions Considered in the Cumulative Impact Assessment for Candidate DOE Sites

Activities	Hanford	INEEL	Pantex	SRS	LLNL	LANL	ORNL
Storage and Disposition of Weapons-Usable Fissile Materials	X	X	X	X			X
Disposition of Surplus Highly Enriched Uranium				X			X
Interim Management of Nuclear Materials at SRS				X			
[Text deleted.]							
Tritium Supply and Recycling				X			
Waste Management	X	X	X	X		X	X
Spent Nuclear Fuel Management and INEL Environmental Restoration and Waste Management	X	X		X			
Foreign Research Reactor Spent Nuclear Fuel	X	X		X			
Tank Waste Remediation System	X						
Shutdown of the River Water System at SRS				X			
Radioactive releases from nuclear power plant sites, Vogtle and WNP	X			X			
Hanford Reach of the Columbia River Comprehensive River Conservation Study	X						
FEIS and Environmental Information Report for Continued Operation of LLNL and SNL					X		
Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapons Components			X				
Stockpile Stewardship and Management			X	X	X		X
[Text deleted.]							
Management of Plutonium Residues and Scrub Alloy at Rocky Flats				X			
Spent Nuclear Fuel Management (SRS)				X			
DWPF Final Supplemental				X			
Supplemental EIS for In-Tank Precipitation Process Alternatives				X			
Construction and Operation of a Tritium Extraction Facility at SRS				X			
Supplement Analysis for Storing Plutonium in the Actinide Packaging and Storage Facility and Building 105–K at SRS				X			
Los Alamos Site-Wide EIS						X	
Hanford Remedial Action and Comprehensive Land Use Plan	X						
Advanced Mixed Waste Treatment Project		X					
Construction and Operation of the Spallation Neutron Source							X
Long-Term Management and Use of Depleted Uranium Hexafluoride							X

Key: DWPF, Defense Waste Processing Facility; LANL, Los Alamos National Laboratory; LLNL, Lawrence Livermore National Laboratory; ORNL, Oak Ridge National Laboratory; SNL, Sandia National Laboratories; WNP, Washington Nuclear Power.

proposed surplus plutonium disposition activities. D&D of the proposed facilities was not addressed in the cumulative impact estimates. Given the uncertainty regarding the timing of D&D, any impact estimate at this time would be highly speculative. A detailed evaluation of D&D will be provided in follow-on NEPA documentation closer to the actual time of those actions.

Recent sitewide NEPA documents (see Table F–16) provide the latest comprehensive evaluation of cumulative impacts for the sites.

Table F–16. Recent Comprehensive National Environmental Policy Act Documents for the DOE Sites

Site	Document	Year	ROD Issued[a]
Hanford	*Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement*	1996	February 1997
INEEL	*DOE Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement*	1995	March 1996
Pantex	*Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components*	1996	January 1997
SRS	*Savannah River Site Waste Management Final Environmental Impact Statement*	1995	October 1995
LLNL	*Final Site-Wide Environmental Impact Statement for Continued Operation of the Lawrence Livermore National Laboratory*	1992	January 1993
LANL	*Final Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory*	1999	Pending

[a] Date of the first ROD issued.

Key: ROD, Record of Decision.

F.15 REFERENCES

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Appendix G
Air Quality

This appendix presents detailed information that support the air quality impact assessments in Chapter 4. Data are provided for the four candidate U.S. Department of Energy sites: the Hanford Site (Hanford), Idaho National Engineering and Environmental Laboratory (INEEL), the Pantex Plant (Pantex), and the Savannah River Site (SRS).

G.1 HANFORD

G.1.1 Assessment Data

Emission rates for criteria, hazardous, and toxic air pollutants at Hanford are presented in Table F.1.2.2–1 of the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement (Storage and Disposition PEIS)* (DOE 1996a:F-6). These emission rates were used as input into the modeled No Action Alternative pollutant concentrations presented in that environmental impact statement (EIS) and reflect projected Hanford facility emissions for 2005. The storage alternative selected for Hanford results in no change in these concentrations (DOE 1996a:4-34). In addition to the concentrations projected for 2005, the concentrations for the Phased Implementation Alternative—Phase II Operation of the vitrification facilities presented in the *Tank Waste Remediation System Final EIS* (DOE 1996b:5-68) were included in the estimate of the No Action concentration for surplus plutonium disposition as shown in Table G–1. Other onsite activities related to programs analyzed in EISs for spent nuclear fuel and waste management are also included. Other activities at Hanford that may occur during the time period 2005–2015 are discussed in the cumulative impacts section. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–1. Estimated Concentrations ($\mu g/m^3$) From No Action at Hanford

Pollutant	Averaging Period	PEIS Estimated Base Year (2005)	Tank Waste Remediation	Other Onsite From PEIS	No Action
Carbon monoxide	8 hours	0.08	34	0	34.1
	1 hour	0.30	48	0	48.3
Nitrogen dioxide	Annual	0.03	0.12	0.1	0.25
PM_{10}	Annual	<0.01	0.0079	0	0.0179
	24 hours	0.02	0.75	0	0.77
Sulfur dioxide	Annual	<0.01	0.02	1.6	1.63
	24 hours	<0.01	1.6	7.3	8.91
	3 hours	0.01	3.6	26	29.6
	1 hour	0.02	4.0	29	32.9
Total suspended particulates	Annual	<0.01	0.0079	0	0.0179
	24 hours	<0.02	0.75	0	0.77
Benzene	Annual	(a)	0.000006	0	0.000006
[Text deleted.]					

[a] No sources of this pollutant have been identified at the site.
Key: PEIS, *Storage and Disposition PEIS.*
Source: DOE 1996a:4-34, 4-912; 1996b:5-68.

G.1.2 Facilities

G.1.2.1 Pit Conversion Facility

G.1.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from modification of the Fuels and Materials Examination Facility (FMEF) and construction of support facilities for pit disassembly and conversion at Hanford were analyzed using the Industrial Source Complex Model, Short-Term, Version 3 (ISCST3) as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–2.

Table G–2. Emissions (kg/yr) From Construction of Pit Conversion Facility in FMEF at Hanford

Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles
Carbon monoxide	1,000	11,300
Nitrogen dioxide	2,400	3,040
PM_{10}	3,500	10,300
Sulfur dioxide	160	0
Volatile organic compounds	200	1,400
Total suspended particulates	9,300	10,300

Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998a.

Maximum air pollutant concentrations from construction activities are summarized in Table G–3.

Table G–3. Concentrations ($\mu g/m^3$) From Construction of Pit Conversion Facility in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	34.1	0.277	34.4
	1 hour	40,000	48.3	1.88	50.2
Nitrogen dioxide	Annual	100	0.25	0.0199	0.27
PM_{10}	Annual	50	0.0179	0.029	0.047
	24 hours	150	0.77	0.323	1.09
Sulfur dioxide	Annual	50	1.63	0.00133	1.63
	24 hours	260	8.91	0.0148	8.93
	3 hours	1,300	29.6	0.1	29.7
	1 hour	660[b]	32.9	0.301	33.2
Total suspended particulates	Annual	60	0.0179	0.0771	0.095
	24 hours	150	0.77	0.857	1.63

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the pit conversion and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–4. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 36 m (118 ft) height, 3.88 m (12.7 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 3.3 m/s (10.8 ft/s). There was no boiler modeled because heating requirements would be met using electric power (UC 1998a).

Table G–4. Emissions (kg/yr) From Operation of Pit Conversion Facility in FMEF at Hanford

Pollutant	Emergency Generator	Process	Vehicles
Carbon monoxide	520	0	41,800
Nitrogen dioxide	2,000	0	11,200
PM_{10}	50	0	38,100
Sulfur dioxide	34	0	0
Volatile organic compounds	58	0	5,150
Total suspended particulates	50	0	38,100

Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998a.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–5. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–5. Concentrations (μg/m³) From Operation of Pit Conversion Facility in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	34.1	0.144	34.2
	1 hour	40,000	48.3	0.978	49.3
Nitrogen dioxide	Annual	100	0.25	0.0166	0.267
PM_{10}	Annual	50	0.0179	0.000415	0.0183
	24 hours	150	0.77	0.00461	0.775
Sulfur dioxide	Annual	50	1.63	0.000282	1.63
	24 hours	260	8.91	0.00313	8.91
	3 hours	1,300	29.6	0.0213	29.6
	1 hour	660[b]	32.9	0.064	33.0
Total suspended particulates	Annual	60	0.0179	0.000415	0.0183
	24 hours	150	0.77	0.00461	0.775

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.2 Immobilization Facility

G.1.2.2.1 Construction of Immobilization Facility

Potential air quality impacts from modification of FMEF and construction of support facilities for plutonium conversion and immobilization (ceramic or glass) at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–6.

Table G–6. Emissions (kg/yr) From Construction of Immobilization Facility in FMEF at Hanford

Pollutant	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	1,170	0	0	39,900
Nitrogen dioxide	3,010	0	0	10,700
PM_{10}	230[b]	193[b]	65[b]	36,400
Sulfur dioxide	310	0	0	0
Volatile organic compounds	240	0	0	4,920
Total suspended particulates	230	193	65	36,400

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1999a, 1999b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–7.

Table G–7. Concentrations ($\mu g/m^3$) From Construction of Immobilization Facility in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Ceramic or Glass	Total
Carbon monoxide	8 hours	10,000	34.1	0.324	34.4
	1 hour	40,000	48.3	2.2	50.5
Nitrogen dioxide	Annual	100	0.25	0.025	0.275
PM_{10}	Annual	50	0.0179	0.00405	0.022
	24 hours	150	0.77	0.158	0.928
Sulfur dioxide	Annual	50	1.63	0.00257	1.63
	24 hours	260	8.91	0.0286	8.94
	3 hours	1,300	29.6	0.194	29.8
	1 hour	660[b]	32.9	0.583	33.5
Total suspended particulates	Annual	60	0.0179	0.00405	0.022
	24 hours	150	0.77	0.158	0.928

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.2.2 Operation of Immobilization Facility

Potential air quality impacts from operation of immobilization (ceramic or glass) and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–8. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35.6 m (116.8 ft) height, 3.88 m (12.7 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 3.3 m/s (10.8 ft/s). There was no boiler modeled because heating requirements would be met using electric power (UC 1999a, 1999b).

Table G–8. Emissions (kg/yr) From Operation of Immobilization Facility in FMEF at Hanford

Pollutant	Emergency Generator	Ceramic or Glass Process	Vehicles
Carbon monoxide	980	0	46,400
Nitrogen dioxide	4,530	0	12,500
PM_{10}	320	0	42,400
Sulfur dioxide	300	0	0
Volatile organic compounds	370	0	5,720
Total suspended particulates	320	0	42,400

Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–9. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–9. Concentrations ($\mu g/m^3$) From Operation of Immobilization Facility in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Ceramic or Glass	Total
Carbon monoxide	8 hours	10,000	34.1	0.271	34.4
	1 hour	40,000	48.3	1.84	50.1
Nitrogen dioxide	Annual	100	0.25	0.0376	0.288
PM_{10}	Annual	50	0.0179	0.00265	0.021
	24 hours	150	0.77	0.0295	0.799
Sulfur dioxide	Annual	50	1.63	0.00249	1.63
	24 hours	260	8.91	0.0277	8.94
	3 hours	1,300	29.6	0.188	29.8
	1 hour	660[b]	32.9	0.564	33.5
Total suspended particulates	Annual	60	0.0179	0.00265	0.021
	24 hours	150	0.77	0.0295	0.799

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.3 MOX Facility

G.1.2.3.1 Construction of MOX Facility

Potential air quality impacts from construction of new mixed oxide (MOX) and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–10.

Table G–10. Emissions (kg/yr) From Construction of New MOX Facility at Hanford

Pollutant	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	3,840	0	0	37,600
Nitrogen dioxide	10,080	0	0	10,100
PM_{10}	768[b]	6,880	1,460[b]	34,400
Sulfur dioxide	1,020	0	0	0
Volatile organic compounds	792	0	0	4,640
Total suspended particulates	768	13,600	1,460	34,400
Toxics[c]	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis, resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Source: UC 1998b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–11.

Table G–11. Concentrations ($\mu g/m^3$) From Construction of New MOX Facility at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	34.1	1.06	35.1
	1 hour	40,000	48.3	7.22	55.5
Nitrogen dioxide	Annual	100	0.25	0.0836	0.334
PM_{10}	Annual	50	0.0179	0.0744	0.092
	24 hours	150	0.77	3.27	4.03
Sulfur dioxide	Annual	50	1.63	0.00846	1.64
	24 hours	260	8.91	0.094	9.
	3 hours	1,300	29.6	0.64	30.3
	1 hour	660[b]	32.9	1.92	34.8
Total suspended particulates	Annual	60	0.0179	0.132	0.15
	24 hours	150	0.77	5.88	6.66
Toxics[c]	Annual	0.12	0.000006	0.000008	0.000014

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) may be emitted during construction and were analyzed as benzene.
Source: EPA 1997; WDEC 1994.

G.1.2.3.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–12. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35.6 m (116.8 ft) height, 0.3048 m (1.0 ft) diameter, stack exit temperature of 20 C (68 F), and an exit velocity of 0.03 m/s (0.1 ft/s). There was no boiler modeled because heating requirements would be met using electric power (UC 1998b).

Table G–12. Emissions (kg/yr) From Operation of New MOX Facility at Hanford

Pollutant	Emergency Generator	Process	Vehicles
Carbon monoxide	374	0	34,200
Nitrogen dioxide	1,738	0	9,170
PM_{10}	122	0	31,200
Sulfur dioxide	114	0	0
Volatile organic compounds	142	0	4,210
Total suspended particulates	122	0	31,200
[Text deleted.]			

[Text deleted.]
Source: UC 1998b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–13. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–13. Concentrations ($\mu g/m^3$) From Operation of New MOX Facility at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Contribution	Total
Carbon monoxide	8 hours	10,000	34.1	0.103	34.2
	1 hour	40,000	48.3	0.704	49.0
Nitrogen dioxide	Annual	100	0.25	0.0144	0.264
PM_{10}	Annual	50	0.0179	0.00101	0.0189
	24 hours	150	0.77	0.0113	0.781
Sulfur dioxide	Annual	50	1.63	0.000946	1.63
	24 hours	260	8.91	0.0105	8.92
	3 hours	1,300	29.6	0.0715	29.7
	1 hour	660[b]	32.9	0.214	33.1
Total suspended particulates	Annual	60	0.0179	0.00101	0.0189
	24 hours	150	0.77	0.0113	0.781
[Text deleted.]					

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[Text deleted.]
Source: EPA 1997; WDEC 1994.

G.1.2.4 Pit Conversion and Immobilization Facilities

G.1.2.4.1 Construction of Pit Conversion and Immobilization Facilities

Potential air quality impacts from modification of FMEF and construction of support facilities for pit disassembly and conversion and plutonium conversion and immobilization (ceramic or glass) at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction

equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized inTable G–14.

Table G–14. Emissions (kg/yr) From Construction of Pit Conversion and Immobilization Facilities in FMEF at Hanford

	Pit Conversion		Immobilization			
Pollutant	Diesel Equipment and Construction Fugitive Emissions	Vehicles	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Vehicles
Carbon monoxide	1,000	11,300	3,060	0	0	40,000
Nitrogen dioxide	2,400	3,040	7,890	0	0	10,700
PM_{10}	3,500	10,300	600[b]	6,770	560[b]	36,500
Sulfur dioxide	160	0	800	0	0	0
Volatile organic compounds	200	1,400	620	0	0	4,930
Total suspended particulates	9,300	10,300	600	13,100	560	36,500

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998a, 1999a, 1999b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–15.

Table G–15. Concentrations ($\mu g/m^3$) From Construction of Pit Conversion and Immobilization Facilities in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	Total
Carbon monoxide	8 hours	10,000	34.1	0.277	0.846	35.2
	1 hour	40,000	48.3	1.88	5.76	55.9
Nitrogen dioxide	Annual	100	0.25	0.0199	0.0654	0.335
PM_{10}	Annual	50	0.0179	0.029	0.0651	0.112
	24 hours	150	0.77	0.323	2.96	4.05
Sulfur dioxide	Annual	50	1.63	0.00133	0.00664	1.64
	24 hours	260	8.91	0.0148	0.0737	9.
	3 hours	1,300	29.6	0.1	0.502	30.2
	[Text deleted.]					
	1 hour	660[b]	32.9	0.301	1.5	34.7
Total suspended particulates	Annual	60	0.0179	0.0771	0.117	0.212
	24 hours	150	0.77	0.857	5.58	7.21

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.4.2 Operation of Pit Conversion and Immobilization Facilities

Potential air quality impacts from operation of pit conversion, immobilization (ceramic or glass), and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–16. Stack parameters used for modeling were as stated previously.

Table G–16. Emissions (kg/yr) From Operation of Pit Conversion and Immobilization Facilities in FMEF at Hanford

	Pit Conversion			Immobilization		
Pollutant	**Emergency Generator**	**Process**	**Vehicles**	**Emergency Generator**	**Ceramic or Glass Process**	**Vehicles[a]**
Carbon monoxide	520	0	41,800	1,460	0	57,100
Nitrogen dioxide	2,000	0	11,200	6,790	0	15,300
PM_{10}	50	0	38,100	480	0	52,100
Sulfur dioxide	34	0	0	450	0	0
Volatile organic compounds	58	0	5,150	550	0	7,040
Total suspended particulates	50	0	38,100	480	0	52,100

[a] For 50-t (55-ton) case.

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998a, 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus No Action concentrations, are summarized in Table G–17. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–17. Concentrations ($\mu g/m^3$) From Operation of Pit Conversion and Immobilization Facilities in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guidelines[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	Total[b]
Carbon monoxide	8 hours	10,000	34.1	0.144	0.404	34.6
	1 hour	40,000	48.3	0.978	2.75	52.
Nitrogen dioxide	Annual	100	0.25	0.0166	0.0563	0.323
PM_{10}	Annual	50	0.0179	0.000415	0.00398	0.0223
	24 hours	150	0.77	0.00461	0.0443	0.819
Sulfur dioxide	Annual	50	1.63	0.000282	0.00373	1.63
	24 hours	260	8.91	0.00313	0.0415	8.95
	3 hours	1,300	29.6	0.0213	0.282	29.9
	[Text deleted.]					
	1 hour	660[c]	32.9	0.064	0.847	33.8
Total suspended particulates	Annual	60	0.0179	0.000415	0.00398	0.0223
	24 hours	150	0.77	0.00461	0.0443	0.819

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] The concentrations for ceramic and glass are the same for both 17-t and 50-t cases.
[c] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.5 Pit Conversion and MOX Facilities

G.1.2.5.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from modification of FMEF and construction of support facilities for pit disassembly and conversion and MOX fuel fabrication at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–18.

Table G–18. Emissions (kg/yr) From Construction of Pit Conversion and MOX Facilities in FMEF at Hanford

Pollutant	Pit Conversion: Diesel Equipment and Construction Fugitive Emissions	Pit Conversion: Vehicles	MOX: Diesel Equipment	MOX: Construction Fugitive Emissions[a]	MOX: Concrete Batch Plant	MOX: Vehicles
Carbon monoxide	1,000	11,300	778	0	0	37,300
Nitrogen dioxide	2,400	3,040	2,009	0	0	10,000
PM_{10}	3,500	10,300	154[b]	2,830	435[b]	34,100
Sulfur dioxide	160	0	204	0	0	0
Volatile organic compounds	200	1,400	160	0	0	4,600
Total suspended particulates	9,300	10,300	154	5,590	435	34,100
Toxics[c]	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998a, 1998b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–19.

Table G–19. Concentrations ($\mu g/m^3$) From Construction of Pit Conversion and MOX Facilities in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	34.1	0.277	0.215	34.6
	1 hour	40,000	48.3	1.88	1.46	51.6
Nitrogen dioxide	Annual	100	0.25	0.0199	0.0167	0.287
PM_{10}	Annual	50	0.0179	0.029	0.0274	0.0743
	24 hours	150	0.77	0.323	1.32	2.41
Sulfur dioxide	Annual	50	1.63	0.00133	0.00169	1.63
	24 hours	260	8.91	0.0148	0.0188	8.94
	3 hours	1,300	29.6	0.1	0.128	29.8
	[Text deleted.]					
	1 hour	660[b]	32.9	0.301	0.384	33.6
Total suspended particulates	Annual	60	0.0179	0.0771	0.051	0.146
	24 hours	150	0.77	0.857	2.4	4.03
Toxics[c]	Annual	0.12	0.000006	0	0.000008	0.000014

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.5.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of pit conversion, MOX, and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–20. Stack parameters used for modeling were as stated previously.

Table G–20. Emissions (kg/yr) From Operation of Pit Conversion and MOX Facilities in FMEF at Hanford

Pollutant	Pit Conversion			MOX		
	Emergency Generator	Process	Vehicles	Emergency Generator	Process	Vehicles
Carbon monoxide	520	0	41,800	374	0	34,200
Nitrogen dioxide	2,000	0	11,200	1,738	0	9,170
PM_{10}	50	0	38,100	122	0	31,200
Sulfur dioxide	34	0	0	114	0	0
Volatile organic compounds	58	0	5,150	142	0	4,210
Total suspended particulates	50	0	38,100	122	0	31,200
[Text deleted.]						

[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998a, 1998b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–21. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–21. Concentrations ($\mu g/m^3$) From Operation of Pit Conversion and MOX Facilities in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	MOX	Total
Carbon monoxide	8 hours	10,000	34.1	0.144	0.103	34.3
	1 hour	40,000	48.3	0.978	0.704	50.0
Nitrogen dioxide	Annual	100	0.25	0.0166	0.0144	0.281
PM_{10}	Annual	50	0.0179	0.000415	0.00101	0.0193
	24 hours	150	0.77	0.00461	0.0113	0.786
Sulfur dioxide	Annual	50	1.63	0.000282	0.000946	1.63
	24 hours	260	8.91	0.00313	0.0105	8.92
	3 hours	1,300	29.6	0.0213	0.0715	29.7
	[Text deleted.]					
	1 hour	660[b]	32.9	0.064	0.214	33.2
Total suspended particulates	Annual	60	0.0179	0.000415	0.00101	0.0193
	24 hours	150	0.77	0.00461	0.0113	0.786
[Text deleted.]						

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.6 Immobilization and MOX Facilities

G.1.2.6.1 Construction of Immobilization and MOX Facilities

Potential air quality impacts from modification of FMEF and construction of support facilities for collocating immobilization (ceramic or glass) and MOX facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–22.

Table G–22. Emissions (kg/yr) From Construction of Immobilization and MOX Facilities Collocated in FMEF at Hanford

Pollutant	Immobilization (Ceramic or Glass) Diesel Equipment	Immobilization Construction Fugitive Emissions[a]	Immobilization Concrete Batch Plant	Immobilization Vehicles	MOX Diesel Equipment	MOX Construction Fugitive Emissions[a]	MOX Concrete Batch Plant	MOX Vehicles
Carbon monoxide	3,900	0	0	49,000	778	0	0	37,300
Nitrogen dioxide	10,100	0	0	13,100	2,009	0	0	10,000
PM_{10}	770[b]	8,860[b]	733[b]	44,700	154	2,830	435[b]	34,100
Sulfur dioxide	1,020	0	0	0	204	0	0	0
Volatile organic compounds	800	0	0	6,040	160	0	0	4,600
Total suspended particulates	770	16,900	733	44,700	154	5,590	435	34,100
Toxics[c]	0	0	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998b, 1999a, 1999b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–23.

Table G–23. Concentrations ($\mu g/m^3$) From Construction of Immobilization and MOX Facilities Collocated in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Immobilization (Ceramic or Glass)	MOX	Total
Carbon monoxide	8 hours	10,000	34.1	1.08	0.215	35.4
	1 hour	40,000	48.3	7.34	1.46	57.1
Nitrogen dioxide	Annual	100	0.25	0.0838	0.0167	0.351
PM_{10}	Annual	50	0.0179	0.0849	0.0274	0.13
	24 hours	150	0.77	3.85	1.32	5.94
Sulfur dioxide	Annual	50	1.63	0.00846	0.00169	1.64
	24 hours	260	8.91	0.094	0.0188	9.02
	3 hours	1,300	29.6	0.64	0.128	30.4
	[Text deleted.]					
	1 hour	660[b]	32.9	1.92	0.383	35.2
Total suspended particulates	Annual	60	0.0179	0.153	0.051	0.222
	24 hours	150	0.77	7.05	2.4	10.2
Toxics[c]	Annual	0.12	0.000006	0	0.000008	0.000014

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.6.2 Operation of Immobilization and MOX Facilities

Potential air quality impacts from operation of the collocated immobilization (ceramic or glass) and MOX and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–24. Stack parameters used for modeling were as stated previously.

Table G–24. Emissions (kg/yr) From Operation of Immobilization and MOX Facilities Collocated in FMEF at Hanford

	Immobilization			MOX		
Pollutant	Emergency Generator	Ceramic or Glass Process	Vehicles	Emergency Generator	Process	Vehicles
Carbon monoxide	1,460	0	52,700	374	0	34,200
Nitrogen dioxide	6,790	0	14,100	1,738	0	9,170
PM_{10}	480	0	48,100	122	0	31,200
Sulfur dioxide	450	0	0	114	0	0
Volatile organic compounds	550	0	6,490	142	0	4,210
Total suspended particulates	480	0	48,100	122	0	31,200
[Text deleted.]						

[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998b, 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources are summarized in Table G–25. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–25. Concentrations (μg/m³) From Operation of Immobilization and MOX Facilities Collocated in FMEF at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Immobilization (Ceramic or Glass)	MOX	Total With Ceramic or Glass
Carbon monoxide	8 hours	10,000	34.1	0.404	0.103	34.6
	1 hour	40,000	48.3	2.75	0.704	51.8
Nitrogen dioxide	Annual	100	0.25	0.0563	0.0144	0.321
PM_{10}	Annual	50	0.0179	0.00398	0.00101	0.023
	24 hours	150	0.77	0.0443	0.0113	0.825
Sulfur dioxide	Annual	50	1.63	0.00373	0.000946	1.64
	24 hours	260	8.91	0.0415	0.0105	8.96
	3 hours	1,300	29.6	0.282	0.0715	30
	[Text deleted.]					
	1 hour	660[b]	32.9	0.847	0.214	34
Total suspended particulates	Annual	60	0.0179	0.00398	0.00101	0.0229
	24 hours	150	0.77	0.0443	0.0113	0.825
[Text deleted.]						

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[Text deleted.]
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.7 Pit Conversion, Immobilization, and MOX Facilities

G.1.2.7.1 Construction of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from modification of FMEF for pit disassembly and conversion and plutonium conversion and immobilization (ceramic or glass), and new construction of MOX and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–26.

Maximum air pollutant concentrations from construction activities are summarized in Table G–27.

Table G–26. Emissions (kg/yr) From Construction of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

	Pit Conversion		Immobilization				MOX			
Pollutant	Diesel Equipment & Construction Fugitive Emissions	Veh	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Veh	Diesel Equipment	Construction Fugitive Emissions[a]	Concrete Batch Plant	Veh
CO	1,000	11,300	3,060	0	0	40,000	3,840	0	0	37,600
NO_2	2,400	3,040	7,890	0	0	10,700	10,080	0	0	10,100
PM_{10}	3,500	10,300	600[b]	6,770	560[b]	36,500	768[b]	6,880	1,460[b]	34,400
SO_2	160	0	800	0	0	0	1,020	0	0	0
VOC	200	1,400	620	0	0	4,930	792	0	0	4,640
TSP	9,300	10,300	600	13,100	560	36,500	768	13,600	1,460	34,400
Toxics[c]	0	0	0	0	0	0	0	<1	0	0

[a] Does not include fugitive emissions from the concrete batch plant.
[b] PM_{10} emissions were assumed to be the same as TSP emissions for the purpose of this analysis resulting in some overestimate of PM_{10} concentrations.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.
Key: CO, carbon monoxide; FMEF, Fuels and Materials Examination Facility; NO_2, nitrogen dioxide; SO_2, sulfur dioxide; TSP, total suspended particulates; Veh, vehicles; VOC, volatile organic compounds.
Source: UC 1998a, 1998b, 1999a, 1999b.

Table G–27. Concentrations ($\mu g/m^3$) From Construction of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

Pollutant	Averaging Period	Most Stringent Standard or Guideline[a]	No Action	Pit Conversion	Immobilization (Ceramic or Glass)	MOX	Total
Carbon monoxide	8 hours	10,000	34.1	0.277	0.846	1.06	36.3
	1 hour	40,000	48.3	1.88	5.76	7.22	63.2
Nitrogen dioxide	Annual	100	0.25	0.0199	0.0654	0.0836	0.419
PM_{10}	Annual	50	0.0179	0.029	0.0651	0.0744	0.186
	24 hours	150	0.77	0.323	2.96	3.27	7.32
Sulfur dioxide	Annual	50	1.63	0.00133	0.00664	0.00846	1.65
	24 hours	260	8.91	0.0148	0.0737	0.094	9.09
	3 hours	1,300	29.6	0.1	0.502	0.64	30.9
	[Text deleted.]						
	1 hour	660[b]	32.9	0.301	1.5	1.92	36.6
Total suspended particulates	Annual	60	0.0179	0.0771	0.117	0.132	0.344
	24 hours	150	0.77	0.857	5.58	5.88	13.1
Toxics[c]	Annual	0.12	0.000006	0	0	0.000008	0.000014

[a] The more stringent of the Federal and State standards is presented if both exist for the averaging period.
[b] At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.
[c] Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.
Key: FMEF, Fuels and Materials Examination Facility.
Source: EPA 1997; WDEC 1994.

G.1.2.7.2 Operation of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from operation of the three surplus plutonium disposition and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–28. Stack parameters used for modeling were as stated previously.