DOE/EIS-0269

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR ALTERNATIVE STRATEGIES FOR THE LONG-TERM MANAGEMENT AND USE OF DEPLETED URANIUM HEXAFLUORIDE

Volume 1: Main Text

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COVER SHEET

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TITLE: Final Programmatic Environmental Impact Statement for Alternative Strategies for the Long-Term Management and Use of Depleted Uranium Hexafluoride (DOE/EIS-0269)

CONTACT: For further information on this Programmatic Environmental Impact Statement (PEIS), call or contact:

Scott E. Harlow *
Office of Nuclear Facilities Management (NE-40)
Office of Nuclear Energy, Science and Technology
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874
301-903-3352

For general information on the DOE NEPA process, call 1-800-472-2756 to leave a message or contact:

Carol 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

ABSTRACT: This PEIS assesses the potential impacts of alternative management strategies for depleted uranium hexafluoride (UF_6) currently stored at three DOE sites: Paducah site near Paducah, Kentucky; Portsmouth site near Portsmouth, Ohio; and K-25 site on the Oak Ridge Reservation, Oak Ridge, Tennessee. The alternatives analyzed in the PEIS include no action, long-term storage as UF_6, long-term storage as uranium oxide, use as uranium oxide, use as uranium metal, and disposal. DOE's preferred alternative is to begin conversion of the depleted UF_6 inventory as soon as possible, either to uranium oxide, uranium metal, or a combination of both, while allowing for use of as much of this inventory as possible.

* Vertical lines in the right margin of this cover sheet and the notation list, summary, and Chapters 1 through 11 indicate changes that have been added after the public comment period.

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NOTATION

The following is a list of acronyms and abbreviations, including units of measure, used in this document. Some acronyms used only in tables are defined in those tables.

ACRONYMS AND ABBREVIATIONS

General

AIHA	American Industrial Hygiene Association
AQCR	Air Quality Control Region
ALARA	as low as reasonably achievable
ANL	Argonne National Laboratory
ANSI	American National Standards Institute
BEA	U.S. Bureau of Economic Analysis
CAAA	*Clean Air Act Amendments*
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act* of 1980
CFR	*Code of Federal Regulations*
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EA	environmental assessment
EBE	evaluation basis earthquake
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ERPG	Emergency Response Planning Guide
FFA	Federal Facilities Agreement
FFCA	*Federal Facilities Compliance Act* of 1992
FR	*Federal Register*
HAP	hazardous air pollutant
HLW	high-level radioactive waste
ICRP	International Commission on Radiological Protection
KAR	*Kentucky Administrative Regulations*
KDEP	Kentucky Department of Environmental Protection
KPDES	Kentucky Pollutant Discharge Elimination System
LCF	latent cancer fatality
LLNL	Lawrence Livermore National Laboratory
LLMW	low-level mixed waste
LLW	low-level radioactive waste
LMES	Lockheed Martin Energy Systems, Inc.
MCL	maximum contaminant level
MEI	maximally exposed individual
MMES	Martin Marietta Energy Systems, Inc.

MOA	memorandum of agreement
NAAQS	National Ambient Air Quality Standards
NCRP	National Council on Radiation Protection and Measurements
NEPA	*National Environmental Policy Act* of 1969
NESHAPS	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	U.S. Nuclear Regulatory Commission
OMB	Office of Management and Budget
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEIS	programmatic environmental impact statement
PEL	permissible exposure limit
PGDP	Paducah Gaseous Diffusion Plant
PM_{10}	particulate matter with a mean diameter of 10 µm or less
PUEC	Portsmouth Uranium Enrichment Complex
ROI	region of influence
RCRA	*Resource Conservation and Recovery Act*
SAR	safety analysis report
TDEC	Tennessee Department of Environment and Conservation
TSCA	*Toxic Substances Control Act*
USC	*United States Code*
USEC	United States Enrichment Corporation
USGS	U.S. Geological Survey
WM PEIS	*Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*

Chemicals

CaF_2	calcium fluoride
CO	carbon monoxide
HC	hydrocarbons
HF	hydrogen fluoride
MgF_2	magnesium fluoride
NH_3	ammonia
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCB	polychlorinated biphenyl
SO_2	sulfur dioxide
SO_x	sulfur oxides
SVOC	semivolatile organic compound

TCE	trichloroethylene
UF_4	uranium tetrafluoride
UF_6	uranium hexafluoride
UO_2	uranium dioxide
UO_2F_2	uranyl fluoride
U_3O_8	triuranium octaoxide (uranyl uranate)
VOC	volatile organic compound

UNITS OF MEASURE

°C	degrees Celsius	m	meter(s)
°F	degrees Fahrenheit	m^2	square meter(s)
Ci	curie(s)	m^3	cubic meter(s)
cm	centimeter(s)	mg	milligram(s)
cm^3	cubic centimeter(s)	mi^2	square mile(s)
d	day(s)	min	minute(s)
ft	foot (feet)	mL	milliliter(s)
ft^2	square foot (feet)	mrem	millirem(s)
g	gram(s)	MVa	megavolt-ampere(s)
gal	gallon(s)	MW	megawatt(s)
GWh	gigawatt hour(s)	pCi	picocurie(s)
h	hour(s)	ppb	part(s) per billion
ha	hectare(s)	ppm	part(s) per million
in.	inch(es)	rem	roentgen equivalent man
kg	kilogram(s)	s	second(s)
km	kilometer(s)	ton(s)	short ton(s)
km^2	square kilometer(s)	yd^3	cubic yard(s)
L	liter(s)	yr	year(s)
lb	pound(s)		
µCi	microcurie(s)		
µg	microgram(s)		
µm	micrometer(s)		

ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

In this document, units of measure are presented with the English unit first, followed in most cases by the metric equivalent in parentheses; if the measurement was originally made in metric units, the values were not converted back to English units. In tables, the data are expressed in one unit only. The following table lists the appropriate equivalents for English and metric units.

Multiply	By	To Obtain
English/Metric Equivalents		
acres	0.4047	hectares (ha)
cubic feet (ft^3)	0.02832	cubic meters (m^3)
cubic yards (yd^3)	0.7646	cubic meters (m^3)
degrees Fahrenheit (°F) -32	0.5555	degrees Celsius (°C)
feet (ft)	0.3048	meters (m)
gallons (gal)	3.785	liters (L)
gallons (gal)	0.003785	cubic meters (m^3)
inches (in.)	2.540	centimeters (cm)
miles (mi)	1.609	kilometers (km)
pounds (lb)	0.4536	kilograms (kg)
short tons (tons)	907.2	kilograms (kg)
short tons (tons)	0.9072	metric tons (t)
square feet (ft^2)	0.09290	square meters (m^2)
square yards (yd^2)	0.8361	square meters (m^2)
square miles (mi^2)	2.590	square kilometers (km^2)
yards (yd)	0.9144	meters (m)
Metric/English Equivalents		
centimeters (cm)	0.3937	inches (in.)
cubic meters (m^3)	35.31	cubic feet (ft^3)
cubic meters (m^3)	1.308	cubic yards (yd^3)
cubic meters (m^3)	264.2	gallons (gal)
degrees Celsius (°C) +17.78	1.8	degrees Fahrenheit (°F)
hectares (ha)	2.471	acres
kilograms (kg)	2.205	pounds (lb)
kilograms (kg)	0.001102	short tons (tons)
kilometers (km)	0.6214	miles (mi)
liters (L)	0.2642	gallons (gal)
meters (m)	3.281	feet (ft)
meters (m)	1.094	yards (yd)
metric tons (t)	1.102	short tons (tons)
square kilometers (km^2)	0.3861	square miles (mi^2)
square meters (m^2)	10.76	square feet (ft^2)
square meters (m^2)	1.196	square yards (yd^2)