Final Uranium Leasing Program Programmatic Environmental Impact Statement

Volume 1: Chapters 1 through 4

DOE/EIS-0472
March 2014

U.S. DEPARTMENT OF ENERGY | Legacy Management

COVER SHEET

Lead Agency: U.S. Department of Energy (DOE)

Cooperating Agencies: The U.S. Department of the Interior (DOI), Bureau of Land Management (BLM); U.S. Environmental Protection Agency (EPA); Colorado Department of Transportation (CDOT); Colorado Division of Reclamation, Mining, and Safety (CDRMS); Colorado Parks and Wildlife (CPW); Mesa County Commission; Montrose County Commission; San Juan County Commission; San Miguel County Board of Commissioners; the Pueblo of Acoma; the Pueblo de Cochiti; the Pueblo de Isleta; the Navajo Nation; and the Southern Ute Indian Tribe

Title: Final Uranium Leasing Program Programmatic Environmental Impact Statement (DOE/EIS-0472)

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Abstract: The U.S. Department of Energy has prepared this *Final Uranium Leasing Program Programmatic Environmental Impact Statement* (ULP PEIS) pursuant to the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality's (CEQ's) NEPA regulations (40 CFR Parts 1500–1508), and DOE's NEPA implementing procedures (10 CFR Part 1021) to analyze the reasonably foreseeable environmental impacts, including the site-specific impacts, of the range of reasonable alternatives for the management of the ULP. DOE's ULP administers 31 tracts of land covering an aggregate of approximately 25,000 acres (10,000 ha) in Mesa, Montrose, and San Miguel Counties in western Colorado for exploration, mine development and operations, and reclamation of uranium mines. There are currently 29 existing leases; two of the lease tracts are not leased. Site-specific information available on the 31 lease tracts (including current lessee information and status, size of each lease tract, previous mining operations that occurred, location of existing permitted mines and associated structures, and other environmental information) has been utilized as the basis for the evaluation contained in this ULP PEIS.

DOE has evaluated five alternatives that address the range of reasonable alternatives for the management of the ULP. These alternatives are as follows:

- *Alternative 1:* DOE would terminate all leases, and all operations would be reclaimed by lessees. DOE would continue to manage the withdrawn lands, without leasing, in accordance with applicable requirements.

- *Alternative 2:* Same as Alternative 1, except once reclamation was completed by lessees, DOE would relinquish the lands in accordance with 43 CFR Part 2370. If DOI/BLM determines, in accordance with that same Part of the CFR, the lands were suitable to be managed as public domain lands, they would be managed by BLM under its multiple use policies. DOE's uranium leasing program would end.

- *Alternative 3:* DOE would continue the ULP as it existed before July 2007[1] with the 13 then-active leases, for the next 10-year period or for another reasonable period, and DOE would terminate the remaining leases.

- *Alternative 4:* DOE would continue the ULP with the 31 lease tracts for the next 10-year period or for another reasonable period.

- *Alternative 5:* This is the No Action Alternative, under which DOE would continue the ULP with the 31 lease tracts for the remainder of the 10-year period, as the leases were when they were issued in 2008.

Preferred Alternative: DOE's preferred alternative is Alternative 4.

Public Participation: DOE encourages public participation in the NEPA process. A Notice of Availability (NOA) for the Draft ULP PEIS was published in the *Federal Register* on March 15, 2013 (78 FR 16483), and this began a 60-day public comment period that was to end on May 16, 2013. This comment period was later extended to May 31, 2013 (78 FR 23926), and it was subsequently re-opened on June 3, 2013 (78 FR 33090), with a closing date of July 1, 2013. Hearings were held on the Draft ULP PEIS in Grand Junction, Montrose, Telluride, and Naturita. The public comment period, including the extension and the re-opening, lasted 109 days. All comments received on the Draft ULP PEIS were considered in the preparation of the Final ULP PEIS.

Changes from the Draft PEIS: In this Final PEIS, vertical lines in the margin indicate where the Draft PEIS has been revised or supplemented. Deletions are not demarcated.

[1] In July 2007, DOE issued a programmatic environmental assessment and Finding of No Significant Impact for the ULP, which a U.S. District Court invalidated on October 18, 2011.

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NOTATION

The following is a list of acronyms and abbreviations, chemical names, and units of measure used in this document. Some acronyms used only in tables may be defined only in those tables.

ACRONYMS AND ABBREVIATIONS

AADT	annual average daily traffic
ACEC	Area of Critical Environmental Concern
ACHP	American Council on Historic Preservation
AEA	Atomic Energy Act
AEC	Atomic Energy Commission
APE	area of potential effects
AQCR	Air Quality Control Region
AQRV	air-quality-related value
ATSDR	Agency for Toxic Substances and Disease Registry
AUM	animal unit month
BA	biological assessment
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
BO	biological opinion
BOR	Bureau of Reclamation
CAA	Clean Air Act
CAAQS	Colorado Ambient Air Quality Standards
CASTNET	Clean Air Status and Trends Network
CCCD	Colorado Center for Community Development
CDA	Colorado Department of Agriculture
CDNR	Colorado Department of Natural Resources
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and Environment
CDRMS	Colorado Division of Reclamation, Mining, and Safety
CDWR	Colorado Division of Water Resources
CEDE	committed effective dose equivalent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CNHP	Colorado Natural Heritage Program
COGCC	Colorado Oil and Gas Conservation Commission
CPW	Colorado Parks and Wildlife (formerly CDOW)

CRD	Comment Response Document
CRS	*Colorado Revised Statutes*
CWA	Clean Water Act
CWCB	Colorado Water Conservation Board
DCF	dose conversion factor
DEM	Digital Elevation Model
DNL	day-night average sound level
DOE	U.S. Department of Energy
DOE-LM	DOE Office of Legacy Management
DOI	U.S. Department of the Interior
DOT	U.S. Department of Transportation
DPS	distinct population segment (USFWS)
DRI	Desert Research Institute
EA	environmental assessment
EDE	effective dose equivalent
EF	enhanced Fujita (scale)
EFR	Energy Fuels Resources
EIA	Energy Information Administration
EIS	environmental impact statement
EMF	electromagnetic field
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
EPP	environmental protection plan
EPS	Economic and Planning Systems
ERNA	Ecological Research Natural Area
ESA	Endangered Species Act
FGR	Federal Guidance Report
FLM	Federal Land Manager
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FTW	full-time worker
GAO	Government Accountability Office
GHG	greenhouse gas
GIS	geographic information system
HA	herd area
HAP	hazardous air pollutant
HEAST	Health Effect Assessment Summary Tables
HFC	hydrofluorocarbon
HI	hazard index
HMA	herd management area
HMR	hazardous materials regulation (DOT)

HQ	hazard quotient
I-	Interstate (Highway)
ICRP	International Commission on Radiological Protection
IDA	intentional destructive act
IPaC	Information, Planning, and Conservation System (USFWS)
IRIS	Integrated Risk Information System
ISM	Integrated Safety Management
KOP	key observation point
KREX	KREX News Channel
L_{90}	sound level exceeded 90% of the time
LCF	latent cancer fatality
L_{dn}	day-night average sound level
L_{eq}	equivalent continuous sound level
Lg	surface wave
LHA	landscape health assessment
LR2000	Land and Mineral Rehost 2000 System (BLM)
LSA	low specific activity
M&E	Monitoring & Evaluation (List)
MLg	surface wave magnitude
MOU	Memorandum of Understanding
MSHA	Mine Safety and Health Administration
NAAQS	National Ambient Air Quality Standard(s)
NAICS	North American Industry Classification System
NCA	National Conservation Area
NCDC	National Climatic Data Center
NCRP	National Council on Radiation Protection
NED	National Elevation Data
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act
NLCS	National Landscape Conservation System (BLM)
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NP	National Park
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NRHP	*National Register of Historic Places*
NWCC	National Wind Coordinating Committee
NWI	National Wetlands Inventory

OAHP	Office of Archaeology and Historic Preservation (Colorado)
OHV	off-highway vehicle
OMP	operations and maintenance plan
ONA	Outstanding Natural Area
ORV	Outstanding Remarkable Value
PA	programmatic agreement
PEA	programmatic environmental assessment
PEIS	programmatic environmental impact statement
PFC	perfluorocarbon
PFYC	Potential Fossil Yield Classification
P.L.	Public Law
PLS	pure live seed
PM	particulate matter
$PM_{2.5}$	particulate matter with a mean aerodynamic diameter of 2.5 µm or less
PM_{10}	particulate matter with a mean aerodynamic diameter of 10 µm or less
PSD	Prevention of Significant Deterioration
QDEH	Queensland Department of Environment and Heritage
RCRA	Resource Conservation and Recovery Act
RfC	reference dose concentration
RfD	reference dose
RILOR	reclamation in lieu of royalties
RMP	resource management plan
RNA	Research Natural Area
ROD	Record of Decision
ROI	region of influence
ROW	right-of-way
SAAQS	State Ambient Air Quality Standard(s)
SDWA	Safe Drinking Water Act
SH	State Highway
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SJPLC	San Juan Public Lands Center
SRE	Slick Rock East
SRMA	Special Recreation Management Area
SRW	Slick Rock West
SVRA	sensitive visual resource area
SWCTR	Southwest Colorado Travel Region
SWMP	stormwater management plan
SWReGAP	Southwest Regional Gap Analysis Project

TDS	total dissolved solids
TEDE	total effective dose equivalent
THC	total hydrocarbons
TIS	traffic impact study
TMDL	total maximum daily load
TSCA	Toxic Substances Control Act
TSP	total suspended particulates
UCC	Union Carbide Corporation
UDEQ	Utah Department of Environmental Quality
UDNR	Utah Department of Natural Resources
UDOGM	Utah Division of Oil, Gas, and Mining
UDOT	Utah Department of Transportation
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geological Survey
ULP	Uranium Leasing Program
UMTRCA	Uranium Milling Tailings Radiation Control Act
UNSCEAR	United Nations Scientific Committee on the Effects of Radiation
US	U.S. Highway
USACE	U.S. Army Corps of Engineers
USC	*United States Code*
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGRCRP	U.S. Global Research Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRI	visual resource inventory
VRM	visual resource management
WA	Wilderness Area
WAPA	Western Area Power Administration
WHO	World Health Organization
WL	working level
WLM	working level month
WRCC	Western Regional Climate Center
WSA	Wilderness Study Area
WSR	National Wild and Scenic Rivers

CHEMICALS

CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
K-40	potassium-40
NO_2	nitrogen dioxide
N_2O	nitrous oxide
NO_x	nitrogen oxides
O_3	ozone
Pb	lead
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
U_3O_8	uranium oxide (triuranium octoxide)
V_2O_5	vanadium oxide (divanadium pentoxide)

UNITS OF MEASURE

ac-ft	acre-foot (feet)
bbl	barrel(s)
ºC	degree(s) Celsius
Ci	curie(s)
cm	centimeter(s)
cm^3	cubic centimeter(s)
d	day(s)
dB	decibel(s)
dBA	a-weighted decibel(s)
ºF	degree(s) Fahrenheit
ft	foot (feet)
ft^3	cubic foot (feet)
g	gram(s)
gal	gallon(s)

h	hour(s)
ha	hectare(s)
hp	horsepower
Hz	hertz
in.	inch(es)
in.^{3}	cubic inch(es)
kg	kilogram(s)
km	kilometer(s)
km^2	square kilometer(s)
L	liter(s)
lb	pound(s)
m	meter(s)
m^2	square meter(s)
m^3	cubic meter(s)
mg	milligram(s)
mGy	milligray
mi	mile(s)
mi^2	square mile(s)
min	minute(s)
mm	millimeter(s)
mo	month(s)
mph	mile(s) per hour
mrem	millirem
MW	megawatt(s)
pCi	picocurie(s)
ppb	part(s) per billion
ppm	part(s) per million
rem	roentgen equivalent man
s	second(s)
yd	yard(s)
yd^3	cubic yard(s)
yr	year(s)
µg	microgram(s)
µm	micrometer(s)
µmho(s)	micromho(s)
µS	microsievert(s)

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CONVERSION TABLE
ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

Multiply	By	To Obtain
English/Metric Equivalents		
acres	0.004047	square kilometers (km^2)
acre-feet (ac-ft)	1,234	cubic meters (m^3)
cubic feet (ft^3)	0.02832	cubic meters (m^3)
cubic yards (yd^3)	0.7646	cubic meters (m^3)
degrees Fahrenheit (ºF) –32	0.5555	degrees Celsius (ºC)
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)
miles per hour (mph)	1.609	kilometers per hour (kph)
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)	0.00081	acre-feet (ac-ft)
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 (ºC) +17.78	1.8	degrees Fahrenheit (ºF)
hectares (ha)	2.471	acres
kilograms (kg)	2.205	pounds (lb)
kilograms (kg)	0.001102	short tons (tons)
kilometers (km)	0.6214	miles (mi)
kilometers per hour (kph)	0.6214	miles per hour (mph)
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)	247.1	acres
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)

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