



Final Uranium Leasing Program Programmatic Environmental Impact Statement

Volume 1: Chapters 1 through 4

DOE/EIS-0472
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U.S. DEPARTMENT OF
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COVER SHEET

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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 DOE would continue to manage the withdrawn lands, without leasing, in accordance with applicable requirements.

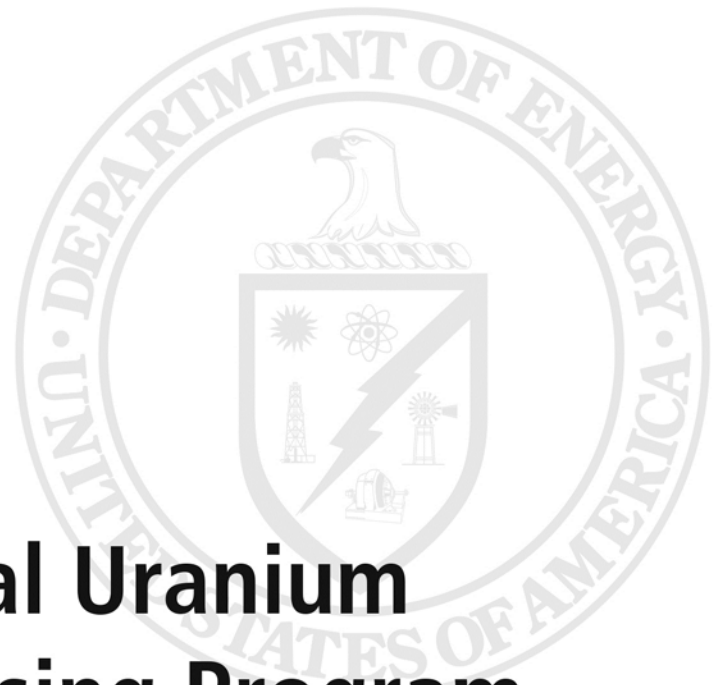
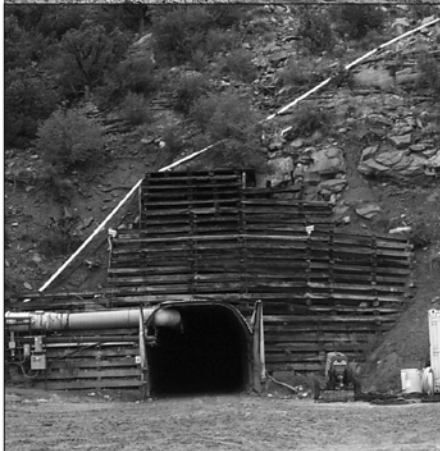
- 1 • *Alternative 2:* Same as Alternative 1, except once reclamation was completed
2 by lessees, DOE would relinquish the lands in accordance with
3 43 CFR Part 2370. If DOI/BLM determines, in accordance with that same Part
4 of the CFR, the lands were suitable to be managed as public domain lands,
5 they would be managed by BLM under its multiple use policies. DOE's
6 uranium leasing program would end.
7
- 8 • *Alternative 3:* DOE would continue the ULP as it existed before July 2007¹
9 with the 13 then-active leases, for the next 10-year period or for another
10 reasonable period, and DOE would terminate the remaining leases.
11
- 12 • *Alternative 4:* DOE would continue the ULP with the 31 lease tracts for the
13 next 10-year period or for another reasonable period.
14
- 15 • *Alternative 5:* This is the No Action Alternative, under which DOE would
16 continue the ULP with the 31 lease tracts for the remainder of the 10-year
17 period, as the leases were when they were issued in 2008.
18

19 ***Preferred Alternative:*** DOE's preferred alternative is Alternative 4.
20

21 ***Public Participation:*** DOE encourages public participation in the NEPA process. A Notice of
22 Availability (NOA) for the Draft ULP PEIS was published in the *Federal Register* on March 15,
23 2013 (78 FR 16483), and this began a 60-day public comment period that was to end on May 16,
24 2013. This comment period was later extended to May 31, 2013 (78 FR 23926), and it was
25 subsequently re-opened on June 3, 2013 (78 FR 33090), with a closing date of July 1, 2013.
26 Hearings were held on the Draft ULP PEIS in Grand Junction, Montrose, Telluride, and Naturita.
27 The public comment period, including the extension and the re-opening, lasted 109 days. All
28 comments received on the Draft ULP PEIS were considered in the preparation of the Final ULP
29 PEIS.
30

31 ***Changes from the Draft PEIS:*** In this Final PEIS, vertical lines in the margin indicate where the
32 Draft PEIS has been revised or supplemented. Deletions are not demarcated.
34
35

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

11	AADT	annual average daily traffic
12	ACEC	Area of Critical Environmental Concern
13	ACHP	American Council on Historic Preservation
14	AEA	Atomic Energy Act
15	AEC	Atomic Energy Commission
16	APE	area of potential effects
17	AQCR	Air Quality Control Region
18	AQRV	air-quality-related value
19	ATSDR	Agency for Toxic Substances and Disease Registry
20	AUM	animal unit month
21		
22	BA	biological assessment
23	BLM	Bureau of Land Management
24	BLS	Bureau of Labor Statistics
25	BMP	best management practice
26	BO	biological opinion
27	BOR	Bureau of Reclamation
28		
29	CAA	Clean Air Act
30	CAAQS	Colorado Ambient Air Quality Standards
31	CASTNET	Clean Air Status and Trends Network
32	CCCD	Colorado Center for Community Development
33	CDA	Colorado Department of Agriculture
34	CDNR	Colorado Department of Natural Resources
35	CDOT	Colorado Department of Transportation
36	CDOW	Colorado Division of Wildlife
37	CDPHE	Colorado Department of Public Health and Environment
38	CDRMS	Colorado Division of Reclamation, Mining, and Safety
39	CDWR	Colorado Division of Water Resources
40	CEDE	committed effective dose equivalent
41	CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
42	CEQ	Council on Environmental Quality
43	CFR	<i>Code of Federal Regulations</i>
44	CNHP	Colorado Natural Heritage Program
45	COGCC	Colorado Oil and Gas Conservation Commission
46	CPW	Colorado Parks and Wildlife (formerly CDOW)

1	CRD	Comment Response Document
2	CRS	<i>Colorado Revised Statutes</i>
3	CWA	Clean Water Act
4	CWCB	Colorado Water Conservation Board
5		
6	DCF	dose conversion factor
7	DEM	Digital Elevation Model
8	DNL	day-night average sound level
9	DOE	U.S. Department of Energy
10	DOE-LM	DOE Office of Legacy Management
11	DOI	U.S. Department of the Interior
12	DOT	U.S. Department of Transportation
13	DPS	distinct population segment (USFWS)
14	DRI	Desert Research Institute
15		
16	EA	environmental assessment
17	EDE	effective dose equivalent
18	EF	enhanced Fujita (scale)
19	EFR	Energy Fuels Resources
20	EIA	Energy Information Administration
21	EIS	environmental impact statement
22	EMF	electromagnetic field
23	E.O.	Executive Order
24	EPA	U.S. Environmental Protection Agency
25	EPP	environmental protection plan
26	EPS	Economic and Planning Systems
27	ERNA	Ecological Research Natural Area
28	ESA	Endangered Species Act
29		
30	FGR	Federal Guidance Report
31	FLM	Federal Land Manager
32	FONSI	Finding of No Significant Impact
33	FR	<i>Federal Register</i>
34	FTW	full-time worker
35		
36	GAO	Government Accountability Office
37	GHG	greenhouse gas
38	GIS	geographic information system
39		
40	HA	herd area
41	HAP	hazardous air pollutant
42	HEAST	Health Effect Assessment Summary Tables
43	HFC	hydrofluorocarbon
44	HI	hazard index
45	HMA	herd management area
46	HMR	hazardous materials regulation (DOT)

1	HQ	hazard quotient
2		
3	I-	Interstate (Highway)
4	ICRP	International Commission on Radiological Protection
5	IDA	intentional destructive act
6	IPaC	Information, Planning, and Conservation System (USFWS)
7	IRIS	Integrated Risk Information System
8	ISM	Integrated Safety Management
9		
10	KOP	key observation point
11	KREX	KREX News Channel
12		
13	L ₉₀	sound level exceeded 90% of the time
14	LCF	latent cancer fatality
15	L _{dn}	day-night average sound level
16	L _{eq}	equivalent continuous sound level
17	L _g	surface wave
18	LHA	landscape health assessment
19	LR2000	Land and Mineral Rehost 2000 System (BLM)
20	LSA	low specific activity
21		
22	M&E	Monitoring & Evaluation (List)
23	ML _g	surface wave magnitude
24	MOU	Memorandum of Understanding
25	MSHA	Mine Safety and Health Administration
26		
27	NAAQS	National Ambient Air Quality Standard(s)
28	NAICS	North American Industry Classification System
29	NCA	National Conservation Area
30	NCDC	National Climatic Data Center
31	NCRP	National Council on Radiation Protection
32	NED	National Elevation Data
33	NEPA	National Environmental Policy Act
34	NESHAP	National Emission Standards for Hazardous Air Pollutants
35	NHPA	National Historic Preservation Act
36	NLCS	National Landscape Conservation System (BLM)
37	NMFS	National Marine Fisheries Service
38	NOI	Notice of Intent
39	NP	National Park
40	NPDES	National Pollutant Discharge Elimination System
41	NPS	National Park Service
42	NRC	U.S. Nuclear Regulatory Commission
43	NRCS	Natural Resources Conservation Service
44	NRHP	<i>National Register of Historic Places</i>
45	NWCC	National Wind Coordinating Committee
46	NWI	National Wetlands Inventory

1		
2	OAHP	Office of Archaeology and Historic Preservation (Colorado)
3	OHV	off-highway vehicle
4	OMP	operations and maintenance plan
5	ONA	Outstanding Natural Area
6	ORV	Outstanding Remarkable Value
7		
8	PA	programmatic agreement
9	PEA	programmatic environmental assessment
10	PEIS	programmatic environmental impact statement
11	PFC	perfluorocarbon
12	PFYC	Potential Fossil Yield Classification
13	P.L.	Public Law
14	PLS	pure live seed
15	PM	particulate matter
16	PM _{2.5}	particulate matter with a mean aerodynamic diameter of 2.5 µm or less
17	PM ₁₀	particulate matter with a mean aerodynamic diameter of 10 µm or less
18	PSD	Prevention of Significant Deterioration
19		
20	QDEH	Queensland Department of Environment and Heritage
21		
22	RCRA	Resource Conservation and Recovery Act
23	RfC	reference dose concentration
24	RfD	reference dose
25	RILOR	reclamation in lieu of royalties
26	RMP	resource management plan
27	RNA	Research Natural Area
28	ROD	Record of Decision
29	ROI	region of influence
30	ROW	right-of-way
31		
32	SAAQS	State Ambient Air Quality Standard(s)
33	SDWA	Safe Drinking Water Act
34	SH	State Highway
35	SHPO	State Historic Preservation Office
36	SIP	State Implementation Plan
37	SJPLC	San Juan Public Lands Center
38	SRE	Slick Rock East
39	SRMA	Special Recreation Management Area
40	SRW	Slick Rock West
41	SVRA	sensitive visual resource area
42	SWCTR	Southwest Colorado Travel Region
43	SWMP	stormwater management plan
44	SWReGAP	Southwest Regional Gap Analysis Project
45		

1	TDS	total dissolved solids
2	TEDE	total effective dose equivalent
3	THC	total hydrocarbons
4	TIS	traffic impact study
5	TMDL	total maximum daily load
6	TSCA	Toxic Substances Control Act
7	TSP	total suspended particulates
8		
9	UCC	Union Carbide Corporation
10	UDEQ	Utah Department of Environmental Quality
11	UDNR	Utah Department of Natural Resources
12	UDOGM	Utah Division of Oil, Gas, and Mining
13	UDOT	Utah Department of Transportation
14	UDWR	Utah Division of Wildlife Resources
15	UGS	Utah Geological Survey
16	ULP	Uranium Leasing Program
17	UMTRCA	Uranium Milling Tailings Radiation Control Act
18	UNSCEAR	United Nations Scientific Committee on the Effects of Radiation
19	US	U.S. Highway
20	USACE	U.S. Army Corps of Engineers
21	USC	<i>United States Code</i>
22	USDA	U.S. Department of Agriculture
23	USFS	U.S. Forest Service
24	USFWS	U.S. Fish and Wildlife Service
25	USGRCRP	U.S. Global Research Change Research Program
26	USGS	U.S. Geological Survey
27		
28	VOC	volatile organic compound
29	VRI	visual resource inventory
30	VRM	visual resource management
31		
32	WA	Wilderness Area
33	WAPA	Western Area Power Administration
34	WHO	World Health Organization
35	WL	working level
36	WLM	working level month
37	WRCC	Western Regional Climate Center
38	WSA	Wilderness Study Area
39	WSR	National Wild and Scenic Rivers
40		
41		
42		

1 **CHEMICALS**

2

3 CH₄ methane
 4 CO carbon monoxide
 5 CO₂ carbon dioxide
 6 CO_{2e} carbon dioxide equivalent

7

8 K-40 potassium-40

9

10 NO₂ nitrogen dioxide11 N₂O nitrous oxide12 NO_x nitrogen oxides

13

14 O₃ ozone

15

16 Pb lead

17

18 SF₆ sulfur hexafluoride19 SO₂ sulfur dioxide

20

21 U₃O₈ uranium oxide (triuranium octoxide)

22

23 V₂O₅ vanadium oxide (divanadium pentoxide)

24

25

26 **UNITS OF MEASURE**

27

28 ac-ft acre-foot (feet)

29

30 bbl barrel(s)

31

32 °C degree(s) Celsius

33 Ci curie(s)

34 cm centimeter(s)

35 cm³ cubic centimeter(s)

36

37 d day(s)

38 dB decibel(s)

39 dBA a-weighted decibel(s)

40

41 °F degree(s) Fahrenheit

42 ft foot (feet)

43 ft³ cubic foot (feet)

44

45 g gram(s)

46 gal gallon(s)

47

1	h	hour(s)
2	ha	hectare(s)
3	hp	horsepower
4	Hz	hertz
5		
6	in.	inch(es)
7	in. ³	cubic inch(es)
8		
9	kg	kilogram(s)
10	km	kilometer(s)
11	km ²	square kilometer(s)
12		
13	L	liter(s)
14	lb	pound(s)
15		
16	m	meter(s)
17	m ²	square meter(s)
18	m ³	cubic meter(s)
19	mg	milligram(s)
20	mGy	milligray
21	mi	mile(s)
22	mi ²	square mile(s)
23	min	minute(s)
24	mm	millimeter(s)
25	mo	month(s)
26	mph	mile(s) per hour
27	mrem	millirem
28	MW	megawatt(s)
29		
30	pCi	picocurie(s)
31	ppb	part(s) per billion
32	ppm	part(s) per million
33		
34	rem	roentgen equivalent man
35		
36	s	second(s)
37		
38	yd	yard(s)
39	yd ³	cubic yard(s)
40	yr	year(s)
41		
42	μg	microgram(s)
43	μm	micrometer(s)
44	μmho(s)	micromho(s)
45	μS	microsievert(s)

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CONVERSION TABLE
ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS

Multiply	By	To Obtain
<i>English/Metric Equivalents</i>		
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 (°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)
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)
<i>Metric/English Equivalents</i>		
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 (°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)
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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