



Draft Uranium Leasing Program Programmatic Environmental Impact Statement

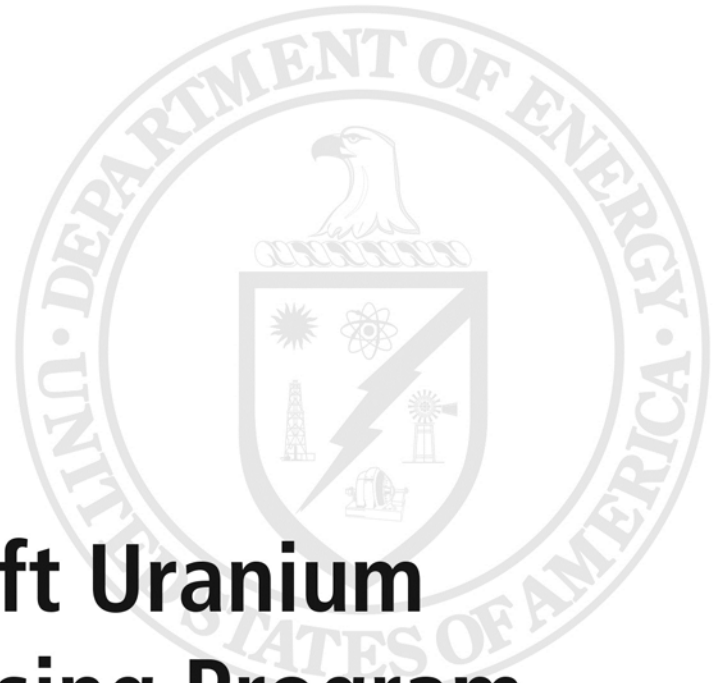
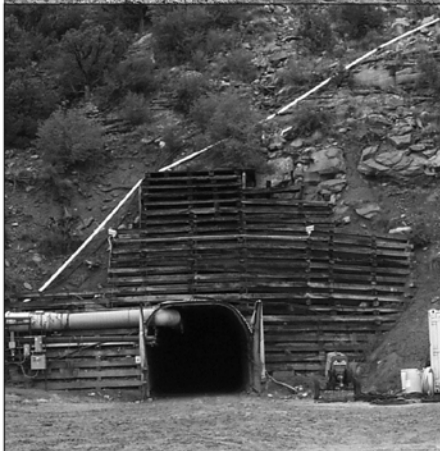
Volume 2: Chapter 5 through Appendix H

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U.S. DEPARTMENT OF
ENERGY

Legacy
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Draft Uranium Leasing Program Programmatic Environmental Impact Statement

Volume 2: Chapter 5 through Appendix H

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

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

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

1	TSP	total suspended particulates
2		
3	UDEQ	Utah Department of Environmental Quality
4	UDNR	Utah Department of Natural Resources
5	UDOGM	Utah Division of Oil, Gas, and Mining
6	UDOT	Utah Department of Transportation
7	UDWR	Utah Division of Wildlife Resources
8	UGS	Utah Geological Survey
9	ULP	Uranium Leasing Program
10	UNSCEAR	United Nations Scientific Committee on the Effects of Radiation
11	US	U.S. Highway
12	USACE	U.S. Army Corps of Engineers
13	USC	<i>United States Code</i>
14	USDA	U.S. Department of Agriculture
15	USFS	U.S. Forest Service
16	USFWS	U.S. Fish and Wildlife Service
17	USGRCRP	U.S. Global Research Change Research Program
18	USGS	U.S. Geological Survey
19		
20	VOC	volatile organic compound
21	VRI	visual resource inventory
22	VRM	visual resource management
23		
24	WA	Wilderness Area
25	WAPA	Western Area Power Administration
26	WHO	World Health Organization
27	WL	working level
28	WLM	working level month
29	WRCC	Western Regional Climate Center
30	WSA	Wilderness Study Area
31	WSR	National Wild and Scenic Rivers

32

33

34 **CHEMICALS**

35

36	CH ₄	methane
37	CO	carbon monoxide
38	CO ₂	carbon dioxide
39	CO _{2e}	carbon dioxide equivalent
40		
41	K-40	potassium-40
42		
43	NO ₂	nitrogen dioxide
44	N ₂ O	nitrous oxide
45	NO _x	nitrogen oxides

46

1	O ₃	ozone
2		
3	Pb	lead
4		
5	SF ₆	sulfur hexafluoride
6	SO ₂	sulfur dioxide
7		
8	U ₃ O ₈	uranium oxide (triuranium octoxide)
9		
10	V ₂ O ₅	vanadium oxide (divanadium pentoxide)

11
12

13 UNITS OF MEASURE

14		
15	ac-ft	acre-foot (feet)
16		
17	bbl	barrel(s)
18		
19	°C	degree(s) Celsius
20	cm	centimeter(s)
21	cm ³	cubic centimeter(s)
22		
23	d	day(s)
24	dB	decibel(s)
25	dBA	a-weighted decibel(s)
26	°F	degree(s) Fahrenheit
27	ft	foot (feet)
28	ft ³	cubic foot (feet)
29		
30	g	gram(s)
31	gal	gallon(s)
32		
33	h	hour(s)
34	ha	hectare(s)
35	hp	horsepower
36	Hz	hertz
37		
38	in.	inch(es)
39	in. ³	cubic inch(es)
40		
41	kg	kilogram(s)
42	km	kilometer(s)
43	km ²	square kilometer(s)

44
45

1	L	liter(s)
2	lb	pound(s)
3		
4	m	meter(s)
5	m ²	square meter(s)
6	m ³	cubic meter(s)
7	mg	milligram(s)
8	mGy	milligray
9	mi	mile(s)
10	mi ²	square mile(s)
11	min	minute(s)
12	mm	millimeter(s)
13	mo	month(s)
14	mph	mile(s) per hour
15	mrem	millirem
16	MW	megawatt(s)
17		
18	pCi	picocurie(s)
19	ppb	part(s) per billion
20	ppm	part(s) per million
21		
22	rem	roentgen equivalent man
23		
24	s	second(s)
25		
26	yd	yard(s)
27	yd ³	cubic yard(s)
28	yr	year(s)
29		
30	µg	microgram(s)
31	µm	micrometer(s)
32	µS	microsievert(s)
33		
34		
35		

1
2
3
4

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)

5

1 **5 APPLICABLE LAWS AND REQUIREMENTS**

2
3
4 This chapter presents the laws and other requirements that could affect implementation of
5 the alternatives for managing the ULP described in this Draft ULP PEIS.

6
7 A number of Federal environmental laws could potentially affect environmental
8 protection, health, safety, compliance, and consultation at the lease tracts discussed in this Draft
9 ULP PEIS. In addition to certain environmental requirements that have been delegated to state
10 authorities for enforcement and implementation, state legislatures have adopted laws to protect
11 health and safety and the environment. County governments often use the powers delegated to
12 them to pass ordinances and plans to protect their citizens and resources. It is DOE policy to
13 conduct its operations in a manner that assures the protection of public health, safety, and the
14 environment through compliance with all applicable Federal, state, and county requirements.

15
16 Federal environmental, cultural, and health and safety laws are summarized in
17 Section 5.1. State of Colorado potentially applicable laws are listed in Section 5.2; ordinances
18 and plans for Mesa, Montrose, and San Miguel Counties in Colorado, where the lease tracts are
19 located, are presented in Section 5.3, and DOE MOU with BLM and CDRMS are presented in
20 Section 5.4.

21
22
23 **5.1 APPLICABLE FEDERAL LAWS AND REGULATIONS**

24
25 This section describes the Federal environmental, cultural, safety, and health laws that
26 could apply to the No Action Alternative and the alternatives for the management of the ULP.

27
28
29 **American Indian Religious Freedom Act of 1978 (42 USC 1996).** This act reaffirms
30 American Indian religious freedom under the First Amendment and sets U.S. policy to protect
31 and preserve the inherent and constitutional right of American Indians to believe, express, and
32 exercise their traditional religions. The Act requires that Federal actions avoid interfering with
33 access to sacred locations and traditional resources that are integral to the practice of tribal
34 religions.

35
36
37 **Antiquities Act of 1906, as amended (16 USC 431 to 433).** This act protects historic
38 and prehistoric ruins, monuments, and antiquities, including paleontological resources, on
39 Federally controlled lands from appropriation, excavation, injury, and destruction without
40 permission.

41
42
43 **Archaeological and Historic Preservation Act of 1974, as amended (16 USC 469**
44 **to 469c).** This act provides for the preservation of historical and archaeological data (including
45 relics and specimens) that might otherwise be irreparably lost or destroyed as the result of

1 Federal actions. Under the law, Federal agencies must notify the Secretary of Interior whenever
2 they find that a Federal project may cause loss or destruction of significant scientific, prehistoric,
3 or archeological data.
4
5

6 **Archaeological Resources Protection Act of 1979, as amended (16 USC 470 *et seq.*).**

7 This act requires a permit for any excavation or removal of archaeological resources from
8 Federal or American Indian lands. Excavations must be undertaken for the purpose of furthering
9 archaeological knowledge in the public interest, and resources removed remain the property of
10 the United States.
11

12
13 **Atomic Energy Act of 1954 (42 USC 2011 *et seq.*).** The AEA provides the statutory
14 framework for DOE, as the successor agency to the AEC, to ensure a supply of domestic
15 uranium adequate to meet the defense needs of the United States. The AEA also authorizes DOE
16 to exercise regulatory authority over activities it conducts or those conducted on its behalf. An
17 extensive system of standards and requirements has been established through DOE directives to
18 protect health and minimize danger to life and property from activities under DOE's jurisdiction.
19

20
21 **Bald and Golden Eagle Protection Act of 1973, as amended (16 USC 668 through**
22 **668d).** The Bald and Golden Eagle Protection Act, as amended, makes it unlawful to take,
23 pursue, molest, or disturb bald (American) and golden eagles, their nests, or their eggs anywhere
24 in the United States. The DOI regulates activities that might adversely affect bald and golden
25 eagles.
26

27
28 **Clean Air Act of 1970, as amended (42 USC 7401 *et seq.*).** The CAA is intended to
29 "protect and enhance the quality of the nation's air resources so as to promote the public health
30 and welfare and the productive capacity of its population." Section 118 of the CAA requires that
31 each Federal agency with jurisdiction over any property or facility engaged in any activity that
32 might result in the discharge of air pollutants comply with "all Federal, state, interstate, and local
33 requirements" with regard to the control and abatement of air pollution.
34

35 Section 109 of CAA directs the EPA to set NAAQS for criteria pollutants. These
36 standards were established for PM, SO₂, CO, ozone, NO₂, and lead. Section 111 of the CAA
37 requires the establishment of national standards of performance for new or modified stationary
38 sources of atmospheric pollutants, and Section 160 requires that specific emission increases be
39 evaluated prior to permit approval to prevent significant deterioration of air quality. Specific
40 standards for releases of hazardous air pollutants (including radionuclides) are required per
41 Section 112. Radionuclide emissions are regulated under the NESHAP Program under
42 40 CFR Part 61.
43

44
45 **Clean Water Act of 1972, as amended (33 USC 1251 *et seq.*).** The CWA provides
46 water quality standards for the nation's waterways, guidelines and limitations for effluent

1 discharges from point-source discharges, and the NPDES permit program that is administered by
2 the EPA or by states under their own laws. Sections 401 through 405 of the Water Quality Act of
3 1987 added Section 402(p) to the CWA, which requires the EPA to establish regulations for
4 permits for stormwater discharges associated with industrial activities. Section 404 of the CWA
5 requires permits for the discharge of dredge or fill materials into navigable waters.
6 Sections 303(d) and 305(b) update water quality conditions for all water bodies every 2 years.
7 The water body that is identified as impaired will be required to be investigated for development
8 of TMDL, which will be implemented to correct the impairment.

9
10
11 **Comprehensive Environmental Response, Compensation, and Liability Act of 1980**
12 **(42 USC 9604; also known as Superfund).** CERCLA provides, among other things, authority
13 for Federal and state governments to respond directly to hazardous substance incidents. The act
14 requires reporting of spills, including radioactive spills, to the National Response Center.

15
16
17 **Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*).** The ESA
18 provides a program for the conservation of threatened and endangered species and the
19 ecosystems on which those species rely. The act is intended to prevent the further decline of
20 endangered and threatened species and to restore those species and their critical habitats.
21 Section 7 requires Federal agencies to assure that any action authorized, funded, or carried out by
22 them is not likely to jeopardize the continued existence of listed species or result in the
23 destruction or adverse modification of their critical habitat.

24
25
26 **Emergency Planning and Community Right-to-Know Act of 1986**
27 **(USC 11001 *et seq.*; also known as Superfund Amendments and Reauthorization Act**
28 **[SARA] Title III).** This act requires emergency planning and notice to communities and
29 Government agencies concerning the presence and release of specific chemicals. Its provisions
30 help increase the public's knowledge of and access to information on chemicals at individual
31 facilities, their uses, and releases into the environment. States and communities can use the
32 information to improve chemical safety and protect public health and the environment.

33
34
35 **Federal Cave Resources Protection Act of 1988 (16 USC 4301 *et seq.*).** This act
36 established requirements for the management and protection of caves and their resources on
37 Federal lands, including allowing the land managing agencies to withhold the location of caves
38 from the public and requiring permits for any removal or collection activities in caves on Federal
39 lands.

40
41
42 **Federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 *et seq.*).** This act
43 regulates the use, registration, and disposal of several classes of pesticides to ensure that they are
44 applied in a manner that protects the public, workers, and the environment. Implementing

1 regulations include recommended procedures for the disposal and storage of pesticides and
2 worker protection standards.
3
4

5 **Federal Land Policy and Management Act, as amended (43 USC 1701 *et seq.*)**. This
6 act is the principal law governing how the BLM manages public lands. It guides the BLM in
7 managing, protecting, developing, and enhancing public land and specifically requires the
8 agency to manage public land resources for multiple uses and sustained yield for both present
9 and future generations. The act governs the issuance of ROWs on public land and reclamation of
10 public land.
11

12
13 **Federal Mine Safety and Health Act of 1977, as amended (30 USC 801 *et seq.*)**. The
14 Federal Mine Safety and Health Act authorizes the Secretary of Labor to establish mandatory
15 health and safety standards for mines, including related surface operations. The act defines a
16 mine as “(a) an area of land from which minerals are extracted in nonliquid form or, if in liquid
17 form, are extracted with workers underground, (b) private ways and roads appurtenant to such
18 [an] area, and (c) lands, excavations, underground passageways, shafts, slopes, tunnels and
19 workings, structures, facilities, equipment, machines, tools, or other property including
20 impoundments, retention dams, and tailings ponds, on the surface or underground, used in, or to
21 be used in, or resulting from, the work of extracting such minerals from their natural deposits in
22 nonliquid form, or if in liquid form, with workers underground, or used in, or to be used in, the
23 milling of such minerals, or the work of preparing coal or other minerals, and includes custom
24 coal preparation facilities.”
25

26
27 **Fish and Wildlife Coordination Act (16 USC 661 *et seq.*)**. The Fish and Wildlife
28 Coordination Act promotes effective planning and cooperation among Federal, state, public, and
29 private agencies for the conservation and rehabilitation of the nation’s fish and wildlife. The act
30 requires consultation with the USFWS and state authorities whenever a Federal action involves
31 impounding, diverting, channel deepening, or otherwise controlling or modifying the waters of
32 any stream or other body of water.
33

34
35 **Noxious Weed Act of 1974, as amended (7 USC 2801 *et seq.*)**. The act authorizes the
36 Secretary of Agriculture to designate plants as noxious weeds by regulation. The movement of
37 all such designated weeds in interstate or foreign commerce is prohibited except under permit.
38 The 1990 amendment requires Federal agencies to develop and adequately fund a program for
39 managing undesirable plants in order to control these plants on Federal lands under their
40 jurisdiction.
41

42
43 **Migratory Bird Treaty Act of 1918, as amended (16 USC 703 *et seq.*)**. This act, as
44 amended, is intended to protect birds that have common migration patterns between the
45 United States and Canada, Mexico, Japan, and Russia. The act stipulates that it is unlawful at any

1 time, by any means, or in any manner to “kill any migratory bird unless and except as permitted
2 by regulation.”
3
4

5 **National Environmental Policy Act of 1969, as amended (42 USC 4321 *et seq.*).**

6 NEPA establishes a national policy that promotes the awareness of the consequences of human
7 activity on the environment and the consideration of environmental impacts during the planning
8 and decision-making stages of a project. It requires Federal agencies to prepare an EIS for
9 “major Federal actions significantly affecting the quality of the human environment.”
10
11

12 **National Historic Preservation Act of 1966, as amended (16 USC 470 *et seq.*).** NHPA

13 provides that sites with significant national historic value be placed on the NRHP maintained by
14 the Secretary of the Interior. Section 106 of the act requires a Federal agency to determine
15 whether its proposed undertaking is the type of activity that could affect historic properties. If so,
16 the agency must consult with the appropriate SHPO or Tribal Historic Preservation Officer. If an
17 adverse effect is found, the consultation often ends with the execution of a Memorandum of
18 Agreement that indicates how the adverse effect will be resolved.
19
20

21 **Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001).**

22 This act establishes a means for American Indians to request the return or repatriation of human
23 remains and other cultural items presently held by Federal agencies or Federally assisted
24 museums or institutions. The act also contains provisions regarding the intentional excavation
25 and removal of, inadvertent discovery of, and illegal trafficking in American Indian human
26 remains and cultural items. The law requires the establishment of a review committee with
27 monitoring and policy-making responsibilities, the development of regulations for repatriation,
28 and the development of procedures to handle unexpected discoveries of graves or grave items
29 during activities on Federal or tribal lands. All Federal agencies that manage land and/or are
30 responsible for archaeological collections obtained from their lands or generated by their
31 activities must comply with this act.
32
33

34 **Noise Control Act of 1972, as amended (42 USC 4901 *et seq.*).** Section 4 of the Noise

35 Control Act of 1972, as amended, directs all Federal agencies to carry out “to the fullest extent
36 within their authority” programs within their jurisdictions in a manner that furthers a national
37 policy that promotes an environment free from noise that would jeopardize health and welfare.
38
39

40 **Occupational Safety and Health Act of 1970 (29 USC 651 *et seq.*).** This act establishes

41 standards for safe and healthful working conditions in places of employment throughout the
42 United States. The act is administered and enforced by the Occupational Safety and Health
43 Administration in the U.S. Department of Labor.
44
45

1 **Paleontological Resources Preservation Act (16 USC 470aaa et seq.)**. This act
2 promotes the preservation and use of paleontological resources on Federal lands by prohibiting
3 the following: (1) taking or damaging paleontological resources located on Federal lands without
4 a permit or permission; (2) selling or purchasing such resources received from Federal lands; and
5 (3) submitting false records or identification for such resources removed from Federal lands.
6
7

8 **Pollution Prevention Act of 1990 (42 USC 13101 et seq.)**. This act establishes a
9 national policy for waste management and pollution control. Source reduction is given first
10 preference, followed by environmentally safe recycling, then by treatment, and finally by
11 disposal.
12
13

14 **Resource Conservation and Recovery Act of 1976, as amended**
15 **(42 USC 6901 et seq.)**. Under this act (abbreviated RCRA), which amended the Solid Waste
16 Disposal Act of 1965, the EPA defines and identifies hazardous waste; establishes standards for
17 its transportation, treatment, storage, and disposal; and requires permits for persons engaged in
18 hazardous waste activities. Section 3006 of RCRA allows states to establish and administer these
19 permit programs with EPA approval. The Federal Facility Compliance Act of 1992
20 (42 USC 6961 et seq.) amended RCRA to require that all Federal agencies having jurisdiction
21 over a solid waste facility or disposal site, or engaged in the management of solid or hazardous
22 waste, are subject to all applicable Federal, state, and local laws, regulations, and ordinances
23 addressing solid and hazardous waste.
24
25

26 **Safe Drinking Water Act of 1974, as amended (42 USC 300(f) et seq.)**. The primary
27 objective of the Safe Drinking Water Act (SDWA) is to protect the quality of public drinking
28 water supplies and sources of drinking water. The implementing regulations, administered by the
29 EPA unless delegated to states, establish standards applicable to public water systems. These
30 regulations include maximum contaminant levels (including those for radioactivity) in public
31 water systems that have at least 15 service connections used by year-round residents or that
32 regularly serve at least 25 year-round residents.
33
34

35 **Theft and Destruction of Government Property (18 USC 641 and 1361)**. This
36 legislation makes it illegal to steal or damage any property of the Federal Government and
37 establishes provisions for fines and imprisonment.
38
39

40 **Toxic Substances Control Act of 1976 (15 USC 2601 et seq.)**. This act (abbreviated
41 TSCA) provides the EPA with the authority to require testing of chemical substances entering
42 the environment and to regulate them as necessary. The law complements and expands existing
43 toxic substance laws such as Section 112 of the CAA and Section 307 of the CWA. TSCA
44 requires compliance with inventory reporting and chemical control provisions of the legislation
45 to protect the public from the risks of exposure to chemicals.

1 **Wild and Scenic Rivers Act (16 USC 1271 et seq.)**. The act establishes a National Wild
2 and Scenic Rivers System and prescribes the methods and standards through which additional
3 rivers may be added to the system. Rivers may be designated by Congress or, under certain
4 conditions, the Secretary of the Interior; designated segments need not include the entire river.
5 Each river is administered by either a Federal or state agency; for Federally administered rivers
6 in the lower 48 states, the designated boundaries generally average one quarter mile on either
7 bank in order to protect river-related values.
8
9

10 **5.2 STATE OF COLORADO ENVIRONMENTAL LAWS**

11
12 Certain environmental requirements are implemented by states under their own state
13 laws, as authorized by the EPA to state authorities for implementation and enforcement. It is
14 DOE policy to conduct its operations in an environmentally safe manner that complies with all
15 applicable requirements, including applicable state requirements. A list of state environmental
16 laws potentially applicable to the No Action Alternative and the alternatives for the management
17 of the ULP is provided in Table 5.2-1.
18
19

20 **5.3 COUNTY ENVIRONMENTAL ORDINANCES AND PLANS**

21
22 Under Colorado state law, county planning commissions are authorized to make and
23 adopt a master plan for the physical development of the unincorporated territory of the county.
24 The lease tracts that are the subject of this Draft ULP PEIS are located in Mesa, Montrose, and
25 San Miguel Counties. County ordinances, plans, and permit requirements that could apply to the
26 No Action Alternative and the ULP management alternatives in this Draft ULP PEIS are listed in
27 Table 5.3-1.
28
29

30 **5.4 MEMORANDA OF UNDERSTANDING**

31
32 In recognition of their shared roles and responsibilities and under their respective
33 authorities, the DOE-LM Office of Site Operations and the CDRMS entered into an MOU in
34 September 2012. The purpose of the MOU is to identify those roles and responsibilities, promote
35 agency coordination in matters affecting the ULP, eliminate duplication, simplify administrative
36 processes, and minimize or eliminate the adverse environmental effects of ULP mining
37 operations.
38

39 The MOU between DOE and CDRMS states that DOE has sole authority over the
40 selection of lessees as well as the negotiation, issuance, management, and termination of leases;
41 DOE is also the lead bonding authority. To allow for its independent review, each agency is to
42 receive copies of lessee documents pertaining to “site-specific Exploration Plans/Notices of
43 Intent and Reclamation Permits/Plans of Operation.” DOE has the authority and responsibility to
44 assure that lessees conduct all operations in compliance with the lease and with all applicable
45 laws and regulations, while the CDRMS has the authority and responsibility to assure that

1 operators conduct uranium and vanadium mining operations in compliance with applicable State
2 of Colorado laws and regulations. Each agency is to conduct its inspections of operations in
3 order to fulfill its regulatory oversight responsibilities, to notify the other agency of
4 noncompliance issues, and to retain its enforcement authorities.
5

6 In 2010, the DOE-LM Office of Site Operations entered into a MOU with the BLM
7 concerning the management of withdrawn lands. The MOU identifies the individual and shared
8 roles and responsibilities of each agency with respect to the ULP.
9

10 Pursuant to this 2010 MOU, DOE has sole authority over the selection of lessees as well
11 as lease negotiation, issuance, management, and termination. DOE is responsible for assuring
12 that all lease-wide stipulations it has agreed to with the BLM are incorporated into leases or, as
13 appropriate, are included as stipulations in Exploration and Mining Plan approvals. DOE also has
14 sole authority to assure that lessees conduct operations in compliance with lease language and all
15 applicable laws and regulations; DOE must notify the BLM of any noncompliance and
16 subsequent response actions. The BLM is to notify DOE of noncompliance, safety, and other
17 issues noted by its staff members while they are performing their duties on the leased premises.
18

19 The MOU provides that DOE is to reclaim all leased tracts when they are no longer
20 required to support the DOE mission and that DOE shall consult with the BLM prior to
21 reclamation in order to ensure that all involved lands are reclaimed to BLM standards and needs.
22
23

1 **TABLE 5.2-1 Potentially Applicable State Requirements**

Law	Citation	Requirement
Agreements for Transfer of Functions from Federal Government to State Government	<i>Colorado Revised Statutes (CRS)</i> , Title 25, "Health," Article 11, "Radiation Control," Section 102, Agreements for transfer of functions from Federal Government to State Government	Authorizes the governor to enter into agreements with the Federal Government allowing the state to assume responsibilities within the state relating to the protection of persons and property from the hazards of radioactive materials and other sources of radiation.
Colorado Air Pollution Prevention and Control Act	CRS, Title 25, "Health," Article 7, "Air Quality Control," Section 101 <i>et seq.</i>	Requires development of an air quality control program in which the benefits of the air pollution control measures utilized bear a reasonable relationship to the economic, environmental, and energy impacts and other costs of such measures.
Colorado Mined Land Reclamation Act	CRS, Title 34, "Mineral Resources," Article 32, "Colorado Mined Land Reclamation Act," Section 101 <i>et seq.</i>	Requires permits for new mining operations and establishes procedures for renewals of existing permits; requires an environmental protection plan for uranium mines; establishes that uranium stockpile areas are subject to rules developed to prevent off-site impacts.
Colorado Natural Areas Act	CRS, Title 33, "Parks and Wildlife," Article 33, "Colorado Natural Areas," Section 101 <i>et seq.</i>	Establishes a statewide natural areas program to identify and protect certain natural areas.
Colorado Noxious Weed Act	CRS, Title 35, "Agriculture," Article 5.5, "Colorado Noxious Weed Act," Section 111, Cooperation with Federal and state agencies	Authorizes local governing bodies of county and municipality governing bodies to enter into cooperative agreements with Federal and state agencies for the integrated management of noxious weeds within their respective territorial jurisdictions.
Colorado Water Quality Control Act	CRS Title 25, "Health," Article 8, "Water Quality Control," Sections 501–503	Requires a permit for the discharge of pollutants into any state waters.
Colorado Water Quality Control Act	CRS, Title 25, "Health," Article 8, "Water Quality Control," Section 506, Nuclear and radioactive wastes	Requires a permit to discharge, deposit, or dispose of any radioactive waste underground in liquid, solid, or explosive form.

TABLE 5.2-1 (Cont.)

Law	Citation	Requirement
Hazardous Waste	CRS Title 25, "Health," Article 15, "Hazardous Waste," Part 3, "State Hazardous Waste Management Plan," Section 308, Prohibited acts, enforcement	Prohibits disposal of hazardous waste at unpermitted facilities.
Groundwater Use	CRS, Title 37, "Water and Irrigation," Article 90, "Underground Water," Section 107, Application for use of groundwater	Requires anyone desiring to appropriate groundwater in designated groundwater basins to file an application prior to doing so.
Historical, Prehistorical, and Archaeological Resources	CRS, Title 24, "Government, State," Article 80, "State History, Archives, and Emblems," Part 4, "Historical, Prehistorical, and Archaeological Resources," Section 406, Permits	Requires permits for the investigation, excavation, gathering, or removal from the natural state of any historical, prehistorical, and archaeological resources within the state.
Maximum Permissible Noise Levels	CRS, Title 25, "Health," Article 12, "Noise Abatement," Section 103, Maximum permissible noise levels	Establishes the dB(A) and time periods that constitute permissible noise levels.
Nongame, Endangered, or Threatened Species Conservation Act	CRS, Title 33, "Parks and Wildlife," Article 2, "Nongame and Endangered Species Conservation," Section 101 <i>et seq.</i>	Authorizes regulations that establish (1) limitations relating to the taking, possession, transportation, exportation, processing, sale or offering for sale, or shipment regarding nongame wildlife and (2) a list of those species indigenous to the state determined to be endangered or threatened.
Pesticide Act	CRS, Title 35, "Agriculture," Article 9, "Pesticide Act," Section 101 <i>et seq.</i>	Controls the use of pesticides in the state.
Pollution Prevention Act of 1992	CRS 25, "Health," Article 16.5, "Pollution Prevention," Section 101 <i>et seq.</i>	Establishes that the prevention of pollution is preferable to treatment and disposal of toxic substances and is the cornerstone of the future of environmental management.
Unmarked Human Graves	CRS, Title 24, "Government, State," Article 80, "State History, Archives, and Emblems," Part 13, "Unmarked Human Graves," Section 1301 <i>et seq.</i>	Establishes the notification requirements upon the discovery of suspected human skeletal remains.

1 **TABLE 5.3-1 Potentially Applicable County Requirements**

Ordinance/Plan/Permit	Citation	Requirements
Mesa County		
Land Development Code	2000 Mesa County Land Development Code/Road and Bridge Standards and Specifications	Establishes land use regulations and development review and approval procedures; requires permits for surface alterations, utility installation, stormwater construction, and driveways. Mining and extractive uses shall be subject to the Mesa County Mineral and Energy Resource Master Plan.
Update Building, Plumbing, Mechanical, Fuel Gas, Property Maintenance, Residential, Electrical, Energy Conservation Codes	Ordinance 008A	Adopts and slightly modifies the International Building Code and International Residential Code.
Noxious Weed Management Plan	Mesa County 2009-204	Lists the noxious weeds covered by the plan and promotes noxious weed management.
Montrose County		
Montrose County Zoning Resolution	Montrose County Zoning Resolution	<p>Establishes county land use zones and requirements for those zones. The exploration of mineral resources and mining of minerals (other than sand and gravel) existing as of October 13, 1994, or the subsequent expansion of existing operations within existing property lines, is a use-by-right in the General Agricultural District; new mineral resource development and extraction operations and facilities are a special use within that district.</p> <p>Applications, a complete site plan, and an impact mitigation plan are required for special uses.</p> <p>Permits are required for any work performed within the public ROWs of Montrose County and within county road access.</p>

TABLE 5.3-1 (Cont.)

Ordinance/Plan/Permit	Citation	Requirements
San Miguel County		
San Miguel County Land Use Code	Section 3-1, General	Requires a building permit or exemption to erect, construct, reconstruct, excavate for a foundation, or alter or change the use of any building or other structure or improvements of land.
	Section 5-11, Conditional Uses on Federal Lands	Establishes the standards for reviewing mineral exploration and mining on Federal land that is subject to Federal and state laws and regulations.
	Section 5-16, Mining	Contains provisions to mitigate the impacts of mining and protect the health, safety, and welfare of residents and travellers on county roads, streets, and highways used for hauling mined material.
	Section 5-321N, Development or Improvement of Roads, Driveways, and Recreational Trails	Requires that any proposed access to a county road must be issued a Driveway Access Permit.
	Section 5-607, Sewage Disposal	Requires a permit for new or replaced septic systems.

1
2
3

6 CONSULTATION PROCESS FOR THE DOE ULP PEIS

DOE is complying with E.O. 13175 and Section 7 of the ESA by engaging in consultation on a Government-to-government basis with Indian tribal governments and with the USFWS, respectively. Sections 6.1 and 6.2 describe the consultation process undertaken to date.

6.1 TRIBAL GOVERNMENT-TO-GOVERNMENT CONSULTATION

The Federal Government formally recognized its relationship with Indian tribal governments on November 6, 2000, with E.O. 13175, *Consultation and Coordination with Indian Tribal Governments*. In addition, DOE Order 144.1, *DOE American Indian Policy*, and memos from the DOE Secretary require that DOE consult and coordinate with Indian tribal governments, Indian tribal communities, and tribal individuals whose interests might be directly and substantially affected by DOE activities. On January 9, 2012, DOE initiated consultation and communication on the ULP PEIS with six Indian tribal governments that are known to have interests in the area and were identified for a previous NEPA effort. These six tribes are: (1) the Hopi Nation; (2) the Navajo Nation; (3) the Southern Ute Indian Tribe; (4) the Ute Indian Tribe; (5) the Ute Mountain Ute Tribe; and (6) the White Mesa Ute Tribe. DOE sent follow-up letters to each of the six tribes on May 2, 2012. Those letters expressed DOE's desire to continue to look into ways to improve the Government-to-government consultation process with the Indian tribal governments and encouraged the tribes to participate during the public participation opportunities provided in the NEPA process for the ULP PEIS. Two tribes (the Navajo Nation and the Southern Ute Indian Tribe) chose to participate in the development of this ULP PEIS as cooperating agencies, while the remaining four chose to participate as commenting agencies.

On September 28, 2012, DOE also contacted 19 additional tribes to consult on the ULP PEIS. These 19 tribes were identified based on BLM's previous activities in the areas around the ULP lease tracts and its knowledge of the ancestral range of tribes connected with the Mesa Verde region. DOE sent follow-up letters to each of the 19 tribes on November 20, 2012, similar to the May 2, 2012, letters to the six tribes contacted above. Three tribes (the Pueblo of Acoma Tribe, the Pueblo de Cochiti Tribe, and the Pueblo of Isleta Tribe) chose to participate in the development of this ULP PEIS as cooperating agencies, while the remaining 16 chose to participate as commenting agencies. The list of cooperating and commenting agencies for the ULP PEIS, and their respective roles on their participation with regard the ULP PEIS process, are included in Section 1.9.

Since January 2012, monthly telephone conferences have been held between DOE and the cooperating agencies to develop the Draft ULP PEIS.

All letters were sent to the tribes by Mr. David W. Geiser, Director, DOE-LM. Facsimiles of all the letters sent are presented in Appendix F. Table 6.1-1 lists the tribes and the lead for the each tribe.

1
2**TABLE 6.1-1 Indian Tribal Governments Contacted by DOE with
Regard to Their Interest in Being Consulted on the ULP PEIS**

	Name of Tribe	Tribal Lead
1	Hopi Tribal Council	The Honorable Leroy Shingoitewa
2	Jicarilla Apache Tribal Council	The Honorable Levi Pestata
3	Kewa Pueblo Tribe	The Honorable Sisto Quintana
4	Navajo Nation	The Honorable Ben Shelley
5	Pueblo de Cochiti Tribe	The Honorable Phillip Quintana
6	Pueblo of Acoma Tribe	The Honorable Randall Vicente
7	Pueblo of Isleta Tribe	The Honorable Frank E. Lujan
8	Pueblo of Jemez Tribe	The Honorable Joshua Madalena
9	Pueblo of Laguna Tribe	The Honorable Richard B. Luarkie
10	Pueblo of Nambe Tribe	The Honorable Phillip A. Perez
11	Pueblo of Picuris Tribe	The Honorable Gerald Nailor
12	Pueblo of Pojoaque Tribe	The Honorable George Rivera
13	Pueblo of San Felipe Tribe	The Honorable Anthony Ortiz
14	Pueblo of San Ildefonso Tribe	The Honorable Terry Aguilar
15	Pueblo of Sandia Tribe	The Honorable Malcolm Montoya
16	Pueblo of Santa Ana Tribe	The Honorable Ernest J. Lujan
17	Pueblo of Santa Clara Tribe	The Honorable Walter Dasheno
18	Pueblo of Taos Tribe	The Honorable Lorian B. Romero
19	Pueblo of Tesuque Tribe	The Honorable Ramos Romero
20	Pueblo of Zia Tribe	The Honorable Wilfred Shije
21	Southern Ute Indian Tribe	The Honorable Pearl Casias
22	Ute Indian Tribe	The Honorable Irene Cuch
23	Ute Mountain Ute Tribe	The Honorable Gary Hayes
24	White Mesa Ute Tribe	The Honorable Elayne Atcitty
25	Zuni Pueblo Tribe	The Honorable Arlen P. Quetawki, Sr.

6.2 CONSULTATION WITH THE U.S. FISH AND WILDLIFE SERVICE

DOE has entered into consultation with the USFWS, in compliance with Section 7 of the ESA, concerning DOE's management of the ULP. Section 7 of the ESA requires Federal agencies to consider the effect of their undertakings on species listed under the ESA and to consult with the USFWS to ensure that their actions, or the actions that they fund, authorize, or permit, are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of the critical habitat of such species.

DOE initiated the informal consultation with a letter dated November 7, 2011, from Ms. Tracy A. Ribeiro of DOE to Ms. Patty Gelatt indicating this intent to the USFWS (see Appendix F). A response from Ms. Pamela Repp of the USFWS was received on November 17, 2011 (see Appendix F). The USFWS letter acknowledged receipt of the DOE letter requesting informal consultation. A meeting between DOE and the USFWS was held in the Grand Junction Office of the USFWS on November 9, 2011. The following points summarize the proceedings of that meeting.

- Since the ESA consultation is in support of a NEPA evaluation, the USFWS does not enter into formal consultation until a preferred alternative has been identified. Informal consultation based on current information regarding a preferred alternative can be conducted, and consultation might need to be redone if later in the PEIS process, the preferred alternative is different.
- The USFWS would respond in writing to DOE's letter of request to enter into informal consultation with the USFWS.
- Prior to the November 9, 2011 meeting, the USFWS had performed a preliminary review of the list of species provided on the DOE letter dated November 7, 2011 (described above). The USFWS provided initial feedback on which species it determined were not an issue based on the species locales. The USFWS also provided initial feedback on which species DOE should continue to review.
- The biological assessment (BA) that would be prepared should consider the entire 25,000 acres (10,000 ha).
- The BA would consider all listed species, even those not potentially present in the area.

In addition to the above discussion, the USFWS also discussed potential activities that could lead to water depletion and that could, in turn, adversely affect the four endangered fish species in the Colorado River; they asked that both water quality and water depletion be addressed in the BA. The USFWS has determined that there would be no impact on these four species and that consultation is not required for them if the water-related activities deplete less than 0.1 ac-ft/yr (32,585 gal/yr). Further, water rights have no bearing on water depletion

1 determinations; that is, any amounts of water depleted from the Colorado River Basin as a result
2 of ULP activities must be addressed, regardless of water rights or ownership.

3
4 Water quality as it relates to the listed fish species is being evaluated in the BA. With
5 regard to water that would be brought onto the ULP lease tracts to support mining operations,
6 some public water entities had previously consulted with the USFWS about water depletions. If
7 the ULP lessees obtain water from these public water entities, these volumes will not need to be
8 entered into the total volume counted as water depleted. However, since it will not be possible to
9 determine the exact source of the water to be utilized for future ULP mining activities, the
10 evaluation in the BA will assume that all consumptive water utilized is water depleted from the
11 Colorado River basin. For water that would be removed during mining operations and then
12 ponded, treated, and released, the water depletions and water quality related to the temporarily
13 ponded water will be evaluated in the BA. Cumulative depletions for mining actions on the ULP
14 lease tracts will also be evaluated.

15
16 DOE and USFWS are continuing the informal consultation process. DOE has kept the
17 USFWS informed about the ULP PEIS schedule, has provided the USFWS with up-to-date
18 information on the ESA consultation and the BA preparation relative to the overall ULP PEIS
19 project schedule, and has provided the USFWS with status updates on June 19, July 10,
20 October 17, and November 19, 2012.

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40	X, Y, Z
41	
42	No entries
43	
44	

8 REFERENCES

- 1
2
3
4 Ackerman, D.J., and F.E. Rush, 1984, *Hydrogeologic Reconnaissance of the San Miguel River*
5 *Basin, Southwestern Colorado*, Open File Report 84-4133, U.S. Geological Survey.
6
7 Acoustical Society of America, 1983, *American National Standard Specification for Sound Level*
8 *Meters, ANSI S1.4-1983*, New York, N.Y.
9
10 Acoustical Society of America, 1985, *American National Standard Specification for Sound Level*
11 *Meters, ANSI S1.4A-1985 Amendment to ANSI S1.4-1983*, New York, N.Y., June 26.
12
13 ACS (American Cancer Society), 2011, *Cancer Facts & Figures*. Available at <http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acspc-029771.pdf>. Accessed Oct. 2012.
14
15
16
17 AEC (U.S. Atomic Energy Commission), 1972, *Leasing of AEC Controlled Uranium Bearing*
18 *Land, Colorado, Utah, New Mexico*, WASH-1523, Sept.
19
20 Ake, J., et al, 2005, “Deep-Injection and Closely Monitored Induced Seismicity at Paradox
21 Valley, Colorado,” *Bulletin of the Seismological Society of America*, 95(2):664–683.
22
23 Allred, T.M., and E.D. Andrews, 2000, *Hydrology, Geomorphology, and Sediment Transport of*
24 *the San Miguel River, Southwest Colorado*, Water Resources Investigation Report 00-4075,
25 U.S. Geological Survey.
26
27 AMA (American Medical Association), 2010, *Physician-Related Data Resources*, Chicago, Ill.
28 Available at <http://www.ama-assn.org/cgi-bin/sserver/datalist.cgi> (data current as of May 2010).
29
30 AMEC Americas Limited, 2005, *Mackenzie Gas Project Effects of Noise on Wildlife*, prepared
31 for Imperial Oil Resources Ventures Limited, July.
32
33 Anderson, R., and G. Stewart, 2003, *Riverine Fish Flow Investigations*, Federal Aid Project
34 F-289-R6, Colorado Division of Wildlife, Fish Research Section, Fort Collins, Colo., June.
35
36 APLIC (Avian Power Line Interaction Committee), 2006, *Suggested Practices for Avian*
37 *Protection on Power Lines: The State of the Art in 2006*, Edison Electric Institute, APLIC, and
38 the California Energy Commission, Washington, D.C., and Sacramento, Calif. Available at
39 [http://www.aplic.org/SuggestedPractices2006\(LR\).pdf](http://www.aplic.org/SuggestedPractices2006(LR).pdf). Accessed March 25, 2008.
40
41 APLIC and USFWS (U.S. Fish and Wildlife Service), 2005, *Avian Protection Plan (APP)*
42 *Guidelines*, April. Available at http://www.eei.org/industry_issues/environmental/land/wildlife_and_endangered_species/AvainProtectionPlanGuidelines.pdf. Accessed March 7, 2007.
43
44

- 1 ARB (California Air Resources Board), 2011, *2004 Inventory: Main Speciation Profiles*.
2 Available at http://www.arb.ca.gov/ei/speciate/profphp04/pmprof_list.php. Accessed
3 Dec. 15, 2011.
4
- 5 Argonne National Laboratory, 2012, *Input Data and Output Results of the Computer Models*
6 *Employed for Human Health Impact Analyses in the Uranium Leasing Program PEIS*, prepared
7 by Environmental Science Division, Argonne National Laboratory, for U.S. Department of
8 Energy, Dec.
9
- 10 Argus (Argus Metals Corp.), 2008a, *Bluerock Updates Mining and Development Project Status*
11 *of US Uranium Mining Operations*, Sept. 22. Available at [http://www.bluerockresources.com/s/](http://www.bluerockresources.com/s/NewsReleases.asp?ReportID=320172&_Title=Bluerock-Updates-Mining-And-Development-Project-Status-Of-US-Uranium-Mining)
12 [NewsReleases.asp?ReportID=320172&_Title=Bluerock-Updates-Mining-And-Development-](http://www.bluerockresources.com/s/NewsReleases.asp?ReportID=320172&_Title=Bluerock-Updates-Mining-And-Development-Project-Status-Of-US-Uranium-Mining)
13 [Project-Status-Of-US-Uranium-Mining](http://www.bluerockresources.com/s/NewsReleases.asp?ReportID=320172&_Title=Bluerock-Updates-Mining-And-Development-Project-Status-Of-US-Uranium-Mining). Accessed Feb. 28, 2012.
14
- 15 Argus, 2008b, *Bluerock Receives First Ore Purchase Payment and Continues with Care and*
16 *Maintenance of US Uranium Mining Operations*, Oct. 31. Available at [http://www.bluerock](http://www.bluerockresources.com/s/NewsReleases.asp?ReportID=326342&_Type=News-Releases&_Title=Bluerock-Receives-First-Ore-Purchase-Payment-And-Continues-With-Care-And-Ma)
17 [resources.com/s/NewsReleases.asp?ReportID=326342&_Type=News-Releases&_Title=](http://www.bluerockresources.com/s/NewsReleases.asp?ReportID=326342&_Type=News-Releases&_Title=Bluerock-Receives-First-Ore-Purchase-Payment-And-Continues-With-Care-And-Ma)
18 [Bluerock-Receives-First-Ore-Purchase-Payment-And-Continues-With-Care-And-Ma](http://www.bluerockresources.com/s/NewsReleases.asp?ReportID=326342&_Type=News-Releases&_Title=Bluerock-Receives-First-Ore-Purchase-Payment-And-Continues-With-Care-And-Ma). Accessed
19 Feb. 28, 2012.
20
- 21 Armstrong, H., 1982, *Fossil Vertebrates, Invertebrates, and Plants of the Uravan Area*, Grand
22 River Institute Project No. 8250 for the Bureau of Land Management, Montrose District Office,
23 Colo.
24
- 25 Arnett, E.B., et al., 2007, *Impacts of Wind Energy Facilities on Wildlife and Wildlife Habitat*,
26 Wildlife Society Technical Review 07-2, The Wildlife Society, Bethesda, Md., Sept.
27
- 28 ATSDR (Agency for Toxic Substances and Disease Registry), 2012, *Minimal Risk Levels*
29 *(MRLs)*, Feb. Available at http://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls_february_2012.pdf.
30 Accessed March 19, 2012.
31
- 32 Backlund, P., et al., 2008, *The Effects of Climate Change on Agriculture, Land Resources, Water*
33 *Resources, and Biodiversity in the United States*, U.S. Climate Change Science Program,
34 Synthesis and Assessment Product 4.3, May.
35
- 36 Barber, J.R., et al., 2010, “The Costs of Chronic Noise Exposure for Terrestrial Organisms,”
37 *Trends in Ecology and Evolution* 25(3):180–189.
38
- 39 Barber, J.R., et al., 2011, “Anthropogenic Noise Exposure in Protected Natural Areas:
40 Estimating the Scale of Ecological Consequences,” *Landscape Ecol.* 26:1281–1295.
41
- 42 Belnap, J., et al., 2001, *Biological Soil Crusts: Ecology and Management*, U.S. Department of
43 the Interior, Bureau of Land Management, Technical Reference 1730-2.
44

- 1 Belnap, J., and J. Herrick, 2006, *Recovery Time of Soil and Vegetation from Historical*
2 *Geophysical Exploration in Southeastern Utah*, prepared for the U.S. Department of Energy and
3 Bureau of Land Management.
4
- 5 Bevanger, K., 1995, "Tetraonid Mortality Caused by Collisions with Power Lines in Boreal
6 Forest Habitats in Central Norway," *Fauna Norvegica, Series C, Cinclus* 18:41–51.
7
- 8 BirdLife International, 2003, *Protecting Birds from Powerlines: A Practical Guide on the Risks*
9 *to Birds from Electricity Transmission Facilities and How to Minimize Any Such Adverse Effects*,
10 T-PVS/Inf (2003) 15, Convention on the Conservation of European Wildlife and Natural
11 Habitats, Standing Committee, 23rd Meeting, Strasbourg, Dec. 1–4. Available at [http://www.coe.int/T/E/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Nature_](http://www.coe.int/T/E/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Nature_protection)
12 [protection](http://www.coe.int/T/E/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Nature_protection). Accessed Oct. 23, 2006.
13
14
- 15 BLM (Bureau of Land Management), 1984, *Manual 8400—Visual Resource Management*.
16 Available at <http://www.blm.gov/nstc/VRM/8400.html>. Accessed Dec. 2, 2011.
17
- 18 BLM, 1985, *San Juan/San Miguel Planning Area, Resource Management Plan*, Montrose
19 District, Sept. Available at [http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/uncompahgre_field/documents.Par.92100.File.dat/SJSMROD.pdf)
20 [uncompahgre_field/documents.Par.92100.File.dat/SJSMROD.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/uncompahgre_field/documents.Par.92100.File.dat/SJSMROD.pdf). Accessed Dec. 12, 2011.
21
- 22 BLM, 1986a, *Manual H-8410-1—Visual Resource Inventory*. Available at [http://www.blm.gov/](http://www.blm.gov/nstc/VRM/8410.html)
23 [nstc/VRM/8410.html](http://www.blm.gov/nstc/VRM/8410.html). Accessed Dec. 1, 2011.
24
- 25 BLM, 1986b, *Manual 8431, Visual Resource Contrast Rating*. Available at [http://www.blm.gov/](http://www.blm.gov/nstc/VRM/8431.html)
26 [nstc/VRM/8431.html](http://www.blm.gov/nstc/VRM/8431.html). Accessed Jan. 30, 2012.
27
- 28 BLM, 1988, *Uncompahgre Basin Resource Management Plan and Environmental Impact*
29 *Statement*, Montrose District, Colo., Uncompahgre Basin Resource Area, Sept. Available at
30 [http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/land_use_planning/rmp/archives/](http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/land_use_planning/rmp/archives/Uncompahgre/final_rmp_eis.Par.41451.File.dat/Ubfrmp.pdf)
31 [Uncompahgre/final_rmp_eis.Par.41451.File.dat/Ubfrmp.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/land_use_planning/rmp/archives/Uncompahgre/final_rmp_eis.Par.41451.File.dat/Ubfrmp.pdf). Accessed Dec. 12, 2011.
32
- 33 BLM, 1995, *Uranium Closure/Reclamation Guidelines*, supplement to the BLM Solid Minerals
34 Reclamation Handbook, BLM Handbook H-3042-1.
35
- 36 BLM, 1998, *BLM Manual Section 8270: Paleontological Resource Management*, July 13.
37
- 38 BLM, 2001, *Colorado Water Rights Fact Sheet*.
39
- 40 BLM, 2002, *Final Environmental Impact Statement Renewal of the Federal Grant for the Trans-*
41 *Alaska Pipeline System Right-of-Way*, BLM/AK/PT-03/005+2880+990, U.S. Department of the
42 Interior, Bureau of Land Management, Anchorage, Alaska, Nov.
43

- 1 BLM, 2007a, “Scenery, Visual Resources, and the Built Environment,” Chapter 3.22 in
2 Volume 1 of *San Juan Public Lands Draft Land Management Plan and Draft*
3 *Environmental Impact Statement*. Available at [http://ocs.fortlewis.edu/forestPlan/DEIS/](http://ocs.fortlewis.edu/forestPlan/DEIS/pdf/Vol1%20Ch3.22%20Scenery,%20Visual%20Resources,%20Built%20Environment.pdf)
4 [pdf/Vol1%20Ch3.22%20Scenery,%20Visual%20Resources,%20Built%20Environment.pdf](http://ocs.fortlewis.edu/forestPlan/DEIS/pdf/Vol1%20Ch3.22%20Scenery,%20Visual%20Resources,%20Built%20Environment.pdf).
5 Accessed Dec. 6, 2011.
6
- 7 BLM, 2007b, “Executive Summary,” in *San Juan Public Lands Draft Land Management Plan*
8 *and Draft Environmental Impact Statement*. Available at [http://ocs.fortlewis.edu/forestPlan/](http://ocs.fortlewis.edu/forestPlan/DEIS/pdf/DLMP-DEIS%20Executive%20Summary.pdf)
9 [DEIS/pdf/DLMP-DEIS%20Executive%20Summary.pdf](http://ocs.fortlewis.edu/forestPlan/DEIS/pdf/DLMP-DEIS%20Executive%20Summary.pdf). Accessed Dec. 12, 2011.
10
- 11 BLM, 2007c, *Potential Fossil Yield Classification (PFYC) System for Paleontological Resources*
12 *on Public Lands*, Instruction Memorandum No. 2008-009, Oct. 15.
13
- 14 BLM, 2008a, *Special Status Species Management*, BLM Manual 6840, Release 6-125,
15 U.S. Department of the Interior, Dec. 12.
16
- 17 BLM, 2008b, *Decision Record, Finding of No Significant Impact, and Final Environmental*
18 *Assessment for the Whirlwind Mine Uranium Mining Project*, Grand Junction Field Office,
19 Grand Junction, Colo., and Moab Field Office, Moab, Utah, Sept. Available at
20 [http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/grand_junction_field/](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/grand_junction_field/PDF.Par.16552.File.dat/WhirlwinMineEAfinal.pdf)
21 [PDF.Par.16552.File.dat/WhirlwinMineEAfinal.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/grand_junction_field/PDF.Par.16552.File.dat/WhirlwinMineEAfinal.pdf). Accessed Feb. 22, 2012.
22
- 23 BLM, 2008c, *Denison Mines (USA) Corp. Sunday Mines Environmental Assessment*,
24 CO-800-2007-104EA, prepared by Denison Mines, Denver, Colo., for U.S. Department of the
25 Interior, BLM Dolores Public Lands Office, Dolores, Colo., Nov.
26
- 27 BLM, 2008d, *Integrated Vegetation Management*, BLM Handbook H1740-2, Release 1-1714,
28 U.S. Department of the Interior, Washington, D.C., March 25.
29
- 30 BLM 2008f, *Assessment and Mitigation of Potential Impacts to Paleontological Resources*,
31 Instruction Memorandum No. 2009-011, Oct. 10.
32
- 33 BLM, 2009a, *Draft Environmental Impact Statement—Proposed Red Cliff Mine Project*
34 *and Federal Coal Lease by Application*, Jan. 6. Available at [http://www.blm.gov/co/st/en/](http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/red_cliff_mine/documents.html)
35 [BLM_Programs/land_use_planning/rmp/red_cliff_mine/documents.html](http://www.blm.gov/co/st/en/BLM_Programs/land_use_planning/rmp/red_cliff_mine/documents.html). Accessed
36 Feb. 24, 2012.
37
- 38 BLM, 2009b, *Decision Record, Finding of No Significant Impact, and Environmental*
39 *Assessment for the Daneros Mine Project*, Monticello Field Office, May. Available at
40 https://www.blm.gov/ut/enbb/files/Daneros__EA_FONSI_DR_revised.pdf. Accessed
41 Feb. 28, 2012.
42
- 43 BLM, 2009c, *A New Paleontology Law—Paleontological Resources: Preservation under the*
44 *Omnibus Public Lands Act of 2009*.
45

- 1 BLM, 2009d, *Wild and Scenic River Eligibility Report for the Grand Junction Field Office*.
2
- 3 BLM, 2009e, *Uncompahgre Basin & San Juan/San Miguel Resource Management Plan*
4 *Amendments, Environmental Assessment*, Nov.
5
- 6 BLM, 2010a, *Uncompahgre RMP Planning*, RMP Planning Fact Sheet 2.1, Uncompahgre
7 Field Office.
8
- 9 BLM, 2010b, *Visual Resource Management*, RMP Planning Fact Sheet 3.3, Uncompahgre
10 Field Office.
11
- 12 BLM, 2010c, *Fact Sheet: Gas Development in the North Fork*, Uncompahgre Field Office.
13 Available at [http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/uncompahgre_field/](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/uncompahgre_field/documents.Par.8035.File.dat/North%20Fork%20O&G%20fact%20sheet_final.pdf)
14 [documents.Par.8035.File.dat/North%20Fork%20O&G%20fact%20sheet_final.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/uncompahgre_field/documents.Par.8035.File.dat/North%20Fork%20O&G%20fact%20sheet_final.pdf). Accessed
15 Feb. 28, 2012.
16
- 17 BLM, 2010d, *Dolores River Information—Dolores Public Lands Office*, March 25. Available at
18 <http://www.blm.gov/co/st/en/fo/sjplc/recreation/sjdolores.html>. Accessed Feb. 22, 2012.
19
- 20 BLM, 2010e, *Final Wild and Scenic River Eligibility Report for the Uncompahgre Planning*
21 *Area*, Uncompahgre Field Office, Colorado, June.
22
- 23 BLM, 2011a, *Notice of Public Scoping for Potassium Prospecting and Exploration*, Dolores
24 Field Office, June 27. Available at [http://www.blm.gov/pgdata/etc/medialib/blm/co/](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/san_juan_public_lands/pdf.Par.22579.File.dat/20110624_SIGNED_SCOPING_LETTER_Potash.pdf)
25 [field_offices/san_juan_public_lands/pdf.Par.22579.File.dat/20110624_SIGNED_](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/san_juan_public_lands/pdf.Par.22579.File.dat/20110624_SIGNED_SCOPING_LETTER_Potash.pdf)
26 [SCOPING_LETTER_Potash.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/field_offices/san_juan_public_lands/pdf.Par.22579.File.dat/20110624_SIGNED_SCOPING_LETTER_Potash.pdf). Accessed Feb. 22, 2012.
27
- 28 BLM, 2011b, *Environmental Assessment: La Sal No. 2 Uranium Sampling Project*, Moab Field
29 Office, DOI-BLM-UT-Y010-2011-0162-EA. Sept. Available at [http://www.blm.gov/pgdata/](http://www.blm.gov/pgdata/etc/medialib/blm/ut/moab_fo/ea_postings.Par.74657.File.dat/LaSalNo2EA.pdf)
30 [etc/medialib/blm/ut/moab_fo/ea_postings.Par.74657.File.dat/LaSalNo2EA.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ut/moab_fo/ea_postings.Par.74657.File.dat/LaSalNo2EA.pdf). Accessed
31 Feb. 28, 2012.
32
- 33 BLM, 2011c, *Determination of NEPA Adequacy: Hanging Flume Replica Construction*,
34 Uncompahgre Field Office, DOI-BLM-CO-S050-2011-0028DNA, Aug. Available at
35 [http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.80861.File.dat/11-28%20DNA%20Hanging%20Flume%20Replica%20Construction.pdf)
36 [ufo_nepa_documents0.Par.80861.File.dat/11-28%20DNA%20Hanging%20Flume%](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.80861.File.dat/11-28%20DNA%20Hanging%20Flume%20Replica%20Construction.pdf)
37 [20Replica%20Construction.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.80861.File.dat/11-28%20DNA%20Hanging%20Flume%20Replica%20Construction.pdf). Accessed Feb. 28, 2012.
38
- 39 BLM, 2011d, *RMP Planning Calendar*, Resource Management Planning, Resource Management
40 Plan, Grand Junction, Colo., Field Office, U.S. Department of the Interior. Available at
41 <http://www.blm.gov/co/st/en/fo/gjfo/rmp.html>. Accessed Dec. 6, 2011.
42
- 43 BLM, 2011e, *Greater Sage-Grouse Interim Management Policies and Procedures*,
44 BLM IM 2012-043. Available at [http://www.blm.gov/wo/st/en/info/regulations/Instruction_](http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-043.html)
45 [Memos_and_Bulletins/national_instruction/2012/IM_2012-043.html](http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-043.html). Accessed Feb. 7, 2012.

- 1 BLM, 2011f, *BLM National Greater Sage-Grouse Land Use Planning Strategy*,
2 BLM IM 2012-044. Available at [http://www.blm.gov/wo/st/en/info/regulations/Instruction_](http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-044.html)
3 [Memos_and_Bulletins/national_instruction/2012/IM_2012-044.html](http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-044.html). Accessed Feb. 7, 2012.
4
- 5 BLM, 2011g, *The National Landscape Conservation System: 15-Year Strategy, 2010–2025*,
6 Report BLM/WO/GI-11/013+6100.
7
- 8 BLM, 2011h, *Land and Mineral Legacy Rehost 2000 System—LR2000*, last updated Sept. 23,
9 2011. Available at <http://blm.gov/lr2000>. Accessed Dec. 14, 2011.
10
- 11 BLM, 2011i, *Herd Management Areas and Herd Area Maps by State*, updated Nov. 1. Available
12 at [http://www.blm.gov/wo/st/en/prog/whbprogram/herd_management/HMA_and_HA_Maps.](http://www.blm.gov/wo/st/en/prog/whbprogram/herd_management/HMA_and_HA_Maps.html)
13 [html](http://www.blm.gov/wo/st/en/prog/whbprogram/herd_management/HMA_and_HA_Maps.html). Accessed Feb. 22, 2012.
14
- 15 BLM, 2011j, *Environmental Assessment: East Paradox LHA Grazing Permit Renewals*,
16 Uncompahgre Field Office, DOI-BLM-CO-S050-2011-0023 EA. Available at
17 [http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.26626.File.dat/11-23%20EA%20E_Paradox%20LHA%20Grazing%20Permit%20Renewal.pdf)
18 [ufo_nepa_documents0.Par.26626.File.dat/11-23%20EA%20E_Paradox%20LHA%20](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.26626.File.dat/11-23%20EA%20E_Paradox%20LHA%20Grazing%20Permit%20Renewal.pdf)
19 [Grazing%20Permit%20Renewal.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.26626.File.dat/11-23%20EA%20E_Paradox%20LHA%20Grazing%20Permit%20Renewal.pdf). Accessed Feb. 22, 2012.
20
- 21 BLM, 2011k, *Uncompahgre Field Office Recreation: Visitation and Land Use*.
22
- 23 BLM, 2011l, *Environmental Assessment for the November 2011 Oil and Gas Lease Sale*,
24 DOI-BLM-CO-130-2011-0043-EA, Grand Junction Field Office, July. Available at
25 [http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2011/](http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2011/november_2011.Par.35745.File.dat/GJ_Final%20Sale%20EA.pdf)
26 [november_2011.Par.35745.File.dat/GJ_Final%20Sale%20EA.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2011/november_2011.Par.35745.File.dat/GJ_Final%20Sale%20EA.pdf). Accessed Feb. 22, 2012.
27
- 28 BLM, 2011m, *Environmental Assessment: November 2011 Competitive Oil and Gas Lease Sale*,
29 DOI-BLM-CO-S050-2011-0003 EA, Uncompahgre Field Office. Available at
30 [http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2011/](http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2011/november_2011.Par.75091.File.dat/UFO_Sale%20NoticeFinal%20EA.pdf)
31 [november_2011.Par.75091.File.dat/UFO_Sale%20NoticeFinal%20EA.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/oil_and_gas/Lease_Sale/2011/november_2011.Par.75091.File.dat/UFO_Sale%20NoticeFinal%20EA.pdf). Accessed
32 Feb. 24, 2012.
33
- 34 BLM, 2011n, *Northern Arizona Proposed Withdrawal Final Environmental Impact Statement*,
35 BLM/AZ/PL-11/002, U.S. Department of the Interior, Bureau of Land Management, Oct.
36
- 37 BLM, 2011o, *Uncompahgre Planning Area Wilderness Characteristic Inventory: 2011 Update*,
38 BLM Uncompahgre Field Office, Colorado. Available at: [http://www.blm.gov/co/st/en/fo/ufo/](http://www.blm.gov/co/st/en/fo/ufo/uncompahgre_rmp.html)
39 [uncompahgre_rmp.html](http://www.blm.gov/co/st/en/fo/ufo/uncompahgre_rmp.html). Accessed Dec. 11, 2012.
40
- 41 BLM, 2012a, *Environmental Assessment: Dolores River Restoration Treatments*, DOI-BLM-
42 CO-S050-2012-0011 EA, Uncompahgre Field Office, March. Available at [http://www.blm.gov/](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.39048.File.dat/12-11%20EA%20Dolores%20RiverRestoration.pdf)
43 [pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.39048.File.dat/12-11%20EA%20Dolores%20RiverRestoration.pdf)
44 [Par.39048.File.dat/12-11%20EA%20Dolores%20RiverRestoration.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/uncompahgre_field/ufo_nepa_documents0.Par.39048.File.dat/12-11%20EA%20Dolores%20RiverRestoration.pdf). Accessed May 8, 2012.
45

- 1 BLM, 2012b, *Land and Mineral Legacy Rehost 2000 System–LR 2000*, last updated July 10,
2 2012. Available at <http://www.blm.gov/lr2000/index.htm>. Accessed Sept. 10 and 11, 2012.
3
- 4 BLM, 2012c, *Environmental Assessment: Devil Canyon Fuels Reduction and Vegetation*
5 *Restoration*, Monticello Field Office, DOI-BLM-UT-Y020-2012-0010-EA, Aug. Available at
6 https://www.blm.gov/ut/enbb/files/Signed_EA,_Fonsi_and_Decision_Record.pdf. Accessed
7 Oct. 12, 2012.
8
- 9 BLM, 2012d, *BLM Manual Section 6310: Conducting Wilderness Characteristics Inventory on*
10 *BLM Lands (Public)*, March 15.
11
- 12 BLM, 2012e, *BLM Manual Section 6320: Considering Lands with Wilderness Characteristics in*
13 *the BLM Land Use Planning Process (Public)*, March 15.
14
- 15 BLM, 2012f, *Wilderness Characteristics Assessment for the BLM Portions of the San Juan*
16 *Public Lands*, BLM Tres Rios Field Office, Nov. 28.
17
- 18 BLM, 2012g, *Grand Junction Field Office Wilderness Characteristics Inventory*
19 *Update: Documentation of Current Wilderness Inventory Conditions*, BLM Grand Junction
20 Field Office, Colorado, July.
21
- 22 BLM, 2012h, *Environmental Assessment: Potash Exploration Project*, Tres Rios Field Office,
23 DOI-BLM-CO-S010-2009-0076-EA, Oct. Available at [http://www.blm.gov/pgdata/etc/medialib/
24 blm/co/information/nepa/san_juan_public_land/trfo_nepa_docs.Par.1940.File.dat/09-
25 76%20RM_Potash_Final_EA_2012-1018.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/co/information/nepa/san_juan_public_land/trfo_nepa_docs.Par.1940.File.dat/09-76%20RM_Potash_Final_EA_2012-1018.pdf). Accessed Dec. 19, 2012.
26
- 27 BLM and CPW (Colorado Parks and Wildlife), 1989, *Colorado Desert Bighorn Sheep*
28 *Management Plan*.
29
- 30 BLM and DOE (U.S. Department of Energy), 2010a, *Memorandum of Understanding between*
31 *the U.S. Bureau of Land Management and the U.S. Department of Energy*, April.
32
- 33 BLM and DOE, 2010b, *Draft Programmatic Environmental Impact Statement for Solar Energy*
34 *Development in Six Southwestern States*, DES 10-59, DOE/EIS-0403, Dec.
35
- 36 BLM and USFS, 2007, *San Juan Public Lands – Draft Land Management Plan, Volume 2*,
37 San Juan Public Lands Center, Durango, Colo.
38
- 39 BLM, undated, *A Recreation and Visitors Strategy, Colorado Recreation Program*.
40
- 41 BLS (Bureau of Labor Statistics), 2011a, *Number of Fatal Work Injuries, 1992–2010*,
42 U.S. Department of Labor. Available at <http://www.bls.gov/iif/oshwc/foi/cfch0009.pdf>.
43 Accessed March 13, 2012.
44

- 1 BLS, 2011b, *2010 Survey of Occupational Injuries & Illnesses, Summary Estimates Charts*
2 *Package*, Oct. 20. Available at <http://www.bls.gov/iif/oshwc/osh/os/osch0044.pdf>. Accessed
3 March 13, 2012.
4
- 5 Boardman, R.L., et al., 1957, *Results of U.S. Geological Survey Exploration for Uranium-*
6 *Vanadium Deposits in the Club Mesa Area, Uravan District, Montrose County, Colorado*, Trace
7 Elements Memorandum Report 979, U.S. Geological Survey, May.
8
- 9 BOR (Bureau of Reclamation), 2009, *McPhee Dam*. Available at [http://www.usbr.gov/projects/](http://www.usbr.gov/projects/PrintFacilityAttributes.jsp?fac_Name=McPhee%20Dam)
10 [PrintFacilityAttributes.jsp?fac_Name=McPhee%20Dam](http://www.usbr.gov/projects/PrintFacilityAttributes.jsp?fac_Name=McPhee%20Dam).
11
- 12 BOR, 2011, *Dolores Project*. Available at [http://www.usbr.gov/projects/Project.jsp?proj_Name=](http://www.usbr.gov/projects/Project.jsp?proj_Name=Dolores%20Project)
13 [Dolores%20Project](http://www.usbr.gov/projects/Project.jsp?proj_Name=Dolores%20Project). Accessed Feb. 17, 2012.
14
- 15 BOR, 2012, *CRBSCP—Paradox Valley Unit—Title II*. Available at [http://www.usbr.gov/](http://www.usbr.gov/projects/Project.jsp?proj_Name=CRBSCP%20-%20Paradox%20Valley%20Unit%20-%20Title%20II&pageType=ProjectPage)
16 [projects/Project.jsp?proj_Name=CRBSCP%20-%20Paradox%20Valley%20Unit%20-%20](http://www.usbr.gov/projects/Project.jsp?proj_Name=CRBSCP%20-%20Paradox%20Valley%20Unit%20-%20Title%20II&pageType=ProjectPage)
17 [Title%20II&pageType=ProjectPage](http://www.usbr.gov/projects/Project.jsp?proj_Name=CRBSCP%20-%20Paradox%20Valley%20Unit%20-%20Title%20II&pageType=ProjectPage). Accessed Feb. 17, 2012.
18
- 19 Breit, G.N., and J.L. Fisher, 1988, *Variations in the Abundance of Occluded Light Hydrocarbons*
20 *(C1–C5) and Their Relation to Diagenetic Changes, in the Salt Wash Member, Late Jurassic*
21 *Morrison Formation, Slick Rock District, San Miguel County, Colorado*, Open File
22 Report 88-586, U.S. Geological Survey.
23
- 24 Brown, B.T., et al., 1999, “The Influence of Weapons-Testing Noise on Bald Eagle Behavior,”
25 *Journal of Raptor Research* 33:227–232.
26
- 27 Brown, P.E., et al., 2000, “Evicting Bats When Gates Won’t Work: Unstable Mines and
28 Renewed Mining,” in K.C. Vories and D. Throgmorton (editors), *Bat Conservation and Mining:*
29 *A Technical Interactive Forum*, U.S. Department of the Interior, Office of Surface Mining; Bat
30 Conservation International; Coal Research Center, Southern Illinois University at Carbondale.
31
- 32 CCCD (Colorado Center for Community Development), 1995, *Unaweeep/Tabeguache Scenic and*
33 *Historic Byway Management Plan*. Aug.
34
- 35 CDA (Colorado Department of Agriculture), 2010, *Noxious Weed Management Program,*
36 *Colorado Weed Mapping*. Available at [http://www.colorado.gov/cs/Satellite/Agriculture-Main/](http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928184069)
37 [CDAG/1167928184069](http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1167928184069). Accessed Dec. 21, 2011.
38
- 39 CDA, 2011, *Noxious Weed Management Program, Noxious Weed List*. Available at
40 [http://www.colorado.gov/cs/Satellite?c=Page&cid=1174084048733&pagename=Agriculture-](http://www.colorado.gov/cs/Satellite?c=Page&cid=1174084048733&pagename=Agriculture-Main%2FCDAGLayout)
41 [Main%2FCDAGLayout](http://www.colorado.gov/cs/Satellite?c=Page&cid=1174084048733&pagename=Agriculture-Main%2FCDAGLayout). Accessed Dec. 21, 2011.
42

- 1 CDM (CDM, Inc.), 2010, *Plan of Operations Amendment, Denison Mines (USA) Corp., La Sal*
2 *Mines Complex, San Juan County, Utah*, prepared for Denison Mines (USA) Corp., Nov.
3 Available at http://www.blm.gov/pgdata/etc/medialib/blm/ut/moab_fo/La_Sal_Mines_
4 [Complex_Documents.Par.78220.File.dat/La%20Sal%20Mines%20Complex%20Plan%20of](http://www.blm.gov/pgdata/etc/medialib/blm/ut/moab_fo/La_Sal_Mines_Complex_Documents.Par.78220.File.dat/La%20Sal%20Mines%20Complex%20Plan%20of%20Operations.pdf)
5 [%20Operations.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/ut/moab_fo/La_Sal_Mines_Complex_Documents.Par.78220.File.dat/La%20Sal%20Mines%20Complex%20Plan%20of%20Operations.pdf). Accessed Feb. 28, 2012.
6
- 7 CDMG (Colorado Division of Minerals and Geology), 2002, *Best Practices in Abandoned Mine*
8 *Land Reclamation*, State of Colorado, Denver, Colo.
9
- 10 CDNR (Colorado Department of Natural Resources), 2008, *Colorado Mineral and Energy*
11 *Industry Activities, 2007*, Colorado Geological Survey. Available at [http://geosurvey.state.co.us/](http://geosurvey.state.co.us/SiteCollectionDocuments/EnergyResources/MER_07_FINAL.pdf)
12 [SiteCollectionDocuments/EnergyResources/MER_07_FINAL.pdf](http://geosurvey.state.co.us/SiteCollectionDocuments/EnergyResources/MER_07_FINAL.pdf). Accessed Feb. 22, 2012.
13
- 14 CDNR, 2011, *Uranium Mining in Colorado 2011*, Division of Reclamation Mining and Safety,
15 June 13.
16
- 17 CDNR, 2012, *Uranium Mining in Colorado 2012*, Division of Reclamation Mining and Safety,
18 Jan. 13.
19
- 20 CDOT (Colorado Department of Transportation), 2011, *DTD Data Access—Statistics, Maps, and*
21 *Data—Traffic Data*. Available at [http://apps.coloradodot.info/dataaccess/Traffic/index.cfm?](http://apps.coloradodot.info/dataaccess/Traffic/index.cfm?fuseaction=TrafficMain&Menu)
22 [fuseaction=TrafficMain&Menu](http://apps.coloradodot.info/dataaccess/Traffic/index.cfm?fuseaction=TrafficMain&Menu). Accessed Nov. 4, 2011.
23
- 24 CDOT, 2012, *Unaweep Tabeguache*.
25
- 26 CDPHE (Colorado Department of Public Health and Environment), 2003, *Total Maximum Daily*
27 *Load for Mercury in McPhee and Narraguinnep Reservoirs, Colorado, Phase I*, Technical
28 Report.
29
- 30 CDPHE, 2008a, *Total Maximum Daily Load Assessment, Silver Creek, Dolores County,*
31 *Colorado*, Technical Report, Water Quality Control Division. Available at [http://www.](http://www.colorado.gov/cs/Satellite/CDPHE-WQ/CBON/1251596042774)
32 [colorado.gov/cs/Satellite/CDPHE-WQ/CBON/1251596042774](http://www.colorado.gov/cs/Satellite/CDPHE-WQ/CBON/1251596042774). Accessed Oct. 22, 2012.
33
- 34 CDPHE, 2008b, *Total Maximum Daily Load Assessment San Miguel River Segments*
35 *(cogusm03a, cogusm03b, cogusm06a, cogusm06b) Zinc and Cadmium, San Miguel County,*
36 *Colorado*, Technical Report, Water Quality Control Division.
37
- 38 CDPHE, 2010, *Addenda/Errata to Total Maximum Daily Load Assessment, San Miguel River*
39 *(Segments cogusm03a, cogusm06a, cogusm06b) Cadmium, San Miguel County, Colorado,*
40 Technical Report, Water Quality Control Division.
41
- 42 CDPHE, 2011a, *2008 Air Pollutant Emissions Inventory*, on-line database, Denver, Colo.
43 Available at http://www.colorado.gov/airquality/inv_maps_2008.aspx. Accessed Nov. 23, 2011.
44

- 1 CDPHE, 2011b, *Air Quality Standards, Designations and Emission Budgets*, 5 CCR 1001-14,
2 Colorado Air Quality Control Commission, Denver, Colo. Available at <http://www.cdphe.state.co.us/regulations/airregs/5CCR1001-14.pdf>. Accessed Nov. 5, 2011.
3
4
5 CDPHE, 2011c, *Colorado 2010 Air Quality Data Report*, Denver, Colo. Available at
6 <http://www.colorado.gov/airquality/tech.aspx>. Accessed Nov. 5, 2011.
7
8 CDPHE, 2011d, *Energy Fuels Piñon Ridge Uranium Mill License Decision*, Radiation Program,
9 March 7.
10
11 CDPHE, 2012a, *Integrated Water Quality Monitoring and Assessment Report, State of*
12 *Colorado*, 2012 Update to the 2010 305(b) Report, prepared pursuant to Section 303(d) and
13 Section 305(b) of the Clean Water Act, Water Quality Control Division. Available at
14 <http://www.colorado.gov/cs/Satellite/CDPHE-WQCC/CBON/1251590894055>. Accessed
15 Oct. 22, 2012.
16
17 CDPHE, 2012b, *Colorado's Section 303(d) List of Impaired Waters and Monitoring and*
18 *Evaluation List, Water Quality*, 2012 Update to the 2010 303(d) List, prepared pursuant to
19 Section 303(d) and Section 305(b) of the Clean Water Act, Water Quality Control Division.
20 Available at <http://www.colorado.gov/cs/Satellite/CDPHE-WQCC/CBON/1251590894055>.
21 Accessed Oct. 22, 2012.
22
23 CDPHE, 2012c, Search results of public water supply systems within 5 miles from the ULP lease
24 tracts, by the Source Water Assessment and Protection Program, CDPHE, Dec.
25
26 CDRMS (Colorado Division of Reclamation, Mining, and Safety), 2011, *Monthly Coal Detail*
27 *Report, January through December 2010*, Feb. 15. Available at [http://mining.state.co.us/Reports/](http://mining.state.co.us/Reports/Detail2010.pdf)
28 [Detail2010.pdf](http://mining.state.co.us/Reports/Detail2010.pdf). Accessed Feb. 17, 2012.
29
30 CDRMS, 2012a, *Monthly Coal Summary Report, January through December 2011*, Feb. 7.
31 Available at <http://mining.state.co.us/Reports/CoalSummary2011.pdf>. Accessed Feb. 17, 2012.
32
33 CDRMS, 2012b, *County Operator Mining Data (Delta, Dolores, Mesa, Montezuma, Montrose,*
34 *and San Miguel Counties)*. Available at [http://mining.state.co.us/County%20Operator%](http://mining.state.co.us/County%20Operator%20Mining%20Data.htm)
35 [20Mining%20Data.htm](http://mining.state.co.us/County%20Operator%20Mining%20Data.htm). Accessed Feb. 17, 2012.
36
37 CDRMS 2012c, *Uranium Mining in Colorado 2012 (Updated July 18, 2012)*, Denver, Colo.
38
39 CDWR (Colorado Division of Water Resources), 2005, *Rules and Regulations for Water Well*
40 *Construction, Pump Installation, Cistern Installation, and Monitoring and Observation*
41 *Hole/Well Construction*, 2-CCR-402-2, Denver, Colo.
42
43 CDWR, 2007, *General Information about Well Permits in Division IV*, Jan. 17.
44

- 1 CDWR, 2011, *Colorado's Decision Support Systems (CDSS)*. Available at [http://cdss.state.co.us/
2 Pages/CDSSHome.aspx](http://cdss.state.co.us/Pages/CDSSHome.aspx). Accessed Dec. 23, 2011.
3
- 4 Cember, H., 1983, *Introduction to Health Physics*, Pergamon Press, Elmsford, N.Y.
5
- 6 CEQ (Council on Environmental Quality), 1997, *Environmental Justice Guidance under the
7 National Environmental Policy Act*, Executive Office of the President, Washington, D.C.
8
- 9 CGS (Colorado Geological Survey), 2003, *Ground Water Atlas of Colorado*, Special Publication
10 53, Division of Minerals and Geology, Department of Natural Resources, Denver, Colo.
11
- 12 Chafin, D.T., 2003, *Effect of the Paradox Valley Unit on the Dissolved-Solids Load of the
13 Dolores River near Bedrock, Colorado, 1988–2001*, Water Resources Investigation
14 Report 02-4275, U.S. Geological Survey.
15
- 16 Chapman, S.S., et al., 2006, *Ecoregions of Colorado* (color poster with map, descriptive text,
17 summary tables, and photographs; map scale 1:1,200,000), U.S. Geological Survey, Reston, Va.
18
- 19 Chenoweth, W.L., 1981, “The Uranium-Vanadium Deposits of the Uravan Mineral Belt and
20 Adjacent Areas, Colorado and Utah,” pp. 165–170 in *New Mexico Geological Society
21 Guidebook*, R.C. Epis and J.F. Callender (editors), 32nd Field Conference, Oct. 8–10.
22
- 23 Chenoweth, W.L., 1987, “Paradox Valley, Colorado: A Collapsed Salt Anticline,” pp. 339–342
24 in *Geological Society of America Centennial Field Guide—Rocky Mountain Section*, Vol. 2,
25 S.S. Beus (editor).
26
- 27 Chronic, H., and F. Williams, 2002, *Roadside Geology of Colorado*, Second Edition, Mountain
28 Press Publishing Co., Missoula, Mont.
29
- 30 CNHP (Colorado Natural Heritage Program), 2011a, *Rare Plant Guide List*. Available at
31 <http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master>. Accessed
32 Dec. 16, 2011.
33
- 34 CNHP, 2011b, *Element Occurrences by Quadrangle*. Available at [http://www.cnhp.colostate.
35 edu/download/gis.asp#maps](http://www.cnhp.colostate.edu/download/gis.asp#maps). Accessed Dec. 16, 2011.
36
- 37 COGCC (Colorado Oil and Gas Conservation Commission), 2012a, *COGCC Reports Portal—
38 Production Data Inquiry for Delta, Dolores, Mesa, Montezuma, Montrose, and San Miguel
39 Counties*, State of Colorado Department of Natural Resources. Available at [http://cogcc.state.
40 co.us/cogis](http://cogcc.state.co.us/cogis). Accessed Feb. 17, 2012.
41
- 42 COGCC, 2012b, *Colorado Oil and Gas Information System—Production Data Inquiries for
43 T43N, R18W, R19W, and R20W; T44N, R18W, and R19W; T45N, R18W; T46N, R17W; T47N,
44 R17W; and T48N, R17W, and R18W*, State of Colorado Department of Natural Resources,
45 Jan. 20.

- 1 Colorado Bat Working Group, 2005, *Colorado Working Bat Group Minutes 22 April 2005*,
2 Available at [http://www.cnhp.colostate.edu/teams/zoology/cbwg/pdfs/
3 CDWG%20Minutes%202005.pdf](http://www.cnhp.colostate.edu/teams/zoology/cbwg/pdfs/CDWG%20Minutes%202005.pdf). Accessed Sept. 19, 2012.
4
- 5 Colorado Bat Working Group, 2010a, *Bats of Colorado*. Available at [http://www.cnhp.colostate.
6 edu/teams/zoology/cbwg/batList.asp](http://www.cnhp.colostate.edu/teams/zoology/cbwg/batList.asp). Accessed Sept. 14, 2012.
7
- 8 Colorado Bat Working Group, 2010b, *The Colorado Bat Matrix*, Available at
9 <http://www.cnhp.colostate.edu/teams/zoology/cbwg/splash.asp>. Accessed Sept. 27, 2012.
10
- 11 Colorado Department of Education, 2011, *Colorado Education Statistics, Class of 2010
12 Graduation Data*. Available at <http://www.cde.state.co.us/cdereval/rv2010GradLinks.htm>.
13
- 14 Colorado Department of Local Affairs, 2011, *Economic Base Analysis—Result*.
15
- 16 Colorado Field Ornithologists, 2010a, *Checklist of the Birds of Colorado—Mesa County*,
17 Available at [http://www.coloradocountybirding.com/checklists/checklist.php?id=
18 40&flag=pdf&name=Mesa](http://www.coloradocountybirding.com/checklists/checklist.php?id=40&flag=pdf&name=Mesa). Accessed Nov. 4, 2011.
19
- 20 Colorado Field Ornithologists, 2010b, *Checklist of the Birds of Colorado—Montrose County*,
21 Available at [http://www.coloradocountybirding.com/checklists/checklist.
22 php?id=44&flag=pdf&name=Montrose](http://www.coloradocountybirding.com/checklists/checklist.php?id=44&flag=pdf&name=Montrose). Accessed Nov. 4, 2011.
23
- 24 Colorado Field Ornithologists, 2010c, *Checklist of the Birds of Colorado—San Miguel County*,
25 Available at [http://www.coloradocountybirding.com/checklists/checklist.
26 php?id=58&flag=pdf&name=SanMiguel](http://www.coloradocountybirding.com/checklists/checklist.php?id=58&flag=pdf&name=SanMiguel). Accessed Nov. 4, 2011.
27
- 28 Condon, S.M., 1997, *Geology of the Pennsylvanian and Permian Cutler Group and Permian
29 Kaibab Limestone in the Paradox Basin, Southeastern Utah and Southwestern Colorado*,
30 Bulletin 2000-P, U.S. Geological Survey.
31
- 32 Colorado State Demography Office, 2011, *Population Forecasts—Years (2000 to 2040)*.
33
- 34 Corona Research, Inc., 2009, *Colorado State Parks Marketing Assessment: Visitor Spending
35 Analysis, 2008–2009*.
36
- 37 Cotter, E., 2012, *RE: ULP Data Request 2*, e-mail from Cotter (S.M. Stoller Corporation, Grand
38 Junction, Colo.), to B. Cantwell (Argonne National Laboratory, Argonne, Ill.), Feb. 8.
39
- 40 Countess Environmental, 2006, *WRAP Fugitive Dust Handbook*, prepared for Western
41 Governors' Association, Denver, Colo., Sept. 7. Available at [http://www.wrapair.org/forums/
42 dejf/fdh/content/FDHandbook_Rev_06.pdf](http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf). Accessed Dec. 15, 2011.
43
- 44 Cowardin, L.M., et al., 1979, *Classification of Wetlands and Deepwater Habitats of the
45 United States*, FWS/OBS-79/31, U.S. Fish and Wildlife Service, Dec.

- 1 CPW (Colorado Parks and Wildlife), 2008, *Recommended Buffer Zones and Seasonal*
2 *Restrictions for Colorado Raptors*. Available at [http://wildlife.state.co.us/](http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Wildlife%20Species/LivingWithWildlife/RaptorBufferGuidelines2008.pdf)
3 [SiteCollectionDocuments/DOW/Wildlife Species/LivingWithWildlife/RaptorBufferGuidelines](http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Wildlife%20Species/LivingWithWildlife/RaptorBufferGuidelines2008.pdf)
4 [2008.pdf](http://wildlife.state.co.us/SiteCollectionDocuments/DOW/Wildlife%20Species/LivingWithWildlife/RaptorBufferGuidelines2008.pdf). Accessed Sept. 14, 2012.
5
- 6 CPW, 2011a, *Natural Diversity Information Source Data*, Colorado Department of Natural
7 Resources, Denver, Colo. Available at <http://ndis.nrel.colostate.edu/wildlife.html>. Accessed
8 Dec. 15, 2011.
9
- 10 CPW, 2011b, *Sandhill Crane*, Colorado Department of Natural Resources, Denver, Colo.
11 Available at <http://wildlife.state.co.us/WildlifeSpecies/Profiles/Birds/Pages/SandhillCrane.aspx>.
12 Accessed May 1, 2012.
13
- 14 CPW, 2012a, *CPW Bat Sites, Uranium Lease Tracts*. Report transmitted from CPW to Argonne
15 National Laboratory, Argonne, Ill., June 15.
16
- 17 Craig, L.C., 1982, *Uranium Potential of the Burro Canyon Formation in Western Colorado*,
18 Open File Report 82-222, U.S. Geological Survey.
19
- 20 CSFS (Colorado State Forest Service), 2009, *Durango District 2009 Annual Report*. Available at
21 http://csfs.colostate.edu/pdfs/FINAL_Durango_AR09.pdf. Accessed Feb. 21, 2012.
22
- 23 Cunnington, G.M., and L. Fahrig, 2010, "Plasticity in the Vocalizations of Anurans in Response
24 to Traffic Noise," *Acta Oecologica* 36:463–470.
25
- 26 Curtis, G.P., et al., 2006, "Simulation of Reactive Transport of Uranium (VI) in Groundwater
27 with Variable Chemical Conditions," *Water Resources Research* 42, W04404, doi:10.1029/
28 2005WR003979.
29
- 30 CWCB (Colorado Water Conservation Board), 2012, *Instream Flow Program*. Available at
31 <http://cwcb.state.co.us/environment/instream-flow-program/Pages/main.aspx>. Accessed
32 Feb. 17, 2012.
33
- 34 Delaney, D.K., et al., 1999, "Effects of Helicopter Noise on Mexican Spotted Owls," *Journal of*
35 *Wildlife Management* 63(1):60–76. Available at [http://www.rmrs.nau.edu/publications/](http://www.rmrs.nau.edu/publications/Delaney_1999b/Delaney_1999b.pdf)
36 [Delaney_1999b/Delaney_1999b.pdf](http://www.rmrs.nau.edu/publications/Delaney_1999b/Delaney_1999b.pdf). Accessed Aug. 13, 2009.
37
- 38 Denison (Denison Mines), 2008, *Sunday Mines Environmental Assessment*, CO-800-2007-
39 104EA, prepared for the U.S. Bureau of Land Management, Nov.
40
- 41 Denison, 2012a, *White Mesa*, Toronto, Ontario. Available at [http://www.denisonmines.com/](http://www.denisonmines.com/Document/Details/96)
42 [Document/Details/96](http://www.denisonmines.com/Document/Details/96). Accessed Feb. 21 and May 2, 2012.
43

- 1 Denison, 2012b, *Denison Outlines 2012 Operating Plans and Releases 2011 Production and*
2 *Sales Volume*, press release, Denison Mines, Toronto, Ontario, Jan. 16. Available at
3 <http://www.infomine.com/index/pr/PB148470.PDF>. Accessed Feb. 21 and May 2, 2012.
4
- 5 Denman, A.R., et al., 2003, “Assessment of Health Risks to Skin and Lung of Elevated Radon
6 Levels in Abandoned Mines,” *Health Physics* 85(6), Dec.
7
- 8 Denver District Court, 2012, Judicial Review Order, Sheep Mountain Alliance and Towns of
9 Telluride, and Ophir, Colorado v. Colorado Department of Public Health and Environment and
10 Energy Fuels Resources, Case Number 2011CV861, June 13, 2012.
11
- 12 DOE (U.S. Department of Energy), 1995a, *Final Environmental Assessment for the Uranium*
13 *Lease Management Program*, DOE/EA-1037, Grand Junction Projects Office.
14
- 15 DOE, 1995b, *Finding of No Significant Impact*, Uranium Lease Management Program.
16
- 17 DOE, 2003, *Estimating Radiation Risk from Total Effective Dose Equivalent (TEDE)*, ISCORS,
18 Technical Report No. 1, DOE/EH-412/0015/0802 Rev. 1, Air, Water and Radiation Information
19 Brief, Office of Environmental Policy and Guidance, Washington, D.C., Jan.
20
- 21 DOE, 2004, *Recommendations for the Preparation of Environmental Assessments and*
22 *Environmental Impact Statements*, Second Edition, Environmental, Safety, and Health, Office of
23 NEPA Policy and Compliance, Washington, D.C., Dec.
24
- 25 DOE, 2005, *Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties,*
26 *Utah, Final Environmental Impact Statement*, DOE/EIS-0355, July. Available at
27 <http://www.gjem.energy.gov/moab/eis/feis.htm>. Accessed May 8, 2012.
28
- 29 DOE, 2009a, *Approval of Exploration Plan Submitted for DOE Lease Tract C-G-26,*
30 *OLM-SRS-2009-150*, Office of Legacy Management, Oct. 19, 2009.
31
- 32 DOE, 2009b, *Approval of Exploration Plan Submitted for DOE Lease Tract C-LP-21,*
33 *OLM-SRS-2009-148*, Office of Legacy Management, Oct. 26, 2009.
34
- 35 DOE, 2009c, *Approval of Exploration Plan Submitted for DOE Lease Tract C-SR-13A,*
36 *OLM-SRS-2009-167*, Office of Legacy Management, Nov. 23, 2009.
37
- 38 DOE, 2009d, *DOE Uranium Leasing Program, U.S. Uranium Corporation—Work Scope for*
39 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2009-171, Nov. 30, 2009.
40
- 41 DOE, 2009e, *DOE Uranium Leasing Program, Golden Eagle Mining, Inc.—Work Scope for*
42 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2009-173, Nov. 30, 2009.
43
- 44 DOE 2009f, *DOE Uranium Leasing Program, Energy Fuels Resources—Work Scope for*
45 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2009-174, Nov. 30, 2009.

- 1 DOE, 2009g, *DOE Uranium Leasing Program, Golden Eagle Uranium—Work Scope for*
2 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2009-172, Nov. 30, 2009.
3
- 4 DOE, 2009h, *Approval of Exploration Plan Submitted for DOE Lease Tract C-CM-24*,
5 OLM-SRS-2009-106, Office of Legacy Management, Aug. 17, 2009.
6
- 7 DOE, 2009i, *Approval of Exploration Plan Submitted for DOE Lease Tract C-CM-25*,
8 OLM-SRS-2009-149, Office of Legacy Management, Oct. 27, 2009.
9
- 10 DOE, 2010a, *Approval of Exploration Plan Submitted for DOE Lease Tract C-SR-15A*,
11 OLM-LEK-2010-099, Office of Legacy Management, July 20, 2010.
12
- 13 DOE, 2010b, *Approval of Exploration Plan Submitted for DOE Lease Tract C-WM-17*,
14 OLM-LEK-2010-099, Office of Legacy Management, July 20, 2010.
15
- 16 DOE, 2010c, *Approval of Phase II Plan Submitted for DOE Lease Tract C-G-26 Mine*
17 *Development and Operation*, OLM-LEK-2010-105, Office of Legacy Management, Aug. 11,
18 2010.
19
- 20 DOE, 2010d, *DOE Uranium Leasing Program, Cotter Corporation—Work Scope for*
21 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2010-150, Nov. 22, 2010.
22
- 23 DOE, 2010e, *DOE Uranium Leasing Program, Golden Eagle Uranium—Work Scope for*
24 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2010-154, Nov. 22, 2010.
25
- 26 DOE, 2010f, *DOE Uranium Leasing Program, Energy Fuels Resources—Work Scope for*
27 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2010-152, Nov. 22, 2010.
28
- 29 DOE, 2011a, *Uranium Leasing Program Mineral Leasing Procedures Manual*,
30 *LMS/PRO/S04344-0.0*, prepared by S.M. Stoller Corporation for Office of Legacy Management,
31 April 26.
32
- 33 DOE, 2011b, *Radiation Protection of the Public and the Environment*, Order DOE O 458.1,
34 Office of Health, Safety and Security, Feb.
35
- 36 DOE 2011c, *DOE Uranium Leasing Program, Energy Fuels Resources—Work Scope for*
37 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2011-161, Oct. 6, 2011.
38
- 39 DOE 2011d, *DOE Uranium Leasing Program, Energy Fuels Resources—Work Scope for*
40 *Reclamation in-Lieu-of Royalty*, OLM-SRS-2011-094, June 22, 2011.
41
- 42 DOE 2011e, *DOE Order 458.1 Radiation Protection of the Public and the Environment*, Office
43 of Health, Safety, and Security, Washington, D.C., Feb.
44

- 1 DOE and CDRMS (Colorado Division of Reclamation, Mining, and Safety), 2012,
2 *Memorandum of Understanding between the U.S. Department of Energy and the Colorado*
3 *Division of Reclamation, Mining, and Safety*, Sept.
4
- 5 DOI (U.S. Department of the Interior), 2011, *Native American Consultation Database*, National
6 NAGPRA Online Databases, National Park Service.
7
- 8 DOI, 2012, *Final Environmental Impact Statement, Aspinall Unit Operations*, Bureau of
9 Reclamation, Jan. Available at [http://www.usbr.gov/uc/envdocs/eis/AspinallEIS/
10 Final%20Volume%20I.pdf](http://www.usbr.gov/uc/envdocs/eis/AspinallEIS/Final%20Volume%20I.pdf). Accessed Feb. 27, 2012.
11
- 12 DOJ (U.S. Department of Justice), 2009a, “Table 10: Offenses Known to Law Enforcement, by
13 State by Metropolitan and Nonmetropolitan Counties, 2009,” *Crime in the United States*, Federal
14 Bureau of Investigation, Criminal Justice Information Services Division.
15
- 16 DOJ, 2009b, “Table 80: Full-Time Law Enforcement Employees, by State by Metropolitan and
17 Nonmetropolitan Counties, 2009,” *Crime in the United States*, Federal Bureau of Investigation,
18 Criminal Justice Information Services Division, Sept.
19
- 20 DOT (U.S. Department of Transportation), 2010a, *Traffic Safety Facts, Dolores County,*
21 *Colorado, 2006–2010*, National Highway Transportation Safety Administration, Washington,
22 D.C. Available at [http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/
23 Counties/Colorado_Dolores%20County_2010.HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Dolores%20County_2010.HTM). Accessed Jan. 25, 2012.
24
- 25 DOT, 2010b, *Traffic Safety Facts, Mesa County, Colorado, 2006–2010*, National Highway
26 Transportation Safety Administration, Washington, D.C. Available at [http://www-nrd.nhtsa.dot.
27 gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Mesa%20County_
28 2010.HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Mesa%20County_2010.HTM). Accessed Jan. 25, 2012.
29
- 30 DOT, 2010c, *Traffic Safety Facts, Montrose County, Colorado, 2006–2010*, National Highway
31 Transportation Safety Administration, Washington, D.C. Available at [http://www-nrd.nhtsa.dot.
32 gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Montrose%20County_
33 2010.HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Montrose%20County_2010.HTM). Accessed Jan. 25, 2012.
34
- 35 DOT, 2010d, *Traffic Safety Facts, San Miguel County, Colorado, 2006–2010*, National Highway
36 Transportation Safety Administration, Washington, D.C. Available at [http://www-nrd.nhtsa.dot.
37 gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_San%20Miguel%20County_
38 2010.HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_San%20Miguel%20County_2010.HTM). Accessed Jan. 25, 2012.
39
- 40 DOT, 2010e, *Traffic Safety Facts, San Juan County, Utah, 2006–2010*, National Highway
41 Transportation Safety Administration, Washington, D.C. Available at [http://www-nrd.nhtsa.dot.
42 gov/departments/nrd-30/ncsa/STSI/49_UT/2010/Counties/Utah_San%20Juan%20County_
43 2010.HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/49_UT/2010/Counties/Utah_San%20Juan%20County_2010.HTM). Accessed Jan. 25, 2012.
44

- 1 DRI (Desert Research Institute), 2011, *RAWS USA Climate Archive*. Available at
2 <http://www.raws.dri.edu/>. Accessed Dec. 21, 2011.
3
- 4 Driver, C.J., 1994, *Ecotoxicity Literature Review of Selected Hanford Site Contaminants*,
5 PNL-9394, U.S. Department of Energy, Pacific Northwest Laboratory, March.
6
- 7 Eckerman, K., et al., 1999, *Cancer Risk Coefficients for Environmental Exposure to*
8 *Radionuclides*, EPA 402-R-99-001, Federal Guidance Report No. 12, prepared by Oak Ridge
9 National Laboratory for U.S. Environmental Protection Agency, Office of Radiation and Indoor
10 Air.
11
- 12 Edge Environmental, Inc., 2009, *Piñon Ridge Project Environmental Report, Montrose County,*
13 *Colorado*, prepared for Energy Fuels Resources Corporation, Lakewood, Colo., Nov. Available
14 at <http://www.co.montrose.co.us/DocumentView.aspx?DID=857>. Accessed Dec. 23, 2011.
15
- 16 EIA (Energy Information Administration), 2010, *2010 Domestic Uranium Production Report*,
17 June. Available at <http://www.eia.gov/uranium/production/annual/pdf/dupr.pdf>. Accessed
18 Feb. 23, 2012.
19
- 20 EIA, 2012, *Annual Energy Outlook 2012 with Projections to 2035*, DOE/EIA-0383(2012), June.
21
- 22 Eldred, K.M., 1982, “Standards and Criteria for Noise Control—An Overview,” *Noise Control*
23 *Engineering* 18(1):16–23.
24
- 25 Ellison, L.E., et al., 2003, *Colorado Bat Conservation Plan*, Colorado Committee of the Western
26 Bat Working Group. Available at [http://www.cnhp.colostate.edu/teams/zoology/cbwg/pdfs/](http://www.cnhp.colostate.edu/teams/zoology/cbwg/pdfs/ColoradoBatConservationPlanFebruary2004.pdf)
27 [ColoradoBatConservationPlanFebruary2004.pdf](http://www.cnhp.colostate.edu/teams/zoology/cbwg/pdfs/ColoradoBatConservationPlanFebruary2004.pdf). Accessed Sept. 19, 2012.
28
- 29 Energy Fuels (Energy Fuels, Inc.), 2009, *Mine Operations Plan: Piñon Ridge Mill Facility*
30 *Montrose County, Colorado*, Aug.
31
- 32 Energy Fuels, 2012a, *Piñon Ridge Mill*. Available at [http://www.pinonridgemill.com/](http://www.pinonridgemill.com/index.html)
33 [index.html](http://www.pinonridgemill.com/index.html). Accessed Feb. 21, 2012.
34
- 35 Energy Fuels, 2012b, *Energy Queen Mine*. Available at [http://www.energyfuels.com/](http://www.energyfuels.com/projects/energy-queen/index.html)
36 [projects/energy-queen/index.html](http://www.energyfuels.com/projects/energy-queen/index.html). Accessed Feb. 24, 2012.
37
- 38 Energy Fuels., 2012c, *Whirlwind Mine*. Available at [http://www.energyfuels.com/projects/](http://www.energyfuels.com/projects/whirlwind/index.html)
39 [whirlwind/index.html](http://www.energyfuels.com/projects/whirlwind/index.html). Accessed Feb. 28, 2012.
40
- 41 Energy Fuels, 2012d, *Piñon Ridge Mill: Schedule*. Available at [http://www.pinonridgemill.](http://www.pinonridgemill.com/schedule.html)
42 [com/schedule.html](http://www.pinonridgemill.com/schedule.html). Accessed May 7, 2012.
43

- 1 Energy Fuels Resources Corp. and Greg Lewicki and Associates, 2008, *Whirlwind Mine Plan of*
2 *Operations*, Vol. 1, prepared for Bureau of Land Management–Colorado, Grand Junction Field
3 Office, and Bureau of Land Management–Utah, Moab Field Office, March. Available at
4 http://www.uraniumwatch.org/whirlwindmine/ww_planofoperation.80331.pdf. Accessed
5 Feb. 1, 2012.
- 6
- 7 EPA (U.S. Environmental Protection Agency), 1974, *Information on Levels of Environmental*
8 *Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*,
9 550/9-74-004, Office of Noise Abatement and Control, March. Available at <http://www.nonoise.org/library/levels74/levels74.htm>. Accessed Sept. 26, 2011.
- 10
- 11
- 12 EPA, 1985, *Draft Background Information Document, Proposed Standard for Radon-222*
13 *Emissions to Air from Underground Uranium Mines*, EPA 520/1-85-010, Office of Radiation
14 Program, Washington, D.C., Feb. 14.
- 15
- 16 EPA, 1988, *Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion*
17 *Factors for Inhalation, Submersion, and Ingestion*, Federal Guidance Report No. 11, EPA-520/1-
18 88-020, Office of Radiation Programs, Washington, D.C.
- 19
- 20 EPA 1989a, *Risk Assessments, Environmental Impact Statement, NESHAPS for Radionuclides,*
21 *Background Information Document-Volume 2*, EPA/520/1-89-006-1, Office of Radiation
22 Programs, Washington, D.C., Sept.
- 23
- 24 EPA 1989b, *User’s Guide for the COMPLY-R Code (Revision 1)*, EPA 520/1-89-029, Office of
25 Radiation Programs, Washington, D.C., Oct.
- 26
- 27 EPA, 1993a, *External Exposure to Radionuclides in Air, Water, and Soil*, Federal Guidance
28 Report No. 12, EPA 402-R-93-081, Office of Radiation and Indoor Air, Washington, D.C.
- 29
- 30 EPA, 1993b, *Diffuse NORM: Waste Characterization and Preliminary Risk Assessment*, Office
31 of Radiation Programs, Washington, D.C.
- 32
- 33 EPA, 1994, *Estimating Radiogenic Cancer Risks*, EPA 402-R-93-076, Office of Radiation and
34 Indoor Air, Washington, D.C., June.
- 35
- 36 EPA, 2006, *How Air Pollution Affects the View*, EPA-456/F-06-001, April.
- 37
- 38 EPA, 2008, *Technical Report on Technologically Enhanced Naturally Occurring Radioactive*
39 *Materials from Uranium Mining, Volume 1: Mining and Reclamation Background*,
40 EPA 402-R-08-005, Office of Radiation and Indoor Air, Washington, D.C., April.
- 41
- 42 EPA, 2011a, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2009*,
43 EPA 430-R-11-005, April 15. Available at [http://www.epa.gov/climatechange/emissions/](http://www.epa.gov/climatechange/emissions/downloads11/US-GHG-Inventory-2011-Complete_Report.pdf)
44 [downloads11/US-GHG-Inventory-2011-Complete_Report.pdf](http://www.epa.gov/climatechange/emissions/downloads11/US-GHG-Inventory-2011-Complete_Report.pdf). Accessed Nov. 5, 2011.
- 45

- 1 EPA, 2011b, *National Ambient Air Quality Standards (NAAQS)*. Available at <http://www.epa.gov/air/criteria.html>, last updated Nov. 8, 2011. Accessed Dec. 15, 2011.
- 2
3
- 4 EPA, 2011c, *The Green Book Nonattainment Areas for Criteria Pollutants*. Available at
5 <http://www.epa.gov/oaqps001/greenbk/>, last updated Aug. 30, 2011. Accessed Nov. 5, 2011.
6
- 7 EPA, 2011d, *AirData: Access to Monitored Air Quality Data from EPA's Air Quality System*
8 *(AQS) Data Mart*. Available at <http://www.epa.gov/airdata/>, last updated Dec. 14, 2011.
9 Accessed Dec. 15, 2011.
10
- 11 EPA, 2012a, *Integrated Risk Information System (IRIS)*. Available at <http://www.epa.gov/IRIS>.
12 Accessed March 17, 2012.
13
- 14 EPA, 2012b, *CASTNET Home*. Available at <http://epa.gov/castnet/javaweb/index.html>. Accessed
15 Sept. 25, 2012.
16
- 17 EPS (Economic and Planning Systems), 2010, *Montrose County Socioeconomic Impact Study*,
18 prepared by EPS, Mike Retzlaff, and Lloyd Levy Consulting (EPS #19841), for Montrose
19 County, Colo., March.
20
- 21 Erwin, W.J., and R.H. Stasiak, 1979, "Vertebrate Mortality during Burning of a Reestablished
22 Prairie in Nebraska," *American Midland Naturalist* 101:247–249.
23
- 24 Faanes, C.A., 1987, *Bird Behavior and Mortality in Relation to Power Lines in Prairie Habitats*,
25 Fish and Wildlife Technical Report 7, U.S. Department of the Interior, Fish and Wildlife Service,
26 Washington, D.C.
27
- 28 Feeney, D., et al., 2004, *Big Game Migration Corridors in Wyoming*, Wyoming Open Spaces,
29 University of Wyoming, Laramie, Wyo., April. Available at [http://www.uwyoedu/openspaces/](http://www.uwyoedu/openspaces/docs/MigrationCorridors.pdf)
30 [docs/MigrationCorridors.pdf](http://www.uwyoedu/openspaces/docs/MigrationCorridors.pdf). Accessed Sept. 26, 2006.
31
- 32 Ferry C., et al. 2002, "An Experimental Method for Measuring the Radon-222 Emanation Factor
33 in Rocks," *Radiation Measurements* 35:570.
34
- 35 Finch, W.I., and J.F. Davis, 1985, "Sandstone-Type Uranium Deposits—An Introduction," in
36 *Geological Environments of Sandstone-Type Uranium Deposits*, Report IAEA-TECDOC-328,
37 International Atomic Energy Agency, March.
38
- 39 Fire Departments Network, 2011, *Colorado Fire Departments*. Available at [http://co.fire](http://co.firedepartments.net/fire/county/Colorado.html)
40 [departments.net/fire/county/Colorado.html](http://co.firedepartments.net/fire/county/Colorado.html).
41
- 42 Fischer, R.P., and L.S. Hilpert, 1952, *Geology of the Uravan Mineral Belt*, Bulletin 988-A,
43 U.S. Geological Survey.
44

- 1 Fleischner, T.L., 1994, "Ecological Costs of Livestock Grazing in Western North America,"
2 *Conservation Biology* 8(3):629–644.
3
- 4 Foos, A., 1999, *Geology of the Colorado Plateau*, Geology Department, University of Akron,
5 Ohio. Available at <http://www.nature.nps.gov/geology/education/foos/plateau.pdf>.
6
- 7 Foppen, R., and R. Reijnen, 1994, "The Effects of Car Traffic on Breeding Bird Populations in
8 Woodland. II. Breeding Dispersal of Male Willow Warblers (*Phylloscopus trochilus*) in Relation
9 to the Proximity of a Highway," *Journal of Applied Ecology* 32:95–101.
10
- 11 Ford, W.M., et al., 1999, "Effects of a Community Restoration Fire on Small Mammals and
12 Herpetofauna in the Southern Appalachians," *Forest Ecology and Management* 114:233–243.
13
- 14 Forman, R.T.T., and L.E. Alexander, 1998, "Roads and Their Major Ecological Effects," *Annual*
15 *Review of Ecology and Systematics* 29:207–231.
16
- 17 Francis, C.D., et al., 2009, "Noise Pollution Changes Avian Communities and Species
18 Interactions," *Current Biology* 19:1415–1419.
19
- 20 Fritz, J.N., 2006, *Potential Traditional Cultural Properties within 38 Uranium Leasing Tracts in*
21 *Southwestern Colorado: A Background Ethnographic Analysis*, prepared for S.M. Stoller
22 Corporation, Grand Junction, Colo., Nov. 1.
23
- 24 Gaines, W.L., et al., 2003, *Assessing the Cumulative Effects of Linear Recreation Routes on*
25 *Wildlife Habitats on the Okanogan and Wenatchee National Forests*, General Technical
26 Report PNW-GTR-586, U.S. Department of Agriculture, Forest Service, Pacific Northwest
27 Research Station, Portland, Ore.
28
- 29 GAO (Government Accounting Office), 2007, *Climate Change: Agencies Should Develop*
30 *Guidance for Addressing the Effects on Federal Land and Water Resources*, GAO-07-863, report
31 to Congressional requesters, Aug.
32
- 33 Gelbard, J.L., and J. Belnap, 2003, "Roads as Conduits for Exotic Plant Invasions in a Semiarid
34 Landscape," *Conservation Biology* 17(2):420–432.
35
- 36 George, J.L., et al. (editors), 2009, *Colorado Bighorn Sheep Management Plan 2009–2019*,
37 Special Report Number 81, Colorado Department of Natural Resources, Division of Wildlife,
38 Denver, Colo., Feb.
39
- 40 GJSentinel (*Grand Junction Daily Sentinel*), 2011, "Knockdown Phase at Cameo Power Plant,"
41 Aug. 15. Available at [http://www.gjsentinel.com/news/articles/knockdown_phase_at_](http://www.gjsentinel.com/news/articles/knockdown_phase_at_cameo_power)
42 [cameo_power](http://www.gjsentinel.com/news/articles/knockdown_phase_at_cameo_power). Accessed Feb. 23, 2012.
43
- 44 Golder Associates (Golder Associates, Inc.), 2009, *Hydrogeologic Report, Piñon Ridge Project,*
45 *Montrose County, Colorado*, technical report, Exhibit F1 of the Mill License Application.

- 1 Groves, C.R., and K. Steenhof, 1988, “Responses of Small Mammals and Vegetation to
2 Wildfires in Shadscale Communities of Southwestern Idaho,” *Northwest Science* 62:205–210.
3
- 4 Grout, M.A., and E.R. Verbeek, 1997, “Tectonic and Paleostress Significance of the Regional
5 Joint Network of the Central Paradox Basin, Utah and Colorado,” in *Laccolith Complexes of
6 Southeastern Utah: Time of Emplacement and Tectonic Setting—Workshop Proceedings*,
7 Friedman and Huffman (editors), Bulletin 2158, U.S. Geological Survey.
8
- 9 Habib, L, et al., 2007, “Chronic Industrial Noise Affects Pairing Success and Age Structure of
10 Ovenbirds *Seiurus aurocapilla*,” *Journal of Applied Ecology* 44:176–184.
11
- 12 Hand, J.L., et al., 2011, *Spatial and Seasonal Patterns and Temporal Variability of Haze and Its
13 Constituents in the United States*, Interagency Monitoring of Protected Visual Environments
14 (IMPROVE) Report V, June. Available at [http://vista.cira.colostate.edu/improve/publications/
15 Reports/2011/PDF/Cover_TOC.pdf](http://vista.cira.colostate.edu/improve/publications/Reports/2011/PDF/Cover_TOC.pdf). Accessed May 4, 2012.
16
- 17 Hanson, C.E., et al., 2006, *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-
18 06, prepared by Harris Miller Miller & Hanson Inc., Burlington, Mass., for U.S. Department of
19 Transportation, Federal Transit Administration, Washington, D.C., May. Available at
20 http://www.hmmh.com/rail_manuals01fta.html. Accessed Feb. 29, 2012.
21
- 22 Harris, C.M. (editor), 1991, *Handbook of Acoustical Measurements and Noise Control*, Third
23 Edition, McGraw-Hill Book Company, New York, N.Y.
24
- 25 Hawn, W.S., 2003, *Soil Survey of San Miguel Area, Colorado—Parts of Dolores, Montrose, and
26 San Miguel Counties*, U.S. Department of Agriculture, Natural Resources Conservation Service
27 in cooperation with the Colorado Agricultural Experiment Station, U.S. Department of the
28 Interior, Bureau of Land Management.
29
- 30 Hazel, J.E., 2000, *Sedimentary Response to Intrabasinal Salt Tectonism in the Upper Triassic
31 Chinle Formation, Paradox Basin, Utah*, Bulletin 2000-F, U.S. Geological Survey.
32
- 33 Hels, T., and E. Buchwald, 2001, “The Effect of Road Kills on Amphibian Populations,”
34 *Biological Conservation* 99:331–340.
35
- 36 Hinck, J.E., et al., 2010, “Biological Pathways of Exposure and Ecotoxicity Values for Uranium
37 and Associated Radionuclides,” Chapter D of *Hydrological, Geological, and Biological Site
38 Characterization of Breccia Pipe Uranium Deposits in Northern Arizona*, A.E. Alpine (editor),
39 Scientific Investigations Report 2010-5025, U.S. Geological Survey.
40
- 41 Hirsch, C.L., et al., 2006, *Range-wide Status of Colorado River Cutthroat Trout* (*Oncorhynchus
42 clarkia pleuriticus*): 2005, Colorado River Cutthroat Trout Conservation Team Report, Colorado
43 Division of Wildlife, Fort Collins, Colo.
44

- 1 Hite, R.J., and S.W. Lohman, 1973, *Geologic Appraisal of Paradox Basin Salt Deposits for*
2 *Waste Emplacement*, Open File Report 73-114, U.S. Geological Survey.
3
- 4 Hobbs, N.T., 1989, "Linking Energy Balance to Survival in Mule Deer: Development and Test
5 of a Simulation Model," *Wildlife Monographs* 101:1–39.
6
- 7 Hockin, D., et al., 1992, "Examination of the Effects of Disturbance on Birds with Reference to
8 Its Importance in Ecological Assessments," *Journal of Environmental Management* 36:253–286.
9
- 10 Hoerling, M., et al., 2008, *Climate Change in Colorado: A Synthesis to Support Water Resources*
11 *Management and Adaptation*, report prepared by the Western Water Assessment for the
12 Colorado Water Conservation Board.
13
- 14 Holmes, T.L., et al., 1993, "Responses of Wintering Grassland Raptors to Human Disturbance,"
15 *Wildlife Society Bulletin* 21:461–468.
16
- 17 Holsinger, K., 2012, *ULP PEIS: T&E Question*, e-mail from Holsinger (Uncompahgre Field
18 Office, Montrose, Colo.) to G.M. Jones (Bureau of Land Management), Aug. 27.
19
- 20 Horn, J., and S. Moore-McMillian, 2009, *Documentation of Historic Mine Features on*
21 *U.S. Department of Energy Uranium Lease Tracts in Western Colorado: Phase 3, Gateway*
22 *Area, Mesa County, Colorado*, prepared for S.M. Stoller Corporation, Grand Junction, Colo.,
23 Sept.
24
- 25 Hunt, C.B., 1974, *Natural Regions of the United States and Canada*, W.H. Freeman and
26 Company.
27
- 28 Hurshman, T., 1994, personal communication between Hurshman (Bureau of Land Management,
29 Montrose District Office) and R. Bleil (Rust Geotech), Oct. 17.
30
- 31 Hutson, S.S., et al., 2004, *Estimated Use of Water in the United States in 2000*, Circular 1268
32 (county-level data download), U.S. Geological Survey. Available at <http://water.usgs.gov/watuse/data/2000/index.html>. Accessed Oct. 23, 2012.
33
34
- 35 IAEA (International Atomic Energy Agency), 2000, *Methods of Exploitation of Different*
36 *Types of Uranium Deposits*, IAEA-TecDoc-1174, Sept. Available at http://www-pub.iaea.org/MTCD/publications/PDF/te_1174_prn.pdf. Accessed Feb. 1, 2012.
37
38
- 39 ICRP (International Commission on Radiological Protection), 1977, *Recommendations of the*
40 *International Commission on Radiological Protection*, ICRP Publication 26, Pergamon Press,
41 Oxford, U.K.
42
- 43 ICRP, 1979, *Limits for Intakes of Radionuclides by Workers*, ICRP Publication 30, Part 1,
44 Pergamon Press, Oxford, U.K.
45

- 1 ICRP, 1980, *Limits for Intakes of Radionuclides by Workers*, ICRP Publication 30, Part 2,
2 Pergamon Press, Oxford, U.K.
3
- 4 ICRP, 1981, *Limits for Intakes of Radionuclides by Workers*, ICRP Publication 30, Part 3,
5 Pergamon Press, Oxford, U.K.
6
- 7 ICRP, 1991, *Recommendations of the International Commission on Radiological Protection*,
8 ICRP Publication 60–1990, Pergamon Press.
9
- 10 ICRP, 1996, *Age-Dependent Doses to the Members of the Public from Intake of Radionuclides*,
11 *Part 5, Compilation of Ingestion and Inhalation Coefficients*, ICRP Publication 72, Pergamon
12 Press, Oxford, U.K.
13
- 14 ICRP, 2011, “ICRP Publication 115: Lung Cancer Risk from Radon and Progeny,” *Annals of the*
15 *ICRP* 40(1).
16
- 17 Information Services, 2001, *Gaining Ground or Shaky Ground? A Detailed Look at Tourism*
18 *Employment in the Southwest Colorado Travel Region*, Final Report, Dec. Available at
19 http://www.scan.org/tourism_report.pdf.
20
- 21 Ingelfinger, F., and S. Anderson, 2004, “Passerine Response to Roads Associated with Natural
22 Gas Extraction in a Sagebrush Steppe Habitat,” *Western North American Naturalist*
23 64(3):385–395.
24
- 25 IUC (International Uranium Corporation), 2003, *Description of the Affected Environment, White*
26 *Mesa Mill, Blanding, Utah, for Transport by Slurry Pipeline and Disposal of the Moab Tailings*,
27 Denver, Colo., May.
28
- 29 Ivahnenko, T., and J.L. Flynn, 2010, *Estimated Withdrawals and Use of Water in Colorado,*
30 *2005*, Scientific Investigations Report 2010-5002, U.S. Geological Survey.
31
- 32 Jackson, P.O., et al., 1980, *An Investigation of Radon-222 Emissions from Underground*
33 *Uranium Mines*, Pacific Northwest Laboratory, Richland, Wash., Feb.
34
- 35 Joesting, H.R., and P.E. Byerly, 1958, *Regional Geophysical Investigations of the Uravan Area,*
36 *Colorado*, Professional Paper 316-A, U.S. Geological Survey.
37
- 38 Jones, G., 2008, “Sensory Ecology: Noise Annoys Foraging Bats,” *Current Biology* 18:1098–
39 1100.
40
- 41 Kenny, J.F., et al., 2009, *Estimated Use of Water in the United States in 2005*, Circular 1344
42 (county-level data download), U.S. Geological Survey. Available at <http://water.usgs.gov/watuse/data/2005/>. Accessed Oct. 23, 2012.
43
44

- 1 Kirkham, R.M., and W.P. Rogers, 1981, *Earthquake Potential in Colorado: A Preliminary*
2 *Evaluation*, Colorado Department of Natural Resources, Open File Report 78-3, Colorado
3 Geological Survey.
4
- 5 Kirschbaum, M.A., and L.R.H. Biewick, 2012, “A Summary of the Coal Deposits in the
6 Colorado Plateau: Arizona, Colorado, New Mexico, and Utah,” in *Geological Assessment of*
7 *Coal in the Colorado Plateau: Arizona, Colorado, New Mexico, and Utah*, M.A. Kirschbaum
8 (editor), Professional Paper 1625-B, U.S. Geological Survey. Available at [http://pubs.usgs.gov/](http://pubs.usgs.gov/pp/p1625b/)
9 [pp/p1625b/](http://pubs.usgs.gov/pp/p1625b/). Accessed Sept. 12, 2012.
10
- 11 KKCO (KKCO NBC 11 News), 2007, “Xcel Officials Want to Shut Down Cameo Power Plant,”
12 Nov. 16. Available at <http://www.nbc11news.com/home/headlines/11498461.html>. Accessed
13 Feb. 24, 2012.
14
- 15 Knick, S.T., and D.L. Dyer, 1997, “Distribution of Black-Tailed Jackrabbit Habitat Determined
16 by GIS in Southwestern Idaho,” *Journal of Wildlife Management* 61(1):75–85.
17
- 18 Knight, R.L., and D.N. Cole, 1991, “Effects of Recreational Activity on Wildlife in Wildlands,”
19 pp. 238–247 in *Transactions of the Fifty-Sixth North American Wildlife and Natural Resources*
20 *Conference*, March 17–22, R.E. McCabe (editor), Wildlife Management Institute, Washington,
21 D.C.
22
- 23 Knight, R.L., and J.Y. Kawashima, 1993, “Responses of Raven and Red-Tailed Hawk
24 Populations to Linear Right-of-Ways,” *Journal of Wildlife Management* 57(2):266–271.
25
- 26 Kotamarthi, V.R., and D.J. Holdridge, 2007, *Process-Scale Modeling of Elevated Wintertime*
27 *Ozone in Wyoming*, ANL/EVS/R-07/7, prepared by Environmental Science Division, Argonne
28 National Laboratory, for BP America, Dec. Available at [http://www.ipd.anl.gov/anlpubs/](http://www.ipd.anl.gov/anlpubs/2008/01/60757.pdf)
29 [2008/01/60757.pdf](http://www.ipd.anl.gov/anlpubs/2008/01/60757.pdf). Accessed Sept. 23, 2011.
30
- 31 Krausman, P.R., et al., 2004, “Effects of Military Operations on Behavior and Hearing of
32 Endangered Sonoran Pronghorn,” *Wildlife Monographs* 157:1-41.
33
- 34 KREX (KREX NewsChannel), 2011, “Plans Set for Teardown of Cameo Power Plant,” Aug. 1.
35 Available at [http://www.krextv.com/news/around-the-region/Plans-Set-For-Teardown-of-](http://www.krextv.com/news/around-the-region/Plans-Set-For-Teardown-of-Cameo-Power-Plant-126550668.html)
36 [Cameo-Power-Plant-126550668.html](http://www.krextv.com/news/around-the-region/Plans-Set-For-Teardown-of-Cameo-Power-Plant-126550668.html). Accessed Feb. 23, 2011.
37
- 38 Larkin, R.P., 1996, *Effects of Military Noise on Wildlife: A Literature Review*, Technical
39 Report 96/21, U.S. Army Construction Engineering Research Laboratory, Champaign, Ill.
40
- 41 Lehman, R.N., and J.W. Allendorf, 1989, “The Effects of Fire, Fire Exclusion, and Fire
42 Management on Raptor Habitats in the Western United States,” in *Proceedings of the Western*
43 *Raptor Management Symposium and Workshop, 1987, October 26–28, Boise, Idaho*, Scientific
44 and Technical Series No. 12, National Wildlife Federation, Washington, D.C.
45

- 1 Lincoln, F.C., et al., 1998, *Migration of Birds*, U.S. Fish and Wildlife Service Circular 16,
2 U.S. Department of the Interior, Washington, D.C. Available at [http://www.npwrc.usgs.gov/
3 resource/birds/migratio/index.htm](http://www.npwrc.usgs.gov/resource/birds/migratio/index.htm). Accessed Oct. 20, 2006.
4
- 5 Lyon, A.G., and S.H. Anderson, 2003, “Potential Gas Development Impacts on Sage Grouse
6 Nest Initiation and Movement,” *Wildlife Society Bulletin* 31(2):486–491.
7
- 8 Lyon, L.J., et al., 2000a, “Direct Effects of Fire and Animal Responses,” in *Wildland Fire in
9 Ecosystems: Effects of Fire on Fauna*, General Technical Report RMRS-GTR-42-Vol. 1,
10 J.K. Smith (editor), U.S. Department of Agriculture, Forest Service, Rocky Mountain Research
11 Station, Ogden, Utah. Available at http://www.fs.fed.us/rm/pubs/rmrs_gtr042_1.pdf. Accessed
12 Aug. 14, 2009.
13
- 14 Lyon, L.J., et al., 2000b, “Fire Effects on Animal Populations,” in *Wildland Fire in Ecosystems:
15 Effects of Fire on Fauna*, General Technical Report RMRS-GTR-42-Vol. 1, J.K. Smith (editor),
16 U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Ogden,
17 Utah. Available at http://www.fs.fed.us/rm/pubs/rmrs_gtr042_1.pdf. Accessed Aug. 14, 2009.
18
- 19 Mackun, P., and S. Wilson, 2011, *Population Distribution and Change: 2000 to 2010*,
20 U.S. Census Bureau, C2010BR-01, March.
21
- 22 Mancini, K.M., et al., 1988, *Effects of Aircraft Noise and Sonic Booms on Domestic Animals and
23 Wildlife: A Literature Synthesis*, NERC-88/29, U.S. Fish and Wildlife Service National Ecology
24 Research Center, Ft. Collins, Colo.
25
- 26 Maxell, B.A., 2000, *Management of Montana’s Amphibians: A Review of Factors That May
27 Present a Risk to Population Viability and Accounts on the Identification, Distribution,
28 Taxonomy, Habitat Use, Natural History, and the Status and Conservation of Individual Species*,
29 a report (Order Number 43-0343-0-0224) to Northern Regional Office (Region 1), USDA Forest
30 Service, Missoula, Mont., Sept. 20. Available at [http://www.isu.edu/~petechar/iparc/
31 Maxell_Mgmt.pdf](http://www.isu.edu/~petechar/iparc/Maxell_Mgmt.pdf). Accessed Aug. 10, 2009.
32
- 33 McAda, C.W., 2003, *Flow Recommendations to Benefit Endangered Fishes in the Colorado and
34 Gunnison Rivers*, final report, Upper Colorado River Endangered Fish Recovery Program, July.
35
- 36 McLellan, B.N., and D.M. Shackleton, 1988, “Grizzly Bears and Resource-Extraction Industries:
37 Effects of Roads on Behaviour, Habitat Use and Demography,” *Journal of Applied Ecology*
38 25:451–46.
39
- 40 Meehan K.A., 2001, *Effects of Exposure to Continuous Low Doses of Ionizing Radiation*, Cape
41 Technikon Theses & Dissertations, Paper 156.
42
43

- 1 Menge, C.W., et al., 1998, *FHWA Traffic Noise Model[®] Technical Manual*, FHWA-PD-96-010
2 and DOT-VNTSC-FHWA-98-2, prepared by U.S. Department of Transportation, John A. Volpe
3 National Transportation Systems Center, Cambridge, Mass., for U.S. Department of
4 Transportation, Federal Highway Administration, Washington, D.C., Feb.
5
- 6 Miller, N.P., 2002, "Transportation Noise and Recreational Lands," *Internoise 2002*, Dearborn,
7 Mich., Aug. 19–21, 2002. Available at <http://www.hmmh.com/cmsdocuments/N011.pdf>.
8 Accessed Dec. 22, 2011.
9
- 10 Molenaar, C.M., 1987, "Correlation Chart — Paradox Basin and Vicinity," in *Geology of*
11 *Cataract Canyon and Vicinity*, J.A. Campbell (editor), Four Corners Geological Society,
12 10th Field Conference.
13
- 14 Montrose County, 2010, *Montrose County Socioeconomic Impact Study*, Department of
15 Community Development and Board of County Commissioners, March 31.
16
- 17 Moore, S., and J. Horn, 2010, *Documentation of Five Historic Mine Features on*
18 *U.S. Department of Energy Uranium Lease Tracts in Western Colorado: Phase 2, Uravan/Long*
19 *Park Area, Montrose County, Colorado*, prepared for S.M. Stoller Corporation, Grand Junction
20 Colo., Jan.
21
- 22 Moore-McMillian, S., and J. Omvig, 2009, *Documentation of Historic Mine Features on*
23 *U.S. Department of Energy Uranium Lease Tracts in Western Colorado: Phase 1, Slick Rock*
24 *Area, San Miguel County, Colorado*, prepared for S.M. Stoller Corporation, Grand Junction,
25 Colo., July.
26
- 27 Morgan, T.A., et al., 2006, *The Four Corners Timber Harvest and Forest Products Industry,*
28 *2002*, Resource Bulletin RMRS-RB-7, U.S. Department of Agriculture, Forest Service, Rocky
29 Mountain Research Station, May.
30
- 31 Morris, R.E., et al., 2009, "Simulation of Wintertime High Ozone Concentrations in
32 Southwestern Wyoming," presented at the 8th Annual CMAS Conference, Chapel Hills, N.C.,
33 Oct. 19–21. Available at [http://www.cmascenter.org/conference/2009/abstracts/morris_](http://www.cmascenter.org/conference/2009/abstracts/morris_simulation_wintertime_2009.pdf)
34 [simulation_wintertime_2009.pdf](http://www.cmascenter.org/conference/2009/abstracts/morris_simulation_wintertime_2009.pdf). Accessed Sept. 23, 2011.
35
- 36 Mullins, T.E., and V.L. Freeman, 1954, *Lithofacies of the Salt Wash Member of the Morrison*
37 *Formation*, Trace Elements Investigations Report 341, U.S. Geological Survey.
38
- 39 Muth, R.T., et al., 2000, *Flow and Temperature Recommendations for Endangered Fishes in the*
40 *Green River Downstream of Flaming Gorge Dam*, final report, Upper Colorado River
41 Endangered Fish Recovery Program, Denver, Colo., Sept.
42
- 43 Nash, T., 2002, *Hydrogeochemical Investigations of Historic Mining Districts, Central Western*
44 *Slope of Colorado, Including Influence on Surface-Water Quality*, Digital Data Series DDS-73,
45 U.S. Geological Survey, Denver, Colo.

- 1 National Research Council, 2011, *Uranium Mining in Virginia: Scientific, Technical,*
2 *Environmental, Human Health and Safety, and Regulatory Aspects of Uranium Mining and*
3 *Processing in Virginia*, prepublication copy, Washington, D.C., Dec. 19.
4
- 5 National Research Council, 2012, *Uranium Mining in Virginia: Scientific, Technical,*
6 *Environmental, Human Health and Safety, and Regulatory Aspects of Uranium Mining and*
7 *Processing in Virginia*, prepublication version, Washington, D.C.
8
- 9 NatureServe, 2011, *NatureServe Explorer: An Online Encyclopedia of Life, Version 7.1,*
10 Arlington, Va. Available at <http://www.natureserve.org/explorer>. Accessed Dec. 16 and 19,
11 2011.
12
- 13 Naugle, D.E., et al., 2004, “West Nile Virus: Pending Crisis for Greater Sage-Grouse,” *Ecology*
14 *Letters* 7:704–713.
15
- 16 NCDC (National Climatic Data Center), 2011a, *Climates of the States (CLIM60): Climate of*
17 *Colorado*, National Oceanic and Atmospheric Administration, Satellite and Information Service.
18 Available at <http://cdo.ncdc.noaa.gov/cgi-bin/climatenormals/climatenormals.pl>. Accessed
19 Nov. 5, 2011.
20
- 21 NCDC, 2011b, *Storm Events*, National Oceanic and Atmospheric Administration, Satellite and
22 Information Service. Available at [http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~](http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms)
23 *Storms*. Accessed Dec. 22, 2011.
24
- 25 NCDC, 2011c, *National Climatic Data Center*. Available at [http://www.ncdc.noaa.gov/oa/](http://www.ncdc.noaa.gov/oa/ncdc.html)
26 *ncdc.html*. Accessed Dec. 21, 2011.
27
- 28 NCDC, 2012, *National Climatic Data Center*. Available at [http://www.ncdc.noaa.gov/oa/](http://www.ncdc.noaa.gov/oa/ncdc.html)
29 *ncdc.html*. Accessed Dec. 12, 2012.
30
- 31 NCES (National Center for Education Statistics), 2011, *Search for Public School Districts*.
32
- 33 NCRP (National Council on Radiation Protection and Measurement), 2009, *Ionizing Radiation*
34 *Exposure of the Population of the United States*, Report No. 160, Bethesda, Md.
35
- 36 Newman, G.J., and E.F. Redente, 2001, “Long-Term Plant Community Development as
37 Influenced by Revegetation Techniques,” *Journal of Range Management* 54(6):717–724.
38
- 39 NRC (U.S. Nuclear Regulatory Commission), 1979, *Final Environmental Statement Related to*
40 *Operation of White Mesa Uranium Project Energy Fuels Nuclear, Inc.*, May.
41
- 42 NRC 1987, *Regulatory Guide 3.59 (Task WM 407-4) Methods for Estimating Radioactive and*
43 *Toxic Airborne Source Terms for Uranium Milling Operations*, U.S. Nuclear Regulatory
44 Commission, Office of Nuclear Regulatory Research, Washington, D.C., March.
45

- 1 NRCS (Natural Resources Conservation Service), 2009, *Soil Survey Geographic (SSURGO)*
2 *Database for Mesa, Montrose, and San Miguel Counties, Colorado.*
3
- 4 NRCS, 2010, *The Twelve Orders of Soil Taxonomy*. Available at [http://soils.usda.gov/](http://soils.usda.gov/technical/soil_orders)
5 [technical/soil_orders](http://soils.usda.gov/technical/soil_orders). Accessed Feb. 11, 2010.
6
- 7 NRCS, 2012a, *Custom Soil Resource Report for Mesa County Area, Colorado; and*
8 *Uncompahgre National Forest Area, Colorado, Parts of Mesa, Montrose, Ouray, and*
9 *San Miguel Counties: Cross Section through Gateway Lease Tracts (Parts 1 and 2),*
10 U.S. Department of Agriculture, Jan. 9.
11
- 12 NRCS, 2012b, *Custom Soil Resource Report for San Miguel Area, Colorado, Parts of Dolores,*
13 *Montrose, and San Miguel Counties: Cross Section through Uravan Lease Tracts (Parts 1*
14 *and 2),* U.S. Department of Agriculture, Jan. 9.
15
- 16 NRCS, 2012c, *Custom Soil Resource Report for San Miguel Area, Colorado, Parts of Dolores,*
17 *Montrose, and San Miguel Counties: Cross Section through Paradox (North) Lease Tracts*
18 *(Parts 1 and 2),* U.S. Department of Agriculture, Jan. 9.
19
- 20 NRCS, 2012d, *Custom Soil Resource Report for San Miguel Area, Colorado, Parts of Dolores,*
21 *Montrose, and San Miguel Counties: Cross Section through Paradox (South) Lease Tracts*
22 *(Parts 1 and 2),* U.S. Department of Agriculture, Jan. 9.
23
- 24 NRCS, 2012e, *Custom Soil Resource Report for San Miguel Area, Colorado, Parts of Dolores,*
25 *Montrose, and San Miguel Counties: Cross Section through Slick Rock (North) Lease Tracts*
26 *(Parts 1 and 2),* U.S. Department of Agriculture, Jan. 10.
27
- 28 NRCS, 2012f, *Custom Soil Resource Report for San Miguel Area, Colorado, Parts of Dolores,*
29 *Montrose, and San Miguel Counties: Cross Section through Slick Rock (South) Lease Tracts*
30 *(Parts 1 and 2),* U.S. Department of Agriculture, Jan. 10.
31
- 32 NRCS, 2012g, *Custom Soil Resource Report for San Miguel Area, Colorado, Parts of Dolores,*
33 *Montrose, and San Miguel Counties: Slick Rock Lease Tract 12 (Parts 1 and 2),*
34 U.S. Department of Agriculture, Jan. 10 and 11.
35
- 36 NRCS, 2012h, *Soil Quality/Soil Health Publications—Available Water Capacity.*
37
- 38 NSTC (National Science and Technology Council), 2008, *Scientific Assessment of the Effects of*
39 *Global Climate Change on the United States*, report of the Committee on Environment and
40 Natural Resources, May.
41
- 42 NWCC (National Wind Coordinating Committee), 2002, *Permitting of Wind Energy*
43 *Facilities: A Handbook*, prepared by the NWCC Siting Subcommittee, Aug. Available at
44 <http://www.nationalwind.org/assets/publications/permitting2002.pdf>. Accessed Sept. 26, 2011.
45

- 1 Olendorff, R.R., and R.N. Lehman, 1986, *Raptor Collisions with Utility Lines: An Analysis*
2 *Using Subjective Field Observations*, prepared by U.S. Department of the Interior, Bureau of
3 Land Management, Sacramento, Calif., for Pacific Gas and Electric Company, San Ramon,
4 Calif., Feb.
5
- 6 Otak, Inc., 2009, *Visual Resource Inventory*, prepared for U.S. Department of the Interior,
7 Bureau of Land Management, Uncompahgre Field Office, Montrose, Colo., Sept.
8
- 9 Ott, R., et al., 2010, *Perspectives on Ute Ethnohistory in West Central Colorado*, prepared by the
10 Dominguez Archaeological Research Group, Inc., for the Ute Indian Tribe of the Uintah and
11 Ouray Reservation; Ute Mountain Ute Tribe; Southern Ute Indian Tribe; and for the Bureau of
12 Land Management's Colorado State Office and its Glenwood Springs, Grand Junction, and
13 Uncompahgre Field Offices, Dec. 6.
14
- 15 Paschke, M.W., et al., 2005, "Long-Term Effects of Biosolids on Revegetation of Disturbed
16 Sagebrush Steppe in Northwestern Colorado," *Restoration Ecology* 13(3):545–551.
17
- 18 Pater, L.L., et al., 2009, "Recommendations for Improved Assessment of Noise Impacts on
19 Wildlife," *Journal of Wildlife Management* 73(5):788–795.
20
- 21 Peters (Peters Geosciences), 2011, *Updated Technical Report on Energy Fuels Resources*
22 *Corporation's Energy Queen Project, San Juan County, Utah*, prepared for Energy Fuels, Inc.,
23 March 15.
24
- 25 Piñon Ridge Mill, 2012, *The Piñon Ridge Mill*. Available at [http://www.Piñonridgemill.com/](http://www.Piñonridgemill.com/index.html)
26 [index.html](http://www.Piñonridgemill.com/index.html). Accessed Feb. 21, 2012.
27
- 28 Power Consulting, 2010, *A Socioeconomic Analysis of the Impact of the Proposed Piñon Ridge*
29 *Uranium Project on Western Mesa, Montrose, and San Miguel Counties, Colorado*, prepared for
30 Sheep Mountain Alliance, Dec.
31
- 32 Red Cliff Mine, 2012, *Red Cliff Mine: EIS Schedule*. Available at [http://www.redcliffmine.com/](http://www.redcliffmine.com/schedule.htm)
33 [schedule.htm](http://www.redcliffmine.com/schedule.htm). Accessed Feb. 22, 2012.
34
- 35 Reed, A.D., 2006, *Class I Cultural Resource Inventory of 38 Department of Energy Uranium*
36 *Lease Withdrawal Areas, Mesa, Montrose, and San Miguel Counties, Colorado*, prepared by
37 Alpine Archaeological Consultants, Inc., Montrose, Colo., for S.M. Stoller Corporation, Grand
38 Junction, Colo., July 6.
39
- 40 Reed, A.D., and M.D. Metcalf, 1999, *Colorado Prehistory: A Context for the Northern Colorado*
41 *River Basin*, Colorado Council of Professional Archaeologists, Denver, Colo.
42
- 43 Reijnen, R., and R. Foppen, 1994, "The Effects of Car Traffic on Breeding Bird Populations in
44 Woodland. I. Evidence of Reduced Habitat Quality for Willow Warblers (*Phylloscopus*
45 *trochilus*) Breeding Close to a Highway," *Journal of Applied Ecology* 32:85–94.

- 1 Ritter, B., 2007, *Colorado Climate Action Plan: A Strategy to Address Global Warming*, Nov.
2
- 3 Rogers, Z., 2011, personal communication from Rogers (Energy Fuels Resources Corporation,
4 Lakewood, Colo.) to Y.-S. Chang (Argonne National Laboratory, Argonne, Ill.), Nov. 8.
5
- 6 Rosentreter, R., et al., 2007, *A Field Guide to Biological Soil Crusts of Western U.S. Drylands—*
7 *Common Lichens and Bryophytes*, U.S. Government Printing Office, Denver, Colo.
8
- 9 RRC Associates and Rees Consulting, Inc., 2011, *Regional Housing Needs Assessment Ouray*
10 *and San Miguel Counties*, Sept. Available at <http://www.smrha.org/NeedsAssessment2011.pdf>.
11
- 12 Sakoda, A., et al., 2010, “Difference of Natural Radioactivity and Radon Emanation Fraction
13 Among Constituent Minerals of Rock or Soil,” *Applied Radiation and Isotopes* 68(12):24–52.
14
- 15 Salek, M.E., 2011, *Colorado Highway Quickfacts*. Available at [http://www.mesalek.com/](http://www.mesalek.com/colo/facts.html)
16 [colo/facts.html](http://www.mesalek.com/colo/facts.html). Accessed Sept. 24, 2012.
17
- 18 Salt, A.N., and T.E. Hullar, 2010, “Responses of the Ear to Low Frequency Sounds, Infrasound
19 and Wind Turbines,” *Hearing Research* 268:12–21.
20
- 21 San Miguel County, 2008. *San Miguel Comprehensive Development Plan, Adopted August 3,*
22 *1978; Amended through February 13, 2008*. Available at [http://www.sanmiguelcounty.org/](http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP.COUNTY.PART1.2008.pdf)
23 [departments/planning/documents/SMCMP.COUNTY.PART1.2008.pdf](http://www.sanmiguelcounty.org/departments/planning/documents/SMCMP.COUNTY.PART1.2008.pdf). Accessed Dec. 2, 2011.
24
- 25 Sargent, M.S., and K.S. Carter (editors), 1999, *Managing Michigan Wildlife: A Landowners*
26 *Guide*, Michigan United Conservation Clubs, East Lansing, Michigan. Available at
27 [http://www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/landowners_](http://www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/landowners_guide/Introduction/index.htm)
28 [guide/Introduction/index.htm](http://www.michigandnr.com/publications/pdfs/huntingwildlifehabitat/landowners_guide/Introduction/index.htm). Accessed Sept. 13, 2012.
29
- 30 Sawyer, H., et al., 2005, “Mule Deer and Pronghorn Migration in Western Wyoming,” *Wildlife*
31 *Society Bulletin* 33(4):1266–1273.
32
- 33 Sawyer, H., et al., 2006, “Winter Habitat Selection of Mule Deer before and during Development
34 of a Natural Gas Field,” *The Journal of Wildlife Management* 70(2):396–403.
35
- 36 Schooley, R.L., et al., 1996, “Can Shrub Cover Increase Predation Risk for a Desert Rodent?,”
37 *Canadian Journal of Zoology* 74:157–163.
38
- 39 Schwinning, S., et al., 2008, “Sensitivity of the Colorado Plateau to Change: Climate,
40 Ecosystems, and Society,” *Ecology and Society* 13(2):28 (online journal). Available at
41 <http://www.ecologyandsociety.org/vol13/iss2/art28/>. Accessed Oct. 23, 2012.
42
- 43 SENES (SENES Consultants Limited), 2009, *Risk Assessment for Proposed Uranium and*
44 *Vanadium Mill at the Piñon Ridge Property*, prepared by SENES Consultants Limited,
45 Englewood, Colo., for Energy Fuels Resources Corporation, Lakewood, Colo., Nov.

- 1 Sharpe, P.B., and B. Van Horne, 1998, "Influence of Habitat on Behavior of Townsend's Ground
2 Squirrel (*Spermophilus townsendii*)," *Journal of Mammalogy* 79:906–918.
3
- 4 Shawe, D.R., 1970, *Structure of the Slick Rock District and Vicinity, San Miguel and Dolores*
5 *Counties, Colorado*, Professional Paper 576-C, U.S. Geological Survey.
6
- 7 Shawe, D.R., 2011, *Uranium-Vanadium Deposits of the Slick Rock District, Colorado*,
8 Professional Paper 576-F, U.S. Geological Survey.
9
- 10 Shawe, D.R., et al., 1968, *Stratigraphy of Slick Rock District and Vicinity, San Miguel and*
11 *Dolores Counties, Colorado*, Professional Paper 576-A, U.S. Geological Survey.
12
- 13 Simmons, G.C., 1957, *Contact of the Burro Canyon Formation with the Dakota Sandstone, Slick*
14 *Rock District, Colorado, and Correlation of the Burro Canyon Formation*, Trace Elements
15 Investigations Report 552, U.S. Geological Survey.
16
- 17 Simmons, J.A., et al., 2008, "Forest to Reclaimed Mine Land Use Change Leads to Altered
18 Ecosystem Structure and Function," *Ecological Applications* 18:104–118.
19
- 20 SJPLC (San Juan Public Lands Center), 2011, *San Juan Public Lands Draft Land Management*
21 *Plan + Draft Environmental Impact Statement: Supplement to the Draft Environmental Impact*
22 *Statement*, Aug. Available at <http://ocs.fortlewis.edu/forestplan/supplement/cover.htm>. Accessed
23 May 8, 2012.
24
- 25 S.M. Stoller Corporation, 2012, *Compiled Field Surveys of U.S. Department of Energy Uranium*
26 *Leasing Program Mine Reclamation Sites, 2000–2012*, prepared by S.M. Stoller Corporation,
27 Contractor to U.S. Department of Energy Office of Legacy Management.
28
- 29 Sonoran Institute, 2009, *Uranium Mining, Tourism, and Outdoor Recreation in Gateway,*
30 *Colorado*, July.
31
- 32 Spears, C.F., and E.V. Kleven, 1978, *Soil Survey of Mesa County Area, Colorado*,
33 U.S. Department of Agriculture, Soil Conservation Service in Cooperation with the Colorado
34 Agricultural Experiment Station, Feb.
35
- 36 Steele, B.A., 1985, *Preliminary Report on and Measured Sections of the Middle Jurassic*
37 *Entrada Sandstone and Wanakah Formation near Placerville, Southwestern Colorado*, Open
38 File Report 85-446, U.S. Geological Survey.
39
- 40 Steenhof, K., et al., 1993, "Nesting by Raptors and Common Ravens on Electrical Transmission
41 Line Towers," *Journal of Wildlife Management* 57(2):271–281.
42

- 1 Stoesser, D.B., et al., 2007, *Preliminary Integrated Geologic Map Databases for the*
2 *United States: Central States—Montana, Wyoming, Colorado, New Mexico, North Dakota,*
3 *South Dakota, Nebraska, Kansas, Oklahoma, Texas, Iowa, Missouri, Arkansas, and Louisiana,*
4 Open File Report 2005-1351, Version 1.2, U.S. Geological Survey, Dec.
5
- 6 Strait, R., et al., 2007, *Final Colorado Greenhouse Gas Inventory and Reference Case*
7 *Projections 1990–2020*, Center for Climate Strategies, Oct. Available at
8 <http://www.coloradoclimate.org/ewebeditpro/items/O14F13894.pdf>. Accessed Nov. 5, 2011.
9
- 10 Streubel, D., 2000, *Ovis canadensis (Bighorn Sheep)*. Available at [http://imnh.isu.edu/](http://imnh.isu.edu/digitalatlas/bio/mammal/Hoofed/bish/sheep.htm)
11 [digitalatlas/bio/mammal/Hoofed/bish/sheep.htm](http://imnh.isu.edu/digitalatlas/bio/mammal/Hoofed/bish/sheep.htm). Accessed Sept. 12, 2012.
12
- 13 Sydnor, R.S., and E.F. Redente, 2000, “Long-Term Plant Community Development on Topsoil
14 Treatments Overlying a Phytotoxic Growth Medium, *Journal of Environmental Quality*
15 29:1778–1786.
16
- 17 Thompson, D.J., and J.A. Jenks, 2007, “Cougar Mortality Attributed to Electrocutation from
18 Power Lines in South Dakota,” *The Prairie Naturalist* 39(314):191–193.
19
- 20 Thornbury, W.D., 1965, *Regional Geomorphology of the United States*, John Wiley & Sons, Inc.,
21 New York, N.Y.
22
- 23 Topper, R., et al., 2003, *Groundwater Atlas of Colorado*, Special Publication 53, Colorado
24 Geological Survey.
25
- 26 Tri-State (Tri-State Generation and Transmission Association, Inc.), 2011, *Baseload Resources:*
27 *Nucla Station*. Available at <http://www.tristategt.org/AboutUs/baseload-resources.cfm>. Accessed
28 Dec. 23, 2011.
29
- 30 Tri-State, 2012a, *Baseload Resources*. Available at [http://www.tristategt.org/AboutUs/baseload-](http://www.tristategt.org/AboutUs/baseload-resources.cfm)
31 [resources.cfm](http://www.tristategt.org/AboutUs/baseload-resources.cfm). Accessed Feb. 21, 2012.
32
- 33 Tri-State, 2012b, *Nucla-Sunshine Project*. Available at [http://www.tristategt.org/Transmission/](http://www.tristategt.org/Transmission/Nucla/Nucla-Sunshine-project.cfm)
34 [Nucla/Nucla-Sunshine-project.cfm](http://www.tristategt.org/Transmission/Nucla/Nucla-Sunshine-project.cfm). Accessed Feb. 21, 2012.
35
- 36 Tri-State, 2012c, *Phase 2 of Nucla-Sunshine Project On Schedule*. Available at
37 <http://www.poweringthewest.org/2011/09/16/phase-2-of-nucla-sunshine-project-on-schedule/>.
38 Accessed Feb. 22, 2012.
39
- 40 Trinity Engineering Associates, Inc., 2007, *CAP88-PC Version 3.0 User Guide*, Cincinnati,
41 Ohio, Dec. 9.
42
- 43 Trombulak, S.C., and C.A. Frissell, 2000, “Review of Ecological Effects of Roads on Terrestrial
44 and Aquatic Communities,” *Conservation Biology* 14(1):18–30.
45

- 1 Tweto, O., 1979, *Geologic Map of Colorado (Scale 1:500,000)*, U.S. Geological Survey,
2 prepared in cooperation with the Colorado Geological Survey.
3
- 4 Twitty, E., 2008, *Guide to Assessing Historic Radium, Uranium, and Vanadium Mining*
5 *Resources in Montrose and San Miguel Counties*, prepared by Mountain States Historical,
6 Boulder, Colo., for Western Colorado Interpretive Association, Delta, Colo., July.
7
- 8 UCDC (Utah Conservation Data Center), 2012, *Common Name Wild Turkey—Rio Grande;*
9 *Scientific Name—Meleagris gallopavo intermedia*, State of Utah Natural Resources, Division of
10 Wildlife Resources, Salt Lake City, Utah. Available at [http://dwrcdc.nr.utah.gov/rsgis2/](http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=melegain)
11 [Search/Display.asp?FINm=melegain](http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=melegain). Accessed Nov. 13, 2012.
12
- 13 UDEQ (Utah Department of Environmental Quality), 2011, *Title V Operating Permit: Lisbon*
14 *Natural Gas Processing Plant*, Division of Air Quality, Aug. 4. Available at
15 http://168.178.6.8/daq_public_pdfs/120397-10034pmt.20110804.pdf. Accessed Feb. 28, 2012.
16
- 17 UDEQ, 2012a, *Denison/White Mesa Uranium Mill*. Available at [http://www.deq.utah.gov/](http://www.deq.utah.gov/businesses/denison/index.htm)
18 [businesses/denison/index.htm](http://www.deq.utah.gov/businesses/denison/index.htm). Accessed Feb. 21, 2012.
19
- 20 UDEQ, 2012b, *Denison/White Mesa Uranium Mill*. Available at [http://www.radiationcontrol.](http://www.radiationcontrol.utah.gov/Uranium_Mills/denison/index.htm)
21 [utah.gov/Uranium_Mills/denison/index.htm](http://www.radiationcontrol.utah.gov/Uranium_Mills/denison/index.htm). Accessed Oct. 24, 2012.
22
- 23 UDNR (Utah Department of Natural Resources), 2011, *Utah Mining 2010*, Circular 114,
24 Utah Geological Survey. Available at <http://geology.utah.gov/online/c/c-114.pdf>. Accessed
25 May 7, 2012.
26
- 27 UDNR, 2012, *Utah Minerals Program*, Division of Oil, Gas, and Mining. Available at
28 <http://linux1.ogm.utah.gov/WebStuff/wwwroot/minerals/mineralsoperatorsbypermit.php>.
29 Accessed Feb. 28, 2012.
30
- 31 UDOGM (Utah Division of Oil, Gas, and Mining), 2012, *Utah Oil and Gas: Annual Production*
32 *Summary—Grand and San Juan Counties, Utah*, Department of Natural Resources. Available at
33 http://oilgas.ogm.utah.gov/Data_Center/DataCenter.cfm#production. Accessed Feb. 17, 2012.
34
- 35 UDOT (Utah Department of Transportation), 2011, *Traffic on Utah Highways, 2010*,
36 Systems Planning and Programming Division, Traffic Analysis Section. Available at
37 <http://www.udot.utah.gov/main/f?p=100:pg:0:::V,T:,529>. Accessed Nov. 7, 2011.
38
- 39 UDWR (Utah Division of Wildlife Resources), 2003, *Utah Division of Wildlife Resources*
40 *Statewide Management Plan for Mule Deer*, State of Utah Natural Resources, Division of
41 Wildlife Resources, Salt Lake City, Utah. Available at [http://www.wildlife.utah.gov/hunting/](http://www.wildlife.utah.gov/hunting/biggame/pdf/mule_deer_plan.pdf)
42 [biggame/pdf/mule_deer_plan.pdf](http://www.wildlife.utah.gov/hunting/biggame/pdf/mule_deer_plan.pdf). Accessed June 12, 2006.
43
- 44 UDWR, 2005, *Statewide Management Plan for Elk*, Salt Lake City, Utah. Available at
45 <http://utah.ptfs.com/awweb/awarchive?type=file&item=10836>. Accessed Oct. 23, 2012.

- 1 UDWR, 2008, *Utah Conservation Data Center*, State of Utah Natural Resources, Division
2 of Wildlife Resources, Salt Lake City, Utah. Available at [http://dwrcdc.nr.utah.gov/ucdc/
3 default.asp](http://dwrcdc.nr.utah.gov/ucdc/default.asp). Accessed Oct. 3, 2008.
4
- 5 UGS (Utah Geological Survey), 2011, *Utah Mining 2010*, Circular 114, Utah Department of
6 Natural Resources.
7
- 8 UGS, 2012, *Table 2.8—Coal Production and Recoverable Reserves in Utah by Coal Mine,
9 2011–2011*. Available at <http://geology.utah.gov/emp/energydata/statistics/coal2.0/pdf/T2.8.pdf>.
10 Accessed Feb. 17, 2012.
11
- 12 UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation), 1993,
13 *Sources and Effects of Ionizing Radiation, UNSCEAR 1993 Report to the General Assembly,
14 with Scientific Annexes*, United Nations, New York, N.Y.
15
- 16 UNSCEAR, 2008, *Effects of Ionizing Radiation, UNSCEAR 2006 Report to the General
17 Assembly with Scientific Annexes, Annex E Sources-to-Effects Assessment for Radon in Homes
18 and Workplaces*, United Nations, New York, N.Y.
19
- 20 UNSCEAR, 2010, *Sources and Effects of Ionizing Radiation, UNSCEAR 2008 Report to the
21 General Assembly with Scientific Annexes, Vol. 1*, United Nations, New York, N.Y.
22
- 23 U.S. Bureau of the Census, 2011a, *County Business Patterns, 2009*.
24
- 25 U.S. Bureau of the Census, 2011b, *State and County Quickfacts*.
26
- 27 U.S. Bureau of the Census, 2011c, *USA Counties*.
28
- 29 U.S. Bureau of the Census, 2011d, *Population Estimates, All Incorporated Places 2000–2009*.
30
- 31 U.S. Bureau of the Census, 2011e, *American Factfinder*.
32
- 33 U.S. Bureau of the Census, 2011f, *American Factfinder, 2005–2009 American Community
34 Survey 5-Year Estimates*.
35
- 36 U.S. Bureau of the Census, 2011g, *2010 Census Summary File 1: Table P5*.
37
- 38 U.S. Bureau of the Census, 2011h, *2009 American Community Survey 5-Year Estimates
39 (2005–2009): Table B17017*.
40
- 41 U.S. Bureau of the Census, 2011i, *The Most Populous Counties and Incorporated Places in 2010
42 Colorado: 2000 and 2010*, CB11-CN.39, Feb. 23.
43
- 44 U.S. Bureau of the Census, 2011j, *The Most Populous Counties and Incorporated Places in 2010
45 Utah: 2000 and 2010*, CB11-CN.53, Feb. 24.

- 1 USDA (U.S. Department of Agriculture), 2004, *Understanding Soil Risks and Hazards: Using*
2 *Soil Survey to Identify Areas with Risks and Hazards to Human Life and Property*, G.B. Muckel
3 (editor).
4
- 5 USDA, 2007a, *Census of Agriculture: Colorado State and County Data, Volume 1, Geographic*
6 *Area Series*, National Agricultural Statistics Service, Washington, D.C.
7
- 8 USDA, 2007b, *Census of Agriculture: Colorado State and County Data, Volume 1, Chapter 2,*
9 *County Level Data, County Summary Highlights: 2007*, National Agricultural Statistics Service,
10 Washington, D.C.
11
- 12 USDA, 2008, *Gypsy Moth Management in the United States: A Cooperative Approach*,
13 U.S. Forest Service, June. Available at <http://na.fs.fed.us/pubs/detail.cfm?id=8523>. Accessed
14 Feb. 27, 2012.
15
- 16 USDA, 2009a, *2007 Census of Agriculture—United States, Summary and State Data, Vol. 1*
17 *Geographic Area Series, Part 51*, Report AC-07-A-51, National Agricultural Statistics Service,
18 Dec.
19
- 20 USDA, 2009b, *Environmental Assessment: Operation and Maintenance Plan for Manti-La Sal*
21 *National Forest Ditch Bill Easements*, U.S. Forest Service, Dec. Available at
22 http://www.fs.fed.us/r4/mantilasal/projects/ditch_bill/final_ea_122109.pdf. Accessed
23 Feb. 28, 2012.
24
- 25 USDA, 2011a, *Decision Memo: Kimmerle Uranium Exploration Drilling, Manti-La Sal National*
26 *Forest*, U.S. Forest Service, Sept. Available at http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/78849_FSPLT2_056443.pdf. Accessed
27 Feb. 28, 2012.
28
29
- 30 USDA, 2011b, *Schedule of Proposed Actions (SOPA) 10/01/2011 to 12/31/2011, San Juan*
31 *National Forest*, U.S. Forest Service, Oct. Available at [http://www.fs.fed.us/sopa/](http://www.fs.fed.us/sopa/components/reports/sopa-110213-2011-10.html)
32 [components/reports/sopa-110213-2011-10.html](http://www.fs.fed.us/sopa/components/reports/sopa-110213-2011-10.html). Accessed Feb. 21, 2012.
33
- 34 USDA, 2011c, *Decision Memo: Agricultural Irrigation and Livestock Watering System*,
35 U.S. Forest Service, Oct. Available at [http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5343833.pdf)
36 [stelprdb5343833.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5343833.pdf). Accessed Feb. 28, 2012.
37
- 38 USDA, 2011d, *Nationwide Aerial Application of Fire Retardant on National Forest System*
39 *Land: Record of Decision*, U.S. Forest Service, Dec. Available at [http://a123.g.akamai.net/7/](http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/71615_FSPLT2_066634.pdf)
40 [123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/71615_FSPLT2_](http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/71615_FSPLT2_066634.pdf)
41 [066634.pdf](http://a123.g.akamai.net/7/123/11558/abc123/forestservic.download.akamai.com/11558/www/nepa/71615_FSPLT2_066634.pdf). Accessed Feb. 27, 2012.
42
- 43 USDA, 2012a, *Schedule of Proposed Actions (SOPA) 01/01/2012 to 03/31/2012, San Juan*
44 *National Forest*, U.S. Forest Service. Available at [http://www.fs.fed.us/sopa/components/](http://www.fs.fed.us/sopa/components/reports/sopa-110213-2012-01.pdf)
45 [reports/sopa-110213-2012-01.pdf](http://www.fs.fed.us/sopa/components/reports/sopa-110213-2012-01.pdf). Accessed Feb. 27, 2012.

- 1 USDA, 2012b, *Colorado Ditch Bill Act*, U.S. Forest Service. Available at <http://www.fs.usda.gov/detail/r2/landmanagement/?cid=STELPRDB5177473>. Accessed Feb. 28, 2012.
- 2
3
- 4 USDA, 2012c, *Schedule of Proposed Actions (SOPA) 01/01/2012 to 03/31/2012, Grand Mesa, Uncompahgre and Gunnison National Forests*, U.S. Forest Service. Available at
5 <http://www.fs.fed.us/sopa/components/reports/sopa-110204-2012-01.pdf>. Accessed
6 Feb. 27, 2012.
7
8
- 9 USDA, 2012d, *Schedule of Proposed Actions (SOPA) 01/01/2012 to 03/31/2012, Manti-La Sal National Forest*, U.S. Forest Service. Available at <http://www.fs.fed.us/sopa/components/reports/sopa-110410-2012-01.pdf>. Accessed Feb. 28, 2012.
10
11
12
- 13 USDA and DOI (U.S. Department of the Interior), 2007, *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development*, BLM/WO/ST-06/021+3071/REV 07, Denver, Colo. Available at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html. Accessed Nov. 2, 2012.
14
15
16
17
- 18 U.S. Department of Commerce, 2011, *Local Area Personal Income*, Bureau of Economic
19 Analysis.
20
- 21 U.S. Department of Labor, 2010a, *Local Area Unemployment Statistics: County Data*, Bureau of
22 Labor Statistics.
23
- 24 U.S. Department of Labor, 2010b, *Local Area Unemployment Statistics: State Data*, Bureau of
25 Labor Statistics.
26
- 27 U.S. Department of Labor, 2011, *Local Area Unemployment Statistics: Monthly County Data*,
28 Bureau of Labor Statistics.
29
- 30 USFS (U.S. Forest Service), 2005, *Threatened, Endangered, and Sensitive Plants and Animals*,
31 Forest Service Manual (FMS) 2670, U.S. Department of Agriculture, Aug. 29.
32
- 33 USFS and BLM, 2012, *San Juan Public Lands—Draft Land Management Plan and Draft
34 Environmental Impact Statement*, San Juan Public Lands Center. Available at
35 <http://ocs.fortlewis.edu/forestplan/DEIS/tocMain.asp>.
36
- 37 USFS, et al., 2010, *Federal Land Managers' Air Quality Related Values Work Group (FLAG):
38 Phase I Report—Revised (2010)*, Natural Resource Report NPS/NRPC/NRR–2010/232, Oct.
39 Available at http://www.nature.nps.gov/air/pubs/pdf/flag/FLAG_2010.pdf. Accessed Sept. 19,
40 2012.
41
- 42 USFWS (U.S. Fish and Wildlife Service), 1990, *Humpback Chub Recovery Plan*, Denver, Colo.
43 Available at http://ecos.fws.gov/docs/recovery_plan/900919c.pdf. Accessed Nov. 25, 2011.
44

- 1 USFWS, 2002a, *Bonytail (Gila elegans) Recovery Goals: Amendment and Supplement to the*
2 *Bonytail Chub Recovery Plan*, USFWS Mountain-Prairie Region 6, Denver, Colo.
3
- 4 USFWS, 2002b, *Colorado Pikeminnow (Ptychocheilus lucius) Recovery Goals: Amendment and*
5 *Supplement to the Colorado Squawfish Recovery Plan*, USFWS Mountain-Prairie Region 6,
6 Denver, Colo.
7
- 8 USFWS, 2002c, *Razorback Sucker (Xyrauchen texanus) Recovery Goals: Amendment and*
9 *Supplement to the Razorback Sucker Recovery Plan*, USFWS Mountain-Prairie Region 6,
10 Denver, Colo.
11
- 12 USFWS, 2003, *Preliminary Estimates of Waterfowl Hunter Activity and Harvest during the 2001*
13 *and 2002 Hunting Seasons, Administrative Report—July 2003*, Division of Migratory Bird
14 Management, Harvest Surveys Section, Laurel, Md.
15
- 16 USFWS, 2009a, *USFWS Block-Cleared Areas for Black-Footed Ferret Surveys in Colorado*,
17 Sept. Available at [http://www.fws.gov/mountain-prairie/species/mammals/blackfootedferret/
18 statewide_block_clearance_map_090809_final.pdf](http://www.fws.gov/mountain-prairie/species/mammals/blackfootedferret/statewide_block_clearance_map_090809_final.pdf). Accessed Feb. 7, 2012.
19
- 20 USFWS, 2009b, *Consultation Guidance for DeMinimis Water Depletions in the Upper Colorado*
21 *River Basin*, U.S. Fish and Wildlife Service, Mountain-Prairie Region, Lakewood, Colo.
22
- 23 USFWS, 2011a, *IPaC—Information, Planning, and Conservation System*. Available at
24 <http://ecos.fws.gov/ipac/>. Accessed Dec. 16, 2011.
25
- 26 USFWS, 2011b, *Critical Habitat Portal, FWS Critical Habitat for Threatened and Endangered*
27 *Species*. Available at <http://criticalhabitat.fws.gov/crithab/>. Accessed Dec. 16, 2011.
28
- 29 USFWS, 2011c, *The Effects of Noise on Wildlife*, Available at [http://www.fws.gov/
30 windenergy/docs/Noise.pdf](http://www.fws.gov/windenergy/docs/Noise.pdf). Accessed Nov. 14, 2011.
31
- 32 USFWS, 2012, *National Wetlands Inventory*, Interactive Mapping Program. Available at
33 <http://www.fws.gov/wetlands>. Accessed Sept. 17, 2012.
34
- 35 USGCRP (U.S. Global Change Research Program), 2009, *Global Climate Change Impacts in the*
36 *United States: A State of Knowledge Report from the U.S. Global Change Research Program*,
37 Cambridge University Press, New York, N.Y.
38
- 39 USGS (U.S. Geological Survey), 2001, *Federally Owned Coal, Federal Lands, and Coal Quality*
40 *in the Colorado Plateau Region*, FS-001-01, Feb.
41
- 42 USGS, 2003, *Physiographic Regions*. Available at <http://tapestry.usgs.gov/physiogr/physio.html>.
43 Accessed Dec. 21, 2011.
44

- 1 USGS, 2004, *National Gap Analysis Program, Provisional Digital Land Cover Map for the*
2 *Southwestern United States*, Version 1.0, RS/GIS Laboratory, College of Natural Resources,
3 Utah State University, Logan, Utah.
4
- 5 USGS, 2005, *Southwest Regional GAP Analysis Project—Land Cover Descriptions*, RS/GIS
6 Laboratory, College of Natural Resources, Utah State University, Logan, Utah.
7
- 8 USGS, 2007, *National Gap Analysis Program, Digital Animal-Habitat Models for the*
9 *Southwestern United States*, Version 1.0, Center for Applied Spatial Ecology, New Mexico
10 Cooperative Fish and Wildlife Research Unit, New Mexico State University. Available at
11 <http://fws-nmcfwru.nmsu.edu/swregap/HabitatModels/default.htm>. Accessed March 15, 2010,
12 and Dec. 16, 2011.
13
- 14 USGS, 2011a, *Hydrologic Unit Maps*. Available at <http://water.usgs.gov/GIS/huc.html>.
15 Accessed Dec. 21, 2011.
16
- 17 USGS, 2011b, *National Water Information System (NWIS)*.
18
- 19 USGS, 2012a, *Earthquake Data Base Search Results: 100 km Radius from Circle Center Point*
20 *Latitude 38.336N, Longitude 108.859W*, National Earthquake Information Center, Sept. 10.
21
- 22 USGS, 2012b, *Glossary of Terms on EQ Maps*, Earthquake Hazards Program.
23
- 24 USGS Canyonlands Research Station, 2006, *An Introduction to Biological Soil Crusts*. Available
25 at <http://www.soilcrust.org/crust101.htm>. Accessed Jan. 11, 2012.
26
- 27 Valdez, R.A., et al., 1992, *Dolores River Native Fish Suitability Study*, BIO/WEST Report
28 No. TR-272-02, final report prepared for Utah Division of Wildlife Resources, Salt Lake City,
29 Utah.
30
- 31 Walker, J.D., and J.W. Geissman, 2009, *Geologic Time Scale*, Geological Society of America.
32
- 33 WAPA (Western Area Power Administration), 2012a, *Transmission Line Management Issues on*
34 *Forested Rights-of-Way: A Brief Overview*. Available at [http://ww2.wapa.gov/sites/western/](http://ww2.wapa.gov/sites/western/transmission/infrastructure/Documents/Western-FS-EIS/Projectoverview.pdf)
35 [transmission/infrastructure/Documents/Western-FS-EIS/Projectoverview.pdf](http://ww2.wapa.gov/sites/western/transmission/infrastructure/Documents/Western-FS-EIS/Projectoverview.pdf). Accessed
36 Feb. 22, 2012.
37
- 38 WAPA, 2012b, *Proposed Project Description Summary*. Available at [http://ww2.wapa.gov/](http://ww2.wapa.gov/sites/western/transmission/infrastructure/Documents/Western-FS-EIS/projectdescription.pdf)
39 [sites/western/transmission/infrastructure/Documents/Western-FS-EIS/projectdescription.pdf](http://ww2.wapa.gov/sites/western/transmission/infrastructure/Documents/Western-FS-EIS/projectdescription.pdf).
40 Accessed Feb. 22, 2012.
41
- 42 Watts, K.R., 2000, *Effects of the Paradox Valley Unit on Dissolved Solids, Sodium, and Chloride*
43 *in the Dolores River near Bedrock, Colorado, Water Years 1988–98*, Water-Resources
44 Investigations Report 00-4011, U.S. Geological Survey.
45

- 1 Watts, S.T., and S.T. Knick, 1996, “The Influence of Vegetation, Soils, and Disturbance on
2 Townsend’s Ground Squirrel Abundance,” in *BLM/IDARNG Research Project Final Report*,
3 Vol. 2, U.S. Geological Survey, Forest and Rangeland Ecosystem Science Center, Snake River
4 Field Station, Boise, Idaho.
5
- 6 Weir, Jr., et al., 1983, *Regional Hydrology of the Dolores River Basin, Eastern Paradox Basin,*
7 *Colorado, and Utah*, Water-Resources Investigations Report 83-4217, U.S. Geological Survey.
8
- 9 WEST, Inc., 2007, *Wildlife and Habitat Baseline Study for the Whiskey Ridge Wind Power*
10 *Project, Kittitas County, Washington*, prepared for Whiskey Ridge Power Partners LLC, May.
11 Available at [http://www.efsec.wa.gov/wildhorse/Supplemental%20EIS/DSEIS/](http://www.efsec.wa.gov/wildhorse/Supplemental%20EIS/DSEIS/WHISKEYRIDGE_BASELINE%20REPORT_FINAL%20Revision%2008-05-08.pdf)
12 [WHISKEYRIDGE_BASELINE%20REPORT_FINAL%20Revision%2008-05-08.pdf](http://www.efsec.wa.gov/wildhorse/Supplemental%20EIS/DSEIS/WHISKEYRIDGE_BASELINE%20REPORT_FINAL%20Revision%2008-05-08.pdf). Accessed
13 Aug. 6, 2009.
14
- 15 Westerling, A.L., et al., 2006, “Warming and Earlier Spring Increase Western U.S. Forest
16 Wildfire Activity,” *Science* 313:940–943.
17
- 18 Whitfield, M.S., et al., 1983, *Regional Hydrology of the Blanding-Durango Area, Southern*
19 *Paradox Basin, Utah, and Colorado*, Water Resources Investigations Report 83-4218,
20 U.S. Geological Survey.
21
- 22 WHO (World Health Organization), 2007, *Extremely Low Frequency Fields*, Environmental
23 Health Criteria 238, WHO Press, Geneva, Switzerland.
24
- 25 Widmann, B.L., 1997, “Fault Number 2286—Paradox Valley Graben,” in *Quaternary Fault and*
26 *Fold Database of the United States*, U.S. Geological Survey. Available at [http://earthquakes.](http://earthquakes.usgs.gov/regional/qfaults)
27 [usgs.gov/regional/qfaults](http://earthquakes.usgs.gov/regional/qfaults). Accessed Dec. 19, 2011.
28
- 29 Williams, G., 2012, *Subject: Notification of Ore Shipments from Cotter Corporation Canon City*
30 *Mill*, letter from Williams to L. Kilpatrick.
31
- 32 Wong, I.G., and J.R. Humphrey, 1989, “Contemporary Seismicity, Faulting, and the State of
33 Stress in the Colorado Plateau,” *Geological Society of America* 101(9):1127–1146.
34
- 35 Woodward, C., 2012a, *CPW Bat Sites Uranium Least (sic) Tracts Analysis by Species*. Subject:
36 CPW Internal Review Comments on DOE Uranium Leasing Program PDEIS. Attachment to
37 e-mail from J. Holst (Energy Liaison, Colorado Parks and Wildlife, Southwest Region, Durango,
38 Colo.) to L. Kilpatrick (Realty Officer, Office of Legacy Management, U.S. Department of
39 Energy, Westminster, Colo.), June 15, 2012.
40
- 41 Woodward, C., 2012b, *CPW Bat Sites Uranium Lease Tracts Analysis, v2*, Subject: CPW
42 Internal Review Comments on DOE Uranium Leasing Program PDEIS. Attachment to e-mail
43 from J. Holst (Energy Liaison, Colorado Parks and Wildlife, Southwest Region, Durango, Colo.)
44 to L. Kilpatrick (Realty Officer, Office of Legacy Management, U.S. Department of Energy,
45 Westminster, Colo.), June 15, 2012.

- 1 WRCC (Western Regional Climate Center), 1997, *Average Annual Precipitation in Colorado*.
2 Available at <http://www.wrcc.dri.edu/pcpn/co.gif>. Accessed Dec. 21, 2011.
3
- 4 WRCC, 2011a, *Western U.S. Climate Historical Summaries*. Available at <http://www.wrcc.dri.edu/Climsum.html>. Accessed Nov. 5, 2011.
5
6
- 7 WRCC, 2011b, *Climate of Colorado*. Available at [http://www.wrcc.dri.edu/narratives/](http://www.wrcc.dri.edu/narratives/COLORADO.htm)
8 [COLORADO.htm](http://www.wrcc.dri.edu/narratives/COLORADO.htm). Accessed Dec. 21, 2011.
9
- 10 www.nationalparked.com, 2011, *Black Canyon of the Gunnison, Visitation Statistics by Year*.
11 Available at [http://www.nationalparked.com/US/Black_Canyon_of_the_Gunnison/Visitation_](http://www.nationalparked.com/US/Black_Canyon_of_the_Gunnison/Visitation_History.php)
12 [History.php](http://www.nationalparked.com/US/Black_Canyon_of_the_Gunnison/Visitation_History.php).
13
- 14 Xcel (Xcel Energy), 2010, *First-ever Solar-Coal Project Is Running*, June 29. Available at
15 [http://www.xcelenergy.com/About_Us/Energy_News/News_Archive/First-ever_solar-](http://www.xcelenergy.com/About_Us/Energy_News/News_Archive/First-ever_solar-coal_project_is_running)
16 [coal_project_is_running](http://www.xcelenergy.com/About_Us/Energy_News/News_Archive/First-ever_solar-coal_project_is_running). Accessed Feb. 24, 2012.
17
- 18 Yarmoloy, C., et al., 1988, “Behavior Responses and Reproduction of Mule Deer, *Odocoileus*
19 *hemionus*, Does Following Experimental Harassment with an All-Terrain Vehicle,” *Canadian*
20 *Field-Naturalist* 102:425–429.
21
- 22 Yu, C., et al., 2001, *User’s Manual for RESRAD Version 6*, ANL/EAD-4, Argonne National
23 Laboratory, Argonne, Ill., July.

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APPENDIX A:
EXAMPLES OF EXISTING LEASES FOR THE
URANIUM LEASING PROGRAM

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APPENDIX A:

**EXAMPLES OF EXISTING LEASES FOR THE
URANIUM LEASING PROGRAM**

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Facsimiles of two generic leases are shown in this appendix. The leases could be modified in the future as a result of the ULP PEIS process. The first lease agreement was used for leases prior to May 2008 (i.e., the original leases issued in 1974, and the continuation of those leases up to and including the issuance of new leases for the 13 “active” lease tracts on April 30, 2008). The second lease agreement was used for the competitive bid solicitation process that DOE completed in June 2008 for the remaining lease tracts that were “inactive” at that time. As discussed in Section 1.2.1, the one primary difference between these two lease agreements is the manner in which the production royalty for each lease is calculated. Please note that for both leases, each lessee is required to pay an annual royalty fee, which is basically an annual rent payment, for which the amount is established by DOE and which is paid at the beginning of each lease year just to hold the lease for that year.

For the “active” leases (see the first lease shown in this appendix [page A-5]), the lessee must pay a production royalty, paid on a monthly basis during periods of active ore production, for ore produced from the lease tract and shipped to a uranium mill or other processing facility. This production royalty is a combination of a “base” royalty, calculated as a three percentage (2%, 10%, and 14%) step-function applied to the value of the ore produced, plus a bid royalty, calculated by applying the lessee’s royalty bid percentage to the value of the ore produced. The base royalty is applied to the lease tract’s total ore production, and the bid royalty is applied to the lease tract’s ore production up to the “bid quantity,” which is an amount specified for each lease tract in pounds of uranium produced.

For the newer leases (see the second lease shown in this appendix [page A-29]), the lessee must pay just the bid royalty, as calculated above; however, the bid royalty is applied to the lease tract’s total ore production.

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URANIUM MINING LEASE

UNITED STATES DEPARTMENT OF ENERGY

THIS LEASE AGREEMENT, effective as of this 30th day of April, 2008, by and between the UNITED STATES OF AMERICA (hereinafter "Government"), represented by the UNITED STATES DEPARTMENT OF ENERGY (hereinafter "DOE"), whose principal place of business for the purpose of this Lease is 2597 B ¾ Road, Grand Junction, Colorado 81503 and

whose principal place of business for the purpose of this Lease is _____ (hereinafter "Lessee"):

WITNESSETH THAT:

DOE represents that it is in possession of certain Government owned uranium mining property in _____ County, _____ more particularly described as Lease Tract C-X-X in Appendix "A" which is attached hereto and hereby made a part this Agreement (the "Property").

DOE desires that said property be explored, developed, and operated for the production of uranium-bearing ores.

This Lease is authorized by Section 67 of the Atomic Energy Act of 1954, as amended, and is issued pursuant to the provisions of the DOE's regulations governing the issuance of leases for mining deposits of uranium in lands held by the DOE (10 CFR Part 760).

NOW, THEREFORE, the parties do hereby agree as follows:

I. GRANT OF LEASE.

For considerations hereinafter stated and performance by the Lessee of the terms and conditions hereinafter provided, the DOE does hereby lease the Property to the Lessee, for the purposes of exploring for, developing, mining, and removing deposits of uranium, vanadium, and associated minerals, the Property described in Appendix "A", which is attached hereto and hereby made a part hereof, subject to the terms and conditions hereinafter set forth. The rights hereby granted are limited to exploration, development, mining, and removal of ore from within the vertical planes of the boundary lines of the Property, and the Lessee shall have no right hereunder to extend its workings beyond such vertical planes. Access to the Property is not guaranteed by the Government. The Lessee shall be responsible for securing such access.

II. TERM. This Lease shall remain in effect for a period of ten (10) years from the aforementioned effective date, except as it may be sooner relinquished or cancelled pursuant to

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other provisions of this Lease. Near the end of that 10-year period, DOE will re-evaluate the leasing program to determine if the leases/leasing program should continue.

III. DEFINITIONS. As used herein:

(a) The term “Government” means the Government of the United States of America, including its authorized representatives associated with the Uranium Leasing Program.

(b) The term “DOE” means the United States Department of Energy, or duly authorized representatives thereof, including the Realty Officer except for the purpose of deciding an appeal under Article XXVII “DISPUTES”.

(c) The term “Realty Officer” means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Realty Officer acting within the limits of their authority as delegated by the Realty Officer.

(d) The term “associated minerals” means any minerals, other than the minerals covered by this Lease, which are (i) so intermingled with the deposits of the mineral or minerals for which this Lease is issued that separate development is, in the opinion of the Realty Officer, not warranted for mining or for economic reasons, or (ii) of such poor quality and in such small quantity that separate development is, in the opinion of the Realty Officer, undesirable for mining or for economic reasons.

(e) The term “applicable statutes and regulations” means all applicable Federal, state, and local statutes, regulations, and standards. These statutes include but are not limited to, those relating to mine safety; radiation; air, water, and land pollution; disposal of liquid and solid waste; and workmen's and unemployment compensation.

(f) The term “Exploration Plan” as described in Article XII “EXPLORATION PLAN” and Appendix “C” means a plan of activity proposed by the Lessee for the purpose of conducting approved operations to explore, test, or prospect for minerals covered by this Lease.

(g) The term “Mining Plan” as referenced in Article XIII “MINING PLAN” and Appendix “C” means a plan of activity proposed by the Lessee for the purpose of conducting surface and underground operations to develop or extract the minerals covered by this Lease.

IV. GENERAL PERFORMANCE REQUIREMENT. The Lessee shall conduct all activities in accordance with the terms and conditions of this Lease and with those in 10 CFR Part 760. Furthermore, the Lessee shall conduct exploration, development, and mining activities on the Property with all reasonable diligence, skill, and care, as is required to systematically advance lease operations toward, and ultimately achieve and maintain, production of uranium ore consistent with good and safe mining practice, and in accordance with market conditions. Reasonable diligence shall be assessed by the Realty Officer at his sole discretion on the basis of the Lessee's ongoing lease activities or the lack thereof. Site permitting activities and the

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performance of cultural resource surveys and/or threatened and endangered species surveys shall be accepted by the Realty Officer as evidence supporting reasonable diligence.

V. ROYALTIES. The Lessee shall pay or cause to be paid, as directed by the DOE, the royalties specified in Appendix "B", which is attached hereto and hereby made a part hereof, at the rates and in the manner set forth therein.

VI. INTEREST ON OVERDUE PAYMENTS — FORFEITURE FOR NON-PAYMENT.

(a) All amounts that become payable by the Lessee to the Government under this Lease shall bear simple interest from the date due until paid unless paid within thirty (30) days of becoming due. The interest rate shall be established by DOE (on a quarterly basis as required) as the Federal Short-Term Rate (applied to and applicable to the calendar quarter in which the amount becomes due) plus three (3) percent. The Federal Short-Term Rate is the rate published monthly by the Internal Revenue Service pursuant to Section 1274(d) of the Internal Revenue Code. Additional interest shall be assessed for each subsequent calendar quarter until the amount is paid.

(b) Amounts shall be due at the earlier of the following dates:

- (1) The date fixed under this Lease.
- (2) The date of the first written demand for payment consistent with this Lease, including any demand resulting from a default cancellation.

(c) Notwithstanding the provisions of paragraphs (a) and (b) of this Article VI, and irrespective of interest payments made by the Lessee to DOE pursuant thereto, the Realty Officer, in his sole discretion, may cancel this Lease for failure by the Lessee to pay the entire principle amount of any annual royalty, base royalty, or bid royalty within sixty (60) calendar days after payment thereof is due from the Lessee to the DOE under the terms of this Lease. Such cancellation shall be effective upon Lessee's receipt of a written notice thereof from the Realty Officer. Failure of DOE to exercise its right to cancel shall not be deemed to be a waiver thereof.

VII. USE OF SURFACE.

(a) Subject to the other provisions of this Lease, the rights granted to the Lessee herein include the right to use so much of the surface of the Property as is required for the exploration for, and development, mining, and removal of ore, including the right to erect such buildings and other structures and install such machinery and other facilities as may be required for such operations; provided, that the Lessee shall recognize existing uses and commitments in the form of grazing, timbering, Bureau of Land Management special use permits, and public recreation, and improvements such as water developments, ditches, roads, trails, pipelines, telephone, telegraph, and power lines, fences, and rights-of-way; and Lessee shall conduct its operations so as to interfere as little as possible with such existing uses and improvements.

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(b) The Property shall at all times be subject to other lawful uses heretofore or hereafter granted by the Government, through any authorized agency; provided, that such uses shall not prevent, obstruct, or unduly interfere with any right granted under this Lease.

VIII. LEASES FOR OTHER MINERALS. The granting of this Lease shall not preclude the issuance by the Government of other leases of the Property for the purposes of mining and extracting oil, gas, oil shale, coal, phosphate, potassium, sodium, sulphur, or other minerals which are or may in the future be leasable pursuant to Federal mineral leasing laws; provided, that any such leases hereafter issued shall provide that operations under such leases shall not prevent, obstruct, or unduly interfere with any right granted under this Lease.

IX. USE OF SALABLE MINERALS. No salable minerals, such as sand, gravel, or stone, found on the lands leased hereunder shall be used by the Lessee in its operations unless such salable minerals have been purchased from the Government under the provisions of the Materials Act of July 31, 1947, 30 U.S.C. 601, as amended, or from the owner of such salable minerals if other than the Government.

X. SECURITY AND SAFETY. The Lessee shall secure and post all areas that might reasonably be considered hazardous to the general public, including, but not limited to ore stockpile areas, loading areas, mining openings, and mine-rock waste piles, in accordance with all applicable statutes and regulations and specific requirements and stipulations set forth in Appendix "C". If necessary, the Lessee agrees to construct fences or other barriers around the perimeter of safety-hazard areas to minimize the potential for intrusion by humans, livestock, and wildlife. Radioactive materials exposed by the Lessee's operation shall be managed to ensure that the exposure of humans and ecosystems is as low as reasonably achievable.

XI. ENVIRONMENTAL REQUIREMENTS. The Lessee, at the Lessee's expense, shall comply with all applicable statutes and regulations and abide by the specific requirements and stipulations set forth in Appendix "C", which is attached hereto and hereby made a part hereof.

XII. EXPLORATION PLAN.

(a) Prior to commencing any surface-disturbing operations to explore, test, or prospect for minerals covered by this Lease, the Lessee shall file with the Realty Officer three (3) copies of a plan for the proposed exploration activities and shall obtain the Realty Officer's approval of such plan. The Exploration Plan shall be consistent with the "Notice of Intent to Conduct Prospecting Operations" (hereinafter "Notice") to be filed with the Colorado Mined Land Reclamation Board (hereinafter MLRB) in accordance with "Rule 5" of the "Mineral Rules and Regulations" of the Colorado MLRB, as these rules may be amended. The Exploration Plan shall include all information required by the "Notice", and in addition, must specifically include the following information:

- (1) A site-specific environmental analysis;

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- (2) A description of specific measures to be taken to assure compliance with the requirements of Article XI "ENVIRONMENTAL REQUIREMENTS", including methods of reclamation contemplated by the Lessee; and
- (3) The specific information outlined in Appendix "C" of this Lease.

(b) All Exploration Plans submitted to the Realty Officer pursuant to this Article XII and all proposed activities contained therein shall be reviewed by DOE in accordance with 10 CFR Part 1021 "National Environmental Policy Act Implementing Procedures".

(c) If preparation and filing of an Exploration Plan for the entire operation is dependent upon factors which cannot or will not be determined except during the progress of exploration activities, partial plans may be submitted and approved from time to time; provided however, that the Lessee shall not perform exploration activities not described in an approved plan.

(d) Changes may be made in the approved Exploration Plan by mutual written agreement of the Lessee and the Realty Officer. Approval is contingent upon the Lessee notifying all other appropriate agencies (as outlined in Appendix "C") of the proposed changes.

XIII. MINING PLAN.

(a) Prior to constructing any surface installation or commencing mine development on the leased lands, the Lessee shall file with the Realty Officer three (3) copies of a plan for the proposed mining operations and shall obtain the Realty Officer's approval of such plan. Such mining plan shall be consistent with the "Reclamation Permit Application" (hereinafter "Application") to be filed with the Colorado MLRB in accordance with "Rule 1.4" and "Rule 6" of the "Mineral Rules and Regulations" of the Colorado MLRB, as these rules may be amended. The Mining Plan shall include all information required by the "Application", and in addition, must specifically include the following information:

- (1) A site-specific environmental analysis;
- (2) A description of specific measures to be taken to assure compliance with the requirements of Article XI "ENVIRONMENTAL REQUIREMENTS", including methods of reclamation contemplated by the Lessee; and
- (3) The specific information outlined in Appendix "C" of this Lease.

(b) All Mining Plans submitted to the Realty Officer pursuant to this Article XIII and all proposed activities contained therein shall be reviewed by DOE in accordance with 10 CFR Part 1021 "National Environmental Policy Act Implementing Procedures".

(c) If preparation and filing of a Mining Plan for the entire operation is dependent on factors which cannot or will not be determined except during the progress of mining activities, a

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partial plan may be submitted and approved from time to time; provided however, that the Lessee shall not perform mining activities not described in an approved plan.

(d) Changes may be made in the approved Mining Plan by mutual written agreement of the Lessee and the Realty Officer. Approval is contingent upon the Lessee notifying all other appropriate agencies (as outlined in Appendix "C") of the proposed changes.

XIV. PERFORMANCE BOND.

(a) Upon approval of an Exploration Plan or Mining Plan, and prior to commencing any surface-disturbing operations, the Lessee shall be required to file a suitable performance bond of not less than \$ _____ with satisfactory surety, payable to the United States Department of Energy. The bond shall be conditioned upon the faithful compliance with all applicable statutes and regulations, the terms and conditions of this Lease, and any Exploration Plans and Mining Plans, including amendments and supplements thereto, which have been approved by the Realty Officer.

(b) The Realty Officer shall set the amount of the initial bond and may, from time to time, require an increase or allow a decrease in the amount of the bond, as in his judgment the circumstances may require. In determining the amount of the bond, the Realty Officer shall take into consideration all applicable statutes and regulations and the character and nature of the reclamation requirements of the Lease, including the requirements of any approved Exploration Plans and Mining Plans and partial or supplementary plans, and the estimated costs of such reclamation.

(c) The Lessee and his sureties shall be liable for any damage to the Government resulting from the Lessee's failure to complete any work required upon the expiration, relinquishment, or cancellation of this Lease.

XV. INSPECTION. The DOE reserves the right, through its officers, employees, agents, and contractors, to enter upon the leased property and into all parts of any of Lessee's mines therein at all reasonable times for inspection and other purposes subject to the Lessee's standard operating procedures.

XVI. GOOD FAITH NEGOTIATIONS. At the request of the Realty Officer, the Lessee will negotiate in good faith with the DOE to reach an agreement under which the Lessee, for appropriate compensation, would correct undesirable conditions existing on the Property as a result of pre-1974 mining activities and such other conditions that may be identified from time to time by the Realty Officer. If for any reason, the Lessee is unable to perform the work required to correct such conditions in a timely manner, DOE reserves the right to contract with another entity to enter upon the leased property and perform said work.

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XVII. INDEMNIFICATION OF GOVERNMENT.

(a) The Government, including its employees, all tiers of contractors, agents, and authorized representatives shall not be responsible for any mechanics' or miners' liens or other liens, encumbrances, or liabilities incurred by the Lessee in connection with the operation of the Property. The Lessee assumes all responsibility for and will hold the Government harmless from any and all claims and liability of any nature arising from the operation or occupancy of the premises.

(b) The Lessee agrees to protect and indemnify the Government against any payroll taxes or contributions imposed with respect to any employee of the Lessee by any applicable law dealing with old age pensions, unemployment compensation, accident compensation, health insurance and related subjects. The Lessee also agrees, at its own cost and expense, to insure to each person employed in, about, or upon the Property, the compensation provided for by law with respect to workmen's compensation and employer's liability insurance, properly safeguarding the Government, including its employees, all tiers of contractors, agents, and authorized representatives, against liability for injuries to persons, including injuries resulting in death, and loss of and damage to property in policies and amounts acceptable to the DOE and to furnish to the DOE written evidence of such insurance.

XVIII. REPORTING REQUIREMENTS.

(a) The Lessee shall provide the Realty Officer with copies of all permits and correspondence from local, state, or other Federal agencies or entities which pertain to the Lessee's activities on the Property.

(b) The Lessee shall provide to the Realty Officer, within twenty calendar days after the end of each month, an accurate record of the tonnage and U₃O₈ and V₂O₅ grades of each lot of ore delivered from the Property to a mill, buying station, or other purchaser during the previous month, including copies of all settlement sheets furnished to the Lessee for ores so delivered.

(c) The Lessee shall provide to the Realty Officer as soon as practicable after the end of each calendar quarter, the following documents, records, and/or maps:

- (1) A formal (written and signed) summary of all activities conducted on the Property during such calendar quarter that, among other things, documents the Lessee's reasonable diligence required by Article IV "GENERAL PERFORMANCE REQUIREMENT".
- (2) A map or maps showing the location of all exploration holes drilled on the Property during such calendar quarter, together with copies of any logs and assay records applicable to such drill holes.

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- (3) A mine map or maps showing the progress of mining on the Property as of the end of such calendar quarter.
- (4) Lessee's estimate of the tonnage and U₃O₈ and V₂O₅ grades of all ores stockpiled on the Property as of the end of such calendar quarter.
- (5) If no activity occurs on the Property during a calendar quarter, a letter submitted to the Realty Officer stating that no activity has occurred shall satisfy this reporting requirement.

(d) The Lessee further agrees to provide to the Realty Officer the results of any inspections of Lessee's mines or other facilities located on the Property, conducted by personnel of local, state, or other Federal agencies under applicable statutes and regulations. Furthermore, the Lessee agrees to notify the Realty Officer of any planned or scheduled inspections to be performed by local, state, or other federal agencies as soon as such schedule is known so that the Realty Officer may participate in said inspection if so desired.

(e) The Lessee is hereby notified that information obtained by DOE from the Lessee under this section shall be subject to the provisions of the Freedom of Information Act (5 U.S.C. 552).

XIX. TAXES. The Lessee agrees to pay when due all taxes lawfully assessed and levied pursuant to state or Federal law upon improvements, output of mines, and other interests, property, and assets of the Lessee in or upon the Property.

XX. ASSIGNMENT. The Lessee agrees that no transfer of this Lease, or of any interest therein or claim thereunder, by assignment, sublease, operating agreement, or otherwise, shall occur unless and until approved in writing by the Realty Officer.

XXI. RELINQUISHMENT OF LEASE. This Lease may be surrendered by the Lessee upon the Lessee's filing with the DOE, and the Realty Officer's approval of, a written application for relinquishment. Approval of the application shall be contingent upon the delivery of the Property to the DOE in a condition satisfactory to the Realty Officer, in accordance with the terms of this Lease, and upon the continued liability of the Lessee to make payment of all royalty and other debts theretofore accrued and due the DOE.

XXII. CANCELLATION OF LEASE. DOE may cancel this Lease if the Realty Officer determines that the Lessee has failed to comply with any provision of this Lease including reasonable diligence. Failure of DOE to exercise its rights to cancel shall not be deemed to be a waiver thereof.

XXIII. DELIVERY OF PREMISES. At the expiration of this Lease, or upon its earlier relinquishment or cancellation as herein provided, the Lessee shall, within one hundred eighty (180) days or other period mutually agreed to by the Lessee and Realty Officer, surrender the Property in a condition satisfactory to the Realty Officer, and shall, unless otherwise directed by

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the Realty Officer in writing, remove from the Property at Lessee's expense all structures, machinery, equipment, tools, and improvements placed thereon by the Lessee; provided, that the Lessee shall not remove any timbers or improvements which are determined by the Realty Officer to be required to be left in the mine workings to protect such workings as a mining property. Furthermore, prior to the surrender of the Property, the Lessee shall remove from the Property at Lessee's expense all stockpiles of ore and/or protore materials placed thereon by the Lessee and remit the required royalties to DOE in accordance with Article V "ROYALTIES" and Appendix "B". Otherwise, the Lessee shall at the Lessee's expense return all stockpiles of ore and/or protore materials to a suitable location within the underground mine workings on the Property or other location on the Property as designated by the Realty Officer.

XXIV. EXAMINATION OF RECORDS.

(a) The DOE and the Comptroller General of the United States or duly authorized representatives of either shall, until three (3) years after final payment under this Lease, have access to and the right to examine any of the Lessee's directly pertinent books, documents, papers, or other records involving transactions related to this Lease. The Lessee shall make these records and documents available to the Government, at the Lessee's offices, at all reasonable times, without any charge.

(b) The Lessee agrees to include in first-tier subcontracts under this Lease a clause to the effect that the DOE or the Comptroller General or duly authorized representatives of either shall, until three (3) years after final payment under the subcontract, have access to and the right to examine any of the subcontractor's directly pertinent books, documents, papers, or other records involving transactions related to the subcontract.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under Article XXVII "DISPUTES", (2) litigation or settlement of claims arising from the performance of this Lease, or (3) costs and expenses of this Lease to which the DOE or the Comptroller General or duly authorized representatives of either has taken exception shall continue until such appeals, litigation, claims, or exceptions are disposed of.

XXV. OFFICIALS NOT TO BENEFIT. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Lease, or to any benefit arising from it. However, this clause does not apply to this Lease to the extent that this Lease is made with a corporation for the corporation's general benefit.

XXVI. COVENANT AGAINST CONTINGENT FEES. The Lessee warrants that no person or selling agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Lessee for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to cancel this Lease without liability, or in its discretion to require the Lessee to pay to DOE the full amount of such commission, percentage, brokerage, or contingent fee.

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XXVII. DISPUTES.

(a) Except as otherwise provided in this Lease, any dispute concerning a question of fact arising under this Lease which is not disposed of by agreement shall be decided by the Realty Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Lessee. The decision of the Realty Officer shall be final and conclusive unless within 30 days from the date of receipt of such copy, the Lessee mails or otherwise furnishes to the Realty Officer a written appeal addressed to the DOE. The decision of the DOE for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Lessee shall be afforded an opportunity to be heard, and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Lessee shall abide by the Realty Officer's decision.

(b) The provisions of paragraph (a) above does not preclude consideration of questions of law; provided, that nothing in this Lease shall be construed as making final the decision of any administrative official, representative, or board on a question of law.

XXVIII. HEIRS AND SUCCESSORS-IN-INTEREST. Each obligation hereunder shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed this Lease, effective as of the date first above written, intending to be legally bound thereby.

UNITED STATES OF AMERICA
UNITED STATES DEPARTMENT OF ENERGY _____ (LESSEE)

By _____ By _____
Title Realty Officer Title _____
Date _____ Date _____

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APPENDIX A

DESCRIPTION OF LEASED PROPERTY

The leased property described herein was referred to as “MINING LEASE NO. AT(05-1)-ML-60.8-_____” during the period from 1974 to the enactment of this Lease.

A full legal description of the lease premises along with all other site-specific and/or lease-specific information will be included in this Appendix “A”.

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APPENDIX B

ROYALTIES

(a) At the beginning of each lease year during the term of this Lease, there shall become due and payable to the DOE an annual royalty of \$_____. Annual royalties paid pursuant to this article shall be credited against base royalties and royalty bid payments which become payable during the term of this Lease. Annual royalties so paid shall not be refunded upon the expiration, relinquishment, or cancellation of this Lease. Additionally, annual royalty payments made during the lease term of MINING LEASE NO. AT(05-1)-ML-60.8-C-X-X that have not been applied against past production royalty payments, shall be brought forward and credited against base royalties and royalty bid payments which become payable during the term of this Lease.

(b) The Lessee agrees to pay to the DOE a base royalty, per dry ton of ore delivered from the Property to a mill or other receiving station, determined as provided in paragraph (h) of this Appendix "B", in the amount of (a) Two percent (2%) of the value per dry ton up to and including a value of Fifty Dollars (\$50.00) per dry ton, plus (b) Ten percent (10%) of the value per dry ton in excess of Fifty Dollars (\$50.00) per dry ton and up to and including One Hundred Twenty-Five Dollars (\$125.00) per dry ton, plus (c) Fourteen percent (14%) of the value per dry ton in excess of a value of One Hundred Twenty-Five Dollars (\$125.00) per dry ton.

(c) The Lessee agrees to pay to the DOE, in addition to the base royalty required to be paid pursuant to paragraph (b) of this Appendix "B", a royalty bid payment, per dry ton of ore delivered from the Property to a mill or other receiving station, in the amount of _____ percent (___%) of the value per dry ton, determined as provided in paragraph (g) of this Appendix "B"; provided, that such royalty bid payments shall not be payable with respect to ores mined from the Property and delivered to a mill or other receiving station after royalty bid payments have been made for ores containing a total of _____ pounds of U₃O₈ so delivered by the Lessee from the Property.

(d) Unless otherwise authorized by DOE in writing, all ores mined from the Property shall be stockpiled on the Property until such time as they are delivered to a mill or other receiving station.

(e) With respect to ores which are mined from the Property and delivered to a mill or other receiving station which is owned or controlled by the Lessee, the Lessee agrees to make base royalty and royalty bid payments, for all lots of such ore assayed or fed to process during each calendar month, within twenty (20) calendar days after the end of such calendar month. Such base royalty and royalty bid payments shall be treated as provisional payments with respect to any lot of ore for which the DOE requests an umpire assay, and an appropriate adjustment shall be made in the first base royalty and royalty bid payment following Lessee's receipt of the results of such umpire assay for such lot of ore.

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(f) With respect to ores which are mined from the Property and delivered to a mill or other receiving station not owned or controlled by the Lessee, the Lessee agrees:

(1) That the DOE may receive base royalty and royalty bid payments directly from the owner or controller of the mill or other receiving station to which such ores are shipped by the Lessee if the DOE makes arrangements therefore satisfactory to the Lessee.

(2) That, in the absence of such arrangements, the Lessee shall make base royalty and royalty bid payments for all lots of such ore assayed or fed to process (includes delivery of such ore to an ore-buying station or sample plant) during each calendar month, within twenty (20) calendar days after payment for such lots is mailed to the Lessee; provided, that an appropriate extension of such twenty (20) day period shall be granted by the Realty Officer for any undue delay in the mails which causes a delay in delivery to the Lessee of payment for such lots of ore. Such base royalty and royalty bid payments shall be treated as provisional payments with respect to any lot of ore for which the DOE requests an umpire assay, and an appropriate adjustment shall be made in the first base royalty and royalty bid payment following finalization of payment to the Lessee for such ore.

(g) Payments of base royalty and royalty bid amounts due the DOE shall be deemed to have been made when received at the DOE Legacy Management Office in Grand Junction, Colorado.

(h) DOE shall establish the prices for uranium and vanadium that shall be used to calculate the fair-market value of lease tract ores. These prices shall be established on a quarterly basis, on or before the twentieth (20th) day after the end of the previous calendar quarter (in January, April, July, and October), and shall remain in effect during the calendar quarter in which they are established. DOE shall establish these prices as follows:

(1) Using an Excel spreadsheet, DOE shall monitor, record, and track the spot-market and long-term-market prices for uranium (quoted as dollars per pound U_3O_8) as reported weekly in *U_x Weekly*. The spreadsheet will then (i) automatically calculate the monthly and quarterly arithmetic average prices for uranium (both spot-market and long-term-market), and (ii) automatically calculate a quarterly weighted-average price for uranium by applying the appropriate purchase contract percentages to the respective quarterly average prices. Using this spreadsheet, DOE shall also monitor, record, and track the Total Purchased (Weighted-Average Price) for uranium as reported annually by the Energy Information Administration in Table S1b. *Weighted-Average Price of Uranium Purchased by Owners and Operators of U.S. Civilian Nuclear Power Reactors (quoted as Dollars per Pound U_3O_8 Equivalent)*. The spreadsheet will then automatically calculate the arithmetic average between the quarterly weighted-average price for uranium and the Total Purchased (Weighted-Average Price) for uranium. The resulting figure is reported as the annualized quarterly weighted-average price for uranium.

(2) Using the same Excel spreadsheet, DOE shall monitor, record, and track the market price of vanadium (quoted as dollars per pound V_2O_5) as reported twice weekly in *Metal Bulletin (Non-Ferrous Primary Metals, Noble Alloys and Ores, Vanadium pentoxide)*. The

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spreadsheet will then (i) automatically calculate the monthly and quarterly arithmetic average prices for vanadium, and (ii) automatically apply an adjustment factor of one-half (0.5) to each quarterly arithmetic average price for vanadium. The resulting figure is reported as the adjusted quarterly average price for vanadium.

(3) Paragraphs (h)(1) and (h)(2) can be summarized by the following three equations:

$$U = (Q_{WA} + TP_{WA}) / 2 \quad (1)$$

where:

U = Annualized Quarterly Weighted-Average Price for Uranium

Q_{WA} = Quarterly Weighted-Average Price for Uranium

TP_{WA} = Total Purchased (Weighted-Average Price) for Uranium

$$Q_{WA} = Q_{SM} * P_{SM} + Q_{LTM} * P_{LTM} \quad (2)$$

where:

Q_{SM} = Quarterly Arithmetic Average Price for the Uranium Spot Market

P_{SM} = Purchase Contract Percentage for the Uranium Spot Market

Q_{LTM} = Quarterly Arithmetic Average Price for the Uranium Long Term Market

P_{LTM} = Purchase Contract Percentage for the Uranium Long Term Market

$$V = Q_{WA} * 0.5 \quad (3)$$

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where:

V = Annualized Quarterly Weighted-Average Price for Vanadium

Q_{WA} = Quarterly Weighted-Average Price for Vanadium

(i) The Lessee shall be notified of these prices (annualized quarterly weighted-average price for uranium and adjusted quarterly average price for vanadium) by formal written correspondence. The Lessee shall use these prices to calculate the fair-market value of the ore in dollars per dry ton (calculated to the nearest cent [\$0.01]), for all lots of such ore assayed during any calendar month. This fair-market value shall be determined by:

(1) Computing the number of recoverable pounds of contained U₃O₈ and V₂O₅ per dry ton of ore in the lots so assayed by (i) multiplying the total number of pounds of U₃O₈ and V₂O₅, respectively, contained in the lots of ore so assayed during such calendar month, by factors of 0.96 and 0.79, respectively (the average milling facility's recovery rates for U₃O₈ and V₂O₅, respectively, as acknowledged by DOE) and (ii) dividing each of the resulting numbers by the total number of dry tons of ore contained in the lots so assayed during such calendar month, and carrying the results to three decimal places for U₃O₈ and two decimal places for V₂O₅; and

(2) Adding together the dollar amounts obtained by (i) multiplying the number of recoverable pounds of U₃O₈ per dry ton of ore in the lots so assayed by the price per pound of U₃O₈ established by DOE and (ii) multiplying the number of recoverable pounds of V₂O₅ per dry ton of ore in the lots so assayed by the price per pound of V₂O₅ established by DOE.

(j) For ores that have been mined from the Property and delivered to a mill or other receiving station, but not assayed or fed to process, the Lessee shall estimate the value of said ores using standard industry practices, and shall make base royalty and royalty bid payments to DOE equal to or greater than 95 percent (95%) of the estimated value of the base royalty and royalty bid payments due to DOE. Such base royalty and royalty bid payments shall be treated as provisional payments with respect to said ores until such time that said ores are assayed or fed to process and the final base royalty and royalty bid payments due to DOE are calculated and final base royalty and royalty bid payments are made.

(k) If price quotations for vanadium pentoxide become unavailable, the DOE and the Lessee will negotiate to establish a method of determining an appropriate market price per pound of V₂O₅ to be used in determining that portion of the value per dry ton of ore attributable to vanadium. Pending agreement on such method, the last prices established by paragraph (h)(2) above shall be used in determining the portion of the value per dry ton of ore attributable to vanadium, for the purpose of computing royalties under this Lease. If the parties fail to reach

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agreement on an applicable method, the matter shall constitute a dispute to be decided in accordance with the Article XXVII "DISPUTES" of this Lease.

(l) The parties hereto agree that if the Lessee is paid for any constituent, other than uranium or vanadium, contained in ores mined from the Property, all amounts so paid shall be held in trust by the Lessee for the DOE until the Lessee and the DOE agree upon a base royalty to be paid to the DOE with respect to Lessee's sale of such constituent.

(m) Consistent with Article XXIII "DELIVERY OF PREMISES", the Lessee agrees, that within one hundred eighty (180) days following the expiration, relinquishment, or termination of this Lease as herein provided, all royalties associated with this lease (annual royalty, base royalty, and bid royalty) shall become due and payable to the DOE. For ores that have been mined from the Property, but not assayed or fed to process, the Lessee shall estimate the value of said ores using standard industry practices, and shall make base royalty and royalty bid payments to DOE equal to or greater than 95 percent (95%) of the estimated value of the base royalty and royalty bid payments due to DOE. Such base royalty and royalty bid payments shall be treated as provisional payments with respect to said ores until such time that said ores are assayed or fed to process and the final base royalty and royalty bid payments due to DOE are calculated and final base royalty and royalty bid payments are made.

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WEIGHING, SAMPLING, AND ASSAYING.

With respect to ores which are mined from the Property and delivered to a mill or other receiving station, the Lessee agrees to the following provisions:

- (a) The Lessee shall weigh, or cause to be weighed, each lot of ore delivered from the Property to its mill or other receiving station and shall furnish the DOE a record of the weight of such lot. The scales used in weighing such ore shall be balanced daily and checked once each week or more often, as appears necessary, by either standard weights or by check-weighing against another scale. Scale platforms will be kept clean and free of the sides of the pit, and the scales shall be inspected and certified every six months by the appropriate entity of the state in which the mill or receiving station is located, if such inspection is available; otherwise, a biannual inspection shall be made by a competent organization which is acceptable to both the Lessee and the DOE.
- (b) The Lessee shall sample, or cause to be sampled, each lot of ore according to standard and accepted practices in ore sampling, and such sampling shall be final and binding on both parties to this Lease. The DOE or its representative may be present at the sampling of such ore. The Lessee shall ensure that moisture determinations are made according to standard practices in ore sampling. The Lessee shall ensure that each final sample is divided into four (4) pulps, one of which shall be promptly furnished to the DOE, one of which shall be retained by the Lessee for assay purposes, and two of which shall be held in reserve by the Lessee for possible umpire analysis. The Lessee shall promptly assay, or cause to be assayed, its pulp for U_3O_8 and V_2O_5 content and shall transmit the assay results to the DOE, together with weight and moisture certificates for the lot sampled. For the purpose of such reporting, all assays for U_3O_8 shall be adjusted to the nearest 0.001% and all assays for V_2O_5 shall be adjusted to the nearest 0.01%.
- (c) The DOE may assay its pulps at its own expense. In case of disagreement with the Lessee's assay with respect to either U_3O_8 or V_2O_5 content, the DOE may, within 30 calendar days after receiving its pulp, mail to the Lessee a written request for an umpire assay. Upon receipt of such written request, the Lessee shall promptly submit one of the pulps held in reserve to an assayer, whom the parties hereto shall agree upon, for umpire assay. With respect to both U_3O_8 and V_2O_5 content, if the assay of the umpire is within the assays of the two parties, it shall be final. If not, the assay which is nearer to that of the umpire shall prevail. The party whose assay for U_3O_8 is further from that of the umpire shall pay the cost of the umpire's assay. In the event that the umpire's assay for U_3O_8 is equally distant from the assay of each party, the cost shall be split equally.
- (d) The quantity of ore comprising a lot, as used herein, shall be determined by the Lessee, except that no lot shall exceed one thousand (1,000) tons of ore except as otherwise agreed in writing by the Realty Officer.

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APPENDIX C

1. SPECIFIC REQUIREMENTS AND STIPULATIONS

The Lessee agrees to comply with all applicable statutes and regulations, including but not limited to the following items:

(a) Prior to resuming operations on the Property that were previously approved by DOE, the Lessee shall notify the Realty Officer in writing of its intentions to resume such operation and shall include any changes, additions, or modifications to the original plan that are now proposed. Upon receipt of such notification, the Realty Officer shall review the approved plan along with any new information provided by the Lessee and determine if additional stipulations are warranted. When all pertinent requirements are satisfied, DOE shall provide the Lessee with a written approval to proceed.

(b) All existing serviceable improvements not associated with the Lessee's operation, such as fences, gates, cattle guards, roads, trails, culverts, pipelines, bridges, and water development and control structures, authorized for use by the Lessee, shall be maintained in serviceable condition by the Lessee. Such improvements (if not owned by the Lessee) which are damaged or destroyed by the Lessee's operations shall be replaced, restored, or compensated for by the Lessee.

(c) The Lessee's operations shall not disturb public land survey corner markers or monuments or Atomic Energy Commission (AEC) survey markers without the prior written approval of the Realty Officer. Additionally, the Lessee shall pay all costs associated with the surveys required to preserve or reestablish the true point of any such marker or monument and the replacement of such marker or monument.

(d) Housing and other buildings and support facilities related to community development shall be constructed or located on the Property only upon the prior written approval of the Realty Officer. In constructing and locating such housing, other buildings, and support facilities, the Lessee shall comply with applicable county planning and zoning regulations, subdivision regulations, and mobile home regulations, and shall furnish evidence of such compliance to the Realty Officer upon request.

(e) Prior to any surface disturbing activity, the Lessee shall file a "Notice of Intent to Conduct Prospecting Operations" (Notice) or "Reclamation Permit Application" (Application), whichever is appropriate, with the Colorado Mined Land Reclamation Board (MLRB) in accordance with "Mineral Rules and Regulations" of the Colorado MLRB, as these rules may be amended. All subsequent modifications to the Notice or Application shall be addressed in accordance with the "Mineral Rules and Regulations" of the Colorado MLRB. The Lessee shall provide the Realty Officer with copies of all pertinent approval documentation including permits issued.

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(f) Prior to any surface disturbing activity, the Lessee shall consult with the U.S. Department of Interior—Bureau of Land Management (BLM), the U.S. Department of Interior—Fish and Wildlife Service (USFWS), and/or the Colorado Department of Natural Resources—Division of Wildlife (CDOW), as appropriate, to determine whether threatened or endangered, or sensitive plant or wildlife species occur in the area to be disturbed or whether the agencies have other plant or wildlife concerns in the area to be disturbed. If required, the Lessee shall conduct surveys or provide other documentation to resolve this concern. The Lessee shall provide the Realty Officer with copies of all documents pertaining to this issue.

(g) Prior to any surface disturbing activity, the Lessee shall perform a cultural and historical survey of the area to be disturbed. If cultural or historical resources are found to exist, the Lessee shall consult with the State Historical Preservation Officer for the appropriate measures to be taken. If required, the Lessee shall prepare a mitigation plan to address the protection of the cultural or historical resources. The Lessee shall provide the Realty Officer with copies of all documents pertaining to this issue.

(h) Prior to any surface disturbance activity in a potential floodplain or wetland area, the Lessee shall consult with the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and the appropriate state agency to determine whether a jurisdictional floodplain or wetland exists in the area to be disturbed. If required, the Lessee shall prepare a Floodplain/Wetlands Assessment that proposes mitigation measures to be taken to resolve this concern. The Lessee shall provide the Realty Officer with copies of all documents pertaining to this issue.

(i) The Lessee shall use existing roads where practicable, and shall conduct activities employing wheel or track vehicles in such a manner as to minimize surface damage. The Lessee shall wash all tracked vehicles or equipment prior to their being mobilized to the Property. The Lessee shall promptly repair any road damage resulting from the Lessee's operations, restoring such road to its previous condition or to a condition acceptable to the Realty Officer. Where existing access roads across the Property are used principally by the Lessee, the Lessee shall construct surface-water control and drainage structures (culverts, water bars, or grade dips) on such roads to minimize erosion. Plans for such structures shall be included in all Exploration Plans and Mining Plans submitted to the Realty Officer pursuant to Articles XII "EXPLORATION PLAN" and XIII "MINING PLAN" hereof, respectively. The Lessee shall construct new roads and trails on the Property only at locations and to specifications approved in advance in writing by the Realty Officer or an authorized representative of the Realty Officer, and shall construct and maintain such roads and trails in a manner that will minimize channeling and other erosion. The Realty Officer's approval of plans for new access road construction, culverts, water bars, or grade dips will be guided by standards established by BLM or the U.S. Department of Agriculture—Forest Service (USFS), where appropriate.

(j) The Lessee shall conduct all operations so as to protect all natural resources and the environment including streams, lakes, ponds, waterholes, seeps, and marshes, and protect fish and wildlife resources as required by applicable laws and regulations. The Lessee shall control all mine wastes, contaminants and pollutants, and sediments associated with stormwater runoff in

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accordance with existing regulations, and shall comply with all environmental regulations regarding discharge into, or degradation of water resources including streams, springs, stock waters, or groundwater. The Lessee shall not use water from any water source without the written consent of the person having the rights to the use of such water source.

(k) Lessee shall keep the clearing of timber, stumps and snags, and any ground cover to a minimum consistent with the conduct of exploration, development, and mining activities approved hereunder. The Lessee shall abide by any restrictions concerning the bulk removal of vegetation (primarily piñon pine) that are established by the Realty Officer. The Lessee shall use due care to avoid scarring or removal of vegetative ground cover in areas not involved in such operations. Open parks (areas where there is a grass, shrub, and/or sagebrush cover) shall be disturbed as little as possible. If the shrub or brush cover is too high and must be cleared, it shall be cleared at or above ground level. The Lessee shall return all disturbed areas to their original condition or a condition acceptable to the Realty Officer promptly after damage to such areas has occurred and operations under this Lease are no longer being conducted in the disturbed areas.

(l) The Lessee agrees that all underground mine openings shall be supported by pillars, timber, or other ground support devices approved by the Federal or state agencies having jurisdiction over such underground workings. The Lessee further agrees, during the term of this Lease, to substantially fence or permanently close all mine openings/portals, subsidence holes, surface excavations, or other workings resulting from the Lessee's operation that may be considered hazardous to human health or the environment. Such protective measures shall be maintained in a proper and safe condition during the term of this Lease. Prior to abandoning operations, the Lessee shall submit a mine-site reclamation plan to the Realty Officer for approval. Such plan shall include the proposed method(s) of permanent closure for all mine openings/portals including shafts, adits, inclines/declines, ventilation shafts, and water discharge points. No underground workings or any part thereof shall be permanently abandoned and rendered inaccessible without the prior written approval of the Realty Officer. All mine-site reclamation shall be performed to the satisfaction of the Realty Officer in accordance with the approved reclamation plan

(m) Surface drill holes and associated disturbances resulting from exploration or development activities shall be abandoned in accordance with existing regulations and in a manner that will protect the surface. All disturbed areas identified by the Lessee as not being needed for future operational activities shall be promptly reclaimed by the Lessee. The Realty Officer, by written notice to the Lessee, shall designate any other areas where reclamation must be undertaken as a result of disturbances caused by the Lessee's operations.

(n) If antiquities or other objects of historic or scientific interest, including but not limited to historic or prehistoric features or ruins, artifacts, or vertebrate fossils are discovered by the Lessee in the performance of operations under this Lease, the Lessee shall cease operations in the vicinity of such discovery and immediately take appropriate steps to protect and save such objects of historic or scientific interest and shall notify the Realty Officer of such discovery. The Realty Officer shall assess the values involved and prescribe such protective measures as deemed necessary.

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(o) The Lessee shall make every effort to prevent, control, or suppress any fire in the operating area and to report any uncontrolled fire to the appropriate BLM or USFS official, as designated by the Realty Officer.

(p) The Lessee shall provide detailed haul route information to the Realty Officer for review prior to commencement of any haul activities. The haul route information shall include, at a minimum, expected routes from the mine site to the proposed mill or other facility accepting material from the mine, expected number of trucks per day, size and approximate weights of the ore being shipped, and expected production rates and mining life timeframes. It is expected that the Lessee will utilize only the specified routing. The lessee shall notify the Realty Officer of any significant changes to the haul route plan.

(q) The Lessee shall comply with Colorado State Access Code Section 43-2-147(4), C.R.S., and Section 24-4-103., C.R.S., effective 8/31/98. Pursuant to said code, the Lessee may be required to participate in a Highway Access Pre-Consultation meeting with DOE and the Colorado Department of Transportation after the completion and submittal to DOE of the approved permit from the Colorado MLRB. The details provided within the Mining Plan and permit, and the information provided under paragraph (p) above shall be used to determine the need for the Pre-Consultation meeting and to determine the potential impacts to county and state roads, highways and intersections from the Lessee's operations, and any resulting mitigation requirements from these impacts. Any revisions or amendments to the permit, or any conversion from one permit type to another approved by the Colorado MLRB shall also be provided to the Realty Officer. The permit revision, modification or conversion may be used to determine any additional impacts to the county roads or state highways from the Lessee's operations, and any resulting mitigation requirements from these additional impacts. Access permits required under this requirement shall be provided to the Realty Officer.

(r) The Lessee shall attend and participate in meetings between DOE and other Federal, state, and local agencies, as required.

(s) Prior to entry into any existing lease tract mines or mine workings (or the resumption of mining operations therein), where mitigative measures have been previously undertaken to conserve potentially critical habitat for BLM-listed sensitive bat species, the Lessee shall consult with BLM and CDOW to mitigate the impacts of the Lessee's activities to the references bat species.

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2. EXPLORATION PLAN FORMAT

It is not DOE's intent to require the Lessee to prepare multiple documents for submittal to the appropriate agencies for review and approval. Consequently, at the Lessee's discretion, a copy of the "Notice of Intent to Conduct Prospecting Operations" filed with the Colorado MLRB may be submitted to DOE for review and approval. That document will meet DOE's requirement for submittal of an Exploration Plan providing it contains, at a minimum, the following information:

- a. Map showing general area to be explored
 1. Tentative location of drill holes or other exploration activity
 2. Location of roads (existing and proposed)
- b. Approximate starting date and duration of drilling
- c. Drilling information
 1. Type of drilling and/or other exploration equipment
 2. Size of hole and core, if any, to be recovered
 3. Type of logging
 4. Target horizon and depth
- d. Road construction necessary for exploration
 1. Location of roads and drill sites
 2. Measures to be taken for erosion control
- e. Abandonment
 1. Procedures for plugging drill holes including the disposition of drill hole cuttings
 2. Surface restoration (grading, revegetation, erosion control measures, etc.)
- f. Provisions made to conform with existing state and federal regulations regarding control of fire, pollution of water and air, protection of other natural resources, and public health and safety, both during and upon abandonment of exploration activities
- g. Specific measures to be taken to assure compliance with environmental and surface use stipulations of this Lease including the preparation of a site-specific environmental document that assures compliance with NEPA and other environmental regulations.

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3. MINING PLAN FORMAT

It is not DOE's intent to require the Lessee to prepare multiple documents for submittal to the appropriate agencies for review and approval. Consequently, at the Lessee's discretion, a copy of the "Reclamation Permit Application" filed with the Colorado MLRB may be submitted to DOE for review and approval. That document will meet DOE's requirement for submittal of a Mining Plan providing it contains, at a minimum, the following information:

- a. Map showing location of:
 1. Ore body and proposed entry
 2. Any new roads required
 3. Mine plant and associated structures and facilities
 4. Waste dumps and ore storage areas
- b. Mining
 1. Initial development plans
 - A. Type of entry and haulage method proposed
 - B. Stoping method
 - C. Estimated rate of daily ore production and mine-life expectations
 - D. Provisions to handle mine water
 2. Proposed ventilation and radiation control methods
- c. Surface Plant
 1. Buildings, utility lines, and storage/stockpile areas
 2. Sewage and refuse disposal
 3. Compliance with any applicable county planning and zoning regulations
 4. Compliance with EPA stormwater discharge regulations
- d. Surface restoration plans
 1. Topsoil removal and storage
 2. Grading and backfilling

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3. Control of stormwater runoff
4. Revegetation (if required)
- e. Abandonment
 1. Permanent closure of all mine openings/portals resulting from, or utilized during, the Lessee's operations.
 2. Removal of structures and associated features
 3. Disposition of mine wastes (contouring, leveling, use for backfill, etc.)
- f. Provisions made to conform with existing state and federal regulations regarding control of fire, pollution of water and air, protection of other natural resources, and public health and safety, both during and upon abandonment of mining activities.
- g. Specific measures to be taken to assure compliance with environmental and surface use stipulations of the Lease including the preparation of a site-specific environmental document that assures compliance with NEPA and other environmental regulations.

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URANIUM MINING LEASE

UNITED STATES DEPARTMENT OF ENERGY

THIS LEASE AGREEMENT, effective as of this ___ day of _____, 2008, by and between the UNITED STATES OF AMERICA (hereinafter "Government"), represented by the UNITED STATES DEPARTMENT OF ENERGY (hereinafter "DOE"), whose principal place of business for the purpose of this Lease is 2597 B ¾ Road, Grand Junction, Colorado 81503 and _____ whose principal place of business for the purpose of this Lease is _____ (hereinafter "Lessee"):

WITNESSETH THAT:

DOE represents that it is in possession of certain Government owned uranium mining property in Montrose County, Colorado, more particularly described as Lease Tract C-X-X in Appendix "A" which is attached hereto and hereby made a part this Agreement (the "Property").

DOE desires that said Property be explored, developed, and operated for the production of uranium-bearing ores.

This Lease is authorized by Section 67 of the Atomic Energy Act of 1954, as amended, and is issued pursuant to the provisions of the DOE's regulations governing the issuance of leases for mining deposits of uranium in lands held by the DOE (10 CFR Part 760).

NOW, THEREFORE, the parties do hereby agree as follows:

I. GRANT OF LEASE.

For considerations hereinafter stated and performance by the Lessee of the terms and conditions hereinafter provided, the DOE does hereby lease to the Lessee, for the purposes of exploring for, developing, mining, and removing deposits of uranium, vanadium, and associated minerals, the Property described in Appendix "A", which is attached hereto and hereby made a part hereof, subject to the terms and conditions hereinafter set forth. The rights hereby granted are limited to exploration, development, mining, and removal of ore from within the vertical planes of the boundary lines of the Property, and the Lessee shall have no right hereunder to extend its workings beyond such vertical planes. Access to the Property is not guaranteed by the Government. The Lessee shall be responsible for securing such access.

II. TERM. This Lease shall remain in effect for a period of ten (10) years from the aforementioned effective date, except as it may be sooner relinquished or cancelled pursuant to other provisions of this Lease. Near the end of that 10-year period, DOE will re-evaluate the leasing program to determine if the leases/leasing program should continue.

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III. DEFINITIONS. As used herein:

(a) The term “Government” means the Government of the United States of America, including its authorized representatives associated with the Uranium Leasing Program.

(b) The term “DOE” means the United States Department of Energy, or duly authorized representatives thereof, including the Realty Officer except for the purpose of deciding an appeal under Article XXVII “DISPUTES”.

(c) The term “Realty Officer” means a person with the authority to enter into, administer, and/or terminate contracts and make related determinations and findings. The term includes certain authorized representatives of the Realty Officer acting within the limits of their authority as delegated by the Realty Officer.

(d) The term “associated minerals” means any minerals, other than the minerals covered by this Lease, which are (i) so intermingled with the deposits of the mineral or minerals for which this Lease is issued that separate development is, in the opinion of the Realty Officer, not warranted for mining or for economic reasons, or (ii) of such poor quality and in such small quantity that separate development is, in the opinion of the Realty Officer, undesirable for mining or for economic reasons.

(e) The term “applicable statutes and regulations” means all applicable Federal, state, and local statutes, rules, regulations, and standards as they may be amended or replaced from time to time. These statutes include but are not limited to, those relating to mine safety; radiation; air, water, and land pollution; disposal of liquid and solid waste; and workmen's and unemployment compensation.

(f) The term “Exploration Plan” as described in Article XII “EXPLORATION PLAN” and Appendix “C” means a plan of activity proposed by the Lessee for the purpose of conducting approved operations to explore, test, or prospect for minerals covered by this Lease.

(g) The term “Mining Plan” as referenced in Article XIII “MINING PLAN” and Appendix “C” means a plan of activity proposed by the Lessee for the purpose of conducting surface and underground operations to develop or extract the minerals covered by this Lease.

(h) Article “Titles and Headings” as used throughout this Lease are inserted for convenience only, and shall not be deemed to be a part of this Lease or considered in construing this Lease.

IV. GENERAL PERFORMANCE REQUIREMENT. The Lessee shall conduct all activities in accordance with the terms and conditions of this Lease and with those in 10 CFR Part 760. Furthermore, the Lessee shall conduct exploration, development, and mining activities on the Property with all reasonable diligence, skill, and care, as is required to systematically advance lease operations toward, and ultimately achieve and maintain, production of uranium ore consistent with good and safe mining practice, and in accordance with market conditions.

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Reasonable diligence shall be assessed by the Realty Officer at his sole discretion on the basis of the Lessee's ongoing lease activities or the lack thereof. Site permitting activities and the performance of cultural resource surveys and/or threatened and endangered species surveys shall be accepted by the Realty Officer as evidence supporting reasonable diligence.

V. ROYALTIES. The Lessee shall pay or cause to be paid, as directed by the DOE, the royalties specified in Appendix "B", which is attached hereto and hereby made a part hereof, at the rates and in the manner set forth therein.

VI. INTEREST ON OVERDUE PAYMENTS — FORFEITURE FOR NON-PAYMENT.

(a) All amounts that become payable by the Lessee to the Government under this Lease shall bear simple interest from the date due until paid unless paid within thirty (30) days of becoming due. The interest rate shall be established by DOE (on a quarterly basis as required) as the Federal Short-Term Rate (applied to and applicable to the calendar quarter in which the amount becomes due) plus three (3) percent. The Federal Short-Term Rate is the rate published monthly by the Internal Revenue Service pursuant to Section 1274(d) of the Internal Revenue Code. Additional interest shall be assessed for each subsequent calendar quarter until the amount is paid.

(b) Amounts shall be due at the earlier of the following dates:

- (1) The date fixed under this Lease.
- (2) The date of the first written demand for payment consistent with this Lease, including any demand resulting from a default cancellation.

(c) Notwithstanding the provisions of paragraphs (a) and (b) of this Article VI, and irrespective of interest payments made by the Lessee to DOE pursuant thereto, the Realty Officer, in his sole discretion, may cancel this Lease for failure by the Lessee to pay the entire principle amount of any annual royalty, base royalty, or bid royalty within sixty (60) calendar days after payment thereof is due from the Lessee to the DOE under the terms of this Lease. Such cancellation shall be effective upon Lessee's receipt of a written notice thereof from the Realty Officer. Failure of DOE to exercise its right to cancel shall not be deemed to be a waiver thereof.

VII. USE OF SURFACE.

(a) Subject to the other provisions of this Lease, the rights granted to the Lessee herein include the right to use so much of the surface of the Property as is required for the exploration for, and development, mining, and removal of ore, including the right to erect such buildings and other structures and install such machinery and other facilities as may be required for such operations; provided, that the Lessee shall recognize existing uses and commitments in the form of grazing, timbering, Bureau of Land Management special use permits, and public recreation, and improvements such as water developments, ditches, roads, trails, pipelines, telephone,

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telegraph, and power lines, fences, and rights-of-way; and Lessee shall conduct its operations so as to interfere as little as possible with such existing uses and improvements.

(b) The Property shall at all times be subject to other lawful uses heretofore or hereafter granted by the Government, through any authorized agency; provided, that such uses shall not prevent, obstruct, or unduly interfere with any right granted under this Lease.

VIII. LEASES FOR OTHER MINERALS. The granting of this Lease shall not preclude the issuance by the Government of other leases of the Property for the purposes of mining and extracting oil, gas, oil shale, coal, phosphate, potassium, sodium, sulphur, or other minerals which are or may in the future be leasable pursuant to Federal mineral leasing laws; provided, that any such leases hereafter issued shall provide that operations under such leases shall not prevent, obstruct, or unduly interfere with any right granted under this Lease.

IX. USE OF SALABLE MINERALS. No salable minerals, such as sand, gravel, or stone, found on the Property shall be used by the Lessee in its operations unless such salable minerals have been purchased from the Government under the provisions of the Materials Act of July 31, 1947, 30 U.S.C. 601, as amended, or from the owner of such salable minerals if other than the Government.

X. SECURITY AND SAFETY. The Lessee shall secure and post all areas that might reasonably be considered hazardous to the general public, including, but not limited to ore stockpile areas, loading areas, mining openings, and mine-rock waste piles, in accordance with all applicable statutes and regulations and specific requirements and stipulations set forth in Appendix "C". If necessary, the Lessee agrees to construct fences or other barriers around the perimeter of safety-hazard areas to minimize the potential for intrusion by humans, livestock, and wildlife. Radioactive materials exposed by the Lessee's operation shall be managed to ensure that the exposure of humans and ecosystems is as low as reasonably achievable.

XI. ENVIRONMENTAL REQUIREMENTS. The Lessee, at the Lessee's expense, shall comply with all applicable statutes and regulations and abide by the specific requirements and stipulations set forth in Appendix "C", which is attached hereto and hereby made a part hereof.

XII. EXPLORATION PLAN.

(a) Prior to commencing any surface-disturbing operations to explore, test, or prospect for minerals covered by this Lease, the Lessee shall file with the Realty Officer three (3) copies of a plan for the proposed exploration activities and shall obtain the Realty Officer's approval of such plan. The Exploration Plan shall be consistent with the "Notice of Intent to Conduct Prospecting Operations" (hereinafter "Notice") to be filed with the Colorado Mined Land Reclamation Board (hereinafter MLRB) in accordance with "Rule 5" of the "Mineral Rules and Regulations" of the Colorado MLRB, as these rules may be amended. The Exploration Plan shall include all information required by the "Notice", and in addition, must specifically include the following information:

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- (1) A site-specific environmental analysis;
- (2) A description of specific measures to be taken to assure compliance with the requirements of Article XI "ENVIRONMENTAL REQUIREMENTS", including methods of reclamation contemplated by the Lessee; and
- (3) The specific information outlined in Appendix "C" of this Lease.

(b) All Exploration Plans submitted to the Realty Officer pursuant to this Article XII and all proposed activities contained therein shall be reviewed by DOE in accordance with 10 CFR Part 1021 "National Environmental Policy Act Implementing Procedures".

(c) If preparation and filing of an Exploration Plan for the entire operation is dependent upon factors which cannot or will not be determined except during the progress of exploration activities, partial plans may be submitted and approved from time to time; provided however, that the Lessee shall not perform exploration activities not described in an approved plan.

(d) Changes may be made in the approved Exploration Plan by mutual written agreement of the Lessee and the Realty Officer. Approval is contingent upon the Lessee notifying all other appropriate agencies (as outlined in Appendix "C") of the proposed changes.

XIII. MINING PLAN.

(a) Prior to constructing any surface installation or commencing mine development on the Property, the Lessee shall file with the Realty Officer three (3) copies of a plan for the proposed mining operations and shall obtain the Realty Officer's approval of such plan. Such mining plan shall be consistent with the "Reclamation Permit Application" (hereinafter "Application") to be filed with the Colorado MLRB in accordance with "Rule 1.4" and "Rule 6" of the "Mineral Rules and Regulations" of the Colorado MLRB, as these rules may be amended. The Mining Plan shall include all information required by the "Application", and in addition, must specifically include the following information:

- (1) A site-specific environmental analysis;
- (2) A description of specific measures to be taken to assure compliance with the requirements of Article XI "ENVIRONMENTAL REQUIREMENTS", including methods of reclamation contemplated by the Lessee; and
- (3) The specific information outlined in Appendix "C" of this Lease.

(b) All Mining Plans submitted to the Realty Officer pursuant to this Article XIII and all proposed activities contained therein shall be reviewed by DOE in accordance with 10 CFR Part 1021 "National Environmental Policy Act Implementing Procedures".

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(c) If preparation and filing of a Mining Plan for the entire operation is dependent on factors which cannot or will not be determined except during the progress of mining activities, a partial plan may be submitted and approved from time to time; provided however, that the Lessee shall not perform mining activities not described in an approved plan.

(d) Changes may be made in the approved Mining Plan by mutual written agreement of the Lessee and the Realty Officer. Approval is contingent upon the Lessee notifying all other appropriate agencies (as outlined in Appendix "C") of the proposed changes.

XIV. PERFORMANCE BOND.

(a) Upon approval of an Exploration Plan or Mining Plan, and prior to commencing any surface-disturbing operations, the Lessee shall be required to file a suitable performance bond of not less than \$_____ with satisfactory surety, payable to the United States Department of Energy, and the bond shall be conditioned upon the faithful compliance with all applicable statutes and regulations, the terms and conditions of this Lease, and any Exploration Plans and Mining Plans, including amendments and supplements thereto, which have been approved by the Realty Officer.

(b) The Realty Officer shall set the amount of the initial bond and may, from time to time, require an increase or allow a decrease in the amount of the bond, as in his judgment the circumstances may require. In determining the amount of the bond, the Realty Officer shall take into consideration all applicable statutes and regulations and the character and nature of the reclamation requirements of the Lease, including the requirements of any approved Exploration Plans and Mining Plans and partial or supplementary plans, and the estimated costs of such reclamation.

(c) The Lessee and his sureties shall be liable for any damage to the Government resulting from the Lessee's failure to complete any work required upon the expiration, relinquishment, or cancellation of this Lease.

XV. INSPECTION. The DOE reserves the right, through its officers, employees, agents, and contractors, to enter upon the Property and into all parts of any of Lessee's mines therein at all reasonable times for inspection and other purposes subject to the Lessee's standard operating procedures.

XVI. GOOD FAITH NEGOTIATIONS. At the request of the Realty Officer, the Lessee will negotiate in good faith with the DOE to reach an agreement under which the Lessee, for appropriate compensation, would correct undesirable conditions existing on the Property as a result of pre-1974 mining activities and such other conditions that may be identified from time to time by the Realty Officer. If for any reason, the Lessee is unable to perform the work required to correct such conditions in a timely manner, DOE reserves the right to contract with another entity to enter upon the Property and perform said work.

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XVII. INDEMNIFICATION OF GOVERNMENT.

(a) The Government, including its employees, all tiers of contractors, agents, and authorized representatives shall not be responsible for any mechanics' or miners' liens or other liens, encumbrances, or liabilities incurred by the Lessee in connection with the operation of the Property. The Lessee assumes all responsibility for and will hold the Government harmless from any and all claims and liability of any nature arising from the operation or occupancy of the Property.

(b) The Lessee agrees to protect and indemnify the Government against any payroll taxes or contributions imposed with respect to any employee of the Lessee by any applicable law dealing with old age pensions, unemployment compensation, accident compensation, health insurance and related subjects. The Lessee also agrees, at its own cost and expense, to insure to each person employed in, about, or upon the Property the compensation provided for by law with respect to workmen's compensation and employer's liability insurance, properly safeguarding the Government, including its employees, all tiers of contractors, agents, and authorized representatives, against liability for injuries to persons, including injuries resulting in death, and loss of and damage to property in policies and amounts acceptable to the DOE and to furnish to the DOE written evidence of such insurance.

XVIII. REPORTING REQUIREMENTS.

(a) The Lessee shall provide the Realty Officer with copies of all permits and correspondence from local, state, or other Federal agencies or entities which pertain to the Lessee's activities on the Property.

(b) The Lessee shall provide to the Realty Officer, within twenty calendar days after the end of each month, an accurate record of the tonnage and U₃O₈ and V₂O₅ grades of each lot of ore delivered from the Property to a mill, buying station, or other purchaser during the previous month, including copies of all settlement sheets furnished to the Lessee for ores so delivered.

(c) The Lessee shall provide to the Realty Officer as soon as practicable after the end of each calendar quarter, the following documents, records, and/or maps:

- (1) A formal (written and signed) summary of all activities conducted on the Property during such calendar quarter that, among other things, documents the Lessee's reasonable diligence required by Article IV "GENERAL PERFORMANCE REQUIREMENT".
- (2) A map or maps showing the location of all exploration holes drilled on the Property during such calendar quarter, together with copies of any logs and assay records applicable to such drill holes.

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- (3) A mine map or maps showing the progress of mining on the Property as of the end of such calendar quarter.
- (4) Lessee's estimate of the tonnage and U_3O_8 and V_2O_5 grades of all ores stockpiled on the Property as of the end of such calendar quarter.
- (5) If no activity occurs on the Property during a calendar quarter, a letter submitted to the Realty Officer stating that no activity has occurred shall satisfy this reporting requirement.

(d) The Lessee further agrees to provide to the Realty Officer the results of any inspections of Lessee's mines or other facilities located on the Property, conducted by personnel of local, state, or other Federal agencies under applicable statutes and regulations. Furthermore, the Lessee agrees to notify the Realty Officer of any planned or scheduled inspections to be performed by local, state, or other federal agencies as soon as such schedule is known so that the Realty Officer may participate in said inspection if so desired.

(e) The Lessee is hereby notified that information obtained by DOE from the Lessee under this section shall be subject to the provisions of the Freedom of Information Act (5 U.S.C. 552).

XIX. TAXES. The Lessee agrees to pay when due all taxes lawfully assessed and levied pursuant to state or Federal law upon improvements, output of mines, and other interests, property, and assets of the Lessee in or upon the Property.

XX. ASSIGNMENT. The Lessee agrees that no transfer of this lease, or of any interest therein or claim thereunder, by assignment shall occur within the first 30-month period of this lease. Additionally, no transfer of this lease, or of any interest therein or claim thereunder, by assignment, sublease, operating agreement, or otherwise, shall occur unless and until approved in writing by the Realty Officer.

XXI. RELINQUISHMENT OF LEASE. This Lease may be surrendered by the Lessee upon the Lessee's filing with the DOE, and the Realty Officer's approval of, a written application for relinquishment. Approval of the application shall be contingent upon the delivery of the Property to the DOE in a condition satisfactory to the Realty Officer, in accordance with the terms of this Lease, and upon the continued liability of the Lessee to make payment of all royalty and other debts theretofore accrued and due the DOE.

XXII. CANCELLATION OF LEASE. DOE may cancel this Lease if the Realty Officer determines that the Lessee has failed to comply with any provision of this Lease including reasonable diligence. Failure of DOE to exercise its rights to cancel shall not be deemed to be a waiver thereof.

XXIII. DELIVERY OF PREMISES. At the expiration of this Lease, or upon its earlier relinquishment or cancellation as herein provided, the Lessee shall, within one hundred eighty

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(180) days or other period mutually agreed to by the Lessee and Realty Officer, surrender the Property in a condition satisfactory to the Realty Officer, and shall, unless otherwise directed by the Realty Officer in writing, remove from the Property at Lessee's expense all structures, machinery, equipment, tools, and improvements placed thereon by the Lessee; provided, that the Lessee shall not remove any timbers or improvements which are determined by the Realty Officer to be required to be left in the mine workings to protect such workings as a mining property. Furthermore, prior to the surrender of the Property, the Lessee shall remove from the Property at Lessee's expense all stockpiles of ore and/or protore materials placed thereon by the Lessee and remit the required royalties to DOE in accordance with Article V "ROYALTIES" and Appendix "B". Otherwise, the Lessee shall at the Lessee's expense return all stockpiles of ore and/or protore materials to a suitable location within the underground mine workings on the Property or other location on the Property as designated by the Realty Officer.

XXIV. EXAMINATION OF RECORDS.

(a) The DOE and the Comptroller General of the United States or duly authorized representatives of either shall, until three (3) years after final payment under this Lease, have access to and the right to examine any of the Lessee's directly pertinent books, documents, papers, or other records involving transactions related to this Lease. The Lessee shall make these records and documents available to the Government, at the Lessee's offices, at all reasonable times, without any charge.

(b) The Lessee agrees to include in first-tier subcontracts under this Lease a clause to the effect that the DOE or the Comptroller General or duly authorized representatives of either shall, until three (3) years after final payment under the subcontract, have access to and the right to examine any of the subcontractor's directly pertinent books, documents, papers, or other records involving transactions related to the subcontract.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under Article XXVII "DISPUTES", (2) litigation or settlement of claims arising from the performance of this Lease, or (3) costs and expenses of this Lease to which the DOE or the Comptroller General or duly authorized representatives of either has taken exception shall continue until such appeals, litigation, claims, or exceptions are disposed of.

XXV. OFFICIALS NOT TO BENEFIT. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Lease, or to any benefit arising from it. However, this clause does not apply to this Lease to the extent that this Lease is made with a corporation for the corporation's general benefit.

XXVI. COVENANT AGAINST CONTINGENT FEES. The Lessee warrants that no person or selling agency has been employed or retained to solicit or secure this Lease upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the Lessee for the purpose of securing business. For breach or violation of this warranty, the Government shall have the right to cancel this Lease without liability, or in its

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discretion to require the Lessee to pay to DOE the full amount of such commission, percentage, brokerage, or contingent fee.

XXVII. DISPUTES.

(a) Except as otherwise provided in this Lease, any dispute concerning a question of fact arising under this Lease which is not disposed of by agreement shall be decided by the Realty Officer, who shall reduce his decision to writing and mail or otherwise furnish a copy thereof to the Lessee. The decision of the Realty Officer shall be final and conclusive unless within 30 days from the date of receipt of such copy, the Lessee mails or otherwise furnishes to the Realty Officer a written appeal addressed to the DOE. The decision of the DOE for the determination of such appeals shall be final and conclusive unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this clause, the Lessee shall be afforded an opportunity to be heard, and to offer evidence in support of its appeal. Pending final decision of a dispute hereunder, the Lessee shall abide by the Realty Officer’s decision.

(b) The provisions of paragraph (a) above does not preclude consideration of questions of law; provided, that nothing in this Lease shall be construed as making final the decision of any administrative official, representative, or board on a question of law.

XXVIII. HEIRS AND SUCCESSORS-IN-INTEREST. Each obligation hereunder shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

XXIX. MEMORANDUM FOR RECORDING. If the Lessee so requests, the parties agree to execute a mutually agreeable written memorandum of even date herewith sufficient to be entitled to be recorded under the laws of the State of Colorado, reciting that all of their right, title, and interest in and to the Property is held subject to this Lease, and that DOE has reserved the royalties described in this Lease, which memorandum Lessee may place of record in the appropriate County. Upon termination of this lease, lessee agrees to execute documentation, which will also be recorded appropriately, showing the lease has terminated.

XXX. NOTICE. Any notice, election, report, or other correspondence (“Documents”) required or permitted hereunder shall be in writing and shall be addressed to the party to whom directed as follows:

(a) If to Lessee:

Company Name

Address (for US Mail and parcel delivery)

City, State, Zip Code

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Attention:

Telephone:

Facsimile:

(b) If to DOE:

U.S. Department Of Energy

11025 Dover Street, Suite 1000

Westminster, CO 80021-5573

Attention: Steven R. Schiesswohl, Realty Officer

Telephone: (720) 377-9683

Facsimile: (720) 377-3829

Time-sensitive Documents shall be (i) sent by registered or certified United States mail, postage prepaid, return receipt requested; (ii) sent by a reputable overnight courier, or (iii) sent by facsimile transmission with confirmation of receipt. All other Documents can be delivered or sent as indicated above, or may be sent by regular United States mail.

Either party may, from time to time, change its address for the delivery of future documents hereunder by notice in accordance with this Section XXX. Except as provided for royalty payments in Appendix "B" paragraph (g), all documents generated in accordance with this Lease shall be deemed complete and effective on the date that the document was issued.

XXXI. SURVIVAL. The following shall survive termination of this Lease: Articles V, VII (a), X, XI, XIV, XV, XVII, XVIII, XIX, XXII, XXIII, XXIV, and XXX and the Appendices.

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IN WITNESS WHEREOF, the parties hereto have executed this Lease, effective as of the date first above written, intending to be legally bound thereby.

UNITED STATES OF AMERICA
UNITED STATES DEPARTMENT OF ENERGY _____ (LESSEE)

By _____	By _____
Title <u>Realty Officer</u>	Title _____
Date _____	Date _____

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APPENDIX A

DESCRIPTION OF LEASED PROPERTY

The leased Property described herein was referred to as “MINING LEASE NO. AT(05-1)-ML-60.8-C-X-X” during the period from 1974 to the enactment of this Lease.

Lease-specific legal description will be inserted here.

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APPENDIX B

ROYALTIES

(a) At the beginning of each lease year during the term of this Lease, there shall become due and payable to the DOE an annual royalty of \$_____. Annual royalties paid pursuant to this article shall be credited against royalty bid payments which become payable during the term of this Lease. Annual royalties so paid shall not be refunded upon the expiration, relinquishment, or cancellation of this Lease.

(b) The Lessee agrees to pay to the DOE a royalty bid payment, per dry ton of ore delivered from the Property to a mill or other receiving station, in the amount of _____ percent (___%) of the value per dry ton, determined as provided in paragraph (g) of this Appendix "B". This royalty shall apply to all ores produced from the Property during the term of this Lease.

(c) Unless otherwise authorized by DOE in writing, all ores mined from the Property shall be stockpiled on the Property until such time as they are delivered to a mill or other receiving station.

(d) With respect to ores which are mined from the Property and delivered to a mill or other receiving station which is owned or controlled by the Lessee, the Lessee agrees to make royalty bid payments, for all lots of such ore assayed or fed to process during each calendar month, within twenty (20) calendar days after the end of such calendar month. Such royalty bid payments shall be treated as provisional payments with respect to any lot of ore for which the DOE requests an umpire assay, and an appropriate adjustment shall be made in the first royalty bid payment following Lessee's receipt of the results of such umpire assay for such lot of ore.

(e) With respect to ores which are mined from the Property and delivered to a mill or other receiving station not owned or controlled by the Lessee, the Lessee agrees:

(1) That the DOE may receive royalty bid payments directly from the owner or controller of the mill or other receiving station to which such ores are shipped by the Lessee if the DOE makes arrangements therefore satisfactory to the Lessee.

(2) That, in the absence of such arrangements, the Lessee shall make royalty bid payments for all lots of such ore assayed or fed to process (includes delivery of such ore to an ore-buying station or sample plant) during each calendar month, within twenty (20) calendar days after payment for such lots is mailed to the Lessee; provided, that an appropriate extension of such twenty (20) day period shall be granted by the Realty Officer for any undue delay in the mails which causes a delay in delivery to the Lessee of payment for such lots of ore. Such royalty bid payments shall be treated as provisional payments with respect to any lot of ore for which DOE requests an umpire assay, and an appropriate adjustment shall be made in the first royalty bid payment following finalization of payment to the Lessee for such ore.

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(f) Royalty bid payments due the DOE shall be deemed to have been made when received at the DOE Legacy Management Office in Grand Junction, Colorado.

(g) DOE shall establish the prices for uranium and vanadium that shall be used to calculate the fair-market value of lease tract ores. These prices shall be established on a quarterly basis, on or before the twentieth (20th) day after the end of the previous calendar quarter (in January, April, July, and October), and shall remain in effect during the calendar quarter in which they are established. DOE shall establish these prices as follows:

(1) Using an electronic spreadsheet, DOE shall monitor, record, and track the spot-market and long-term-market prices for uranium (quoted as dollars per pound U_3O_8) as reported weekly in *U_x Weekly*. The spreadsheet will then (i) automatically calculate the monthly and quarterly arithmetic average prices for uranium (both spot-market and long-term-market), and (ii) automatically calculate a quarterly weighted-average price for uranium by applying the appropriate purchase contract percentages to the respective quarterly average prices. Using this spreadsheet, DOE shall also monitor, record, and track the Total Purchased (Weighted-Average Price) for uranium as reported annually by the Energy Information Administration in Table S1b. *Weighted-Average Price of Uranium Purchased by Owners and Operators of U.S. Civilian Nuclear Power Reactors (quoted as Dollars per Pound U_3O_8 Equivalent)*. The spreadsheet will then automatically calculate the arithmetic average between the quarterly weighted-average price for uranium and the Total Purchased (Weighted-Average Price) for uranium. The resulting figure is reported as the annualized quarterly weighted-average price for uranium.

(2) Using the same electronic spreadsheet, DOE shall monitor, record, and track the market price of vanadium (quoted as dollars per pound V_2O_5) as reported twice weekly in *Metal Bulletin (Non-Ferrous Primary Metals, Noble Alloys and Ores, Vanadium pentoxide)*. The spreadsheet will then (i) automatically calculate the monthly and quarterly arithmetic average prices for vanadium, and (ii) automatically apply an adjustment factor of one-half (0.5) to each quarterly arithmetic average price for vanadium. The resulting figure is reported as the adjusted quarterly average price for vanadium.

(3) Paragraphs (g)(1) and (g)(2) can be summarized by the following three equations:

$$U = (Q_{WA} + TP_{WA}) / 2 \quad (1)$$

where:

U = Annualized Quarterly Weighted-Average Price for Uranium

Q_{WA} = Quarterly Weighted-Average Price for Uranium

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TP_{WA} = Total Purchased (Weighted-Average Price) for Uranium

$$Q_{WA} = Q_{SM} * P_{SM} + Q_{LTM} * P_{LTM} \quad (2)$$

where:

Q_{SM} = Quarterly Arithmetic Average Price for the Uranium Spot Market

P_{SM} = Purchase Contract Percentage for the Uranium Spot Market

Q_{LTM} = Quarterly Arithmetic Average Price for the Uranium Long Term Market

P_{LTM} = Purchase Contract Percentage for the Uranium Long Term Market

$$V = Q_{WA} * 0.5 \quad (3)$$

where:

V = Annualized Quarterly Weighted-Average Price for Vanadium

Q_{WA} = Quarterly Weighted-Average Price for Vanadium

(h) The Lessee shall be notified of these prices (annualized quarterly weighted-average price for uranium and adjusted quarterly average price for vanadium) by formal written correspondence. The Lessee shall use these prices to calculate the fair-market value of the ore in dollars per dry ton (calculated to the nearest cent [\$0.01]), for all lots of such ore assayed during any calendar month. This fair-market value shall be determined by:

(1) Computing the number of recoverable pounds of contained U_3O_8 and V_2O_5 per dry ton of ore in the lots so assayed by (i) multiplying the total number of pounds of U_3O_8 and V_2O_5 , respectively, contained in the lots of ore so assayed during such calendar month, by factors of 0.96 and 0.79, respectively (the average milling facility's recovery rates for U_3O_8 and V_2O_5 , respectively, as acknowledged by DOE) and (ii) dividing each of the resulting numbers by the

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total number of dry tons of ore contained in the lots so assayed during such calendar month, and carrying the results to three decimal places for U_3O_8 and two decimal places for V_2O_5 ; and

(2) Adding together the dollar amounts obtained by (i) multiplying the number of recoverable pounds of U_3O_8 per dry ton of ore in the lots so assayed by the price per pound of U_3O_8 established by DOE and (ii) multiplying the number of recoverable pounds of V_2O_5 per dry ton of ore in the lots so assayed by the price per pound of V_2O_5 established by DOE.

(i) For ores that have been mined from the Property and delivered to a mill or other receiving station, but not assayed or fed to process, the Lessee shall estimate the value of said ores using standard industry practices, and shall make royalty bid payments to DOE equal to or greater than 95 percent (95%) of the estimated value of the royalty bid payments due to DOE. Such royalty bid payments shall be treated as provisional payments with respect to said ores until such time that said ores are assayed or fed to process and the final royalty bid payments due to DOE are calculated and final royalty bid payments are made.

(j) If price quotations for vanadium pentoxide become unavailable, the DOE and the Lessee will negotiate to establish a method of determining an appropriate market price per pound of V_2O_5 to be used in determining that portion of the value per dry ton of ore attributable to vanadium. Pending agreement on such method, the last prices established by paragraph (g)(2) above shall be used in determining the portion of the value per dry ton of ore attributable to vanadium, for the purpose of computing royalties under this Lease. If the parties fail to reach agreement on an applicable method, the matter shall constitute a dispute to be decided in accordance with the Article XXVII "DISPUTES" of this Lease.

(k) The parties hereto agree that if the Lessee is paid for any constituent, other than uranium or vanadium, contained in ores mined from the Property, all amounts so paid shall be held in trust by the Lessee for the DOE until the Lessee and the DOE agree upon a base royalty to be paid to the DOE with respect to Lessee's sale of such constituent.

(l) Consistent with Article XXIII "DELIVERY OF PREMISES", the Lessee agrees, that within one hundred eighty (180) days following the expiration, relinquishment, or termination of this Lease as herein provided, all royalties associated with this Lease (annual royalty, base royalty, and bid royalty) shall become due and payable to the DOE. For ores that have been mined from the Property, but not assayed or fed to process, the Lessee shall estimate the value of said ores using standard industry practices, and shall make royalty bid payments to DOE equal to or greater than 95 percent (95%) of the estimated value of the royalty bid payments due to DOE. Such royalty bid payments shall be treated as provisional payments with respect to said ores until such time that said ores are assayed or fed to process and the final royalty bid payments due to DOE are calculated and royalty bid payments are made.

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WEIGHING, SAMPLING, AND ASSAYING.

With respect to ores which are mined from the Property and delivered to a mill or other receiving station, the Lessee agrees to the following provisions:

- (a) The Lessee shall weigh, or cause to be weighed, each lot of ore delivered from the Property to a mill or other receiving station and shall furnish the DOE a record of the weight of such lot. The scales used in weighing such ore shall be balanced daily and checked once each week or more often, as appears necessary, by either standard weights or by check-weighing against another scale. Scale platforms will be kept clean and free of the sides of the pit, and the scales shall be inspected and certified every six months by the appropriate entity of the state in which the mill or receiving station is located, if such inspection is available; otherwise, a biannual inspection shall be made by a competent organization which is acceptable to both the Lessee and the DOE.
- (b) The Lessee shall sample, or cause to be sampled, each lot of ore according to standard and accepted practices in ore sampling, and such sampling shall be final and binding on both parties to this Lease. The DOE or its representative may be present at the sampling of such ore. The Lessee shall ensure that moisture determinations are made according to standard practices in ore sampling. The Lessee shall ensure that each final sample is divided into four (4) pulps, one of which shall be promptly furnished to the DOE, one of which shall be retained by the Lessee for assay purposes, and two of which shall be held in reserve by the Lessee for possible umpire analysis. The Lessee shall promptly assay, or cause to be assayed, its pulp for U_3O_8 and V_2O_5 content and shall transmit the assay results to the DOE, together with weight and moisture certificates for the lot sampled. For the purpose of such reporting, all assays for U_3O_8 shall be adjusted to the nearest 0.001% and all assays for V_2O_5 shall be adjusted to the nearest 0.01%.
- (c) The DOE may assay its pulps at its own expense. In case of disagreement with the Lessee's assay with respect to either U_3O_8 or V_2O_5 content, the DOE may, within 30 calendar days after receiving its pulp, mail to the Lessee a written request for an umpire assay. Upon receipt of such written request, the Lessee shall promptly submit one of the pulps held in reserve to an assayer, whom the parties hereto shall agree upon, for umpire assay. With respect to both U_3O_8 and V_2O_5 content, if the assay of the umpire is within the assays of the two parties, it shall be final. If not, the assay which is nearer to that of the umpire shall prevail. The party whose assay for U_3O_8 is further from that of the umpire shall pay the cost of the umpire's assay. In the event that the umpire's assay for U_3O_8 is equally distant from the assay of each party, the cost shall be split equally.
- (d) The quantity of ore comprising a lot, as used herein, shall be determined by the Lessee, except that no lot shall exceed one thousand (1,000) tons of ore except as otherwise agreed in writing by the Realty Officer.

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APPENDIX C

SPECIFIC REQUIREMENTS AND STIPULATIONS

The Lessee agrees to comply with all applicable statutes and regulations, including but not limited to the following items:

(a) Prior to resuming operations on the Property that were previously approved by DOE, the Lessee shall notify the Realty Officer in writing of its intentions to resume such operation and shall include any changes, additions, or modifications to the original plan that are now proposed. Upon receipt of such notification, the Realty Officer shall review the approved plan along with any new information provided by the Lessee and determine if additional stipulations are warranted. When all pertinent requirements are satisfied, DOE shall provide the Lessee with a written approval to proceed.

(b) All existing serviceable improvements such as fences, gates, cattle guards, roads, trails, culverts, pipelines, bridges, and water development and control structures, authorized for use by the Lessee, shall be maintained in serviceable condition by the Lessee. Improvements damaged or destroyed by the Lessee's operations shall be replaced, restored, or compensated for by the Lessee.

(c) The Lessee's operations shall not disturb public land survey corner markers or monuments or Atomic Energy Commission (AEC) survey markers without the prior written approval of the Realty Officer. Additionally, the Lessee shall pay all costs associated with the surveys required to preserve or reestablish the true point of any such marker or monument and the replacement of such marker or monument.

(d) Housing and other buildings and support facilities related to community development shall be constructed or located on the Property only upon the prior written approval of the Realty Officer. In constructing and locating such housing, other buildings, and support facilities, the Lessee shall comply with applicable county planning and zoning regulations, subdivision regulations, and mobile home regulations, and shall furnish evidence of such compliance to the Realty Officer upon request.

(e) Prior to any surface disturbing activity, the Lessee shall file a "Notice of Intent to Conduct Prospecting Operations" (Notice) or "Reclamation Permit Application" (Application), whichever is appropriate, with the Colorado Mined Land Reclamation Board (MLRB) in accordance with "Mineral Rules and Regulations" of the Colorado MLRB, as these rules may be amended. All subsequent modifications to the Notice or Application shall be addressed in accordance with the "Mineral Rules and Regulations" of the Colorado MLRB. The Lessee shall provide the Realty Officer with copies of all pertinent approval documentation including permits issued.

(f) Prior to any surface disturbing activity, the Lessee shall consult with the U.S. Department of Interior—Bureau of Land Management (BLM), the U.S. Department of Interior—

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Fish and Wildlife Service (USFWS), and/or the Colorado Department of Natural Resources—Division of Wildlife (CDOW), as appropriate, to determine whether threatened or endangered, or sensitive plant or wildlife species occur in the area to be disturbed or whether the agencies have other plant or wildlife concerns in the area to be disturbed. If required, the Lessee shall conduct surveys or provide other documentation to resolve this concern. The Lessee shall provide the Realty Officer with copies of all documents pertaining to this issue.

(g) Prior to any surface disturbing activity, the Lessee shall perform a cultural and historical survey of the area to be disturbed. If cultural or historical resources are found to exist, the Lessee shall consult with the State Historical Preservation Officer for the appropriate measures to be taken. If required, the Lessee shall prepare a mitigation plan to address the protection of the cultural or historical resources. The Lessee shall provide the Realty Officer with copies of all documents pertaining to this issue.

(h) Prior to any surface disturbance activity in a potential floodplain or wetland area, the Lessee shall consult with the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, and the appropriate state agency to determine whether a jurisdictional floodplain or wetland exists in the area to be disturbed. If required, the Lessee shall prepare a Floodplain/Wetlands Assessment that proposes mitigation measures to be taken to resolve this concern. The Lessee shall provide the Realty Officer with copies of all documents pertaining to this issue.

(i) The Lessee shall use existing roads where practicable, and shall conduct activities employing wheel or track vehicles in such a manner as to minimize surface damage. The Lessee shall wash all tracked vehicles or equipment prior to their being mobilized to the Property. The Lessee shall promptly repair any road damage resulting from the Lessee's operations, restoring such road to its previous condition or to a condition acceptable to the Realty Officer. Where existing access roads across the Property are used principally by the Lessee, the Lessee shall construct surface-water control and drainage structures (culverts, water bars, or grade dips) on such roads to minimize erosion. Plans for such structures shall be included in all Exploration Plans and Mining Plans submitted to the Realty Officer pursuant to Articles XII "EXPLORATION PLAN" and XIII "MINING PLAN" hereof, respectively. The Lessee shall construct new roads and trails on the Property only at locations and to specifications approved in advance in writing by the Realty Officer or an authorized representative of the Realty Officer, and shall construct and maintain such roads and trails in a manner that will minimize channeling and other erosion. The Realty Officer's approval of plans for new access road construction, culverts, water bars, or grade dips will be guided by standards established by BLM or the U.S. Department of Agriculture—Forest Service (USFS), where appropriate.

(j) The Lessee shall conduct all operations so as to protect all natural resources and the environment including streams, lakes, ponds, waterholes, seeps, and marshes, and protect fish and wildlife resources as required by applicable statutes and regulations. The Lessee shall control all mine wastes, contaminants and pollutants, and sediments associated with stormwater runoff in accordance with existing regulations, and shall comply with all environmental regulations regarding discharge into, or degradation of water resources including streams,

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springs, stock waters, or groundwater. The Lessee shall not use water from any water source without the written consent of the person having the rights to the use of such water source.

(k) Lessee shall keep the clearing of timber, stumps and snags, and any ground cover to a minimum consistent with the conduct of exploration, development, and mining activities approved hereunder. The Lessee shall abide by any restrictions concerning the bulk removal of vegetation (primarily piñon pine) that are established by the Realty Officer. The Lessee shall use due care to avoid scarring or removal of vegetative ground cover in areas not involved in such operations. Open parks (areas where there is a grass, shrub, and/or sagebrush cover) shall be disturbed as little as possible. If the shrub or brush cover is too high and must be cleared, it shall be cleared at or above ground level. The Lessee shall return all disturbed areas to their original condition or a condition acceptable to the Realty Officer promptly after damage to such areas has occurred and operations under this Lease are no longer being conducted in the disturbed areas.

(l) The Lessee agrees that all underground mine openings shall be supported by pillars, timber, or other ground support devices approved by the Federal or state agencies having jurisdiction over such underground workings. The Lessee further agrees, during the term of this Lease, to substantially fence or permanently close all mine openings/portals, subsidence holes, surface excavations, or other workings resulting from the Lessee's operation that may be considered hazardous to human health or the environment. Such protective measures shall be maintained in a proper and safe condition during the term of this Lease. Prior to abandoning operations, the Lessee shall submit a mine-site reclamation plan to the Realty Officer for approval. Such plan shall include the proposed method(s) of permanent closure for all mine openings/portals including shafts, adits, inclines/declines, ventilation shafts, and water discharge points. No underground workings or any part thereof shall be permanently abandoned and rendered inaccessible without the prior written approval of the Realty Officer. All mine-site reclamation shall be performed to the satisfaction of the Realty Officer in accordance with the approved reclamation plan.

(m) Surface drill holes and associated disturbances resulting from exploration or development activities shall be abandoned in accordance with existing regulations and in a manner that will protect the surface. All disturbed areas identified by the Lessee as not being needed for future operational activities shall be promptly reclaimed by the Lessee. The Realty Officer, by written notice to the Lessee, shall designate any other areas where reclamation must be undertaken as a result of disturbances caused by the Lessee's operations.

(n) If antiquities or other objects of historic or scientific interest, including but not limited to historic or prehistoric features or ruins, artifacts, or vertebrate fossils are discovered by the Lessee in the performance of operations under this Lease, the Lessee shall cease operations in the vicinity of such discovery and immediately take appropriate steps to protect and save such objects of historic or scientific interest and shall notify the Realty Officer of such discovery. The Realty Officer shall assess the values involved and prescribe such protective measures as deemed necessary.

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(o) The Lessee shall make every effort to prevent, control, or suppress any fire in the operating area and to report any uncontrolled fire to the appropriate BLM or USFS official, as designated by the Realty Officer.

(p) The Lessee shall provide detailed haul route information to the Realty Officer for review prior to commencement of any haul activities. The haul route information shall include, at a minimum, expected routes from the mine site to the proposed mill or other facility accepting material from the mine, expected number of trucks per day, size and approximate weights of the ore being shipped, and expected production rates and mining life timeframes. It is expected that the Lessee will utilize only the specified routing. The lessee shall notify the Realty Officer of any significant changes to the haul route plan.

(q) The Lessee shall comply with Colorado State Access Code Section 43-2-147(4), C.R.S., and Section 24-4-103., C.R.S., effective 8/31/98. Pursuant to said code, the Lessee may be required to participate in a Highway Access Pre-Consultation meeting with DOE and the Colorado Department of Transportation after the completion and submittal to DOE of the approved permit from the Colorado MLRB. The details provided within the Mining Plan and permit, and the information provided under paragraph (p) above shall be used to determine the need for the Pre-Consultation meeting and to determine the potential impacts to county and state roads, highways and intersections from the Lessee's operations, and any resulting mitigation requirements from these impacts. Any revisions or amendments to the permit, or any conversion from one permit type to another approved by the Colorado MLRB shall also be provided to the Realty Officer. The permit revision, modification or conversion may be used to determine any additional impacts to the county roads or state highways from the Lessee's operations, and any resulting mitigation requirements from these additional impacts. Access permits required under this requirement shall be provided to the Realty Officer.

(r) The Lessee shall attend and participate in meetings between DOE and other Federal, state, and local agencies, as required.

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EXPLORATION PLAN FORMAT

It is not DOE's intent to require the Lessee to prepare multiple documents for submittal to the appropriate agencies for review and approval. Consequently, at the Lessee's discretion, a copy of the "Notice of Intent to Conduct Prospecting Operations" filed with the Colorado MLRB may be submitted to DOE for review and approval. That document will meet DOE's requirement for submittal of an Exploration Plan providing it contains, at a minimum, the following information:

- a. Map showing general area to be explored
 1. Tentative location of drill holes or other exploration activity
 2. Location of roads (existing and proposed)
- b. Approximate starting date and duration of drilling
- c. Drilling information
 1. Type of drilling and/or other exploration equipment
 2. Size of hole and core, if any, to be recovered
 3. Type of logging
 4. Target horizon and depth
- d. Road construction necessary for exploration
 1. Location of roads and drill sites
 2. Measures to be taken for erosion control
- e. Abandonment
 1. Procedures for plugging drill holes including the disposition of drill hole cuttings
 2. Surface restoration (grading, revegetation, erosion control measures, etc.)
- f. Provisions made to conform with existing state and federal regulations regarding control of fire, pollution of water and air, protection of other natural resources, and public health and safety, both during and upon abandonment of exploration activities
- g. Specific measures to be taken to assure compliance with environmental and surface use stipulations of this Lease including the preparation of a site-specific environmental document that assures compliance with NEPA and other environmental regulations.

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MINING PLAN FORMAT

It is not DOE's intent to require the Lessee to prepare multiple documents for submittal to the appropriate agencies for review and approval. Consequently, at the Lessee's discretion, a copy of the "Reclamation Permit Application" filed with the Colorado MLRB may be submitted to DOE for review and approval. That document will meet DOE's requirement for submittal of a Mining Plan providing it contains, at a minimum, the following information:

- a. Map showing location of:
 1. Ore body and proposed entry
 2. Any new roads required
 3. Mine plant and associated structures and facilities
 4. Waste dumps and ore storage areas
- b. Mining
 1. Initial development plans
 - A. Type of entry and haulage method proposed
 - B. Stoping method
 - C. Estimated rate of daily ore production and mine-life expectations
 - D. Provisions to handle mine water
 2. Proposed ventilation and radiation control methods
- c. Surface Plant
 1. Buildings, utility lines, and storage/stockpile areas
 2. Sewage and refuse disposal
 3. Compliance with any applicable county planning and zoning regulations
 4. Compliance with EPA stormwater discharge regulations
- d. Surface restoration plans
 1. Topsoil removal and storage
 2. Grading and backfilling

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3. Control of stormwater runoff
4. Revegetation (if required)
- e. Abandonment
 1. Permanent closure of all mine openings/portals resulting from, or utilized during, the Lessee's operations.
 2. Removal of structures and associated features
 3. Disposition of mine wastes (contouring, leveling, use for backfill, etc.)
- f. Provisions made to conform with existing state and federal regulations regarding control of fire, pollution of water and air, protection of other natural resources, and public health and safety, both during and upon abandonment of mining activities.
- g. Specific measures to be taken to assure compliance with environmental and surface use stipulations of the Lease including the preparation of a site-specific environmental document that assures compliance with NEPA and other environmental regulations.

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APPENDIX B:
SUMMARY OF THE PUBLIC SCOPING PROCESS FOR THE ULP PEIS

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APPENDIX B:**SUMMARY OF THE PUBLIC SCOPING PROCESS FOR THE ULP PEIS****B.1 INTRODUCTION AND BACKGROUND**

The U.S. Department of Energy (DOE) issued the Notice of Intent (NOI) to prepare the Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) on June 21, 2011 (see Volume 76 of the *Federal Register*: 76 FR 36098). It issued a supplemental notice on July 21, 2011 (76 FR 43678) that announced four public scoping meetings and extended the scoping period through September 9, 2011.

The issuance of the NOI marked the start of the National Environmental Policy Act (NEPA) process for the ULP PEIS that includes opportunities for public participation. This appendix presents a summary of the comments that were received during the scoping period of June 21 through September 9, 2011, for consideration in preparing the Draft PEIS. All comments, regardless of how they were submitted, were given equal consideration in the development of this Draft ULP PEIS.

B.2 SCOPING PROCESS

The NOI and the supplemental notice identified three methods by which the public could provide scoping comments or suggestions for the scope of the ULP PEIS:

- In person at public scoping meetings;
- By electronic mail (e-mail) and regular mail; and
- By electronic comment submittal through the project web site.

DOE conducted scoping meetings for the ULP PEIS at the four locations and on the dates shown in Table B-1. The number of people who attended these meetings is also presented in Table B-1. Meetings were held in Montrose, Naturita, and Telluride, Colorado, and in Monticello, Utah. Each meeting started at 5:30 with registration to provide oral comments, and a brief presentation was given by DOE at 7:00 p.m. In addition to presenting verbal comments at the scoping meetings, stakeholders could also e-mail comments, send comments by mail, or could fill out a comment form at the scoping meetings or on the project web site (<http://ulpeis.anl.gov/>).

During the scoping period, a total of 287 unique comment documents were received from individuals, organizations, and government agencies that addressed the scope of the ULP PEIS. A “comment document” can be a written document (web form or comment form that was distributed at the scoping meetings or by mail), an e-mail submission, or an oral presentation given during a scoping meeting that provides comments on the scope and content of the ULP PEIS. A single comment document may contain multiple comments on one or more issues. There

1 were 61 comment documents provided through the scoping meetings, 164 e-mails and letters, and
 2 62 comment forms submitted through the project web site. Among the 287 comment documents
 3 received, 8 were from Federal, state, or local government agencies; and the remainder were from
 4 individuals or other organizations. Comment documents were received from 13 states; however,
 5 approximately 88% of the comments were from Colorado communities or communities near the
 6 DOE ULP lease tracts.

9 **B.3 SUMMARY OF SCOPING COMMENTS**

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 11 All public scoping comments were reviewed and considered in determining the scope for
 12 this Draft ULP PEIS. Table B-2 summarizes the public scoping comments that were considered
 13 to be within the scope of the Draft ULP PEIS. Those that were considered outside the scope are
 14 summarized in Table B-3. The rationales for the determinations are also presented in both tables.

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 17 **TABLE B-1 Public Scoping Meeting Locations,**
 18 **Dates, and Attendance**

Location	Date	No. in Attendance
Montrose, Colorado	August 8, 2011	65
Telluride, Colorado	August 9, 2011	85
Naturita, Colorado	August 10, 2011	51
Monticello, Utah	August 11, 2011	1
Total		202

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1 **TABLE B-2 Public Scoping Comments Considered To Be within the Scope of the PEIS**

Public Scoping Comment	Rationale
1. Alternatives	
1A. Support for Alternative 1.	Alternative 1 is included in the range of reasonable alternatives that are evaluated in the Draft PEIS. Under this alternative, all the existing leases (there are 29) would be terminated, and reclamation would be completed on disturbed areas that remained on the lease tracts. DOE would continue to manage the withdrawn land but would not lease the land for uranium mining.
1B. Support for Alternative 5 because uranium is a clean nuclear energy source that can be mined safely. Some commenters urged DOE to continue the leasing program as it was before the preparation of the PEIS, arguing that companies and individuals should have the right to mine and produce uranium and vanadium just as companies extract coal and other resources such as natural gas.	Alternative 5 is included in the range of reasonable alternatives that are evaluated in the Draft PEIS. Under this alternative, all 31 lease tracts are evaluated for potential exploration, mine development and operations, and reclamation. The 29 leases that were signed in 2008 would have expired in 2018, but these leases have been placed on hold for the duration that it would take to complete this PEIS. The leases would be extended for a duration equivalent to the time taken to complete the PEIS (e.g., if 3 years were added, the end date for the leases would be 2021).
1C. Alternatives should include these: maintaining current withdrawals without issuing leases; expanding the lease program without issuing leases; issuing leases only on the previously active tracts for the purpose of reclamation; issuing fewer leases requiring interim reclamation; and requiring additional lease stipulations for protection of public lands.	Currently, 29 leases exist (this has been the case since 2008); however, a situation in which current withdrawals would be maintained without issuing leases would occur under Alternative 1. Reclamation that was needed and terminations of the 29 existing leases would also be done as part of Alternative 1. Current leases include adequate stipulations providing appropriate protection of public lands.
1D. An Alternative that stipulates protection of the Dolores River and San Miguel River watersheds. Lease tracts in the Dolores River Canyon should be withdrawn from the ULP (i.e., Slick Rock Lease Tracts 13, 13A, and 14).	Leases for Lease Tracts 13 and 13A have been in existence since 1974 and still currently exist. Lease Tract 14 (Tracts 14-1, 14-2, and 14-3) is not presently leased. Future uranium mines on all three lease tracts would be expected to be at least 0.25 mi (0.40 km) from the Dolores River. As discussed in the rationale for 1C, Alternative 1 would result in the existing leases being terminated and the currently withdrawn lands being maintained by DOE without leasing for uranium mining.
1E. An Alternative to keep the lease tracts in place but to prohibit any further mining or exploration until reclamation has been completed on existing or old leases.	DOE believes that the range of reasonable alternatives evaluated in the Draft PEIS addresses this concern. Under Alternatives 1 and 2, the existing leases would be terminated, and reclamation would be conducted. In addition, all legacy mine sites located on the DOE lease tracts have been reclaimed.
1F. Vacate all leases and re-bid them with both a royalty component and a performance-based component.	DOE's ULP incorporates a royalty component that is inherently performance-based. The option of terminating all leases is incorporated in Alternatives 1 and 2.

TABLE B-2 (Cont.)

Public Scoping Comment	Rationale
2. Impact Analysis	
<p>2A. Cultural resources must be adequately studied, documented, and protected. DOE is encouraged to work closely with local Native Americans familiar with surrounding anthropological resources and cultural artifacts. Archaeological surveys should be conducted where future mining and disturbances might occur, and all recorded sites must be evaluated for significance. An antiquities preservation plan should be prepared for unavoidable impacts.</p>	<p>The analysis of cultural resources discussed in the Draft PEIS for the five alternatives evaluated addresses this concern. DOE initiated Government-to-government consultation with six tribes. The status of these consultations to date is summarized in Chapter 6 of the Draft PEIS. The Draft PEIS does identify archaeological surveys to be conducted on a project-specific basis as exploration and mine development plans are submitted to DOE for approval. The preparation of an antiquities preservation plan and other plans would be done consistent with appropriate requirements.</p>
<p>2B. Consider negative impacts on tourism, recreation, and property values, and the overall impact on the local economy and land use in surrounding communities. There is concern that uranium mining could create a boom-and-bust economy.</p>	<p>The impacts analysis in Chapter 4 for socioeconomics addresses this concern.</p>
<p>2C. Estimate the number and types of jobs to be created under each alternative, and how each alternative might affect the number of employees needed from outside the region. The concern is that uranium mining would not provide many jobs, and that those jobs would be available only for the short term.</p>	<p>Same as 2B.</p>
<p>2D. Evaluate impacts of uranium mining on water quality. Many commenters were concerned with the impacts on downstream water users. They thought that downstream water quality should be included in the impact analysis, and that water use for uranium mining and milling should be included in the analysis.</p>	<p>The impacts analysis for water resources addresses potential impacts on water quality from the ULP proposed action (i.e., from exploration, mine development and operations, and reclamation). Uranium ore milling or processing (e.g., at the proposed Piñon Ridge Mill or at White Mesa Mill) is outside the scope of the ULP proposed action. However, the cumulative impacts analyses conducted for the Draft ULP PEIS considered potential impacts from the proposed Piñon Ridge Mill and the White Mesa Mill.</p>
<p>2E. Include best management practices (BMPs) to minimize stormwater runoff as well as a mitigation measure that would require all vent shafts to be grouted where they intercept aquifers.</p>	<p>BMPs, mitigation measures, and compliance measures are discussed in the Draft ULP PEIS (see Section 4.6 for a summary list) and were considered in the impact analyses for specific resource areas discussed in Chapter 4. These measures include ones that address stormwater runoff. Final measures for mitigating potential impacts would be determined in the record of decision (ROD) for the ULP PEIS and incorporated into approved mine plans, as appropriate.</p>

TABLE B-2 (Cont.)

Public Scoping Comment	Rationale
2F. Provide description of uranium mining activities and a realistic estimate of activities that will occur on lease tracts until the end of the 10-year time frame.	Since project-specific mine plans were not available prior to the start of the preparation of this Draft ULP PEIS, existing information based on current permits was augmented with reasonable assumptions to simulate realistic but upper-bound mining scenarios (covering, for example, how many mines would operate at the same time, the size of the mines, tonnage produced per mine, amount of water used, number of workers, and types of equipment used). These assumptions provided the basis for the impacts evaluation discussed in Chapter 4 of this Draft PEIS, providing reasonable upper-bound estimates for consideration. These assumptions are discussed in Chapter 2 of this Draft PEIS.
2G. DOE should undertake its duties under Section 7 of the Endangered Species Act (ESA). The PEIS must fully address impacts on native fish, on aquatic species and riparian habitat, and on the river corridor. The PEIS should exclude development on all designated critical habitat areas. Species downstream from the lease tracts on the Colorado River should be included in the analysis of biological resources. The PEIS should fully survey the area for rare and imperiled species and should include an ecosystems services analysis of the Dolores River watershed.	DOE is engaged in consultation with the USFWS per Section 7 of the ESA. A biological assessment is also being prepared as part of this consultation. This Draft ULP PEIS evaluates potential impacts on ecological resources in the area of the lease tracts, as well as on the threatened and endangered species identified through consultation with the USFWS.
2H. Include impacts from the release of radioactive and other toxic materials into the atmosphere from mining and milling operations.	The Draft ULP PEIS addresses the potential impacts from the release of material associated with the ore production. The potential impacts of milling operations are outside the scope of the proposed action but are addressed as part of the cumulative impacts analysis in Section 4.7.
2I. Evaluate the amount of disturbed land that will be a source of increased fugitive dust. There is high potential for air toxicity affecting a widespread area as a result of any weather events that would involve high winds over a dry desert. DOE should identify air emissions, evaluate adverse National Ambient Air Quality Standards (NAAQS) impacts on any Federal Class I or sensitive Class II areas (Colorado National Monument), and include plans to control dust.	The analyses for air quality included in Sections 4.1.1, 4.2.1, 4.3.1, 4.4.1, and 4.5.1 of this Draft ULP PEIS address this concern.
2J. Evaluate impacts from the release of radon gas and radioactive particulates from mine openings and radon vents; also determine the emissions from mine operations and the impacts on air, climate change, soils, water, and vegetation.	The analysis for potential human health impacts addresses potential impacts from radon gas and uranium on workers and members of the general public within a 50-mi (80-km) radius based on the maximum distance that models allow for deriving dose estimates. Potential impacts on air, climate change, soils, water, and vegetation are addressed in Chapter 4.

TABLE B-2 (Cont.)

Public Scoping Comment	Rationale
<p>2K. Address the long-term impacts on human health, livestock, and wildlife, including food sources, both locally and regionally, due to mining and milling activities. The PEIS must consider health effects of mining and milling, including cancer incidence, on the human population in towns neighboring the mining operation, workers, and local residents.</p>	<p>The analyses of impacts on human health and ecological resources (on livestock and wildlife) address the concern about potential impacts from mining operations. The analysis of human health impacts in Chapter 4 considers the population within a 50-mi (80-km) radius of the lease tract. The analysis for potential impacts on ecological resources addresses resources in the three counties that encompass the 31 lease tracts. The cumulative impacts evaluated in this Draft ULP PEIS (see Section 4.7) address a 50-mi (80-km) radius of the lease tracts and include the White Mesa and Piñon Ridge Mills.</p>
<p>2L. Describe the impacts from the increased use of area roads, as well as mitigation measures for traffic. The PEIS should evaluate potential adverse impacts on public health and safety, the risk of collisions with wildlife, and the effects on the environment from increased truck traffic that would pass through the Curecanti National Recreation Area. The PEIS should also analyze potential impacts of ore haul routes next to rivers and streams.</p>	<p>The analysis for transportation impacts from hauling ore from the DOE ULP lease tracts (including potential traffic impacts) is discussed in Chapter 4 of this Draft ULP PEIS. Measures to mitigate potential impacts from transportation are also summarized in Section 4.6. The analysis provides an estimate of the potential increase in the number of truck trips on the haul routes to the two mills (proposed Piñon Ridge Mill and the White Mesa Mill). Mitigation measures are discussed in Section 4.6 of this Draft PEIS. Any potential impacts on streams or rivers would result from an ore spill following a transportation accident, as discussed in Section 4.3.10.4 of this Draft ULP PEIS. The Cotter Corporation uranium mill in Cañon City, Colorado, is not discussed in this PEIS because it is currently inoperable, and Cotter Corporation has notified the Colorado Department of Public Health and Environment that the radioactive materials license for the mill will not be renewed. Accordingly, U.S. Highway 50, through the Curecanti National Recreation Area, is no longer an ore haulage route.</p>
<p>2M. Address the impacts from erosion by wind and rain runoff. The PEIS must identify, review, consider, and reference all state geological studies and U.S. Geological Survey (USGS) studies of the Uravan Mineral Belt and surrounding areas.</p>	<p>Potential erosion impacts are evaluated in this Draft ULP PEIS (see Sections 4.1.3.1, 4.1.3.2, 4.2.3, 4.3.3, and 4.4.3). Relevant USGS studies, reports, and papers were reviewed to support the discussion and analyses presented in this Draft PEIS.</p>
<p>2N. Consider the environmental sensitivity of Conservation Areas of the Colorado Natural Heritage Program, Areas of Critical Environmental Concern (ACECs), and Special Recreation Management Areas (SRMAs) in the Dolores River Canyon. Development in the three Wilderness Study Areas (WSAs) and 10 Citizen Wilderness Proposals in the affected area should be excluded. The PEIS should consider the views from the Dolores River Canyon at each lease location. There is a concern about the visual impacts that would result from ore trucks travelling along Highway 141, which has been designated the “Unaweep-Tabeguache Scenic and Historic Byway.”</p>	<p>The analysis for visual resources addresses the potential impacts on views from sensitive areas, such as the Dolores River Canyon and the Unaweep-Tabeguache Scenic and Historic Byway.</p>

TABLE B-2 (Cont.)

Public Scoping Comment	Rationale
<p>2O. Any aboveground equipment that makes noise louder than 75 dB that is located within 1 mi (1.6 km) of the Dolores River or any residence should be limited to operating only from 10 a.m. to 6 p.m. on weekdays, and all aboveground blasting anywhere should be limited to between 10 a.m. and 6 p.m. only on weekdays. The PEIS must assess the impacts of noise from intake and exhaust vent fans. The PEIS must include an assessment of the effects from noise on insects, birds, mammals, animal hunting habits, animal mating and reproduction, recreation, grazing, and human habitation.</p>	<p>Any mine plans that would be approved would include measures for mining activities to meet applicable Federal, state, and local requirements, including any requirements regarding noise. It is expected that most mining activities would occur during normal daytime work hours on weekdays. The analysis of potential noise impacts in Chapter 4 of this Draft PEIS addresses potential impacts from the equipment used, including impacts from intake and exhaust vent fans. The analysis for potential impacts on ecological resources also addresses noise. The responses of wildlife to noise would vary by species; the individual's physiological or reproductive condition; distance; and the type, intensity, and duration of the disturbance. Excessive noise levels can alter wildlife habitat use and activity patterns (e.g., exacerbating fragmentation impacts), increase the animals' stress levels, decrease their immune response, reduce reproductive success, increase predation risk, degrade communication, and cause hearing damage. Generally, deleterious physiological responses to noise occur at exposure levels of 55 to 60 dBA or more, although other potential impacts on wildlife would occur at lower levels. Noise levels tend to be lower than this exposure level at distances of more than 1,000 ft (300 m) from the noise source. With the exception of blasting, rock drilling, or pile driving, typical noise levels for heavy equipment range from 75 to 90 dBA at a distance of 50 ft (15 m). If only geometrical spreading and ground effects (among noise attenuation mechanisms) are considered, and if an upper range of 90 dBA is assumed, a noise level of 55 dBA would occur at about 1,100 ft (340 m) from the noise source.</p>
<p>2P. Assess topsoil required for reclamation, assess gaps in reclamation soil requirements and availability, and determine the impacts if there was an insufficient amount of topsoil.</p>	<p>Mine plans are required to address reclamation procedures, and they address surface soil material needed for covering the waste-rock pile and other disturbed surfaces. The source of this top cover material is typically soil material removed from the lease tracts during the course of mine development and operations and retained on the site for subsequent use during the reclamation phase.</p>
<p>2Q. Consider the proximity to the Dolores River and whether a 0.25-mi (0.40-km) buffer from the Dolores River and Calamity Creek should be supported. All water rights associated with the lease tracts should be considered in the PEIS, as well as a requirement for monitoring wells to be established around the perimeter of each lease tract.</p>	<p>Currently, a 0.25-mi (0.40-km) buffer from the Dolores River is being observed as far as the placement of new uranium mining operations on the DOE ULP lease tracts. The analysis for water resources in Chapter 4 focuses on the potential impacts on water quality, since the amount of water needed for the proposed action would be trucked onto the lease tracts and therefore supplied by the vendors used for this service. Requirements for monitoring wells and other requirements will be addressed by DOE and other regulatory agencies as mine plans are submitted for approval.</p>

TABLE B-2 (Cont.)

Public Scoping Comment	Rationale
2R. Assess the practice of ore stockpiling at the lease tracts and its impacts. This should include the amount of stockpiled ore, the radioactive and nonradioactive constituents of the stockpiled ore, the estimated length of time the ore will remain at the sites, and environmental impacts.	The ore that would be generated is not expected to be stockpiled for a length of time that would adversely affect human health and the environment. The Colorado Division of Reclamation, Mining, and Safety (CDRMS) has a requirement that ore cannot be stockpiled for longer than 180 days. However, the continual existence of ore stockpiles during active mining operations is to be expected; it gives the mining companies and their ore transportation contractors flexibility to operate in an efficient manner.
3. Tribal Concerns	
3A. Address any associated environmental and spiritual impacts on all downstream Native American Nations. Must engage in Section 106 consultation.	The consultation with the Colorado State Historic Preservation Officer (SHPO) with regard to cultural resources would be conducted when project-specific information was submitted by the lessees to DOE for review and approval.
4. Policy and Regulatory Issues	
4A. Adequate nuclear fuel supplies are available for the U.S. nuclear power industry for the foreseeable future. The development of western Colorado uranium reserves should be given a low priority until there is a clear need for a domestic nuclear fuel supply.	DOE has prepared this Draft ULP PEIS consistent with the purpose and need for agency action discussed in Chapter 1.
4B. DOE should collaborate with other agencies, including the CDRMS, BLM, and EPA.	DOE is collaborating with various agencies, including the CDRMS, BLM, and EPA, on this PEIS process. Section 1.9 presents a list of the cooperating agencies and the commenting agencies.
4C. There is a lack of oversight and safeguards, and penalties to companies are not high enough to assure environmental compliance or adherence to current safety laws on reclamation.	DOE's approval of mine plans would be contingent on the fact that these plans contained appropriate and adequate measures for the protection of human health and the environment. The leases specify conditions that must be met by the lessees.
4D. The PEIS is redundant and repeats the efforts of numerous other environmental assessments performed by both private mining companies and governmental agencies in or adjacent to the DOE lease tracts.	DOE has prepared this Draft PEIS consistent with the purpose and need for agency action discussed in Chapter 1. This Draft ULP PEIS addresses the range of reasonable alternatives for the management of the DOE ULP consistent with NEPA requirements.
4E. Local governments requested that affected counties be given an opportunity to meet with DOE separately from the public scoping meetings that were held.	DOE invited the Montrose, Mesa, San Miguel, and San Juan County Commissions to participate as cooperating agencies for the preparation of this PEIS, and they agreed.

TABLE B-2 (Cont.)

Public Scoping Comment	Rationale
<p>4F. Requests were received to hold meetings in other locations, such as Cañon City, Gateway, and Grand Junction, as well as with the White Mesa Ute Indian Community and in Blanding, Utah.</p>	<p>Public comment hearings for the Draft ULP PEIS will be held in Grand Junction in addition to Montrose, Naturita, and Telluride, Colorado. It is felt that public hearings at these four locations would provide the interested members of the public adequate opportunities to participate in a meeting format with regard to accessibility of venues and proximity to where interested members of the public reside.</p>
<p>4G. The review and approval process should include a project-specific NEPA review for each proposed mining operation. The PEIS should include site-specific mitigation measures in addition to general mitigation measures.</p>	<p>Section 1.6 of this Draft ULP PEIS contains a discussion of the NEPA process that would be conducted once project-specific mine plans were submitted by the lessees to DOE for approval. Measures that could be implemented to minimize potential impacts are summarized in Section 4.6. Site-specific and project-specific mitigative measures would be specified in the approved mine plans and associated documentation.</p>
<p>4H. Include a history of the compliance of existing lease holders with their lease agreements and applicable statutes and regulations. It should also include DOE or BLM lease and mine inspection reports.</p>	<p>A summary of the mining history that has occurred on the DOE ULP lease tracts is provided in this Draft ULP PEIS in Chapter 1. DOE enforces the requirements stipulated in the leases, and to date, no outstanding issues exist.</p>
<p>5. Mining Methods</p>	
<p>5A. In assessing the environmental impacts, the PEIS should consider what traditional mining methods or other methods should be used (e.g., should both the in-situ leaching and the in-situ recovery methods be allowed, or should the method used be limited to one or the other?).</p>	<p>This Draft PEIS evaluated underground and surface open-pit mining methods. The in-situ leaching method was not evaluated because it is not considered to be a viable option due to the location of the ore in “dry” sedimentary strata (see 6A below).</p>
<p>6. Uranium Resources</p>	
<p>6A. Most of the uranium resources in the Colorado Plateau province of western Colorado are located in sedimentary strata, where the distribution of ore is scattered and patchy. This results in large volumes of low-grade radioactive mine waste.</p>	<p>The location of ore described (i.e., in sedimentary strata) is precisely why the underground mining method and, to a lesser extent, the surface open-pit method are more practical methods for extracting the ore. These methods do result in waste rock (material that contains less than 0.05% of uranium) that is partially placed back into the mine workings (if groundwater is demonstrated to be not an issue) or reclaimed as a pile that is contoured to be consistent with its surroundings, covered with available topsoil material, and seeded (or revegetated). This approach has been proven to be an acceptable and protective means of managing the waste rock that is an unavoidable by-product of uranium mining.</p>

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1 **TABLE B-3 Public Scoping Issues Considered To Be outside the Scope of the PEIS**

Public Scoping Comment	Rationale
1. Alternatives	
1A. Because of unstable uranium markets and the uncertainty regarding future commercial development of nuclear power facilities, uranium should be preserved for the future use of the American people until it becomes critical for national strategic energy purposes.	The timing for when uranium mining should be conducted for the purposes described does not meet the purpose and need for DOE's action.
1B. Investigate the economic feasibility of renewable and alternative energy development.	The evaluation of renewable and alternative energy development does not meet the purpose and need for DOE's action described in Chapter 1 of this Draft PEIS.
1C. Include an alternative that requires old, inactive, and/or abandoned mines to be reclaimed before new leases are granted or any new mines are established.	DOE has reclaimed all abandoned mines within its purview. The 29 leases that currently exist have been in place since 2008, and all mining activities are currently on-hold until the completion of this PEIS process.
1D. Analyze a no-action alternative that would allow the 1995 leases to lapse with no reclamation conducted.	The option of not performing reclamation when leases lapse or are terminated is not consistent with the requirements of the leases, the ULP, or applicable laws.
1E. Incorporate into the reclamation goals or standards the option of developing brownfields at some mines, so that the reclaimed land can be used for renewable energy production.	The development of brownfields is outside the scope of this Draft ULP PEIS. It does not respond to the purpose and need for DOE's action described in Chapter 1.
2. Impacts Analysis	
2A. Analyze the economic benefits of fully reclaiming and rehabilitating all Federal and state lands in the Uravan Mineral Belt and compare that to the economic benefit of maintaining the existing uranium leases over the next 5 years.	The economic studies suggested are outside the scope of this Draft ULP PEIS. They do not respond to the purpose and need for DOE's action described in Chapter 1.
2B. Analyze the costs to local and state governments to develop and maintain roads and develop and operate other infrastructure to support any future increase in uranium mining and milling activities.	An analysis of the costs to local and state governments to maintain roads to support an increase in uranium mining activities has not been included. However, the evaluation in the Draft ULP PEIS for transportation included discussion on potential traffic congestion, radiological impacts, and accident injuries and fatalities. It does not meet the purpose and need for DOE's action described in Chapter 1.
2C. A market analysis should be conducted to determine how much uranium should be put on the market now versus in the future, when prices might be higher.	Conducting a market analysis to determine the optimal time for uranium ore to be generated relative to uranium ore prices is outside the scope of this Draft PEIS. It does not respond to the purpose and need for DOE's action described in Chapter 1.

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APPENDIX C:
EMISSION INVENTORIES, COSTS, AND OTHER ESTIMATES
USED AS A BASIS FOR THE ULP PEIS IMPACT ANALYSES

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APPENDIX C:

**EMISSION INVENTORIES, COSTS, AND OTHER ESTIMATES
USED AS A BASIS FOR THE ULP PEIS IMPACT ANALYSES**

This appendix is a compilation of the emission inventories, cost assumptions and estimates, equipment and materials utilized, and workforce estimates used as the basis for the impact analyses conducted for this Draft ULP PEIS. Estimates of waste volumes (other than those for the waste-rock piles) are also provided. Unless specified elsewhere, the level of effort (number of workers and worker hours), equipment and equipment hours, and cost estimates are based on RS Means construction data (RS Means 2009). Section C.1 presents information to support the analyses for the exploration phase. Sections C.2 and C.3 present similar information for the mine development and operations phase and the reclamation phase, respectively.

C.1 EXPLORATION

Under Alternatives 3 through 5, exploration activities are assumed to occur on the lease tracts being evaluated in this Draft ULP PEIS. Under Alternative 3, Lease Tracts 5, 6, 7, 8, 9, 11, 13, 13A, 15, 18, 21, and 25 are evaluated for potential uranium exploration and mining. Leases for these lease tracts were held in 2007 by Gold Eagle Mining, Inc., and Cotter Corporation. Lease Tract 7 was composed of two tracts (7 and 7A) in 2007, but since then it has been combined into one least tract. Hence, for the purposes of this Draft ULP PEIS, Alternative 3 evaluates 12 lease tracts. Alternatives 4 and 5 evaluate all 31 lease tracts for potential future exploration and mining activities. Tables C.1-1 through C.1-9 tabulate various information developed for use as the basis for the impact analyses presented in Section 4 of this Draft ULP PEIS.

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**TABLE C.1-1 Number of Mines
Considered per Mine Size and
Alternative^{a,b}**

Mine Size	No. of Mines per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Small	2	6	0
Medium	4	10	16
Large	1	2	2
Very large	1	1	1
Total	8	19	19

- ^a Alternatives 1 and 2 are not presented in the table because they do not involve potential future mines to be developed.
- ^b The range in size and number of mines considered is based on past mining experience in the region (Cotter 2011a).

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**TABLE C.1-2 Total Disturbed Acreage
per Mine Size and Alternative during
Exploration^{a,b}**

Mine Size	Disturbed Acreage per Alternative ^a		
	Alt. 3	Alt. 4	Alt. 5
Small	0.11	0.33	0
Medium	0.44	1.10	1.76
Large	0.17	0.33	0.33

- ^a Alternatives 1 and 2 are not presented in the table because they do not involve potential future mines to be developed. The very large mine size is not considered for exploration because it is only used in reference to the existing open-pit mine on Lease Tract JD-7.
- ^b Based on a 20 × 60 ft drilling pad per borehole with two, four, and six exploratory boreholes assumed for each small, medium, and large mine, respectively.

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3**TABLE C.1-3 Assumed Workforce per Labor Category and Alternative during Exploration**

Labor Category	No. of Workers per Alternative ^a		
	Alt. 3	Alt. 4	Alt. 5
Foreman	2.4	5.9	7.0
Laborer	3.4	8.3	9.9
Equipment operator	2.0	4.8	5.7
Truck driver ^b	0.1	0.3	0.3
Cement finisher	0.3	0.8	1.0
Total	8.2	20.1	23.9

^a No exploration activities for Alternatives 1 and 2.

^b Also assumed to operate equipment.

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1 **TABLE C.1-4 Assumed Total Costs per Alternative during Exploration^a**

Cost Element	Cost (\$ 2009) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Drawings showing boring details	4,810	11,840	14,060
Report and recommendations from PE	10,790	26,560	31,540
Mobilization and demobilization	2,569	6,606	6,606
Mobilization and demobilization, over 500 mi	13,734	35,316	35,316
Air rotary drilling, 6-in.-diameter borehole, unconsolidated, depth of >100 ft	397,667	978,873	1,162,411
Air rotary drilling, 6-in.-diameter borehole, consolidated, depth of >100 ft	132,655	326,536	387,762
Air rotary drilling, 8-in.-diameter borehole, unconsolidated, depth of ≤100 ft	31,488	77,509	92,042
Air rotary drilling, 8-in.-diameter borehole, consolidated, depth of ≤100 ft	17,806	43,830	52,048
Casing for initial borehole	183,082	450,663	535,163
Sample collection during borehole advancement	522,285	1,285,624	1,526,679
Move drill rig around site	72,246	191,609	232,444
Drumming of drill cuttings	202,581	498,474	591,867
Decontamination of drill rig, etc.	1,809	4,453	5,288
Surface pads, concrete (3,000 lb/in. ² or psi, 6-in.-thick concrete)	187,534	461,623	548,177
Total direct costs	1,781,057	4,399,517	5,221,404
Contractor's overhead and profit (6%)	107,000	264,000	313,000
<i>Subtotal contractor's costs</i>	1,888,057	4,663,517	5,534,404
Contractor's bond (1%)	19,000	47,000	56,000
<i>Total contractor's field costs</i>	1,907,057	4,710,517	5,590,404
Construction management (10%)	191,000	471,000	559,000
<i>Total field costs</i>	2,098,057	5,181,517	6,149,404
Architect/engineer costs (25%)	524,000	1,295,000	1,538,000
<i>Subtotal</i>	2,622,057	6,476,517	7,687,404
Program management (6%)	157,000	389,000	462,000
Total exploration costs	2,779,000	6,866,000	8,149,000

^a Exploration activities were assumed to be completed within a 1-year time frame.

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2**TABLE C.1-5 Assumed Equipment and Total Hours Operated per Mine Size and Alternative during Exploration^a**

Items Assumed	Hours Operated per Mine Size			
	Small	Medium	Large	Very Large
Alternative 3				
Truck, highway, 24,500 GVW, ^b 4×2, 2-axle	214	874	324	0
Flatbed, 8×16 ft	214	862	322	0
Front-end loader, wheeled, 2.5-yd ³ capacity	193	772	290	0
Gas engine, vibrator	221	882	331	0
Water truck	104	416	156	0
Driller/auger	111	452	168	0
Cement truck	141	561	211	0
Alternative 4				
Truck, highway, 24,500 GVW, 4×2, 2-axle	654	2,192	654	0
Flatbed, 8×16 ft	646	2,159	646	0
Front-end loader, wheeled, 2.5-yd ³ capacity	579	1,930	579	0
Gas engine, vibrator	661	2,203	661	0
Water truck	312	1,039	312	0
Driller/auger	339	1,135	339	0
Cement truck	421	1,401	421	0
Alternative 5				
Truck, highway, 24,500 GVW, 4×2, 2-axle	0	3,511	654	0
Flatbed, 8×16 ft	0	3,456	646	0
Front-end loader, wheeled, 2.5-yd ³ capacity	0	3,087	579	0
Gas engine, vibrator	0	3,525	661	0
Water truck	0	1,661	312	0
Driller/auger	0	1,817	339	0
Cement truck	0	2,241	421	0

^a Exploration activities were assumed to be completed within a 1-year time frame.

^b GVW = gross vehicle weight.

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2**TABLE C.1-6 Assumed Total Material Amounts per Alternative during Exploration^a**

Items Assumed	Amount of Materials per Mine Size			
	Small	Medium	Large	Total
Alternative 3				
Diesel fuel (gal)	12,000	49,000	18,000	79,000
Oil and grease (gal)	300	1,100	400	1,800
Water (gal)	12,000	49,000	18,000	79,000
55-gal drums (each)	385	1,539	577	2,501
Concrete (yd ³)	90	360	130	580
Alternative 4				
Diesel fuel (gal)	37,000	124,000	37,000	198,000
Oil and grease (gal)	800	2,700	800	4,300
Water (gal)	37,000	121,000	37,000	195,000
55-gal drums (each)	1,154	3,846	1,154	6,154
Concrete (yd ³)	270	890	270	1,430
Alternative 5				
Diesel fuel (gal)	0	198,000	37,000	235,000
Oil and grease (gal)	0	4,400	800	5,200
Water (gal)	0	194,000	37,000	231,000
55-gal drums (each)	0	6,153	1,154	7,307
Concrete (yd ³)	0	1,420	270	1,690

^a Exploration activities were assumed to be completed within a 1-year time frame.

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2**TABLE C.1-7 Assumed Annual Air Emissions on an Individual Mine Basis during Exploration^a**

Criteria Pollutant	Annual Air Emissions (tons) per Mine Size		
	Small	Medium	Large
Total hydrocarbons (THC)	0.1	0.2	0.2
Reactive organic compounds (ROCs)	0.1	0.1	0.2
Nitrogen oxides (NO _x)	0.6	1.2	1.8
Sulfur dioxide (SO ₂)	0.1	0.1	0.2
Carbon monoxide (CO)	0.3	0.5	0.8
Total suspended particulates (TSP)	0.1	0.2	0.3
Particulate matter ≤10 μm (PM ₁₀) ^b	0.1	0.2	0.3
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	0.1	0.1	0.2
Carbon dioxide (CO ₂) ^d	68.6	138	206

- ^a The latest emission factors were taken from the U.S. Environmental Protection Agency's (EPA's) WebFIRE application located at <http://cfpub.epa.gov/webfire/>.
- ^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).
- ^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).
- ^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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TABLE C.1-8 Assumed Total Air Emissions during Exploration^a

Criteria Pollutant	Total Air Emission (tons) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Total hydrocarbons (THC)	2.2	5.4	6.5
Reactive organic compounds (ROCs)	2.1	5.2	6.2
Nitrogen oxides (NO _x)	17	43	51
Sulfur dioxide (SO ₂)	2.0	4.8	5.7
Carbon monoxide (CO)	7.4	18.3	21.7
Total suspended particulates (TSP)	2	5	5
Particulate matter ≤10 μm (PM ₁₀) ^b	2	4	5
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	1	3	4
Carbon dioxide (CO ₂) ^d	2,192	5,415	6,432

- ^a The latest emission factors were taken from the EPA’s WebFIRE application located at <http://cfpub.epa.gov/webfire/>.
- ^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).
- ^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).
- ^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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TABLE C.1-9 Wastes Generated per Alternative during Exploration

Waste Category	Waste Generated (gal) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Sanitary ^a	33,000	81,000	97,000
Other	15,000	36,000	43,000

- ^a Amount of sanitary waste was estimated based on the total exploration workforce.

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1 **C.2 MINE DEVELOPMENT AND OPERATIONS**
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3 Tables C.2-1 through C.2-16 tabulate various information developed for use as the basis
 4 for the impact analyses presented in Section 4 of this Draft ULP PEIS.
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7 **TABLE C.2-1 Estimated Material Amounts and Labor Time per**
 8 **Mine Size during Development**

Cost Element	Amount per Mine Size			
	Small	Medium	Large	Very Large
Labor (person-hours)	5,015	7,584	11,500	14,671
Steel (tons)	400	528	695	816
Lumber (1,000 board feet)	92	120	153	177
Fuel (gal)	4,981	7,663	11,494	14,559
Lubricant (gal)	1,250	1,750	2,750	3,500
Explosives (tons)	186	249	333	395
Electricity (kWh)	41,000	61,000	102,000	132,000

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 11 **TABLE C.2-2 Estimated Materials and Labor Time per**
 12 **Alternative during Development**

Cost Element	Amount per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Labor (person-hours)	67,000	144,000	159,000
Steel (tons)	4,400	9,900	10,600
Lumber (1,000 board feet)	1,000	2,200	2,400
Fuel (gal)	67,000	144,000	159,000
Lubricant (gal)	16,000	35,000	38,000
Explosives (tons)	2,100	4,700	5,000
Electricity (kWh)	580,000	1,232,000	1,375,000

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2**TABLE C.2-3 Number of Workers per Mine Size and Worker Salary per Labor Category**

Labor Category	No. of Workers per Mine Size				Individual Annual Salary with Overhead and Profit (\$)
	Small	Medium	Large	Very Large	
Mine workers	6	10	16	50	81,250
Mechanic	0.1	0.1	0.1	0.1	81,250
Geologist	0.1	0.1	0.1	0.1	137,500
Surveyor	0.1	0.1	0.1	0.1	81,250
Engineer	0.1	0.1	0.1	0.1	81,250
Environmental specialist	0.1	0.1	0.1	0.1	75,000
Other administrative support (e.g., accountant)	0.1	0.1	0.1	0.1	83,333
Total	6.6	10.6	16.6	50.6	

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6**TABLE C.2-4 Annual Worker Salaries per Labor Category and Mine Size**

Labor Category	Salary (\$) per Mine Size			
	Small	Medium	Large	Very Large
Mine workers	487,500	812,500	1,300,000	4,062,500
Mechanic	8,125	8,125	8,125	8,125
Geologist	13,750	13,750	13,750	13,750
Surveyor	8,125	8,125	8,125	8,125
Engineer	8,125	8,125	8,125	8,125
Environmental specialist	7,500	7,500	7,500	7,500
Other administrative support (e.g., accountant)	8,333	8,333	8,333	8,333
Total	541,458	866,458	1,353,958	4,116,458

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1 **TABLE C.2-5 Number and Cost of Capital Equipment Units per Mine Size**

Items Assumed	Number of Units per Mine Size ^a				Unit Cost (\$)
	Small	Medium	Large	Very Large	
Underground equipment					
Diesel skid steer loaders, 2-yd ³ capacity	1	2	3	– ^a	55,000
Diesel trucks (buggies), 5- to 10-ton capacity	2	4	8	–	77,800
Development drill, jumbo	1	1	1	–	55,000
Production drills, jacklegs	3	6	9	–	300
Exploration drills, longhole	1	1	2	–	82,000
Diesel boss buggies and utility vehicles	2	3	4	–	12,200
Surface Equipment					
Front-end loader, 2- to 3-yd ³ capacity	1	1	1	1	342,000
Loaders, 8- to 10-yd ³ capacity	–	–	–	3	123,000
Backhoe/skid loader or excavator	1	1	1	1	157,000
Highway haul trucks, 22- to 24-ton capacity	2	2	3	–	599,000
Dump truck, 12 yd ³	–	–	–	3	200,000
Bulldozer, 200 hp	1	1	1	–	315,000
Bulldozer, 400 hp	–	–	–	3	625,000
Motor grader, 140 hp	1	1	1	1	160,000
Flatbed trailer with tractor or 1-ton vehicle	1	1	1	–	10,000
Maintenance truck	–	–	–	1	158,000
Pickup truck, ¾ ton, four-wheel drive	1	1	2	4	30,000
Snow plow	1	1	1	–	62,000
Power generators	1	1	2	–	79,950
Scraper	–	–	–	4	77,200
Truck, ≥60 tons	–	–	–	4	599,000

^a A dash indicates none.

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TABLE C.2-6 Total Capital Equipment Costs per Alternative

Items Assumed	Total Capital Equipment Cost (\$ 2009) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Underground equipment			
Diesel skid steer loaders, 2-yd ³ capacity	715,000	1,760,000	2,090,000
Diesel trucks (buggies), 5- to 10-ton capacity	2,178,400	5,290,400	6,224,000
Development drill, jumbo	385,000	990,000	990,000
Production drills, jacklegs	11,700	28,800	34,200
Exploration drills, longhole	656,000	1,640,000	1,640,000
Diesel boss buggies and utility vehicles	244,000	610,000	683,200
Surface equipment			
Front-end loader, 2- to 3-yd ³ capacity	2,736,000	6,498,000	6,498,000
Loaders, 8- to 10-yd ³ capacity	369,000	369,000	369,000
Backhoe/skid loader or excavator	1,256,000	2,983,000	2,983,000
Highway haul trucks, 22- to 24-ton capacity	8,985,000	22,762,000	22,762,000
Dump truck, 12 yd ³	600,000	600,000	600,000
Bulldozer, 200 hp	2,205,000	5,670,000	5,670,000
Bulldozer, 400 hp	1,875,000	1,875,000	1,875,000
Motor grader, 140 hp	1,280,000	3,040,000	3,040,000
Flatbed trailer with tractor or 1-ton vehicle	70,000	180,000	180,000
Maintenance truck	158,000	158,000	158,000
Pickup truck, ¾ ton, four-wheel drive	360,000	720,000	720,000
Snow plow	434,000	1,116,000	1,116,000
Power generators	639,600	1,599,000	1,599,000
Scraper	308,800	308,800	308,800
Truck, ≥60 tons	2,396,000	2,396,000	2,396,000
Total	27,862,500	60,594,000	61,936,200

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1 **TABLE C.2-7 Estimated Total Capital Costs per Mine Size**

Cost Element	Total Capital Cost (\$ 2009) per Mine Size			
	Small	Medium	Large	Very Large
Equipment purchase	2,727,000	2,951,000	4,121,000	6,486,000
Labor	242,000	366,000	555,000	708,000
Steel	232,000	306,000	403,000	473,000
Lumber	23,000	30,000	38,000	44,000
Fuel	13,000	20,000	30,000	38,000
Lubricant	5,000	7,000	11,000	14,000
Explosives	124,000	166,000	222,000	263,000
Tires	9,000	14,000	20,000	26,000
Construction materials	223,000	317,000	451,000	554,000
Electricity	4,000	6,000	10,000	13,000
Total direct costs	3,602,000	4,183,000	5,861,000	8,619,000
Contractor's overhead and profit (6%)	216,000	251,000	352,000	517,000
<i>Subtotal contractor's costs</i>	<i>3,818,000</i>	<i>4,434,000</i>	<i>6,213,000</i>	<i>9,136,000</i>
Contractor's bond (1%)	38,000	44,000	62,000	91,000
<i>Total contractor's field costs</i>	<i>3,856,000</i>	<i>4,478,000</i>	<i>6,275,000</i>	<i>9,227,000</i>
Construction management (10%)	386,000	448,000	628,000	923,000
<i>Total field costs</i>	<i>4,242,000</i>	<i>4,926,000</i>	<i>6,903,000</i>	<i>10,150,000</i>
Architecture/engineering costs (25%)	1,061,000	1,232,000	1,726,000	2,538,000
<i>Subtotal</i>	<i>5,303,000</i>	<i>6,158,000</i>	<i>8,629,000</i>	<i>12,688,000</i>
Program management (6%)	318,000	369,000	518,000	761,000
Total capital costs	5,621,000	6,527,000	9,147,000	13,449,000

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TABLE C.2-8 Estimated Total Capital Costs per Alternative

Cost Element	Total Capital Cost (\$ 2009) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Equipment purchase	27,863,000	60,595,000	61,937,000
Labor	3,213,000	6,934,000	7,681,000
Steel	2,565,000	5,732,000	6,174,000
Lumber	246,000	555,000	593,000
Fuel	174,000	375,000	414,000
Lubricant	64,000	138,000	152,000
Explosives	1,396,000	3,108,000	3,359,000
Tires	118,000	257,000	283,000
Construction materials	2,717,000	5,958,000	6,524,000
Electricity	57,000	121,000	135,000
Total direct costs	38,413,000	83,773,000	87,252,000
Contractor's overhead and profit (6%)	2,305,000	5,026,000	5,235,000
<i>Subtotal contractor's costs</i>	40,718,000	88,799,000	92,487,000
Contractor's bond (1%)	407,000	888,000	925,000
<i>Total contractor's field costs</i>	41,125,000	89,687,000	93,412,000
Construction management (10%)	4,113,000	8,969,000	9,341,000
<i>Total field costs</i>	45,238,000	98,656,000	102,753,000
Architecture/engineering costs (25%)	11,310,000	24,664,000	25,688,000
<i>Subtotal</i>	56,548,000	123,320,000	128,441,000
Program management (6%)	3,393,000	7,399,000	7,706,000
Total capital costs	59,941,000	130,719,000	136,147,000

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2**TABLE C.2-9 Assumed Annual Air Emissions on an Individual Mine Basis during Development^a**

Criteria Pollutant	Annual Air Emissions (tons) per Mine Size			
	Small	Medium	Large	Very Large
Total hydrocarbons (THC)	0.1	0.1	0.1	0.2
Reactive organic compounds (ROCs)	0.1	0.1	0.1	0.2
Nitrogen oxides (NO _x)	2.2	3.0	4.2	5.1
Sulfur dioxide (SO ₂)	0.3	0.4	0.5	0.6
Carbon monoxide (CO)	6.5	8.8	11.8	14.0
Total suspended particulates (TSP)	11.3	15.5	20.6	58.1
Particulate matter ≤10 μm (PM ₁₀) ^b	9.6	13.1	17.4	37.5
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	1.2	1.6	2.1	5.0
Carbon dioxide (CO ₂) ^d	56.8	84.3	126	162

^a The latest emission factors were taken from the EPA's WebFIRE application located at <http://cfpub.epa.gov/webfire/>.

^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).

^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).

^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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2**TABLE C.2-10 Estimated Annual Air Emissions per Alternative during Development^a**

Criteria Pollutant	Annual Air Emissions (tons) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Total hydrocarbons (THC)	0.8	1.8	2.0
Reactive organic compounds (ROCs)	0.8	1.7	1.9
Nitrogen oxides (NO _x)	26	57	62
Sulfur dioxide (SO ₂)	3.1	6.9	7.5
Carbon monoxide (CO)	74	165	176
Total suspended particulates (TSP)	262	520	554
Particulate matter ≤10 μm (PM ₁₀) ^b	225	459	489
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	36	73	78
Carbon dioxide (CO ₂) ^d	745	1,601	1,767

^a The latest emission factors were taken from the EPA's WebFIRE application located at <http://cfpub.epa.gov/webfire/>.

^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).

^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).

^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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6**TABLE C.2-11 Wastes Generated per Alternative during Development**

Waste Category	Waste Generated (gal) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Sanitary ^a	136,000	292,000	322,000
Other	60,000	130,000	143,000

^a Amount of sanitary waste was estimated based on total construction workforce.

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2**TABLE C.2-12 Total Worker Peak-Year Annual Wages per Mine Size and Alternative**

Mine Size	Annual Wages (\$) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Small	1,083,000	3,249,000	0
Medium	3,466,000	8,665,000	13,863,000
Large	1,354,000	2,708,000	2,708,000
Very large	4,116,000	4,116,000	4,116,000
Total	10,019,000	18,738,000	20,688,000

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6**TABLE C.2-13 Peak-Year Annual Water Usage per Mine Size and Alternative during Operations^a**

Mine Size	Monthly Volume per Mine Size (gal)	Total Annual Volume per Alternative (gal)		
		Alt. 3	Alt. 4	Alt. 5
Small	7,583	181,992	545,976	0
Medium	30,666	1,471,968	3,679,920	5,887,872
Large	45,999	551,988	1,103,976	1,103,976
Very large ^b	160,000	960,000	960,000	960,000
Total		3,165,948	6,289,872	7,951,848

^a Based on per-mine water use from Cotter (2011b) and Ribeiro (2012).

^b Assumes water usage for 6 months only (summer) for dust suppression activities.

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2**TABLE C.2-14 Total Peak-Year Annual Cost of Operations per Alternative**

Item	Annual Cost of Operations (\$) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Mining equipment operations	5,553,000	\$5,553,000	4,579,000
Utilities (electricity)	229,000	489,000	546,000
Diesel fuel	180,000	373,000	425,000
Other materials (explosives)	41,000	83,000	95,000
Water	21,000	36,000	45,000
Worker salaries	10,019,000	18,738,000	20,687,000
Total	16,043,000	25,272,000	26,377,000

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6**TABLE C.2-15 Assumed Annual Air Emissions on an Individual Mine Basis during Operations^a**

Criteria Pollutant	Annual Air Emissions (tons) per Mine Size			
	Small	Medium	Large	Very Large
Total hydrocarbons (THC)	0.75	0.59	4.48	8.63
Reactive organic compounds (ROCs)	0.72	0.57	4.30	8.29
Nitrogen oxides (NO _x)	7.36	5.85	44.03	84.71
Sulfur dioxide (SO ₂)	0.95	0.75	5.66	10.89
Carbon monoxide (CO)	3.42	2.84	20.30	38.90
Total suspended particulates (TSP)	7.11	0.56	4.23	8.15
Particulate matter ≤10 μm (PM ₁₀) ^b	4.00	0.53	4.02	7.74
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	0.79	0.47	3.58	6.89
Carbon dioxide (CO ₂) ^d	672	532	4,025	7,748

^a The latest emission factors were taken from the EPA's WebFIRE application located at <http://cfpub.epa.gov/webfire/>.

^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).

^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).

^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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2**TABLE C.2-16 Estimated Peak-Year Annual Air Emissions per Alternative during Operations^a**

Criteria Pollutant	Annual Air Emissions (tons) per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Total hydrocarbons (THC)	14.0	28.0	31.6
Reactive organic compounds (ROCs)	13.4	26.9	30.4
Nitrogen oxides (NO _x)	137.7	275.5	313.1
Sulfur dioxide (SO ₂)	17.7	35.4	40.1
Carbon monoxide (CO)	64.2	128.4	145.1
Total suspended particulates (TSP)	32	65	74
Particulate matter ≤10 μm (PM ₁₀) ^b	23	45	51
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	11.8	23.5	26.7
Carbon dioxide (CO ₂) ^d	13,000	25,000	29,000

^a The latest emission factors were taken from the EPA's WebFIRE application located at <http://cfpub.epa.gov/webfire/>.

^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).

^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).

^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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6**C.3 RECLAMATION**

7 The reclamation phase would occur under each of the five alternatives evaluated in the
8 Draft PEIS. Tables C.3-1 through C.3-8 tabulate the information developed as a basis for the
9 impact analyses discussed in Chapter 4. The basis for the estimated values used in Table C.3-1 is
10 that it would take 3 months per mine site for 1 team to complete reclamation. Under
11 Alternatives 1 and 2, 10 mine sites would be reclaimed (9 mines plus JD-7, the open-pit mine).

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The assumptions made for Alternative 3 would be the same as those made for
Alternatives 1 and 2 because essentially the same number of mines would be reclaimed.

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The assumptions made for Alternatives 4 and 5 would be the same since the number of
mines would be the same (i.e., 18 mines plus JD-7). Each of the 18 underground mines would
require 3 months to reclaim by 1 team. It is assumed that there would be 5 reclamation teams for
the 18 underground mines. Three of these teams would be able to work for 12 months rather than
only 9 months, because they would be working at the southern lease tracts (i.e., where no snow
would inhibit field work). Thus, 3 teams × 12 months = 36 months, plus 2 teams × 9 months =
18 months, for a total of 54 months available for reclamation. The open-pit mine (JD-7) would

1 be reclaimed by a separate team consisting of 14 workers, and it is assumed that reclamation
 2 would take 12 months to complete.

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TABLE C.3-1 Assumed Workforce per Labor Category, Team, JD-7 Mine, and Alternative during Reclamation

Labor Category	No. of Workers per Team ^a	No. of Workers for JD-7 Mine	Total No. of Workers per Alternative			
			Alts. 1 and 2 ^b	Alt. 3 ^c	Alt. 4 ^d	Alt. 5 ^e
Foreman	1	1	4	4	6	6
Equipment operator	3	10	19	19	25	25
Truck driver ^f	1	2	5	5	7	7
Electrician/mechanic ^g	0	1	1	1	1	1
Total	5	14	29	29	39	39

- a Other than for work on JD-7 open-pit mine.
- b Three teams plus the JD-7 team.
- c Three teams plus the JD-7 team.
- d Five teams plus the JD-7 team.
- e Five teams plus the JD-7 team.
- f Also assumed to operate equipment.
- g Assumed for very large mine (JD-7) reclamation only.

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TABLE C.3-2 Total Disturbed Acreage per Mine Size and Alternative during Reclamation^a

Mine Size	Disturbed Acreage per Alternative		
	Alt. 3	Alt. 4	Alt. 5
Small	20	60	0
Medium	60	150	240
Large	20	40	40
Very large	210	210	210

^a Alternatives 1 and 2 would each involve the reclamation of 257 acres (Cotter 2012) as shown in Table 2.2-1 and involve 10 lease tracts.

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1 **TABLE C.3-3 Assumed Total Costs per Alternative during Reclamation**

Cost Element	Costs (\$ 2009) per Alternative			
	Alts. 1 and 2	Alt. 3	Alt. 4	Alt. 5
Remove aboveground structures	58,436	62,085	136,157	149,067
Seal portal(s)	23,000	18,400	43,700	43,700
Establish 3:1 slopes	447,621	539,931	801,189	853,440
Pock areas of steep slope to reduce future erosion	486,831	587,229	871,371	928,200
Spread available topsoil over pocking	58,009	69,971	103,829	110,600
Cut and fill and water bars on access road	153,906	185,646	275,474	293,440
Revegetate slope and access road	1,297,055	1,564,541	2,321,577	2,472,985
Place obstruction boulders at access entrance	3,060	2,448	5,814	5,814
Replace ore in mine	13,472	17,963	35,925	41,314
Remove 18 in. of subsurface from ore pad area	98,760	131,680	263,360	302,864
Rip compacted areas	59,427	71,683	106,368	113,305
Spread topsoil over disturbed areas	40,072	48,335	71,723	76,401
Backfill sedimentation pond	28,122	33,922	50,335	53,618
Seal ventilation shafts (72-in. diameter)	85,190	68,152	161,861	161,861
Seal power drop holes	2,540	2,032	4,826	4,826
Remove power drops	4,690	3,752	8,911	8,911
Rip vent and power drop pads	8,327	10,045	14,905	15,877
Push topsoil over vent and power drop pads	3,955	4,770	7,078	7,540
Revegetate area around vent and power drop pads	60,917	73,480	109,034	116,145
Conduct initial site mobilization	49,840	39,872	94,696	94,696
Conduct secondary seeding mobilization	18,380	14,704	34,922	34,922
Total direct costs	3,001,610	3,550,640	5,523,056	5,889,526
Contractor's overhead and profit (6%)	180,000	213,000	331,000	353,000
<i>Subtotal contractor's costs</i>	3,181,610	3,763,640	5,854,056	6,242,526
Contractor's bond (1%)	32,000	38,000	60,000	63,000
<i>Total contractor's field costs</i>	3,213,610	3,801,640	5,914,056	6,305,526
Construction management (10%)	321,000	380,000	591,000	630,000
<i>Total field costs</i>	3,534,610	4,181,640	6,505,056	6,935,526
Architecture/engineering costs (25%)	883,000	1,045,000	1,626,000	1,733,000
<i>Subtotal</i>	4,417,610	5,226,640	8,131,056	8,668,526
Program management (6%)	266,000	314,000	488,000	521,000
Total reclamation costs (rounded)	4,684,000	5,541,000	8,619,000	9,189,000

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2**TABLE C.3-4 Assumed Equipment and Total Hours of Operation per Mine Size and Alternative during Reclamation**

Items Assumed	Total Hours of Operation per Mine Size			
	Small	Medium	Large	Very Large
Alternatives 1 and 2				
Bulldozer, 310 hp	903	0	0	3,719
Diesel skid steer loaders, 2-yd ³ capacity	725	0	0	2,614
Motor grader, 140 hp	233	0	0	729
Excavator, 125 hp	1,179	0	0	4,953
Front-end loader, 2- to 3-yd ³ capacity	1,149	0	0	626
Grass drill and seeder	725	0	0	2,614
Dump trucks, 12 yd	1,189	0	0	1,998
Flatbed trailer with tractor or 1-ton vehicle	144	0	0	16
Pickup truck, ¾ ton, four-wheel drive	0	0	0	4,400
Alternative 3				
Bulldozer, 310 hp	369	1,092	361	3,719
Diesel skid steer loaders, 2-yd ³ capacity	279	806	263	2,614
Motor grader, 140 hp	85	238	77	729
Excavator, 125 hp	487	1,445	479	4,953
Front-end loader, 2- to 3-yd ³ capacity	255	909	427	626
Grass drill and seeder	279	806	263	2,614
Dump trucks, 12 yd	331	1,152	498	1,998
Flatbed trailer with tractor or 1-ton vehicle	32	64	16	16
Pickup truck, ¾ ton, four-wheel drive	0	2,200	2,200	4,400
Alternative 4				
Bulldozer, 310 hp	1,108	2,731	723	3,719
Diesel skid steer loaders, 2-yd ³ capacity	838	2,016	527	2,614
Motor grader, 140 hp	254	595	153	729
Excavator, 125 hp	1,461	3,612	958	4,953
Front-end loader, 2- to 3-yd ³ capacity	766	2,273	853	626
Grass drill and seeder	838	2,016	527	2,614
Dump trucks, 12 yd	992	2,879	996	1,998
Flatbed trailer with tractor or 1-ton vehicle	96	160	32	16
Pickup truck, ¾ ton, four-wheel drive	0	4,400	2,200	4,400
Alternative 5				
Bulldozer, 310 hp	0	4,369	723	3,719
Diesel skid steer loaders, 2-yd ³ capacity	0	3,225	527	2,614
Motor grader, 140 hp	0	952	153	729
Excavator, 125 hp	0	5,780	958	4,953
Front-end loader, 2- to 3-yd ³ capacity	0	3,638	853	626
Grass drill and seeder	0	3,225	527	2,614
Dump trucks, 12 yd	0	4,607	996	1,998
Flatbed trailer with tractor or 1-ton vehicle	0	256	32	16
Pickup truck, ¾ ton, four-wheel drive	0	4,400	2,200	4,400

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1 **TABLE C.3-5 Assumed Amounts of Materials per Mine Size and Alternative**
 2 **during Reclamation**

Items Assumed	Amount of Materials per Mine Size				
	Small	Medium	Large	Very Large	Total
Alternatives 1 and 2					
Diesel fuel (gal)	25,000	0	0	76,000	101,000
Oil and grease (gal)	1,300	0	0	3,800	5,100
Water (gal)	45,350	0	0	114,900	160,000
Grass seed (40 lb/acre) (tons)	0.9	0	0	4.2	5.14
Hay, delivered (1 ton/acre) (tons)	47	0	0	210	257
Alternative 3					
Diesel fuel (gal)	9,000	29,000	12,000	76,000	126,000
Oil and grease (gal)	400	1,700	900	3,800	6,800
Water (gal)	29,000	53,400	29,000	114,900	226,000
Grass seed (40 lb/acre) (tons)	0.4	1.2	0.4	4.2	6.2
Hay, delivered (1 ton/acre) (tons)	20	60	20	210	310
Alternative 4					
Diesel fuel (gal)	26,000	71,000	22,000	76,000	195,000
Oil and grease (gal)	1,200	4,100	1,400	3,800	10,500
Water (gal)	53,400	99,900	38,800	114,900	307,000
Grass seed (40 lb/acre) (tons)	1.2	3.0	0.8	4.2	9.2
Hay, delivered (1 ton/acre) (tons)	60	150	40	210	460
Alternative 5					
Diesel fuel (gal)	0	111,000	22,000	76,000	209,000
Oil and grease (gal)	0	6,000	1,400	3,800	11,200
Water (gal)	0	151,200	38,800	114,900	305,000
Grass seed (40 lb/acre) (tons)	0.0	4.8	0.8	4.2	9.8
Hay, delivered (1 ton/acre) (tons)	0	240	40	210	490

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2**TABLE C.3-6 Assumed Annual Air Emissions on an Individual Mine Basis during Reclamation^a**

Criteria Pollutant	Annual Air Emissions (tons) per Mine Size			
	Small	Medium	Large	Very Large
Total hydrocarbons (THC)	0.05	0.09	0.14	0.92
Reactive organic compounds (ROCs)	0.05	0.08	0.13	0.88
Nitrogen oxides (NO _x)	0.52	0.84	1.30	9.07
Sulfur dioxide (SO ₂)	0.07	0.11	0.18	1.18
Carbon monoxide (CO)	0.24	0.41	0.66	4.33
Total suspended particulates (TSP)	2.00	2.97	7.88	157
Particulate matter ≤10 μm (PM ₁₀) ^b	1.05	1.54	5.98	137
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	0.19	0.29	1.22	28.1
Carbon dioxide (CO ₂) ^d	48.6	80.4	128	854

^a The latest emission factors were taken from the EPA's WebFIRE application located at <http://cfpub.epa.gov/webfire/>.

^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).

^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).

^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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TABLE C.3-7 Assumed Total Air Emissions during Reclamation^a

Criteria Pollutant	Total Air Emissions (tons) per Alternative			
	Alts. 1 and 2	Alt. 3	Alt. 4	Alt. 5
Total hydrocarbons (THC)	1.2	1.5	2.4	2.6
Reactive organic compounds (ROCs)	1.2	1.5	2.3	2.5
Nitrogen oxides (NO _x)	12	15	23	25
Sulfur dioxide (SO ₂)	1.6	2.0	3.0	3.3
Carbon monoxide (CO)	5.8	7.2	11.1	12.0
Total suspended particulates (TSP)	167	180	216	221
Particulate matter ≤10 μm (PM ₁₀) ^b	142	150	172	175
Particulate matter ≤2.5 μm (PM _{2.5}) ^c	29	31	35	35
Carbon dioxide (CO ₂) ^d	1,140	1,420	2,200	2,360

^a The latest emission factors were taken from the EPA's WebFIRE application located at <http://cfpub.epa.gov/webfire/>.

^b Assumes that the construction emission factor for fugitive dust PM₁₀ is 0.22 ton/acre-mo (average conditions) (SCAQMD 2007).

^c Assumes that 21% of fugitive dust PM₁₀ is PM_{2.5} and that 89% of combustion PM₁₀ is PM_{2.5} (SCAQMD undated).

^d The CO₂ emission factor for diesel fuel was taken from EPA (2008).

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TABLE C.3-8 Wastes Generated per Alternative during Reclamation

Waste Category	Waste Generated (gal) per Alternative			
	Alts. 1 and 2	Alt. 3	Alt. 4	Alt. 5
Sanitary ^a	81,000	126,000	162,000	154,000
Other	36,000	56,000	72,000	68,000

^a Amount of sanitary waste was estimated based on the total reclamation workforce.

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C.4 REFERENCES

1
2
3 Cotter, E., 2011a, personal communication from Cotter (S.M. Stoller Corporation, Grand
4 Junction, Colo.) to M. Picel (Argonne National Laboratory, Argonne, Ill.), Nov. 10.

5
6 Cotter, E., 2011b, personal communication from Cotter (S.M. Stoller Corporation, Grand
7 Junction, Colo.) to M. Picel (Argonne National Laboratory, Argonne, Ill.), Nov. 17.

8
9 Cotter, E., 2012, personal communication from Cotter (S.M. Stoller Corporation, Grand
10 Junction, Colo.) to M. Picel (Argonne National Laboratory, Argonne, Ill.), Feb. 16.

11
12 EPA (U.S. Environmental Protection Agency), 2008, *Climate Leaders Greenhouse Gas*
13 *Inventory Protocol Core Module Guidance: Direct Emissions from Mobile Combustion Sources*,
14 EPA430-K-08-004, May. Available at [http://www.epa.gov/climateleadership/documents/](http://www.epa.gov/climateleadership/documents/resources/mobilesource_guidance.pdf)
15 [resources/mobilesource_guidance.pdf](http://www.epa.gov/climateleadership/documents/resources/mobilesource_guidance.pdf).EPA430-K-08-004.

16
17 Ribeiro, T., 2012, personal communication from Ribeiro (U.S. Department of Energy, Office of
18 Legacy Management) to M. Picel (Argonne National Laboratory, Argonne, Ill.), Aug. 21.

19
20 RS Means (R.S. Means Company, Inc.), 2009, *Building Construction Cost Data 2009, 67th*
21 *Annual Edition*, Kingston, Mass.

22
23 SCAQMD (South Coast Air Quality Management District), 2007, “Software User’s Guide:
24 URBEMIS2007 for Windows, Version 9.2, Emissions Estimation for Land Use Development
25 Projects,” Diamond Bar, Calif., Nov. Available at [http://www.urbemis.com/software/](http://www.urbemis.com/software/URBEMIS9%20Users%20Manual%20Appendices.pdf)
26 [URBEMIS9%20Users%20Manual%20Appendices.pdf](http://www.urbemis.com/software/URBEMIS9%20Users%20Manual%20Appendices.pdf). Accessed Oct. 24, 2012.

27
28 SCAQMD, undated, “Handout #1.” Available at [www.aqmd.gov/CEQA/handbook/PM2_5/](http://www.aqmd.gov/CEQA/handbook/PM2_5/handout1.doc)
29 [handout1.doc](http://www.aqmd.gov/CEQA/handbook/PM2_5/handout1.doc). Accessed Oct. 24, 2012.

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**APPENDIX D:
IMPACT ASSESSMENT METHODOLOGIES**

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APPENDIX D:**IMPACT ASSESSMENT METHODOLOGIES**

This appendix summarizes the methodologies used in evaluating the various environmental resource areas discussed in this draft programmatic environmental impact statement (PEIS). The environmental resource areas evaluated are as follows:

- Air quality;
- Acoustical environment;
- Geology and soils;
- Water resources;
- Human health;
- Ecological resources;
- Socioeconomics;
- Environmental justice;
- Land use;
- Transportation;
- Cultural resources;
- Visual resources; and
- Waste management.

In addition to these resource areas, the U.S. Department of Energy (DOE) has evaluated cumulative impacts that could result from implementation of the Uranium Leasing Program (ULP) proposed action in combination with past, present, and planned activities (including Federal and non-Federal activities) at or in the vicinity of the DOE ULP lease tracts.

D.1 AIR QUALITY

Potential air quality impacts under each alternative were evaluated by estimating air pollutant emissions from two phases: (1) mine development and operations; and (2) reclamation. (Air emissions from the exploration phase were not estimated because of its short duration and the negligible amount of emissions it would generate in comparison with the other phases.) Air emissions were estimated for criteria pollutants, volatile organic compounds (VOCs), and carbon dioxide (CO₂, a primary greenhouse gas [GHG]) that would result from the activities associated with engine exhaust and fugitive dust emissions from heavy equipment and vehicles, wind erosion from the disturbed areas, and explosives use. Air emissions from traffic due to workers commuting were not included because only a small number of workers would be involved (typically 12 to 24 people) and the amount of any associated emissions would thus be small in comparison to the amount of air emissions generated from heavy equipment and other related activities. Detailed emission inventory tables, including data on emission factors, activity levels, fugitive dust control efficiencies, and total emissions, are presented in Appendix C.

1 To determine the annual emissions, emission factors for each activity were multiplied by
2 activity-level data and the estimated number of items of equipment required for development,
3 operations, and reclamation. Emission factors available in the standard references, which are
4 most commonly used in emission inventories, were employed for these estimates. Except for the
5 following, emission factors were taken from the WebFIRE database (EPA 2012a):
6

- 7 • For operations under average conditions, an emission factor of
8 0.22 ton/acre-month was used for uncontrolled emissions of particulate matter
9 of less than or equal to 10 μm (PM_{10}) (Jones & Stokes Associates 2007).
10 $\text{PM}_{2.5}$ emissions were assumed to be 21% of PM_{10} emissions (AQMD 2012).
11
- 12 • For wind erosion, an emission factor of 0.38 ton/acre-yr was used for
13 uncontrolled emissions of total suspended particulates (TSP). PM_{10} and $\text{PM}_{2.5}$
14 emissions were assumed to be 50% and 7.5%, respectively, of TSP emissions
15 (EPA 2012b).
16
- 17 • For blasting, emission factors of 92 and 10 lb/ton for uncontrolled emissions
18 of PM_{10} and $\text{PM}_{2.5}$, respectively, were used (QDEH 1999).
19
- 20 • For diesel combustion from heavy equipment, an emission factor of
21 22.23 lb/gal for CO_2 emissions was used (EPA 2008).
22

23 For operations and wind erosion, a fugitive dust control efficiency of 50% was assumed
24 by spraying water on the exposed area twice a day. Projected activity-level data were based on
25 assumptions discussed in Appendix C and the alternatives discussed in Chapter 2.
26

27 The significance of project-related emissions with regard to overall air quality was
28 determined by comparing estimated annual project-related emissions of criteria pollutants and
29 VOCs with annual emissions in the three counties that encompass the DOE ULP lease tracts
30 (Mesa, Montrose, and San Miguel Counties) in 2008 and by comparing annual project-related
31 emissions of CO_2 with annual GHG emissions in Colorado in 2010 and in the United States in
32 2009 (CDPHE 2011; EPA 2011; Strait et al. 2007).
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35 **D.2 ACOUSTIC ENVIRONMENT**

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37 Potential noise impacts under each alternative were assessed by estimating the combined
38 noise levels from noise-emitting sources associated with ULP activities and then performing
39 noise propagation modeling. These levels were compared with the Colorado noise limit and the
40 U.S. Environmental Protection Agency (EPA) guideline level to estimate the distance from the
41 noise source area or haul routes at which noise would attenuate to these limits or guideline
42 levels.
43

44 Primary sources of noise over the life of ULP activities would include operations of
45 aboveground and underground heavy equipment, on-road and off-road vehicle traffic, and, if

1 necessary, blasting. Aboveground equipment includes backhoes, dozers, graders, power
 2 generators, and scrapers, while underground equipment includes rock drills; various types of
 3 loaders and trucks would be used both above and under the ground. The average noise levels
 4 from most of this heavy equipment range from 80 to 90 dBA, with the exception of 98 dBA for a
 5 rock drill at a distance of 50 ft (15 m) (Hanson et al. 2006). In general, the dominant noise source
 6 from most construction equipment is the diesel engine, which is continuously operating around a
 7 fixed location or has limited movement. Except for rock drills, noise levels for the type of
 8 construction equipment that would probably be used at the ULP lease tracts range from about
 9 80 to 90 dBA at a distance of 50 ft (15 m) from the equipment. To estimate noise levels
 10 associated with ULP activities, a composite noise level of 95 dBA at a distance of 50 ft (15 m)
 11 from the mine site was conservatively assumed, if noisy equipment (such as rock drills) was not
 12 being used. Typically, this level could be reached when several pieces of noisy heavy equipment
 13 were operating simultaneously near each other at peak load. For impact analysis along the haul
 14 routes, a peak “pass-by” noise level of 84 dBA at a reference distance of 50 ft (15 m) from a
 15 heavy-duty truck traveling at 55 mph (88 km/h) was estimated (Menge et al. 1998).

16
 17 Several important factors affect the propagation of sound in the outdoor environment,
 18 such as source characteristics, geometric spreading, ground effects, air absorption,
 19 meteorological effects (due to turbulence and variations in vertical wind speed and temperature),
 20 and screening by topography, structures, dense vegetation, and other natural or human-made
 21 barriers. At this programmatic level, no detailed information (e.g., types and capacities of heavy
 22 equipment, work schedules, specific locations of projects) was available, so screening-level
 23 estimates were made by considering only geometric spreading and ground effects, as shown here
 24 (Barry and Reagan 1978; Hanson et al. 2006):

25
 26
$$L_p = L_{p,ref} - (20 + 10 G) \log_{10} (D/D_{ref})$$
 for point sources

27
 28 and

29
 30
$$L_p = L_{p,ref} + 10 \log_{10} (N\pi D_{ref}^2 / (5280 \times ST)) - (10 + 10 G) \log_{10} (D/D_{ref})$$
 for line sources,

31
 32 where

- 33
 34 L_p = A-weighted sound pressure level at a given distance (dBA),
 35 $L_{p, ref}$ = A-weighted sound pressure level at a reference distance (dBA),
 36 G = Ground factor that accounts for ground effects (unitless),
 37 D = Distance from the noise to the receptor (ft),
 38 D_{ref} = Reference distance (ft; assumed to be 50 ft [15 m]),
 39 N = Number of vehicles per hour,
 40 5,280 = Conversion factor from miles to feet,
 41 S = Average vehicle speed (mph) (assumed to be 55 mph [88 km/h]), and
 42 T = Time period over which noise level is computed (assumed to be 1 hour).

43
 44 For hard ground, $G = 0$. For soft ground, G depends on the effective path height (H_{eff}), as
 45 follows:

1 $G = 0.66$ if H_{eff} is <5 ft (1.5 m);

2
3 $G = 0.75 (1 - H_{eff}/42)$ if H_{eff} is ≥ 5 ft [1.5 m] and <42 ft [12.8 m];

4
5 and

6
7 $G = 0$ if H_{eff} is ≥ 42 ft (13 m).

8
9 For this analysis, the ground was assumed to be soft based on the land cover around the ULP
10 lease tracts. The effective path height (H_{eff}) is the average of the source height and the receptor
11 height. The source height for heavy equipment was assumed to be 7.9 ft (2.4 m), which is the
12 average height of drivetrain and exhaust contributions (Wayson 1993). The receptor height was
13 set at 5 ft (1.5 m), which is the approximate height of human ears from the ground.

14
15 Noise levels at receptor locations were estimated by using the above formulas. Day-night
16 average noise levels (L_{dn} , or DNL) were derived by assuming a work schedule of 10 hours per
17 day. For ULP activities, the distances at which noise levels reach the Colorado daytime
18 maximum permissible limit of 55 dBA¹ and the EPA guideline level of 55 dBA L_{dn} for
19 residential areas (EPA 1974) were estimated. In addition, the residences within this distance
20 range were counted, based on the assumption that the ULP activities would occur at the ULP
21 lease tract boundaries. During operations, the distances at which noise levels from heavy-duty
22 trucks along the haul routes would approach the Colorado limit and EPA guideline were
23 estimated.

24
25 There are several specially designated areas (e.g., Dolores River Special Recreation
26 Management Area [SRMA], Dolores River Canyon Wilderness Study Area [WSA]) and other
27 nearby wildlife habitats around the DOE ULP lease tracts and haul routes where noise might be a
28 concern. Negative impacts on wildlife begin between 55 and 60 dBA, a range that corresponds to
29 the onset of adverse physiological impacts (Barber et al. 2010). Distances up to the lower
30 threshold level from the mine sites and from the haul routes were estimated to identify the range
31 of noise impacts on wildlife.

32 33 34 **D.3 GEOLOGY AND SOILS**

35
36 The geologic setting established for the ULP lease tracts was based on a review of aerial
37 maps, topographic maps, geologic maps, and the scientific literature. Geologic map data
38 (shapefiles) were obtained from the U.S. Geological Survey (USGS; see Stoesser et al. 2007).
39 References to the geologic time scale were based on the age ranges compiled by Walker and
40 Geissman (2009).

1 Colorado Revised Statutes, Title 25, "Health," Article 12, "Noise Abatement," Section 103: "Maximum permissible noise levels are source-oriented regulations (e.g., daytime level shall not exceed 55 dBA at 25 ft or more from the residence's property boundary)." For this analysis, the Colorado limit for residential areas was applied as a receptor-oriented regulation (e.g., daytime level shall not exceed 55 dBA at a residence) like other noise guidelines or regulations.

1 The impact assessment for soil resources relied on field observations, consultations with
2 DOE ULP management staff, and reviews of the academic and professional literature to
3 characterize site-specific soil conditions and identify the types of impact-producing activities
4 related to mining within the lease tracts.
5

6 Soil conditions within each of the ULP lease tracts were characterized by using
7 customized map data from the U.S. Department of Agriculture (USDA) Natural Resources
8 Conservation Service (NRCS) web soil survey (NRCS 2012) as a starting point and
9 supplementing it with information provided by state and local agencies, as available. Data on
10 various factors, such as soil texture and composition, parent materials, landforms on which the
11 soils developed, drainage class, permeability, surface runoff potential, rutting potential, whole
12 soil erodibility factor (K factor), wind erodibility group/index, and land classification, were
13 gathered to gain a general understanding of the soil's susceptibility to impacts that could result
14 from ground-disturbing activities. Information on special soil features, such as biological crusts,
15 was also obtained. Chapter 3 (on the affected environment) provides general soil maps and map
16 unit descriptions for each of the four lease tract groupings (Gateway, Uravan, Paradox Valley,
17 and Slick Rock). These maps are based on the soil units delineated on county soil surveys at
18 scales of 1:12,000 to 1:100,000 (USDA 1999). The types of potential soil impacts are described
19 in detail in Section 4.2.3.1, and information on the areas of potential disturbance (subject to these
20 impacts) is provided in the soil resources discussion under each alternative in Chapter 4.
21
22

23 **D.4 WATER METHODOLOGY**

24
25 The analysis of water resources considered impacts on surface water features and
26 groundwater within the ULP lease tracts, the surrounding valleys, the entire groundwater basins,
27 as well as upstream/upgradient and downstream/downgradient valleys and groundwater basins
28 (if it was determined that there was connectivity and the potential for indirect impacts). The
29 surface water features considered were streams, lakes, wetlands, surface springs and seeps,
30 ephemeral washes/drainages, dry lakes, and floodplains.
31

32 Impacts on surface water and groundwater resources were mainly related to the alteration
33 of natural hydrologic conditions (e.g., surface runoff, infiltration, and groundwater
34 recharge/flow), degradation of water quality, and water usage. The ROI for the impacts on
35 surface water is within the Upper Dolores, San Miguel, and Lower Dolores basins (USGS
36 HUC-8 basins) where local surface runoff and groundwater discharge flows from the lease tracts
37 to Dolores River, San Miguel River, and their tributaries. ROI for impacts on groundwater
38 resource would be primarily on the lease tracts and would not exceed 5 mi (8 km) downgradient
39 from mining activities in the lease tracts or any rivers and tributaries that local groundwater
40 discharges to. ROI for impacts on water usage is primarily within Montrose, Mesa, and
41 San Miguel Counties. The assessment of impacts related to hydrologic alterations and water
42 quality was performed by using a variety of data sources (e.g., geologic maps, aerial
43 photographs, professional reports on standard mine practices, and the scientific literature) to
44 characterize water features and by exercising professional judgment to identify potential direct
45 and indirect impacts from mining operations. For impacts related to water usage, water use

1 during mine development and operations of the underground mines and for the JD-7 surface
2 open-pit mine was mainly for the workers' potable water supply and for dust control activities.
3 Water volumes assumed are discussed in Section 2.2 and Appendix C.
4
5

6 **D.5 HUMAN HEALTH RISK**

7

8 Potential human health impacts were analyzed for the mine exploration, development and
9 operations, reclamation, and post-reclamation phases. The region of influence (ROI) for human
10 health impacts was a 50-mi (80-km) radius of the lease tracts. Potential impacts to individuals are
11 typically estimated to be at low levels (<2 mrem/yr) at distances greater than about 5 mi (8 km)
12 from the source, a larger radius of 50 mi (80 km) was selected as the ROI to assess the potential
13 impacts to the population as a whole (i.e., for collective dose evaluation). The maximum distance
14 from the source that state-of-the art computer models can evaluate is also 50 mi (80 mi). At this
15 distance, the individual doses would have dropped to negligible levels (<0.1–0.2 mrem/yr),
16 which supports the selection of 50 mi (80 km) as the ROI. With regard to the exploration phase,
17 any impacts that might result during that phase were expected to be minor, because exploratory
18 drillings would disturb only small areas and because most of the mineralized cutting excavated
19 from drilling would be placed back to fill the drill holes. Furthermore, the exploration phase
20 would last for only a short period of time (i.e., a few weeks); therefore, potential impacts would
21 be limited to only a few workers. For these reasons, potential human health impacts associated
22 with the exploration phase were not quantified.
23
24

25 **D.5.1 Impact Assessment for the Operational Phase**

26

27 For this phase, potential impacts on the workers and the general public living near the
28 uranium lease tracts as well as within 50 mi (80 km) of the lease tracts were analyzed. Because
29 the impacts would primarily result from radiation exposures, they (especially radon exposures)
30 were the focus of the analyses conducted for this phase.
31

32 Potential impacts assessed for the workers (i.e., uranium miners) included physical
33 hazards and radiation exposures. Physical hazards included nonfatal injuries and illnesses as well
34 as fatal injuries. Statistical data for the mining industry published by the U.S. Department of
35 Labor, Bureau of Labor Statistics (BLS 2011a,b) were used for assessing physical hazards. The
36 potential radiation exposures of the workers, on the other hand, were assessed by using historical
37 data compiled by the United Nations Scientific Committee on the Effects of Atomic Radiation
38 (UNSCEAR 2010).
39

40 Radiation exposures of the general public would result primarily from radon emissions
41 from the exhaust vents of the uranium mines. The radon emission rates for three hypothetical
42 underground mines whose sizes ranged from small to medium to large were estimated on the
43 basis of their respective uranium ore production rates, as assumed in the working assumptions.
44 According to the EPA (1985), the radon emission rate for an underground mine correlates
45 linearly with the cumulative uranium ore production. For radon emission rates, an operational

1 period of 10 years was assumed for the uranium mines under consideration when human health
2 impacts under Alternatives 3, 4, and 5 were assessed. This operational period corresponds
3 roughly to the assumed mining periods of operation for Alternatives 3, 4, and 5 evaluated in
4 Chapter 4. The emission rates from the same mines would be lower if the operational period was
5 shorter. An emission rate of 600 Ci/yr was assumed for a very large open-pit mine, which,
6 according to the working assumptions, would be located on Lease Tract 7. This 600-Ci/yr
7 emission rate was determined on the basis of the emission rates of actual open-pit mines
8 compiled by the EPA in its background report on National Emission Standards for Hazardous
9 Air Pollutants (NESHAP) and is at the upper end of the emission rates for the open-pit mines
10 included in the report (EPA 1989a).

11
12 The computer code, CAP88-PC (Trinity Engineering Associates, Inc. 2007), which is
13 supported and maintained by the EPA for demonstrating compliance with regulations, was used
14 to estimate radon concentrations at various downwind locations. Potential maximum radiation
15 doses resulting from radon emissions associated with different sizes of uranium mines were
16 calculated. These calculation results were tabulated as functions of the distance from the
17 emission point and can be used for inferring the potential radiation dose to an individual living
18 close to the ULP lease tracts.

19
20 The collective dose to the general public living within 50 mi (80 km) of the lease tracts
21 was also calculated by using CAP88-PC (Trinity Engineering Associates, Inc. 2007). However,
22 rather than the radon emission rate from a single uranium mine, the total radon emission rate
23 from all the uranium mines that would be operated at the same time was used. Because the actual
24 number of mines that would be operated at any time is not known, potential human health
25 impacts were analyzed only for the peak year of operations as defined in the working
26 assumptions (Chapter 2). It is expected that potential collective exposures in any other year
27 would be lower than those estimated for the peak year of operations. Because the exact locations
28 of the active mines during the peak year of operations are not known, the potential range of the
29 collective dose was inferred by placing the radon emission point at four alternative locations.
30 These four alternative locations were selected to be the center points of four lease tract groups,
31 which were formed by aggregating the uranium lease tracts whose geographic locations are close
32 to each other. Figure D.5-1 depicts the four lease tract groups used for analyzing the population
33 exposure. Population distributions within 50 mi (80 km) of the center of each lease tract group
34 were developed by using 2010 Census Bureau data.

35 36 37 **D.5.2 Impact Assessment for the Reclamation Phase**

38
39 For the reclamation phase, potential human health impacts were analyzed for the
40 reclamation workers and the general public living close to the uranium lease tracts. Both
41 chemical and radiological risks were analyzed. The major radiation sources of concern were the
42 uranium isotopes and their decay products contained in the waste-rock piles. In addition to
43 emitting radiation, the uranium compounds could pose chemical hazards to human health. The
44 vanadium content in the uranium ores is about 5 to 10 times higher than the uranium content. As
45 a result of intermixing from mining, the waste-rock piles could also contain vanadium, which, if

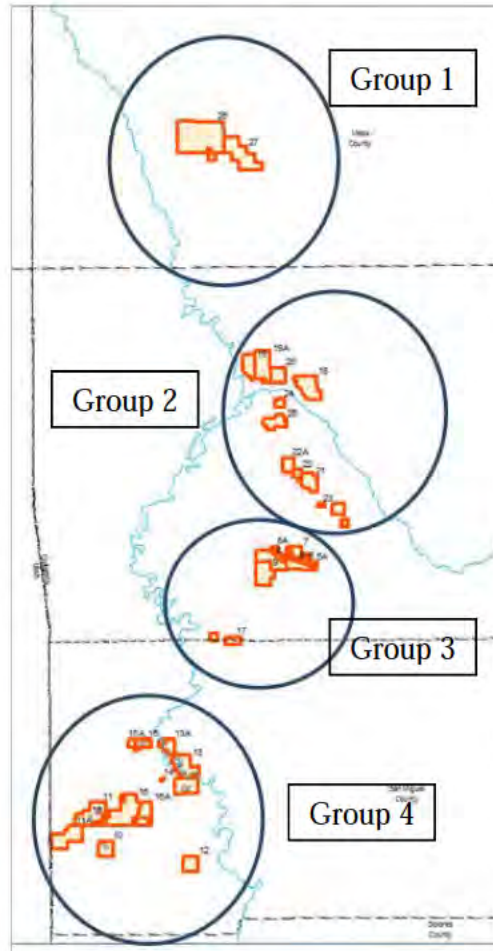


FIGURE D.5-1 Designated Grouping of the ULP Lease Tracts Used as a Basis for Human Health Impacts Evaluation

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inhaled or ingested, could have adverse effects on human health. To account for the possible range of radionuclide concentrations in waste rocks, three sets of concentrations were used to evaluate the potential human health risks for the reclamation phase. The base set includes an Ra-226 concentration of 23.7 pCi/g (EPA 1993), which is judged to be the most reasonable value for all waste-rocks for use in the risk assessment. A concentration of 3.5 pCi/g for Ra-226, reflecting measurement data with waste-rock samples (BLM 2008), was used as the lower bound in the risk assessment. A concentration of 168 pCi/g for Ra-226, reflecting the highest content of uranium (0.05%) in waste rocks, was used as the upper bound in the assessment.

The reclamation workers were assumed to incur radiation exposures from working on top of the waste-rock pile through three pathways: external radiation; inhalation of radioactive dust particles and radon; and accidental soil ingestion. The exposures were analyzed by using Version 6.7 of the RESRAD computer code (Yu et al. 2001). For chemical exposures, the

1 potential exposure pathways considered were inhalation of dust particles and incidental soil
2 ingestion. The EPA guidance on human health risk assessment (EPA 1989b) was followed to
3 evaluate the potential chemical risks that could result from exposures to uranium and vanadium
4 compounds.
5

6 The general public living near the uranium lease tracts would incur radiation and
7 chemical exposures primarily through the airborne release of particulates from the waste-rock
8 piles. In addition, the release of radon could add to the potential radiation exposure. The
9 emission rate of radon was calculated by using Version 6.7 of the RESRAD code
10 (Yu et al. 2001). In the analysis of potential radiation exposures of reclamation workers,
11 RESRAD calculated the radon flux from the surface of a waste-rock pile; this calculated radon
12 flux was multiplied by the surface area of the waste-rock pile to obtain the radon emission rate.
13 The release rate of dust particles was calculated following the guidance from *Regulatory*
14 *Guide 3.59* (NRC 1987) on emissions from exposed uranium mill tailings sands due to wind
15 erosion. The frequencies of different wind speed groups required in the dust particle emission
16 calculation were calculated on the basis of meteorological data from the lease tracts
17 (Rogers 2011).
18

19 On the basis of the emission rates of radon and particulates calculated by the methods
20 discussed in the preceding paragraph, concentrations of radon, uranium isotopes and decay
21 products, total uranium, and vanadium at various downwind locations from the emission point
22 were obtained by using CAP88-PC (Trinity Engineering Associates, Inc. 2007). These
23 concentrations at downwind locations were then used to infer potential radiation and chemical
24 exposures for an individual living close to the uranium lease tracts during the reclamation phase.
25
26

27 **D.5.3 Impact Assessment for Post-Reclamation Phase** 28

29 The receptor considered for analysis of the human health impacts in the post-reclamation
30 phase was a nearby resident and recreationist who unknowingly entered the uranium lease tract.
31 It was assumed that the recreationist would camp on top of a waste-rock pile for 2 weeks, collect
32 wild berries, and hunt wildlife animals for consumption. Potential impacts from camping would
33 result from the inhalation of radon diffusing from the waste-rock pile, inhalation of dust
34 particles, accidental soil ingestion, and the direct external radiation emitted by radionuclides
35 contained in the waste-rock pile. The RESRAD code was used for dose calculations. Although it
36 is expected that a layer of soil materials would be spread on top of the waste-rock pile to
37 facilitate the growth of vegetation, the thickness of the soil materials could vary. Therefore, in
38 the analysis, a thickness ranging from 0 to 1 ft (0 to 0.3 m) was assumed, and the range of
39 potential impact was calculated.
40

41 The residents living close to the uranium lease tracts could still be exposed to radon and
42 dust particles emitted from the waste-rock piles. However, because of the cover soils spread on
43 top of the waste-rock piles, the emission rates would be reduced. As a result, the potential dose
44 associated with airborne emissions incurred by a resident after the reclamation phase would be
45 less than the dose incurred during the reclamation phase.
46

1 A less likely exposure scenario for residents living close to the uranium lease tracts
2 considers that the residents let their livestock graze in the uranium lease tracts and consume the
3 meat and milk produced by the livestock. The RESRAD code was used for this analysis.
4
5

6 **D.5.4 Parameter Values for Modeling Potential Radiation and Chemical Exposures** 7

8 For the impact analyses, a resident living close to or within 50 mi (80 km) of the uranium
9 lease tracts was assumed to be at his residence for 350 days per year and to spend 8 hours
10 outdoors and 16 hours indoors each day. Because the windows and doors of the residence would
11 be closed most of the time, a dust or radon filtration factor of 0.4 was assumed (i.e., the indoor
12 radon or airborne particulate level was assumed to be 40% of the outdoor level). The average
13 inhalation rate was assumed to be 8,000 m³/yr (the default value used in CAP88-PC), while the
14 average soil ingestion rate was assumed to be 100 mg/d.
15

16 For reclamation workers, an exposure duration of 20 days was used for impact analyses.
17 The inhalation rate was assumed to be 8,000 m³/yr, and the soil ingestion rate was assumed to be
18 100 mg/d. An exposure duration of 2 weeks was assumed for the recreationist who camps on a
19 waste-rock pile. This recreationist was assumed to ingest 1 lb (0.45 kg) of wild berries collected
20 from the lease tracts and 100 lb (45.4 kg) of deer meat obtained through hunting activities. This
21 individual was assumed to have the same inhalation and soil ingestion rate as a reclamation
22 worker. For the nearby residents, the inhalation rate and soil ingestion rate were assumed to be
23 the same as those for the recreationist. The ingestion rates of milk (92 L/yr) and meat (63 kg/yr)
24 were set to the RESRAD default values.
25

26 For modeling radon emissions from a waste-rock pile, an emanation factor of 0.15 was
27 assumed based on experimental measurement data taken from rock samples (Ferry et al. 2002;
28 Sakoda et al. 2010). The RESRAD default value of 2×10^{-6} m²/s was assumed for the radon
29 diffusion coefficient, while the porosity in a waste-rock pile was assumed to be 0.4, the
30 RESRAD default value.
31

32 For CAP88-PC analysis, the emission of radon from an underground mine was modeled
33 as a stack source, with a release height of 3 ft (1 m) and a diameter of 6.0 ft (2 m), taken from the
34 diameter of the ventilation shaft in the *Final Environmental Assessment for the Whirlwind Mine*
35 *Uranium Mining Project* (BLM 2008). An exit velocity of 16 ft/s (5 m/s) was assumed for the
36 gas escaping from the exhaust vents. This exit velocity was obtained by considering the average
37 ventilation rate in an underground mine, the number of exhaust vents, and the diameter of the
38 exhaust vents. An average annual precipitation of 1 ft/yr (0.32 m/yr), ambient temperature of
39 50°F (10°C), and absolute humidity of 8 g/m³ were selected to reflect site-specific conditions.
40 An average mixing height of 4,900 ft (1,500 m), considering both morning and afternoon
41 conditions, was also assumed for the analyses. For the analysis involving an open-pit mine, the
42 emission of radon was assumed to come from an area source that occupied 100 acres (40 ha)—or
43 50% of the disturbed area—based on assumptions presented in Chapter 2 for the alternatives.
44 The release height was 0 ft (0 m), and there was no plume rise for release from the open-pit
45 mine.

D.5.5 Dose Conversion Factors and Toxicity Values

The exposure concentration of radon is usually expressed as a working level (WL), which is a measure of the release of alpha energy by the short-lived progenies of radon. The exposures are measured in working level months (WLMs). One WLM is equivalent to an exposure of 170 hours to a concentration of 1 WL. UNSCEAR recommends that an exposure of 1 WLM corresponds to 506 mrem of effective dose for workers (UNSCEAR 2008, 2010). For the general public, the corresponding effective dose of an exposure of 1 WLM is about 388 mrem (UNSCEAR 2008). The difference in the conversion from WLM to effective dose used for workers and the conversion used for the general public lies in the different inhalation rates considered for the conversion. The International Commission on Radiation Protection (ICRP 2011) indicates that, based on the pooled results from studies of radon-exposed miners, a lifetime excess risk of 5×10^{-4} per WLM should be used for estimating radon progeny-induced lung cancer.

Potential radiation doses resulting from exposures to uranium isotopes and their decay products were calculated by using the ICRP 60-based dose conversion factors for inhalation and ingestion. The corresponding cancer risks were calculated by using the slope factors obtained from Federal Guidance Report No. 13 (Eckerman et al. 1999).

Potential chemical risks that could result from exposures to uranium and vanadium compounds were assessed by comparing the estimated exposures with threshold values. The threshold values used are reference concentrations (RfCs) for inhalation exposures and reference doses (RfDs) for ingestion exposures. The RfD used for assessing risks associated with vanadium exposure is 0.009 mg/kg-d, obtained from the EPA Integrated Risk Information System (IRIS) for V_2O_5 (EPA 2012c). The RfC used is 0.0001 mg/m³ from the Agency for Toxic Substances and Disease Registry (ATSDR 2012). Because no RfC value is provided in IRIS or the Health Effect Assessment Summary Tables (HEASTs) for vanadium, the minimum risk level (MRL) proposed by the ATSDR for chronic exposure was used as a surrogate for RfC. The RfC used for assessing risks associated with uranium exposure is 0.0008 mg/m³ (ATSDR 2012), which is the MRL proposed by ATSDR for chronic exposure to insoluble uranium compounds. The RfD used for uranium is 0.003 mg/kg-d, obtained from the IRIS database (EPA 2012c).

D.5.6 Comparison of CAP88-PC Results and COMPLY-R Results

According to Title 40 in the *Code of Federal Regulations* (40 CFR Part 61), emissions of Rn-222 to the ambient air from an underground uranium mine must not result in any member of the general public receiving in any year an effective dose of 10 mrem or greater. Owners or operators of uranium mines must use COMPLY-R (EPA 1989c) or a model equivalent to COMPLY-R, provided they have received approval from EPA headquarters, to demonstrate compliance with this requirement. For human health impact analyses, in addition to the use of COMPLY-R, the CAP88-PC computer code (Trinity Engineering Associates, Inc. 2007) was also used for conducting analyses in this Draft ULP PEIS because it has been supported and

1 maintained by the EPA and used extensively in human health risk assessments for evaluating
2 potential radiation exposures resulting from airborne emissions of radionuclides, including
3 radon. Furthermore, the emissions considered by CAP88-PC can originate from point sources,
4 such as the exhaust vents of underground uranium mines, or from area sources, such as the
5 waste-rock piles accumulated from uranium-mining activities. In addition to being used to obtain
6 air concentrations for estimating the radiation dose to an individual, CAP88-PC can also be used
7 to estimate the collective exposures to a population living or working around the emission
8 sources. Consistency in the methodology was maintained by applying CAP88-PC to evaluate the
9 potential exposures of the general public, both as individual members and collectively,
10 associated with the different phases of uranium mine operations considered in this Draft ULP
11 PEIS.

12
13 In this section, the calculation results of CAP88-PC and COMPLY-R associated with the
14 release of radon during the operation of a small underground uranium mine (which was defined
15 by the working assumptions described in Chapter 2) are compared. This small uranium mine was
16 assumed to produce 50 tons of uranium ore per day, with an annual production rate of
17 12,000 tons/yr (10,800 metric tons/yr). The mining activities were assumed to have been
18 conducted for 10 years. Based on the equation proposed by the EPA (EPA 1985) that correlates
19 the radon emission rate with the cumulative uranium ore production, a radon emission rate of
20 528 Ci/yr was calculated. The volumetric flow rate from the exhaust vent was calculated to be
21 450 ft³/s (13 m³/s), corresponding to an exit speed of 16 ft/s (5 m/s) and a diameter of 6 ft (2 m)
22 as used in the CAP88-PC analysis. The vent was assumed to be vertical with a height of 3 ft
23 (1 m) above the ground. Both the ambient temperature and the temperature of the exhaust stream
24 were 50°F (10°C). By using the joint frequency data (Rogers 2011) collected from a 30-ft (10-m)
25 high meteorological tower installed by Energy Fuels Resources Corp. in the proposed Piñon
26 Ridge Mill site in Montrose County, Colorado, the frequency and average wind speed in each of
27 the 16 directional sectors were calculated (Table D.5-1). These data represent the site-specific
28 conditions from April 2008 to March 2011.

29
30 Table D.5-2 compares the maximum radon doses calculated with CAP88-PC and those
31 calculated with COMPLY-R at different distances from the radon emission point. The radon
32 doses calculated with CAP88-PC were much smaller than those calculated with COMPLY-R for
33 shorter distances, but the difference in calculated doses became smaller as the distance from the
34 emission point increased. According to the users guide (EPA 1989c), COMPLY-R uses a
35 conversion factor of 920 mrem/WLM to convert radon exposures to effective doses, and, by
36 default, a receptor was assumed to spend 75% of the exposure time indoors. For the CAP88-PC
37 results, an updated conversion factor of 388 mrem/WLM (UNSCEAR 2008) was used, and a
38 receptor was assumed to spend 16 hours indoors and 8 hours outdoors each day for 350 days per
39 year at the same location. Furthermore, the indoor radon level was assumed to be 40% of the
40 outdoor level. If the same exposure-to-dose conversion factor is used in both sets of calculations,
41 the radon dose calculated with COMPLY-R would be greater than that calculated with
42 CAP88-PC for an exposure distance of less than 4,900 ft (1,500 m). However, at 4,900 ft
43 (1,500 m) or more, the radon dose calculated with COMPLY-R would be smaller than that
44 calculated with CAP88-PC.

45

1
2
3**TABLE D.5-1 Meteorological
Data Used in the COMPLY-R
Calculations**

Wind from	Frequency	Speed (m/s)
N	0.026	2.63
NNE	0.015	1.98
NE	0.015	1.53
ENE	0.018	1.43
E	0.04	1.7
ESE	0.137	2.16
SE	0.139	2.01
SSE	0.054	2.01
S	0.047	3.47
SSW	0.077	5.02
SW	0.07	4.54
WSW	0.061	3.1
W	0.07	2.58
WNW	0.094	2.41
NW	0.09	2.87
NNW	0.047	2.85

4
5
6
7
8**TABLE D.5-2 Comparison of the Radon Doses
Calculated by CAP88-PC and Those Calculated
by COMPLY-R**

Distance (m)	Radon Dose (mrem/yr)		
	CAP88-PC	COMPLY-R	Ratio ^a
500	7.8	35.7	4.56
1,000	5.6	12.0	2.13
1,500	3.7	6.5	1.75
2,000	2.7	4.3	1.61
3,000	1.6	2.5	1.53
4,000	1.2	1.7	1.39
5,000	1.0	1.3	1.34

^a The ratio is calculated as COMPLY-R divided by CAP88-PC.

9
10
11

D.6 ECOLOGICAL RESOURCES

D.6.1 Vegetation

This section describes the methodology used to evaluate potential impacts on vegetation within the potentially affected area of the ULP lease tracts.

D.6.1.1 Vegetation Included in the Assessment

Vegetation considered in the assessment included plant communities associated with the ecoregions and land cover types mapped for the potentially affected area (see data sources below). Habitats associated with wetland types, or other water-dependent habitats, known to occur in the potentially affected area were also included.

D.6.1.2 Affected Area

The affected area considered in this assessment included the areas of direct and indirect effects. The area of direct effects was defined as the area that would be physically modified during project development (i.e., where ground-disturbing activities would occur). The area of direct effects encompassed the entire lease tracts, which included all project components and access roads.

The area of indirect effects was defined as the area where ground-disturbing activities would not occur but that could be indirectly affected by activities in the area of direct effects. This indirect effects area was defined as the area outside the lease tracts but within 5 mi (8 km) of the tract boundary. The area of indirect effects could be affected by all phases of project activities, including the construction and use of access roads, in the area of direct effects related to groundwater withdrawals, surface runoff, dust, and accidental spills. The distance from the lease tract boundary used to define this area of indirect effects was based on professional judgment and was considered sufficiently large to bound the area that would potentially be subject to indirect effects. The potential magnitude of indirect effects would decrease with increasing distance from the lease tract.

D.6.1.3 Data Sources

The types of data used to determine the known or potential presence of plant communities in the vicinity of the DOE ULP lease tracts were collected from various sources and at different geographical and organizational levels. Sources of information included, but were not limited to, the following:

- Level III and Level IV ecoregions (Chapman et al. 2006);

- 1 • Gap analysis programs—Southwest Regional Gap Analysis Project
- 2 (SWReGAP) (USGS 2004, 2005);
- 3
- 4 • State noxious weed lists; and
- 5
- 6 • National Wetlands Inventory (USFWS 2012).
- 7
- 8

9 **D.6.1.4 Analysis Approach**

10
11 Plant communities that were known to occur or could potentially occur within the
12 affected area were included in the impact analysis. A landscape-level analysis was used to
13 determine impacts by quantifying the total number of acres of each land cover type,
14 encompassing a range of similar plant communities, within the area of direct effects.

15
16 The magnitudes of impacts on plant communities would depend on the locations of
17 projects, project-specific designs, the mitigation measures applied (including avoidance,
18 minimization, and compensation), and the status of plant communities in project areas.

19
20 The analysis of impacts on environmental resources from mining and reclamation
21 activities was based, in part, on a set of assumptions regarding site preparation and reclamation
22 activities. These assumptions were based on management practices at existing mines and current
23 DOE guidance and were used for the evaluation of impacts at the programmatic level.

24
25 The actual extent of land disturbance within the footprint of any mine site would be
26 specified in a detailed plan. However, to ensure an upper-bound assumption for the impact
27 analyses, the entire project area was assumed to be cleared of all vegetation during site
28 preparation. Development and operations were assumed to continue for 8 to 15 years. Ground
29 disturbance was assumed to range from 10 acres (4 ha) for small mines to 20 acres (8 ha) for a
30 large mine. In addition, the very large, 210-acre (80-ha) open-pit mine at JD-7 was assumed to
31 resume operations under some of the alternatives.

32
33 It was assumed that immediately following the decommissioning of a mine, land surfaces
34 would be recontoured to the greatest extent feasible. The operator would subsequently establish
35 vegetation on the waste-rock area and other disturbed areas. It was assumed that reclamation
36 activities would occur over a 2-year period and would include grading to create landforms
37 conforming to the surrounding area, application of topsoil, and seeding. A seed mix (see
38 Table 4.1-8) has been developed for use on reclamation activities for the ULP. The final
39 determination of successful vegetation establishment would be made by DOE in coordination
40 with the BLM and Colorado Division of Reclamation, Mining, and Safety (CDRMS).

1 **D.6.2 Wildlife and Aquatic Biota**

2
3 Analysis of potential impacts on terrestrial and aquatic species and their habitats
4 considered mine development, mine operations, and reclamation activities at and in the vicinity
5 of the lease tracts. Direct and indirect impacts on ecological resources were evaluated on the
6 basis of the following:

- 7
- 8 • The quality and quantity of habitats present;
- 9
- 10 • The potential magnitude of changes to habitat quality and quantity;
- 11
- 12 • The season when impacts could occur;
- 13
- 14 • The expected duration of impacts;
- 15
- 16 • The sensitivity of biological resources that could be affected by changes in
17 habitat quality or quantity; and
- 18
- 19 • The rarity and importance of affected resources.
- 20

21 Impacting factors considered in evaluating effects from mining in the lease tracts
22 included the following:

- 23
- 24 • Habitat loss, modification, and fragmentation;
- 25
- 26 • Barriers to movement;
- 27
- 28 • Changes in stream flow and water quality;
- 29
- 30 • Erosion and sedimentation;
- 31
- 32 • Air quality and fugitive dust;
- 33
- 34 • Introduction of invasive species;
- 35
- 36 • Exposure to contaminants (including radionuclides);
- 37
- 38 • Mortality and injury; and
- 39
- 40 • Noise and disturbance.
- 41
- 42

1 **D.6.2.1 Wildlife**

2
3 This section describes the methodology used to evaluate impacts on wildlife known to
4 occur, or for which suitable habitat could occur, within the potentially affected area of the ULP
5 lease tracts.

6
7
8 **D.6.2.1.1 Wildlife Species Included in the Assessment.** Wildlife species considered in
9 the assessment included representative amphibian, reptile, bird, and mammal species.
10 Representative species were selected among those species known to occur, or for which
11 potentially suitable habitat occurs, within the lease tracts. To a large extent, the selection of
12 representative species was based on whether a species (1) has key habitats within or near the
13 lease tracts, (2) is important to humans (e.g., big game, small game, and furbearer species), (3) is
14 representative of other species that share predominant habitats found in the lease tracts, (4) could
15 make use of lease tract mines (e.g., bats), or (5) has some type of regulatory protection
16 (e.g., Migratory Bird Treaty Act). To the extent practicable, representative species included
17 wildlife species whose range included the three-county study area or at least extended throughout
18 the region for all or most of the lease tracts.

19
20
21 **D.6.2.1.2 Affected Area.** For the wildlife impact assessment, the affected area included
22 those portions of Mesa, Montrose, and San Miguel Counties that encompassed the lease tracts.
23 The area of direct effects was defined as the area that would be physically modified during
24 project development (i.e., where ground-disturbing activities would occur). The area of direct
25 effects encompassed the entire lease tracts, which included all project components and access
26 roads. The area of indirect effects was defined as the area where ground-disturbing activities
27 would not occur but that could be indirectly affected by activities in the area of direct effects.
28 This indirect effects area was defined as the area outside the lease tracts but within 5 mi (8 km)
29 of the tract boundary. The distance from the lease tract boundary used to define this area of
30 indirect effects was based on professional judgment and was considered sufficiently large to
31 bound the area that would potentially be subject to indirect effects.

32
33
34 **D.6.2.1.3 Data Sources.** The types of data used to determine the known or potential
35 presence of wildlife species and life history information on the species were collected from
36 various sources and at different geographical and organizational levels. The most current,
37 location-specific data at the highest resolution were used whenever available. Sources of
38 information included, but were not limited to, the following:

- 39
40 • Colorado National Heritage Program (CNHP 2009) and Colorado Parks and
41 Wildlife (formerly Colorado Division of Wildlife; CPW 2011);
42
43 • Gap analysis programs—SWReGAP (USGS 2004, 2005, 2007); and
44
45 • NatureServe (2011).

1 **D.6.2.1.4 Analysis Approach.** Because of the uncertainty regarding species distributions
2 and the inherent challenges involved with tracking wildlife species in a lease tract, a conservative
3 approach was used to determine the potential for species to occur on or in the vicinity of the
4 lease tracts. The identification of potential wildlife species in the general area of the lease tracts
5 was based on (1) county-level occurrences, (2) locations of species observations as determined
6 by Colorado's wildlife and/or natural heritage agencies, and (3) occurrences of identified land
7 cover for the species listed by SWReGAP (USGS 2005).
8

9 Spatial data provided by state natural heritage and regional gap analysis programs were
10 used to determine whether potentially suitable habitat occurred in the affected area. Gap analysis
11 program data consisted of vertebrate animal land cover models. When maps of key habitats for a
12 big game or game bird species (e.g., crucial winter range) were available, the acreages of those
13 habitats within each of the lease tracts were determined by using ESRI ArcGIS Version 9
14 software.
15

16 A landscape-level analysis was used to determine impacts by quantifying the total
17 acreage of potentially suitable habitat for representative species within the lease tracts per
18 alternative evaluated in this Draft ULPPEIS.
19

20 With regard to the assessment of vegetation, relative impact magnitude categories were
21 based on Council on Environmental Quality (CEQ) regulations for implementing the National
22 Environmental Policy Act (NEPA; see 40 CFR 1508.27). These categories were as follows:
23

- 24 • *None.* No impacts are expected.
- 25
- 26 • *Small.* Effects would not be detectable or would be so minor that they would
27 neither destabilize nor noticeably alter any important attribute of the resource.
28 (For this analysis, impacts were considered small if $\leq 1\%$ of identified habitat
29 for a representative species would be lost in the region of influence.)
30
- 31 • *Moderate.* Effects would be sufficient to alter noticeably but not destabilize
32 important attributes of the resource. (For this analysis, impacts were
33 considered moderate if $\geq 1\%$ but $< 10\%$ of identified habitat for a
34 representative species would be lost in the region.)
35
- 36 • *Large.* Effects would be clearly noticeable and sufficient to destabilize
37 important attributes of the resource. (For this analysis, impacts were
38 considered large if 10% or more of identified habitat for a representative
39 species would be lost in the region.)
40

41 Actual impact magnitudes on wildlife species would depend on the locations of projects,
42 project-specific designs, mitigation measures applied (including avoidance, minimization, and
43 compensation), and status of the species and their habitats in the project areas.
44
45

1 **D.6.2.2 Aquatic Biota**

2
3 This section describes the methodology used to evaluate direct and indirect impacts on
4 aquatic habitats and biota known to occur on or within the potentially affected area of the ULP
5 lease tracts.

6
7
8 **D.6.2.2.1 Affected Area.** For the aquatic biota impact assessment, the affected area is
9 similar to that for the wildlife assessment. The area of direct effects was defined as the area that
10 would be physically modified during project development (i.e., where ground-disturbing
11 activities would occur). The area of direct effects encompassed the entire lease tracts, which
12 included all project components and access roads. The area of indirect effects was defined as the
13 area where ground-disturbing activities would not occur but that could be indirectly affected by
14 activities in the area of direct effects. This indirect effects area was defined as the area outside
15 the lease tracts but within 5 mi (8 km) of the tract boundary. The distance from the lease tract
16 boundary used to define this area of indirect effects was based on professional judgment and was
17 considered sufficiently large to bound the area that would potentially be subject to indirect
18 effects.

19
20
21 **D.6.2.2.2 Analysis Approach.** Aquatic habitat and communities were assessed by first
22 determining the perennial and intermittent/ephemeral surface water features (streams and other
23 water bodies) within or adjacent to the lease tracts. The occurrences of surface water features
24 were based on data from the USGS national atlas (<http://nationalatlas.gov/mapmaker>) and
25 available reports.

26
27 Descriptions of aquatic communities within the aquatic habitats were derived from state
28 records, reports conducted on aquatic systems in the lease tracts, and existing NEPA documents
29 for the lease tracts. For many of the ephemeral/intermittent washes and rivers, no data were
30 available. Many of the surface water features in the lease tracts are ephemeral and are not
31 expected to contain aquatic habitat or biota. However, with sufficient frequency and flow,
32 ephemeral or intermittent surface water may contain a diverse seasonal community of
33 opportunistic species or habitat specialists adapted to living in temporary aquatic environments.
34 Such specialists may be present in a dormant state even in dry periods. Therefore, aquatic biota
35 could be present at least temporarily. Also, mining activities could affect permanent water
36 features located near some of the lease tracts. To better resolve whether aquatic habitat and biota
37 are present within or near a lease tract, site-specific surveys of aquatic communities are
38 presumed to be required prior to mine development.

39
40 It was assumed that impacts on aquatic habitat and communities could potentially result
41 from direct disturbance; surface water and groundwater withdrawals; and changes in water,
42 sediment, and contaminant inputs to surface water features. Based on best professional judgment,
43 much greater weight was given to the magnitude of direct effects, because those effects could be
44 difficult to mitigate. The potential for indirect impacts on surface water outside the lease tracts
45 was evaluated on the basis of their proximity and connectivity to surface water inside the lease

1 tracts. In most cases, it was assumed that mitigation would reduce most indirect effects to
2 negligible levels. Actual impacts on aquatic habitat and biota would depend on the locations of
3 mines relative to surface water, mine-specific designs, and mitigation measures applied
4 (including avoidance, minimization, and compensation). Mitigation was considered if there was
5 a potential for impacts on aquatic habitat and biota.
6
7

8 **D.6.3 Threatened, Endangered, and Sensitive Species**

9

10 **D.6.3.1 Species Included in the Assessment**

11
12
13 Potential impacts on threatened, endangered, and sensitive species were evaluated in a
14 manner similar to that used for plant communities and habitats and wildlife and aquatic resources
15 (Sections D.6.1 and D.6.2), and impacts on these species and their habitats from mine
16 development, mine operations, and reclamation activities at and in the vicinity of the lease tracts
17 were considered. The following types of species were evaluated in this Draft ULP PEIS as
18 threatened, endangered, or sensitive species:
19

- 20 • Species listed as threatened or endangered under the Endangered Species Act
21 (ESA) or that are proposed or candidates for listing under the ESA;
22
- 23 • Species that are listed by the BLM as sensitive;
24
- 25 • Species that are listed by the U.S. Forest Service (USFS) as sensitive; and
26
- 27 • Species that are listed as threatened or endangered by the State of Colorado.
28

29 Data used to determine baseline conditions and evaluate impacts of the ULP on
30 threatened, endangered, and sensitive species were obtained from the following sources:
31

- 32 • USFWS Information, Planning, and Conservation (IPaC) System
33 (USFWS 2011a);
34
- 35 • USFWS Critical Habitat Portal (USFWS 2011b);
36
- 37 • NatureServe Explorer (NatureServe 2011);
38
- 39 • CNHP Rare Plant Guide (CNHP 2011a);
40
- 41 • CNHP element occurrence records (CNHP 2011b);
42
- 43 • CPW Natural Diversity Information Source (CPW 2011); and
44
- 45 • SWReGAP (USGS 2007).

D.6.3.2 Affected Area

The affected area includes areas that may be directly or indirectly affected by activities conducted under the ULP. The area of direct effects for threatened, endangered, and sensitive species includes those portions of Mesa, Montrose, and San Miguel Counties that intersect the lease tracts. The area of indirect effects for threatened, endangered, and sensitive species encompasses a larger area of habitats that could be affected by indirect factors including, but not limited to, groundwater withdrawal; changes in water quality, sedimentation, and erosion; dispersion of contaminants (including radionuclides); and fugitive dust dispersion. The spatial extent for the area of indirect effects was conservatively defined based on the species' biology and potential mechanisms of impacts. For example, the areas of indirect effects for aquatic species are generally larger than those for terrestrial species. The indirect effects area for terrestrial species was defined as the area outside the lease tracts but within 5 mi (8 km) of the tract boundary. However, the indirect effects area for aquatic species was determined to include downstream intermittent streams and water bodies to account for potential impacts of altered water quality and quantity related to ULP activities. For aquatic species, the indirect effects area included downstream portions of the Dolores and San Miguel Rivers, as well as downstream portions of the Colorado River. The distance between the confluence of the Dolores and Colorado Rivers and the Lease Tracts ranges between approximately 35 river miles (56 river km) from the Gateway Lease Tracts and greater than 70 river miles (112 river km) from the Slick Rock Lease Tracts. In general, the magnitude of indirect effects decreases with increasing distance from the lease tracts.

D.6.3.3 Analysis Approach

Because of the uncertainty regarding species distributions and the inherent challenges involved with tracking species in the lease tracts, a conservative approach was used to determine the potential for species to occur on or in the vicinity of the lease tracts. The identification of potential threatened, endangered, and sensitive species in the vicinity of the lease tracts was based on (1) county-level occurrences, (2) locations of species observations as determined by Colorado wildlife and/or natural heritage agencies, and (3) occurrences of potentially suitable habitat for the species listed by SWReGAP (USGS 2007).

Spatial data provided by the CNHP and SWReGAP were used to determine whether potentially suitable habitat occurred in the affected area. The SWReGAP habitat suitability models consisted only of vertebrate animal land cover models.

A spatial analysis was performed by using ESRI ArcGIS 10 software to determine the intersections of the ULP lease tracts with CNHP element occurrences and SWReGAP habitat suitability models. Based on this analysis, a determination was made regarding the species' known or potential occurrence on the lease tract. A lack of data did not preclude a species from potentially occurring in a given area. When there was a lack of CNHP records or SWReGAP habitat suitability models for a species, modeled land cover types were used to determine the

1 potential suitability of the affected area with regard to what is known about the species' biology
2 and habitat preferences.

3
4 Relative impact magnitude categories were based on CEQ regulations for implementing
5 NEPA (40 CFR 1508.27) and were as follows:

- 6
7 • *None*. No impacts are expected.
- 8
9 • *Small*. Effects would not be detectable or would be so minor that they would
10 neither destabilize nor noticeably alter any important attribute of the resource.
- 11
12 • *Moderate*. Effects would be sufficient to alter noticeably but not destabilize
13 important attributes of the resource.
- 14
15 • *Large*. Effects would be clearly noticeable and sufficient to destabilize
16 important attributes of the resource.
- 17

18 Actual impact magnitudes on threatened, endangered, and sensitive species would depend
19 on the locations of projects, project-specific designs, and mitigation measures applied (including
20 avoidance, minimization, and compensation).

21 22 23 **D.7 LAND USE**

24
25 The area of analysis focused on public and private lands within a 25-mi (40-km) radius of
26 the ULP lease tracts. Existing right-of-way (ROW) authorizations and land designations under
27 BLM's lands and realty program were identified (including specially designated lands with
28 wilderness characteristics). Other information on agriculture, livestock grazing, wild horses and
29 burros, mineral resources (and mining), oil and gas leasing, timber harvest, and recreation were
30 obtained from Federal and state sources. Major sources of information included (1) BLM's
31 resource management plans, the national landscape conservation system, public land statistics,
32 and the Land and Mineral Legacy Rehost 2000 system (LR2000); (2) USDA's 2007 census of
33 agriculture and resource bulletins; and (3) various reports and database searches from web sites
34 sponsored by the Colorado Department of Natural Resources (CDNR), CDRMS, Colorado Oil
35 and Gas Conservation Commission (COGCC), Utah Geological Survey, and Utah Division of
36 Oil, Gas, and Mining.

37
38 The impacts analysis for land use considered issues such as land use conflicts within the
39 lease tracts (e.g., mining, oil and gas leasing, livestock grazing, and recreation), whether or not
40 lease tracts would be open to mineral entry (under the various alternatives), and visual impacts at
41 specially designated lands. The main factors considered as part of the land use impacts analysis
42 were the (1) proximity of lease tracts to specially designated areas, (2) nature of the resources
43 and resource values present within the proximate specially designated areas, and (3) quality of
44 the view of the lease tracts from these areas.

1 **D.8 SOCIOECONOMICS**

2
3 The analysis of socioeconomic impacts from the mining activities at the DOE ULP lease
4 tracts assessed impacts in a region of influence (ROI). The ROI includes Mesa, Montrose, and
5 San Miguel Counties in Colorado, in which the majority (up to 90%) of employees for the DOE
6 ULP proposed mines would reside. The ROI includes county governments, city governments,
7 and school districts. The assessment of the impacts from mining at the DOE ULP lease tracts
8 covered impacts on employment, income, population, housing, community services, and traffic.

10 11 **D.8.1 Regional Employment and Income**

12
13 The assessment of impacts from mining activities on regional employment and income
14 was based on the use of regional economic multipliers in association with project expenditure
15 data for the mine development and operations phase and the reclamation phase. Multipliers
16 captured the indirect (off-site) effects of on-site activities associated with mining operational and
17 reclamation activities. Data on expenditures were derived from numerous sources.

18
19 Cost data for each cost category were then mapped into the relevant North American
20 Industry Classification System (NAICS) codes for use with multipliers from an IMPLAN model
21 specified for each state (MIG 2011). IMPLAN input-output economic accounts show the flow of
22 commodities to industries from producers and institutional consumers. The accounts also show
23 consumption activities by workers, owners of capital, and imports from outside the region. The
24 IMPLAN model contains 528 sectors representing industries in agriculture, mining, construction,
25 manufacturing, the wholesale and retail trade, utilities, finance, insurance and real estate, and
26 consumer and business services. The model also includes information for each sector on
27 employee compensation; proprietary and property income; personal consumption expenditures;
28 Federal, state, and local expenditures; inventory and capital formation; and imports and exports.

29
30 Impacts on employment were described in terms of the total number of jobs created in the
31 ROI in the peak years for mine development, mine operations, and reclamation. The relative
32 impact of the increase in employment in the ROI was calculated by comparing the total mining
33 employment (without considering ULP-related activities), over the same period, with the
34 employment that was assumed in order to estimate the number of jobs created by the ULP
35 exploration, mine development and operations, and reclamation activities. Impacts were
36 expressed in terms of the percentage point difference in the average annual employment growth
37 rate with and without the DOE ULP mining activities. Forecasts were based on data provided by
38 the U.S. Department of Commerce.

40 41 **D.8.2 Population**

42
43 An important consideration in the assessment of the impacts from DOE ULP mining and
44 reclamation activities was the number of workers, families, and children who would migrate into
45 the ROI, either temporarily or permanently. The capacity of regional labor markets to supply a

1 sufficient number of workers in the occupations required for mining and reclamation is closely
2 related to the occupational profile of the ROI and occupational unemployment rates. To estimate
3 the in-migration that would occur to satisfy direct labor requirements, the analysis developed
4 estimates of the available labor in each direct labor category based on ROI unemployment rates
5 applied to each occupational category. In-migration associated with indirect labor requirements
6 was derived from estimates of the available labor supply in the ROI economy as a whole that
7 would be able to satisfy the demand for labor by industry sectors in which mining and
8 reclamation spending initially occurred. The national average household size (2.6) was used to
9 calculate the number of additional family members who would accompany direct and indirect
10 in-migrating workers. Based on other analyses of energy project labor in-migration (Fahys-
11 Smith 1983), it was assumed that 28% of the workers in-migrating into each ROI would bring
12 their family members with them.

13
14 Impacts on population were described in terms of the total number of in-migrants arriving
15 in the ROI in the peak year(s) of DOE ULP mining and reclamation. The relative impact of the
16 increase in population in the ROI was calculated by comparing total DOE ULP in-migration over
17 the period in which mining and reclamation was assumed to occur with baseline ROI population
18 forecasts over the same period. Impacts were expressed in terms of the percentage point
19 difference in the average annual population growth rate with and without the DOE ULP mining
20 and reclamation activities. Forecasts were based on data provided by the Colorado State
21 Demography Office.

22 23 24 **D.8.3 Housing**

25
26 The in-migration of workers occurring during mine development and operations has the
27 potential to affect the housing market in the ROI. The analysis considered these impacts by
28 estimating the increase in demand for rental housing units in the peak year(s) of operations and
29 reclamation that would result from the in-migration of both direct and indirect workers into the
30 ROI. The impacts on housing were described in terms of the number of rental units required in
31 the peak year of operations. The relative impact on the existing housing in the ROI was
32 estimated by calculating the impact of mining-related housing demand on the number of vacant
33 rental housing units in the peak year of operations.

34 35 36 **D.8.4 Community Services**

37
38 In-migration associated with mining activities could translate into an increased demand
39 for educational and public services (schools, police, firefighters, health services, and so on) in the
40 ROI. Impacts of mining activities on community service employment were also calculated for
41 the ROI in which the majority of new workers would locate. The analysis used estimates of the
42 number of in-migrating workers and families to calculate the number of newly sworn police
43 officers, firefighters, and general government employees who would be required to maintain the
44 existing levels of service for each community service. Calculations were based on the existing
45 number of employees per 1,000 persons for each community service. The analysis of the impact

1 on educational employment estimated the number of teachers in each school district who would
2 be required to maintain existing teacher-student ratios across all student age groups. Information
3 on existing employment and levels of service was collected from the individual jurisdictions
4 providing each service.
5
6

7 **D.8.5 Recreation**

8

9 Mining activities could have impacts on recreation. Providing quantitative estimates of
10 these potential impacts is difficult as it is unclear how mining operations and reclamation would
11 affect visits by recreationists. An approach to quantify the magnitude of the potential impacts on
12 the economy (for tourism and recreation) was developed for this Draft ULPPEIS in order to
13 provide some perspective. The approach examined the impact of a 1%, 5%, and 10% reduction
14 in ROI employment and income in the recreation sector. Impacts were estimated by using
15 IMPLAN data for the ROI (MIG 2011). Impacts on employment were described in terms of the
16 total number of jobs that would be lost in the ROI from a reduction in the recreation sector. The
17 relative impact of the decrease in employment in the ROI was calculated by comparing total
18 recreation employment over the period assumed for the proposed mining activities with
19 recreation employment forecasts for the ROI (without the proposed action) for the same period.
20
21

22 **D.9 ENVIRONMENTAL JUSTICE**

23

24 Exploration, mine development and operations, and reclamation of uranium mines at the
25 DOE ULP lease tracts could affect environmental justice if any adverse human health and
26 environmental impacts resulting from any phase were significantly high and if these impacts
27 would disproportionately affect minority and low-income populations. If the analysis determined
28 that human health and environmental impacts were not significant and if the analysis accounted
29 for any cumulative or multiple adverse exposures from environmental hazards and unique factors
30 associated with the populations that might result in differential routes of exposure, or other
31 unique ecological, cultural, human health or socioeconomic impacts, then there could not be any
32 disproportionately high and adverse impacts on minority and low-income populations. If the
33 analysis determined a potential for human health or environmental impacts to be significant,
34 disproportionality would be determined by comparing the proximity of any high and adverse
35 impacts with the locations of low-income and minority populations. For example, the analysis
36 would consider whether potentially significant human health risks would appreciably exceed the
37 risk to the general population.
38

39 The analysis of environmental justice issues associated with the development of uranium
40 mines considered impacts within the ULP lease tracts and an associated 50-mi (80-km) radius
41 around the boundary of the proposed lease tracts. The geographic distribution of minority and
42 low-income groups in the 50-mi (80-km) radius was based on demographic data from the
43 U.S. Bureau of the Census (2011a,b). The following definitions were used to define minority and
44 low-income population groups:
45

- 1 • *Minority.* Persons are included in the minority category if they identify
2 themselves as belonging to any of the following racial groups: (1) Hispanic;
3 (2) Black (not of Hispanic origin) or African American; (3) American Indian
4 or Alaska Native; (4) Asian; or (5) Native Hawaiian or Other Pacific Islander.
5

6 Beginning with the 2010 Census, where appropriate, the census form allows
7 individuals to designate multiple population group categories to reflect their
8 ethnic or racial origin. In addition, persons who classify themselves as being
9 of multiple racial origins may choose up to six racial groups as the basis of
10 their racial origins. The term minority includes all persons, including those
11 classifying themselves in multiple racial categories, except those who classify
12 themselves as not of Hispanic origin and as White or “Other Race”
13 (U.S. Bureau of the Census 2011a).
14

15 The CEQ guidance proposed that minority populations should be identified
16 where either (1) the minority population of the affected area exceeds 50% or
17 (2) the minority population percentage of the affected area is meaningfully
18 greater than the minority population percentage in the general population or
19 other appropriate unit of geographic analysis.
20

21 The Draft ULP PEIS applied both criteria in using Census Bureau data for
22 census block groups, wherein consideration was given to minority populations
23 that were both greater than 50% and 20 percentage points higher than they
24 were in the state (the reference geographic unit).
25

- 26 • *Low-income.* These are individuals who fall below the poverty line. The
27 poverty line takes into account family size and the ages of individuals in the
28 family. In 2009, for example, the poverty line for a family of five with three
29 children younger than 18 was \$26,023. For any given family below the
30 poverty line, all family members are considered as being below the poverty
31 line for the purposes of analysis (U.S. Bureau of the Census 2011b).
32
33

34 **D.10 TRANSPORTATION** 35

36 This section provides the methodology and key input parameters used for the
37 transportation risk analysis performed in support of this Draft ULP PEIS. The methodology
38 followed the common approach identified in the DOE Handbook (DOE 2002). The analysis
39 evaluated the transportation of mined uranium ore from the lease tracts to the uranium mills.
40 Transportation impacts were estimated for shipment by truck because, historically, all such
41 shipments in the area have been by truck. Shipment by rail would not be practical, because there
42 are no rail lines located at or near any of the lease tracts or the uranium mills.
43
44

1 **D.10.1 Overview**

2
3 The transportation risk assessment considered human health risks from routine (normal,
4 incident-free) transport of radiological materials and from accidents. The risks associated with
5 the nature of the cargo itself (“cargo-related impacts”) were considered for routine transport.
6 Risks related to the transportation vehicle regardless of type of cargo (“vehicle-related impacts”) were considered for potential accidents. Radiological cargo-related accident risks were not
7 quantified, as discussed in Section D.10.1.2. The transportation of hazardous chemicals was not
8 quantified, because hazardous chemicals utilized are similar in types and volumes typical of
9 general small industrial activity (e.g., use of diesel fuel to operate equipment).
10
11

12 **D.10.1.1 Routine Transportation Risk**

13
14
15 The radiological risk associated with routine transportation would be cargo-related and
16 result from the potential exposure of people to low levels of external radiation near a loaded
17 shipment. No direct physical exposure to radioactive material would occur during routine
18 transport, because the uranium ore would be covered by a tarp during transport. No significant
19 unintended releases would occur.
20
21

22 **D.10.1.2 Accident Transportation Risk**

23
24 The cargo-related radiological risk from transportation-related accidents would come
25 from the potential release and dispersal of radioactive material into the environment during an
26 accident and the subsequent exposure of people through multiple exposure pathways
27 (e.g., exposure to contaminated soil, inhalation, or the ingestion of contaminated food).
28 However, the bulk of the uranium ore, with an approximate uranium concentration range of
29 about 0.2% U_3O_8 by weight, would be in cobbles and stones, which would minimize the
30 potential for any significant release of uranium to the surrounding air, soil, or water. Thus, the
31 radiological accident transportation risk from the shipment of uranium ore was not explicitly
32 quantified, because the short-term dose to an individual involved in an accidental spill or the
33 cleanup would be minimal (e.g., a small fraction of that received by a uranium miner, as
34 discussed in Section 4.3.5.1). A miner is estimated to receive an *annual* dose of 433 mrem,
35 primarily from radon inhalation because of the confined nature of the mine. Such confinement
36 would be absent from an accident spill location, and a worker involved in cleanup might
37 therefore be expected to receive a dose on the order of 1 mrem or less.
38

39 “Vehicle-related accident risks” refers to the potential for transportation-related accidents
40 that would result in injuries and fatalities caused by physical trauma unrelated to the cargo.
41
42

1 **D.10.2 Routine Risk Assessment Methodology**

2
3 The RADTRAN 5 computer code (Neuhauser and Kanipe 2003; Weiner et al. 2006) was
4 used in the routine risk assessment to estimate the radiological impacts on collective populations.
5 RADTRAN 5 was developed by Sandia National Laboratories to calculate population risks
6 associated with the transportation of radioactive materials by truck, rail, air, ship, or barge. The
7 code has been used extensively for transportation risk assessments since it was originally issued
8 in the late 1970s as RADTRAN (RADTRAN 1) and has been reviewed and updated periodically.
9 RADTRAN 1 was originally developed to facilitate the calculations presented in NUREG-0170
10 (NRC 1977).

11 12 13 **D.10.2.1 Collective Population Risk**

14
15 The radiological risk associated with routine transportation would result from the
16 potential exposure of people to low-level external radiation in the vicinity of loaded shipments.
17 Even under routine transportation, some radiological exposure could occur. Because the
18 radiological consequences (dose) would occur as a direct result of normal operations, the
19 probability of routine consequences is taken to be 1 in the RADTRAN 5 code. Therefore, the
20 dose risk is equivalent to the estimated dose.

21
22 For routine transportation, the RADTRAN 5 computer code considers major groups of
23 potentially exposed persons. The RADTRAN 5 calculations of risk for routine highway
24 transportation include exposures of the following population groups:

- 25
26 • *Persons along the route (off-link population)*. Collective doses were
27 calculated for all persons living or working within 0.5 mi (0.8 km) of each
28 side of a transportation route. The total number of persons within the 1-mi
29 (1.6-km) corridor was calculated separately for each route considered in the
30 assessment.
 - 31
32 • *Persons sharing the route (on-link population)*. Collective doses were
33 calculated for persons in all vehicles sharing the transportation route. This
34 group included persons travelling in the same or the opposite direction in
35 which the shipment was going, as well as persons in vehicles passing the
36 shipment.
 - 37
38 • *Persons at stops*. Collective doses can be calculated for people who might be
39 exposed while a shipment was stopped en route. For truck transportation,
40 these stops would include those for refueling, food, and rest. Truck stops were
41 not considered in this Draft ULP PEIS because of the relatively short
42 shipment distances being considered.
- 43

- 1 • *Crew members.* Collective doses were calculated for truck drivers involved in
2 the actual shipment of material. Workers involved in loading or unloading
3 were not considered in the transportation analysis.
4

5 The doses calculated for the first three population groups were added together to yield the
6 collective dose to the public. The dose calculated for the fourth group represents the collective
7 dose to workers.
8

9 The RADTRAN 5 calculations for routine doses generically compute the dose rate as a
10 function of distance from a point source or line source (Neuhauser and Kanipe 2003). Associated
11 with the calculation of routine doses for each exposed population group are parameters such as
12 the radiation field strength, source-receptor distance, duration of exposure, vehicle speed,
13 stopping time, traffic density, and route characteristics (such as population density). The
14 RADTRAN manual contains derivations of the equations used and descriptions of these
15 parameters (Neuhauser and Kanipe 2003).
16
17

18 **D.10.2.2 Highest-Exposed Individual Risk** 19

20 In addition to the routine collective population risk, the risks to individuals receiving the
21 highest impacts were estimated for a number of hypothetical exposure scenarios by using the
22 RISKIND model (Yuan et al. 1995; Biwer et al. 1997). Receptors included members of the
23 public exposed while standing along the route, during traffic delays, or while living near a
24 facility, as summarized in Table D.10-1.
25

26 RISKIND was used to calculate the dose to each individual considered for an exposure
27 scenario defined by an exposure distance, duration, and frequency specific to that receptor. The
28 distances and durations of exposure were similar to those given in previous transportation risk
29 assessments (DOE 1995, 1996, 1997, 1999, 2011). The scenarios were not meant to be
30 exhaustive but were selected to provide a range of potential exposure situations.
31

32 The RISKIND external dose model considers direct external exposure and exposure from
33 radiation scattered from the ground and air. RISKIND was used to calculate the dose as a
34 function of distance from a shipment on the basis of the dimensions of the shipment (millirems
35 per hour for stationary exposures and millirem per event for moving shipments). The code
36 approximates the shipment as a cylindrical volume source, and the calculated dose includes
37 contributions from secondary radiation scattering from buildup (scattering by the material
38 contents), cloudshine (scattering by the air), and groundshine (scattering by the ground). As a
39 conservative measure, credit for potential shielding between the shipment and the receptor was
40 not considered.
41
42

1

TABLE D.10-1 Individual Exposure Scenarios

Receptor	Exposure Event
Person at roadside	2 m
Person in traffic jam	1.2 m for 30 minutes
Resident near route	30 m

2

3

D.10.3 Accident Assessment Methodology

5

6 “Vehicle-related accident risk” refers to the potential for transportation accidents that
7 could directly result in injuries and fatalities not related to the nature of the cargo in the
8 shipment. This risk represents injuries and fatalities from physical trauma. Route-specific rates or
9 county-wide average rates for transportation injuries and fatalities were used in the assessment
10 (see Section D.10.4.1.3). Vehicle-related accident risks were calculated by multiplying the total
11 distance travelled by the rates for transportation injuries and fatalities. In all cases, the vehicle-
12 related accident risks were calculated on the basis of distances for round-trip shipments, because
13 the presence or absence of cargo would not be a factor in accident frequency.

14

15

D.10.4 Input Parameters and Assumptions

17

18 The principal input parameters and assumptions used in the transportation risk
19 assessment are discussed in this section. These shipments are subject to regulation by the
20 U.S. Department of Transportation (DOT) and other entities, as appropriate. The Hazardous
21 Materials Transportation Act of 1975, as amended in Volume 49 of the *United States Code*
22 (49 USC 5105 *et seq.*), requires DOT to establish regulations for safely transporting hazardous
23 materials (including radioactive materials) in commerce. Title 49 of the CFR contains DOT
24 standards and requirements for packaging, transporting, and handling radioactive materials for
25 all modes of transportation. DOT’s hazardous materials regulations (HMRs) on the
26 transportation of hazardous and radioactive materials can be found in 49 CFR Parts 171–180.
27 Natural uranium ore is classified as a low-specific activity (LSA) material with no activity limit
28 and no specific packaging requirements, as covered under 49 CFR Part 173 (Shippers – General
29 Requirements for Shipments and Packaging). Requirements for motor carrier transportation can
30 also be found in 49 CFR Parts 350–399.

31

32

D.10.4.1 External Dose Rate

34

35 For input to RADTRAN and RISKIND calculations, the dose rate at a distance of 7 ft
36 (2 m) from the side of a uranium ore haul truck was estimated to be approximately 0.1 mrem/h.
37 An ore content of 0.2% U₃O₈ by weight was modeled by using the MicroShield code
38 (Grove 2006) with 25 tons of ore.

39

D.10.4.2 Route Characteristics

Uranium ore shipments would travel from the lease tracts to a uranium mill for processing. These shipments would not necessarily go to the mill that is nearest to a given lease tract. At the time of actual shipment, many factors (e.g., existing road conditions, traffic, weather, road maintenance or repairs, and mill capacities and costs) would be the criteria used to determine which mill should receive a given ore shipment. The transportation route selected for a shipment determines the total population of potentially exposed individuals and the expected frequency of transportation-related accidents.

D.10.4.3 Routine Impacts

For truck transportation, the route characteristics most important for a risk assessment include the total shipping distance between each origin site and destination site and the population density along the route. Shipping distances between the lease tracts and the proposed Piñon Ridge Mill and White Mesa Mill are presented in Section 4.3.10 and Table 4.3-10.

The population density in the uranium lease tracts is very low, less than one person per square kilometer in most locations. Higher population densities are encountered in the small towns of Naturita, Colorado, and Monticello, Utah—the only population centers along any of the potential uranium shipment routes. For this Draft ULP PEIS analysis, representative unit risk factors were developed on a per-kilometer basis for the collective population and worker (truck driver) doses. These factors were calculated by assuming that the longest potential route would be used.

For the lease tracts and uranium mills under consideration, the longest route is 266 km (165 mi), from New Verde Mine on Lease Tract 26 to White Mesa Mill. The route runs from New Verde Mine on local roads to State Highway (SH) 141, then through Naturita, traveling south to US 491, west into Utah to US 191, through Monticello, and south on US 191 to the White Mesa Mill. This route uses roads typical of most potential routes and runs through both rural and populated areas representative of the region. Population densities at the lease tract level from the 2010 Census were used in RADTRAN 5 to estimate the collective population risks along the route. The average collective dose to the public from uranium ore in the region was estimated to be approximately 1.54×10^{-7} person-rem/km. The average dose to a truck driver was estimated to be approximately 8.08×10^{-7} rem/km.

D.10.4.4 Injury and Fatality Rates

Injury and fatality rates for use in estimating potential injuries and fatalities from truck accidents during the shipment of uranium ore were developed by using route-specific and county-specific data. The injury and accident fatality rates used in the analysis were 1.85×10^{-7} /km for injuries and 1.66×10^{-8} /km for fatalities. These rates were generated based on injuries, fatalities, and vehicle miles travelled as reported by the Colorado Department of

1 Transportation (CDOT) for the years 2002 through 2007 for SH 90, SH 141, and SH 491
2 (CDOT 2002, 2003, 2004, 2005, 2006a, 2007a) in the vicinity of the lease tracts and along any
3 potential route to either of the two uranium mills considered. These rates are high for heavy truck
4 travel because they include all vehicle types. For comparison, a rate of $1.80 \times 10^{-8}/\text{km}$ for
5 fatalities was estimated from data on all large-truck vehicle miles (CDOT 2006b, 2007b, 2008,
6 2009, 2010) and all traffic fatalities (DOT 2010a–d) in Dolores, Mesa, Montrose, and
7 San Miguel Counties for the years 2006 through 2010. This second value is in relatively good
8 agreement with (within <10% of) the value of $1.66 \times 10^{-8}/\text{km}$ for fatalities for all vehicles on the
9 roads considered in the analysis.

10
11 For Utah, injury and fatality rates were derived from the available data for 2005 through
12 2009 for San Juan County. Data on vehicle miles travelled in the county for all vehicles were
13 used in conjunction with the number of injuries and fatalities recorded (Utah 2005, 2006, 2007,
14 2008, 2009) to obtain rates of $2.77 \times 10^{-7}/\text{km}$ for injuries and $2.41 \times 10^{-8}/\text{km}$ for fatalities.
15 Because these rates included contributions from vehicles other than heavy trucks as well as all
16 roads in the county and not just US 491 and US 191 on the route to the White Mesa Mill (which
17 represent relatively short distances), the Colorado injury and fatality rates were used for the
18 analysis of all shipments to White Mesa Mill.

19 20 21 **D.10.4.5 Ore Production Rates and Shipment Capacities**

22
23 Because of the uncertainties associated with the actual locations and sizes of uranium
24 mines that could operate in the future, the transportation analysis conducted for Alternatives 3
25 through 5 used an assumed mine size, which determines the number of ore shipments, for each
26 lease tract listed in Table D.10-2. The mine sizes used (small, medium, large, and very large)
27 with assumed uranium ore production rates (50, 100, 200, and 300 tons/d, respectively) are
28 discussed further in Section 2.2. The size of a mine on a specific lease tract was first selected
29 roughly on the basis of past uranium ore production. If no previous ore production had occurred,
30 the assumed mine sizes for those lease tracts were assigned so as to distribute uranium ore
31 production in a generally even manner across the entire region considered, if all mines were to
32 operate at the same time. In reality, such an occurrence would generate 2,900 tons of ore per day.
33 The ore production was averaged over the region to highlight the general level of traffic that
34 could occur in various areas.

35 36 37 **D.11 CULTURAL RESOURCES**

38
39 The following procedures were employed to estimate the potential impacts of the
40 alternatives proposed in this Draft ULP PEIS. The process began with a review of available
41 documentation of known cultural resources, including archaeological sites, historic structures,
42 and traditional cultural properties. It began with a Class I cultural resource review of the lease
43 tracts conducted by Alan Reed in 2006, the ethnographic background study and potential for
44 traditional cultural properties analysis of the lease tracts conducted by J.N. Fritz in 2006, and the
45 discussion of the historic mines on the lease tracts by E. Twitty in 2008. Information on cultural

1
2
3**TABLE D.10-2 Mine Size for Each Lease Tract as Assumed for the Transportation Analysis for Alternatives 3, 4, and 5**

Lease Tract	Assumed Mine Size	Ore Production Rate (tons/d)	Ore Shipments per Day ^a
C-JD-5	Large	200	8
C-JD-5A	Small	50	2
C-JD-6	Large	200	8
C-JD-7	Very large	300	12
C-JD-8	Medium	100	4
C-JD-8A	Small	50	2
C-JD-9	Medium	100	4
C-SR-10	Medium	100	4
C-SR-11	Medium	100	4
C-SR-11A	Medium	100	4
C-SR-12	Small	50	2
C-SR-13	Medium	100	4
C-SR-13A	Medium	100	4
C-SR-14	Medium	100	4
C-SR-15	Small	50	2
C-SR-15A	Small	50	2
C-SR-16	Small	50	2
C-SR-16A	Small	50	2
C-WM-17	Small	50	2
C-SM-18	Medium	100	4
C-AM-19	Large	200	8
C-AM-19A	Medium	100	4
C-AM-20	Small	50	2
C-LP-21	Medium	100	4
C-LP-22	Small	50	2
C-LP22A	Medium	100	4
C-LP-23	Medium	100	4
C-CM-24	Small	50	2
C-CM-25	Small	50	2
C-G-26	Small	50	2
C-G-27	Small	50	2

^a Assumes an ore haul truck capacity of 25 tons.

4
5
6
7
8
9
10
11
12

resource surveys conducted within the tracts since 2006 was obtained as geographic information system (GIS) layers from Colorado's Office of Archaeology and Historic Preservation (OAHP). For purposes of comparison, GIS data were also obtained for a 15-mi (24-km) buffer surrounding the lease tracts. Since some lease tracts were closer than 15 mi (24 km) from the Utah border, buffer information was requested from the Utah State Historic Preservation Office (SHPO) as well. The data obtained from the Colorado OAHP and the Utah SHPO were used to update the description of known cultural resources within the lease tracts.

1 The most recent GIS data from the OAHP were used to compare the number of acres
2 surveyed within each lease tract with the area of each lease tract, to determine the percentage of
3 each lease tract that had been surveyed. Then, for purposes of analysis, the lease tracts were
4 grouped into the four proximity-based clusters used for visual resource analysis: North; North
5 Central; South Central; and South. The total acreage surveyed and the number of sites recorded
6 for each cluster were tallied and used to determine site densities for each cluster. On the basis of
7 the assumption that the site densities in the unsurveyed areas would be similar to those of the
8 surveyed areas for each cluster, the number of potential sites was projected for each cluster.
9

10 Two types of potential impacts were considered. Direct impacts are those in which the
11 resource is directly destroyed, altered, or damaged by mining operations. Impacts such as
12 vandalism and unpermitted collecting are considered indirect when they do not result from
13 mining itself or the construction of access roads to the mines but are instead the result of
14 increased human presence due to mine operations or increased access due to the construction of
15 or improved maintenance on roads to the mines. On the basis of the site density within each
16 cluster and the number of acres that would be disturbed by a mine in each mine category (small,
17 medium, large, and very large), the number of sites likely to be directly affected by a mine in
18 each category was projected. Under each alternative, a different number of small, medium, large,
19 and very large mines would likely be developed. The number of direct impacts for each
20 alternative was projected, based on the acreage likely to be disturbed. For indirect impacts, it was
21 assumed that all the sites projected for each cluster would have the potential to be indirectly
22 affected. These were, of course, projections only. Pedestrian surveys would be necessary to
23 determine the actual locations of sites. The number of sites directly affected could be reduced by
24 changing the location of mining activities.
25

26 The GIS data from the Colorado OAHP does not identify traditional cultural properties.
27 Unless already documented, the presence of such properties can be determined only by
28 communications with the relevant cultural groups. Federally recognized Native American tribes
29 are being contacted, but to date, none of them have identified any culturally important properties
30 on or near the lease tracts.
31

32 33 **D.12 VISUAL RESOURCES** 34

35 The visual impact analysis for this Draft ULP PEIS utilizes distance zones specified
36 within the Bureau of Land Management's (BLM's) visual resource management (VRM) system
37 to identify potentially sensitive visual resource areas (SVRAs) that might be affected by one or
38 more of the five alternatives. In order to assess these impacts, reverse viewshed analyses were
39 conducted to identify which lands surrounding the lease tracts would have views of infrastructure
40 and activities in at least some portion of the lease tracts. Reverse viewshed analyses were
41 conducted for Alternatives 1, 3, and 4. A separate analysis was not conducted for Alternatives 2
42 and 5 because of the similarities in the visual impacts associated with Alternatives 1 and 4,
43 respectively.
44

1 A primary component considered in conducting this analysis was the impact of distance
2 on determining what could be seen from within a lease tract. The distance between the viewer
3 and the mining activities (during exploration, mine development and operations, and
4 reclamation) that are the source of visual contrast is a critical element in determining the level of
5 perceived impact. For this analysis, the BLM distance zones in the VRM system were utilized.
6 These zones are as follows:

- 7
- 8 • *Foreground–middleground* (0 to 5 mi [0 to 8 km]). This zone includes areas
9 where management activities may be seen in detail. For instance, the outer
10 boundary of this distance zone is defined as the point at which the texture and
11 form of individual plants are no longer apparent in the landscape.
- 12
- 13 • *Background* (5 to 15 mi [8 to 24 km]). This zone includes the area beyond the
14 foreground–middle ground up to 15 mi (24 km) and the area where some
15 detail beyond the form or outline of the project is visible. For example,
16 vegetation should be visible at least as patterns of light and dark.
- 17
- 18 • *Seldom seen* (beyond 15 mi [24 km]). This zone includes areas beyond 15 mi
19 (24 km) (BLM 1986).
- 20

21 A GIS-based impact analysis was used to identify locations within the SVRAs from
22 which some portions of the lands containing the lease tracts would be visible. Assuming an
23 unobstructed view of the ULP lease tract, viewers in these areas would be likely to perceive
24 some level of visual contrast from the mining activities.

25

26 The “spatial analyst extension” of the ESRI ArcGIS 10 software was used to calculate
27 viewsheds. (A viewshed is an area of landscape visible to the human eye from a fixed vantage
28 point.) The viewshed analyses determined the potential visibility of the four lease tract groups or
29 portions of these groups from lands within 25 mi (40 km). The ROI for visual resource analysis
30 was set at 25 mi (40 km) because it is the approximate limit at which non-negligible visual
31 contrasts from the structures and landforming activities in the proposed action could reasonably
32 be expected to be visible in this region, assuming favorable viewing conditions and strong
33 contrast between an object and its background. Viewshed calculations were performed by using
34 National Elevation Dataset (NED) 10-meter Digital Elevation Model (DEM) with the earth
35 curvature set to a refractivity coefficient of 0.13.

36

37 Because each of the four groups or a portion of the groups of lease tracts represents a
38 large geographic area rather than specifically located points, a grid-based sample of points was
39 used to calculate visibility.

40

41 Viewsheds were calculated based on an assumed height of 30 ft (9 m) to represent the
42 mining sites and 5 ft (1.5 m) to represent the observer height.

43

44 The selected SVRAs included in the analysis were as follows:

45

- 1 • National Parks, National Monuments, National Recreation Areas, National
2 Preserves, National Wildlife Refuges, National Reserves, National
3 Conservation Areas, National Historic Sites;
- 4
- 5 • Congressionally authorized Wilderness Areas;
- 6
- 7 • Wilderness Study Areas;
- 8
- 9 • National Wild and Scenic Rivers;
- 10
- 11 • Congressionally authorized Wild and Scenic Study Rivers;
- 12
- 13 • National Scenic Trails and National Historic Trails;
- 14
- 15 • National Historic Landmarks and National Natural Landmarks;
- 16
- 17 • All-American Roads, National Scenic Byways, State Scenic Highways, and
18 BLM-designated and U.S. Forest Service-designated Scenic Highways and
19 Byways;
- 20
- 21 • BLM-designated Special Recreation Management Areas; and
- 22
- 23 • Areas of Critical Environmental Concern (ACECs) designated because of
24 outstanding scenic qualities.
- 25

26 Although the viewshed analysis showed areas that may be subject to visual impacts from
27 mining-related activities conducted within the lease tracts, the actual acreage that would
28 be affected would likely be smaller than that indicated by the analysis, because of potential
29 screening of views of the lease tracts by vegetation or structures. The viewshed analyses also did
30 not account for the heights of vegetation or existing structures that might screen views. The
31 analyses conducted for this Draft ULP PEIS were limited to data available in GIS format at the
32 time of analysis. They did not analyze any of the additional scenic resources that exist at the
33 national, state, or local levels. Furthermore, although a GIS-based analysis is capable of having
34 extremely high spatial accuracy, it is limited by the accuracy of the data used in the analysis,
35 which were obtained from many sources and are subject to error.

36
37 After the GIS-based analysis was completed, views to the lease tracts from the SVRAs
38 were simulated by using Google Earth software. Keyhole Markup Language (KML) files of the
39 lease tracts and the SVRA boundaries were imported from ArcGIS. Analysts then selected a
40 variety of viewpoints within the SVRAs that were depicted as having potential views of the lease
41 tracts. The intent of this analysis was to evaluate the apparent size and viewing angle of the lease
42 tracts from a potential viewing location and thereby determine the potential level of contrast that
43 could be observed from the various activities associated with each alternative.

44
45

1 **D.13 WASTE MANAGEMENT**

2
3 Wastes (other than waste rock) generated during the three phases of uranium mining
4 (exploration, mine development and operations, and reclamation), such as liquids and solids
5 from the treatment of water, spent oil, grease, and lubricant, and other trash were evaluated in
6 terms of how this additional waste would affect the existing practices or availability of the
7 disposal capacity for similar waste.
8

9 10 **D.14 CUMULATIVE IMPACTS**

11
12 The methodology for cumulative impacts analysis is consistent with guidance provided
13 by the CEQ (CEQ 1997; Connaughton 2005). It includes defining the region of cumulative
14 impacts; identifying past, present, and reasonably foreseeable projects and activities (Federal and
15 non-Federal) within the region; summarizing the impacts associated with those projects and
16 activities (if available); and determining the magnitude and significance of the cumulative
17 impacts.
18

19 The region of cumulative impacts was defined as 50 mi (80 km) for all resource areas,
20 which is considered conservative for most resource areas. Past, present, and reasonably
21 foreseeable projects and activities within the region of cumulative impacts were identified from a
22 variety of sources, including NEPA assessments performed by various Federal and state agencies
23 for nearby projects. Projects and activities within the region of cumulative impacts were also
24 identified by using NEPA registers from regional BLM field offices and schedules of proposed
25 actions from nearby National Forests.
26

27 28 **D.15 REFERENCES FOR APPENDIX D**

29
30 ATSDR (Agency for Toxic Substances and Disease Registry), 2012, *Minimal Risk Levels*
31 *(MRLs)* Feb.
32

33 AQMD (South Coast Air Quality Management District), 2012, *Particulate Matter (PM) 2.5*
34 *Significance Thresholds and Calculation Methodology*.
35

36 Barber, J.R., et al., 2010, "The Costs of Chronic Noise Exposure for Terrestrial Organisms,"
37 *Trends in Ecology and Evolution* 25(3):180–189.
38

39 Barry, T.M., and J.A. Reagan, 1978, *FHWA Highway Traffic Noise Prediction Model*, FHWA-
40 RD-77-108, prepared for the Federal Highway Administration, Washington, D.C., Dec.
41

42 Biwer, B.M., et al., 1997, *RISKIND Verification and Benchmark Comparisons*,
43 ANL/EAD/TM-74, Argonne National Laboratory, Argonne, Ill., Aug.
44

- 1 BLM (Bureau of Land Management), 1986, *Visual Resource Inventory*, BLM Manual Handbook
2 8410-1, Release 8-28, U.S. Department of the Interior, Washington, D.C., Jan.
3
- 4 BLM, 2008, *Final Environmental Assessment for the Whirlwind Mine Uranium Mining Project*,
5 Grand Junction Field Office, Grand Junction, Colo., and Moab Field Office, Moab, Utah, Sept.
6
- 7 BLS (Bureau of Labor Statistics), 2011a, *Number and Rate of Fatal Occupational Injuries, by*
8 *Industry Sector, 2010*.
9
- 10 BLS, 2011b, *2010 Survey of Occupational Injuries & Illnesses, Summary Estimates Charts*
11 *Package*, Oct. 20.
12
- 13 CDOT (Colorado Department of Transportation), 2002, *Crashes and Rates on State Highways,*
14 *2002*, Traffic Safety and Traffic Engineering Branch, Accident Management Unit.
15
- 16 CDOT, 2003, *Crashes and Rates on State Highways, 2003*, Traffic Safety and Traffic
17 Engineering Branch, Accident Management Unit.
18
- 19 CDOT, 2004, *Crashes and Rates on State Highways, 2004*, Traffic Safety and Traffic
20 Engineering Branch, Accident Management Unit.
21
- 22 CDOT, 2005, *Crashes and Rates on State Highways, 2005*, Traffic Safety and Traffic
23 Engineering Branch, Accident Management Unit.
24
- 25 CDOT, 2006a, *Crashes and Rates on State Highways, 2006*, Safety and Traffic Engineering
26 Branch, Accident Management Unit.
27
- 28 CDOT, 2006b, *Roadway Statistics, 2006 State Highway Statistics—Daily Vehicle Miles of Travel*
29 *(DVMT) for All Trucks by County*. Available at [http://apps.coloradodot.info/dataaccess/](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2006/2006TruckDVMTbyCounty.htm)
30 [Statistics/dsp_folder/Roadway/2006/2006TruckDVMTbyCounty.htm](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2006/2006TruckDVMTbyCounty.htm). Accessed Jan. 25, 2012.
31
- 32 CDOT, 2007a, *Crashes and Rates on State Highways, 2007*, Safety and Traffic Engineering
33 Branch, Accident Management Unit.
34
- 35 CDOT, 2007b, *Roadway Statistics, 2007 State Highway Statistics—Daily Vehicle Miles of Travel*
36 *(DVMT) for All Trucks by County*. Available at [http://apps.coloradodot.info/dataaccess/Statistics/](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2007/2007TruckDVMTbyCounty.htm)
37 [dsp_folder/Roadway/2007/2007TruckDVMTbyCounty.htm](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2007/2007TruckDVMTbyCounty.htm). Accessed Jan. 25, 2012.
38
- 39 CDOT, 2008, *Roadway Statistics, 2008 State Highway Statistics—Daily Vehicle Miles of Travel*
40 *(DVMT) for All Trucks by County*. Available at [http://apps.coloradodot.info/dataaccess/Statistics/](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2008/2008TruckDVMTbyCounty.htm)
41 [dsp_folder/Roadway/2008/2008TruckDVMTbyCounty.htm](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2008/2008TruckDVMTbyCounty.htm). Accessed Jan. 25, 2012.
42
- 43 CDOT, 2009, *Roadway Statistics, 2009 State Highway Statistics—Daily Vehicle Miles of Travel*
44 *(DVMT) for All Trucks by County*. Available at [http://apps.coloradodot.info/dataaccess/Statistics/](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2009/2009TruckDVMTbyCounty.htm)
45 [dsp_folder/Roadway/2009/2009TruckDVMTbyCounty.htm](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2009/2009TruckDVMTbyCounty.htm). Accessed Jan. 25, 2012.

- 1 CDOT, 2010, *Roadway Statistics, 2010 State Highway Statistics—Daily Vehicle Miles of Travel*
2 *(DVMT) for All Trucks by County*. Available at [http://apps.coloradodot.info/dataaccess/Statistics/
3 dsp_folder/Roadway/2010/2010TruckDVMTbyCounty.pdf](http://apps.coloradodot.info/dataaccess/Statistics/dsp_folder/Roadway/2010/2010TruckDVMTbyCounty.pdf). Accessed Jan. 25, 2012.
4
- 5 CDPHE (Colorado Department of Public Health and Environment), 2011, *2008 Air Pollutant*
6 *Emissions Inventory*, online database, Denver, Colo. Available at [http://www.colorado.gov/
7 airquality/inv_maps_2008.aspx](http://www.colorado.gov/airquality/inv_maps_2008.aspx). Accessed Nov. 23, 2011.
8
- 9 CEQ (Council on Environmental Quality), 1997, *Environmental Justice Guidance under the*
10 *National Environmental Policy Act*, Executive Office of the President, Washington, D.C.
11
- 12 Chapman, S.S., et al., 2006, *Ecoregions of Colorado* (color poster with map, descriptive text,
13 summary tables, and photographs; map scale 1:1,200,000), U.S. Geological Survey, Reston, Va.
14
- 15 CNHP (Colorado Natural Heritage Program), 2009, *Summary of Services*. Available at
16 <http://www.cnhp.colostate.edu/>. Accessed Sept. 9, 2009.
17
- 18 CNHP, 2011a, *Colorado Natural Heritage Program—Rare Plant Guide List*. Available at
19 <http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=master>. Accessed
20 Dec. 16, 2011.
21
- 22 CNHP, 2011b, *Colorado Natural Heritage Program—Element Occurrences by Quad*. Available
23 at <http://www.cnhp.colostate.edu/download/gis.asp#maps>. Accessed Dec. 16, 2011.
24
- 25 Connaughton, J.L., 2005, “Guidance on the Consideration of Past Actions in Cumulative Effects
26 Analysis,” letter from Connaughton (Chairman, Council on Environmental Quality) to Heads of
27 Federal Agencies, June 24.
28
- 29 CPW (Colorado Parks and Wildlife), 2011, *Natural Diversity Information Source*, Colorado
30 Department of Natural Resources, Division of Wildlife, Denver, Colo. Available at [http://ndis.
31 nrel.colostate.edu/index.html](http://ndis.nrel.colostate.edu/index.html). Accessed Dec. 15, 2011.
32
- 33 DOE (U.S. Department of Energy), 1995, *Department of Energy Programmatic Spent Nuclear*
34 *Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and*
35 *Waste Management Programs Final Environmental Impact Statement*, DOE/EIS-0203-F, Office
36 of Environmental Management, Idaho Operations Office, Idaho Falls, Id., Apr.
37
- 38 DOE, 1996, *Final Environmental Impact Statement on a Proposed Nuclear Weapons*
39 *Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel, Appendix E:*
40 *Evaluation of Human Health Effects of Overland Transportation*, DOE/EIS-0218F, Vol. 2,
41 Assistant Secretary for Environmental Management, Washington, D.C., Feb.
42
- 43 DOE, 1997, *Final Waste Management Programmatic Environmental Impact Statement for*
44 *Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*,
45 DOE/EIS0200-F, Office of Environmental Management, Washington, D.C.

- 1 DOE, 1999, *Final Programmatic Environmental Impact Statement for Alternative Strategies for*
2 *the Long-Term Management and Use of Depleted Uranium Hexafluoride*, DOE/EIS-0269, Office
3 of Nuclear Energy, Science and Technology, Germantown, Md., April.
4
- 5 DOE, 2002, *A Resource Handbook on DOE Transportation Risk Assessment*,
6 DOE/EM/NTP/HB-01, prepared by Transportation Risk Assessment Working Group Technical
7 Subcommittee for DOE, Office of Environmental Management, National Transportation
8 Program, Albuquerque, N.M., July.
9
- 10 DOE, 2011, *Draft Environmental Impact Statement for the Disposal of Greater-Than-Class-C*
11 *(GTCC) Low-Level Radioactive Waste and GTCC-Like Waste*, DOE/EIS-0375-D, Office of
12 Environmental Management, Washington, D.C., Feb.
13
- 14 DOT (U.S. Department of Transportation), 2010a, *Traffic Safety Facts, Dolores County,*
15 *Colorado, 2006–2010*, National Highway Transportation Safety Administration,
16 Washington, D.C. Available at [http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Dolores%20County_2010.HTM)
17 [8_CO/2010/Counties/Colorado_Dolores%20County_2010.HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Dolores%20County_2010.HTM). Accessed Jan. 25, 2012.
18
- 19 DOT, 2010b, *Traffic Safety Facts, Mesa County, Colorado, 2006–2010*, National Highway
20 Transportation Safety Administration, Washington, D.C. Available at [http://www-nrd.nhtsa.dot.](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Mesa%20County_2010.HTM)
21 [gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Mesa%20County_2010.](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Mesa%20County_2010.HTM)
22 [HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Mesa%20County_2010.HTM). Accessed Jan. 25, 2012.
23
- 24 DOT, 2010c, *Traffic Safety Facts, Montrose County, Colorado, 2006–2010*, National Highway
25 Transportation Safety Administration, Washington, D.C. Available at [http://www-nrd.nhtsa.dot.](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Montrose%20County_2010.HTM)
26 [gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Montrose%20County_2010.](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Montrose%20County_2010.HTM)
27 [HTM](http://www-nrd.nhtsa.dot.gov/departments/nrd-30/ncsa/STSI/8_CO/2010/Counties/Colorado_Montrose%20County_2010.HTM). Accessed Jan. 25, 2012.
28
- 29 DOT, 2010d, *Traffic Safety Facts, San Miguel County, Colorado, 2006–2010*, National Highway
30 Transportation Safety Administration, Washington, D.C.
31
- 32 Eckerman, K., et al., 1999, *Cancer Risk Coefficients for Environmental Exposures to*
33 *Radionuclides*, EPA 402-R-99-001, Federal Guidance Report No. 13, prepared by Oak Ridge
34 National Laboratory for U.S. Environmental Protection Agency, Office of Radiation and Indoor
35 Air.
36
- 37 EPA (U.S. Environmental Protection Agency), 1974, *Information on Levels of Environmental*
38 *Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*,
39 550/9-74-004, Office of Noise Abatement and Control, March.
40
- 41 EPA, 1985, *Draft Background Information Document, Proposed Standard for Radon-222*
42 *Emissions to Air from Underground Uranium Mines*, EPA/520/1-85-010, Office of Radiation
43 Programs, Washington, D.C., Feb. 14.
44

- 1 EPA, 1989a, *Risk Assessments, Environmental Impact Statement, NESHAPS for Radionuclides,*
2 *Background Information Document—Volume 2*, EPA/520/1-89-006-1, Office of Radiation
3 Programs, Washington, D.C. Sept.
4
- 5 EPA, 1989b, *Risk Assessment Guidance for Superfund, Vol. I: Human Health Evaluation*
6 *Manual (Part A), Interim Guidance*, EPA/540/1-89/002, Office of Emergency and Remedial
7 Response, Washington, D.C.
8
- 9 EPA, 1989c, *Users Guide for the COMPLY-R Code (Revision 1)*, EPA 520/1-89-029, Office of
10 Radiation Programs, Washington, D.C., Oct.
11
- 12 EPA, 1993, *Diffuse NORM: Waste Characterization and Preliminary Risk Assessment*, Office of
13 Radiation Programs, Washington, D.C.
14
- 15 EPA, 2004, *Unit Conversions, Emissions Factors, and Other Reference Data*, Nov. Available at
16 <http://www.epa.gov/cpd/pdf/brochure.pdf>. Accessed Feb. 24, 2012.
17
- 18 EPA, 2008, *Climate Leaders Greenhouse Gas Inventory Protocol Coe Mobile Guidance: Direct*
19 *Emissions from Mobile Combustion Sources*, EPA/430-K-08-004, May.
20
- 21 EPA, 2011, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2009*,
22 EPA 430-R-11-005, April 15.
23
- 24 EPA, 2012a, *Search WebFIRE*. Available at <http://cfpub.epa.gov/webfire/>. Accessed Jan. 27,
25 2012.
26
- 27 EPA, 2012b, Section 11.9, “Western Surface Coal Mining (10/98),” and Section 13.2.4,
28 “Aggregate Handling and Storage Piles (11/06),” in Volume 1, “Stationary Point and Area
29 Sources,” of *Compilation of Air Pollutant Emission Factors*, AP 42, Fifth Edition.
30
- 31 EPA, 2012c, *Integrated Risk Information System (IRIS)*. Available at <http://www.epa.gov/IRIS>.
32 Accessed March 17, 2012.
33
- 34 Fahys-Smith, V., 1983, “Migration of Boom-town Construction Workers: The Development of
35 an Analytic Framework,” *Environmental Geochemistry and Health* 5:104–112.
36
- 37 Ferry, C., et al., 2002, “An Experimental Method for Measuring the Radon-222 Emanation
38 Factor in Rocks,” *Radiation Measurements* 35:570.
39
- 40 Grove, 2006, *MicroShield User’s Manual Version 7*, Grove Software Inc., Lynchburg, Va.
41
- 42 Hanson, C.E., et al., 2006, *Transit Noise and Vibration Impact Assessment*,
43 FTA-VA-90-1003-06, prepared by Harris Miller Miller & Hanson Inc., Burlington, Mass., for
44 U.S. Department of Transportation, Federal Transit Administration, Washington, D.C., May.
45

- 1 ICRP (International Commission on Radiological Protection), 2011, “ICRP Publication 115:
2 Lung Cancer Risk from Radon and Progeny,” *Annals of the ICRP* 40(1).
3
- 4 Jones & Stokes Associates, 2007, *Software User’s Guide: URBEMIS2007 for Windows,*
5 *Version 9.2, Emissions Estimation for Land Use Development Projects*, prepared for South Coast
6 Air Quality Management District, Diamond Bar, Calif., Nov. Available at <http://www.urbemis.com/software/download.html>. Accessed Feb. 24, 2012.
7
8
- 9 Menge, C.W., et al., 1998, *FHWA Traffic Noise Model® Technical Manual*, FHWA-PD-96-010
10 and DOT-VNTSC-FHWA-98-2, prepared by U.S. Department of Transportation, John A. Volpe
11 National Transportation Systems Center, Cambridge, Mass., for U.S. Department of
12 Transportation, Federal Highway Administration, Washington, D.C., Feb.
13
- 14 MIG (Minnesota IMPLAN Group, Inc.), 2011, *IMPLAN Version 3 Software System*, Hudson,
15 Wisc.
16
- 17 NatureServe, 2011, *NatureServe Explorer—An Online Encyclopedia of Life*. Available at
18 <http://www.natureserve.org/explorer/>. Accessed Dec. 16, 2011.
19
- 20 Neuhauser, K.S., and F.L. Kanipe, 2003, *RADTRAN 5 User Guide*, SAND2003-2354, Sandia
21 National Laboratories, Albuquerque, N.M., July.
22
- 23 NRC (U.S. Nuclear Regulatory Commission), 1977, *Final Environmental Statement on the*
24 *Transportation of Radioactive Material by Air and Other Modes*, NUREG-0170, Washington,
25 D.C.
26
- 27 NRC, 1987, *Regulatory Guide 3.59 (Task WM 407-4) Methods for Estimating Radioactive and*
28 *Toxic Airborne Source Terms for Uranium Milling Operations*, Office of Nuclear Regulatory
29 Research, Washington, D.C., March.
30
- 31 NRCS (National Resources Conservation Service), 2012, *Soil Taxonomy, A Basic System of Soil*
32 *Classification for Making and Interpreting Soil Surveys*, USDA Handbook 436, 2nd Edition,
33 U.S. Department of Agriculture.
34
- 35 Rogers, Z., 2011, personal communication from Rogers (Energy Fuels Resources Corporation,
36 Lakewood, Colo.) to Y.-S. Chang (Argonne National Laboratory, Argonne, Ill.), Nov. 8.
37
- 38 QDEH (Queensland Department of Environment and Heritage), 1999, *Emission Estimation*
39 *Technique Manual for Explosives Detonation and Firing Ranges*, March.
40
- 41 Sakoda, A., et al., 2010, “Difference of Natural Radioactivity and Radon Emanation Fraction
42 Among Constituent Minerals of Rock or Soil,” *Applied Radiation and Isotopes* 68(12):2452.
43
44

- 1 Stoeser, D.B., et al., 2007, *Preliminary Integrated Geologic Map Databases for the*
2 *United States—Central States: Montana, Wyoming, Colorado, New Mexico, North Dakota,*
3 *South Dakota, Nebraska, Kansas, Oklahoma, Texas, Iowa, Missouri, Arkansas, and Louisiana,*
4 Open File Report 2005-1351, Version 1.2, original file updated in Dec. 2007, U.S. Geological
5 Survey.
6
- 7 Strait, R., et al., 2007, *Final Colorado Greenhouse Gas Inventory and Reference Case*
8 *Projections 1990—2020*, Center for Climate Strategies, Oct. Available at
9 <http://www.coloradoclimate.org/ewebeditpro/items/O14F13894.pdf>. Accessed Nov. 5, 2011.
10
- 11 Trinity Engineering Associates, Inc., 2007, *CAP88-PC Version 3.0 User Guide*, Cincinnati,
12 Ohio, Dec. 9.
13
- 14 UNSCEAR (United Nations Scientific Committee on the Effects of Atomic Radiation), 2008,
15 Annex E, “Sources-to-Effects Assessment for Radon in Homes and Workplaces,” in *Effects of*
16 *Ionizing Radiation*, UNSCEAR 2006 Report to the General Assembly, with Scientific Annexes,
17 United Nations, New York, N.Y.
18
- 19 UNSCEAR, 2010, *Sources and Effects of Ionizing Radiation*, UNSCEAR 2008 Report to the
20 General Assembly, with Scientific Annexes, Vol. 1, United Nations, New York, N.Y.
21
- 22 U.S. Bureau of the Census, 2011a, *2010 Census Summary File 1: Table P5*.
23
- 24 U.S. Bureau of the Census, 2011b, *2009 American Community Survey 5-Year Estimates*
25 *(2005–2009): Table B17017*.
26
- 27 USDA (U.S. Department of Agriculture), 1999, *Soil Taxonomy—A Basic System of Soil*.
28
- 29 USFWS (U.S. Fish and Wildlife Service), 2011a, *IPaC—Information, Planning, and*
30 *Conservation System*. Available at <http://ecos.fws.gov/ipac/>. Accessed Dec. 16, 2011.
31
- 32 USFWS, 2011b, *Critical Habitat Portal*, FWS Critical Habitat for Threatened and Endangered
33 Species. Available at <http://criticalhabitat.fws.gov/crithab/>. Accessed Dec. 16, 2011.
34
- 35 USFWS, 2012, *National Wetlands Inventory*, Interactive Mapping Program, U.S. Department of
36 the Interior, Washington, D.C. Available at <http://fws.gov/wetlands>. Accessed Sept. 17, 2012.
37
- 38 USGS (U.S. Geological Survey), 2004, *National Gap Analysis Program, Provisional Digital*
39 *Land Cover Map for the Southwestern United States*, Version 1.0, RS/GIS Laboratory, College
40 of Natural Resources, Utah State University. Available at [http://earth.gis.usu.edu/swgap/](http://earth.gis.usu.edu/swgap/landcover.html)
41 [landcover.html](http://earth.gis.usu.edu/swgap/landcover.html). Accessed March 15, 2010.
42
- 43 USGS, 2005, *National Gap Analysis Program, Southwest Regional GAP Analysis Project—Land*
44 *Cover Descriptions*, RS/GIS Laboratory, College of Natural Resources, Utah State University.
45 Available at http://earth.gis.usu.edu/swgap/legend_desc.html. Accessed March 15, 2010.

- 1 USGS, 2007, *National Gap Analysis Program, Digital Animal-Habitat Models for the*
2 *Southwestern United States. Version 1.0.* Center for Applied Spatial Ecology, New Mexico
3 Cooperative Fish and Wildlife Research Unit, New Mexico State University. Available at
4 <http://fws-nmcfwru.nmsu.edu/swregap/default.htm>. Accessed Dec. 16, 2011.
5
- 6 Utah (State of Utah), 2005, *Utah Crash Summary, 2005*, Department of Public Safety.
7
- 8 Utah, 2006, *Utah Crash Summary, 2006*, Department of Public Safety.
9
- 10 Utah, 2007, *Utah Crash Summary, 2007*, Department of Public Safety. Available at
11 <http://publicsafety.utah.gov/highwaysafety/1997-2005.html>. Accessed Feb. 10, 2012.
12
- 13 Utah, 2008, *Utah Crash Summary, 2008*, Department of Public Safety.
14
- 15 Utah, 2009, *Utah Crash Summary, 2009*, Department of Public Safety.
16
- 17 Walker, J.D., and J.W. Geissman (compilers), 2009, *Geologic Time Scale*, Geological Society of
18 America, Cambridge University Press.
19
- 20 Wayson, R.L., 1993, "Sound Fundamentals, Part 2," *The Wall Journal*, Sept./Oct.
21
- 22 Weiner, R.F., et al., 2006, *RadCat 2.3 User Guide*, SAND2006-6315, Sandia National
23 Laboratories, Albuquerque, N.M, Oct.
24
- 25 Yu, C., et al., 2001, *User's Manual for RESRAD Version 6*, ANL/EAD-4, Argonne National
26 Laboratory, Argonne, Ill., July.
27
- 28 Yuan, Y.C., et al., 1995, *RISKIND —A Computer Program for Calculating Radiological*
29 *Consequences and Health Risks from Transportation of Spent Nuclear Fuel*, ANL/EAD-1,
30 Argonne National Laboratory, Argonne, Ill., Nov.

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APPENDIX E:
SPECIES ACCOUNTS FOR SPECIES LISTED UNDER
THE ENDANGERED SPECIES ACT

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APPENDIX E:**SPECIES ACCOUNTS FOR SPECIES LISTED UNDER
THE ENDANGERED SPECIES ACT**

This section presents information on all species listed under the Endangered Species Act (ESA), including those that are proposed or are candidates for listing and that may occur in the region of the U.S. Department of Energy (DOE) Uranium Leasing Program (ULP) lease tracts. Species accounts are presented for those species that may occur in the affected area of one or more of the lease tracts. The species accounts include information on the life history, ecology, listing history, and threats to conservation for each species. Species accounts are presented by taxonomic group (plants, invertebrates, fish, amphibians, reptiles, birds, and mammals) and alphabetically, by common name, within each taxonomic group.

E.1 PLANTS**E.1.1 Clay-Loving Wild Buckwheat**

The clay-loving wild buckwheat (*Eriogonum pelinophilum*) is a long-lived, low-growing (only 5–10 cm high), rounded subshrub that has dark green, inrolled leaves that are needlelike in appearance and clusters of white- to cream-colored flowers. It is pollinated by more than 50 species, including native bees and ants. Flowering occurs from late May to early September, and individual flowers only last for fewer than 3 days (USFWS 2009a).

The clay-loving wild buckwheat is endemic to the rolling clay hills and flats next to Delta and Montrose, Colorado. It grows in whitish, alkaline, clay soils of the Mancos shale formation that are relatively barren of vegetation at elevations ranging from 5,180 to 6,446 ft (1,579 to 1,965 m). It occurs in the greatest density and frequency away from other shrubs. It is found within swales or drainages that are moister than surrounding areas. Plants sometimes associated with the clay-loving wild buckwheat include mat saltbrush, black sagebrush, shadscale, and Gardner's saltbrush (USFWS 2009a).

The clay-loving wild buckwheat was listed as endangered on July 13, 1984; approximately 120 acres (48.6 ha) in Delta County, Colorado, were also designated as critical habitat on that date (USFWS 1984). The current range of the clay-loving wild buckwheat is roughly 576 acres (233 ha) (USFWS 2009a). The size of the current clay-loving wild buckwheat population is roughly 278,000 individual plants (USFWS 2009a).

The greatest threat to the clay-loving wild buckwheat is habitat loss and fragmentation from urban development (NatureServe 2012). Potential threats that may be associated with ULP activities include surface disturbance from the construction of facilities and roads, as well as from increased vehicle traffic and human presence. Other threats include agricultural

1 development, non-native invasive plants, livestock use, oil and gas development, and herbicide
2 use (USFWS 2009a).

5 **E.1.2 Colorado Hookless Cactus**

7 The Colorado hookless cactus (*Sclerocactus glaucus*) was previously part of a larger
8 complex of *S. glaucus*; however, this complex was split into three distinct species in 2009. All
9 three species are listed as threatened under the ESA (USFWS 2009b). The Colorado hookless
10 cactus is a barrel-shaped cactus that ranges from 1.2 to 4.8 in. (3.0 to 12.2 cm) tall. The stem is
11 ribbed with hooked spines radiating out from areoles along the ribs. It produces pink to violet
12 bell or funnel-shaped flowers and short barrel-shaped fruit from April to May (USFWS 2010a).
13 After blooming, the cactus may shrink below the ground or become a dull grayish-green color,
14 making the plant very hard to identify.

16 The Colorado hookless cactus is endemic to western Colorado in Delta, Montrose, Mesa,
17 and Garfield Counties. Its range is estimated to be around 1,700 to 2,099 mi² (2,736 to
18 3,378 km²) (USFWS 2010a; NatureServe 2012). The total known population is estimated to
19 consist of more than 19,000 plants (USFWS 2010a). There are currently two population centers
20 of the Colorado hookless cactus that may be morphologically and genetically distinct. The two
21 populations are on the alluvial river terraces of (1) the Gunnison River and (2) the Colorado
22 River, and in the Plateau and Roan Creek drainages (CNHP 2011; USFWS 2011a). The species
23 does not occur in the vicinity of any of the ULP lease tracts.

26 Populations are most often found on alluvial benches along the Colorado and Gunnison
27 Rivers and their tributaries at elevations ranging from 3,937–6,562 ft (1,200–2,000 m). The
28 Colorado hookless cactus prefers gravelly or rocky surfaces on river terrace deposits and lower
29 mesa slopes (NatureServe 2011). It is more abundant on south-facing slopes. Populations have
30 also been found in big sagebrush-dominated sites and in transition zones from sagebrush to
31 piñon-juniper communities (USFWS 2011a).

33 The Colorado hookless cactus was listed as threatened on November 13, 1979
34 (USFWS 1979). A recovery plan for the Colorado hookless cactus was created on April 14, 2010
35 (USFWS 2010a) that identified the following recovery needs: (1) surveying to document
36 populations and suitable habitat accurately; (2) protecting and restoring habitat and corridors to
37 provide connectivity; and (3) protecting individual plants from direct and indirect threats.

39 A number of threats to the Colorado hookless cactus have been identified. Some of the
40 threats could be associated with mining activities. These include surface disturbance from the
41 construction of facilities and roads, as well as from increased vehicle traffic and human presence.
42 Activities associated with mining can fragment and destroy the Colorado hookless cactus's
43 habitat. Roads and associated infrastructure can disturb individual plants and habitat. The
44 potential increase in the use of access roads by off-road vehicles increases erosion, fugitive dust,
45 soil compaction, and sedimentation and it can crush the cacti. Dust accumulation on the cacti can
lead to a decrease in plant growth and water use efficiency. Increased erosion, soil compaction,

1 and sedimentation can kill the cacti. An increase in human presence could lead to the illegal
2 collection and loss of individual plants. Additional threats to the Colorado hookless cactus
3 include livestock grazing, which occurs on 94% of the potential habitat of the Colorado hookless
4 cactus, as well as competition with invasive weed species (USFWS 2010a). However, the
5 Colorado hookless cactus does not occur in the vicinity of the ULP lease tracts; therefore, no
6 impacts to this species from ULP activities are expected.
7
8

9 **E.1.3 Debeque Phacelia**

10
11 The Debeque phacelia (*Phacelia submutica*) is a low-growing annual herb with small
12 white, tube-shaped flowers hidden within its leaves (USFWS 2011b). Stems are usually 0.8 to
13 3 in. (2.0 to 7.6 cm) long and are deep red and covered in stiff hairs. Leaves are also covered
14 with stiff hairs, are reddish when mature, and are egg shaped. The Debeque phacelia shows
15 yearly variation in its abundance as a result of environmental factors, such that in one year, no
16 plants may grow and yet thousands may grow the next. Seeds can remain dormant for up to
17 five years. The plant flowers between late April and late June and sets seed from mid-May
18 through late June (USFWS 2011b).
19

20 Habitat requirements of the Debeque phacelia include clay soils from the Atwell Gulch
21 and Shire members of the Wasatch Formation with little other vegetation (generally less than
22 10% plant coverage) at elevations ranging from 5,080 to 7,100 ft (1,548 to 2,164 m). The shrink–
23 swell action of clay soils are essential to the species, because seed banks are maintained in cracks
24 formed in the soil. It has been associated with other plants including cheatgrass, pointed
25 gumweed, Gordon’s buckwheat, Nuttall’s poverty weed, and tufted evening primrose. Although
26 it can be found on slopes ranging from flat to 42 degrees, it is generally found on moderately
27 steep slopes, benches, and ridge tops that are adjacent to valley floors (USFWS 2011b).
28

29 The Debeque phacelia was listed as threatened on August 26, 2011 (USFWS 2011c);
30 24,987 acres (10,112 ha) were proposed as critical habitat in Mesa and Garfield counties in
31 Colorado on July 27, 2011 (USFWS 2011b). There are currently nine known populations of the
32 Debeque phacelia. It is estimated that the current population size may be as large as 68,000 when
33 climatic conditions are favorable (USFWS 2011b). The estimated total number of plants ranges
34 from 7,767 to 68,371 per year (USFWS 2011c). The current range of the Debeque phacelia is
35 centered in De Beque, Colorado, in Mesa and Garfield counties. A polygon around all nine
36 populations of the Debeque phacelia covers 86,230 acres (34,896 ha), within which 625.2 acres
37 (253.3 ha) are actually occupied by the plants (USFWS 2011b).
38

39 Potential threats to the Debeque phacelia that may be associated with ULP activities
40 include surface disturbance from the construction of facilities and roads, as well as from
41 increased vehicle traffic and human presence. The disturbance of seed banks from within the soil
42 would be detrimental to the Debeque phacelia (NatureServe 2012). Other threats include
43 livestock grazing and oil and gas development (USFWS 2011c).
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1 E.2 INSECTS

4 E.2.1 Uncompahgre Fritillary Butterfly

5
6 The Uncompahgre fritillary butterfly (*Boloria acrocne*) is an insect that has a
7 wingspan of 0.8 to 1.2 in. (2 to 3 cm). Males have rusty brown wings with crisscrossed black
8 bars. Females have lighter wings. The hind wing has a white jagged bar dividing the brown inner
9 half and the purple-grey outer surface. The body is brownish black. Females lay eggs on snow
10 willow, and the larvae feed on that plant. Adults consume nectar from a range of flowering
11 alpine plants. The butterfly has a biennial life history where eggs laid in one year will be
12 caterpillars the following year and would mature into adults the following year. Adults live only
13 one to two weeks (USFWS 2011d).

14
15 Habitat requirements for this species include the snow willow (*Salix nivalis*) for food and
16 shelter at elevations above 12,402 ft (3,780 m) on northeast-facing Alpine slopes in the San Juan
17 Mountains of southwestern Colorado (USFWS 2011d; NatureServe 2012). These habitats do not
18 occur in the vicinity of the ULP lease tracts.

19
20 The Uncompahgre fritillary butterfly was listed as an endangered species on June 24,
21 1991 (USFWS 1991a). A recovery plan was finalized on March 17, 1994 (USFWS 1994a).
22 Currently, 11 known colonies of the butterfly exist (USFWS 2009c). Only 3 of those colonies are
23 monitored, and the current population size of those colonies is estimated to be between 3,400 and
24 23,000 (USFWS 2011d). The overall population size is currently unknown. The current range is
25 estimated to be 62 to 155 mi² (100 to 250 km²) (NatureServe 2012).

26
27 The only current threats to the Uncompahgre fritillary butterfly are minor and include
28 collection by people and habitat degradation from the widening of hiking trails and from sheep
29 grazing (USFWS 2011d). Potential threats that may be associated with mining activities include
30 habitat disturbance from the construction of facilities and roads, as well as from increased
31 vehicle traffic and human presence. However, the Uncompahgre fritillary butterfly does not
32 occur in the vicinity of the ULP lease tracts; therefore, no impacts to this species from ULP
33 activities are expected.

36 E.3 FISH

39 E.3.1 Bonytail Chub

40
41 The bonytail chub (*Gila elegans*) is a species of fish in the family *Cyprinidae*. It is
42 endemic to the Colorado River Basin. This species has a very slender, round, and long caudal
43 peduncle; a subterminal mouth; and fins that are large and falcate. Adults have a relatively-flat,
44 concave head and a smooth dorsal hump and back. Young fish are typically silver-gray with
45 white bellies. Adults have a dark olive back that contains small iridescent highlights

1 (Mueller 2006). Adults grow to be about 21.6 in. (55 cm) in length and weigh 2.4 lb (1.1 kg)
2 (USFWS 2002a). Hatchery-reared bonytail chub become sexually mature after two years
3 (NatureServe 2012). Although the diet of the bonytail chub is unknown, it is hypothesized that
4 they eat insects, fishes, and plants (NatureServe 2012).
5

6 The historic range of the bonytail chub is unknown because it was extirpated from many
7 areas before surveys were conducted; however, it was common in the warm-water reaches of
8 larger rivers from Mexico to Wyoming (USFWS 2002a). Currently, no self-sustaining
9 populations of bonytail chub exist in the wild; only a small number of adults exist in the wild in
10 Lake Mohave, Lake Havasu, in the Green River, and in the upper Colorado River subbasins
11 (USFWS 2002a). The current population size is estimated to be between 1 and 1000 individuals
12 (NatureServe 2012). Although hatchery-reared adults have been released into rivers in the upper
13 basin, results indicate a low survival rate and no reproduction or recruitment (USFWS 2002a).
14

15 In addition, while the habitat requirements of the bonytail chub are uncertain, it has been
16 observed in pools and eddies on main stem rivers. Habitats necessary for conservation of the
17 bonytail chub include river channels and flooded, ponded, or inundated riverine habitats
18 (USFWS 2002a). Bonytail chubs in rivers probably spawn in spring over rocky substrates and
19 spawning in reservoirs has been observed over rocky shoals and shorelines (USFWS 2002a).
20 Spawning was observed to occur in June and July at water temperatures of about 64°F (18°C)
21 (USFWS 1994b). It is hypothesized that flooded bottomland habitats are important as nursery
22 habitats for the young bonytail chub (USFWS 2002a).
23

24 The bonytail chub was listed as an endangered species on April 23, 1980 (USFWS 1980).
25 Approximately 312 mi (502 km) of river in the Colorado River Basin were designated as critical
26 habitat for the bonytail chub on March 21, 1994. The critical habitat spans five states and
27 includes portions of the Colorado, Green, and Yampa Rivers in the Upper Basin and the
28 Colorado River in the Lower Basin (USFWS 1994b). A recovery plan was approved on
29 August 1, 2002 (USFWS 2002a).
30

31 Potential threats to the bonytail chub that may be associated with ULP activities include
32 impacts to water quality and water withdrawals. Uranium mining can contaminate surrounding
33 water with high levels of ammonia and uranium, which can bioaccumulate in fish species
34 (Karp and Metzler 2006; Fresques 2008; Metzler et al. 2008). The toxicity of uranium mine
35 tailings has been shown to be devastating to aquatic life in the Colorado River system
36 (USFWS 1990). The effects of ammonium include reduced growth rate, reduced gamete
37 production, body deformities and malformations, and degenerative gill and kidney appearance
38 and function. Mining activities may also increase the amount of sediment in the river
39 (Leyda 2011). A catastrophic tailings pile failure could bury important nursery areas and destroy
40 other fish habitat. Water depletions associated with uranium mining might contribute to the
41 destruction or adverse modification of designated critical habitat for the bonytail chub
42 (USFWS 2011e). Other threats include stream alteration, competition with and predation by
43 introduced species, and pollution.
44
45

1 **E.3.2 Colorado Pikeminnow**

2
3 The Colorado pikeminnow (*Ptychocheilus lucius*) is a species of fish in the family
4 *Cyprinidae*. It is a long-distance migrator (average of 409 mi [658 km]) that reaches a maximum
5 length of 5.9 ft (1.8 m) and a weight of 79 lb (36 kg) and it can live for more than 40 years
6 (USFWS 2002b). It is an elongated fish with a greenish, slender body with gold flecks on the
7 dorsal surface. The mouth is large and nearly horizontal, with slender teeth (USFWS 2007).
8 Reproduction occurs after five to seven years (NatureServe 2012). Juveniles feed mainly on
9 zooplankton and insect larvae; the larger fish (greater than 4 in. [10 cm]) feed mainly on other
10 fish (USFWS 2007; NatureServe 2012). Spawning occurs in river canyons when water flows
11 decline from June to August and when water temperatures are between 64°F and 73°F (18°C and
12 23°C) (USFWS 1994b, 2002b). The optimal temperature for egg hatching is 68°F (20°C)
13 (NatureServe 2012). Adult habitats after spawning include pools, deep runs, and eddies
14 maintained by high spring flows. Larvae drift downstream to nutrient-rich nursery backwaters
15 (USFWS 2002b). Young of the year prefer shallow, ephemeral backwaters along the shore with
16 little or no current and silt or sand substrates (NatureServe 2012; USFWS 2007). When juveniles
17 reach about 8 in. (20 cm) in length, they prefer deeper water with a faster velocity
18 (USFWS 2007). During the winter, adults are most common in shallow, ice-covered shorelines
19 (USFWS 1994b). Temperature tolerances range from less than 50°F to 95°F (10°C to 35°C)
20 (USFWS 2007).

21
22 The Colorado pikeminnow is endemic to the Colorado River Basin. Although it was
23 extirpated from the Lower Basin in the 1970s, experimental introductions have been made into
24 the Verde River since the 1980s. Currently, three wild, reproducing populations occur in the
25 Green River, San Juan River, and upper Colorado River subbasins. Current population estimates
26 are 6,600 to 8,900 total for the three populations (6,000 to 8,000 in the Green River; 600 to
27 900 in the upper Colorado River; and 19 to 50 in the San Juan River) (USFWS 2002b).

28
29 The Colorado pikeminnow was listed as an endangered species on March 11, 1967.
30 Approximately 1,148 mi (1,848 km) of river in the Colorado River Basin were designated as
31 critical habitat for the Colorado pikeminnow on March 21, 1994. The critical habitat spans
32 three states and includes portions of the Colorado, Green, Yampa, White, and San Juan Rivers in
33 the Upper Basin (USFWS 1994b). An original recovery plan was approved on August 28, 2002,
34 and the current recovery goals were approved on July 27, 2006 (USFWS 2002b).

35
36 Potential threats to the Colorado pikeminnow that may be associated with ULP activities
37 include impacts to water quality and water withdrawals. Uranium mining can contaminate
38 surrounding water with high levels of ammonia and uranium, which can bioaccumulate in fish
39 species (Karp and Metzler 2006; Fresques 2008; Metzler et al. 2008). The toxicity of uranium
40 mine tailings has been shown to be devastating to aquatic life in the Colorado River system
41 (USFWS 1990). The effects of ammonium include reduced growth rate, reduced gamete
42 production, body deformities and malformations, and degenerative gill and kidney appearance
43 and function. Mining activities may also increase the amount of sediment in the river
44 (Leyda 2011). A catastrophic tailings pile failure could bury important nursery areas and destroy
45 other fish habitat (USFWS 2002b). Water depletions associated with uranium mining may

1 contribute to the destruction or adverse modification of designated critical habitat for the
2 Colorado pikeminnow (USFWS 2011e). Other threats include stream alteration from dams,
3 competition with and predation by introduced species, and pollution.
4
5

6 **E.3.3 Greenback Cutthroat Trout**

7

8 The greenback cutthroat trout (*Oncorhynchus clarki* ssp. *stomias*) is a species of fish in
9 the family *Salmonidae*. It is one of the most colorful subspecies of cutthroat trout
10 (USFWS 1998). This species is characterized by dark, round spots on the sides and tail and two
11 colorful blood-red stripes on each side of the throat under the jaw (USFWS 2011f). Mature males
12 have crimson red along the ventral region during spawning season (USFWS 1998). The diet of
13 the greenback cutthroat trout includes mainly aquatic and terrestrial insects, but they are also
14 opportunistic feeders (USFWS 2009d; Coleman 2007). Males spawn at age two and females
15 reach sexual maturity when they reach a length of about 7 in. (18 cm) (usually after their third or
16 fourth summer) (USFWS 2011f; Coleman 2007). They spawn in spring or early summer
17 depending on the elevation. Females dig redds in the gravel bed of streams where they deposit
18 eggs. Spawning occurs when water reaches about 41°F to 46°F (5°C to 8°C) (Coleman 2007).
19 Larger females can lay up to 6,000 eggs (USFWS 2009d).
20

21 Although the historic range of the greenback cutthroat trout is not known, it is
22 hypothesized that all mountain and foothill habitats of the South Platte and Arkansas River
23 drainages in Colorado were included (USFWS 2009d). Only nine naturally occurring populations
24 are known to have persisted; however, many additional populations have been established in
25 lakes and streams with introductions (USFWS 1998). The most stable population occurs in
26 Rocky Mountain National Park (NatureServe 2012). Currently, 145 populations, in 142 mi
27 (228 km) of streams and 412 acres (167 ha) of lakes, have been documented within the
28 greenback's historic range (USFWS 2011f).
29

30 Habitat requirements of the greenback cutthroat trout differ as it moves through its life
31 stages. Juveniles need the protective cover and low-velocity flow found in side channels and
32 small tributaries. Spawning occurs in riffles with clean gravel; over-wintering fish prefer deep
33 water, low-velocity flow, and protective cover. Adults prefer slow-water areas for resting and
34 fast-water areas for feeding with protective cover from boulders, logs, overhanging vegetation,
35 or undercut banks (USFWS 2009d). Greenbacks also usually require clear, cold, well-
36 oxygenated water (USFWS 2009d).
37

38 The greenback cutthroat trout was listed as an endangered species in 1973 and it was
39 reclassified to a threatened species on April 18, 1978 (USFWS 1978). A recovery plan was
40 approved on March 1, 1998 (USFWS 1998). Critical habitat for this species has not been
41 designated.
42

43 Potential threats to the greenback cutthroat trout that may be associated with ULP
44 activities include impacts to water quality and water flow. Uranium mining can contaminate
45 surrounding water with high levels of ammonia and uranium, which can bioaccumulate in fish

1 (Karp and Metzler 2006; Fresques 2008; Metzler et al. 2008). Eggs of greenback cutthroat trout
2 did not survive in a stream with increased levels of heavy metals (USFWS 1998). The effects of
3 ammonium include reduced growth rate, reduced gamete production, body deformities and
4 malformations, and degenerative gill and kidney appearance and function. Mining activities may
5 also increase the amount of sediment in the river (Leyda 2011). Water depletions associated with
6 uranium mining may contribute to the destruction or adverse modification of habitat for the
7 greenback cutthroat trout (USFWS 2011f). Other threats include removal of riparian habitat;
8 logging; grazing; road and trail construction and use; and recreational vehicle use, fire, and
9 diversion of streams for agricultural or municipal purposes (USFWS 2009d).

12 **E.3.4 Humpback Chub**

14 The humpback chub (*Gila cypha*) is a freshwater fish species in the family *Cyprinidae*.
15 This species is less than 19.7 in. (50 cm) in total length. It has silvery sides and a brown back.
16 Adults have a distinctive dorsal hump, a long snout, and small eyes. Humpback and roundtail
17 chubs can look very similar, and the young in particular do not possess easily identifiable
18 morphological differences (USFWS 1990). The humpback chub reproduces from May to July
19 depending on the location. Spawning occurs when water temperatures are near 68°F (20°C) and
20 spring water flows are at their highest (USFWS 1994b). Both the young and adults are bottom
21 feeders and consume mainly insects and other invertebrates, although they occasionally also
22 consume algae and fish.

24 The humpback chub is found in river canyons in a variety of habitats, including pools,
25 riffles, and eddies. They have also been found near boulder-strewn canyons, travertine dams,
26 rocky runs, riffles, and rapids (USFWS 1994b). Adult humpback chub inhabit deep (1 to 15 ft
27 [0.3 to 4.6 m]), swift-river regions (0–6 in./s or 0–15 cm/s), but they also use microhabitats with
28 low-velocity water. The young are generally found in shallower areas (i.e., in depths of less than
29 9.8 ft [2.9 m]).

31 The humpback chub is endemic to the Colorado River Basin and it is presently restricted
32 to remote, white water canyons. Manmade alterations to the Colorado River may have caused the
33 humpback chub to disappear from certain areas before its presence was documented
34 (USFWS 1990). Because of this uncertainty, the historical distribution of the humpback chub is
35 not well known, although the earliest known record of the species is from the Grand Canyon and
36 it dates from around 4,000 B.C. (USFWS 1990, 1994b).

38 The humpback chub was listed as an endangered species on March 11, 1967. An original
39 recovery plan was approved on August 22, 1979, and the current *Second Revised Recovery Plan*
40 was approved on September 19, 1990 (USFWS 1990). Approximately 379 mi (610 km) of river
41 in the Colorado River Basin were designated as critical habitat for the humpback chub on
42 March 24, 1994. The critical habitat spans three states and it includes portions of the Colorado,
43 Green, and Yampa rivers in the Upper Basin and the Colorado and Little Colorado rivers in the
44 Lower Basin (USFWS 1994b). The largest remaining population of humpback chub in the

1 Colorado River Basin occurs in the Little Colorado and Colorado rivers in the Grand Canyon
2 (USFWS 1994b).

3
4 Potential threats to the humpback chub that may be associated with ULP activities
5 include impacts to water quality and water withdrawals. Uranium mining can contaminate
6 surrounding water with high levels of ammonia and uranium, which can bioaccumulate in fish
7 (Karp and Metzler 2006; Fresques 2008; Metzler et al. 2008). The toxicity of uranium mine
8 tailings has been shown to be devastating to aquatic life in the Colorado River system
9 (USFWS 1990). The effects of ammonium include reduced growth rate, reduced gamete
10 production, body deformities and malformations, and degenerative gill and kidney appearance
11 and function. Mining activities may also increase the amount of sediment in the river
12 (Leyda 2011). Water depletions associated with uranium mining may contribute to the
13 destruction or adverse modification of designated critical habitat for the humpback chub
14 (USFWS 2011e). Other threats include stream alteration, competition with and predation by
15 introduced species, and pollution.

18 E.3.5 Razorback Sucker

19
20 The razorback sucker (*Xyrauchen texanus*) is a species of fish in the family
21 *Catostomidae*. This species has a long, high hump behind the head. The head and body are dark,
22 and the sides are brownish and fade to a yellowish-white abdomen. It reaches lengths of 36 to
23 39 in. (91 to 99 cm) and weighs up to 12 lb (5.4 kg) (USFWS 2007). The diet of adults includes
24 planktonic crustaceans, diatoms, filamentous algae, midge larvae, and detritus.

25
26 Habitat requirements of the razorback sucker in rivers include deep runs, eddies,
27 backwaters, and flooded off-channel environments in spring; runs and pools often found in
28 shallow water and associated with submerged sandbars in summer; and low-velocity runs, pools,
29 and eddies in winter (USFWS 2002c). Adults may travel long distances to spawning sites, and
30 spawning usually occurs in rivers over gravel, cobble, or sand substrates during spring runoff at
31 temperatures greater than 57°F (14°C) (USFWS 1991b, 2002c). Spawning can also occur over
32 rocky shoals and shorelines. Young razorback suckers require nursery environments with quiet,
33 warm, and shallow water, such as tributary mouths, backwaters, or inundated floodplain habitats
34 in rivers and coves or shorelines in reservoirs (USFWS 2002c).

35
36 The razorback sucker is endemic to the Colorado River Basin. The historic range of the
37 razorback sucker extended through 3,500 mi (5,633 km) of the Colorado River basin throughout
38 Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, Baja California Norte,
39 and Sonora of Mexico (USFWS 1991b). Currently, the razorback sucker only inhabits about
40 25% of its historical range (750 mi [1,207 km]) in the upper Colorado River basin
41 (USFWS 1991b, 2002c). Most wild fish are now found in Lake Mohave, which represents the
42 largest population within the lower basin (USFWS 2007). This population has dropped from
43 60,000 in 1991 to 9,000 in 2000 (USFWS 2002c). Razorback suckers are currently found in
44 small numbers in the Green River, upper Colorado River, and San Juan River subbasins, the

1 lower Colorado River, the reservoirs of Lakes Mead and Mohave, and in the small tributaries of
2 the Gila River subbasin (USFWS 2002c).

3
4 The razorback sucker was listed as an endangered species on October 23, 1991.
5 Approximately 1,724 mi (2,774 km) of river in the Colorado River Basin were designated as
6 critical habitat for the razorback sucker on March 21, 1994. The critical habitat spans six states
7 and it includes portions of the Green, Yampa, Duchesne, Colorado, White, Gunnison, and San
8 Juan Rivers in the Upper Basin and portions of the Colorado, Gila, Salt, and Verde Rivers in the
9 Lower Basin (USFWS 1994b). A recovery plan was approved on August 28, 2002
10 (USFWS 2002c).

11
12 Potential threats to the razorback sucker that may be associated with ULP activities
13 include impacts to water quality and water withdrawals. Uranium mining can contaminate
14 surrounding water with high levels of ammonia and uranium, which can bioaccumulate in fish
15 species (Karp and Metzler 2006; Fresques 2008; Metzler et al. 2008). The toxicity of uranium
16 mine tailings has been shown to be devastating to aquatic life in the Colorado River system
17 (USFWS 1990). The effects of ammonium include reduced growth rate, reduced gamete
18 production, body deformities and malformations, and degenerative gill and kidney appearance
19 and function. Mining activities might also increase the amount of sediment in the river
20 (Leyda 2011). A catastrophic tailings pile failure could bury important nursery areas and destroy
21 other fish habitat (USFWS 2002c). Water depletions associated with uranium mining may
22 contribute to the destruction or adverse modification of designated critical habitat for the
23 razorback sucker (USFWS 2011c). Other threats include stream alteration, competition with and
24 predation by introduced species, and pollution.

25 26 27 **E.4 BIRDS**

28 29 30 **E.4.1 Gunnison Sage-Grouse**

31
32 The Gunnison sage-grouse (*Centrocercus minimus*) is one of two sage grouse species in
33 the family *Phasianidae* (the other sage grouse species is the greater sage-grouse
34 [*C. urophasianus*]). The Gunnison sage-grouse weighs about a third less than the greater sage-
35 grouse; however, the males of both species possess conspicuous filoplumes and yellow-green air
36 sacs on the chest during the breeding season. Sage grouse gather on leks during the spring where
37 males establish territories and strut for approximately 6 weeks. Sage grouse are polygamous and
38 males do not provide any parental care. The majority of females establish nests within 2 mi
39 (3.2 km) of an active lek. Gunnison sage-grouse have an average clutch size of 6.8 eggs and have
40 one of the lowest nest success rates of all upland game bird species (ranging from 10% to 63%)
41 (Gunnison Sage-Grouse Rangewide Steering Committee 2005).

42
43 Sage grouse are typically found in large expanses of sagebrush-dominated habitats.
44 Various habitats, such as riparian meadows, agricultural lands, and native grasses and forbs are
45 also used if intermixed with sagebrush (USFWS 2010b). The Gunnison sage-grouse relies

1 heavily on sagebrush for nesting, shelter, and food throughout the year. Although forbs and
2 insects are eaten during the summer and early fall, its diet consists entirely of sage brush during
3 the winter (USFWS 2006a).

4
5 Gunnison sage-grouse historically occupied 21,370 mi² (34,392 km²) throughout
6 southwestern Colorado, northwestern New Mexico, northeastern Arizona, and southeastern Utah
7 (USFWS 2006a). Currently, only seven widely scattered and isolated populations occur in
8 Colorado and Utah, occupying 1,511 mi² (2,432 km²) in Gunnison Basin, San Miguel Basin,
9 Monticello-Dove Creek, Piñon Mesa, Crawford, Cerro Summit–Cimarron–Sims Mesa, and
10 Poncha Pass (USFWS 2010b). Gunnison sage-grouse now occupy about 10% of the habitat that
11 existed before the arrival of European settlers (BLM 2010). The breeding population size was
12 estimated to be fewer than 4,000 individuals in 2000, with the largest population (2,000 to
13 3,000 individuals) occurring primarily in Gunnison and Saguache counties, Colorado. The
14 remaining seven populations have fewer than 300 breeding individuals (NatureServe 2012).

15
16 The Gunnison sage-grouse became a candidate for Federal listing on September 28, 2010
17 (USFWS 2010b). The listing of this species was determined to be warranted but was precluded
18 by higher-priority listing actions. The USFWS assigned a listing priority number of two to this
19 species because threats have a high magnitude and are imminent.

20
21 The main threat to the Gunnison sage-grouse is the fragmentation and degradation of
22 sagebrush habitats resulting from conversion to cropland, energy development, and urban
23 development (NatureServe 2012). Potential threats that may be associated with ULP activities
24 include direct habitat loss, fragmentation, and degradation as well as direct disturbance of nests
25 or leks. Mining may result in abandoned mining pits, mining infrastructure, access roads, and
26 overburden placement in sagebrush habitats. Fragmentation of these habitats could force sage-
27 grouse to choose less optimal habitats. Construction of any substantial structure or road, as well
28 as use of access roads, can cause increased deposition of dust on plants and invasion of non-
29 native plants, potentially effecting sagebrush distribution. Increased noise and traffic from
30 human presence may also lead to a disruption of normal grouse behavior and productivity
31 (Gunnison Sage-Grouse Rangelwide Steering Committee 2005). Other threats include fencing
32 (increases mortality due to collision and increased perch sites for nest predators), fires (increases
33 weeds and degrades suitable habitat), and domestic grazing (changes plant communities and
34 soils) (USFWS 2010b).

35 36 37 **E.4.2 Mexican Spotted Owl**

38
39 The Mexican spotted owl (*Strix occidentalis lucida*) is one of three subspecies of the
40 spotted owl (*S. occidentalis*) (USFWS 2011g). They are medium-sized owls without ear tufts
41 (USFWS 2011g). They have dark eyes and ashy-chestnut brown bodies with white and brown
42 spots on their abdomens, backs, and heads (USFWS 2011h). Their wing and tail feathers are dark
43 brown with lighter brown and white bars (USFWS 2011g). Young owls less than 5 months old
44 have a downy appearance. Subadults (5 to 26 months) look like adults but have pointed tail
45 feathers with a white terminal band. Adult tail feathers have rounded tips, and the terminal band

1 is mottled brown and white (USFWS 2011g). Females are generally larger than males
2 (USFWS 2011h). Although most Mexican spotted owls are nonmigratory, some individuals
3 migrate to lower elevations during the winter (USFWS 2011g). The diet of the Mexican spotted
4 owl mainly consists of small and medium-sized rodents; however, they also consume bats, birds,
5 reptiles, and arthropods (USFWS 2011g).

6
7 The habitat requirements of the Mexican spotted owl include forested mountains and
8 canyonlands. Forests used by the Mexican spotted owl are generally uneven-aged and
9 multistoried and have high canopy cover. Larger trees (with an average diameter of 24 in.
10 [61 cm]) are usually chosen for nesting sites. In canyonlands, important features for the Mexican
11 spotted owl include steep canyon walls with isolated pinnacles and rims with large vertical cliffs.
12 The canyon habitats also often include a variety of desert scrub and riparian vegetation
13 communities. Cliff faces contain numerous caves and ledges that create protected microsites for
14 nesting and roosting (USFWS 2011g). Foraging occurs in a wide range of habitats, including in
15 managed and unmanaged forests, piñon-juniper woodlands, mixed-conifer and ponderosa pine
16 forests, cliff faces and terraces between cliffs, and riparian zones.

17
18 Mexican spotted owls rely on existing structures for nesting (e.g., nests built by other
19 birds on cliffs, debris platforms in trees, and tree cavities). Courtship begins in March, with
20 females laying one to three eggs in late March or early April; incubation lasts about 30 days
21 (USFWS 2011g).

22
23 The current range of the Mexican spotted owl is nearly the same as the historical range
24 and it is estimated to include 12,427–1,553,428 mi² (20,000–2,500,000 km²) across Utah,
25 Colorado, Arizona, New Mexico, the western portions of Texas, and several states in Mexico
26 (NatureServe 2012; USFWS 2011g).

27
28 The Mexican spotted owl has experienced a long-term population decline of 30–50%
29 (NatureServe 2012). Currently, 1,301 owl sites (used repeatedly by a single owl or by a pair of
30 owls for nesting, roosting, or foraging) are known in the U.S. portion of the owl's range
31 (USFWS 2011g). The current population size is estimated to be 1,000 to 2,500 individuals. A
32 little more than half of the U.S. population occurs in the Upper Gila Mountains Recovery Unit in
33 Arizona and New Mexico. Many populations occur in isolated mountain ranges separated by
34 large areas of unforested land (NatureServe 2012).

35
36 The Mexican spotted owl was listed as threatened on March 16, 1993 (USFWS 1993). A
37 draft recovery plan was made available for comment on June 28, 2011 (USFWS 2011g).
38 Approximately 4.6 million acres (1.9 million ha) of critical habitat were designated in Arizona,
39 Colorado, New Mexico, and Utah on June 6, 1995. The designated critical habitat was changed
40 first on February 1, 2001 (USFWS 2001a) and again on August 31, 2004 (USFWS 2004).
41 Currently, critical habitat includes approximately 8.6 million acres (3.5 million ha) of habitat in
42 Arizona, Colorado, New Mexico, and Utah (USFWS 2004).

43
44 The greatest threat to the Mexican spotted owl has been loss of habitat resulting from
45 even-aged timber management (NatureServe 2012). Potential threats that may be associated with

1 mining activities include increased mortality, loss or fragmentation of habitat, and a reduced
2 ability to hunt. Increased vehicle traffic associated with mining operations could increase the
3 number of owls killed from colliding with vehicles. The development of mining facilities and
4 access roads could remove or fragment the Mexican spotted owl's habitat. Recent research on
5 acoustic predators (bats and owls) shows that even low levels of traffic noise will mask the
6 rustling sounds of rodents and reduce the ability of the owls to hear them. The noise of the mine
7 operations may have a similar effect and prevent the owls from catching prey (Leyda 2011).
8 Other threats include forest fires, predation, starvation, disease, and parasites (USFWS 2011g). It
9 is unlikely for ULP activities to affect the Mexican spotted owl because suitable habitat for this
10 species is not located in the vicinity of the ULP lease tracts. The species may only occur in the
11 area as a rare migratory transient.
12
13

14 **E.4.3 Southwestern Willow Flycatcher**

15

16 The southwestern willow flycatcher (*Empidonax traillii extimus*) is one of four willow
17 flycatcher subspecies (*E. traillii*). The subspecies are distinguished by subtle differences in color,
18 morphology, and habitat use (USFWS 2002d). The southwestern willow flycatcher is less than
19 6 in. (15 cm) in length; weighs about 4 oz (12 g); and has a brownish-olive body, whitish throat,
20 pale olive breast, pale yellow belly, and two light wing bars (USFWS 2002d, 2011i;
21 NatureServe 2012). The bill is depressed and wide at the base (NatureServe 2012). The birds eat
22 mainly insects, including wasps, bees, moths, caterpillars, and butterflies, although they will
23 sometimes eat berries as well (NatureServe 2012).
24

25 The southwestern willow flycatcher is a neotropical migrant that travels from breeding
26 grounds in the United States to wintering grounds in Central America and South America
27 (USFWS 2005a). Essential habitat includes forested wetlands or scrub-shrub wetlands for
28 breeding, foraging, migrating stopovers, dispersing, and shelter (USFWS 2005a). The species
29 breeds in southern California, southern Nevada, southern Utah, southern Colorado, Arizona, and
30 New Mexico from sea level to around 8,000 ft (2,438 m) above sea level. Nesting occurs
31 primarily in dense swampy thickets of willow, buttonbush, tamarisk, vines, or other plants from
32 6.5 to 98 ft (2 to 30 m) in height (NatureServe 2012; USFWS 2005a). Nesting has been observed
33 in patches ranging from 0.25 to 173 acres (0.1 to 70 ha) (USFWS 2005a). Nesting occurs from
34 early June through the end of July. The clutch size is usually three or four and both parents take
35 care of the young (NatureServe 2012).
36

37 Although the current range of the southwestern willow flycatcher is similar to the
38 historical range, suitable habitat within that range has been greatly reduced (USFWS 2002d).
39 The current range is estimated to be 7,700–965,000 mi² (20,000–2,500,000 km²), and the
40 population is found in relatively small, isolated, and widely dispersed locales
41 (NatureServe 2012). In 2000, 53% of the southwestern willow flycatchers were distributed
42 across only 10 sites (USFWS 2002d). The population has experienced a long-term decline of
43 30–50%, and the population was estimated to be between 1,200 and 1,300 pairs
44 (NatureServe 2012).
45

1 The southwestern willow flycatcher was listed as an endangered species on March 29,
2 1995 (USFWS 2002d). A Recovery Plan was approved on August 30, 2002 (USFWS 2002d).
3 Approximately 599 river mi (964 river km) were designated as critical habitat for the
4 southwestern willow flycatcher on July 22, 1997 (USFWS 1997). On October 19, 2005, the
5 designated critical habitat was amended and it now includes 737 mi (1,186 km) of critical habitat
6 (USFWS 2005a). The currently designated critical habitat includes portions of Arizona,
7 California, Nevada, New Mexico, and Utah.
8

9 The greatest threat to the southwestern willow flycatcher is the loss or degradation of
10 riparian habitat (USFWS 2002d). Potential threats to the southwestern willow flycatcher that
11 may be associated with ULP activities include facility development, water withdrawal, and
12 increased human presence. Direct habitat loss may occur from the development of mining
13 facilities and access roads. Reduction of water in riparian habitats degrades habitat that is
14 essential to the southwestern willow flycatcher habitat. Human disturbances at nesting sites
15 resulting from human presence or traffic noise may result in nest abandonment (USFWS 2011i).
16 Additional threats include fire, livestock grazing, and brood parasitism by the brown-headed
17 cowbird (USFWS 2002d).
18
19

20 **E.4.4 Western Yellow-Billed Cuckoo**

21
22 The western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is one of two
23 subspecies of yellow-billed cuckoo (*C. americanus*). The western yellow-billed cuckoo is about
24 12 in. (31 cm) in length with a slender, long-tailed profile (USFWS 2009e). It is brownish above
25 and white below, with rusty-colored flight feathers. The upper mandible of the bill is black, and
26 the lower mandible is yellow. The underside of the tail has pairs of large, white spots
27 (USFWS 2011j).
28

29 The breeding habitat for the western yellow-billed cuckoo consists of large lease tracts of
30 deciduous riparian woodland, especially dense stands of cottonwood and willow, although
31 desirable breeding habitat can also include mesquite and salt-cedar, in some areas. Nests are
32 placed in dense cover of trees, shrubs, or vines; near water; and generally 4.9 to 42.6 ft (1.5 to
33 13 m) above ground. Dense understory foliage appears to be an important factor in nest-site
34 selection, while cottonwood trees are an important foraging habitat (USFWS 2009e).
35 Nonbreeding habitats include various types of forest, woodland, and scrub (NatureServe 2012).
36

37 The western yellow-billed cuckoo arrives on breeding grounds in the United States from
38 late May to June and begins fall migration to South America from August to late September
39 (Wiggins 2005). While they are courting females, the males will often carry a food item to offer
40 the females during copulation (Wiggins 2005). Clutch size varies from one to five eggs; both
41 parents build the nest, incubate the eggs, and feed the young. They feed primarily on slow-
42 moving insects including grasshoppers, caterpillars, and beetles (Wiggins 2005).
43

44 The western yellow-billed cuckoo, which historically had bred throughout most of
45 western North America, is now extirpated in western Canada, Washington, and Oregon—and
now is rare and patchily distributed throughout most of the United States west of the Rocky

1 Mountains. In western Colorado, the western yellow-billed cuckoo, which was never common in
2 that area, appears to be disappearing (Wiggins 2005).

3
4 It is estimated that there could be less than 2,000 breeding pairs of the western yellow-
5 billed cuckoo across the entire range. It is estimated that this breeding population has declined by
6 at least 90% since the end of the 19th century (NatureServe 2012).

7
8 The western yellow-billed cuckoo became a candidate for Federal listing on October 30,
9 2001 (USFWS 2001b). The listing of this species was determined to be warranted but was
10 precluded by higher-priority listing actions. The U.S. Fish and Wildlife Service (USFWS)
11 assigned a listing priority number of three to the western Distinct Population Segment that occurs
12 in Washington, Oregon, California, Idaho, Nevada, Montana, Wyoming, Utah, Arizona,
13 Colorado, New Mexico, Texas, British Columbia, and Mexico.

14
15 Potential threats to the western yellow-billed cuckoo that may be associated with the ULP
16 activities include loss or fragmentation of breeding habitat due to the development of facilities or
17 roads. Increased noise from human presence and vehicle traffic may also affect the western
18 yellow-billed cuckoo. The western yellow-billed cuckoo was 10 times more likely to be present
19 at sites far (i.e., greater than 2,297 ft [700 m]) from roads with heavy traffic than at sites near
20 (i.e., less than 820 ft [250 m]) to roads with heavy traffic (Goodwin and Shriver 2011). Other
21 threats include use of pesticides and loss or degradation of habitat as a result of grazing and river
22 management (NatureServe 2012).

23 24 25 **E.5 MAMMALS**

26 27 28 **E.5.1 Black-Footed Ferret**

29
30 The black-footed ferret (*Mustela nigripes*) is the only ferret species native to North
31 America. It is brownish in color with a slightly paler belly and black facemask, legs, and tip of
32 tail (NatureServe 2012; USFWS 2003). It is about 23.6 in. (60 cm) in length and weighs up to
33 2.4 lb (1.1 kg) (USFWS 2003). In captivity, the black-footed ferret reproduces in March and
34 early April, and the gestation period is about 45 days. The average litter size is 3.5; the young
35 disperse in the fall. Some females can reproduce as yearlings. Black-footed ferrets are nocturnal
36 and can remain inactive for up to 6 days during the winter. Their main food item is prairie dogs,
37 but ground squirrels, rabbits, deer mice, voles, pocket gophers, birds, and insects are also
38 sometimes consumed (NatureServe 2012; USFWS 1988).

39
40 Historically, the black-footed ferret's range extended throughout Arizona, Colorado,
41 Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas,
42 Utah, Wyoming, Alberta, and Saskatchewan. The current range is estimated to be between
43 62 and 155 mi² (100 and 250 km²) (NatureServe 2012). The black-footed ferret relies on prairie
44 dog colonies for food, shelter, and denning; and thus, has only been found in the vicinity of
45 black-tailed prairie dog, white-tailed prairie dog, and Gunnison's prairie dog colonies

1 (USFWS 2003). By the early 1970s, the black-footed ferret was near extinction as a result of the
2 intentional poisoning of prairie dogs and the introduction of disease to prairie dogs
3 (USFWS 2003). Remaining ferrets were used for captive breeding and a few reintroductions
4 have successfully established reproducing populations (NatureServe 2012). The population size
5 is now estimated to be between 250 and 1,000 individuals (NatureServe 2012). In late 2005,
6 400 reintroduced individuals were alive in the wild (NatureServe 2012).

7
8 The black-footed ferret was listed as an endangered species on March 11, 1967
9 (USFWS 2001b). A Recovery Plan was approved on August 8, 1988 (USFWS 1988). The
10 species may be extirpated from the State of Colorado, with the exception of reintroduced
11 populations in the northwestern portion of the state (CPW 2012; USFWS 2012). Black-footed
12 ferrets were released in the Wolf Creek Management Area in Moffat and Rio Blanco counties in
13 Colorado between 2001 and 2006 (BLM 2008). These populations are considered to be
14 experimental, nonessential populations under Section 10(j) of the Endangered Species Act.
15 While it is unlikely that these species will occur in the affected areas of the ULP lease tracts, the
16 area of western Colorado containing the ULP lease tracts has not been block-cleared for black-
17 footed ferrets (USFWS 2012).

18
19 Black-footed ferret habitat is the same habitat used by prairie dogs and includes
20 grasslands, steppe, and shrub steppe. Prairie dog holes serve as resting and birth sites. Between
21 99 and 148 acres (40 and 60 ha) of prairie dog colony are needed to support one ferret
22 (NatureServe 2012).

23
24 Potential threats to black-footed ferrets or their habitat associated with the ULP activities
25 may include increased mortality resulting from collision with vehicles and loss of habitat
26 stemming from the development of mining facilities and access roads. Other threats include
27 prairie dog poisoning and shooting, canine distemper, sylvatic plague, and predation
28 (USFWS 1988).

31 **E.5.2 Canada Lynx**

32
33 The Canada lynx (*Lynx canadensis*) is a medium-sized cat reaching 30–35 in. (76–89 cm)
34 in length and weighing 18–23 lb (8–10.4 kg). The lynxes have large feet; long legs; tufts on their
35 ears; and short, black-tipped tails. During the winter, their fur is dense and grayish-brown mixed
36 with buff or pale brown on the back; and grayish-white on the belly, legs, and feet. During the
37 summer, their fur is more reddish to gray-brown (USFWS 2011k). They prey on snowshoe hares,
38 but if hare densities are low, they will prey opportunistically on other small mammals (like red
39 squirrels, flying squirrels, ground squirrels, porcupines, beavers, mice, voles, shrews), birds
40 (grouse), and fish (USFWS 2009f, 2011k). Home ranges are generally between 19 and 134 mi²
41 (31 and 216 km²) (USFWS 2009f). Breeding occurs in March and April for yearling females,
42 with litter sizes averaging three to four kittens. The male does not help with rearing the young
43 (NatureServe 2012).

1 Habitat requirements of the Canada lynx include boreal forests, deciduous temperate
2 forests, and subalpine forests that experience cold winters with deep, fluffy snow for extended
3 periods. Hunting occurs in forests with dense understories. Denning occurs in forests where
4 woody debris, such as logs and windfalls, provide protection for kittens (USFWS 2009f). The
5 lynx density in the contiguous United States is lower than it is in Canada because of a smaller
6 and patchier habitat range and an increased rate of competition for food (USFWS 2009f). Canada
7 lynx in the contiguous United States occur in forested portions of Colorado, Idaho, Maine,
8 Michigan, Minnesota, Montana, New Hampshire, New York, Oregon, Utah, Vermont,
9 Washington, and Wisconsin. Although a lack of historic or current lynx data for the contiguous
10 United States makes it difficult to determine population estimates or trends for this region, it is
11 estimated to be fewer than 2,000 (USFWS 2000; NatureServe 2012). Their current range
12 (including Alaska and Canada) is estimated to be greater than 1,553,428 mi² (2,500,000 km²)
13 [1.5 million mi² (2.5 million km²)] (NatureServe 2012).
14

15 The Canada lynx was listed as a threatened species on March 24, 2000 (USFWS 2000).
16 On December 17, 2009, the Canada lynx became a candidate for Federal listing in New Mexico,
17 with a listing priority number of 12 because they are regularly and frequently crossing the state
18 boundary between Colorado and New Mexico, leaving them without Federal protection
19 (USFWS 2009g). A recovery plan was outlined on September 14, 2005 (USFWS 2005b).
20 Approximately 2,963 mi² (4,768 km²) were designated as critical habitat for the Canada lynx on
21 November 9, 2006 (USFWS 2006b). On February 25, 2009, additional critical habitat was
22 designated, bringing the total designated critical habitat to 62,765 mi² (101,010 km²) in Maine,
23 Minnesota, Montana, Wyoming, Idaho, and Washington (USFWS 2009f).
24

25 Given the species' preference for high-elevation coniferous forests, it is unlikely that the
26 Canada lynx will occur in areas of direct ULP activity. Previous threats to this species include
27 loss or alteration of habitat because of climate change, timber harvest, and human recreation
28 (USFWS 2009f; NatureServe 2012).
29
30

31 **E.5.3 Gunnison's Prairie Dog**

32

33 The Gunnison's prairie dog (*Cynomys gunnisoni*) is a large rodent that occurs from
34 central Colorado to central Arizona, including small portions of northwestern New Mexico and
35 southeastern Utah. The species is divided into mountain and prairie populations which are
36 separated by mountain ranges that almost completely limit prairie dog movement between
37 populations. Genetic testing is currently being conducted to determine whether montane and
38 prairie Gunnison's prairie dogs are populations or subspecies (USFWS 2011). The Gunnison's
39 prairie dog is darker overall and has less striking facial markings than does the white-tailed
40 prairie dog. It reaches a length of 11.8–15.4 in. (30–39 cm) and a weight of 0.6–3 lb (0.3–1.4 kg)
41 (Seglund and Schnurr 2010). Females reproduce as yearlings, whereas only a quarter of males
42 reproduce as yearlings (NatureServe 2012). Polygamous mating usually occurs in April and May
43 and one litter with an average litter size of six is produced per year (Seglund and Schnurr 2010;
44 NatureServe 2012). Colonies consist of 50 to 100 individuals. Only 50% of females survive their
45 first year and less than 15% survive to their second year. Their diet consists mainly of grasses,

1 forbs, sedges, and shrubs, although they also consume insects. Prairie dogs can exhibit periods of
2 inactivity during winter that last for months, and individuals in some parts of the range hibernate
3 (NatureServe 2012).
4

5 Habitat requirements for the Gunnison's prairie dog include level to gently sloping (less
6 than 30%) grasslands and semidesert or montane shrublands at elevations of 6,004–12,008 ft
7 (1,830–3,660 m) in high mountain valleys and plateaus. Burrows require well-drained soils and
8 are usually found on slopes or in hummocks (Seglund and Schnurr 2010; NatureServe 2012;
9 USFWS 2011). The montane portion of their habitat comprises about 40% of the total potential
10 habitat (USFWS 2008a).
11

12 The Gunnison's prairie dog has experienced a long-term population decline of 30–70%
13 throughout its range. The current distribution is estimated to be between 100 and 8,000 mi²
14 (161 and 12,875 km²) in Arizona, Colorado, New Mexico, and Utah (USFWS 2011). From
15 1916 to 2008, the habitat occupied by the Gunnison's prairie dog declined from 60,273 mi²
16 (97,000 km²) to 845–1,243 mi² (1,360–2,000 km²). Only 3.6% of potential habitat is occupied in
17 the montane portion of the range. The montane population of prairie dogs no longer has the
18 metapopulation structure necessary to recover from catastrophic events because of their small
19 population size and isolation in montane habitats (USFWS 2011). The current total population
20 size for prairie and montane populations is estimated to be between 100,000 and 1,000,000
21 (NatureServe 2012).
22

23 The Gunnison's prairie dog became a candidate for Federal listing on February 5, 2008
24 (USFWS 2008a). The listing of this species was determined to be warranted but was precluded
25 by higher-priority listing actions. The USFWS originally assigned a listing priority number of
26 two to the species because threats have a high magnitude and are imminent (USFWS 2008a). On
27 December 10, 2008, the listing priority was changed to three because listing of the Gunnison's
28 prairie dog is warranted but precluded only in the montane region of its range within Colorado
29 and New Mexico (USFWS 2008b).
30

31 The greatest threat to the Gunnison's prairie dog is the sylvatic plague
32 (NatureServe 2012). Potential threats to the Gunnison's prairie dog that may be associated with
33 the ULP activities include development and the presence of infrastructure and traffic, which
34 could result in highly fragmented habitats (Seglund and Schnurr 2010). Other threats include
35 predation and human chemical control and shooting (USFWS 2011).
36
37

38 **E.5.4 North American Wolverine** 39

40 The North American wolverine (*Gulo gulo luscus*) is a subspecies of the wolverine
41 (*G. gulo*), which has a Holarctic range. It is the largest terrestrial member of the weasel family,
42 with adult males weighing 26–40 lb (12–18 kg) and females weighing 18–26 lb (8–12 kg). It has
43 a similar appearance to a small bear with a bushy tail; round head; short, rounded ears; small
44 eyes; and claws used for digging and climbing (USFWS 2010c). It is a dark brown color with a

1 paler head and two broad yellowish stripes running from the shoulders and joining on the rump
2 (NatureServe 2012).

3
4 The North American wolverine breeds at two-years-of-age from late spring to early fall
5 and has an average of 3.4 kits per litter. Because of high rates of spontaneous abortion, rates of
6 successful reproduction are among the lowest for mammals. Gestation lasts 30–40 days.
7 Wolverines are opportunistic feeders that primarily consume carrion but will also eat small
8 animals, birds, fruits, berries, and insects. They naturally occur at low densities ranging from
9 one wolverine per 40 to 209 mi² (65 to 337 km²) (USFWS 2010c). The home range of a
10 wolverine can range from 62 to 559 mi² (100 to 900 km²) (USFWS 2011m).

11
12 Habitat requirements for the North American wolverine include 4.9 ft (1.5 m) of snow to
13 excavate natal dens. Rocky sites such as north-facing boulder talus and subalpine cirques in
14 forest openings above 8,202 ft (2,500 m) are selected for dens. Wolverines occur within a wide
15 variety of cold habitats that receive enough winter precipitation. Their range includes alpine,
16 boreal, and arctic habitats, such as boreal forests, tundra, and high-elevation alpine regions
17 (USFWS 2010c).

18
19 The North American wolverine occurs throughout Alaska, Canada, and high-elevation
20 habitats of Washington, Idaho, Montana, Wyoming, California, and Colorado. The current
21 population of the North American wolverine in the contiguous United States is estimated to be
22 between 250 and 300 with the largest population occurring in the Northern Rocky Mountains. It
23 is believed that wolverines were entirely or nearly extirpated from the contiguous United States
24 in the first half of the 20th century and currently functioning populations have reestablished in
25 two regions: the North Cascades in Washington; and the northern Rocky Mountains in Idaho,
26 Montana, and Wyoming. Wolverines are also present in the southern Rocky Mountains and the
27 Sierra Nevada Mountains; however, reestablishment of populations has not occurred in those
28 areas yet (USFWS 2010c).

29
30 The North American wolverine became a candidate for Federal listing on December 14,
31 2010 (USFWS 2010c). This decision was reached after several status reviews arose because of
32 complaints and lawsuits filed by environmental groups after the initial USFWS decision in 2003
33 that listing was not warranted (NatureServe 2012). In 2010, the listing of this species was
34 determined to be warranted but was precluded by higher-priority listing actions. USFWS
35 originally assigned a listing priority number of six to the species because threats have a high
36 magnitude but are not imminent (USFWS 2011m).

37
38 The main threat to the North American wolverine is habitat loss due to climate change
39 (USFWS 2011m). Other threats include loss of habitat due to human activities such as winter and
40 summer recreation, housing and industrial development, and extractive industry such as logging
41 (USFWS 2010c). Given the species' preference for high elevation forested areas, it is unlikely
42 for the North American wolverine to occur in areas of direct ULP activity.
43

E.6 REFERENCES

- BLM (Bureau of Land Management), 2008, *A Review of Black-Footed Ferret Reintroduction in Northwest Colorado, 2001–2006*, Technical Note 426, Aug.
- BLM, 2010, *Sage-Grouse and Sagebrush Conservation*. Available at http://www.blm.gov/wo/st/en/prog/more/sage_grouse_home2.html. Accessed Nov. 28, 2011.
- CNHP (Colorado Natural Heritage Program), 2011, *Endangered Species Act Listed Plants, Colorado Hookless Cactus*. Available at <http://www.cnhp.colostate.edu/download/projects/rareplants/list.asp?list=esa>. Accessed Nov. 25, 2011.
- Coleman, M.A., and CNHP (Colorado Natural Heritage Program), 2007, *Life-History and Ecology of the Greenback Cutthroat Trout*, prepared for the Greenback Cutthroat Trout Recovery Program, April 26. Available at http://www.cnhp.colostate.edu/download/documents/2007/GBN_Life_History-Coleman-4-26-07.pdf. Accessed Nov. 29, 2011.
- CPW (Colorado Parks and Wildlife, formerly Colorado Division of Wildlife), 2012, *Natural Diversity Information Source, Black-Footed Ferret (Mustela nigripes)*. Available at <http://ndis.nrel.colostate.edu/wildlifespx.asp?SpCode=050120>. Accessed April 17, 2012.
- Fresques, T., 2008, *Programmatic Biological Assessment for BLM’s Fluid Minerals Program in Western Colorado Re: Water Depletions and Effects on the Four Endangered Big River Fishes: Colorado pikeminnow (Ptychocheilus lucius), humpback chub (Gila cypha), bonytail chub (Gila elegans), and razorback sucker (Xyrauchen texanus)*. Available at http://westernenergyalliance.org/wp-content/uploads/uploads/Draft_OG_WD_PBA_5-5-08%20%282%29.pdf. Accessed Nov. 28, 2011.
- Goodwin, S., and W.G. Shriver, 2011, “Effects of Traffic Noise on Occupancy Patterns of Forest Birds,” *Conservation Biology* 25(2):406–411.
- Gunnison Sage-Grouse Rangewide Steering Committee, 2005, *Gunnison Sage-Grouse Rangewide Conservation Plan*, Colorado Division of Wildlife, Denver, Colo.
- Karp, K.E., and D.R. Metzler, 2006, “Moab, Utah, UMTRA Site: The Last Large Uranium Mill Tailings Pile To Be Cleaned Up in the United States,” pp. 671–682 in *Uranium in the Environment: Mining Impact and Consequences*, B.J. Merkel and A. Hasche-Berger (editors).
- Leyda, J.D., 2011, *Ecological Effects of Uranium Mining—Colorado, USA*, Leyda Consulting, Inc. Available at http://uraniumwatch.org/doe_uraniumleasingprogram/exhibitA_LCI_UranMine-Ecol-Effcts.110908.pdf. Accessed Nov. 28, 2011.
- Metzler, D.R., et al., 2008, “Ground Water Remediation at the Moab, Utah, USA, Former Uranium-Ore Processing Site,” pp. 37–44 in *Uranium Mining and Hydrogeology*, B.J. Merkel and A. Hasche-Berger (editors).

- 1 Mueller, G.A., 2006, *Ecology of Bonytail and Razorback Sucker and the Role of Off-Channel*
2 *Habitats in Their Recovery*, Scientific Investigations Report 2006-5065, U.S. Department of the
3 Interior, U.S. Geological Survey.
4
- 5 NatureServe, 2012, *NatureServe Explorer: An Online Encyclopedia of Life*, Arlington, Va.
6 Available at <http://www.natureserve.org/explorer>. Accessed April 17, 2012.
7
- 8 Seglund, A.E., and P.M. Schnurr, 2010, *Colorado Gunnison's and White-Tailed Prairie Dog*
9 *Conservation Strategy*, Colorado Division of Wildlife, Denver, Colo.
10
- 11 USFWS (U.S. Fish and Wildlife Service), 1978, "Endangered and Threatened Wildlife and
12 Plants; Listing of the Greenback Cutthroat Trout as a Threatened Species," *Federal*
13 *Register* 43:16343–16345.
14
- 15 USFWS, 1979, "Endangered and Threatened Wildlife and Plants; Determination That
16 *Sclerocactus glaucus* is a Threatened Species," *Federal Register* 44:58868–58870.
17
- 18 USFWS, 1980, "Determination That the Bonytail Chub (*Gila elegans*) is an Endangered
19 Species," *Federal Register* 45:27710–27713.
20
- 21 USFWS, 1984, "Endangered and Threatened Wildlife and Plants; Final Rule To Determine
22 *Eriogonum Pelinophilum* To Be an Endangered Species and To Designate Its Critical Habitat,"
23 *Federal Register* 49:28562–28565.
24
- 25 USFWS, 1988, *Black-Footed Ferret Recovery Plan*, Denver, Colo.
26
- 27 USFWS, 1990, *Humpback Chub Recovery Plan*, Denver, Colo. Available at http://ecos.fws.gov/docs/recovery_plan/900919c.pdf. Accessed Nov. 25, 2011.
28
29
- 30 USFWS, 1991a, "Endangered and Threatened Wildlife and Plants; Uncompahgre Fritillary
31 Butterfly Determined To Be Endangered," *Federal Register* 56:28712–28717.
32
- 33 USFWS, 1991b, "Endangered and Threatened Wildlife and Plants; the Razorback Sucker
34 (*Xyrauchen texanus*) Determined To Be an Endangered Species," *Federal Register* 56:
35 54957–54967.
36
- 37 USFWS, 1993, "Endangered and Threatened Wildlife and Plants; Final Rule To List the
38 Mexican Spotted Owl as a Threatened Species," *Federal Register* 58:14248–14271.
39
- 40 USFWS, 1994a, *Uncompahgre Fritillary Butterfly Recovery Plan*, Denver, Colo. Available at
41 http://ecos.fws.gov/docs/recovery_plan/940317.pdf. Accessed Nov. 30, 2011.
42
- 43 USFWS, 1994b, "Endangered and Threatened Wildlife and Plants; Determination of Critical
44 Habitat for the Colorado River Endangered Fishes: Razorback Sucker, Colorado Squawfish,
45 Humpback Chub, and Bonytail Chub," *Federal Register* 59:13374–13400.

- 1 USFWS, 1997, “Endangered and Threatened Wildlife and Plants; Final Determination of Critical
2 Habitat for the Southwestern Willow Flycatcher,” *Federal Register* 62:39129–39147.
3
- 4 USFWS, 1998, *Greenback Cutthroat Trout Recovery Plan*, Denver, Colo.
5
- 6 USFWS, 2000, “Endangered and Threatened Wildlife and Plants; Determination of Threatened
7 Status for the Contiguous U.S. Distinct Population Segment of the Canada Lynx and Related
8 Rule,” *Federal Register* 65:16053–16086.
9
- 10 USFWS, 2001a, “Endangered and Threatened Wildlife and Plants; Final Designation of Critical
11 Habitat for the Mexican Spotted Owl,” *Federal Register* 66:8530–8553.
12
- 13 USFWS, 2001b, “Endangered and Threatened Wildlife and Plants; Review of Plant and Animal
14 Species That Are Candidates or Proposed for Listing as Endangered or Threatened, Annual
15 Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing
16 Actions,” *Federal Register* 66:54808–54832.
17
- 18 USFWS, 2002a, *Bonytail (Gila elegans) Recovery Goals: Amendment and Supplement to the
19 Bonytail Chub Recovery Plan*, Mountain-Prairie Region 6, Denver, Colo.
20
- 21 USFWS, 2002b, *Colorado Pikeminnow (Ptychocheilus lucius) Recovery Goals: Amendment and
22 Supplement to the Colorado Squawfish Recovery Plan*, Mountain-Prairie Region 6, Denver,
23 Colo.
24
- 25 USFWS, 2002c, *Razorback Sucker (Xyrauchen texanus) Recovery Goals: Amendment and
26 Supplement to the Razorback Sucker Recovery Plan*, Prairie Region 6, Denver, Colo.
27
- 28 USFWS, 2002d, *Southwestern Willow Flycatcher Recovery Plan*, Region 2, Albuquerque, N.M.
29
- 30 USFWS, 2003, “Endangered and Threatened Wildlife and Plants; Establishment of Nonessential
31 Experimental Population Status and Reintroduction of Black-Footed Ferrets in South-Central
32 South Dakota,” *Federal Register* 68:26498–26510.
33
- 34 USFWS, 2004, “Endangered and Threatened Wildlife and Plants; Final Designation of Critical
35 Habitat for the Mexican Spotted Owl,” *Federal Register* 69:53182–53298.
36
- 37 USFWS, 2005a, “Endangered and Threatened Wildlife and Plants; Designation of Critical
38 Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*),” *Federal
39 Register* 70:60886–61009.
40
- 41 USFWS, 2005b, *Recovery Outline: Contiguous United States Distinct Population Segment of the
42 Canada Lynx*, Helena, Mont. Available at [http://ecos.fws.gov/docs/recovery_plan/final%
43 20draft%20Lynx%20Recovery%20Outline%2009-05.pdf](http://ecos.fws.gov/docs/recovery_plan/final%20draft%20Lynx%20Recovery%20Outline%2009-05.pdf). Accessed Dec. 2, 2011.
44

- 1 USFWS, 2006a, “Endangered and Threatened Wildlife and Plants; Final Listing Determination
2 for the Gunnison Sage-Grouse as Threatened or Endangered,” *Federal Register* 71:
3 19954–19982.
4
- 5 USFWS, 2006b, “Endangered and Threatened Wildlife and Plants; Designation of Critical
6 Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx,”
7 *Federal Register* 71:66008–66061.
8
- 9 USFWS, 2007, *The Colorado Pikeminnow and the Razorback Sucker*, San Juan River Basin
10 Recovery Implementation Program. Available at [http://www.fws.gov/southwest/sjrip/
11 GB_FS.cfm](http://www.fws.gov/southwest/sjrip/GB_FS.cfm). Accessed Nov. 28, 2011.
12
- 13 USFWS, 2008a, “Endangered and Threatened Wildlife and Plants; 12-Month Finding on a
14 Petition To List the Gunnison’s Prairie Dog as Threatened or Endangered,” *Federal Register*
15 73:6660–6684.
16
- 17 USFWS, 2008b, “Endangered and Threatened Wildlife and Plants; Review of Native Species
18 That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on
19 Resubmitted Petitions; Annual Description of Progress on Listing Actions,” *Federal Register*
20 73:75176–75244.
21
- 22 USFWS, 2009a, *Eriogonum pelinophilum* (Clay-Loving Wild Buckwheat) 5-Year Review:
23 *Summary and Evaluation*, Grand Junction, Colo.
24
- 25 USFWS, 2009b, “Endangered and Threatened Wildlife and Plants; Taxonomic Change of
26 *Sclerocactus Glaucus* to Three Separate Species,” *Federal Register* 74:47112–47117.
27
- 28 USFWS, 2009c, *Uncompahgre Fritillary Butterfly* (*Boloria acrocneuma*) 5-Year Review:
29 *Summary and Evaluation*, Grand Junction, Colo.
30
- 31 USFWS, 2009d, *Greenback Cutthroat Trout* (*Oncorhynchus clarki stomias*) 5-Year Review:
32 *Summary and Evaluation*, Denver, Colo.
33
- 34 USFWS, 2009e, “Endangered and Threatened Wildlife and Plants; Review of Native Species
35 That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on
36 Resubmitted Petitions; Annual Description of Progress on Listing Actions,” *Federal Register*
37 74:57804–57878.
38
- 39 USFWS, 2009f, “Endangered and Threatened Wildlife and Plants; Revised Designation of
40 Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada
41 Lynx,” *Federal Register* 74:8616–8702.
42
- 43 USFWS, 2009g, “Endangered and Threatened Wildlife and Plants; 12-Month Finding on a
44 Petition To Change the Final Listing of the Distinct Population Segment of the Canada Lynx To
45 Include New Mexico,” *Federal Register* 74:66937–66950.

- 1 USFWS, 2010a, *Recovery Outline for the Colorado Hookless Cactus* (*Sclerocactus glaucus*),
2 Region 6, Denver, Colo.
3
- 4 USFWS, 2010b, “Endangered and Threatened Wildlife and Plants; Determination for the
5 Gunnison Sage-Grouse as a Threatened or Endangered Species,” *Federal Register*
6 75:59804–59863.
7
- 8 USFWS, 2010c, “Endangered and Threatened Wildlife and Plants; 12-Month Finding on a
9 Petition To List the North American Wolverine as Endangered or Threatened,” *Federal*
10 *Register* 75:78030–78061.
11
- 12 USFWS, 2011a, *U.S. Fish and Wildlife Service Environmental Conservation Online System*,
13 *Colorado Hookless Cactus*. Available at [http://ecos.fws.gov/speciesProfile/profile/
14 speciesProfile.action?sPCODE=Q3KI](http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=Q3KI). Accessed Nov. 25, 2011.
15
- 16 USFWS, 2011b, “Endangered and Threatened Wildlife and Plants; Designation of Critical
17 Habitat for *Ipomopsis polyantha* (Pagosa Skyrocket), *Penstemon debilis* (Parachute
18 Beardtongue), and *Phacelia submutica* (Debeque Phacelia),” *Federal Register* 76:45078–45128.
19
- 20 USFWS, 2011c, “Endangered and Threatened Wildlife and Plants; Determination of Endangered
21 Status for *Ipomopsis polyantha* (Pagosa Skyrocket) and Threatened Status for *Penstemon debilis*
22 (Parachute Beardtongue) and *Phacelia submutica* (Debeque Phacelia),” *Federal Register*
23 76:45054–45075.
24
- 25 USFWS, 2011d, *Species Profile: Uncompahgre Fritillary Butterfly* (*Boloria acrocne*).
26 Available at <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=I01Q>.
27 Accessed Nov. 30, 2011.
28
- 29 USFWS, 2011e, *Federally Listed, Proposed and Candidate Species: Colorado River Fish*,
30 Wyoming Ecological Services. Available at [http://www.fws.gov/wyominges/Pages/Species/
31 Species_Listed/CORivFish.html](http://www.fws.gov/wyominges/Pages/Species/Species_Listed/CORivFish.html). Accessed Nov. 28, 2011.
32
- 33 USFWS, 2011f, *Species Profile: Greenback Cutthroat Trout* (*Oncorhynchus clarki ssp.*
34 *Stomias*). Available at [http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?
35 sPCODE=E00F](http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=E00F). Accessed Nov. 29, 2011.
36
- 37 USFWS, 2011g, *Draft Recovery Plan for the Mexican Spotted Owl* (*Strix occidentalis lucida*),
38 *First Revision*, Albuquerque, N.M.
39
- 40 USFWS, 2011h, *Species Profile: Mexican Spotted Owl* (*Strix occidentalis lucida*). Available at
41 <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B074>. Accessed
42 Nov. 30, 2011.
43

- 1 USFWS, 2011i, *Species Profile: Southwestern Willow Flycatcher* (*Empidonax traillii extimus*).
2 Available at <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B094>.
3 Accessed Nov. 28, 2011.
4
- 5 USFWS, 2011j, *Species Profile: Yellow-Billed Cuckoo* (*Coccyzus americanus*). Available at
6 <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B06R>. Accessed
7 Nov. 25, 2011.
8
- 9 USFWS, 2011k, *Species Profile: Canada Lynx* (*Lynx Canadensis*). Available at
10 <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=A073>. Accessed
11 Dec. 2, 2011.
12
- 13 USFWS, 2011l, “Endangered and Threatened Wildlife and Plants; Review of Native Species
14 That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on
15 Resubmitted Petitions; Annual Description of Progress on Listing Actions,” *Federal Register*
16 76:66370–66439.
17
- 18 USFWS, 2011m, *Species Profile: North American Wolverine* (*Gulo gulo luscus*). Available at
19 <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=A0FA>. Accessed
20 Dec. 1, 2011.
21
- 22 USFWS, 2012, *Endangered Species: Black-Footed Ferret*. Available at [http://www.fws.gov/
23 mountain-prairie/species/mammals/blackfootedferret/](http://www.fws.gov/mountain-prairie/species/mammals/blackfootedferret/). Accessed April 18, 2012.
24
- 25 Wiggins, D., 2005, *Yellow-Billed Cuckoo* (*Coccyzus americanus*): *A Technical Conservation*
26 *Assessment*, U.S. Forest Service, Rocky Mountain Region. Available at [http://www.fs.fed.us/
27 r2/projects/scp/assessments/yellowbilledcuckoo.pdf](http://www.fs.fed.us/r2/projects/scp/assessments/yellowbilledcuckoo.pdf). Accessed Nov. 25, 2011.
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APPENDIX F:
CONSULTATION CORRESPONDENCE FOR THE
URANIUM LEASING PROGRAM PROGRAMMATIC
ENVIRONMENTAL IMPACT STATEMENT

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APPENDIX F:

**CONSULTATION CORRESPONDENCE FOR THE
URANIUM LEASING PROGRAM PROGRAMMATIC
ENVIRONMENTAL IMPACT STATEMENT**

Table F-1 lists the consultation correspondence related to the ULP lease tracts discussed in this Draft ULP PEIS. Copies of the correspondence follow this table. The figure that appears on page F-62 was an attachment to all the letters that were sent on September 28, 2012.

TABLE F-1 Consultation Correspondence

Date of Letter	Page	Source	Recipient
January 9, 2012	F-7	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	White Mesa Ute Board Chairperson
January 9, 2012	F-9	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairwoman, Southern Ute Indian Tribe
January 9, 2012	F-11	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairperson, Ute Business Committee, Ute Indian Tribe
January 9, 2012	F-13	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	President of The Navajo Nation
January 9, 2012	F-15	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairman of the Hopi Tribal Council
January 9, 2012	F-17	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairman of the Ute Mountain Ute Tribe
May 2, 2012	F-19	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	President of The Navajo Nation
May 2, 2012	F-20	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairman of the Hopi Tribal Council
May 2, 2012	F-21	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairman of the Ute Mountain Ute Tribe
May 2, 2012	F-22	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	White Mesa Ute Board Chairperson
May 2, 2012	F-23	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairman of the Southern Ute Indian Tribe
May 2, 2012	F-24	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Chairperson of the Ute Business Committee, Ute Indian Tribe

TABLE F-1 (Cont.)

Date of Letter	Page	Source	Recipient
September 28, 2012	F-25	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	President of the Jicarilla Apache Tribal Council
September 28, 2012	F-27	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Kewa Pueblo Tribe
September 28, 2012	F-29	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Acoma Tribe
September 28, 2012	F-31	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo de Cochiti Tribe
September 28, 2012	F-33	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Isleta Tribe
September 28, 2012	F-35	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Jemez Tribe
September 28, 2012	F-37	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Laguna Tribe
September 28, 2012	F-39	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Nambe Tribe
September 28, 2012	F-41	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Picuris Tribe
September 28, 2012	F-43	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Pojoaque Tribe
September 28, 2012	F-45	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of San Felipe Tribe
September 28, 2012	F-47	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of San Ildefonso Tribe
September 28, 2012	F-49	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Sandia Tribe
September 28, 2012	F-51	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Santa Ana Tribe
September 28, 2012	F-53	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Santa Clara Tribe
September 28, 2012	F-55	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Taos Tribe
September 28, 2012	F-57	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Tesuque Tribe

TABLE F-1 (Cont.)

Date of Letter	Page	Source	Recipient
September 28, 2012	F-59	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Zia Tribe
September 28, 2012	F-61	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Zuni Pueblo Tribe
November 7, 2011	F-64	U.S. Department of Energy, Office of Legacy Management (T.A. Ribeiro, Environmental Program Manager)	U.S. Fish and Wildlife Service, Western Colorado Field Office (P. Gelatt, Fish and Wildlife Biologist)
November 16, 2011	F-69	U.S. Fish and Wildlife Service, Western Colorado Field Office (P. Repp, Acting Western Colorado Field Supervisor)	U.S. Department of Energy, Office of Legacy Management (T.A. Ribeiro, Environmental Program Manager)
November 20, 2012	F-71	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	President of the Jicarilla Apache Tribal Council
November 20, 2012	F-73	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Kewa Pueblo Tribe
November 20, 2012	F-75	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Jemez Tribe
November 20, 2012	F-77	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Laguna Tribe
November 20, 2012	F-79	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Nambe Tribe
November 20, 2012	F-81	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Picuris Tribe
November 20, 2012	F-83	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Pojoaque Tribe
November 20, 2012	F-85	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of San Felipe Tribe
November 20, 2012	F-87	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of San Ildefonso Tribe
November 20, 2012	F-89	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Sandia Tribe
November 20, 2012	F-91	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Santa Ana Tribe

TABLE F-1 (Cont.)

Date of Letter	Page	Source	Recipient
November 20, 2012	F-93	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Taos Tribe
November 20, 2012	F-95	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Tesuque Tribe
November 20, 2012	F-97	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Pueblo of Zia Tribe
November 20, 2012	F-99	U.S. Department of Energy, Office of Legacy Management (D.W. Geiser, Director)	Governor of the Zuni Pueblo Tribe

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Department of Energy

Washington, DC 20585

January 9, 2012

The Honorable Elayne Atcitty
White Mesa Ute Board Chairperson
White Mesa Ute Tribe
P.O. Box 7096
White Mesa, UT 84511

Dear Chairperson Atcitty:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the White Mesa Ute Tribe on the DOE *Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE-LM currently manages this uranium leasing program and administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<<http://ulpeis.anl.gov>>>.

DOE-LM has already sent a request to your office and to the Vice Chair of the White Mesa Ute Tribe asking if the agency would like to be a cooperating agency during the drafting and review of the PEIS. DOE-LM is interested in identifying the White Mesa Ute Tribe's preferences on a consultation approach for the PEIS other than participation as a NEPA cooperating agency. DOE-LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE-LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in 2012 and a Final PEIS in 2013.

As summarized below, consultation activities could include staff-to-staff technical briefings, government-to-government consultations between DOE-LM senior officials and elected Tribal leaders, Tribal Government participation during the development of the Draft PEIS, or other activities that the White Mesa Ute Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Staff-to-staff technical briefings between DOE-LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS



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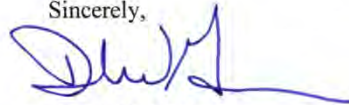
process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.

- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft EIS. As mentioned above, DOE-LM has already initiated this process via requests to a Tribal government agency to become a cooperating agency during the PEIS development. This agency has agreed to be a cooperating agency.

I would like to initiate a teleconference with government representatives of the White Mesa Ute Tribe to discuss consultation options. I would appreciate a response as to White Mesa Ute Tribe's interest in participating with DOE-LM in government-to-government consultation by January 31, 2012. If you would like to participate, please provide the dates of your availability in February 2012 with your response. I will send out invitations for our kick-off telephone conference call as soon as we receive this information.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, who is LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Laura Kilpatrick, LM
Tracy Ribeiro, LM
April Gil, LM
Deborah Sullivan, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

January 9, 2012

The Honorable Pearl Casias
Chairwoman
Southern Ute Indian Tribe
P.O. Box 737
Ignacio, CO 81137

Dear Chairwoman Casias:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Southern Ute Indian Tribe on the DOE *Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE-LM currently manages this uranium leasing program and administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<<http://ulpeis.anl.gov/>>>.

DOE-LM has already sent a request to your office asking if the agency would like to be a cooperating agency during the drafting and review of the PEIS. DOE-LM is interested in identifying the Southern Ute Indian Tribe's preferences on a consultation approach for the PEIS other than participation as a NEPA cooperating agency. DOE-LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE-LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in 2012 and a Final PEIS in 2013.

As summarized below, consultation activities could include staff-to-staff technical briefings, government-to-government consultations between DOE-LM senior officials and elected Tribal leaders, Tribal Government participation during the development of the Draft PEIS, or other activities that the Southern Ute Indian Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Staff-to-staff technical briefings between DOE-LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.



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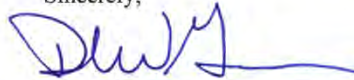
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- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft EIS. As mentioned above, DOE-LM has already initiated this process via requests to a Tribal government agency to become a cooperating agency during the PEIS development. This agency has agreed to be a cooperating agency.

I would like to initiate a teleconference with government representatives of the Southern Ute Indian Tribe to discuss consultation options. I would appreciate a response as to Southern Ute Indian Tribe's interest in participating with DOE-M in government-to-government consultation by January 31, 2012. If you would like to participate, please provide the dates of your availability in February 2012 with your response. I will send out invitations for our kick-off telephone conference call as soon as we receive this information.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, who is LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Laura Kilpatrick, LM
Tracy Ribeiro, LM
April Gil, LM
Deborah Sullivan, LM
David Conrad, CI
Michael Olguin



Department of Energy

Washington, DC 20585

January 9, 2012

The Honorable Irene Cuch
Chairperson, Ute Business Committee
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026

Dear Chairperson Cuch:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Ute Indian Tribe on the DOE *Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE-LM currently manages this uranium leasing program and administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<<http://ulpeis.anl.gov>>>.

DOE-LM has already sent a request to your office and to Mr. Rollie Wilson asking if the agency would like to be a cooperating agency during the drafting and review of the PEIS. DOE-LM is interested in identifying the Ute Indian Tribe's preferences on a consultation approach for the PEIS other than participation as a NEPA cooperating agency. DOE-LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE-LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in 2012 and a Final PEIS in 2013.

As summarized below, consultation activities could include staff-to-staff technical briefings, government-to-government consultations between DOE-LM senior officials and elected Tribal leaders, Tribal Government participation during the development of the Draft PEIS, or other activities that the Ute Indian Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Staff-to-staff technical briefings between DOE-LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS



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process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.

- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft EIS. As mentioned above, DOE-LM has already initiated this process via requests to a Tribal government agency to become a cooperating agency during the PEIS development. This agency has agreed to be a cooperating agency.

I would like to initiate a teleconference with government representatives of the Ute Indian Tribe to discuss consultation options. I would appreciate a response as to Ute Indian Tribe's interest in participating with DOE-LM in government-to-government consultation by January 31, 2012. If you would like to participate, please provide the dates of your availability in February 2012 with your response. I will send out invitations for our kick-off telephone conference call as soon as we receive this information.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, who is LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Laura Kilpatrick, LM
Tracy Ribeiro, LM
April Gil, LM
Deborah Sullivan, LM
David Conrad, CI
Rollie Wilson



Department of Energy

Washington, DC 20585

January 9, 2012

The Honorable Ben Shelley
President
The Navajo Nation
P.O. Box 7440
2000 Tribal Hill Drive
Window Rock, AZ 86515

Dear President Shelley:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with The Navajo Nation on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted following the National Environmental Policy Act (NEPA). DOE-LM currently manages this uranium leasing program and administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<<http://ulpeis.anl.gov/>>>.

DOE-LM has already sent a request to your office, the Supervisory Anthropologist, and the Tribal Historic Preservation Officer asking if the agency would like to be a cooperating agency during the drafting and review of the PEIS. DOE-LM is interested in identifying the Navajo Nation's preferences on a consultation approach for the PEIS other than participation as a NEPA cooperating agency. DOE-LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE-LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in 2012 and a Final PEIS in 2013.

As summarized below, consultation activities could include staff-to-staff technical briefings, government-to-government consultations between DOE-LM senior officials and elected Tribal leaders, Tribal Government participation during the development of the Draft PEIS, or other activities that the Navajo Nation would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Staff-to-staff technical briefings between DOE-LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.



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process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.

- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft EIS. As mentioned above, DOE-LM has already initiated this process via requests to a Tribal government agency to become a cooperating agency during the PEIS development. This agency has agreed to be a cooperating agency.

I would like to initiate a teleconference with government representatives of The Navajo Nation to discuss consultation options. I would appreciate a response as to The Navajo Nation's interest in participating with DOE LM in government-to-government consultation by January 31, 2012. If you would like to participate, please provide the dates of your availability in February 2012 with your response. I will send out invitations for our kick-off telephone conference call as soon as we receive this information.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, who is LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Laura Kilpatrick, LM
Tracy Ribeiro, LM
April Gil, LM
Deborah Sullivan, LM
David Conrad, CI
Tony H. Joe, Jr.
Dr. Alan Downer



Department of Energy

Washington, DC 20585

January 9, 2012

The Honorable Leroy Shingoitewa
Chairman
Hopi Tribal Council
P.O. Box 123
Kykotsmovi, AZ 86039

Dear Chairman Shingoitewa:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Hopi Tribal Council on the DOE *Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE-LM currently manages this uranium leasing program and administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<<http://ulpeis.anl.gov/>>>.

DOE-LM has already sent a request to your office and the Directors office asking if the agency would like to be a cooperating agency during the drafting and review of the PEIS. DOE-LM is interested in identifying the Hopi Tribal Council's preferences on a consultation approach for the PEIS other than participation as a NEPA cooperating agency. DOE-LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE-LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in 2012 and a Final PEIS in 2013.

As summarized below, consultation activities could include staff-to-staff technical briefings, government-to-government consultations between DOE-LM senior officials and elected Tribal leaders, Tribal Government participation during the development of the Draft PEIS, or other activities that the Hopi Tribal Council would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Staff-to-staff technical briefings between DOE-LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS



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process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.

- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft EIS. As mentioned above, DOE-LM has already initiated this process via requests to a Tribal government agency to become a cooperating agency during the PEIS development. This agency has declined to be a cooperating agency.

I would like to initiate a teleconference with government representatives of the Hopi Tribal Council to discuss consultation options. I would appreciate a response as to Hopi Tribal Council's interest in participating with DOE-LM in government-to-government consultation by January 31, 2012. If you would like to participate, please provide the dates of your availability in February 2012 with your response. I will send out invitations for our kick-off telephone conference call as soon as we receive this information.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, who is LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Laura Kilpatrick, LM
Tracy Ribeiro, LM
April Gil, LM
Deborah Sullivan, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

January 9, 2012

The Honorable Gary Hayes
Chairman
Ute Mountain Ute Tribe
P.O. Box JJ
Towaoc, CO 81137

Dear Chairman Hayes:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Ute Mountain Ute Tribe on the DOE *Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE-LM currently manages this uranium leasing program and administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<<http://ulpeis.anl.gov/>>>.

DOE-LM has already sent a request to your office, the Tribal Historic Preservation Officer, and the Ute Mountain Ute Agency asking if the agency would like to be a cooperating agency during the drafting and review of the PEIS. DOE-LM is interested in identifying the Ute Mountain Ute Tribe's preferences on a consultation approach for the PEIS other than participation as a NEPA cooperating agency. DOE-LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE-LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in 2012 and a Final PEIS in 2013.

As summarized below, consultation activities could include staff-to-staff technical briefings, government-to-government consultations between DOE-LM senior officials and elected Tribal leaders, Tribal Government participation during the development of the Draft PEIS, or other activities that the Ute Mountain Ute Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Staff-to-staff technical briefings between DOE-LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.



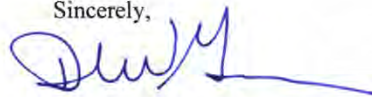
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- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft EIS. As mentioned above, DOE-LM has already initiated this process via requests to a Tribal government agency to become a cooperating agency during the PEIS development. This agency has declined to be a cooperating agency.

I would like to initiate a teleconference with government representatives of the Ute Mountain Ute Tribe to discuss consultation options. I would appreciate a response as to Ute Mountain Ute Tribe's interest in participating with DOE- LM in government-to-government consultation by January 31, 2012. If you would like to participate, please provide the dates of your availability in February 2012 with your response. I will send out invitations for our kick-off telephone conference call as soon as we receive this information.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, who is LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Laura Kilpatrick, LM
Tracy Ribeiro, LM
April Gil, LM
Deborah Sullivan, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

MAY 02 2012

The Honorable Ben Shelley
President
The Navajo Nation
P.O. Box 7440
2000 Tribal Hill Drive
Window Rock, AZ 86515

Dear President Shelley:

This letter is a follow-up to our letter dated January 9, 2012, and phone calls placed to your office on February 22, 2012, and March 7, 2012. The Department of Energy (DOE) remains interested in consultation with the Navajo Nation on the DOE *Uranium Leasing Program (ULP), Programmatic Environmental Impact Statement (PEIS)*. DOE currently administers thirty-one (31) lease tracts in the Uruavan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In addition to the request for consultation, we also sent letters to your office, the Supervisory Anthropologist, and the Tribal Historic Preservation Officer asking if the Tribe would be a cooperating agency during the drafting and review of the PEIS. DOE is now in the middle stages of developing the PEIS, with plans to issue a Draft PEIS in the fall of 2012 and a Final PEIS in 2013. We welcome your input and encourage your participation during the public participation portion of the NEPA process that is scheduled to commence this fall.

DOE continues to look for ways to improve the government-to-government consultation process with the Navajo Nation. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management

cc: Tony H. Joe, Jr., Supervisory Anthropologist
Dr. Alan Downer, Tribal Historic Preservation Officer and Department Manager
Historic Preservation



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Department of Energy

Washington, DC 20585

MAY 02 2012

The Honorable Leroy Shingoitewa
Chairman
Hopi Tribal Council
P.O. Box 123
Kykotsmovi, AZ 86039

Dear Chairman Shingoitewa:

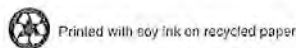
This letter is a follow-up to our letter dated January 9, 2012, and phone calls placed to your office on February 22, 2012, and March 7, 2012. The Department of Energy (DOE) remains interested in consultation with the Hopi Tribal Council on the DOE *Uranium Leasing Program (ULP), Programmatic Environmental Impact Statement (PEIS)*. DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <http://ulpeis.anl.gov/>.

In addition to the request for consultation, we also sent letters to your office and to the Directors Office asking if the Tribe would be a cooperating agency during the drafting and review of the PEIS. DOE is now in the middle stages of developing the PEIS, with plans to issue a Draft PEIS in the fall of 2012 and a Final PEIS in 2013. We welcome your input and encourage your participation during the public participation portion of the NEPA process that is scheduled to commence this fall.

DOE continues to look for ways to improve the government-to-government consultation process with the Hopi Tribal Council. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management





Department of Energy
Washington, DC 20585

MAY 02 2012

The Honorable Gary Hayes
Chairman
Ute Mountain Ute Tribe
P.O. Box JJ
Towaoc, CO 81137

Dear Chairman Hayes:

This letter is a follow-up to our letter dated January 9, 2012, and phone calls placed to your office on February 22, 2012, and March 7, 2012. The Department of Energy (DOE) remains interested in consultation with the Ute Mountain Ute Tribe on the DOE *Uranium Leasing Program (ULP), Programmatic Environmental Impact Statement (PEIS)*. DOE currently administers thirty-one (31) lease tracts in the Ute Mountain Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpcis.anl.gov/>>.

In addition to the request for consultation, we also sent letters to your office, to the Tribal Historic Preservation Officer, and to the Ute Mountain Ute Agency asking if the Tribe would be a cooperating agency during the drafting and review of the PEIS. DOE is now in the middle stages of developing the PEIS, with plans to issue a Draft PEIS in the fall of 2012 and a Final PEIS in 2013. We welcome your input and encourage your participation during the public participation portion of the NEPA process that is scheduled to commence this fall.

DOE continues to look for ways to improve the government-to-government consultation process with the Ute Mountain Ute Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management

cc: Terry Knight, Tribal Historic Preservation Officer
Priscilla Bancroft, Superintendent, Ute Mountain Ute Agency



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Department of Energy
Washington, DC 20585

MAY 02 2012

The Honorable Elayne Atcitty
White Mesa Ute Board Chairperson
White Mesa Ute Tribe
P.O. Box 7096
White Mesa, UT 84511

Dear Chairperson Atcitty:

This letter is a follow-up to our letter dated January 9, 2012, and phone calls placed to your office on February 22, 2012, and March 7, 2012. The Department of Energy (DOE) remains interested in consultation with the White Mesa Ute Tribe on the DOE *Uranium Leasing Program (ULP)*, *Programmatic Environmental Impact Statement (PEIS)*. DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In addition to the request for consultation, we also sent letters to your office and to the Vice Chair of the White Mesa Ute Tribe asking if the Tribe would be a cooperating agency during the drafting and review of the PEIS. DOE is now in the middle stages of developing the PEIS, with plans to issue a Draft PEIS in the fall of 2012 and a Final PEIS in 2013. We welcome your input and encourage your participation during the public participation portion of the NEPA process that is scheduled to commence this fall.

DOE continues to look for ways to improve the government-to-government consultation process with the White Mesa Ute Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management



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Department of Energy

Washington, DC 20585

MAY 02 2012

The Honorable Jimmy R. Newton, Jr.
Chairman
Southern Ute Indian Tribe
P.O. Box 737
Ignacio, CO 81137

Dear Chairman Newton:

This letter is a follow-up to our letter dated January 9, 2012, and phone calls placed to your office on February 22, 2012, and March 7, 2012. The Department of Energy (DOE) remains interested in consultation with the Southern Ute Indian Tribe on the DOE *Uranium Leasing Program (ULP), Programmatic Environmental Impact Statement (PEIS)*. DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In addition to the request for consultation, we also sent letters to your office asking if the Tribe would be a cooperating agency during the drafting and review of the PEIS. DOE is now in the middle stages of developing the PEIS, with plans to issue a Draft PEIS in the fall of 2012 and a Final PEIS in 2013. We welcome your input and encourage your participation during the public participation portion of the NEPA process that is scheduled to commence this fall.

DOE continues to look for ways to improve the government-to-government consultation process with the Southern Ute Indian Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management

cc: Michael Olguin, Vice Chair, Southern Ute Indian Tribe



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Department of Energy

Washington, DC 20585

MAY 02 2012

The Honorable Irene Thompson
Chairperson
Ute Business Committee
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026

Dear Chairperson Thompson:

This letter is a follow-up to our letter dated January 9, 2012, and phone calls placed to your office on February 22, 2012, and March 7, 2012. The Department of Energy (DOE) remains interested in consultation with the Ute Indian Tribe on the DOE *Uranium Leasing Program (ULP), Programmatic Environmental Impact Statement (PEIS)*. DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov>>.

In addition to the request for consultation, we also sent letters to your office and to Mr. Rollie Wilson of the Ute Indian Tribe asking if the Tribe would be a cooperating agency during the drafting and review of the PEIS. DOE is now in the middle stages of developing the PEIS, with plans to issue a Draft PEIS in the fall of 2012 and a Final PEIS in 2013. We welcome your input and encourage your participation during the public participation portion of the NEPA process that is scheduled to commence this fall.

DOE continues to look for ways to improve the government-to-government consultation process with the Ute Indian Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management

cc: Rollie Wilson, Ute Indian Tribe, Fredericks, Peebles & Morgan, LLP



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Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Levi Pestata
President
Jicarilla Apache Tribal Council
P.O. Box 507
Dulce, NM 87528

Dear President Pestata:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Jicarilla Apache Tribal Council on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Jicarilla Apache Tribal Council Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Jicarilla Apache Tribal Council Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Jicarilla Apache Tribal Council Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by



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DOE and Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Jicarilla Apache Tribal Council Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Jicarilla Apache Tribal Council Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Gifford Velarde, Director, Office of Cultural Indian Affairs
Dr. Jeff Blythe, THPO, Office of Cultural Indian Affairs
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Sisto Quintana
Governor
Kewa Pueblo Tribe
P.O. Box 99
Santo Domingo Pueblo, NM 87052

Dear Governor Quintana:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Kewa Pueblo Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Kewa Pueblo Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Kewa Pueblo Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Kewa Pueblo Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Kewa Pueblo Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Kewa Pueblo Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Randall Vicente
 Governor
 Pueblo of Acoma Tribe
 P.O. Box 309
 Acoma, NM 87034

Dear Governor Vicente:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Acoma Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Acoma Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Acoma Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Acoma Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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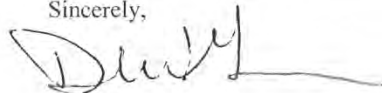
Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Acoma Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Acoma Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Theresa Pasqual, Director, Historic Preservation Office
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Phillip Quintana
Governor
Pueblo de Cochiti Tribe
P.O. Box 70
Cochiti, NM 87072

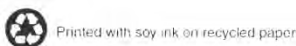
Dear Governor Quintana:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo de Cochiti Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo de Cochiti Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo de Cochiti Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo de Cochiti Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo de Cochiti Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo de Cochiti Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Vernon Garcia, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Frank E. Lujan
 Governor
 Pueblo of Isleta Tribe
 P.O. Box 1270
 Isleta, NM 87022

Dear Governor Lujan:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Isleta Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Isleta Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Isleta Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Isleta Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Isleta Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Isleta Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Dr. Henry Walt, THPO, Pueblo of Isleta Tribe
Stephanie Zuni, Administrator for Elders, Pueblo of Isleta Tribe
Valentino Jaramillo, NAGPRA Contact, Cultural Affairs Committee, Pueblo of Isleta Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

September 28, 2012

The Honorable Joshua Madalena
Governor
Pueblo of Jemez Tribe
P.O. Box 100
Jemez Pueblo, NM 87024

Dear Governor Madalena:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Jemez Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Jemez Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Jemez Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Jemez Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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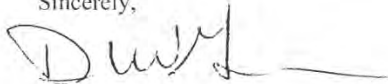
Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Jemez Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Jemez Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Christopher Toya, Traditional Cultural Properties Project Manager
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Richard B. Luarkie
Governor
Pueblo of Laguna Tribe
P.O. Box 194
Laguna, NM 87026

Dear Governor Luarkie:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Laguna Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Laguna Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Laguna Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Laguna Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



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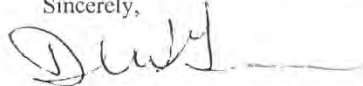
Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Laguna Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Laguna Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Robert Mooney, Sr., Records, Pueblo of Laguna Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Phillip A. Perez
Governor
Pueblo of Nambe Tribe
Route 1, Box 117-BB
Santa Fe, NM 87506

Dear Governor Perez:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Nambe Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Nambe Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Nambe Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Nambe Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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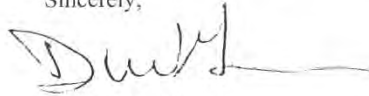
Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Nambe Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Nambe Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Ernest Mirabal, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Gerald Nailor
Governor
Pueblo of Picuris Tribe
P.O. Box 127
Penasco, NM 87553

Dear Governor Nailor:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Picuris Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Picuris Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Picuris Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Picuris Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Picuris Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Picuris Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Christy Van Buren, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable George Rivera
Governor
Pueblo of Pojoaque Tribe
78 Cities of Gold Road
Santa Fe, NM 87506

Dear Governor Rivera:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Pojoaque Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

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DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Pojoaque Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Pojoaque Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



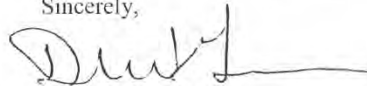
Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Pojoaque Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Pojoaque Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Vernon Lujan, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Anthony Ortiz
Governor
Pueblo of San Felipe Tribe
P.O. Box 4339
San Felipe Pueblo, NM 87001

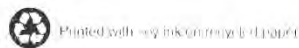
Dear Governor Ortiz:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of San Felipe Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of San Felipe Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of San Felipe Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of San Felipe Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



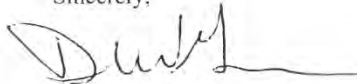
Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of San Felipe Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of San Felipe Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Sarah Candelaria, NAGPRA Contact, Tribal Administrator
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Terry Aguilar
Governor
Pueblo of San Ildefonso Tribe
Route 5, P.O. Box 315-A
Santa Fe, NM 87506

Dear Governor Aguilar:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of San Ildefonso Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of San Ildefonso Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of San Ildefonso Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of San Ildefonso Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of San Ildefonso Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of San Ildefonso Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Brain Montoya, NAGPRA Contact, Pueblo of San Ildefonso Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

September 28, 2012

The Honorable Malcolm Montoya
Governor
Pueblo of Sandia Tribe
481 Sandia Loop
Bernalillo, NM 87004

Dear Governor Montoya:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Sandia Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Sandia Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Sandia Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Sandia Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Sandia Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Sandia Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Frank Chaves, Environmental Department Director
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Ernest J. Lujan
Governor
Pueblo of Santa Ana Tribe
Two Dove Road
Santa Ana Pueblo, NM 87004

Dear Governor Lujan:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Santa Ana Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Santa Ana Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Santa Ana Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Santa Ana Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



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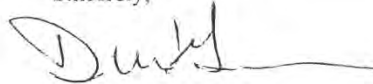
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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Santa Ana Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Santa Ana Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Ben Robbins, Tribal Resource Administrator
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

September 28, 2012

The Honorable Walter Dasheno
Governor
Pueblo of Santa Clara Tribe
P.O. Box 580
Espanola, NM 87532

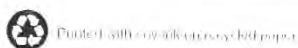
Dear Governor Dasheno:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Santa Clara Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

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DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Santa Clara Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

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Tribal Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Santa Clara Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Santa Clara Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Ben Chavarria, NAGPRA Contact, Land Claims Office
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Lorian B. Romero
Governor
Pueblo of Taos Tribe
P.O. Box 1846
Taos, NM 87571

Dear Governor Romero:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Taos Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Pueblo of Taos Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Taos Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Taos Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Taos Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Taos Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Gilbert Suazo Sr., Lt. Governor, Pueblo of Taos tribe
Tina Romero, Executive Assistant
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI

**Department of Energy**

Washington, DC 20585

September 28, 2012

The Honorable Ramos Romero
Governor
Pueblo of Tesuque Tribe
Route 42, P.O. Box 360-T
Santa Fe, NM 87506

Dear Governor Romero:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Tesuque Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

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DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Tesuque Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Pueblo of Tesuque Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and



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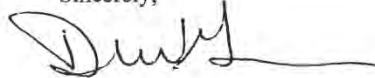
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- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Tesuque Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Tesuque Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Charles Dorame, Pueblo of Tesuque Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Wilfred Shije
Governor
Pueblo of Zia Tribe
135 Capitol Square Drive
Zia Pueblo, NM 87053-6013

Dear Governor Shije:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Pueblo of Zia Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

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DOE LM would like to invite you into the process at this point and is interested in identifying the Pueblo of Zia Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

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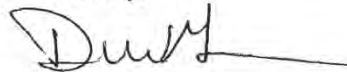
Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Pueblo of Zia Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Pueblo of Zia Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Peter Pino, NAGPRA Contact for CO/UT
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

September 28, 2012

The Honorable Arlen P. Quetawki, Sr.
Governor
Zuni Pueblo Tribe
P.O. Box 339
Zuni, NM 87327

Dear Governor Quetawki:

The purpose of this letter is to communicate the Department of Energy (DOE) Office of Legacy Management's (LM) interest in consulting with the Zuni Pueblo Tribe on the DOE Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS) being conducted in accordance with the National Environmental Policy Act (NEPA). A PEIS evaluates the environmental impacts of broad agency actions, such as those that may be associated with the ULP. Under the ULP, the DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel counties in western Colorado that cover a cumulative area of approximately 25,000 acres. Attached is a map of the lease tracts.

Activities related to these lease sites are being analyzed in the PEIS, as discussed on the ULP PEIS website at <http://ulpeis.anl.gov/>. DOE LM has already begun the NEPA process for the PEIS by having public scoping meetings and completing the initial, internal draft of the PEIS. Currently, DOE LM is addressing comments by cooperating agencies provided during the internal review of the draft PEIS. The Bureau of Land Management (BLM) is one of the cooperating agencies, specifically the Tres Rios Field Office. Based on the BLM's previous activities in the areas around the ULP lease tracts and their knowledge of ancestral range of tribes connected with the Mesa Verde region, the BLM identified the Zuni Pueblo Tribe as a group that we should contact for tribal consultation.

DOE LM would like to invite you into the process at this point and is interested in identifying the Zuni Pueblo Tribe's preferences on a consultation approach for the PEIS. DOE LM plans to incorporate the consultation activities into its schedule for issuing the PEIS. DOE LM is in the early stages of developing the PEIS, with plans to issue a Draft PEIS in early 2013 and a Final PEIS in late 2013.

As detailed below, government-to-government consultations between DOE LM senior officials and elected Tribal leaders could include staff-to-staff technical briefings, Tribal Government participation during the development of the Draft PEIS, or other activities that the Zuni Pueblo Tribe would like to propose consistent with established policies and protocols. These approaches have been successfully used by DOE and Tribal



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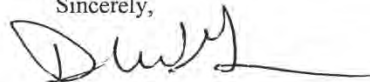
Governments in developing EIS documents that include Tribal Nation concerns and perspectives.

- Formal government-to-government consultations between senior DOE officials and elected Tribal officials can be conducted at agreed upon points in the PEIS process to further ensure that Tribal rights, values, and interests are identified and considered in pertinent decision-making on the ULP activities.
- Staff-to-staff technical briefings between DOE LM and Tribal Government representatives can be used to share information, obtain Tribal Government input on technical issues, and identify possible topics for discussion during government-to-government consultations. Tribal officials would be welcome to participate in the technical briefings, although the briefings themselves would not be considered formal consultation.
- Participation in the development of the ULP PEIS can include Tribal Nations providing review and comment on the Draft PEIS.

I would appreciate a response as to Zuni Pueblo Tribe's interest in participating with DOE LM in government-to-government consultation by **October 12, 2012**. Based on your response, I will then initiate follow-up actions with the Zuni Pueblo Tribe to address your consultation preferences.

If you should have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-8324 or Tony Carter at (202) 586-3323, LM's Programmatic Headquarters point of contact for Tribal Nations.

Sincerely,



David W. Geiser
Director
Office of Legacy Management

cc: Arden Kucate, Head Councilman, Zuni Pueblo Tribe
Kurt Dongoske, Acting Director, Historic Preservation
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI

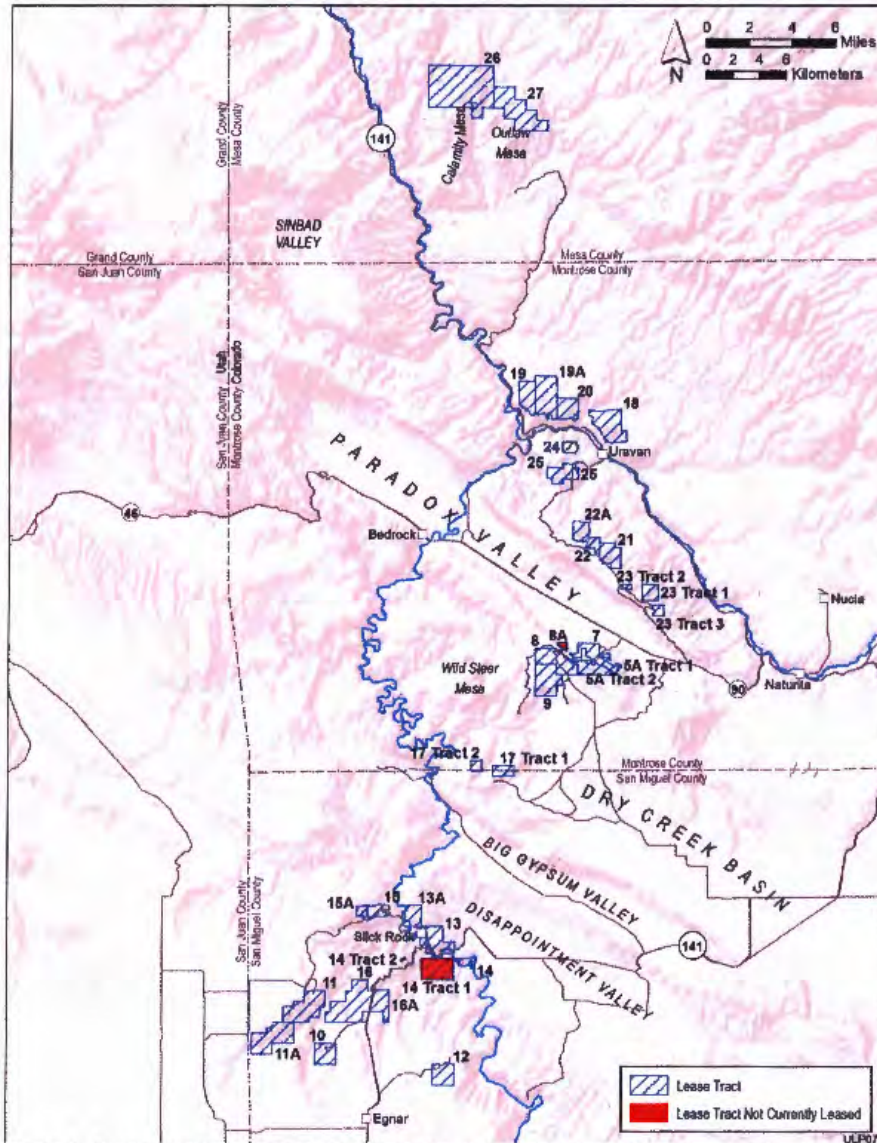


Figure 1. Locations of lease tracts to be potentially administered by the Department of Energy under the Uranium Leasing Program.

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Department of Energy
Washington, DC 20585

November 7, 2011

Ms. Patty Gelatt
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
Western Colorado Field Office
764 Horizon Drive, Building B
Grand Junction, CO 81506-3946

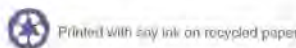
Subject: Initiation of Endangered Species Act Informal Consultation for the
Department of Energy's Uranium Leasing Program

Dear Ms. Gelatt:

The U.S. Department of Energy Office of Legacy Management (DOE) is preparing a Programmatic Environmental Impact Statement (PEIS) to evaluate potential impacts associated with the management of DOE's Uranium Leasing Program (ULP), under which DOE administers tracts of land for the exploration, development, and extraction of uranium and vanadium ores. The PEIS is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended, following implementing regulations developed by the President's Council on Environmental Quality in 40 CFR Parts 1500-1508 and DOE's NEPA implementing procedures provided in 10 CFR Part 1021. The PEIS will analyze potential impacts to environmental resources including those involving threatened or endangered species. The Notice of Intent for the PEIS was published in the Federal Register on June 21, 2011 (76 FR 36097). Public scoping meetings for the PEIS were conducted on August 8-11, 2011 at Montrose, Telluride, and Naturita, in Colorado, and at Monticello, in Utah.

DOE's ULP includes tracts of land located in Mesa, Montrose, and San Miguel Counties, Colorado, that cover a cumulative acreage of approximately 25,000 acres. The locations of the ULP lease tracts are shown in Figure 1 of the Attachment.

By this letter, DOE is initiating informal consultation with the U.S. Fish and Wildlife Service (USFWS) under the provisions of the Endangered Species Act of 1973, as amended (ESA). DOE has identified a preliminary list of species that may be listed as endangered, threatened, or species that are proposed or candidates for listing under the ESA that may occur in the counties where DOE's ULP lease tracts are located (see Table 1 of the Attachment). In addition, our preliminary determination indicates that there are no critical habitats on DOE's ULP lease tracts. The nearest critical habitats are indicated in Figure 2 of the Attachment and are about twenty miles from the nearest DOE ULP lease tract(s). DOE requests a letter from your office concurring with or commenting on this preliminary list and the preliminary determination of critical habitat locations. Finally, please provide any other information you consider appropriate during the consultation process.



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Ms. Patty Gelatt

-2-

DOE and its PEIS contractor (Argonne National Laboratory) will be contacting you and members of your staff in the near future to coordinate this effort. DOE looks forward to further consultation and coordinating activities with the USFWS on potential impacts, if any, of the ULP to federally-listed species.

Please do not hesitate to contact me if you have any questions on the ULP project at (970) 248-6621, or by e-mail at Tracy.Ribeiro@lm.doe.gov. Please send any correspondence to:

U.S. Department of Energy
Office of Legacy Management
2597 Legacy Way
Grand Junction, CO 81503

Sincerely,



Tracy A. Ribeiro
Environmental Program Manager

Enclosures

cc w/enclosures:

M. Picel, Argonne National Laboratory (e)
D. Geiser, DOE (e)
L. Kilpatrick, DOE (e)
T. Pauling, DOE (e)
S. Schiesswohl, DOE (e)
E. Cotter, Stoller (e)

ULP webpage
<http://ulpeis.anl.gov>

ATTACHMENTS

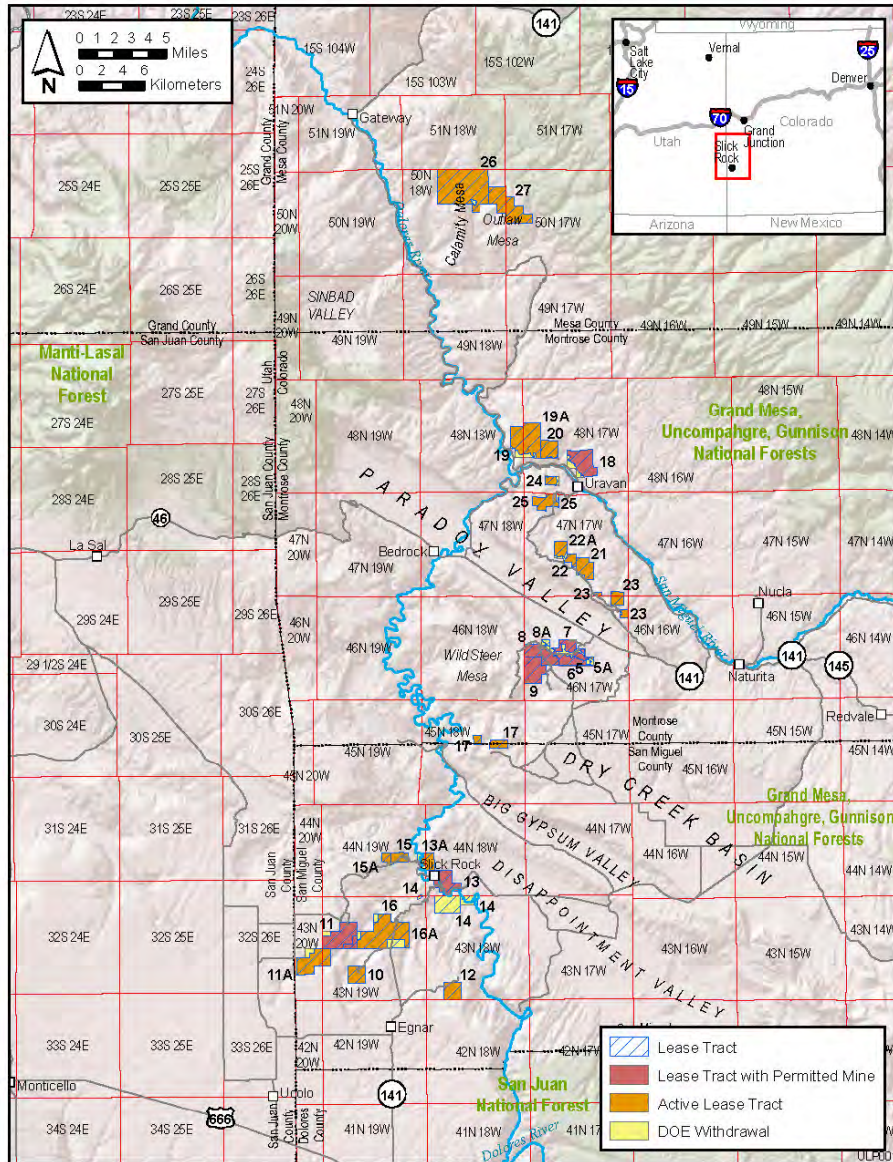


FIGURE 1 – Location of DOE ULP Lease Tracts in Mesa, Montrose, and San Miguel Counties, Colorado

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TABLE 1 – Species Listed as Endangered or Threatened Under the Endangered Species Act, or Species That are Proposed or Candidates for Listing Under the Endangered Species Act That May Occur in the Counties Where DOE ULP Lease Tracts are Located

Scientific Name	Common Name	Status ^a	Counties in Which Species May Occur	Counties in Which Critical Habitat May Occur
Plants				
<i>Phacelia submutica</i>	Debeque phacelia	PT	Mesa	
<i>Eriogonum pelinophilum</i>	Clay-loving wild buckwheat	E	Montrose	
<i>Sclerocactus glaucus</i>	Colorado hookless cactus	T	Mesa, Montrose	
Invertebrates				
<i>Boloria acrocnema</i>	Uncompahgre fritillary butterfly	E	San Miguel	
Fish				
<i>Gila cypha</i>	Humpback chub	E	Mesa, Montrose, San Miguel	Mesa ^b
<i>Gila elegans</i>	Bonytail	E	Mesa, Montrose, San Miguel	Mesa ^b
<i>Oncorhynchus clarki stomias</i>	Greenback cutthroat trout	T	Mesa	
<i>Ptychocheilus lucius</i>	Colorado pikeminnow	E	Mesa, Montrose, San Miguel	Mesa ^b
<i>Xyrauchen texanus</i>	Razorback sucker	E	Mesa, Montrose, San Miguel	Mesa ^b
Birds				
<i>Centrocercus minimus</i>	Gunnison sage-grouse	C	Mesa, Montrose, San Miguel	
<i>Centrocercus urophasianus</i>	Greater sage-grouse	C	Mesa, Montrose, San Miguel	
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	C	Mesa, Montrose, San Miguel	
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	E	San Miguel	
<i>Strix occidentalis lucida</i>	Mexican spotted owl	T	Montrose, San Miguel	
Mammals				
<i>Cynomys gunnisoni</i>	Gunnison's prairie dog	C	Montrose	
<i>Lynx canadensis</i>	Canada lynx	T	Mesa, Montrose, San Miguel	
<i>Mustela nigripes</i>	Black-footed ferret	E	Montrose, San Miguel	

^a C = candidate; E = endangered; PT = proposed threatened; T = threatened.

^b Designated critical habitats for these species are located outside the DOE ULP lease tracts (on the Colorado and Gunnison Rivers).

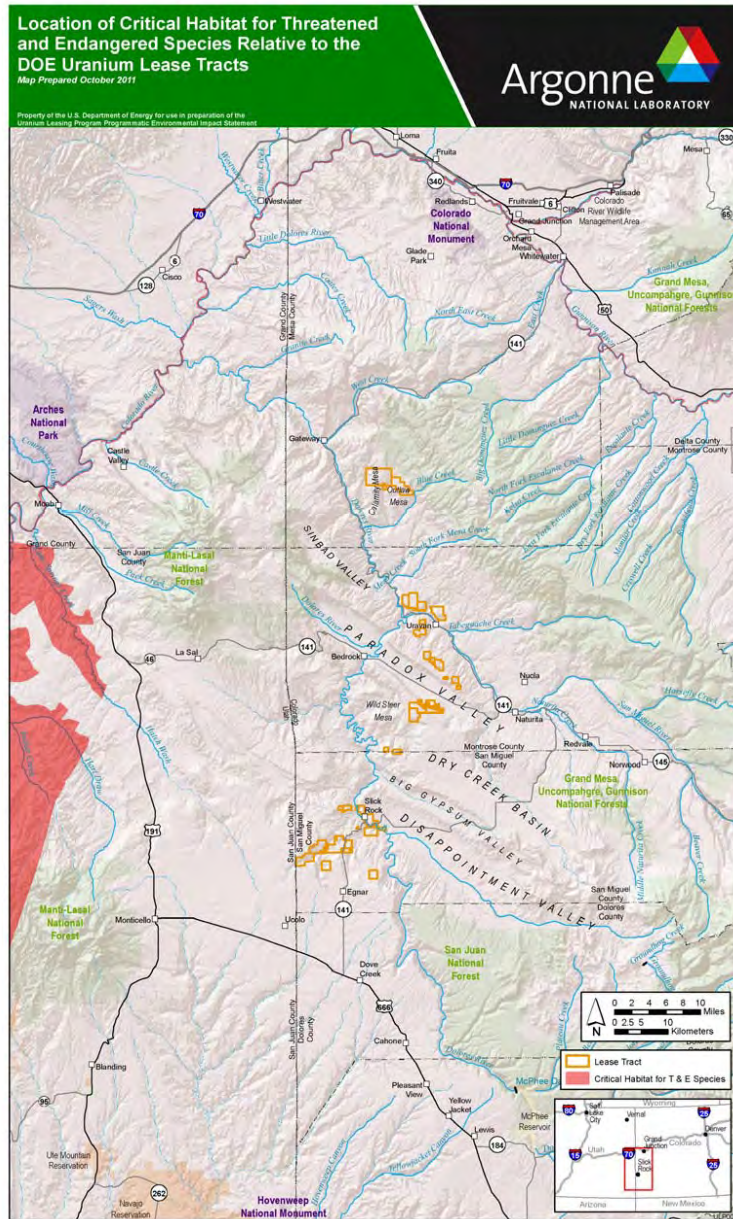


FIGURE 2 – Location of Designated Critical Habitats Relative to the DOE ULP Lease Tracts

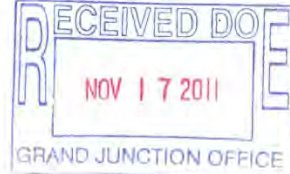
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
ES/CO: DOE
TAILS: 06E24100-2012-TA-0033



November 16, 2011

Tracy A. Ribeiro
Environmental Manager
US Department of Energy
Office of Legacy Management
Grand Junction, CO 81503

Dear Ms. Ribeiro:

This responds to your November 7, 2011, correspondence regarding the US Department of Energy, Office of Legacy Management (DOE) Uranium Leasing Program (ULP). We understand that you are preparing a Programmatic Environmental Impact Statement to evaluate the potential impacts of the ULP in Mesa, Montrose, and San Miguel Counties, Colorado.

You submitted a preliminary list of federally endangered, threatened, and candidate species that may occur in the counties where DOE's ULP lease tracts are located. We discussed your preliminary species list in our meeting on November 9, and concluded that it is an appropriate list with the following exceptions: 1) remove greater sage-grouse (*Centrocercus urophasianus*) because this candidate species does not occur in Mesa, Montrose, or San Miguel Counties, and 2) add North American wolverine (*Gulo gulo luscus*) because this candidate species may occur in Mesa, Montrose, or San Miguel Counties. You should determine what species on the list occur in the ULP areas, or may be affected by the ULP. Your biological assessment should provide an analysis of how the ULP may affect listed species.

One or more candidate species potentially occur within the project area. Federal candidates for official listing as threatened or endangered have no legal protection under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). However, it is within the spirit of the Act to consider project impacts to these species.

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In the future, we recommend that DOE and its contractors use our web-based Information Planning and Conservation system (IPAC) (<http://ecos.fws.gov/ipac/>) to obtain an official species list. If the Service can be of further assistance, please contact Patty Gelatt at the letterhead address or (970) 243-2778, extension 26.

Sincerely,



Pamela Repp
Acting Western Colorado Field Supervisor



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Levi Pesata
President
Jicarilla Apache Tribal Council
P.O. Box 507
Dulce, NM 87528

Dear President Pesata:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Jicarilla Apache Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Jicarilla Apache Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", written over a horizontal line.

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Gifford Velarde, Director, Office of Cultural Indian Affairs
Dr. Jeff Blythe, THPO, Office of Cultural Indian Affairs
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Sisto Quintana
Governor
Kewa Pueblo Tribe
P.O. Box 99
Santo Domingo Pueblo, NM 87052

Dear Governor Quintana:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Kewa Pueblo Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Kewa Pueblo Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", with a long horizontal line extending to the right.

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Joshua Madalena
Governor
Pueblo of Jemez Tribe
P.O. Box 100
Jemez Pueblo, NM 87024

Dear Governor Madalena:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Jemez Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Jemez Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", with a long horizontal flourish extending to the right.

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Christopher Toya, Traditional Cultural Properties Project Manager
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Richard B. Luarkie
Governor
Pueblo of Laguna Tribe
P.O. Box 194
Laguna, NM 87026

Dear Governor Luarkie:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Laguna Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Laguna Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "David W. Geiser".

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Robert Mooney, Sr., Records, Pueblo of Laguna Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

November 20, 2012

The Honorable Phillip A. Perez
Governor
Pueblo of Nambe Tribe
Route 1, Box 117-BB
Santa Fe, NM 87506

Dear Governor Perez:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Nambe Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Nambe Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Ernest Mirabal, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Gerald Nailor
Governor
Pueblo of Picuris Tribe
P.O. Box 127
Penasco, NM 87553

Dear Governor Nailor:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012 communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Picuris Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Picuris Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser".

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Christy Van Buren, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable George Rivera
Governor
Pueblo of Pojoaque Tribe
78 Cities of Gold Road
Santa Fe, NM 87506

Dear Governor Rivera:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Pojoaque Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Pojoaque Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", written over a horizontal line.

David W. Geiser
Director
Office of Legacy Management



Printed with soy ink on recycled paper

cc: Vernon Lujan, NAGPRA Representative
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

November 20, 2012

The Honorable Anthony Ortiz
Governor
Pueblo of San Felipe Tribe
P.O. Box 4339
San Felipe Pueblo, NM 87001

Dear Governor Ortiz:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of San Felipe Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of San Felipe Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

David W. Geiser
Director
Office of Legacy Management



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cc: Sarah Candelaria, NAGPRA Contact, Tribal Administrator
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

November 20, 2012

The Honorable Terry Aguilar
Governor
Pueblo of San Ildefonso Tribe
Route 5, P.O. Box 315-A
Santa Fe, NM 87506

Dear Governor Aguilar:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of San Ildefonso Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of San Ildefonso Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", written over a horizontal line.

David W. Geiser
Director
Office of Legacy Management



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cc: Brain Montoya, NAGPRA Contact, Pueblo of San Ildefonso Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI

November 20, 2012



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Malcolm Montoya
Governor
Pueblo of Sandia Tribe
481 Sandia Loop
Bernalillo, NM 87004

Dear Governor Montoya:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Sandia Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Sandia Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "David W. Geiser".

David W. Geiser
Director
Office of Legacy Management



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cc: Frank Chaves, Environmental Department Director
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Ernest J. Lujan
Governor
Pueblo of Santa Ana Tribe
Two Dove Road
Santa Ana Pueblo, NM 87004

Dear Governor Lujan:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Santa Ana Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Santa Ana Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "David W. Geiser", with a long horizontal flourish extending to the right.

David W. Geiser
Director
Office of Legacy Management



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cc: Ben Robbins, Tribal Resource Administrator
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Lorian B. Romero
Governor
Pueblo of Taos Tribe
P.O. Box 1846
Taos, NM 87571

Dear Governor Romero:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Taos Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Taos Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "David W. Geiser", with a long horizontal flourish extending to the right.

David W. Geiser
Director
Office of Legacy Management



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cc: Gilbert Suazo Sr., Lt. Governor, Pueblo of Taos tribe
Tina Romero, Executive Assistant
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plieness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Ramos Romero
Governor
Pueblo of Tesuque Tribe
Route 42, P.O. Box 360-T
Santa Fe, NM 87506

Dear Governor Romero:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Tesuque Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Tesuque Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "David W. Geiser".

David W. Geiser
Director
Office of Legacy Management



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cc: Charles Dorame, Pueblo of Tesuque Tribe
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy
Washington, DC 20585

November 20, 2012

The Honorable Wilfred Shije
Governor
Pueblo of Zia Tribe
135 Capitol Square Drive
Zia Pueblo, NM 87053-6013

Dear Governor Shije:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Pueblo of Zia Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Pueblo of Zia Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", with a long horizontal flourish extending to the right.

David W. Geiser
Director
Office of Legacy Management



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cc: Peter Pino, NAGPRA Contact for CO/UT
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI



Department of Energy

Washington, DC 20585

November 20, 2012

The Honorable Arlen P. Quetawki, Sr.
Governor
Zuni Pueblo Tribe
P.O. Box 339
Zuni, NM 87327

Dear Governor Quetawki:

This letter is a follow-up to the letter dated September 28, 2012 and phone call placed to your office on October 24, 2012, communicating the Department of Energy (DOE) interest in consulting with the Zuni Pueblo Tribe on the DOE *Uranium Leasing Program (ULP)*, specifically on the *Programmatic Environmental Impact Statement (PEIS)* being conducted following the National Environmental Policy Act (NEPA). DOE currently administers thirty-one (31) lease tracts in the Uravan Mineral Belt in southwestern Colorado. Twenty-nine (29) of these lease tracts are actively held under lease. Activities related to these lease sites are being analyzed in the PEIS, as discussed on the dedicated web page <<http://ulpeis.anl.gov/>>.

In the inquiry letter on consultation, DOE identified three approaches to government-to-government consultations for your consideration in the event you deemed it appropriate to participate in the PEIS process. DOE is currently reviewing the Draft PEIS with the cooperating agencies; comments are due by November 30, 2012. DOE plans to issue a Draft PEIS for public review in February 2013 and a Final PEIS in late 2013. We welcome your input and encourage your participation in the NEPA process.

DOE continues to look for ways to improve the government-to-government consultation process with the Zuni Pueblo Tribe. We invite any suggestions or advice you might have to improve this process. If you have any questions concerning the ULP PEIS, please do not hesitate to contact me at (202) 586-7550 or Tony Carter at (202) 586-3323, my headquarters representative for activities with Tribal Nations.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Geiser", with a long horizontal flourish extending to the right.

David W. Geiser
Director
Office of Legacy Management



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cc: Arden Kucate, Head Councilman, Zuni Pueblo Tribe
Kurt Dongoske, Acting Director, Historic Preservation
Thomas C. Pauling, LM
Tony Carter, LM
Ray Plienness, LM
Tracy Ribeiro, LM
David Conrad, CI

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**APPENDIX G:
LIST OF PREPARERS**

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**APPENDIX G:
LIST OF PREPARERS**

Table G-1 lists the U.S. Department of Energy (DOE) management team members for the Uranium Leasing Program (ULP) Programmatic Environmental Impact Statement (PEIS). Table G-2 lists the names, education, and expertise of the ULP PEIS preparers (all are at Argonne National Laboratory). In addition, Ed Cotter of Stoller Corporation provided valuable project insight and information on the ULP for the preparation of this Draft ULP PEIS.

TABLE G-1 DOE Management Team

Name	Office	Title
<i>U.S. Department of Energy</i>		
David S. Shafer	DOE Office of Legacy Management	Acting Director, Office of Site Operations
Raymond M. Plieness	DOE Office of Legacy Management	ULP PEIS Document Manager and Acting Team Leader, Asset Management Team
Tracy A. Ribeiro	DOE Office of Legacy Management	NEPA Compliance Manager
Laura E. Kilpatrick	DOE Office of Legacy Management	ULP Program Manager

1 **TABLE G-2 ULP PEIS Preparers**

Name	Education/Expertise	Contribution
<i>Argonne National Laboratory</i>		
Timothy Allison	M.S., Mineral and Energy Resource Economics; M.A., Geography; 26 years of experience in regional analysis and economic impact analysis	Socioeconomics, environmental justice
Kevin J. Beckman	B.S., Mathematics and Computer Science; 1 year of experience in Web programming and visual impact analysis	Public web site development and technical support for visual impact analysis
Bruce Biwer	Ph.D., Chemistry; 20 years of experience in environmental assessment and transportation risk analysis	Transportation
Brian Cantwell	B.S., Forestry, 26 years of experience in cartography and GIS	GIS
Young-Soo Chang	Ph.D., Chemical Engineering; 21 years of experience in air quality and noise impact analysis	Climate, air quality, noise
Jing-Jy Cheng	Ph.D., Polymer Science and Engineering; 19 years of experience in computer model development and applications for human health and ecological risk assessments	Human health impacts
Karl Fischer	B.S.E., Nuclear Engineering; M.Eng., Radiological Health Engineering; 13 years of relevant experience for assessing cumulative impacts	Cumulative impacts
Linda Graf	Desktop publishing specialist; 39 years of experience in creating, revising, formatting, and printing documents	Document assembly and production
Elizabeth Hocking	J.D.; 18 years of experience in environmental and energy policy analysis	Applicable laws, regulations, and other requirements

TABLE G-2 (Cont.)

Name	Education/Expertise	Contribution
Mary Moniger	B.A., English; 30 years of experience in technical editing and writing	Technical editor
Ellen Moret	M.P.P., Public Policy; B.A., Environmental Studies; 6 years of experience in environmental assessment	Socioeconomic
Michele Nelson	Certificate of Design; 32 years of experience in graphic design and technical illustration	Graphic designer
Terri Patton	M.S., Geology; 22 years of experience in environmental research and assessment	Geology, land use; cumulative impacts
Mary Picel	M.S., Environmental Health Sciences; 23 years of experience in environmental assessment, risk assessment, and waste management	Project manager, document manager, development of alternatives and programmatic topics, human health impacts, waste management, cumulative impacts
Robert Sullivan	M.L.A., Landscape Architecture; 21 years of experience in visual impact analysis and simulation; 13 years in web site development	Visual impact analysis
Robert A. Van Lonkhuyzen	B.A., Biology; 20 years of experience in ecological research and environmental assessment	Ecological resources analysis (plant communities/habitats)
Bruce Verhaaren	Ph.D., Archaeology; 20 years of experience in archaeological analysis; 16 years in environmental assessment and records management	Native American concerns analysis
William S. Vinikour	M.S. and B.S., Biology with environmental emphasis; 34 years of experience in ecological research and environmental assessment	Ecological resources analysis (wildlife and aquatic biota)
Leroy J. Walston, Jr.	M.S., Biology; 5 years of experience in ecological research and environmental assessment	Ecological resources analysis (special status species)

TABLE G-2 (Cont.)

Name	Education/Expertise	Contribution
Eugene Yan	Ph.D., Hydrogeology; 15 years of experience in hydrological studies, environmental remediation, and water resources assessment.	Water resources
Emily A. Zvolanek	B.A., Environmental Science; 2 years of experience in GIS mapping	GIS mapping

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**APPENDIX H:
CONTRACTOR DISCLOSURE STATEMENT**

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APPENDIX H:
CONTRACTOR DISCLOSURE STATEMENT

Argonne National Laboratory is the contractor assisting the U.S. Department of Energy (DOE) in preparing the Uranium Leasing Program (ULP) programmatic environmental impact statement (PEIS). DOE is responsible for reviewing and evaluating the information and determining the appropriateness and adequacy of incorporating any data, analyses, or results in the PEIS. DOE determines the scope and content of the PEIS and supporting documents and will furnish direction to Argonne, as appropriate, in preparing these documents.

The Council on Environmental Quality’s regulations (40 CFR 1506.5(c)), which have been adopted by DOE (10 CFR Part 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 the purposes of this disclosure is defined on pages 18026–18038 in Volume 46 of the *Federal Register* of March 23, 1981, under “Forty Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations” at Questions 17a and 17b. It states that financial or other interest in the outcome of the project includes “any financial benefit such as promise of future construction or design work on the project, as well as indirect benefits the consultant is aware of (e.g., if the project would aid proposals sponsored by the firm’s other clients)” (46 FR 18026–18038).

In accordance with these regulations, Argonne National Laboratory hereby certifies that it has no financial or other interest in the outcome of the project.

Certified by:


Signature

John R. Krummel

Name

Director, Environmental Science Division

Title

May 1, 2012

Date

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