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ENVIRONMENTAL ASSESSMENT

FOR RECLAMATION OF THE BURRO MINES COMPLEX IN SAN MIGUEL COUNTY, COLORADO

Draft

AUGUST 2020

U.S. DEPARTMENT OF ENERGY | Legacy Management

DRAFT

ENVIRONMENTAL ASSESSMENT FOR RECLAMATION OF THE BURRO MINES COMPLEX IN SAN MIGUEL COUNTY, COLORADO

U.S. Department of Energy
Office of Legacy Management

August 2020

Prepared by
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GENERAL ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
AEA	Atomic Energy Act of 1954
AQRV	air quality related value
BA	Biological Assessment
BLM	U.S. Bureau of Land Management
BMP	best management practice
BO	Biological Opinion
BOR	U.S. Bureau of Reclamation
CAA	Clean Air Act
CDA	Colorado Department of Agriculture
CDPHE	Colorado Department of Public Health and Environment
CDWR	Colorado Division of Water Resources
CEQ	Council on Environmental Quality
CPW	Colorado Parks and Wildlife
CR	County Road
CWA	Clean Water Act
DOE	U.S. Department of Energy
DOJ	U.S. Department of Justice
DRMS	Colorado Division of Reclamation, Mining and Safety
EA	Environmental Assessment
EIS	Environmental Impact Statement
E.O.	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FTE	full-time equivalent
GHG	greenhouse gas
GIS	geographic information system
GPS	Global Positioning System
HFC	hydrofluorocarbon
ICRP	International Commission on Radiation Protection
L_{dn}	day-night average sound level
L_{eq}	equivalent-continuous sound level
LM	Office of Legacy Management

MCL	maximum concentration limit
MSHA	Mine Safety and Health Administration
NAAQS	National Ambient Air Quality Standards
NCDC	National Climate Data Center
NCES	National Center for Education Statistics
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966, as amended
NIOSH	National Institute for Occupational Safety and Health
NLCS	National Land Conservation System
NPS	National Park Service
NRC	Nuclear Regulatory Commission
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
PEIS	Programmatic Environmental Impact Statement
PFC	perfluorocarbons
PFYC	Potential Fossil Yield Classification
P.L.	Public Law
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter of 2.5 µm or less
PM_{10}	particulate matter with an aerodynamic diameter of 10 µm or less
PWS	public water supply
RMP	Resource Management Plan
ROI	region of influence
SH	State Highway
SHPO	State Historic Preservation Office
SRMA	Special Recreation Management Area
SWReGAP	Southwest Regional Gap Analysis Project
TDS	total dissolved solids
ULP	Uranium Leasing Program
Umetco	Umetco Minerals Corporation
UMTRCA	Uranium Mill Tailings Radiation Control Act
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRI	Visual Resource Inventory
VRM	Visual Resource Management
WLM	working level month
WSA	Wilderness Study Area

CHEMICALS

CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
O_3	ozone
Pb	lead
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
SO_x	sulfur oxides

UNITS OF MEASURE

ac-ft	acre-foot (feet)
cm	centimeters
dB	decibel dB
dBA	A-weighted decibel(s)
ft	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)
g	gram(s)
gal	gallon(s)
ha	hectare(s)
hr	hour(s)
Hz	Hertz
in.	inch(es)
kg	kilogram(s)
km	kilometer(s)
L	liter(s)
m	meter(s)
m^3	cubic meter(s)
mg	milligram(s)
mi	mile(s)
mi^2	square mile(s)
min	minute(s)
mph	mile(s) per hour
mrem	millirem(s)
mSv	millisievert(s)
pCi	picoCurie(s)
s	second
yd^3	cubic yard(s)
yr	year(s)

ENGLISH METRIC AND METRIC/ENGLISH EQUIVALENTS

The following table lists the appropriate equivalents for English and metric units.

Multiply	By	to Obtain
English/Metric Equivalents		
Acres (ac)	0.4047	hectares (ha)
cubic feet (ft^3)	0.02832	cubic meters (m^3)
cubic yards (yd^3)	0.7646	cubic meters (m^3)
feet (ft)	0.3048	meters
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)
square feet (ft^2)	0.09290	square meters (m^2)
square miles (mi^2)	2.590	square kilometers (km^2)
Metric/English Equivalents		
centimeters (cm)	0.3937	inches (in.)
cubic meters (m^3)	35.31	cubic feet (ft^3)
cubic meters (m^3)	1.308	cubic yards (yd^3)
cubic meters (m^3)	264.2	gallons (gal)
hectares (ha)	2.471	acres
kilograms (kg)	2.205	pounds (lb)
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)
square kilometers (km^2)	0.3861	square miles (mi^2)

EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) has prepared this Environmental Assessment (EA) to evaluate the potential environmental impacts from reclamation of the Burro Mines Complex. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and DOE regulations for implementing NEPA (10 CFR 1021).

PROJECT LOCATION: The Burro Mines Complex is located on and adjacent to the northern end of DOE's Uranium Leasing Program Lease Tract C-SR-13 and is immediately adjacent to County Road S8 in close proximity to the Dolores River. Colorado State Highway (SH) 141 traverses Lease Tract C-SR-13 for approximately 2.1 mi (3.4 km) and the Dolores River traverses the tract for approximately 3.3 mi (5.3 km). In addition, a good portion of the surface estate (approximately 390 ac [157 ha]) located along the highway and the river is privately owned by multiple entities. Most of the lease tract is comprised of lands withdrawn from the U.S. Bureau of Land Management (BLM), as allowed under the Atomic Energy Act of 1954 (AEA), as revised. On adjacent public lands administered by BLM, DOE proposes temporary site access, staging, and hauling of waste rock.

PURPOSE AND NEED: As its mission, LM fulfills DOE's post-closure responsibilities for sites it oversees by ensuring that site conditions are protective of human health and the environment; and that it maintains protectiveness of site conditions and implements improvements to provide additional protection, as needed. Storm related erosion has increased the sediment load within the Dolores River several times, as observed with the storm events in September 2007 and again in August 2014. With the proposed action, DOE intends to protect the Dolores River from further sediment load originating from legacy waste rock at the Burro Mines Complex. The proposed reclamation activities would prevent further runoff (flash floods) associated with future major storm events from eroding waste rock into the river.

The purpose of the BLM's action is to respond to DOE's application for a right-of-way (ROW) to access, stage, and reclaim land associated with mine sites located on public lands. The need for the action is to fulfill the BLM's responsibility in accordance with the Federal Land Policy and Management Act and its implementing regulations in 43 CFR Parts 2300 and 2800. The BLM will decide whether to approve a ROW grant for access, staging, and reclamation on public lands associated with DOE's preferred alternative to action and if so, under what terms and conditions.

PROPOSED ACTION: The proposed action involves the reclamation of three "legacy" mine sites associated with the Burro Mines Complex near Slick Rock, Colorado with relocation of the waste rock to a nearby former gravel pit. These mine sites are the Burro Tunnel Mine, a portion of which is currently permitted and controlled by Gold Eagle Mining, Inc. (GEMI); and two shaft sites located on Burro No. 3 and Burro No. 5 claims that were developed and operated by Union Carbide Corporation, now known as Umetco Minerals Corporation (Umetco). These shafts were developed during the early uranium boom (circa 1948–1965) to access ores within the series of claims. DOE's project scope does not include the two additional mine sites that are in the area and thus, are not part of the proposed action. These two mines are the Burro No. 7 shaft and the associated waste rock pile that were previously reclaimed by Umetco; and the New Ellison mine which is currently permitted and controlled by GEMI.

The BLM is a cooperating agency, with a connected action. The BLM's connected action is to process DOE's request for land use authorization on public lands for the reclamation of the three "legacy" mine sites within the Burro Mines Complex.

ALTERNATIVES EVALUATED: DOE evaluated two alternatives and identified Alternative 2 (reclamation of the Burro Mines Complex) as the preferred alternative that would meet the purpose and need for the proposed action and would also be protective of human health and the environment. The No Action alternative was evaluated as Alternative 1 to provide a baseline for comparison with Alternative 2.

Alternative 2 involves the reclamation of the entire waste rock pile located at the Burro Tunnel Mine site and the crown portions of the waste rock piles at Burro mines No. 3 and No. 5. The waste rock would be relocated to a former gravel pit located approximately 2,500 ft (762 m) south and slightly east of the existing Burro Tunnel Mine site. The gravel pit is located on Lease Tract C-SR-13 and is an existing topographic depression located primarily on public lands in an area that is more than 1,100 ft (335 m) away from and 200 ft (61m) higher than the Dolores River and does not affect the visual aesthetics or views from the river or County Road S8.

In addition to the two alternatives evaluated in the EA, DOE also considered other alternatives that were eliminated from further analysis: (1) reclamation in-place; and (2) reclamation with relocation of the waste rock to two alternate sites. DOE determined that the "reclamation in-place" option would not meet the purpose and need as it would not reduce the potential for further erosion of the waste rock to the Dolores River. Relocation of the waste rock to the two alternate sites would result in greater potential environmental impacts, increased engineering difficulties, and a substantially higher cost than relocation to the gravel pit site evaluated in Alternative 2.

ENVIRONMENTAL CONSEQUENCES: The affected environment for the following environmental resources at the Burro Mines Complex were evaluated for potential impacts from Alternatives 1 and 2: (1) air quality, (2) noise, (3) soil, (4) water, (5) human health, (6) ecology, (7) land use, (8) socioeconomics, (9) environmental justice, (10) transportation, (11) cultural resources, (12) visual resources, and (13) waste management.

Overall, the No Action Alternative would result in no additional environmental impacts, however, the potential for the waste rock at the Burro Mines Complex to erode into the Dolores River would remain. Alternative 2 would result in negligible to minor short-term impacts that can be minimized further or prevented by implementing mitigation measures discussed in the EA. Long-term benefits would be realized with Alternative 2. In particular, the potential erosion and runoff from the Burro Mines Complex into the Dolores River would be reduced as the waste rock would be relocated and would be farther from the river. Cumulative impacts from reclamation of the Burro Mines Complex is expected to be negligible.

COORDINATION AND CONSULTATION: The BLM and the Colorado Division of Reclamation, Mining and Safety are cooperating agencies in the preparation of the EA. DOE is in consultation with the U.S. Fish and Wildlife Service (USFWS) and the Colorado State Historic Preservation Office. DOE consulted with the USFWS, and it concurred with DOE's determination that formal consultation for this project is not necessary.

PUBLIC INVOLVEMENT: During the preparation of the EA, DOE and BLM sent notification letters and/or emails to applicable federal, state, and local agencies, local residents, affected organizations, and interested tribes regarding DOE's proposed action and BLM's connected action, and intent to prepare an EA. Scoping comments received were carefully considered in the preparation of the Draft EA.

Comments on the Draft EA should be submitted to DOE by email at ULinfo@lm.doe.gov or by U.S. mail to U.S. Department of Energy, Office of Legacy Management, 11035 Dover Street, Suite 600, Westminster, CO 80021, no later than September 8, 2020. The Draft EA can be accessed using the following links: www.energy.gov/nepa/public-comment-opportunities and www.energy.gov/lm/burro-mines-reclamation-environmental-assessment. DOE and BLM will consider all public comments received during the 30-day comment period in making their respective decisions. Based on the decisions made, and if appropriate, a Final EA and draft Finding of No Significant Impact (FONSI) would be prepared. The Final EA and draft FONSI would be made publicly available via DOE's website and newspaper notices as was the process for the Draft EA. The draft FONSI would become final after a 30-day public availability period.

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1 INTRODUCTION

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) evaluated the potential environmental impacts of the two alternatives considered for reclamation of the Burro Mines Complex. DOE has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 and DOE regulations for implementing NEPA (10 CFR 1021).

1.1 PROJECT LOCATION

The Burro Mines Complex is located on and adjacent to the northern end of DOE's Uranium Leasing Program (ULP) Lease Tract C-SR-13 and is immediately adjacent to County Road (CR) S8 in close proximity to the Dolores River (Figure 1-1). The Colorado State Highway (SH) 141 traverses Lease Tract C-SR-13 for approximately 2.1 mi (3.4 km) and the Dolores River traverses the tract for approximately 3.3 mi (5.3 km). A good portion of the surface estate (approximately 390 ac [157 ha]) located along the highway and the river is privately owned by multiple entities.

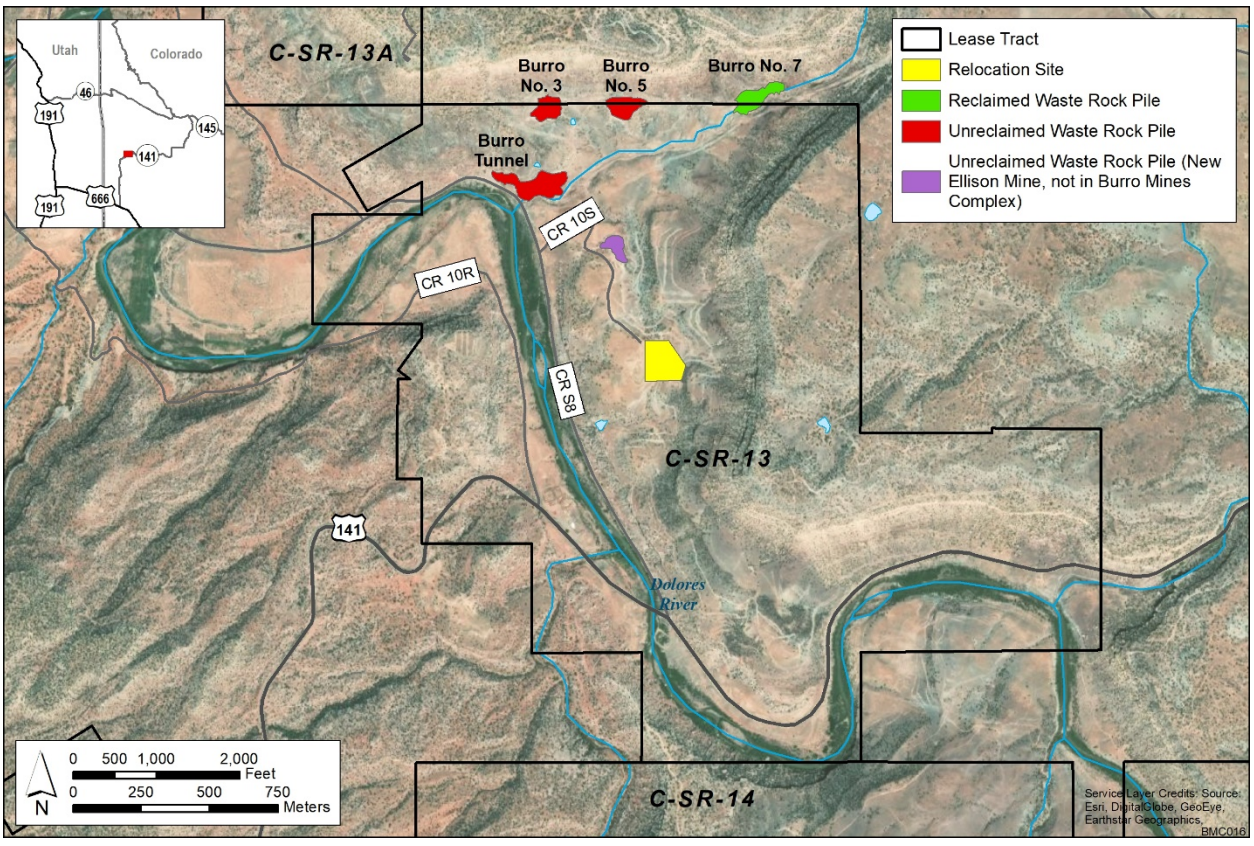

FIGURE 1-1 DOE Lease Tract C-SR-13 and Location of the Burro Mines Complex

The majority of the lease tract comprises lands withdrawn from the U.S. Bureau of Land Management (BLM)[1], as allowed under the Atomic Energy Act of 1954 (AEA), as revised. On adjacent public lands administered by BLM, DOE proposes temporary site access, staging, and hauling of waste rock.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The proposed action involves the reclamation of three "legacy" mine sites within the Burro Mines Complex located near Slick Rock, Colorado (Figure 1-1), with relocation of the waste rock to a nearby former gravel pit. The mine sites are the Burro Tunnel Mine, a portion of which is currently permitted and controlled by Gold Eagle Mining, Inc. (GEMI); and two shaft sites, developed and operated by Umetco Minerals Corporation (Umetco). The two shafts are located on their namesake unpatented mining claims, Burro No. 3 and Burro No. 5. These shafts were developed during the early uranium boom (circa 1948–1965) to access ores within the series of claims. The proposed project area is shown in Figure 1-2. Aside from the three mine sites and the gravel pit, the project area includes site roads, potential access routes, setbacks for erosion control, and staging areas.

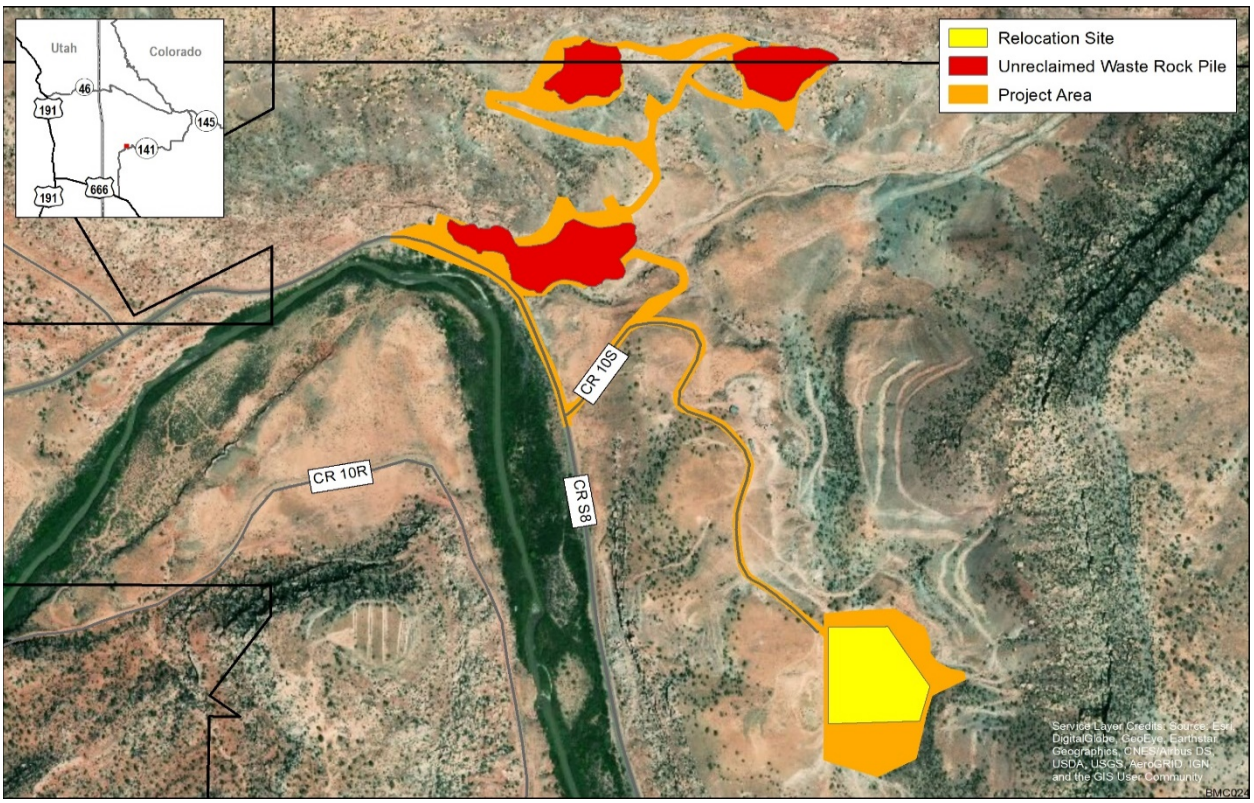

FIGURE 1-2 Project Area Associated with the Proposed Reclamation

[1] Withdrawn lands associated with Lease Tract C-SR-13 are covered by portions of Public Land Orders 494 and 1495. Additionally, that portion of Lease Tract C-SR-13 that lies within the Dolores River corridor was acquired through a Quit Claim Deed from the Union Mines Development Corporation which was contracted by the Atomic Energy Commission to acquire uranium properties for the Government.

Not included in DOE's project scope and therefore, not part of the proposed action, are the two other mine sites that are present in the Burro Mines Complex area. These two mine sites are the Burro No. 7 shaft and the associated waste rock pile, and the New Ellison mine (shown in Figure 1-1). The Burro No. 7 shaft and associated waste rock pile were private unpatented mining claims that have been previously reclaimed by the claimant (Umetco) and have never been associated with any DOE projects (including the ULP). The New Ellison mine is outside of the Burro Mines Complex and is currently permitted and controlled by GEMI. The Burro Mines Complex combines legacy pre-law (or pre-permitting by the Colorado Division of Reclamation, Mining and Safety [DRMS]) mine sites with multiple permitted mine sites, which are located on both private and public lands.

In addition, the proposed action is not associated with the ULP or the ULP Programmatic Environmental Impact Statement (PEIS) (2014) as the waste rock piles being proposed for reclamation are legacy (pre-law) materials that resulted from private, non-lease related mining activities. Hence, this proposed reclamation project is a DOE federally funded action rather than one proposed by the lessee under their lease agreement and in accordance with the ULP PEIS.

The BLM is a cooperating agency, with a connected action. The BLM's connected action is to process DOE's request for land use authorization on public lands for the reclamation of the three "legacy" mine sites within the Burro Mines Complex.

1.3 PURPOSE AND NEED

As its mission, LM fulfills DOE's post-closure responsibilities for sites it oversees by ensuring that site conditions are protective of human health and the environment; and that it maintains protectiveness of site conditions and implements improvements to provide additional protection, as needed. Storm related erosion has increased the sediment load within the Dolores River several times, as observed with the storm events in September 2007 and again in August 2014. With the proposed action, DOE intends to protect the Dolores River from further sediment load originating from legacy waste rock at the Burro Mines Complex. The proposed reclamation activities would prevent further runoff (flash floods) associated with future major storm events from eroding waste rock into the river.

DOE has evaluated two alternatives regarding reclamation of the Burro Mines Complex and has identified Alternative 2 as the preferred alternative as described in Chapter 2. The preferred alternative would best provide the improvements and additional protection needed, and would result in minimal impacts on human health and the environment.

The purpose of the BLM's action is to respond to DOE's application for a right-of-way (ROW) to access, stage, and reclaim land associated with mine sites located on public lands. The need for the action is to fulfill the BLM's responsibility in accordance with the Federal Land Policy and Management Act (FLPMA) and its implementing regulations in 43 CFR Parts 2300 and 2800. The BLM will decide whether to approve a ROW grant for access, staging, and reclamation on public lands associated with DOE's preferred alternative to action and if so, under what terms and conditions.

1.4 NEPA PROCESS AND PUBLIC INVOLVEMENT

During the preparation of this EA, DOE sent letters to notify applicable federal, state, and local agencies, local residents, affected organizations, and interested tribes regarding this EA. The distribution list used for the notification is included in Appendix B, Table B-1. DOE developed the distribution list based on its ULP stakeholders list because the location (the Burro Mines Complex is located in one of the ULP lease tracts) and the nature of the proposed action (a reclamation project) would be expected to be of interest to the same stakeholders that have participated in past similar ULP projects. DOE received several correspondence that contained scoping comments regarding its notification and proposed action. Table B-2 (in Appendix B) lists the correspondence that were received and DOE's responses to the scoping comments are presented in Table C-1 (in Appendix C). DOE carefully considered the scoping comments in preparing this Draft EA.

In addition, BLM initiated scoping with the interested public on June 2020 for the connected action to respond to DOE's application for a ROW to perform reclamation activities on public lands. See Table B-3 for the notification distribution list. The BLM received scoping comments from three commenters as listed in Table B-4. All comments submitted were outside of the scope of BLM's connected action; and with the exception of one comment requesting reclamation of Burro No. 7, the comments submitted to BLM were the same comments submitted in response to DOE's notification (see comments 1–10, 11, 13–16, and 18 in Table C-1). Reclamation of Burro No. 7 is outside of the scope of DOE's proposed action as described in Section 1.2.

This Draft EA is being distributed for public review and comment for a 30-day period from August 7, 2020 to September 8, 2020. Appendix D, Tables D-1 and D-2 present the distribution lists for DOE and BLM, respectively. In addition, DOE announced the availability of the Draft EA for public review and comment via notices published on August 5, 2020 to August 7, 2020 in the following local newspapers: Montrose Daily Press, San Miguel Basin Forum (paper of record), Cortez Journal, Durango Herald, and the Telluride Daily Planet. The Draft EA can be accessed using the following links: www.energy.gov/nepa/public-comment-opportunities and www.energy.gov/lm/burro-mines-reclamation-environmental-assessment.

Public comments on this Draft EA can be submitted to DOE by email at ULinfo@lm.doe.gov or by U.S. mail to U.S. Department of Energy, Office of Legacy Management, 11035 Dover Street, Suite 600, Westminster, CO 80021, no later than September 8, 2020.

DOE and BLM will consider all public comments received on the Draft EA in making their respective decisions. Based on the decisions made, and if appropriate, a Final EA and a draft Finding of No Significant Impact (FONSI) would be prepared. Responses to public comments would be included in the Final EA. The Final EA and draft FONSI would be made publicly available via DOE's website and newspaper notices as was the process for the Draft EA. The draft FONSI would become final after a 30-day public availability period.

1.4.1 Cooperating Agencies

For the preparation of this EA, DOE invited the BLM and the Colorado DRMS as cooperating agencies; and both agencies agreed (Barr, D.L. 2020a, b; Clementson, C. 2020; Means, R. 2020). The BLM is a cooperating agency with a connected action. The BLM's connected action is to process DOE's request for land use authorization on public lands. The Colorado DRMS is also a cooperating agency because it has been an ongoing partner and regulator in evaluating ULP activities and served as a cooperating agency for the 2014 ULP PEIS (DOE 2014). This will provide continuity to ensure that mining operators conduct uranium and vanadium exploration, mining, and reclamation activities consistent with agreements and regulatory requirements.

1.4.2 Consultations

DOE consulted with the U.S. Fish and Wildlife Service (USFWS) and it concurred with DOE's determination that formal consultation for this project is not necessary (Vendramel 2019). Impacts to threatened or endangered species or their designated critical habitat, including downstream effects on endangered fish from construction water depletions, were evaluated in the Biological Opinion (BO) issued for the ULP (DOE 2014, Appendix E).

DOE has likewise been in consultation with the Colorado State Historic Preservation Office (SHPO) to evaluate potential architectural and archaeological resources at the Burro Mines Complex in accordance with the National Historic Preservation Act (NHPA).

1.5 ORGANIZATION OF THIS EA

The two alternatives (which includes the preferred alternative as Alternative 2) are described in Chapter 2. The affected environment for each environmental resource evaluated is presented in Chapter 3. The environmental impacts of each of the two alternatives are detailed in Chapter 4. Mitigation measures to minimize the potential impacts are identified in Chapter 5. Finally, Chapter 6 discusses the cumulative impacts from the proposed action. Five appendices are also included with this Draft EA: Appendix A, which lists the references cited in the Draft EA; Appendix B, which provides the lists of DOE's and BLM's notification recipients and the scoping comment letters and emails received by both agencies in response to the notifications; Appendix C provides DOE's responses to the scoping comments it received; Appendix D provides DOE's and BLM's distribution lists for this Draft EA, and finally, Appendix E lists the preparers.

2 PROPOSED ACTION AND ALTERNATIVES

Two alternatives were evaluated as discussed in Sections 2.1 and 2.2.

- Alternative 1, no action. A no action alternative is required under NEPA to provide a baseline for the evaluations performed in this EA. Under this alternative, no reclamation activity would occur.

- Alternative 2, reclamation of the Burro Mines Complex to include relocation of the associated waste rock piles to a nearby former gravel pit. This is the preferred alternative.

2.1 ALTERNATIVE 1: NO ACTION

Under this alternative, no action would be taken to reclaim any of the mine sites. That portion of the Burro Tunnel Mine covered by the lessee's permit would be fully reclaimed in-place by the lessee after termination of mining operations at some point in the future. Burro No. 3 and No. 5 shaft sites would not be reclaimed. The potential for the waste rock at the Burro Mines Complex to erode into the Dolores River would remain.

2.2 ALTERNATIVE 2: RECLAMATION OF THE BURRO MINES COMPLEX

The preferred alternative would prevent runoff associated with significant storm events from eroding additional waste rock into, and increasing the sediment load within, the Dolores River. This alternative involves removal of the entire waste rock pile located at the Burro Tunnel Mine site and the crown portions of the waste rock piles at Burro mines No. 3 and No. 5. The waste rock removed would be relocated to a former gravel pit located approximately 2,500 ft (762 m) south and slightly east of the existing Burro Tunnel Mine site (Figure 2-1). The reclamation is expected to involve 10 workers and take about 22 weeks to complete. Reclamation activities would also include obtaining access and ROWs, grading to create landforms conforming to the surrounding area, and application of surface soil materials, and seeding.

The crown portions removed from Burro No. 3 and No. 5 would include the upper and outer portion of the pile where the flat area at the top of the pile meets the outer slope of the pile. The amount removed would be based on DRMS requirements and engineering designs to achieve final stable slopes reflecting original topography or a slope of at least 3:1 depending on the area (with select areas achieving a 2:1 slope due to current topography).

Once the waste rock piles have been relocated, the Burro Tunnel Mine site would remain a permitted mine site, complete with a functional infrastructure in accordance with the lessee's plan of operation. The remaining portion of the of the waste rock piles at the Burro No. 3 and No. 5 mine sites would be recontoured and reclaimed in-place. Historically significant features associated with the mine complex would not be disturbed.

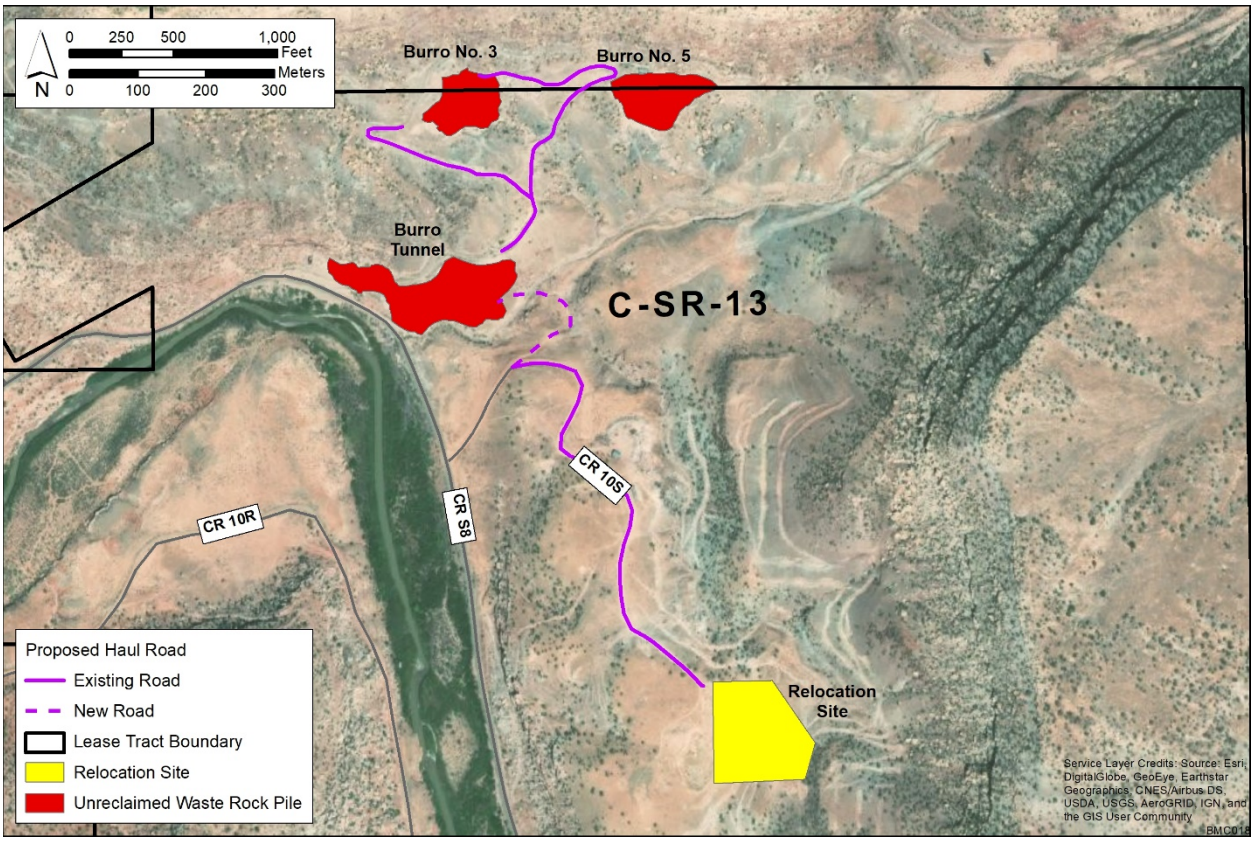

FIGURE 2-1 Proposed Waste Rock Relocation Site

The former gravel pit is located on Lease Tract C-SR-13. This gravel pit, henceforth referred to as the "relocation site" is the preferred relocation site because it is an existing topographic depression located in an area that is more than 1,100 ft (335 m) away from and 200 ft (61 m) higher than the Dolores River and does not affect the visual aesthetics or views from the river or CR S8 (Figure 2-1). The relocation site would be excavated to enlarge the capacity of the pit. The approximately 10,000 yd^3 (7,646 m^3) of surface soil materials excavated would be stockpiled to use as cover for the recontoured waste rock piles at the Burro Mines Complex. The relocation site would be reclaimed consisting of a soil cover, surface roughening, and revegetation.

Relocation activities would follow designated existing haul routes. Haul routes would originate at the waste rock piles and proceed along CR S8 or across a proposed low water crossing at the Burro Canyon drainage that would connect with CR 10S and lead to the relocation site. All haul roads would remain in place unless BLM requires DOE to abandon and reclaim the road between Burro No. 3 and Burro No. 5 that is located north of the lease tract on BLM land. Restoration of up to six existing stormwater catchment basins below the mine sites would be conducted, as needed. Some catchment basins would remain in place and final reclamation would be the responsibility of the lessee and would occur when their mining operations are complete. Table 2.2-1 summarizes the activities of the preferred alternative that are on either DOE or BLM managed land surfaces as follows: (1) waste rock volumes removed

from the three mine sites at the Burro Mines Complex, (2) the linear feet of haul roads to be improved and/or constructed, and (3) the acreage of land disturbed.

TABLE 2.2-1 Waste Rock Volume, Road Improvements, and Acreage Disturbed

Activity	On DOE Land Surface	On BLM Land Surface
Waste Rock Volume Removed (yd^3)	70,000 (Burro Tunnel Mine)	0 (Burro Tunnel Mine)
	16,000 (Burro No. 3)	4,000 (Burro No. 3)
Total = 120,000 yd^3	24,000 (Burro No.5)	6,000 (Burro No. 5)
Roads to be improved and/or constructed (linear feet)	6,100	950
Total =7,050[a]		
Acreage of Land Disturbed (ac)	3.9 (Burro Tunnel Mine)	0.0 (Burro Tunnel Mine)
	1.1 (Burro No.3)	0.3 (Burro No.3)
Total = 28.7 ac	1.0 (Burro No.5)	0.5 (Burro No. 5)
	4.6 (relocation site)	0.0 (relocation site
	5.6 (roads)	0.4 (roads)
	9.6 (staging areas, erosion control, alternative access)	1.7 (staging areas, erosion control, alternative access)

[a] A total of 7,050 linear feet based on the following activities: (1) widening of approximately 2,450 linear feet of existing unpaved roadways leading from the Burro Tunnel Mine site up the hill northward to the Burro No. 5 mine site and then extending westward to the Burro No. 3 mine site; (2) widening of approximately 2,200 linear feet of the existing unpaved CR 10S to the relocation site; and (3) construction of approximately 400 linear feet of new 20-ft wide unpaved haul road including a low-water crossing across a drainage. The new road will connect the Burro Tunnel Mine site to the existing unpaved CR 10S haul road to the relocation site.

Surface roughening (i.e., pocking or scarification) and seeding would be conducted for a total area of approximately 28.7 ac (11.6 ha) disturbed by project activities (includes areas at the Burro Mines Complex and at the relocation site). A native seed mix identified through coordination with cooperating agencies would be utilized. Satisfactory reclamation would involve stabilization of soil erosion and the successful establishment of perennial and desirable native species. The reclaimed areas would be monitored until vegetation establishment was determined to be successful. Follow-up activities might be required to correct deficiencies in community composition or cover. Table 2.2-2 presents a proposed seed mixture for use in reclamation. The list includes a proven seed mixture originally developed for the ULP lease tracts plus several pollinator species. Weed-free seed mixes, obtained from local sources would be used, where available.

TABLE 2.2-2 Proposed Seed Mixture for Use in Reclamation

Species		Suggested Broadcast Application Rate (lb PLS/acre)[a]
Scientific Name	Common Name	
Achillea millefolium var. *occidentalis*	Western yarrow	TBD[b]
Achnatherum hymenoides	Paloma Indian ricegrass	4.0

TABLE 2.2-2 (Cont.)

Species		Suggested Broadcast Application Rate (lb PLS/acre)[a]
Scientific Name	Common Name	
Atriplex canescens	Rincon fourwing saltbush	3.0
Bouteloua gracilis	Hachita blue grama grass	2.0
Cleome serrulate	Rocky Mountain beeplant	TBD
Elymus trachycaulus trachycaulus	Slender wheatgrass	2.0
Helianthus annuus	Common sunflower	TBD
Hesperostipa comate	Needleandthread grass	1.0
Krascheninnikovia lanata	Winter sage	1.0
Linum lewisii	Maple Grove Lewis flax	1.0
Machaeranthera canescens	Hoary tansyaster	TBD
Nassella viridula	Lodorm green needlegrass	2.0
Oenothera pallida	Pale evening primrose	TBD
Pascopyrum smithii	Arriba western wheatgrass	4.0
Penstemon cyanocaulis	Bluestem beardtongue[c]	0.5
Pleuraphis jamesii	Galleta grass	2.0
Sphaeralcea coccinea or *Sphaeralcea parvifolia*	Scarlet or small-leaf globemallow	0.3

[a] PLS = pure live seed.

[b] TBD = to be determined, a suggested pollinator species not included in the originally-developed seed mixture.

[c] Rocky Mountain penstemon (*Penstemon strictus*) should be used if bluestem beardtongue is not available.

Source: DOE (2014); USDA and USDI (2015).

2.3 OTHER ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

In addition to the two alternatives evaluated in this EA, DOE considered other alternatives, including (1) reclamation in-place and (2) reclamation with relocation of the waste rock to two other sites (other than the preferred site which is the relocation site discussed in Alternative 2). These two alternate relocation sites are shown in Figure 2-2. Sections 2.3.1 and 2.3.2 below provide the reasons why these options were not analyzed further in this EA.

2.3.1 Reclamation In-Place

The reclamation in-place option would address the reclamation of the Burro Tunnel Mine site only. The existing waste rock piles at Burro No. 3 and Burro No. 5 shafts would remain in their current condition. They are considered legacy or pre-law (pre-permitting by Colorado DRMS) sites by the BLM and DRMS. The waste rock piles were also largely constructed prior to the enactment of FLPMA and BLM's 43 CFR 3809 surface management regulations. A 3809 Plan of Operations was subsequently approved for the Burro Mines, but it allowed the waste rock piles to be left in their current state.

The potential impacts from the reclamation in-place option would be expected to be slightly less than those discussed for Alternative 2 for all the environmental resources evaluated (discussed in Chapter 4 of this EA). This is primarily because the reclamation in-place option addresses only the Burro Tunnel Mine and would therefore affect a smaller footprint, involve a fewer number of workers and equipment (including trucks), and require fewer construction days to complete the action.

Overall, although reclamation in-place would result in less potential impacts than Alternative 2 and is also widely used as a reclamation approach in the uranium mining industry (including those conducted under DOE's ULP), this alternative was not considered to meet the purpose and need for the proposed action. That is, further erosion from the waste rock piles at the Burro Tunnel Mine, Burro No.3, and Burro No.5 and subsequent sediment loading to the Dolores River would not be optimally minimized or prevented. Reclamation in-place would not create any more distance between the waste rock piles at the Burro Mines Complex and the Dolores River. A suitable location would be one that is farther away from the Dolores River corridor and less visible from SH 141, CR S8, and the river.

2.3.2 Alternate Relocation Sites

For the option of moving the waste rock piles to locations other than the preferred relocation site, DOE considered two alternate sites identified as Site A and Site B in Figure 2-2.

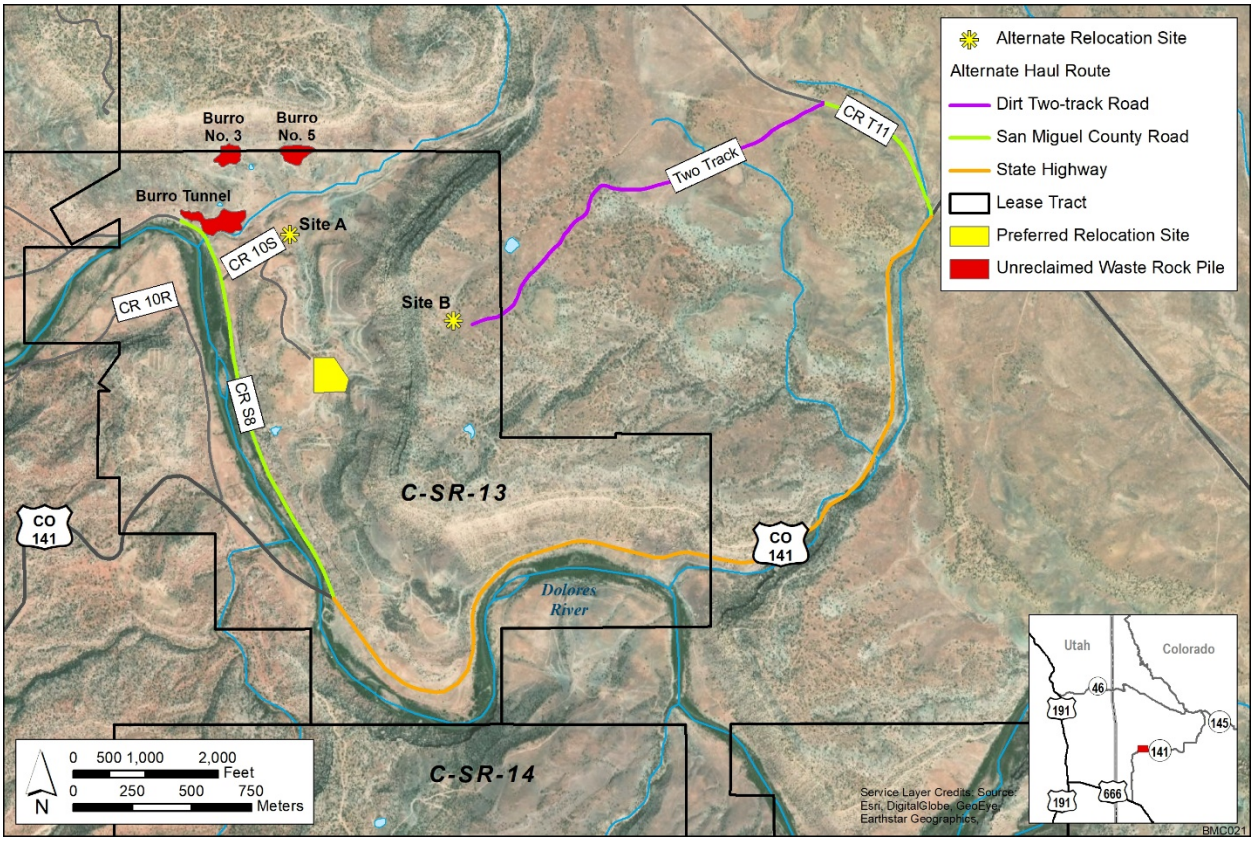

FIGURE 2-2 Relocation Site Options

2.3.2.1 Evaluation of Site A

Site A is located on Lease Tract C-SR-13 a relatively flat area located approximately 1,000 ft (300 m) east and slightly south of the existing Burro Tunnel Mine site, across the drainage and eastward up the Burro Canyon. While Site A is large enough to accommodate the volume of waste rock to be relocated, it was not considered further because of the presence of potential safety hazards associated with an overhead electric power line and an underground high-pressure natural gas pipeline traverse the site.

2.3.2.2 Evaluation of Site B

Site B is also located on Lease Tract C-SR-13 and would require traversing about 1.09 mi (1.8 km) on CR S8, about 2.6 mi (4.2 km) on SH 141, 0.43 mi (0.7 km) on CR T11, and finally about a 1.1-mi (1.8-km) stretch of a two-track dirt road. This location has no natural depression and the waste rock end-state would be mounded to accommodate the volume to be relocated. Haul route roadways would have to be upgraded, and this may require addressing applicable federal, state, and local transportation regulations. A comparison between relocation to Site B and Alternative 2 is discussed below:

- The affected environment for the Site B option would generally be the same as that described for Alternative 2 as it is also located on Lease Tract C-SR-13 and therefore, the region of influence (ROI) would be the same.
- Relocation to Site B would involve about 36 weeks of construction, 15 workers, and disturbing about 34.9 ac (14.1 ha) as compared to 22 weeks of construction, 10 workers, and 28.7 ac (11.6 ha) disturbed for Alternative 2. Accordingly, potential impacts for land use, soil resources, and waste management (management of non-hazardous solid waste such as miscellaneous trash), would be greater proportionally if relocating to Site B.
- For air quality, the PM_{10} emissions from relocating to Site B could be about 50% higher, i.e., PM_{10} emissions account for about 2.9% of San Miguel County annual total compared to 2.0 % estimated for Alternative 2. These additional emissions are primarily because of the longer distances of unpaved roads that would need to be traversed.
- For noise impacts, the residences along the haul route could experience noise levels similar to those estimated for Alternative 2 which are below the Colorado daytime and U.S. Environmental Protection Agency (EPA) limit of 55 decibels (dBA). In fact, Site B is farther away from the nearest residence than the Burro Mines Complex including the preferred relocation site so noise impacts could be less at Site B.
- As for water resources, the relocation to Site B could impact more tributaries that discharge to the Dolores River than Alternative 2 which potentially impacts one tributary only. Water consumption would be about 50% higher for Site B relocation due to the longer construction period, longer haul route distances, and more workers.
- For human health, as the ROI evaluated for Alternative 2 includes the area where Site B is located, potential human health impacts from the Site B option can be inferred from the estimates for the hypothetical resident and recreationist receptor for

Alternative 2 and would be the same. The estimates for physical injuries would be about 50% greater for the Site B option because more workers are involved.

- For ecological resources, the potential impacts from the Site B option could be somewhat greater than for Alternative 2. An additional 6.2 ac (2.5 ha) of habitat would be disturbed for Site B to account for the increased acreage of the waste pile footprint and two track haul road needed compared to the habitat disturbed for the haul road and gravel pit for Alternative 2. In addition, the habitat associated with Site B and the two-track haul road currently provide better habitat (currently less disturbed) than the haul road and preferred relocation site associated with Alternative 2. The additional 14 weeks required to complete relocation to Site B would also prolong visual and noise disturbance to wildlife due to increased presence of workers, vehicles, and construction equipment.
- For socioeconomics, the potential impacts for Site B would be slightly greater than those evaluated in Alternative 2. The increased workforce and project duration for relocating to Site B would result in an increase in labor income, a positive economic impact within the ROI. Overall, socioeconomic impacts would be minor. The potential impacts to recreation would also be minor, however, increased traffic on the state highway and county road from hauling waste rock could be perceived as a negative impact to recreationalists traveling along those routes.
- For environmental justice, the potential impacts for relocating to Site B would be the same as that for Alternative 2. There are no disproportionate low-income or minority populations within the ROI, therefore, actions from relocation to Site B would have no disproportionate socioeconomic or human health and safety impacts on low-income and minority populations. Similarly, there would be no environmental justice impacts associated with water use, subsistence use, or visual resources.
- As for transportation, the estimate for potential number of injuries and fatalities from haulage of the waste rock to Site B would increase from that for Alternative 2. Estimates would increase from 0.006 to 0.04 and from 0.0001 to 0.004 for number of potential injuries and fatalities, respectively. Although relocation to Site B is associated with higher estimates, no worker injuries or fatalities are expected (similar to Alternative 2).
- Additional cultural resources surveys would be required because the Site B area has not been surveyed. Visual impacts would be similar to that of the preferred alternative.

Based on the discussion above, relocation to Site B would result in somewhat greater potential impacts than Alternative 2 for some of the environmental resources. There are also other factors not explicitly considered in NEPA evaluations (as done in this EA) that would be worthwhile considering including engineering logistics and cost. Alternative 2 would pose fewer engineering difficulties, would result in a more stable reclaimed state (at the preferred relocation site), and would also be lower in cost (less than half the cost).

For the reasons discussed in this section and the comparisons made between relocation to Site B versus the preferred relocation site for Alternative 2, DOE made the determination that the two alternatives (Alternatives 1 and 2) that are evaluated in detail in this EA, provides the range of reasonable alternatives for reclamation of the Burro Mines Complex.

2.4 SUMMARY OF ENVIRONMENTAL IMPACTS AND COMPARISON OF THE TWO ALTERNATIVES

For the No Action Alternative, no additional environmental impacts are expected other than what has already occurred at the Burro Mines Complex because no activity would be conducted. However, in their current configuration, the waste rock piles have the potential to erode, which could result in increased sedimentation into the nearby Dolores River in the long term.

Alternative 2 (the Preferred Alternative) would result in negligible to minor, short-term impacts on environmental resources, such as air quality, noise, water resources, socioeconomics, cultural resources, visual resources, and transportation, but would also be expected to provide improvement or positive impacts in the long-term. For the long-term, the relocation and recontouring of the remaining waste rock piles at the Burro Mines Complex would modify the general form, line, and texture of the manmade waste rock piles. However, the action, as intended, should make the waste rock piles blend in better with the surrounding landform. Additionally, alternative contrasts in line, color, and texture associated with the erosion control and seeding and revegetation efforts would begin to decrease as vegetation becomes established in reclaimed areas. More significantly, the potential erosion and runoff from the Burro Mines Complex would be decreased, thereby reducing the likelihood for sediments to be eroded and transported into the Dolores River. Table 2.4-1 provides a summary of the potential impacts discussed in detail in Chapter 4 for Alternatives 1 and 2. These potential impacts could be further minimized and/or prevented with the implementation of mitigation measures and BMPs described in Table 5-1.

TABLE 2.4-1 Summary Comparison of Potential Impacts of Various Environmental Resources from Alternatives 1 and 2

Resource	Alternative 1, No Action	Alternative 2, Reclamation of the Burro Mines Complex (Preferred Alternative)
Air quality	No measurable ambient air quality changes.	National Ambient Air Quality Standards (NAAQS) exceedances for particulate matter (PM) could occur as a result of dust-generating activities at the project boundary and publicly accessible roads within the project area on occasion but are not likely to occur at nearby residences. Potential impacts on ambient air quality would be minor but temporary (only a few months), and potential impacts on climate change would be negligible.
Noise	No measurable impacts; noise levels would continue at background levels.	Noise levels from reclamation activities are anticipated to be lower than Colorado or EPA limits at nearby residences. Noise impacts on nearby residences would be minor and temporary (occasional exceedances over a 22-week period).
Paleontological and soil resources	No measurable impacts.	Negligible to minor impacts on paleontological resources that could be avoided with proper mitigation. Beneficial soil impacts (due to a reduced potential for mass movement) in the long term. For the short term, potential increase in erosion until disturbed areas are vegetated. Area of potential impacts is 28.7 ac (11.6 ha).

TABLE 2.4-1 (Cont.)

Resource	Alternative 1, No Action	Alternative 2, Reclamation of the Burro Mines Complex (Preferred Alternative)
Water resources	Surface water conditions at the Dolores River and the intermittent stream near the Burro Mines Complex will continue to be adversely affected by potential runoff from the waste rock present at the Burro Mines Complex especially during major storm events which have occurred before.	Potential temporary increases in erosion and runoff during the reclamation construction period because unconsolidated materials could be exposed especially if a flash-flooding event(s) occur during this period. The reclaimed state at the Burro Mines Complex would be expected to reduce waste rock materials from further eroding to the Dolores River. Any temporary water quality issues (e.g., sediment and pollutant loading) in runoff from the site during the reclamation period would have negligible effect on the water quality in the Dolores River. The amount of water needed (15,000 gal/month or 0.05 ac-ft/month) is about 0.7% of the current water use for mining and 0.14% of the current public water supply in San Miguel County. Small-scale, downstream effects on endangered fish from construction water depletions have been addressed as discussed in the BO issued for the ULP (DOE 2014, Appendix E). No effect on local drinking water supplied from groundwater.
Human health	The potential for radiation exposure from the waste rock piles for a nearby resident or recreationist is expected to be a small fraction of that due to natural background radiation and the 100 mrem/yr standard for members of the general public. Chemical exposure from the waste rock piles is unlikely (i.e., waste rock piles have settled over the years and released of dust would be minimal).	The potential additional radiation dose for a hypothetical resident or recreationist from the single reclaimed waste rock pile at the relocation site would be a small fraction of that due to natural background radiation or the100 mrem/yr standard for the protection of members of the general public. Chemical exposure would not occur as the reclaimed areas at the Burro Mines Complex and at the relocation site would eventually have vegetative cover which prevents particulate emissions. The estimated total dose that the reclamation worker would receive would be less than 38 mrem. This is about 2% of the dose limit recommended by the International Commission on Radiation Protection (ICRP) for occupational workers which is given as an effective dose of 20 mSv or 2,000 mrem/yr averaged over 5 years. No injury or fatality is expected to occur among the reclamation workers handling the waste rock piles.
Ecological resources	Future waste rock erosion into the Dolores River could lead to potential adverse impact to aquatic species; no measurable change to other ecological resources.	Short-term loss of vegetation on the 28.7 ac (11.6 ha) being reclaimed. Localized disturbance to 240 ft^2 of an intermittent streambed from haul road crossing. Short-term localized disturbance of wildlife. Negligible to minor potential for sediments that could affect aquatic biota to reach the Dolores River. The reclaimed area will be contoured to make it less prone to erosion, especially after vegetation becomes established. Minor, short-term impacts on wildlife that occur within or close to the Burro Tunnel Mine and the relocation site. Long-term localized improved habitat conditions for wildlife and terrestrial special status species.
Land use	No measurable land use impacts.	No measurable land use impacts.
Socioeconomics and environmental justice	No socioeconomic or environmental justice impacts.	Minor, short-term socioeconomic impacts associated with the 10 direct jobs over the 22-week project period. No environmental justice impacts.

TABLE 2.4-1 (Cont.)

Resource	Alternative 1, No Action	Alternative 2, Reclamation of the Burro Mines Complex (Preferred Alternative)
Transportation	No impacts on transportation.	No changes in traffic trends near the Burro Mines Complex. Additional traffic associated with reclamation workers will not cause any issues with traffic flow in the area. The estimated number of injuries and fatalities due to relocation of the waste rock piles is 0.006 and 0.0001 (i.e., less than one person for each of the estimates), respectively. Thus, no transportation-related injuries or fatalities are expected.
Cultural resources	No impacts on cultural resources.	Potential adverse effects on historic elements present at the Burro Mines Complex. However, reclamation would apply mitigation measures to retain historic onsite features including an ore bin, a tunnel sized for trackless vehicles, multiple vertical shafts, support structures, support building foundations, an air and water line, major portions of a large ventilation system, and one steel headframe with associated ore and waste rock bins.
Visual resources	No change to current levels of visual contrast.	Long-term positive visual impacts could result from reclamation activities under Alternative 2; alternative contrasts in form, line, color, and texture associated with the erosion control and seeding and revegetation efforts would begin to decrease as vegetation became established in reclaimed areas. Short-term temporary negative impacts could result from activities such as the construction of the new road and expansion of the relocation site which might introduce minor visual contrasts to the landscape contained in the local area rather than spread throughout the site.
Waste management	No waste management impacts.	Negligible to minor waste management impacts associated with 28.7 ac (11.6 ha) being reclaimed.

3 AFFECTED ENVIRONMENT

The affected environment evaluated for the following environmental resource areas are presented in this chapter: (1) air quality, (2) noise, (3) geologic setting and soil resources, (4) water resources, (5) human health and safety, (6) ecological resources, (7) land use, (8) socioeconomics, (9) environmental justice, (10) transportation, (11) cultural resources, (12) visual resources, and (13) waste management. The ROI evaluated varied for each environmental resource in order to provide an adequate evaluation for a given resource (see Text Box). Figure 3-1 shows the ROI at the 10-mi (40-km) and the 25-mi (80-km) radius from the Burro Mines Complex.

Region of Influence (ROI) of the Various Environmental Resources Evaluated

Air Quality: Within 25 mi (40 km) from the Burro Mines Complex (based on air model capability which is typically up to (30 mi [50 km]).

Noise: Within 2–3 mi (3–5 km), from noise source(s) at best (noise levels typically attenuate to background levels at this distance).

Geologic Setting and Soil Resources: The Burro Mines Complex and any other areas on adjacent lands (e.g., unpaved access roads) that could be affected by the reclamation activities.

Water Resources: Primarily on the Burro Mines Complex area, Lease Tract C-SR-13, and the Dolores River, San Miguel River, and their tributaries.

Human Health: 10-mi (16-km) radius of the Burro Mines Complex (air dispersion model utilized for the evaluation provides estimates up to a 50-mile (80 km) radius, however, model results approached zero at approximately 10-mi [16 km] radius).

Ecological Resources: Species within a 0.5-mi (0.8 km) radius of the Burro Mines Complex and portions of the Dolores River downstream of the complex potentially affected by sediment load; and threatened and endangered species at the Dolores, San Miguel, and Colorado Rivers.

Land Use: The land within a 10-mi (16-km) radius of the Burro Mines Complex, with an emphasis on specially designated public land areas.

Socioeconomics: Dolores, Montrose, and San Miguel Counties (considering where reclamations workers could be from).

Environmental Justice: 25-mi (40-km) radius of the Burro Mines Complex (based on the largest ROI from the environmental resources analyzed).

Transportation: The haul roads including county and state roads associated with the reclamation of the Burro Mines Complex.

Cultural Resources: The Burro Mines Complex and any other areas on adjacent lands that could be affected by the reclamation activities.

Visual Resources: 25 mi (40 km) from the Burro Mines Complex which is the approximate limit at which non-negligible visual contrasts occurs.

Waste Management: The Burro Mines Complex and nearby permitted waste disposal facilities.

3.1 AIR QUALITY

3.1.1 Existing Air Emissions

San Miguel County has many small-scale industrial emission sources including oil and gas extractions, mining, airport operations, and concrete manufacturing. The absolute amount of emissions is relatively low. In western San Miguel County, where the Burro Mines Complex is located, SH 141 runs in a northeast–southwest direction, along which oil and gas extraction and mining activities occur.

Data on annual emissions of criteria pollutants and volatile organic compounds (VOCs) in San Miguel County are presented in Table 3.1-1 (CDPHE 2019a). Biogenic sources (i.e., vegetation—including trees, plants, and crops—and soils) that release naturally occurring emissions accounted for a significant portion of the VOC emissions (about 95%) and were a primary contributor to carbon monoxide (CO) emissions (38%), followed by on-road vehicles (about 28%) and nonroad mobile sources (about 27%). Oil and gas extraction were the primary contributor (about 29%) to total nitrogen oxides (NO_X) emissions, followed by biogenic sources (about 28%) and on-road vehicles (25%). Construction and road dust were the primary contributor to PM emissions (PM_{10} emissions [about 82%] and $PM_{2.5}$emissions [57%]). Residential heating accounted for about 56% of sulfur oxides (SO_X) emissions.

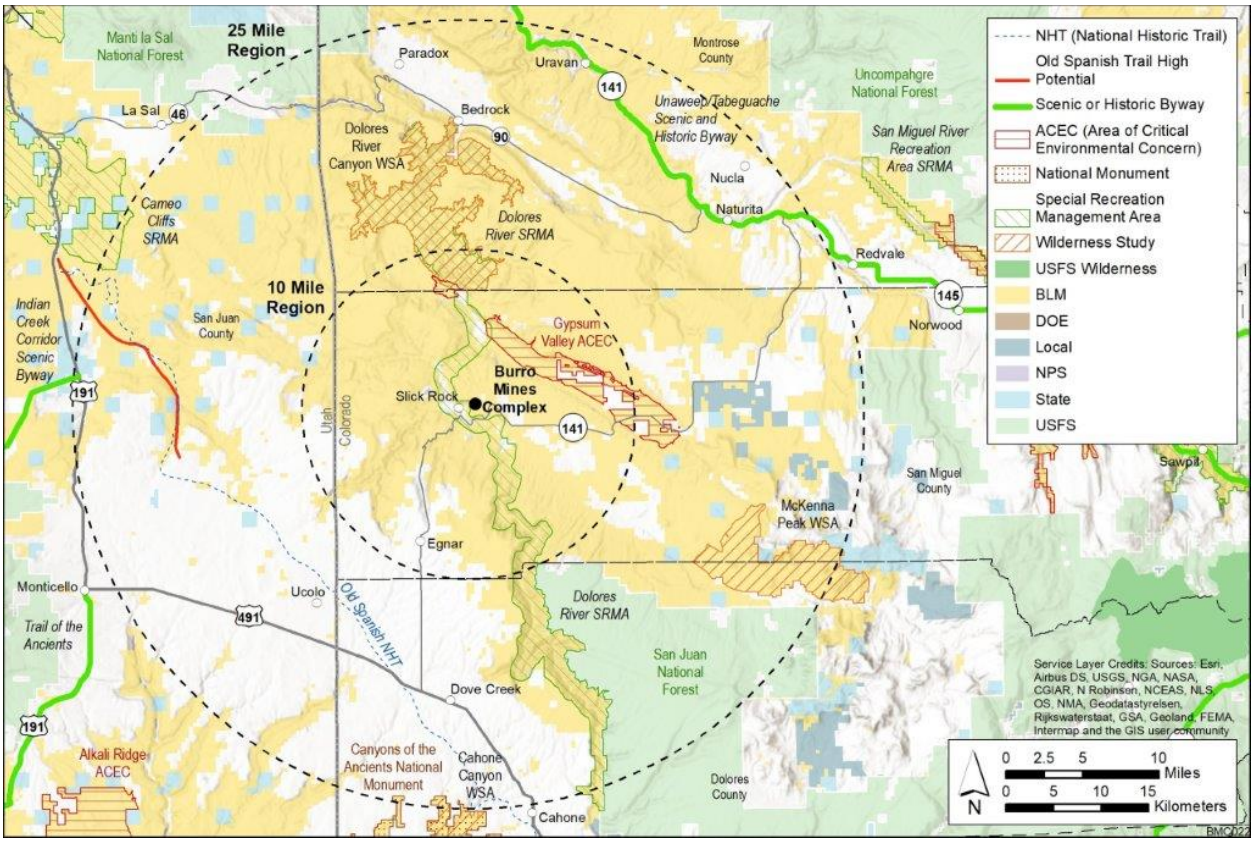

FIGURE 3-1 Region of Influence (ROI) for the Various Environmental Resources Evaluated

3.1.2 Existing Air Quality

Under the Clean Air Act (CAA), as amended, the EPA set NAAQS for pollutants considered harmful to public health and the environment (EPA 2019b). NAAQS have been established for six criteria pollutants: CO, lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), PM (both $PM_{2.5}$ and PM_{10}), and sulfur dioxide (SO_2). The CAA established two types of NAAQS: primary standards to protect public health including sensitive populations (e.g., asthmatics, children, and the elderly) and secondary standards to protect public welfare, including protection against degraded visibility and damage to animals, crops, vegetation, and buildings. Colorado has a more stringent standard than the NAAQS for 3-hr SO_2 (CDPHE 2019b).

Because of the relatively low population density, low level of industrial activities, and relatively low traffic volume in the western counties of Colorado, the quantity of anthropogenic emissions is small, and ambient air quality is relatively good. San Miguel County is located administratively within the Grand Mesa Intrastate Air

TABLE 3.1-1 Annual Emissions of Criteria Pollutants and VOCs in San Miguel County, Colorado, Encompassing the Burro Mines Complex[a]

Criteria Pollutant	Annual Emissions (tons/yr)
CO	4,197
NO_x	806
VOCs	12,508
$PM_{2.5}$[a]	205
PM_{10}	733
SO_x	3.2

[a] $PM_{2.5}$ emissions were not included in the CDPHE's 2013 air pollutant emissions inventory database, so they were estimated by using available $PM_{2.5}/PM_{10}$ ratios (California Air Resources Board 2018).

Source: CDPHE (2019a).

Quality Control Region 10 (see 40 CFR 81.173). San Miguel County is designated as being in unclassifiable/attainment for all criteria pollutants (EPA 2019c). Attainment means that a geographic area meets or is cleaner than the national standard.

There are no measurement data for criteria air pollutants near the Burro Mines Complex. Currently, O_3 data and PM_{10} data are collected at Norwood and Telluride, respectively, in San Miguel County (EPA 2019d). Based on 2016–2018 data collected at Norwood and Telluride, O_3 and PM_{10} levels are 0.065 ppm and 70 $\mu g/m^3$, which correspond to about 93% and 47%, respectively, of their respective NAAQS.

3.2 NOISE

3.2.1 Background Noise Levels

Background noise is defined as the noise from all sources other than the source of interest. Background noise level can vary considerably, depending on the location, season, and time of day. Background noise levels in a busy urban setting can be as high as 80 dBA during the day. In isolated outdoor locations with no wind, vegetation, animals, or running water, background noise may be less than 10 dBA. Typical noise levels in rural settings are about 40 dBA during the day and 30 dBA during the night, which correspond to an L_{dn} of 40 dBA; in Wilderness Areas, typical noise levels are on the order of 20 dBA (Harris 1991).

The Burro Mines Complex is immediately adjacent to CR S8, and several unpaved roads are scattered over the area. SH 141 is as close as 0.6 mi (1 km) to the south-southwest of the Burro Mines Complex. No railroads occur within 50 mi (80 km) of the Burro Mines Complex. The nearest airport is Dove Creek Airport in Dolores County, about 19 mi (30 km) to the south. In addition to natural sound sources (e.g., wind, rain, wildlife, river or streams), noise sources around the Burro Mines Complex include road traffic, aircraft flyovers, domestic animal noise, and industrial activities. Other potential noise sources are recreational (all-terrain vehicles, rafters, and hunters) and ventilation shafts from underground mines. In summary, the area around the Burro Mines Complex is remote, sparsely populated, and undeveloped; the overall character is considered mostly rural or undisturbed wilderness.

No sensitive receptors (e.g., hospitals, schools, or nursing homes) exist within a range of 3 mi (5 km) from the Burro Mines Complex. Only four residences exist within 2 mi (3.2 km) of the Burro Mines Complex, two of which are located within 1 mi (1.6 km). The closest residence is located about 2,200 ft (670 m) to the west–southwest. To date, no environmental noise surveys have been conducted around the Burro Mines Complex. It is likely that noise levels along the state highways and near agricultural/industrial activities would be relatively higher (about 50–60 dBA), while levels in areas far removed from manmade noise sources would be similar to wilderness background noise levels (below 30 dBA). Based on county population density data, L_{dn} noise level estimates would be about 30 dBA for San Miguel County (Miller 2002). For comparison, rural and undeveloped areas typically have L_{dn} levels in a range of 33–47 dBA (Eldred 1982).

3.2.2 Noise Regulations

Reclamation activities would have to follow applicable federal, state, or local guidelines and regulations on noise. Colorado has a noise statute with quantitative noise limits by zone and time of day. Table 3.2-1 presents the Colorado Revised Statutes on maximum permissible noise levels (Colorado Revised Statutes 2019). San Miguel County does not have quantitative noise guidelines and regulations applicable to the reclamation activities.

At the federal level, the Noise Control Act of 1972 and subsequent amendments (Quiet Communities Act of 1978, 42 USC 4901–4918) delegate the authority to regulate noise to the states and direct government agencies to comply with local noise regulations. EPA guidelines recommend an L_{dn} of 55 dBA as sufficient to protect the public from the effect of broadband environmental noise in typically quiet outdoor and residential areas and farms (EPA 1974). For protection against hearing loss in the general population from non-impulsive noise, the EPA recommends an L_{eq} of 70 dBA or less over a 40-yr period.

TABLE 3.2-1 Colorado Limits on Maximum Permissible Noise Levels

Zone	Maximum Permissible Noise Level (dBA)[a]	
	7 a.m. to next 7 p.m.[b]	7 p.m. to next 7 a.m.
Residential	55	50
Commercial	60	55
Light industrial	70	65
Industrial	80	75

[a] At a distance of 25 ft (7.6 m) or more from the property line. Periodic, impulsive, or shrill noises are considered a public nuisance at a level of 5 dBA less than the levels tabulated. Construction projects shall be subject to the maximum permissible noise levels specified for industrial zones for (1) the period within which construction is to be completed pursuant to any applicable construction permit issued by the proper authority or (2) if no time limitation is imposed, for a reasonable period of time for completion of the project.

[b] The tabulated noise levels may be exceeded by 10 dBA for a period not to exceed 15 minutes in any 1-hr period.

Source: Colorado Revised Statutes, Title 25, "Health," Article 12, "Noise Abatement," Section 103, "Maximum Permissible Noise Levels."

3.3 GEOLOGIC SETTING, PALEONTOLOGICAL, AND SOIL RESOURCES

3.3.1 Geologic Setting

The Burro Mines Complex area is located at the southern end of the Uravan mineral belt. Major faults in the region have a northwest trend and run parallel to the collapsed Gypsum Valley salt anticline that lies to the northeast. The Disappointment syncline is just to the southwest of the Gypsum Valley anticline (Shawe 1970, 2011).

Sedimentary rocks cropping out in the region range in age from Permian to Cretaceous and are at least 4,700 ft (1,400 m) thick. These rocks and the older Paleozoic sedimentary rocks that underlie them together are about 13,000 ft (4,000 m) thick. Uranium and vanadium deposits occur in the Moss Back Member of the Chinle Formation (upper Triassic) and several levels of the Morrison Formation (upper Jurassic); however, most of the important ore production has been from the Salt Wash Member of the Morrison Formation (Shawe et al. 1968; Shawe 2011).

The Burro Mines Complex is located near the Dolores River, which flows northward through the narrow and steep-walled Dolores River Canyon. The canyon bottom and lower slopes consist of unconsolidated fluvial deposits and alluvial/colluvial deposits, respectively. In

this region, the canyon floor is underlain by the Entrada Sandstone. Bedrock formations exposed along the canyon walls and adjoining mesas include, in ascending order, the Salt Wash and Brushy Basin Members of the Morrison Formation (upper Jurassic), and the Burro Canyon Formation and the Dakota Sandstone (lower Cretaceous). The Burro Mines Complex covers part of the Dolores River Canyon and adjacent ridges. Elevations range from about 5,400 ft (1,650 m) above sea level along the Dolores River to a little over 6,000 ft (1,830 m) above sea level on the mesa top (Figure 3.3-1).

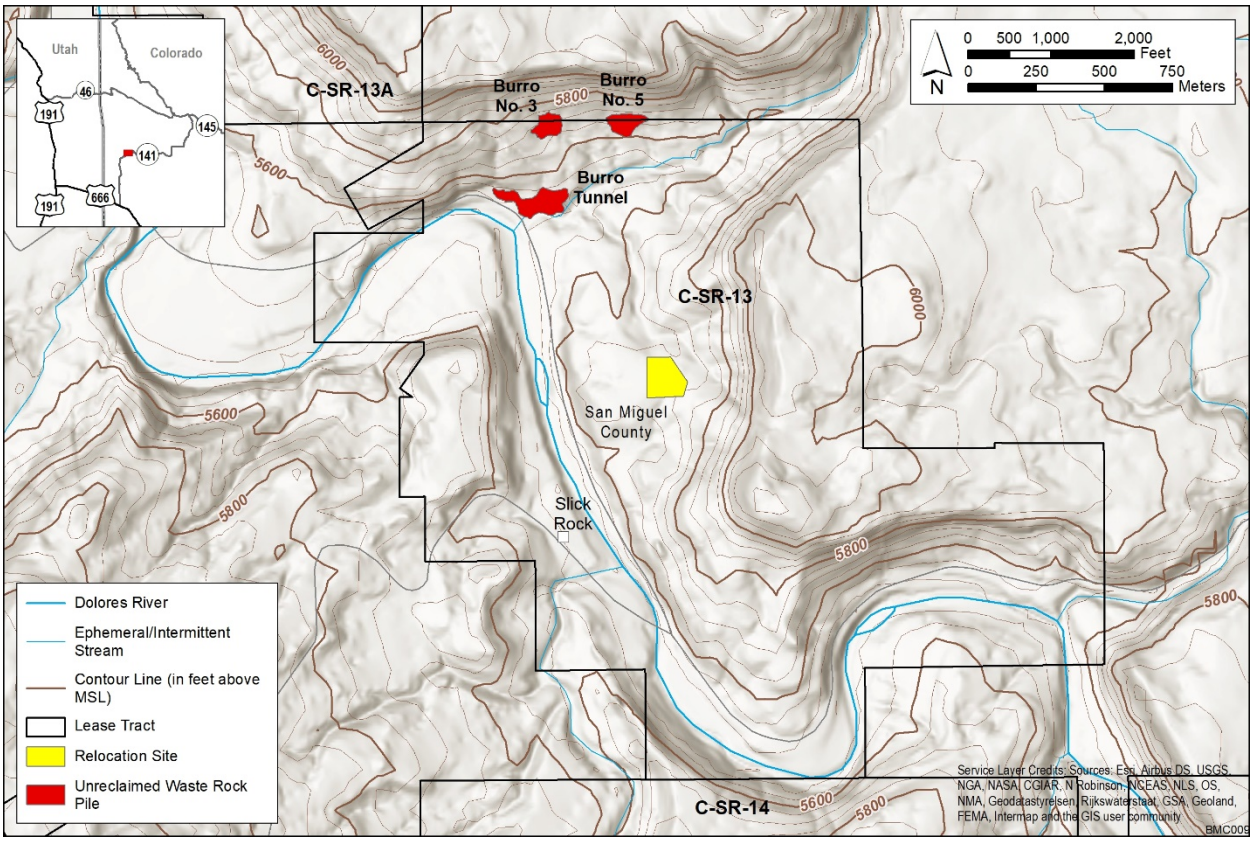

FIGURE 3.3-1 Topography of Lease Tract C-SR-13

3.3.2 Paleontological and Soil Resources

Soils within the Burro Mines Complex and adjacent areas are predominantly the sandy and stony loams of the Farb-Rock outcrop (1% to 30% slopes) and Rock outcrop-Orthents (40% to 90% slopes) complexes along the Dolores River Canyon, which together make up about 62% of the soil coverage within the lease tract as shown on Figure 3.3-2 (this figure also provides the Map Unit equivalence for various soil types in Colorado). Soils of the Farb-Rock outcrop complex formed in residuum weathered from sandstone; soils of the Rock outcrop-Orthents complex formed from colluvium and slope alluvium weathered from sandstone and shale. These shallow soils predominate in the northern part of the lease tract where the Burro Mines Complex is located. They are well to excessively drained with very slow infiltration rates (i.e., very high surface runoff) when wet. These soils, when combined with the steep topography located in Burro Canyon, lead to massive runoff events with very little precipitation. Available water-holding capacity is very low for most soils within the Burro Mines Complex and adjacent areas.

Water erosion potential is moderate (Kw[1] factors range from 0.20 to 0.49; the Farb-Rock outcrop complex is not rated), with the highest potential occurring for the Killpack-Deaver loams (Map Unit 52) on the high elevation slopes along the Dolores River. The susceptibility to wind erosion is low to moderate (wind erodibility groups 3 to 8). Soils in the canyon bottom (Fluvaquents, Map Unit 43) are poorly drained and prone to flooding. These soils cover only a small portion of the site (about 3%) and have a moderate water erosion potential (Kw factor 0.37)[2] (NRCS 2019).

Lease Tract C-SR-13 is in a region where significant paleontological resources have been known to occur (DOE 2014). Paleontological resources on public lands are managed and protected under the FLPMA (P.L. 94-579, codified at 43 USC 1701-1782) and Theft and Destruction of Government Property (18 USC 641), which penalizes the theft or degradation of property of the U.S. Government.

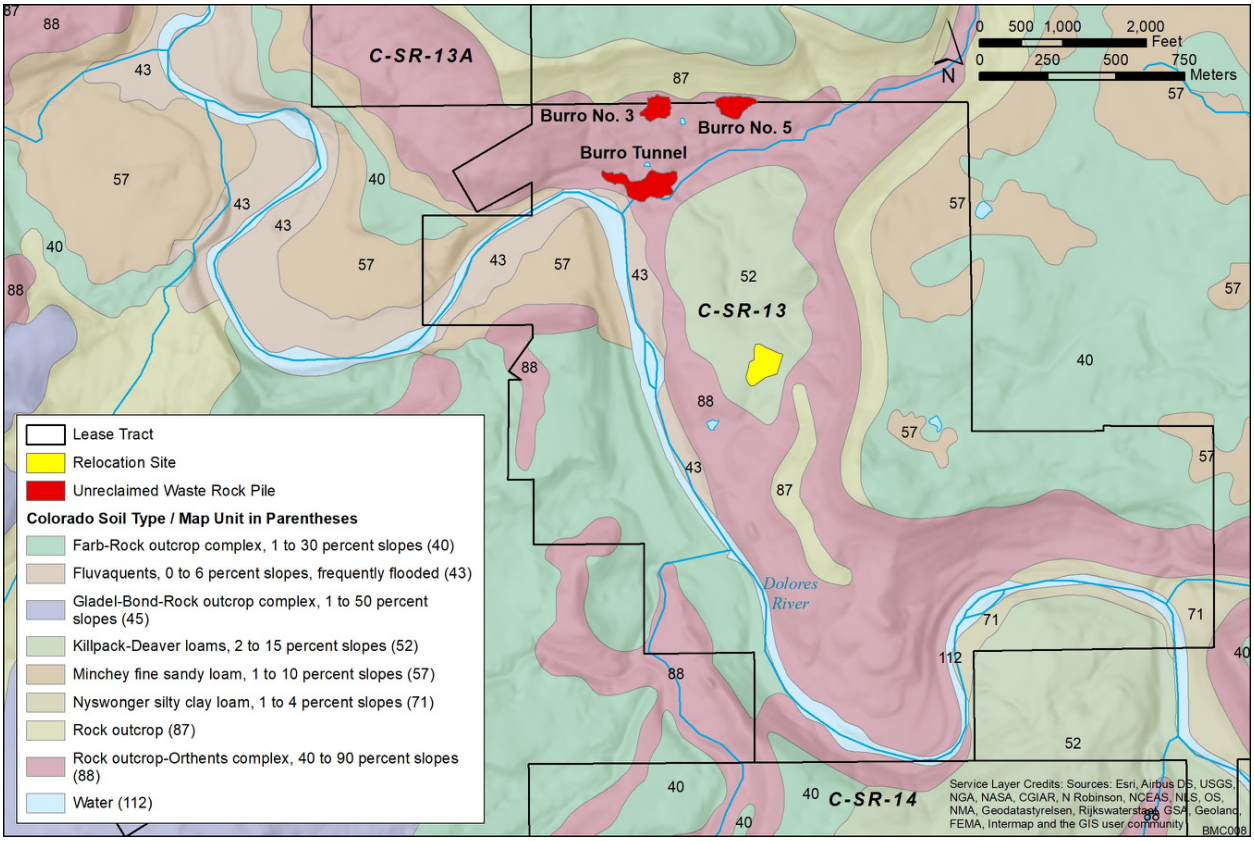

FIGURE 3.3-2 Soils within and around Lease Tract C-SR-13

[2] Kw, or erodibility factor, quantifies soil detachment by runoff or raindrop impact based on a number of soil properties. It is an index used to predict the long-term average soil loss from sheet and rill erosion. The Kw factor assigned to soil ranges from 0.02 to 0.69; the higher the value, the higher the soil erodibility.

3.4 WATER RESOURCES

3.4.1 Surface Waters and Floodplains

The Dolores River is the only perennial river located near the project area. It is regulated by the McPhee Dam. The nearest U.S. Geological Survey stream gage (USGS gage 09168730) is located 5 mi (8 km) downstream from the project area. The monthly mean flow rate recorded at this gage ranges from 3 to 3,062 ft^3/s with a mean flow rate of 177 ft^3/s over the time period of 1997–2018. There are no perennial tributaries to the Dolores River in the project area. However, one unnamed intermittent stream drains the project area with a length of 2 mi (3.7 km). The estimated drainage area contributing to the intermittent stream is about 1.2 mi^2 (3.2 km^2). It extends from the headwater area north of Burro No. 3, No. 5, and No. 7 mines to the east and then back to the southwest through Burro Canyon, immediately south of the Burro Tunnel Mine (Figure 3.4-1). The peak discharge of this intermittent stream is unknown. In an intermittent stream located near Slick Rock, the peak discharge is in a range of 36 to 260 ft^3/s (USGS gage 9168700). Several small stormwater catchment basins are associated with the Burro Mines Complex and the relocation site (Figure 3.4-1); these are intermittent.

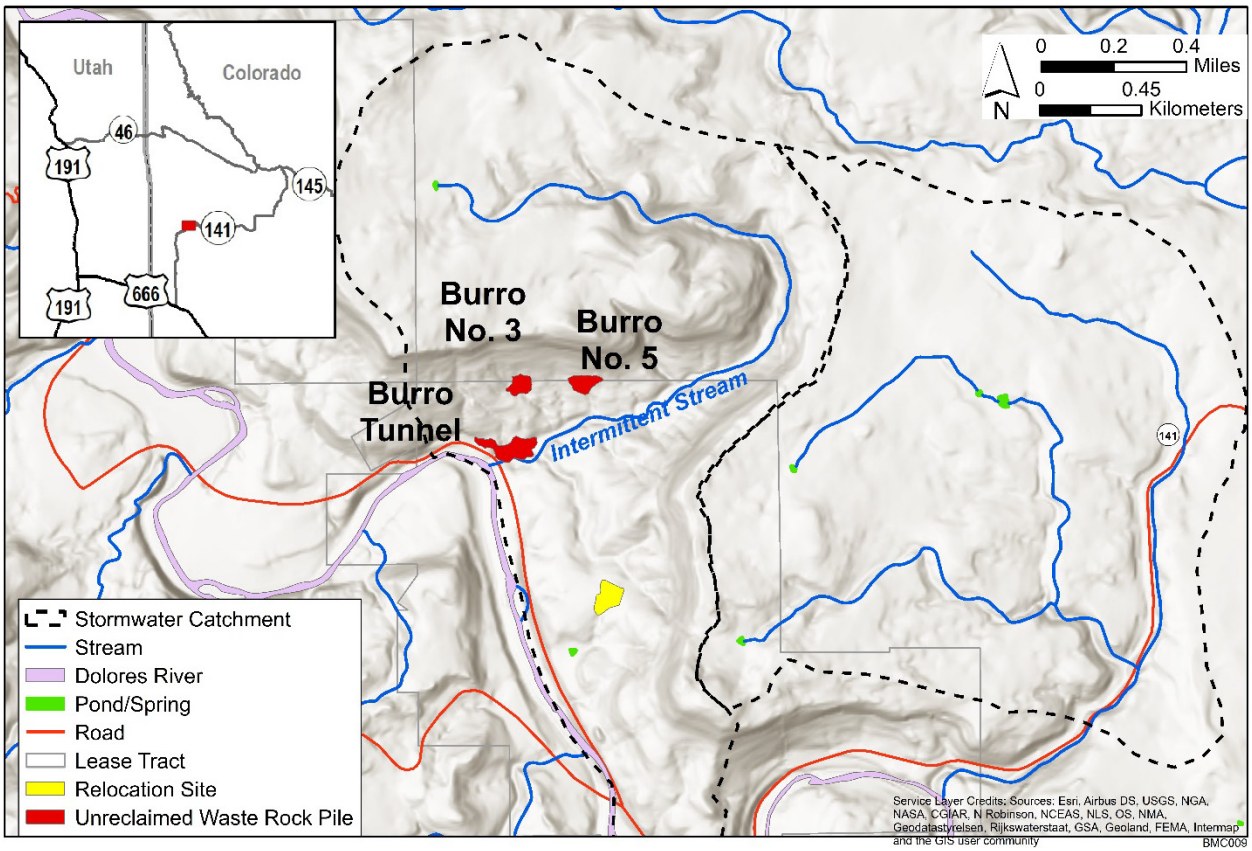

FIGURE 3.4-1 Surface Waters in the Burro Mines Complex Area

The local monthly precipitation and snowfall amounts have been recorded at Slick Rock, Colorado, since 2010 (National Centers for Environmental Information 2019). Average monthly precipitation totals range from 0.2 to 1.5 in. (0.5 to 3.8 cm), with a maximum monthly precipitation of 1.9 in. (4.8 cm), and snowfall occurs between November and April, with

monthly totals averaging 0.2 to 2.3 in. (0.5 to 5.8 cm). The average annual precipitation is 7.2 in. (18.3 cm). The potential annual evaporation rate is estimated to be 38 in. (97 cm) by Golder Associates (2009). The soil water content is usually deficient, and direct groundwater recharge is thus minimal under the condition of low annual precipitation and the high potential for evaporation in the area.

No floodplains are present within the project boundary. Floodplains are mainly located along the Dolores River. A narrow floodplain with an average width of 250 ft (76 m) is located at the east side of Dolores River between CR S8 and the main river channel. Larger floodplain areas are associated with the segment of Dolores River one mile or more downstream from the project area.

As for surface water quality, the Clean Water Act (CWA), as amended, requires states to develop lists of waterbodies that do not meet water quality standards and to submit updated lists to the EPA every two years, along with a report required in Section 305(b). The latest update (CDPHE 2018a) summarized water quality conditions in the state of Colorado from July 1, 2015, through June 2017. The assessment of water quality includes physical (e.g., sediment, dissolved oxygen, temperature), biological (e.g., E coli, aquatic life), inorganics (e.g., nitrate, sulfate), and metals (e.g., iron, lead, manganese, uranium) and other elements.

Nonattainment because of total iron concentrations was recently identified for a segment of the Dolores River that runs adjacent to the Burro Mines Complex identified as COGULD02 D in Figure 3.4-2 (CDPHE 2018a). Nonattainment does not appear to be associated with historical activities at Lease Tract C-SR-13 where the Burro Mines Complex is located. (CDPHE 2018a). Other potentially impaired river segments, which are currently placed by CDPHE in the Monitoring and Evaluation List (M&E List) for further validation, are located three miles upstream from Slick Rock (Figure 3.4-2). Water quality in these segments are also not affected by the Burro Mines Complex because they are located upstream. The sediments in water in the river segments near the area do not exceed standards.

In addition to the state surface water quality assessment, the 2017–2018 annual monitoring results at two sites (the Slick Rock East and the Slick Rock West), located in the floodplain of the Dolores River about 1 mi (1.6 km) downstream of the Burro Mines Complex, indicate that all analytes are currently below the EPA drinking water standards and Uranium Mill Tailings Radiation Control Act (UMTRCA) maximum concentration limits (MCLs) (DOE 2019a). Surface water monitoring data were collected for uranium at monitoring locations for Slick Rock East; and for manganese, molybdenum, nitrate, selenium, and uranium at Slick Rock West (DOE 2019a). Monitoring data collected from these two sites have been stable based on data reported for previous years (before 2017 and 2018). This indicates that the Burro Mines Complex has not affected surface water conditions at the Dolores River.

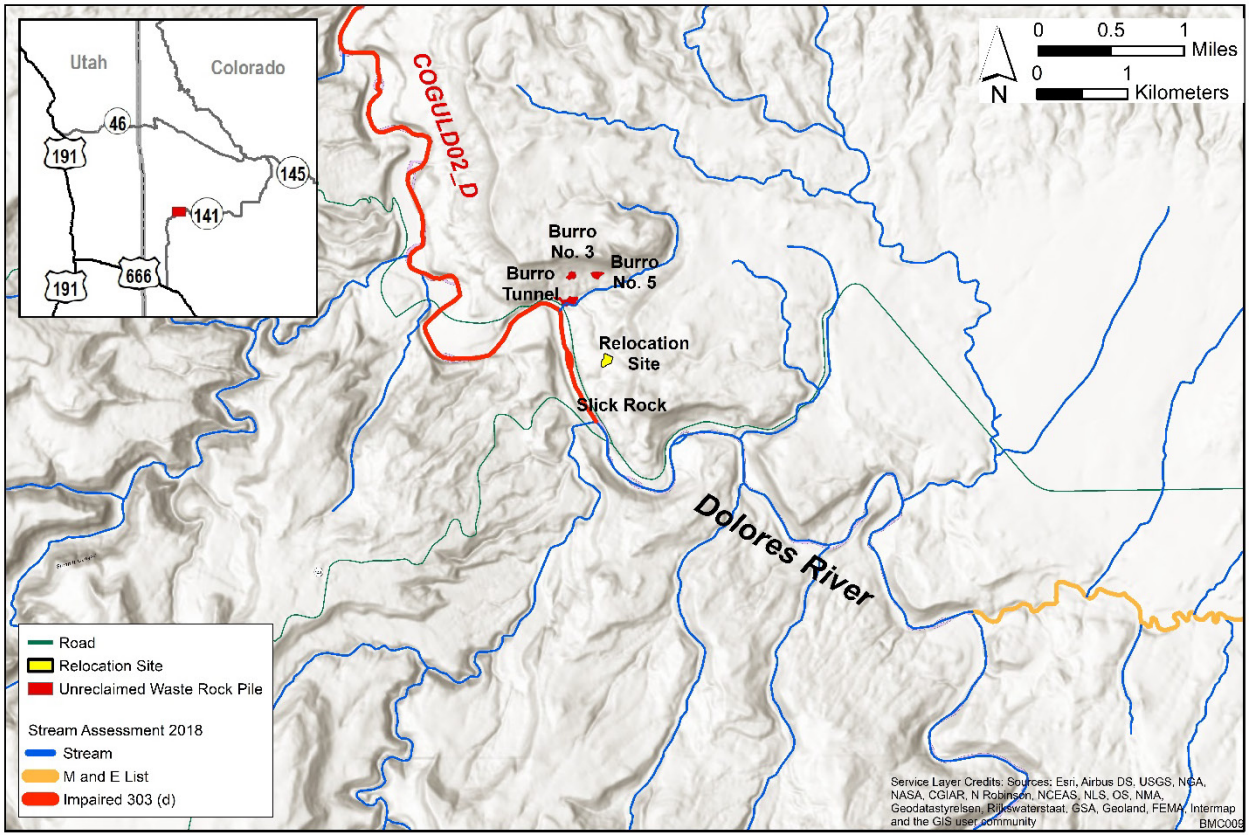

FIGURE 3.4-2 Surface Water Impaired or Placed on the Monitoring and Evaluation List Based on 2018 Stream Assessment (CDPHE 2018b)

3.4.2 Groundwater

Groundwater in the region is primarily located in bedrock aquifers and small, isolated alluvial aquifers. The alluvial aquifers within the study region are primarily composed of gravel, silts, and clays of Quaternary age and located in isolated canyon margins of the Dolores River (Topper et al. 2003). Near Slick Rock, limited, shallow alluvial aquifers were reported along the Dolores River bounded by the canyon wall (DOE 2019a). The water yield in the alluvial aquifer varies in a range of 1–200 gal/min (4.5–910 L/min) (CDWR 2011).

The bedrock aquifer consists of upper and lower groundwater systems. The lower groundwater system is hosted by fractured limestone overlain by confining salt bed and is typically saline (Weir et al. 1983). The upper groundwater system consists of layered sedimentary rock beds overlain by a confining shale layer in mesas and unconsolidated alluvial material mainly along the Dolores River. Groundwater in the sandstone units is typically low in salinity, and these units vary with respect to the amount of fracturing, which controls their groundwater yields (Weir et al. 1983). Reported groundwater yields in the sandstone units are typically less than 20 gal/min (91 L/min), except for isolated regions of high fracturing, which have groundwater yields up to 230 gal/min (1,000 L/min) (CDWR 2011).

On the basis of the registered water well records in the project area, as well as the lease tract areas in the Upper Dolores River Basin, the main water-bearing formations include (a) alluvium along the Dolores River, (b) Dakota Sandstone and Burro Canyon Formation near the top of Mesa, (c) Saltwash Sandstone in Morrison Member and Entrada Sandstone near the floor of the valley or river canyon, and (d) the underlying Navajo Sandstone and Wingate Sandstone (Figure 3.4-3). Within the Burro Mines Complex area, the primary source of groundwater recharge is from infiltration of precipitation. The low annual precipitation (12.5 in. [31.8 cm]) and high annual evaporation rate (38 in. [97 cm]; Golder Associates 2009) result in an extremely low quantity of groundwater in the water-bearing formations in and near the mesa areas. The highest water well yields are 0.05–1.5 gal/min (0.2–5.7 L/min) (Weir et al. 1983).

The underground mines that penetrate through Dakota or Burro Canyon water-bearing formations into Saltwash Sandstone were often dry or encountered minimal seepage in the lease tract area. The uppermost aquifer varies across locations within the region from Entrada Sandstone, Navajo Sandstone, to Wingate Sandstone, which underlies the confining layers, Summerville Formation, Carmel Formation, and Kayenta Formation, respectively (Figure 3.4-3). In the floodplains of the Dolores River, alluvial aquifer may directly overlie the Entrada aquifer. A local upward vertical hydraulic gradient from Navajo to Entrada and further to alluvial aquifers may occur in the floodplain as identified along Dolores River near the Slick Rock area (DOE 2019a). This upward hydraulic condition inhibits water from potential flowing downward from the shallow groundwater or surface ponding water the Slick Rock area.

Depths to groundwater are highly dependent on their locations between mesas and valley regions. Depths to groundwater in alluvial aquifers along the river valleys range from 2 to 90 ft (0.6 to 27 m) below the ground surface, with shallow depths quite commonly found (Topper et al. 2003). Within the segment of the Dolores River immediately downstream of the Burro Mines Complex, alluvial aquifers are underlying the floodplains with depths to groundwater ranging from 10 to 18 ft (3.0 to 5.5 m) at the Slick Rock East site, across the Dolores River from the project area, and from 6 to 16 ft (1.8 to 4.9 m) at the Slick Rock West site (DOE 2019a), which is 0.5 mi (0.8 km) downstream from the Slick Rock East site. For the upper groundwater system in the area, depths to groundwater are greater than 100 ft (30 m). Table 3.4-2 lists values for the depth to groundwater for USGS monitoring wells within the Upper Dolores River Basin.

Eight domestic groundwater wells were identified within 5 mi (8 km) of the Burro Mines Complex on the Colorado well permit database maintained by the Colorado Division of Water Resources (CDWR). These wells are all shallow, less than 100 ft (30 m), and withdrawing groundwater from alluvial aquifer located along the Dolores River. Among them, three wells are located in alluvial aquifer near the upstream segment of the Dolores River and five wells along the downstream segment of the Dolores River. No domestic wells are located directly along the groundwater flow pathway in the alluvial aquifer between the Burro Mines Complex and the Dolores River.

The database for the public water supply (PWS) system maintained by the Source Water Assessment and Protection Program at the Colorado Department of Public Health and Environment (CDPHE) indicates that none of the PWS wells are located within 5 mi (8 km) of the Burro Mines Complex (CDPHE 2019c). The source water protection areas for all PWS wells are not intercepted within 5 mi (8 km) from the project area.

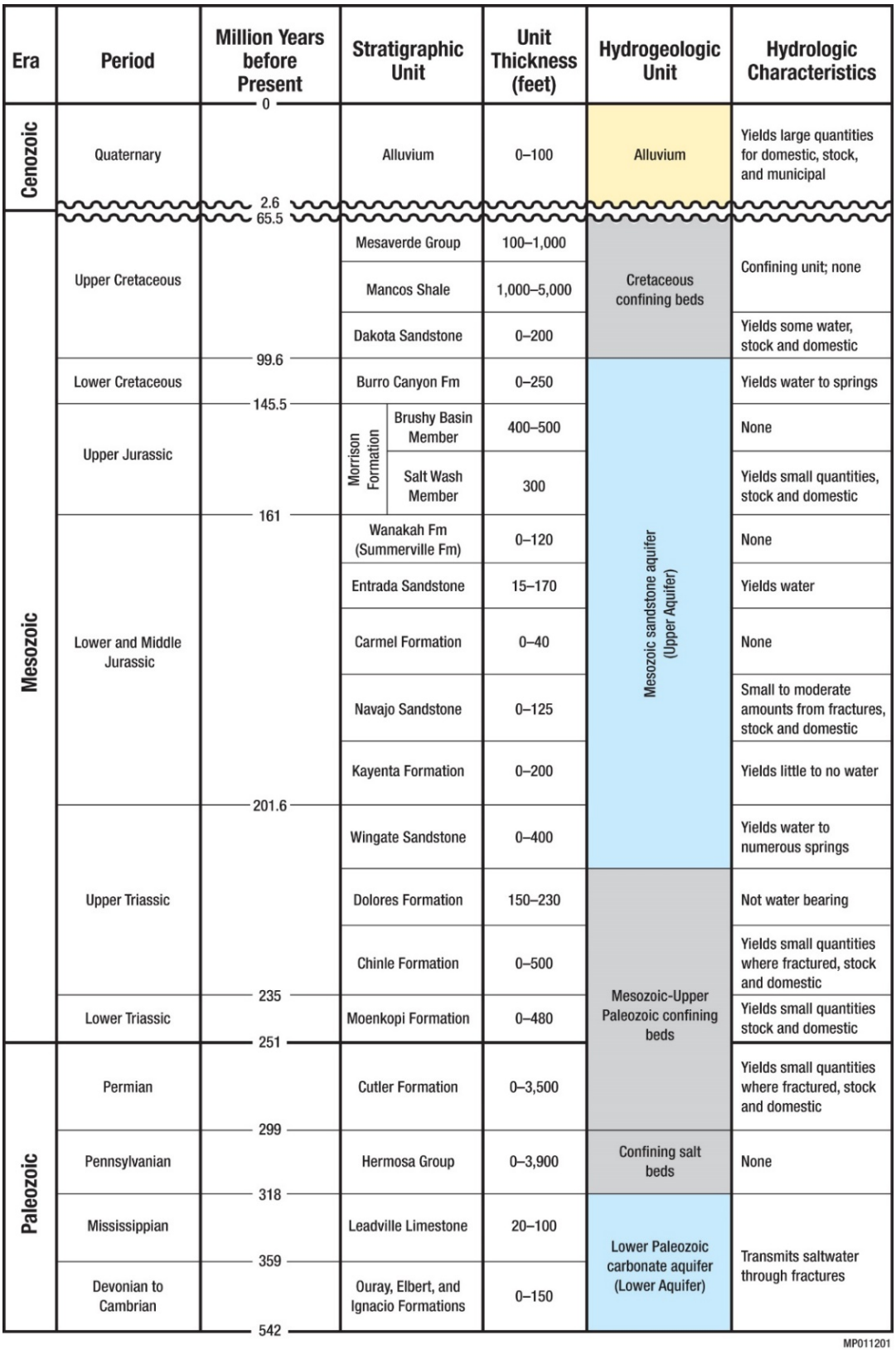

FIGURE 3.4-3 Water-Bearing Formations in the Upper Dolores River Basin (Sources: Topper et al. 2003; Walker and Geissman 2009)

Information on groundwater quality in the Upper Dolores River basin is limited. In the immediate area of the Burro Mines Complex, elevated concentrations of constituents associated with uranium mines in groundwater have been identified at the Slick Rock East and Slick Rock West sites. Both sites are located at the floodplain of the Upper Dolores River downstream of the Burro Mines Complex. At the locations upgradient from Slick Rock East site, concentrations of constituents are far below the MCL except for manganese. None of the constituents monitored exceed the MCL or background level at offsite locations downgradient from Slick Rock West, suggesting those constituents are currently contained with the sites (DOE 2019a).

TABLE 3.4-2 Depths to Groundwater Observed in USGS Monitoring Wells Located within the Upper Dolores Basins (HUC8)

USGS Well No.	Elevation[a] (ft)	Well Depth (ft)	Number of Observations	Depth to Groundwater (ft)
Upper Dolores				
382025108530401	5,010	91	10	32.78–39.24
381932108542801	5,130	205	10	107.09–132.03
380258108544400	5,450	125	7	12.88–19.96
375733108370501	6,190	65	1	7.25
375504108353201	6,370	115	1	42.5
372742108300901	6,930	240	11	6–12.99
372930108244800	7,110	132	11	7.25–12.51
375115108242601	7,400	80	4	12.97–41
382043109110201	7,535	160	1	50
373515108094901	8,060	63	4	25–37.27
374242108020501	8,955	49	5	36.68–38.33

[a] Surface elevation of the wells below 5,500 ft (1,676 m) are typically located in canyons and along alluvial areas, and wells located above 5,500 ft (1,676 m) are typically located on mesas.

Source: USGS (2011b).

3.4.3 Water Management

Water resources and water rights are primarily the responsibility of the CDWR, but several other agencies also address water management issues, including the CDPHE, which oversees stormwater management and water quality issues. Water rights in Colorado are governed by using the Doctrine of Prior Appropriation as the cornerstone; water rights are granted by a water court system and administered by the CDWR (CDWR 2012). The project area is located within the boundaries of Division 7 of the CDWR, where both surface water and groundwater are considered over-appropriated (CDWR 2007). In addition, instream flow water rights (nonconsumptive water rights for ecological

TABLE 3.4-3 Water Use by Category for San Miguel County in 2015

Category of Water Use	Daily Water Withdrawals (10^6 gal)
Irrigation	47.09
Aquaculture	0.2
Public supply	0.35
Domestic	0.27
Industrial	0
Livestock	0.03
Mining	0.07
Thermo-electric	0
Total surface water withdrawals	47.33
Total groundwater withdrawals	0.68

Source: Dieter et al. (2018).

benefits, which are administered by the Colorado Water Conservation Board (2012) have been established on segments of the Dolores River in the vicinity of Lease Tract C-SR-13. Surface water is the dominant water supply source used in southwestern Colorado, primarily for irrigation (Table 3.4-3).

Water use data for 2015 (Dieter et al. 2018) indicate that water withdrawals in San Miguel County increased by 70%. The total surface water withdrawal is reported to be 47 million gallons per day primarily for irrigation use. The total groundwater withdrawal was reported to be about daily 680,000 gallons.

3.5 HUMAN HEALTH

The evaluation of human health impacts considered an ROI within a 10-mi radius of the Burro Mines Complex and the relocation site. The potential sources of exposure and receptors are discussed below in Sections 3.5.1 and 3.5.2, respectively. The radionuclide and chemical exposure concentrations are discussed in Section 3.5.3.

3.5.1 Sources of Exposure

The potential sources of exposure include the following: (1) the waste rock piles at the Burro Mines Complex and the reclaimed waste rock pile at the relocation site; (2) groundwater; (3) surface water; and (4) natural background radiation sources.

Potential exposure to the waste rock piles could include direct external radiation exposure (if in close proximity to the piles), potential inhalation of radon and airborne dust particles containing radioactivity, and potential inhalation of chemicals in dust particles generated from the surface of the waste rock piles. Other exposure pathways such as incidental ingestion of dust particles (from the surface of the waste rock piles) are possible, but the exposures would be much less than those from the direct external and inhalation pathways.

Potential radiation and chemical exposure from groundwater and surface water at the complex was not evaluated as currently, these environmental resources are not affected by any constituents (e.g., uranium and vanadium) associated with the waste rock (see also Section 3.4).

Natural background radiation sources that people are exposed to every day include terrestrial radioactive materials in rocks and soils, cosmic rays, and cosmogenic radioactivity. The total dose from natural background radiation that a resident receptor living near the Burro Mines Complex and the relocation site could be higher than the national average (430 mrem/yr versus 310 mrem/yr) (DOE 2014). This higher radiation background is attributed to higher cosmic and cosmogenic radioactivity due to the elevation of the area, higher terrestrial radioactivity because the area is enriched with uranium ores which also results in higher radon. In general, the radiation dose from radon constitutes about 70% of the background radiation in the US.

3.5.2 Potential Receptors

Potential exposure to the following three receptors were considered: (1) a resident; (2) a recreationist; and (3) a reclamation worker.

For the resident receptor, the primary pathway of exposure would be the inhalation of radon and other chemicals from airborne dust released from the waste rock piles. This pathway is only possible if the resident is in the prevailing wind direction (the direction from which winds originate) which is southwest to northwest for this region. Known current residents are not located in the prevailing wind direction as they are located west and south of the Burro Mines Complex and the relocation site. However, to provide perspective, estimates for a resident (a hypothetical one) located in the prevailing winds of the complex and the relocation site is presented in Section 4.5.2.

For this EA, a recreationist is defined as a person camping on top of the reclaimed waste rock pile for two weeks. The reclamation worker is a worker who is within 1m (3 ft) of the waste rock materials while conducting reclamation activities. For both the recreationist and reclamation worker, the primary exposure pathways include the external radiation pathway (for radiation exposure) and the inhalation pathway (for chemical exposure).

3.5.3 Waste Rock Radionuclide and Chemical Concentrations

As radionuclide and chemical concentration data are not available for the Burro Mines Complex, it is assumed for the analysis in this EA that uranium and vanadium concentrations for waste rocks at the Burro Mines Complex would be the same as those from the ULP lease tracts because the complex is mostly located on ULP Lease Tract C-SR-13. An exposure concentration of 70 pCi/g for Ra-226 was assumed as this was the highest concentration measured in samples of waste rock from ULP lease tracts mines JD-6 and JD-8 (Whetstone Associates 2011, 2012). This same concentration was also assumed for U-234 and U-238 and other long-lived radionuclides (Th-230 and Pb-210) in the uranium decay chains that involve Ra-226. It was also assumed that the U-235 concentration is 4.6% of the concentration of U-234 and U-238 (as in natural uranium).

Uranium (from the waste rock) could also affect human health because of its chemical toxicity. Another waste rock constituent to consider for potential chemical effects is vanadium as it is present at five to six times as much as the uranium in the ores mined in ULP lease tracts. For this EA, the vanadium concentration in the waste rock piles was assumed to be six times the total uranium concentration of 212 mg/kg. No other radionuclide or chemical constituents aside from uranium and vanadium were reported at a concentration of concern based on the waste rock samples analyzed from ULP lease tracts (Whetstone Associates 2011, 2012).

Aside from radiation and chemical exposures, the potential for physical injuries was also evaluated for workers involved in reclamation activities.

3.6 ECOLOGICAL RESOURCES

3.6.1 Vegetation

The Burro Mines Complex is located within the Level IV Ecoregion 20c, Semiarid Benchlands and Canyonlands (Chapman et al. 2006), which contain primarily sandy soils that support a sagebrush steppe, cool- and warm-season grasses and shrubs, and stony soils that support piñon-juniper woodlands (Chapman et al. 2006).

Land cover types encompasses a range of similar plant communities or other land cover (e.g., quarries, mines, gravel pits, and oil wells) (USGS 2011a). The Burro Mines Complex is located on the Inter-Mountain Basins Shale Badland cover type. This cover type consists of barren and sparsely vegetated areas (<10% plant cover) with high rate of erosion and deposition. Vegetation consists of sparse dwarf shrubs and herbaceous plants. In addition to the Inter-Mountain Basins Shale Badland cover type, the other land cover types that occur within the area, including the planned access road between the mine sites and the relocation site, include the Inter-Mountain Basins Mat Saltbush Shrubland, Inter-Mountain Basins Greasewood Flat, Colorado Plateau Piñon -Juniper Woodland, and Colorado Plateau Piñon-Juniper Shrubland. Plants present in these land cover types include two-needle piñon (*Pinus edulis*), Utah juniper (*Juniperus osteosperma*), and mat saltbush (*Atriplex corrugate*). Herbaceous species are generally sparse (USGS 2011a; NatureServe 2019).

Depending on the time of disturbance and historical reclamation efforts, areas that have been previously disturbed by mining activities generally support a mixture of commonly occurring native and non-native species, which include noxious weeds and other weedy early successional species. The Colorado Department of Agriculture (CDA) maintains an official state list of noxious weed species (CDA 2017). Noxious weed species that have been identified within the project area include Canada thistle (*Cirsium arvense*), cheatgrass (*Bromus tectorum*), saltlover (*Halogeton glomeratus*), hardheads or Russian knapweed (*Acroptilon repens*), and salt-cedar (*Tamaris chinensis*, *T. parviflora*, and *T. ramosissima*) (S.M. Stoller Corp. 2012). Russian olive (*Elaeagnus angustifilia*) also occurs along the Dolores River (CDA 2019).

3.6.2 Wetlands

There are no jurisdictional wetlands within the Burro Mines Complex. Wetlands proximal to the Burro Mines Complex are primarily associated with the Dolores River and its floodplain (Figure 3.6-1). Stormwater catchment basins associated with the Burro Mines Complex are not jurisdictional wetlands. They retain only runoff water, do not contain wetland vegetation, and are not located along potentially jurisdictional channels. Similarly, the temporary flooded intermittent streambed located just south of the Burro Tunnel Mine is not considered a jurisdictional wetland (Figure 3.6-1).

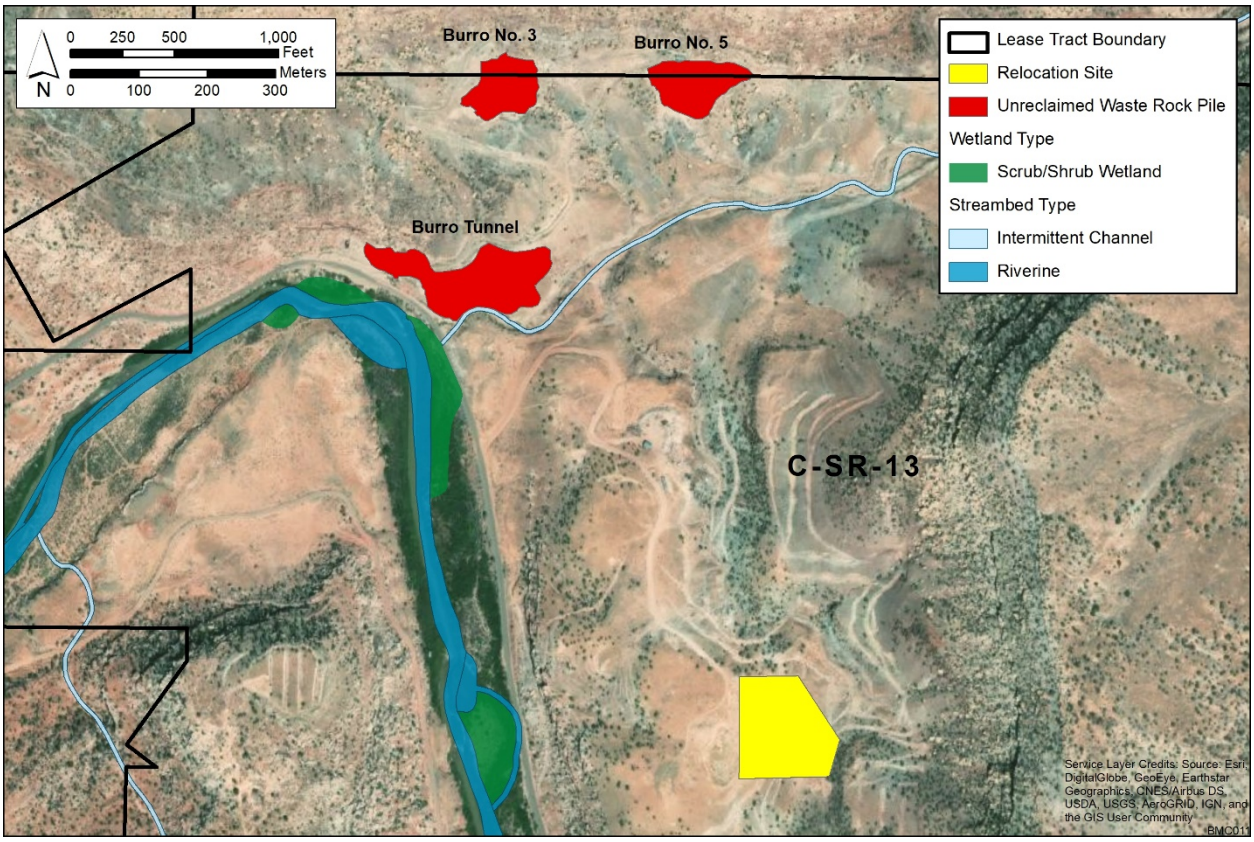

FIGURE 3.6-1 Wetlands and Streambeds Located near the Burro Mines Complex (modified from USFWS 2020a)

3.6.3 Wildlife

In San Miguel County, 28 species of reptiles and amphibians, 227 species of birds, and 81 species of mammals have been reported (DOE 2014; Colorado Field Ornithologists 2019). Some of these species are expected to occur in the Burro Mines Complex area at least seasonally or occasionally. Threatened, endangered, and other special status wildlife species (e.g., BLM sensitive species) are addressed in Section 3.6.5.

Reptiles would be limited within the Burro Mines Complex because most of the area is disturbed and provides little habitat. Waterfowl (ducks, geese, and swans), wading birds (herons and cranes), and shorebirds (plovers, sandpipers, and similar birds) live on and near the larger permanent waterbodies such as the Dolores River. These birds would not be expected to occur within the project area because suitable habitat is not present. For similar reasons, amphibians would also not be abundant within the project area.

More than 50 species of songbirds and 13 birds of prey (raptors, owls, and vultures) are found in the region (DOE 2014; Tables 3.6-8 and 3.6-9). Many of these species have the potential to occur within the Burro Mines Complex. Upland game birds that could inhabit the area include Gambel's Quail (*Callipepla gambelii*), Mourning Dove (*Zenaida macroura*), and Chukar (*Alectoris chukar*). These species are year-round residents. All these birds would be more abundant in the less disturbed areas surrounding the Burro Mines Complex.

The Burro Mines Complex occurs within the range of the following big game species: American black bear (*Ursus americanus*), mountain lion (*Puma concolor*), desert bighorn sheep (*Ovis canadensis nelsoni*), elk (*Cervis canadensis*), and mule deer (*Odocoileus hemionus*).[3] Big game species may occur within the immediate area of the Burro Mines Complex, but high-quality habitat for any of these species is not present. The American black bear occurs mostly within forested or brushy mountain environments and woody riparian corridors. Its habitat is characterized by relatively inaccessible terrain, thick understory vegetation, and abundant sources of food in the form of shrub- or tree-borne mast (Dewey and Kronk 2007).

The mountain lion is generally associated with mountainous or remote undisturbed areas. It may occupy a wide variety of habitats such as swamps, riparian woodlands, and broken country with good cover of brush or woodlands (NatureServe 2019). Elk generally inhabit open woodlands such as coniferous swamps, clear cuts, aspen-hardwood forest, and coniferous-hardwood forests (Senseman 2002). The Burro Mines Complex is not within identified migration corridors for elk, but it occurs just within its winter range where elk forage in sagebrush/mixed grass, big sagebrush/rabbitbrush, and mountain shrub habitats.

The desert bighorn sheep is a year-long resident and does not make seasonal migrations like elk and mule deer. The desert bighorn sheep prefers open vegetation, such as low shrub, grassland, and other treeless areas with steep talus and rubble slopes. It inhabits areas along the Dolores River and could be present within the project area. The Burro Mines Complex area is within the winter and summer ranges of the desert bighorn sheep (CPW 2019); including, more specifically, winter concentration area, severe winter range, and production area.[4] The project is located within an area that provides a critical linkage point between the upper Dolores and middle Dolores desert bighorn sheep populations (DOE 2014). Global Positioning System (GPS) collars on individual desert bighorn sheep in the Dolores River area have demonstrated that the area around Slick Rock is a significant movement corridor between two desert bighorn sheep populations and may be where many of the sheep lamb and winter (DOE 2014). This species is considered sensitive by BLM (Section 3.6.5.2).

Mule deer occur within most ecosystems but attain their highest densities in shrublands characterized by rough, broken terrain with abundant browse and cover. The Burro Mines Complex is not within identified migration corridors for mule deer, but it occurs within its winter range (CPW 2019). Mule deer have a high fidelity to specific winter ranges, where they congregate within a small area at a high density. Their winter range is at lower elevations within sagebrush and piñon-juniper vegetation.

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[3] Elk and the American black bear are considered secure in Colorado (very low or no risk of extirpation due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats), while the bighorn sheep, mule deer, and mountain lion are apparently secure in Colorado (at a fairly low risk of extirpation due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors) (NatureServe 2019).

[4] Winter concentration area is that part of the winter range where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten; severe winter range is that part of the winter range where 90% of the individual animals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten; and production area is that part of the overall range of bighorn sheep occupied by pregnant females during a specific period of spring (February 28 to May 1 for desert bighorn sheep).

Other mammals that could occur in the Burro Mines Complex area include small game, furbearers, and nongame species. Small game species include black-tailed jackrabbit (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendii*), and desert cottontail (*Sylvilagus audubonii*). Furbearers include American badger (*Taxidea taxus*), American beaver (*Castor canadensis*), bobcat (*Lynx rufus*), common muskrat (*Ondatra zibethicus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), and striped skunk (*Mephitis mephitis*). Nongame species include bats, shrews, mice, voles, chipmunks, and many other rodent species. Habitat for bats may be present at the Burro Tunnel Mine, which has a bat gate closure.

3.6.4 Aquatic Biota

The Dolores River is the only significant waterbody near the Burro Mines Complex. Several native fish species inhabit the Dolores River, including the roundtail chub (*Gila robusta*), bluehead sucker (*Catostomus discobolus*), flannelmouth sucker (*Catostomus latipinnis*), and speckled dace (*Rhinichthys osculus*). Some of these are special status species and are discussed in Section 3.6.5. Non-native fish species are also present in the Dolores River (Muth et al. 2000; McAda 2003; Anderson and Stewart 2003), including channel catfish (*Ictalurus punctatus*), black bullhead (*Ameiurus melas*), common carp (*Cyprinus carpio*), green sunfish (*Lepomis cyanellus*), pumpkinseed (*Lepomis gibbosus*), red shiner (*Cyprinella lutrensis*), sand shiner (*Notropis stramineus*), fathead minnow (*Pimephales promelas*), and brown trout (*Salmo trutta*).

3.6.5 Special Status Species

This section discusses federal and state special status species described below that may occur in the vicinity of the Burro Mines Complex.

3.6.5.1 Species Listed under the ESA

There are seven species (three bird and four fish species) listed under the Endangered Species Act (ESA) identified by the Information for Planning and Consultation (IPaC) tool reported for the Burro Mines Complex area (USFWS 2020b). No proposed or candidate species or designated critical habitat for any species are present in the area. The bird species are the Gunnison sage-grouse (*Centrocercus minimus*), Mexican Spotted Owl (*Strix occidentalis lucida*), and Yellow-billed cuckoo (*Coccyzus americanus*). The Gunnison sage-grouse was listed as threatened on December 22, 2014. This species occurs in and near sagebrush-dominated habitats in southwestern Colorado and other areas. No habitat for this species is present on or near the project area. The closest unoccupied designated critical habitat occurs more than 3 mi (4.8 km) west of the Burro Mines Complex.

The Mexican spotted owl was listed as threatened on March 16, 1993. It is considered a rare transient in San Miguel County; recent surveys by the BLM and USFWS have not detected this species. The Mexican Spotted Owl inhabits steep canyons with dense old-growth coniferous forests. Suitable habitat does not occur in or near the project area. The Yellow-billed cuckoo was listed as threatened on November 3, 2014. It inhabits deciduous riparian woodlands, particularly cottonwood and willow. This species is not known to occur near the Burro Mines Complex, and no habitat is present in the project area.

The four fish species are the bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and razorback sucker (*Xyrauchen texanus*). These species do not inhabit waterbodies near the Burro Mines Complex (such as the Dolores River). The fish are listed in IPaC because of concerns related to water depletions within the Colorado River Basin (downstream effects on these fish species and their habitat must be considered for federal projects). All four species could inhabit the Colorado River, which joins the Dolores River approximately 70 mi downstream.

3.6.5.2 Sensitive and State-Listed Species

There are 16 special status species not listed under the ESA that could occur in the vicinity of the Burro Mines Complex (Table 3.6-1). These include species designated as sensitive by the BLM[5], species listed as threatened by the State of Colorado, and species protected under the Bald and Golden Eagle Protection Act. Most of these species are terrestrial species that inhabit desert shrublands or piñon-juniper forests which occur near the Burro Mines Complex.

There are four aquatic or semiaquatic sensitive species that could be associated with the Dolores River near the Burro Mines Complex, including three fish species and one amphibian species (Table 3.6-1). The three BLM-sensitive fish species (bluehead sucker, flannelmouth sucker, and roundtail chub) are experiencing variable or declining population trends in the Dolores River (see Section 3.6.4).

[5] Most of the species listed as sensitive by the BLM are also listed as sensitive by the USFS. No USFS-administered lands occur within 10 mi (16 km) of the Burro Mines Complex.

TABLE 3.6-1 Special Status Species That Could Occur in the Immediate Vicinity of the Burro Mines Complex

Common Name	Scientific Name	Status[a]	Habitat and Occurrence in the Vicinity of the Burro Mines Complex[b,c]
Plants			
Naturita Milkvetch	*Astragalus naturitensis*	BLM-S	Inhabits sandstone mesas, ledges, crevices, and slopes in piñon-juniper woodlands. Elevation range is 5,000–7,000 ft. Known occurrences and habitat for this species are on Lease Tract C-SR-13, . Suitable habitat could occur on or near the Burro Mines Complex.
Fish			
Bluehead Sucker	*Catostomus discobolus*	BLM-S	Found in a variety of aquatic habitats from headwater streams to large rivers. The bluehead sucker requires water moving at a moderate to fast velocity, preferably over rock substrates. This species could occur in the Dolores River, which transects Lease Tract C-SR-13 and is a few hundred feet from the Burro Tunnel Mine.
Flannelmouth Sucker	*Catostomus latipinnis*	BLM-S	Inhabits moderate to large rivers, is seldom in small creeks, and is absent from impoundments. Prefers pools and deep runs. Spawns in riffles, usually over a substrate of coarse gravel. This species could occur in the Dolores River, which transects Lease Tract C-SR-13 and is a few hundred feet from the Burro Tunnel Mine.
Roundtail Chub	*Gila robusta*	BLM-S	Found in the Colorado River mainstream and its larger tributaries. Prefers slow-moving waters adjacent to areas of faster water. This species could occur in the Dolores River, which transects Lease Tract C-SR-13 and is a few hundred feet from the Burro Tunnel Mine.
Amphibians			
Northern Leopard Frog	*Rana pipiens*	BLM-S	Inhabits wet meadows, marshes, ponds, lakes, and reservoirs, as well as streams and irrigation ditches. Elevation range is 3,000–11,000 ft. Potentially suitable habitat could occur along the Dolores River near the Burro Mines Complex.
Birds			
Bald Eagle	*Haliaeetus leucocephalus*	BLM-S; BGEPA	Preferred habitat includes reservoirs and large rivers. In winter, bald eagles may occur locally in semidesert and grassland habitats, especially near prairie dog towns. Winter in riparian habitat along the Dolores River and in Dry Creek Basin. A winter nocturnal roost area occurs in the Slick Rock area. Probably forage for carrion within the Burro Mines Complex.
Golden Eagle	*Aquila chrysaetos*	BGEPA	Utilize a wide range of habitats. Most frequently use cliffs for nesting but will also nest in trees. Tundra, high- and mid-elevation pine forest, piñon-juniper woodlands, sagebrush and other shrub habitats, grassland, and agricultural habitats are all used for foraging. Primarily breed in montane habitats (in western Colorado). In winter, they range widely and occur commonly throughout Colorado. Potentially suitable foraging habitat could occur on or near the Burro Mines Complex.
Northern Goshawk	*Accipiter gentilis*	BLM-S	A rare migrant and winter resident in western Colorado, it inhabits various forest types including coniferous, piñon-juniper, and riparian habitats. May also forage in shrubland areas. Potentially suitable foraging habitat may occur on or near the Burro Mines Complex.

TABLE 3.6-1 (Cont.)

Common Name	Scientific Name	Status[a]	Habitat and Occurrence in the Vicinity of the Burro Mines Complex[b,c]
Birds (cont.)			
White-faced Ibis	*Plegadis chihi*	BLM-S	A rare fall migrant in western Colorado, this species inhabits wet meadows, marshlands, and reservoir shorelines. This species is not known to occur on any of the lease tracts; however, potentially suitable migratory habitat could occur along the Dolores River within Burro Mines Complex.
Mammals			
Big Free-tailed Bat	*Nyctinomops macrotis*	BLM-S	Forages primarily on moths in a variety of habitats, including montane forests and shrublands. Roosts in crevices on cliff faces or in buildings. Potentially suitable year-round habitat may occur on or near the Burro Mines Complex.
Fringed Myotis	*Myotis thysanodes*	BLM-S	A snag-dependent bat species that occurs in a wide variety of forest types including ponderosa pine, oak, and piñon-juniper. Also forages in grasslands and shrublands. Roosts in snags and rock crevices. Potentially suitable year-round habitat may occur on or near the Burro Mines Complex.
Gunnison's Prairie Dog	*Cynomys gunnisoni*	BLM-S	In Colorado, this species is restricted to the southwestern and south-central portion of the state. Inhabits grasslands and semiarid shrublands. Suitable habitat for this species may occur on or near the Burro Mines Complex.
Desert Bighorn Sheep	*Ovis canadensis nelson*	BLM-S	Inhabits visually open, steep, rocky terrain in mountainous habitats of the southwestern United States. Rarely uses valleys and lowlands, except as travel corridors between mountain ranges. Known to occur in in the Burro Mines Complex. Winter concentration areas occur on or near the Burro Mines Complex.
Northern River Otter	*Lutra canadensis*	CO-T	Occupies riparian and riverine habitats where permanent water is available. Feeds primarily on fish and crustaceans. Known to occur in the Dolores River, which is a few hundred feet from the Burro Tunnel Mine.
Spotted Bat	*Euderma maculatum*	BLM-S	Occurs near forests and shrubland habitats. Uses caves and rock crevices for day roosting and winter hibernation. Potentially suitable year-round habitat may occur on or near the Burro Mines Complex.
Townsend's Big-eared Bat	*Corynorhinus townsendii pallescens*	BLM-S	Inhabits semiarid shrublands, piñon-juniper woodlands, and montane forests below elevations of 10,000 ft (3,048 m). Roosts in caves, mines, rock crevices, under bridges, or within buildings. Known to occur in the Burro Mines Complex. Potentially suitable year-round habitat may occur on or near the Burro Mines Complex.

[a] BGEPA = protected under the Bald and Golden Eagle Protection Act; BLM-S = listed as sensitive by the BLM; CO-T = listed as threatened by the State of Colorado.

[b] The potential to occur on or near the Burro Mines Complex is based on the known or potential distribution and availability of suitable habitat in the vicinity of the complex. Sources that were considered included USFWS (2020b,c), CNHP (2019), and USGS (2007). If potential for occurrence exists, a site-specific survey will be conducted prior to any ground-disturbing activity.

[c] The availability of potentially suitable habitat was determined by using the SWReGAP habitat suitability models (USGS 2007). Quad-level occurrences were obtained from CNHP (2011b). Habitat and natural history information was obtained from NatureServe (2011, 2019), CNHP (2011a), and CPW (2011).

3.7 LAND USE

The Burro Mines Complex is located primarily on Lease Tract C-SR-13 (DOE 2014). A portion is also on BLM-administered lands, and privately-owned split-estate lands. Most of the lands surrounding the Burro Mines Complex are administered by the BLM. There are no lands managed by the U.S. Forest Service (USFS) located within a 10-mi (16-km) radius of the Burro Mines Complex. Figure 3.7-1 shows BLM land designations on public lands near Lease Tract C-SR-13. There are three areas within 10 mi (16 km) of the Burro Mines Complex that are components of the BLM's National Landscape Conservation System (NLCS) which includes specially designated areas. Specially designated areas are those areas designated by an Executive Order, an Act of Congress, or the BLM (through its land use planning process) as being deemed to possess unique or important resource values. These areas are the Gypsum Valley Area of Critical Environmental Concern (ACEC) consisting of 6,170 ac (2,497 ha), the Dolores River Canyon Wilderness Study Area (WSA) consisting of 30,134 ac (12,195 ha), and the Dolores River Specially Designated Recreation Area (SRMA) consisting of 64,588 ac (26,139 ha) (Figure 3.7-1).

Various other land use activities occur within 10 mi (16 km) of the Burro Mines Complex. Domestic livestock grazing is a major and widespread use of public lands managed by the BLM. Lease Tract C-SR-13 provides some forage for livestock grazing but does not support concentrated grazing (DOE 2014). Mineral resources in southwestern Colorado include uranium, vanadium, oil, natural gas, coal, and other metallic and nonmetallic minerals and mineral materials. Beginning in 1948, lands within the Uravan Mineral Belt in southwestern Colorado (including the subject Burro Mines Complex) were withdrawn from mineral entry under Public Land Order 459 (and others) to reserve them for the exploration and development of uranium and vanadium resources (DOE 2014). There are no coal leases within Lease Tract C-SR-13. Oil and gas leases are located along the Dolores River Canyon in the Slick Rock area. Mined metallic minerals include gold, silver, and platinum; while non-metallic minerals include gypsum and potash. Mineral materials of commercial value mined in the region include sand and gravel, crushed stone, dimension stone, granite, limestone, sandstone (silica, stone, and quartz), shale, clay, and aggregate. (DOE 2014). The proposed relocation site is a former gravel pit that was permitted by BLM to San Miguel County, between 1985 and 2003.

BLM Plan Conformance. The BLM manages its lands within a framework of numerous laws, the most comprehensive of which is the FLPMA. The BLM's Resource Management Plans (RMPs) provide direction for managing BLM-administered lands. The public lands associated with the proposed action are covered by the Tres Rios Field Office RMP (BLM 2015). FLPMA requires that the BLM determine lands available for ROWs in RMPs and that ROW decisions conform to those plans.

The action is in conformance with the 2015 RMP for the Tres Rios Field Office and Record of Decision (BLM 2015), as described in management action (Guideline) 2.19.15 on Page II-105 of the Tres Rios Field Office RMP; and any plan amendments in effect at the time this document is published. Additionally, the action meets Desired Condition 2.20.4 on Page II-114 of the RMP which states: "Reclamation of mineral exploration, development, and production activities is stable, long term, and implemented as soon as is reasonably possible in order to minimize impacts to other resources."

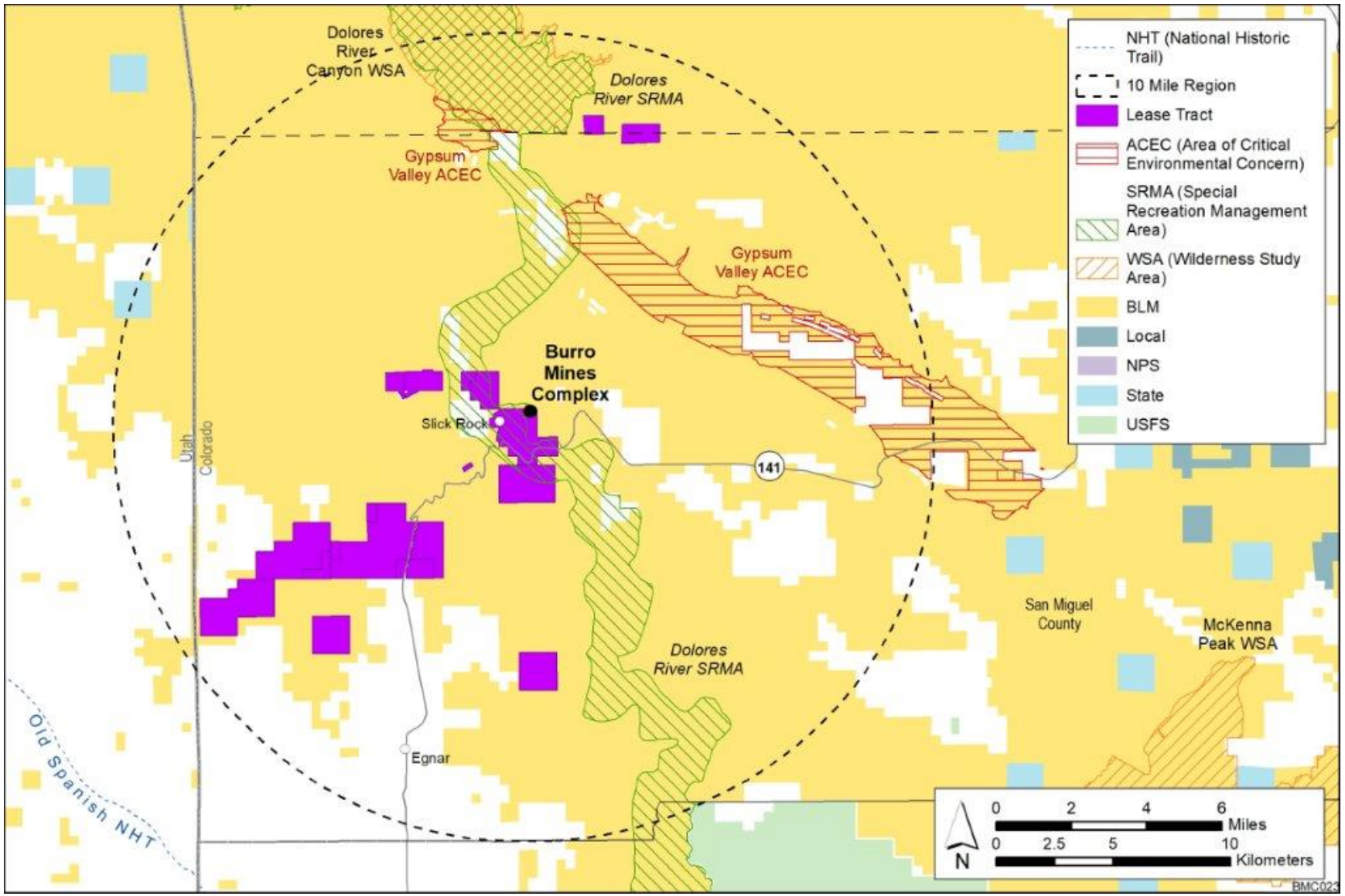

FIGURE 3.7-1 Specially Designated Areas on Public Lands near Lease Tract C-SR-13

3.8 SOCIOECONOMICS

The Burro Mines Complex is located near Slick Rock, Colorado, in San Miguel County, Colorado. The ROI includes the area that could be affected by the reclamation of the Burro Mines Complex and where workers are expected to reside and spend their wages. For this analysis, the ROI includes Dolores, Montrose, and San Miguel counties in western Colorado. This section describes three economic indicators for the ROI: employment, unemployment, and personal income. Measures of social activity considered include population, housing, public service employment, and levels of service for education (schools), health care, and public safety. The socioeconomics analysis is based on current information within the ROI.

3.8.1 Economic Environment

The ROI population is concentrated in Montrose County, specifically the town of Montrose. In San Miguel County, where the Burro Mines Complex is located, the population is much smaller and is concentrated in the eastern portion of the county; Slick Rock, the closest town to the Burro Mines Complex, is an unincorporated community located near SH 141 and the Dolores River. All the incorporated towns within the ROI are located at least 35 mi (56 km) from the Burro Mines Complex.

While Colorado and the ROI experienced an increase in employment between 2000 and 2010, employment in San Miguel and Dolores counties fell slightly, as shown in Table 3.8-1. However, between 2010 and 2018, the overall growth in employment rose in all counties within the ROI (1.55%) and the state of Colorado as a whole (2.04%). Unemployment in the ROI and Colorado fell significantly between 2010 and 2018 (Table 3.8-2).

TABLE 3.8-1 Employment for ROI and the State of Colorado, 2001–2018

Location	2000	2010	Average Annual Growth Rate, 2001–2010	2018	Average Annual Growth Rate, 2010–2018
Dolores County	853	823	-0.36	1,163	3.5
Montrose County	15,615	18,360	1.63	21,136	1.42
San Miguel County	4,580	4,508	-0.16	5,326	1.68
ROI	21,048	23,691	1.19	27,625	1.55
Colorado	2,303,494	2,447,712	0.61%	2,994,756	2.04

Sources: U.S. Bureau of Labor Statistics (2020a-d).

The services industry represents more than 50% of all employment in the ROI because of the high level of recreation and tourism in the area (see Section 3.8.3). Telluride, Colorado, which represents 30% of the entire population of San Miguel County, provides numerous seasonal jobs; the ski resort is likely responsible for the lower rates of unemployment and high percentage of services industry employment

TABLE 3.8-2 Unemployment Data for ROI and the State of Colorado, 2000–2018

Location	2000 Average	2010 Average	2018 Average
Dolores County	5.6	17.0	2.8
Montrose County	3.7	11.0	3.7
San Miguel County	3.0	7.8	3.5
Colorado	2.76	8.7	3.16

Sources: U.S. Bureau of Labor Statistics (2020a-d).

in the county. Wholesale and retail trade provide the second-highest number of jobs, accounting for 17% (Table 3.8-3). Construction jobs make up 9.2% of employment in the ROI.

TABLE 3.8-3 Employment within ROI by Sector

	Dolores County		Montrose County		San Miguel County		ROI	
Sector	Employ-ment	% of Total	Employ-ment	% of Total	Employ-ment	% of Total	Employ-ment	% of Total
Agriculture	0	0.0%	20	0.2%	0	0.0%	20	0.1%
Mining	2	0.7%	55	0.4%	0	0.0%	57	0.3%
Construction	23	8.4%	1,197	9.5%	410	8.3%	1,630	9.2%
Manufacturing	28	10.2%	1,365	10.9%	99	2.0%	1,492	8.4%
Transportation and public utilities	20–99[a]	7.3–36.1%	826	6.6%	63	1.3%	909–988	5.1–5.6%
Wholesale and retail trade	84	30.7%	2,426	19.3%	563	11.4%	3,073	17.3%
Finance, information, insurance, and real estate	3	1.1%	618	4.9%	359	7.3%	980	5.5%
Services	57–136[a]	20.8–49.6%	6,046	48.2%	3,401	68.9%	9,504–9,583	53.5–53.9%
Other	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total	274		12,553		4,937		17,764	

[a] For Dolores County, the employment sectors were estimated as a range.

Source: U.S. Census Bureau (2018a-c).

Between 2014 and 2018, per capita income in the ROI ranged from $24,505 (Dolores County) to $45,396 (San Miguel County). The per capita income for the State of Colorado was $36,415 (U.S. Census Bureau 2020a).

3.8.2 Population and Housing

Population in the ROI experienced an average annual growth rate of 0.4% from 2010 to 2018, which is less than the growth rate in the state of Colorado over the same period. San Miguel County had the largest growth rate for 2010–2018 in the ROI and is mostly unchanged from the growth rate between 2000 and 2010. The annual average growth rate in the ROI is expected to increase to 1.5% between 2018 and 2023, although population is expected to decrease in Dolores County during that time period (see Table 3.8-4).

TABLE 3.8-4 Population for the ROI and the State of Colorado, 2000–2023

Location	2000	2010	Average Annual Growth Rate (2000–2010)	2018 (estimated)	Average Annual Growth Rate (2010–2018)	2021	2023
Dolores County	1,844	2,064	1.1%	2,074	0.1%	2,024	2,011
Montrose County	33,432	41,276	2.1%	42,214	0.3%	48,873	45,327
San Miguel County	6,594	7,359	1.1%	8,191	1.3%	8,729	9,116
ROI	41,870	50,699	1.9%	52,479	0.4%	54,626	56,454
Colorado	4,301,261	5,160,189	1.8%	5,695,564	1.2%	5,916,483	6,491,972

Sources: U.S. Census Bureau (2019, 2020b); Colorado State Demography Office (2020).

Table 3.8-5 indicates that vacant housing units within the ROI increased slightly between 2009–2013 and 2013–2017, but overall vacancy rates stayed the same. The vacancy rate was highest in Dolores and San Miguel counties. In San Miguel County, the population growth since 2010 has increased pressure on the housing market. Many residential units in San Miguel County are used as vacation accommodations or second homes rather than for primary housing, and therefore, available units are generally priced too high. The average sale price in San Miguel County in 2018 was just under $1.5 million, and the rental rates for market rate units range from $1,600 per month to $2,500 per unit (Economic & Planning Systems, Inc. 2018). The current vacancy rate for deed-restricted housing is only 2.5%, and information based on an employer survey suggests that there are unfilled jobs attributed to lack of available housing (Economic & Planning Systems, Inc. 2018). This suggests that most of the vacancy stems from high sale prices, because even though there is a demand for affordable housing, the vacancy rate remains high.

TABLE 3.8-5 ROI Housing Characteristics, 2009–2013 and 2013–2017

	Dolores County		Montrose County		San Miguel County		ROI	
	2009–2013 Estimates	2013–2017 Estimates	2009–2013 Estimates	2013–2017 Estimates	2009–2013 Estimates	2013–2017 Estimates	2009–2013 Estimates	2013–2017 Estimates
Total housing units	1,473	1,422	18,204	18,716	6,663	6,763	26,340	26,901
Total occupied units	780	707	16,586	16,951	3,234	3,301	20,600	20,959
Total vacancy units	693	715	1,618	1,765	3,429	3,462	5,740	5,942
Vacancy rate	47%	50%	9%	9%	51%	51%	22%	22%

Source: U.S. Census Bureau (2020c, d)

3.8.3 Community and Social Services

The following sections discuss community and social services for the ROI, including education, healthcare, and public safety. City jurisdictions within the ROI are listed in Table 3.8-6.

TABLE 3.8-6 ROI Jurisdiction

Type of Jurisdiction	Governments
Counties	Dolores, Montrose, San Miguel
Cities	Dove Creek, Rico, Montrose, Naturita, Nucla, Olathe, Redvale, Mountain Village, Norwood, Ophir, Sawpit, Telluride
School districts	Dolores County School District RE-2J, Montrose County School District Re-1J, West End School District No. Re-2, Norwood School District No. R-2J Telluride School District No. R-1
Tribal	Jicarilla Apache Nation, New Mexico

Source: NCES (2019), DOI (2011)

There were 25 schools located in the ROI during the 2018–2019 school year with a total of 7,968 students and 473 teachers, resulting in a student-teacher ratio of 17.2 (Table 3.8-7). Most students in the ROI attend school in Montrose County.

TABLE 3.8-7 ROI School District Data, 2018–2019

Location	Number of Students	Number of Teachers	Student-Teacher Ratio	Level of Service[a]
Dolores County	250	19	12.85	9.16
Montrose County	6,577	360	18.3	8.53
San Miguel County	1,141	94	12.1	11.47
ROI	7,968	473	17.2	9.01

[a] Number of teachers per 1,000 population.

Source: NCES (2019)

There are two hospitals in the ROI; the largest is in Montrose County with 75 beds and the smallest is in San Miguel County with seven beds. There are no hospitals in Dolores County. In 2017, the ROI had 127 police officers with a level of service of 2.4 and 53 professional firefighters (not including volunteers), with a lower level of service of 1.0 (Table 3.8-8). The crime rates for the ROI are provided in Table 3.8-9.

TABLE 3.8-8 ROI Public Safety Employment, 2017, 2014

Location	Number of Police Officers, 2017	Level of Service[a]	Number of Firefighters[b], 2014	Level of Service
Dolores County	4	1.9	0	0.0
Montrose County	96	2.3	41	0.97
San Miguel County	27	3.3	12	1.47
ROI	127	2.4	53	1.0

Footnotes continued on next page.

TABLE 3.8-8 (Cont.)

[a] Number per 1,000 population

[b] Number does not include volunteers

Sources: DOJ (2017), Fire Departments Network (2020a-e)

TABLE 3.8-9 County Crime Rates, 2016[a]

	Violent Crime[b]		Property Crime[c]		All Crime	
Location	Number. of Offenses	Rate[a]	Number of Offenses	Rate	Number of Offenses	Rate
Dolores County	5	2.4	17	8.2	44	21.2
Montrose County	12	0.3	229	5.4	484	11.5
San Miguel County	7	0.9	3	0.37	20	2.44
ROI	24	0.46	249	4.74	548	10.4

[a] Rates are the number of crimes per 1,000 population.

[b] Violent crime includes murder and non-negligent manslaughter, rape, robbery, and aggravated assault.

[c] Property crime includes burglary, larceny, theft, motor vehicle theft, and arson.

Source: DOJ (2016).

3.8.4 Recreation and Tourism Economy

Western Colorado is a major year-round tourist destination for outdoor sports, including hiking, biking, whitewater rafting, horseback riding, skiing, off-highway vehicle trail riding, hunting, fishing, and snowshoeing. Most of the land in the ROI is managed by the USFS and BLM. Among the many recreation areas that the BLM manages are numerous Special Recreation Management Areas (SRMAs) and NLCS units (BLM undated). SRMAs are areas where recreation is the principal management focus and where the objective is to provide specific "structured" recreational opportunities (BLM 2011). These can include campgrounds, trails, and boat ramps for river access. The project area is within the Dolores River SRMA, which is managed to provide for a broad range of recreational benefits, primarily to river users. Developed recreation sites are located near the Burro Mine site along the Dolores River SRMA. The Unaweep-Tabeguache Scenic and Historic Byway follows the Dolores and San Miguel Rivers and offers recreational opportunities such as hiking and bicycling on backroads, trails on BLM and USFS land, and river rafting (Advanced Resource Management, Inc. 2013).

As discussed in Section 3.8.1, employment in the ROI is concentrated in the service industry, and much of that stems from the recreation provided by the publicly managed areas discussed above. The tourism industry is difficult to quantify; it covers multiple job sectors and has direct and indirect impacts on the local economy resulting from increased sales from visitor spending, changes to local employment and income, and induced effects reflected in local goods and services purchased by residents who experience changes in income from new economic

activity. Activities on public lands include skiing and touring, visits to parks and monuments, and outdoor recreation. In San Miguel County, where the Burro Mine Complex is located, the ski resort in Telluride provided the largest number of jobs in the tourism sector.

3.9 ENVIRONMENTAL JUSTICE

E.O. 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," formally requires federal agencies to incorporate environmental justice as part of their missions (U.S. President 1994). Specifically, it directs them to address, as appropriate, any disproportionately high and adverse human health or environmental effects of their actions, programs, or policies on minority and low-income populations.

The analysis of how mining projects, including reclamation, affect environmental justice concerns follows guidelines described in the Council on Environmental Quality's (CEQ's) Environmental Justice Guidance under NEPA (CEQ 1997). The analysis method has three parts. First, a description of the geographic distribution of low-income and minority populations in the affected area is undertaken. Then an assessment is conducted to determine whether reclamation and relocation of waste rock would produce human health or environmental impacts that are high and adverse. Finally, if impacts are high and adverse, a determination is made as to whether these impacts disproportionately affect minority and low-income populations.

Reclamation of the Burro Mines Complex could affect environmental justice if any adverse human health and environmental impacts would be significantly high and if these impacts would disproportionately affect minority and low-income populations. If the analysis determined that human health and environmental impacts would not be significant, there would be no disproportionately high and adverse impacts on minority and low-income populations. In the event a potential for human health or environmental impacts is significant, disproportionality would be determined by comparing the proximity of any high and adverse impacts with the location of low-income and minority populations. For example, the analysis would consider whether potentially significant human health risks would appreciably exceed the risk to the general population.

No disproportionately high minority or low-income population groups occurred within a 10-mi (16-km) radius of the Burro Mines Complex (DOE 2014).

3.10 TRANSPORTATION

The road network in southwestern Colorado in the vicinity of the Burro Mines Complex consists of SH 141 as the primary access road to the area with San Miguel CR S8 and CR 10S (Slick Rock gravel pit road, unpaved) providing the nearest access to the site, as shown in Figure 1-1. CR S8 runs north from SH 141 on the east side of the Dolores River up to the Burro Tunnel Mine site. South of the Burro Tunnel Mine site, CR 10S branches off CR S8 to the northeast, eventually curving to follow a south–southeasterly direction down to the relocation site where the waste rock piles are proposed to be relocated under Alternative 2 (Preferred Alternative).

Less than 0.1 mi (1 km) to the northwest of the intersection of SH 141 with CR S8, near its intersection with CR 10R, the average annual daily traffic along SH 141 is approximately 220 for all vehicles, including 20 single unit trucks and 30 combination trucks (Colorado Department of Transportation 2019).

3.11 CULTURAL RESOURCES

Cultural resources are important to maintaining the heritage of the people of the United States. They provide a physical connection to the past and contemporary traditional culture. They include archaeological sites; historic buildings and structures; landscapes; culturally important natural features; and traditional cultural properties important to specific social or cultural groups, such as Native American Indian tribes. Cultural resources that meet the eligibility criteria for listing on the National Register of Historic Places (NRHP) are termed "historic properties" under the NHPA of 1966, as amended. NHPA requires federal agencies to take into account the potential effects of their undertakings, such as mine reclamation, on cultural resources that are listed on or eligible for listing on the NRHP.

3.11.1 Cultural History

The discovery of carnotite ore in the 1890s led to the development of the Uravan Mineral Belt, including the construction of uranium and vanadium ore processing plants and the prosperity of the nearby towns of Bedrock, Nucla, and Naturita. As is a common occurrence with mining and mineral extraction, the Uravan Mineral Belt experienced a repeated boom-and-bust cycle tied to the supply of and demand for radioactive metals and vanadium which continued until the 1970s (Twitty 2008). The remains of the prospects, mines, roads, mining camps, drill pads, and other modifications of the landscape remain in the Uravan Mineral Belt. Those remains that still retain their historic integrity and association are typically eligible for listing on the NRHP as historic properties or as historic districts.

3.11.2 Cultural Resources within Burro Mines Complex

DOE and the BLM have collaborated on the analysis of archaeological, architectural, and landscape resources at Burro Canyon to define the historic properties within the area of potential effect (APE) at this location, and the context in which they were established. The Burro Mines Complex (5SM.2725) consists of the remnants of a historic hard-rock uranium mine located on BLM-owned, DOE-managed land. The Burro Mines Complex includes four separate and distinct mine sites; the Burro Tunnel mine, the Burro No. 3 shaft mine, the Burro No. 5 shaft mine and the Burro No. 7 shaft mine (Burro No. 7 is not included in the project scope for this EA). The file and literature search indicated three previous inventories within the project location; two previously recorded sites (5SM.2725 and 2726) and one previously recorded isolated find (5SM.1501). Remaining onsite features include an ore bin, a tunnel sized for trackless vehicles, multiple vertical shafts, support structures, support building foundations, an air and water line, major portions of a large ventilation system, and one steel headframe with associated ore and waste rock bins.

The BLM participation on this project included the analysis of the APE for archaeological resources; the archaeological work included a field inventory covering 93 ac (38 ha) of new survey. This resulted in the documentation of the Burro Mines Complex in its

entirety and one new prehistoric site (5SM.8290). The various Burro Mine features have been combined into one continuous site under the site number 5SM.2725 for the entire complex. Site number 5SM.2726 will be retired following this recording. The BLM also identified a prehistoric component within the Burro Mines complex and identified no other cultural resources during their survey. The prehistoric component of the site does not contribute to the eligibility of this site.

The Burro Mines Complex retains features not normally found on small-scale uranium mining operations in this region. This makes the Burro Mines complex historically important because the remaining features retain a rare degree of integrity not typically found at uranium and vanadium mine sites in the region. Remaining architectural and archaeological assemblages include: Burro Tunnel mine (mine features include an ore bin, ore bin trestle, waste rock, and road and loadout area), Burro No. 5 mine (support buildings, shaft, steam engine, boiler, engine cooler, and waste rock) and Burro No. 7 mine (headframe, hoist house with hoist, waste rock, access road, air and water line, and vehicles). Previous reclamation activity at the Burro No. 3 mine included removal of the majority of buildings and structures that once existed; however, it retains sufficient features to contribute to the overall design, setting, and feeling of the mine complex.

DOE has determined, in consultation with the BLM, that the Burro Mines Complex is eligible for listing under Criterion A for its association with broad patterns in U.S. history. Specifically, the mine produced vanadium and uranium ore used by U.S. defense and consumer industries during the Cold War. The Burro Mines Complex, which operated from circa 1952 until circa 1984, maintains integrity of location, design, workmanship, and materials. The surrounding area, a desert canyon adjacent to a perennial river, contributes to the site's integrity of setting, feeling, and association. The Burro Mines Complex is an excellent example of a hard-rock uranium mine that operated within the larger time period of the Cold War as a district (i.e., a collection of related buildings and structures that share a common theme). DOE has initiated consultation with the Colorado SHPO regarding this determination and the proposed undertaking.

The Burro Mines Complex contains sufficient structural remnants and archaeological assemblages that strongly retain the aspect of design, making the mine complex also eligible for listing under Criterion C. The surrounding landscape retains substantial features associated with mining during the 1950-1980s, such as the myriad of access roads blazed through the landscape. The mine's overall footprint speaks of its development during a time that predates the majority of the current environmentally-driven limitations on the surface activity of a modern mine. The archaeological assemblages discussed above, combined with structural features across the complex such as roads, water line, powerlines, an explosive magazine, vent holes, and other features and artifacts, convey that the individual mine sites were part of a larger industrial landscape.

The period of significance for the Burro Mines Complex extends to the end of operations in circa 1984 because the mine's operations during the 1970s and 1980s contributed to the continuation of the nuclear industry during the Cold War. The period of mining activity that is less than 50 years in age is eligible under Criteria Consideration G for its exceptional importance. During this time, the uranium mining industry responded to the nation's energy-related nuclear capabilities. During the 1970s and 1980s, the federal government no longer

purchased uranium for military uses. Instead, it promoted nuclear power, which became a significant energy source. Given the large-scale operation at the Burro Mine, which yielded high volumes of ore, this mine complex can be considered to have rendered significant contributions of uranium ore to the nuclear power programs of the time period.

3.12 VISUAL RESOURCES

The Burro Mines Complex is located in San Miguel County's "West End," as it is known locally, just north of Slick Rock, Colorado. The area is noted for its wildlife, historical and archaeological sites, natural resources, and landmarks, including the Dolores River. Elevation within this region varies between approximately 5,400 and 6,000 ft (1,646 and 1,830 m). Natural vegetation consists of grasses and shrubland. The land forms are characterized by a range of features, including, basins, valleys, and rock outcrops (Chapman et al. 2006), creating a highly variable landscape with numerous colors, textures, forms, and lines. This surrounding region has historically been utilized for mining activities, including the exploration and development of coal, oil, and gas; sand and gravel; and radium, uranium, and vanadium.

The ROI for visual resource analysis was set at 25 mi (40 km) because it is the approximate limit at which non-negligible visual contrasts from the structures and activities in the proposed action could reasonably be expected to be visible in this region, assuming favorable viewing conditions and strong contrast between an object and its background. A geographic information system (GIS)-based impact analysis was used to identify locations within 25 mi (40 km) of the Burro Mines Complex from which some portions of the lands containing the complex would be visible. Assuming an unobstructed view of the Burro Mines Complex, viewers in these areas would be likely to perceive some level of visual contrast from the reclamation activities.

The "spatial analyst extension" of the ESRI ArcGIS 10.6 software was used to calculate viewsheds. A viewshed is an area of landscape visible to the human eye from a fixed vantage point. The viewshed analyses determined the potential visibility of the Burro Mines Complex from lands within 25 mi (40 km). Viewshed calculations were performed by using National Elevation Dataset 10-meter Digital Elevation Model (DEM) with the earth curvature set to a refractivity coefficient of 0.13. Viewsheds were calculated based on an assumed height of 30 ft (9 m) to represent the mining sites and 5 ft (1.5 m) to represent the observer height.

Special consideration was given to Sensitive Visual Resource Areas (SVRAs). SVRAs are defined as surrounding lands with a Federal, state, or BLM designation that have scenic and visual values and are thereby visually sensitive, which include, but are not limited to, National Parks; Wilderness Areas; National Scenic Trails; and Scenic highways, byways and All-American Roads; and often have the protection of scenic resources incorporated into their management plans. The Dolores River SRMA is the only SVRA with visibility of the Burro Mines Complex (See Figure 3.12-1). The total acreage of the Dolores SRMA is 702,558 ac (284,325 ha), of which 1,381 ac (559 ha) has visibility of the Burro Mines Complex. Further, only 1,361 ac (551 ha) and 20 ac (8 ha) has visibility within 5mi (8 km) and 15 mi (24 km) of the Burro Mines Complex, respectively.

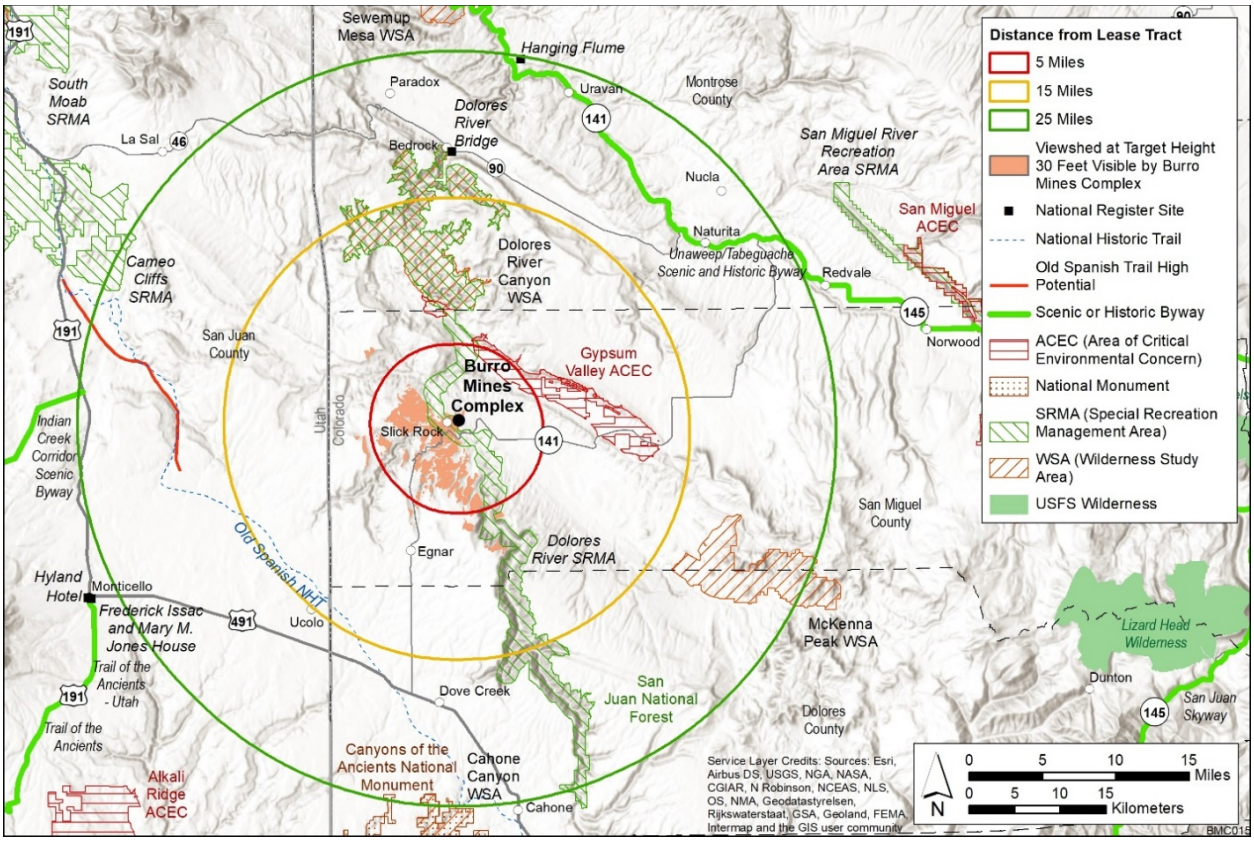

FIGURE 3.12-1 Viewshed Analysis for the Burro Mines Complex

The BLMs Visual Resource Management (VRM) system (BLM 1986a, b) was used to determine visual impacts from reclamation activities. The VRM system assigns lands a VRM class I-IV. The VRM classes set VRM objectives for lands in each class, as well as the level of visual change in the landscape character that is allowed as a result of proposed management activities. The Burro Mines Complex is located on BLM lands with a Class II VRM value, which aims to "retain the existing character of the landscape" (BLM 2015). Visual impacts can depend on the type and degree of visual contrasts introduced into an existing landscape. Where modifications repeat the general form, line, color, and texture of the existing landscape, the degree of visual contrast is generally lower and the perceived impacts are lower. Where modifications introduce pronounced changes in form, line, color, and texture, the degree of contrast is often greater, and perceived impacts are greater too.

Key Observation Points (KOPs) are typically used as viewpoints for assessing potential visual impacts resulting from proposed projects in an area. A KOP is a point on/in a travel route, use area, site, or place of cultural importance where the majority of activity takes place or the view would be most revealing. To address visual impacts within the Dolores River SRMA, a viewshed analysis was conducted on a more frequently used place where recreationists may spend a significant amount of time looking at the surrounding scenery and may potentially notice changes to the landscape. The KOP selected for analysis is the Slick Rock Boat Ramp, which is on private land, just on the north side of the SH 141 bridge. No portion of the Burro Mines Complex is visible from this point (see Figure 3.12-2).

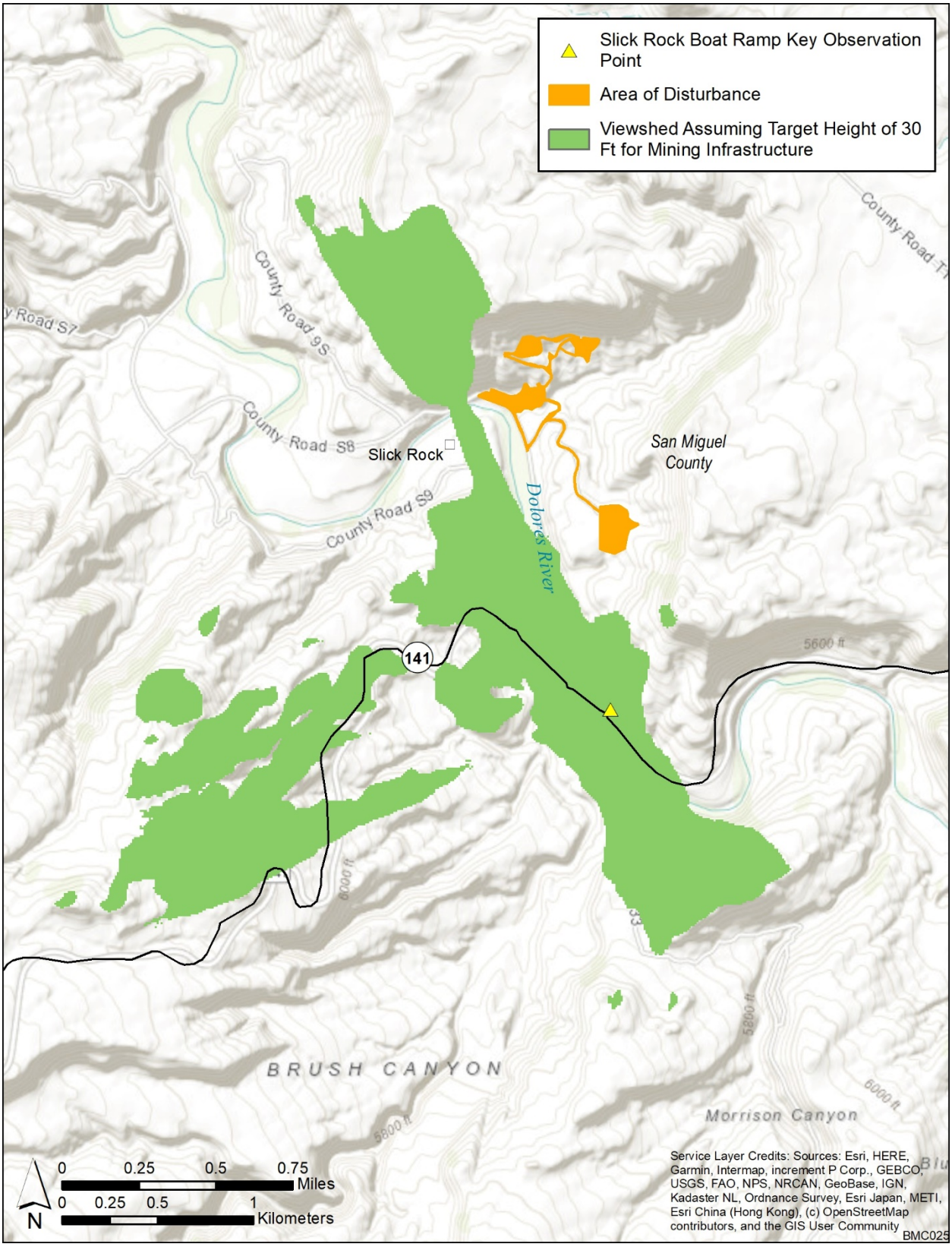

FIGURE 3.12-2 Viewshed from Slick Rock Boat Ramp on SH 141 KOP

3.13 WASTE MANAGEMENT

During reclamation (Alternative 2), waste other than the waste rock piles that are the subject of reclamation activities could be generated. Such waste would generally be in the category of non-hazardous solid waste (e.g., debris, miscellaneous trash, and sanitary waste from portable facilities). These wastes would be properly managed and transported to permitted solid waste disposal facilities. A fuel storage and spill prevention plan would be followed for onsite management of fuel needed for the various equipment utilized for the reclamation activities.

4 ENVIRONMENTAL IMPACTS

The potential impacts for each of the environmental resource areas evaluated for the two alternatives are presented in the following sections. As described in Section 2.1, the two alternatives are Alternative 1, No Action; and Alternative 2, Reclamation of the Burro Mines Complex (Preferred Alternative).

4.1 AIR QUALITY

The ROI evaluated for potential impacts is within the 25 mi (40 km) radius of the Burro Mines Complex. In general, reclamation activities would be similar to conventional construction activities in terms of procedures and equipment. During reclamation, primary emission sources would include fugitive dust from earth-moving activities on waste rock piles and vehicle traffic on unpaved roads, engine exhaust from diesel-powered heavy equipment and dump trucks, and exposed ground or stockpiles being eroded by the wind. Engine exhaust emissions from heavy equipment and vehicles would include criteria pollutants, such as CO, NO_x, PM ($PM_{2.5}$ and PM_{10}), and SO_x; VOCs; and greenhouse gases (GHGs) (e.g., the primary GHG, carbon dioxide [CO_2]). Soil disturbances and wind erosion would generate mostly PM emissions. Typically, the amount of fugitive dust emissions is larger than the amount of engine exhaust emissions during reclamation.

To evaluate potential impacts on ambient air quality under the two alternatives, air emissions from reclamation activities were estimated using the standard emission factor references and activity level data, such as heavy equipment type and usage. Fugitive dust emissions are estimated based on emission factors presented in *AP-42* (EPA 2019e): Section 11.9 Western Surface Coal Mining for dozing and wind erosion; Section 13.2.2 Unpaved Roads for vehicle traffic on unpaved roads and loader operations on disturbed surfaces; and Section 13.2.4 Aggregate Handling and Storage Piles for material handling. A mean vehicle weight for dump trucks is assumed based on the 15-yd^3 truckload. Silt content and moisture content are taken from the industries similar to reclamation activities at the site (EPA 2019e), and average wind speed of 6.6 mph (2.9 m/s) is taken from Hopkins Field in Nucla, Colorado (NCDC 2019).

It is assumed that a conventional dust control measure of water spraying with an emission control efficiency of 50% would be applied over the disturbed area, such as waste material piles and unpaved roads (Countess Environmental 2006). Engine exhaust emissions from vehicles traveling to and from the Burro Mines Complex are estimated based on published emission factors generated using emission factor motor vehicle model MOBILE6.2 (EPA 2003). Emission factors for nonroad equipment were estimated using the EPA's NONROAD emission factor model (EPA 2004a). Estimated air emissions are compared with total annual emissions for criteria pollutants and VOCs in San Miguel County and for GHGs in Colorado and the United States to assess emissions from reclamation activities for the Burro Mines Complex relative to emissions for the state and the country.

4.1.1 Alternative 1: No Action

Under Alternative 1, no action would be taken to reclaim any of the mine sites; thus, there would be no fugitive dust or engine exhaust emissions from heavy equipment and dump trucks around the Burro Mines Complex. Therefore, ambient air quality and effects of climate change would remain the same and no potential impacts would be anticipated under this alternative.

4.1.2 Alternative 2: Reclamation of Burro Mines Complex

For Alternative 2, air emission estimates for criteria pollutants and GHGs are provided in Table 4.1-1. Total PM_{10} emission estimates of about 14.3 tons are highest among criteria pollutants and VOCs, accounting for about 2.0% of annual emission totals in San Miguel County. Reclamation activities would be limited to daytime hours, when air emissions are more easily dispersed because of strong turbulence. However, on occasion, 24-hr PM_{10} NAAQS exceedances at the project boundary or publicly accessible roads within the project area are anticipated when heavy activities would occur. During the day, westerly winds are predominant in the area, so reclamation activities would not cause high PM concentrations at nearby residences, which are located west or south of the Burro Mines Complex.

TABLE 4.1-1 Criteria Pollutants, VOCs, and CO_2 Emissions under Alternative 2 Compared with San Miguel County and National Ambient Air Quality Standards (NAAQS)

	Air Emissions (tons)						
Emission Source	CO	NO_x	VOCs	$PM_{2.5}$	PM_{10}	SO_x	CO_2
San Miguel County Total[a]	4,197	806	12,508	205	733	3.2	1.48×10^8 [b] 7.12×10^9 [c]
Reclamation Activities							
Fugitive Dust	–[d]	–	–	2.29	14.1	–	–
Engine Exhaust	0.59	1.16	0.09	0.15	0.16	0.002	239
Total[e]	0.59 (0.01%)	1.16 (0.14%)	0.09 (0.001%)	2.44 (1.2%)	14.3 (2.0%)	0.002 (0.07%)	239 (0.0002%) (0.000003%)
Averaging Time	National Ambient Air Quality Standards (NAAQS)						
1-hr	35 ppm[f]	100 ppb[f]	–	–	–	75 ppb[f]	–
3-hr	–	–	–	–	–	0.5 ppm[g]	–
8-hr	9 ppm[f]	–	0.070 ppm[h,i]	–	–	–	–
24-hr	–	–	–	35 µg/m³ [h]	150 µg/m³ [h]	–	–
Annual	–	53 ppb[h]	–	12.0 µg/m³ [f] 15.0 µg/m³ [g]	–	–	–

Footnotes continued on next page.

TABLE 4.1-1 (Cont.)

[a] Total annual emissions in 2013, except for CO_2.

[b] Annual emissions in 2020 for Colorado on a CO_2e basis.

[c] Annual emissions in 2017 for the U.S. on a CO_2e basis.

[d] A hyphen denotes "not applicable."

[e] Values in parentheses are percentages of San Miguel County total emissions except for CO_2, which are percentages of total Colorado emissions (top line) and total U.S. emissions (bottom line).

[f] Primary standards, which provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly.

[g] Secondary standards, which provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

[h] Both Primary and Secondary Standards.

[i] Ozone (O_3) standards. VOCs are precursors of O_3 along with NO_x.

Sources: Arnold et al. (2014); CDPHE (2019a); EPA (2019a); EPA (2020).

Among non-PM emissions, NO_x emissions from diesel combustion of heavy equipment and dump trucks are highest, about 0.14% of the annual emission total in San Miguel County. These low-level emissions are not anticipated to cause measurable impacts on regional O_3 or air quality related values (AQRVs), such as visibility or acid deposition, at nearby Class I areas. In addition, CO_2 emissions of 239 tons during reclamation are estimated to be about 0.0002% of Colorado GHG emissions in 2020 at 148 million tons (134 million metric tons) of CO_2e and 0.000003% of U.S. GHG emissions in 2017 at 7,117 million tons (6,457 million metric tons) of CO_2e (EPA 2019a; Arnold et al. 2014).

In summary, NAAQS exceedances for PM emissions could occur as a result of dust-generating activities and publicly accessible roads within the project area on occasion but are not likely to occur at nearby residences. These air emissions are not likely to cause any measurable impacts on AQRVs at nearby Class I areas, considering the magnitude of emissions and the distance. Therefore, under Alternative 2, potential impacts on ambient air quality would be minor and temporary (only a few months), and potential impacts on climate change would be negligible. Air emission control measures (i.e., compliance measures) would be implemented to ensure compliance with environmental regulations. Other mitigation measures and best management practices [BMPs]) could be implemented to further reduce potential impacts (see Table 5-1).

4.2 NOISE

For noise, the ROI evaluated for potential impacts is within 2 to 3 mi (3 to 5 km) radius of the Burro Mines Complex. During reclamation activities at the Burro Mines Complex, the primary source of noise would be heavy equipment, such as dozers, excavators, and front-end loaders, and dump trucks. In general, the dominant noise source from most heavy equipment is a diesel engine without adequate muffling. To estimate noise levels associated with reclamation activities, a composite noise level at a distance of 50 ft (15 m) from the reclamation site was

estimated based on engine rated powers and load factors (Wood 1992; EPA 2004b), assuming that a number of heavy equipment and dump trucks are operating in close proximity to each other. Among several sound attenuation algorithms, only geometric spreading and ground effects are considered for simplicity (Hanson et al. 2006). The distances from the reclamation site are calculated to determine where noise levels would attenuate to the Colorado daytime maximum permissible limit of 55 dBA in a residential zone (C.R.S. 25-12-103, "Maximum Permissible Noise Levels") and the EPA guideline level of 55 dBA L_{dn} for residential areas (EPA 1974). Potential impacts are evaluated by comparing these distances with distances from the reclamation site to nearby human receptors (or residences) and are presented in Sections 4.2.1 and 4.2.2 below.

4.2.1 Alternative 1: No Action

Under Alternative 1, no action would be taken to reclaim any of the mine sites; thus, there would be no operations of heavy equipment and dump trucks around the Burro Mines Complex. Under this alternative, noise levels would continue at background levels, and consequently, it is anticipated that there would be no potential noise impacts on nearby residences.

4.2.2 Alternative 2: Reclamation of Burro Mines Complex

To estimate noise levels associated with reclamation activities for Alternative 2, a composite noise level of 94 dBA at a distance of 50 ft (15 m) from the reclamation site is conservatively assumed, if one dozer, one excavator, one front end loader, and three dump trucks (half of six dump trucks in operation) are operating in close proximity to each other. When only geometric spreading and ground effects are considered (Hanson et al. 2006), noise levels would attenuate to about 55 dBA at 1,600 ft (490 m) from the reclamation site. If an 8-hr daytime work schedule is considered, the EPA guideline level of 55 dBA L_{dn} for residential areas (EPA 1974) would occur at about 1,100 ft (330 m) from the reclamation site (or at the gravel pit site). Therefore potential noise impacts above the EPA guideline could occur at distances shorter than 1,100 ft (330 m); however, other attenuation mechanisms, such as air absorption, screening effects (e.g., natural barriers by terrain features), and skyward reflection due to temperature lapse conditions typical of daytime hours, would reduce noise levels further. The closest residence from the Burro Mines Complex is about 2,200 ft (670 m) and one seasonal residence is located about 2,150 ft (650 m) from the relocation site. Both residences are a distance away from the locations where Colorado or EPA noise limits could be exceeded.

On occasion, noise levels could briefly exceed the Colorado limit at the nearby residences because of downward refraction of sound induced by vertical temperature inversion (typically lasting up to 1 hr after sunrise) if the reclamation activities would occur during early morning hours following a calm and clear night. Mitigation measures would be undertaken such that reclamation activities would not be started or would not be conducted at such time periods when there is a probability of exceeding the Colorado limits for nearby residences. Worthy of note is that noise from reclamation activities would be audible due to lower background noise level around the area, although noise levels at nearby residences would be less than Colorado or EPA limits.

Reclamation activities would typically occur during the day, when noise is better tolerated because of the masking effects of background noise during daytime. Most of the time, noise levels from reclamation activities are anticipated to be lower than the Colorado or EPA limits at nearby residences. Therefore, potential noise impacts on nearby residences would be minor and temporary (only a few months). Implementation of mitigation measures and BMPs (see Table 5-1) and adherence to noise management plans could further minimize potential impacts.

4.3 PALEONTOLOGICAL AND SOIL RESOURCES

The ROI evaluated is the Burro Mines Complex and any other areas on adjacent lands (e.g., unpaved access roads) that could be affected by the reclamation activities.

4.3.1 Alternative 1: No Action

There would be no impacts on paleontological resources and soil from Alternative 1 as no reclamation activities would be conducted.

4.3.2 Alternative 2: Reclamation of Burro Mines Complex

Reclamation activities under Alternative 2 could result in adverse impacts on paleontological resources at the Burro Tunnel Mine, Burro No. 3 and No. 5 mine sites, and the relocation site, if present, because they would involve ground disturbances that could expose fossils, making them vulnerable to damage or destruction and looting/vandalism. Field surveys, conducted by a qualified paleontologist early in the reclamation process, would identify areas of moderate to high fossil-yield potential or known significant localities so that these areas could be avoided. In addition, DOE would notify the BLM of any fossil discoveries so appropriate measures could be taken to protect discoveries from adverse impacts (see Table 5-1). For this reason, it is anticipated that impacts on paleontological resources would be negligible to minor.

Reclamation activities under Alternative 2 would initially result in minor adverse impacts on soil resources because of ground disturbance. Ground disturbance could increase the potential for soil erosion and deposition by wind and water, potentially negatively affecting water quality in nearby ephemeral basins and drainages. Ground-disturbing activities would involve construction of an unpaved haul route, removing and/or recontouring waste rock piles, spreading surface soil material over disturbed areas (using salvaged surface soil material from the mining site, if available); and seeding the disturbed areas.

Excavation and grading of surface soil materials (to enlarge the waste rock relocation site) would also occur at the relocation site. Direct adverse impacts would be minor because they would occur over a short duration and because existing access roads would be used, leading to minimal compaction and erosion of currently undisturbed areas. However, if subjected to high winds or intense rainfall, soils would likely remain susceptible to erosion throughout the (4 to 5 yr time frame (following completion of reclamation field activities) needed to reestablish vegetation at disturbed areas.

Soil contamination during reclamation activities could occur from fuel and oil releases related to the use of trucks and mechanical equipment. This impact, however, would be negligible given DOE's requirements for fuel spill prevention and cleanup.

In total, an estimated 28.7 ac (11.6 ha) would be disturbed temporarily under Alternative 2. In addition, it is estimated that 10,000 yd^3 (7,646 m^3) of surface soil material would be disturbed at the relocation site, and a limited amount of surface soil material would be disturbed at the Burro Tunnel Mine and Burro No. 3 and No. 5 mine sites. In the long-term, reclamation activities under Alternative 2 would result in greater benefits (e.g., slope stabilization, resistance to erosion, limited sheet flow and runoff), compared to the No Action Alternative because of the larger area that would be revegetated due to reclamation. Implementing compliance measures, mitigation measures, and BMPs (see Table 5-1) would reduce the potential for adverse impacts associated with these activities.

4.4 WATER RESOURCES

As described in Section 3.4, the ROI evaluated is primarily the Burro Mines Complex area, Lease Tract C-SR-13, and the Dolores River, San Miguel River, and their tributaries.

4.4.1 Alternative 1: No Action

4.4.1.1 Surface Waters and Floodplains

As discussed in Section 3.4.1, the Dolores River adjacent to and downstream from the Burro Mines Complex is currently not affected by any constituents (e.g., uranium and vanadium) associated with the waste rock based on 2018 state surface water quality assessment (CDPHE 2018a). The Burro Mines Complex is in close proximity to the intermittent stream that is contributing to the Dolores River. Potential soil erosion and degradation of the condition of the waste rock piles at the Burro Mines Complex due to the cumulative effects of rainfall events could contribute to increased sedimentation loading and lead to deterioration of the water quality of the Dolores River. Storm or flash flood related erosion has increased the sediment load within the river several times, as observed in September 2007 and again in August 2014.

4.4.1.2 Groundwater

Under Alternative 1, the groundwater condition near the Burro Mines Complex would remain the same. There is limited information on groundwater quality in areas surrounding the Burro Mines Complex. Annual monitoring data for downgradient locations of the Burro Mines Complex (wells for the Slick Rock East and Slick Rock West sites) indicate that the constituents related to uranium mining activities (e.g., uranium and vanadium) are far below the MCL (DOE 2019a). This suggests that current conditions at the Burro Mines Complex have no impacts on groundwater. No floodplain impacts are expected as the Burro Mines Complex is not located within the floodplains of the Dolores River.

4.4.1.3 Water Management

Under Alternative 1, the water resource will not be affected.

4.4.2 Alternative 2: Reclamation of Burro Mines Complex

4.4.2.1 Surface Water and Floodplains

Under Alternative 2, the entire waste rock pile located at the Burro Tunnel Mine site and the crown portions of the waste rock piles at Burro mines No. 3 and No. 5 would be transported to the relocation site by way of an unpaved haul route, a portion of which would be newly constructed leading to and across the intermittent stream where road base materials would be temporarily installed. The remaining waste rock piles at Burro mines No. 3 and No.5 would be recontoured in-place creating gentler slopes reducing runoff flow velocity and erosion potential. Erosion controls at the relocation site would consist of a surface soil cover, surface roughening, establishing vegetation, and grading to achieve a stable slope. Subsequent engineering designs will specify specific measures to reduce and/or minimize erosion and enhance vegetation.

The assumed total land area that would be disturbed is about 28.7 ac (11.6 ha). Reclamation activities could temporarily increase erosion and runoff by exposing unconsolidated materials and by compacting soils, especially under flash-flooding events (Nash 2002; BLM 2008). Soil erosion due to rainfall or flash flooding events could potentially lead to increased loading of sediments to the Dolores River. Pollutants could include sediment-associated compounds, chemical dust control compounds (e.g., magnesium chloride), fuels, and other chemicals used in reclamation (National Research Council 2012). However, the potential increase in soil erosion and runoff would be moderate and temporary given the relatively short reclamation period (i.e., 22 weeks) for Alternative 2 and the limited rainfall in the area. Further, the actual impact of soil erosion and runoff could be minimized through the implementation of compliance measures, mitigation measures, and BMPs (see Table 5-1).

Stormwater infrastructure would need to accommodate the permitting requirements for stormwater discharge according to state and federal regulations administered by the CDPHE. While stormwater regulations are typically adequate to accommodate large flooding events, western Colorado has the potential for infrequent and localized flash flooding that could overwhelm even properly designed stormwater infrastructure (Nash 2002). An appropriate stormwater drainage system would need to be considered to route water away from the project areas to reduce the potential of soil erosion and runoff throughout the area of unconsolidated waste rock. The stormwater BMPs would be followed to minimize impacts related to stormwater (see Table 5-1).

The potential decrease of surface water quantity in the Dolores River through the intermittent stream are considered temporary and negligible. The maximum runoff generated from the storm catchment (Figure 3.4-1) taking into account the project area that includes the three mine sites, the relocation site, and other areas associated with the proposed project area, was estimated for this EA. Assuming an extreme scenario with a maximum monthly precipitation of 1.9 in (4.8 cm), the maximum runoff could be 0.1 ft^3/s, which will contribute 0.06% of the mean flow (177 ft^3/s) in the Dolores River near the site. The actual impact of water quality issues (e.g., sediment and pollutant loading) in runoff from the Burro Mines Complex would have a negligible effect on the water quality in the Dolores River.

During the relocation activities, the waste rock would be transported across the intermittent stream, which flows to the Dolores River, to the relocation site. To avoid any accidents that might release waste rock to the stream, compliance measures and BMPs would be implemented (see Table 5-1). Many of these are based on the guidelines proposed by the Colorado Division of Minerals and Geology (CDMG 2002) and by DOE's standard reclamation procedures outlined in the *Uranium Program Mineral Leasing Procedures Manual* (DOE 2011b).

No floodplain impacts are expected as the reclamation activities conducted under Alternative 2 would not occur within or affect the floodplain.

In summary, the potential impacts from the reclamation activities would be minimal and temporary and could be further reduced or eliminated with implementation of mitigation measures and BMPs. Reclamation would be expected to reduce or minimize future potential runoff, erosion and sediment loading from the Burro Mines Complex. Thereby, protecting currently unaffected and acceptable surface water quantity and quality at the Dolores River.

4.4.2.2 Groundwater

Under Alternative 2, reclamation activities would include excavation to provide more space to accommodate the waste rock moved to the relocation site. However, the excavation would be limited and shallow in nature so that potential impacts to shallow aquifers are not expected. Based on information presented in Section 3.4, the scarcity of groundwater in shallow aquifers results from extremely low groundwater recharge because of low precipitation (12.5 in. [31.8 cm]) and from the high potential for evaporation (38 in. [97 cm]) in the area. Groundwater availability in the shallow aquifer is localized and varies from season to season. An intermittent spring was identified about 650 ft (198 m) southwest of the relocation site (see Figure 3.4-1) based on the USGS National Hydrography Dataset. Implementation of mitigation measures and BMPs (see Table 5-1) would further reduce or minimize potential groundwater impacts.

During the reclamation, although precipitation and surface overland flow are limited and temporal, it may increase a potential of infiltration downward to groundwater in the area of the relocation site. An appropriate stormwater drainage system or diversion ditches could be considered to route water away from the relocation site to reduce the potential groundwater recharge through permeable layers. Subsequent engineering designs would identify stormwater controls that would need to be implemented in accordance with CDPHE construction and stormwater permitting requirements.

Upon completion of the waste rock relocation, a surface cover consisting of surface soil materials of adequate thickness (typically 6 in [15 cm]) to support vegetation would be provided on the relocation site to divert precipitation water away from the area and reduce water from infiltration to groundwater underneath the waste rock. In accordance with state regulations and standards set by the CDWR, the measures could minimize the surface erosion and potential infiltration to groundwater.

4.4.2.3 Water Management

Water use under Alternative 2 would include that required for dust suppression over the area affected by reclamation activities. The portable water supply for workers, which is typically provided by project contractors from an off-site source, is estimated to be a total of 15,000 gal/month (0.05 ac-ft/month). For perspective, the amount of water use is about 0.7% of the current water use for mining and 0.14% of the current PWS in San Miguel County (Table 3.4-3, Section 3.4). The impact of water use on local water supplies would be minor. As far was water depletion impacts under Alternative 2, DOE's consultation with the USFWS regarding its proposed action during the preparation of this EA determined that consultation is not necessary as downstream impacts on endangered fish and their designated critical habitat from water depletion were evaluated in the August 13, 2013 BO issued by the USFWS (DOE 2014). In this BO, the USFWS provided DOE with the determination that water depletions less than 100 ac-ft in the upper Colorado River Basin is covered in its June 4, 2010 intra-Service BO. Additionally, it is not anticipated that the reclamation activities would affect existing water rights in the county.

4.5 HUMAN HEALTH

The ROI evaluated for potential human health impacts is within the 10 mi (16 km) radius of the Burro Mines Complex and the relocation site. As discussed in Section 3.5, three receptors (i.e., a resident, a recreationist, and a reclamation worker) were considered to have the potential to incur radiation and chemical exposure to the waste rock piles at the Burro Mines Complex and the relocation site. The analysis for a resident is hypothetical in the sense that such a receptor is not currently present as discussed in Section 3.5.

For the estimates of dose for the hypothetical resident and recreationist presented in this EA, a layer of 6 inches of soil was assumed to cover the surface of the reclaimed waste rock pile to facilitate the growth of vegetation on the surface. A thicker layer of cover would further reduce the dose estimates. Air dispersion modeling that evaluated a 10-mi radius of the Burro Mines Complex and the relocation site was performed to estimate the dispersion of radon, and airborne dust (assumed to contain radionuclides and chemical constituents from the waste rock piles) to the surrounding areas.

Based on the assumption that there is secular equilibrium between long-lived parent radionuclides and their short-lived decay products, the base activity concentration of 70 pCi/g for U-238 was applied to Th-234, Pa-234m, and Pa-234, and the base activity concentration of 3.22 pCi/g assumed for U-235 was applied to Pa-231 and Ac-227. The vanadium concentration in the waste rock piles was assumed to be six times the total uranium concentration of 212 mg/kg.

4.5.1 Alternative 1: No Action

Under the No Action Alternative, the current conditions and locations of the waste rock piles would remain the same since no reclamation activities would be conducted. For a nearby resident or recreationist, the potential additional radiation exposure due to the waste rock piles would be a small fraction of that due to natural background radiation. Chemical exposure from

the waste rock piles is unlikely as the waste rock piles have settled over the years and released of dust should be minimal.

The evaluation of potential exposure to radiation and chemicals, and estimates for physical injury for reclamation workers are not needed for the No Action Alternative as no activity would be conducted and thereby, no reclamation workers would be involved.

4.5.2 Alternative 2: Reclamation of Burro Mines Complex

For this alternative, the potential radiation exposure associated with the waste rock piles for a hypothetical resident, recreationist, and reclamation worker was estimated. For the hypothetical resident and recreationist, chemical exposure is not expected to occur because cover material used to encourage vegetation as part of the reclamation designs would prevent emission of particulates. For reclamation workers, in addition to radiation exposure, chemical exposure and physical injuries were estimated.

4.5.2.1 Exposure to Radiation

To estimate the radiation dose, the waste rock piles from Burro No. 3 and No. 5 shafts and the Burro Tunnel Mine site were combined to form a single pile as the radiation source reflecting the reclaimed state that would be present at the relocation site. This single reclaimed waste rock pile was assumed to encompass an area of 183,000 ft^2 (44,000 km^2) with an average height of about 19 ft (6 m). Air dispersion modeling was then conducted to calculate the air concentration and ground surface deposition of radioactivity at various distances from the toe of the single waste rock pile based on the estimated emission rate of particulate and radon from its surface. The resulting air concentration and ground surface deposition were then used to estimate the radiation dose to the hypothetical resident at the downwind locations.

Hypothetical Resident. Table 4.5-1presents the calculated radiation dose due to the inhalation of radon (the primary exposure pathway) for the hypothetical resident receptor located in the prevailing wind direction from the single reclaimed waste rock pile. As indicated in the table, the dose decreases farther away from the single reclaimed waste rock pile.

TABLE 4.5-1 Potential Radiation Doses to a Hypothetical Resident from the Reclaimed Waste Rock Pile

Distance (m)	Dose[a] (mrem/yr)
500	1.06
1,000	0.41
1,500	0.23
2,000	0.16
2,500	0.11
3,000	0.09
4,000	0.07
5,000	0.05

[a] The dose estimates correspond to a Ra-226 concentration of 70 pCi/g for waste rocks. Doses are primarily from the radon pathway.

The estimates indicate that the potential dose for a hypothetical resident would be about 1.06 mrem/yr at 500 m (1,650 ft) from the toe of the single reclaimed waste rock pile. This dose is small compared with the100 mrem/yr standard for the protection of members of the general public (DOE 2011a); and is essentially not distinguishable from that due to natural background radiation.

Recreationist. The potential radiation dose that could be incurred by a recreationist camping on top of the single reclaimed waste rock pile for two weeks was estimated

to be 4.3 mrem. Direct external radiation is the primary exposure pathway contributing about 90% of the dose, followed by the radon inhalation pathway. The potential radiation dose for the recreationist is also small compared to that due to natural background radiation and the100 mrem/yr standard for the protection of members of the general public (DOE 2011a).

Reclamation Worker. For reclamation workers, the pathways of exposure due to the waste rock pile would include external radiation, inhalation of particulates, inhalation of radon, and incidental ingestion of particulates. The radiation dose rate associated with the reclamation activities was estimated assuming that the reclamation worker was on top of the waste rock pile without a soil cover and only at 1 m (3 ft) from the radiation source (the waste rock). This calculation indicates that the dose would be about 0.086 mrem/hr based on 70 pCi/g of Ra-226.

The construction period for Alternative 2 is about 22 weeks or 110 workdays. For this analysis, it was assumed that the reclamation worker is in close proximity to or on top of the single reclaimed waste rock pile for half of the construction period (i.e., 55 days for 8 hours per day). For the other half of the construction period, it was assumed that the reclamation worker would be performing other reclamation activities that would not involve being in close proximity to the waste rock. The total dose incurred by the reclamation worker was estimated to be 38 mrem. This estimate is about 2% of the dose limit recommended by the ICRP for occupational workers which is given as an effective dose of 20 mSv/yr or 2,000 mrem/yr averaged over 5 years (ICRP 2007). Additionally, the actual dose incurred by the reclamation worker would be expected to be less than the estimated total dose of 38 mrem as the analysis does not take credit for worker safety practices that would be implemented.

Table 4.5-2 provides a summary of the dose estimates for the potential receptors evaluated for Alternative 2.

TABLE 4.5-2 Estimated Doses for Receptors Evaluated for Alternative 2

Receptor	Primary Exposure Pathway	Exposure Assumption(s)	Dose[a]
Hypothetical Resident (500 m from the toe of the waste rock pile)	Inhalation of radon	350 days per year at residence	1 mrem/yr
Recreationist	External radiation	14 days camping on top of the waste rock pile	4.3 mrem
Worker	External radiation	55 work days 8 hours per day	38 mrem

[a] The estimated doses are based on a Ra-226 concentration of 70 pCi/g assumed for the waste rock.

4.5.2.2 Chemical Exposure and Physical Injuries

Hypothetical Resident and Recreationist. Chemical exposure is not expected to occur because cover material used as part of the reclamation designs (i.e., for seeding) would minimize release of dust.

Reclamation Worker. The potential chemical hazard index to a worker was estimated to be 0.33 and 0.02 from vanadium and uranium, respectively. These estimates are based on 212 mg/kg for total uranium and 1,272 mg/kg for vanadium in the waste rock, assuming 55 days, 8 hours per day, working in close proximity to a waste rock pile. The pathways of exposure analyzed included inhalation of particulates and incidental ingestion. Because the hazard indices are less than 1, no adverse health effect is expected for the worker.

The potential number of physical injuries and fatalities for conducting reclamation activities was also estimated for the reclamation workers. The estimate was based on statistics from the surface mining industry. That is, using the 10-yr averages from annual estimates compiled by the National Institute for Occupational Safety and Health (NIOSH) from Mine Safety and Health Administration (MSHA) data. For the period from 2008 through 2017, the injury and fatality rates for the entire surface mining industry in the United States were 1.53 per 100 full-time equivalent (FTE) and 10.2 per 100,000 FTE, respectively, where 1 FTE represents 2,000 hr (NIOSH 2019a,b).

For Alternative 2, based on the assumptions that 10 workers (excluding truck drivers) would be needed to conduct all the activities and that each worked for 110 days for a total of 880 hours, the number of injuries and fatalities among the workers was estimated to be 0.040 and 0.00027, respectively. Therefore, no injury or fatality is expected to occur among the workers performing reclamation activities.

4.6 ECOLOGICAL RESOURCES

The ROI evaluated addressed species within a 0.5-mi radius of the Burro Mines Complex and portions of the Dolores River downstream of the complex potentially affected by sediment load. The Dolores River, San Miguel River, and Colorado River were also evaluated for presence of threatened and endangered species. Potential environmental impacts on vegetation, wetlands, wildlife, aquatic biota, and special status species for the two alternatives are discussed in the following sections.

4.6.1 Alternative 1: No Action

4.6.1.1 Vegetation

No reclamation activities would occur for Alternative 1. The existing vegetation at the Burro Mines Complex area creates conditions conducive to long-term erosion and the establishment or spread of invasive or noxious weeds. Therefore, ongoing localized minor adverse impacts on vegetation would be expected to continue. These would include indirect impacts on areas surrounding the Burro Mines Complex from deposition of fugitive dust, erosion, sedimentation, and the introduction of non-native species, including noxious weeds. Impacts on vegetation under Alternative 1 (e.g., establishment and spread of noxious weeds and limited vegetation establishment) are expected to be minor but long-term.

4.6.1.2 Wetlands

Jurisdictional wetlands are not present within the Burro Mines Complex. No direct impacts to nearby wetlands associated with the Dolores River would occur under Alternative 1.

However, there is the potential for long-term indirect impacts associated with erosion of sediment from the unreclaimed waste rock piles to impact the Dolores River wetlands.

4.6.1.3 Wildlife

Existing habitat characteristics and the species supported by the habitats would be left unchanged under Alternative 1; these generally consist of previously disturbed wildlife habitat areas. It could take years for more productive habitat conditions to become established in areas not improved by reclamation activities. Effects to wildlife under this alternative would be negligible.

4.6.1.4 Aquatic Biota

Although no direct impacts on aquatic biota would occur under Alternative 1, there is the potential for long-term indirect impacts associated with erosion of sediment from the unreclaimed waste rock piles into the Dolores River and associated aquatic habitats.

4.6.1.5 Special Status Species

Currently disturbed habitat at the Burro Mines Complex provides minimal habitat conditions suitable for special status species. No direct impacts on special status species would occur under Alternative 1. If special status species are present, indirect effects would be similar to those described above for vegetation, wildlife, and aquatic biota.

4.6.2 Alternative 2: Reclamation of Burro Mines Complex

4.6.2.1 Vegetation

Potential impacts on vegetation from Alternative 2 include clearing and trampling of vegetation during initial reclamation activities. Impacts would be minor and short-term. Habitats affected by reclamation are generally previously disturbed areas with lower ecological value, although some less disturbed habitats could be affected near the outer margins of the areas being reclaimed.

Overall, the surface would be roughened (i.e., pocked or scarified) over 28.7 ac (11.6 ha), and seeded with a native seed mix identified through coordination with cooperating agencies. Successful reclamation would establish more diverse, native plant communities on the disturbed areas; however, the successful re-establishment of some plant communities such as sagebrush shrubland or piñon-juniper woodland could require decades.

Reclamation activities could result in indirect, short-term impacts on vegetation in adjacent areas because of deposition of fugitive dust, erosion, sedimentation, and the introduction of non-native species, including noxious weeds. However, because of the small areas involved and short duration of reclamation activities, these would be short-term and minor. Local, long-term impacts could result from the establishment of invasive species. Mitigation measures, such as applying dust suppressants, creating gentle slopes, controlling runoff and sediment, and controlling invasive species, would mitigate these potential impacts. The potential

degree of indirect effects would decrease with increasing distance from areas of the Burro Mines Complex where direct effects from reclamation would occur.

Deposition of fugitive dust is linked to reduced photosynthesis and productivity in nearby plant communities. Prolonged exposure to fugitive dust can alter plant community composition, reducing the occurrence of species less tolerant of disturbance and resulting in habitat degradation. However, because of the short duration of reclamation activities (22 weeks), the deposition of fugitive dust under Alternative 2 would constitute a short-term, localized negligible to minor impact.

Soils disturbed by equipment during reclamation could be subject to erosion and sedimentation. Soil erosion might also occur in areas where biological soil crusts are disturbed by equipment or foot traffic. Soil compaction from the operation of heavy equipment could reduce the infiltration of precipitation or snowmelt and result in increased runoff and subsequent erosion. Erosion and associated sedimentation could result in the localized loss of plant communities in areas where surface soil materials were lost or where sediments accumulate, including areas outside the Burro Mines Complex. Effects might include mortality or reduced growth of plants, changes in species composition, or reduced biodiversity. Species more tolerant of disturbance, including invasive or noxious weed species, might be favored in affected areas.

Seeds of invasive or noxious weed species could be inadvertently brought to the site by vehicles or equipment used during reclamation and revegetation. Invasive species or noxious weeds might also colonize disturbed soils from established populations in nearby areas. The establishment of invasive species or noxious weeds might slow or prevent the establishment of desired plant communities but would be minimized by weed control measures. Reclaimed areas would be monitored until vegetation establishment was successful, and invasive species would be eradicated immediately. Therefore, the spread of these species would be minimized. Based on the assumption that invasive species would be successfully treated, no lasting effects from invasive species would occur and improved vegetation cover would be established at areas being reclaimed. In addition, any noxious weeds or invasive species present in areas to be reclaimed would be replaced by native plant communities over the long term, reducing seed sources for invasive species in adjacent areas.

Overall, the impacts of reclamation activities from Alternative 2 on vegetation would be negligible to minor–adverse in the short-term and beneficial in the long-term. Compliance measures, mitigation measures, and BMPs (see Table 5-1) would further reduce the potential impacts on vegetation.

4.6.2.2 Wetlands

No jurisdictional wetlands are present within the project area. No direct impacts to nearby wetlands associated with the Dolores River would occur under Alternative 2. However, minor sediment could run off from the disturbed areas during reclamation and potentially reach the Dolores River wetlands. These impacts would be negligible and short-term, as revegetation would reduce the potential for sediment as plant cover becomes established.

4.6.2.3 Wildlife

Reclamation activities would affect wildlife by altering existing habitats and the species supported by those habitats. The Burro Mines Complex affected by Alternative 2 generally consists of previously disturbed wildlife habitat areas. The Burro Mines Complex does not provide high-quality habitat for wildlife species. Small tracts of adjacent undisturbed habitats might also be affected by reclamation activities. Acreage of current habitat potentially affected by reclamation activities for Alternative 2 totals 28.7 ac (11.6 ha). Reclamation is expected to take about 22 weeks and would be scheduled so that there would be no activities conducted during the period of December 1 through May1 (see Section 4.6.2.5). Therefore, winter habitat use by big game and other wildlife species would not be affected. However, if due to unavoidable circumstances (e.g., delayed start, weather issues), and the reclamation schedule has to be extended beyond December 1, an exception may be requested through the BLM in coordination with the Colorado Parks and Wildlife (CPW). The mitigation measure described in Table 5-1 for special status species would also be followed. An exception may be granted if CPW determines that conditions allow for reclamation activities to continue but are also still protective of the desert bighorn sheep. Otherwise, reclamation activities would be halted until restrictions can be lifted.

During reclamation, localized obstructions of wildlife movement could occur. Although habitats adjacent to reclamation activities might remain unaffected, wildlife might tend to avoid these areas because of noise and visual disturbance. Avoidance would be a short-term impact. Traffic and equipment operations during reclamation and revegetation could result in low levels of wildlife mortality but are not expected to cause population-level impacts.

Some fuel and chemical spills could also occur, but they would generally be confined to access roads and project site areas. The probability of wildlife exposure to such spills would be small and limited to a few individuals. Also, a spill prevention and response plan would minimize the potential for, and the impacts from, any spills.

The above-mentioned impacts associated with reclamation activities would last primarily during the period of active reclamation (22 weeks). Overall, the localized impacts on wildlife would be negligible to minor. Post-reclamation conditions should improve forage and/or habitat for wildlife as revegetation of the reclaimed areas occurs. Reclamation of the Burro Mines Complex area is expected to result in a relatively small, but beneficial, increase in wildlife habitat on the 28.7 ac (11.6 ha) reclaimed (area reseeded).

4.6.2.4 Aquatic Biota

Under Alternative 2, there would be a localized disturbance to at least 240 ft^2 (22 m^2) of an ephemeral stream to create a low water crossing for the haul road from the Burro Tunnel Mine to the relocation site. This would involve the use of road base fill material to create a stable surface for driving across the ephemeral stream. This crossing could be constructed when the intermittent stream is dry, resulting in no impacts to any aquatic or semi-aquatic biota that may make use of the stream when it contains water.

Reclamation of the Burro Mines Complex would disturb up to 28.7 ac (11.6 ha), which could potentially result in erosion and sediment deposition in the Dolores River. However, the potential for sediments (including those that could contain radioactive or chemical contaminants) to enter the Dolores River during reclamation is unlikely, particularly with the appropriate use of compliance measures, mitigation measures, and BMPs to control erosion (see Table 5-1). Areas reclaimed would become less prone to erosion over time because site grading would be completed, and more vegetative cover would be established. Following reclamation, the potential for erosion from the reclaimed mine sites would be less than what currently exists for the unreclaimed mine site areas (Alternative 1). Overall, impacts on aquatic biota from the Alternative 2 would be negligible.

4.6.2.5 Special Status Species

Impacts on special status species from reclamation activities at the Burro Mines Complex are fundamentally similar to those described for impacts on more common and widespread plant, aquatic, and wildlife species described above. However, because of their low population levels, special status species may be more sensitive to impacts than more common and widespread species. Low population size makes these species more vulnerable to the effects of habitat fragmentation, habitat alteration, habitat degradation, human disturbance and harassment, mortality of individuals, and the loss of genetic diversity.

As discussed in Section 3.6.5.1, the Burro Mines Complex is within the range of seven ESA-listed species, including three bird species (Gunnison sage-grouse, Mexican Spotted Owl, and Yellow-billed cuckoo) and four fish species (bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker). The USFWS issued a BO for the ULP lease tracts in 2013 (DOE 2014, Appendix E) and amended it in 2017 (Ribeiro 2016; Timberman 2017). Based on these documents, the proposed work at the Burro Mines Complex would not significantly affect the three federally listed bird species or their designated critical habitat. The USFWS has identified that water depletions may affect the four fish species. However, the volume of construction water for the reclamation activities would be small enough to be mitigated by USFWS activities, as described in the 2013 BO (DOE 2014, Appendix E).

DOE consulted with the USFWS and it concurred with DOE's determination that consultation for this project is not necessary (Vendramel 2019). Impacts of reclamation activities to threatened or endangered species or their designated critical habitat were evaluated in the BO issued for the ULP (DOE 2014, Appendix E). For four of the special status species listed in Table 3.6-3, reclamation activities are unlikely to occur near their habitats. These species are Northern leopard frog, Northern Goshawk, White-faced Ibis, and Northern river otter. If present, impacts on the Naturita milkvetch could occur through direct effects such as mortality and habitat disturbance, as well as indirect effects such as runoff, sedimentation, and dispersion of fugitive dust. Implementation of mitigation and minimization measures would reduce the potential for impact.

For several special status wildlife species, impacts could occur through direct effects from habitat disturbance (e.g., foraging habitat or movement corridor) and from behavioral disturbance (e.g., from the presence of workers and noise). In order to meet Guideline 2.4.54 of the Tres Rios Field Office RMP (BLM 2015), projects or activities that adversely impact desert bighorn sheep severe winter range and winter concentration areas should be limited or avoided

using access restrictions from December 1 through April 15. Similarly, in order to meet Guideline 2.4.53, projects or activities that adversely impact desert bighorn sheep production areas should be limited or avoided from February 1 through May 1. Although nesting of Bald Eagle, Golden Eagle, and other raptor species are not expected to occur at the Burro Mines Complex; raptor nest surveys should be conducted prior to reclamation to ensure compliance with the Migratory Bird Treaty Act. Also, to meet Guideline 2.4.39 of the Tres Rios Field Office RMP (BLM 2015), the recommended buffer zones and seasonal restrictions for Colorado's raptors (see also CPW 2020) should be followed. For most of the other special status wildlife species, direct impacts could occur from both habitat disturbance and, although less likely, mortality (e.g., if individuals are present and are unable to avoid reclamation activities). These species include the big free-tailed bat, fringed myotis, Gunnison's prairie dog, spotted bat, and Townsend's big-eared bat.

For the bluehead sucker, flannelmouth sucker, and roundtail chub, impacts could occur through indirect effects such as runoff and sedimentation into the Dolores River.

Based on habitat conditions present at the Burro Mines Complex, no adverse population-level impacts due to reclamation are expected for any of the special status species. Following applicable Terrestrial Wildlife Guidelines in the Tres Rios Field Office RMP (BLM 2015); and implementation of compliance measures, mitigation measures, and BMPs (see Table 5-1) would further reduce any potential for reclamation of the Burro Mines Complex to have adverse impacts on the special status species discussed above.

4.7 LAND USE

The ROI evaluated included the land within a 10-mi (16-km) radius of the Burro Mines Complex, with an emphasis on specially designated public land areas.

4.7.1 Alternative 1: No Action

Under Alternative 1, no land use impacts are expected as no reclamation activities would be conducted.

4.7.2 Alternative 2: Reclamation of Burro Mines Complex

Under Alternative 2, as mine operations could continue at the Burro Tunnel Mine and as there are currently no active land use activities at Burro No. 3 and No. 5 and the relocation site, no land use impacts due to reclamation are expected.

4.8 SOCIOECONOMICS

The ROI evaluated includes the Dolores, Montrose, and San Miguel Counties. For the purposes of this EA, the economic impacts were measured in terms of employment and income. Direct impacts would include wages and salaries as well as the purchase of goods and services required for reclamation. Indirect and induced impacts would include project wages and salaries as well as the purchase of goods and services required for reclamation that would subsequently circulate through the economy, creating additional employment and income. Sales of goods and services by retailers in the ROI, together with the purchase of equipment and materials required

for reclamation, would provide new sources of indirect employment and income to ROI residents.

As discussed in Section 3.8, the ROI contains large acreages of public lands that are both state and federally managed. These public lands include designated SRMAs (including the Dolores River SRMA), NCAs, WSAs, the Unaweep-Tabeguache Scenic and Historic Byway, State Parks, National Forests, and other areas used for recreation. Recreation and tourism together are an economic driver in the area, with significant indirect impacts on the local economy.

4.8.1 Alternative 1: No Action

Under Alternative 1, there would be no socioeconomic impacts (e.g., no impacts on the local economy and tourism) as no reclamation activities would be performed.

4.8.2 Alternative 2: Reclamation of Burro Mines Complex

The potential socioeconomic impacts from reclamation activities and relocation of the waste rock materials are expected to be minor. Reclamation would require 10 direct jobs for a project duration of 22 weeks. Reclamation would generate four indirect and induced jobs (see Table 4.8-1). In total, reclamation activities would constitute 0.03% of total employment in the ROI, which comprises Dolores, Montrose and San Miguel counties. Reclamation of the waste rock piles would also produce $0.45 million in income. Based on the available labor supply in the ROI, the current workforce could meet the demand for labor necessary for reclamation; therefore, in-migration of workers or families may not be required. No additional teachers, physicians, or public safety workers would be required.

TABLE 4.8-1 Socioeconomic Impacts of Reclamation in the ROI under Alternative 2

Parameter	Reclamation
Employment (no.)	
Direct	10
Indirect	4
Total	14
Income[a]	
Total	0.45
In-migrants (no.)[b]	0
Vacant housing (no.)[c]	0
Local community service employment[d]	
Teachers (no.)	0
Physicians (no.)	0
Public safety (no.)	0

[a] Unless indicated otherwise, values are reported in $ million 2020.

[b] Reclamation would not result in anyone migrating to the ROI.

[c] Reclamation would not affect vacant rental housing or vacant owner-occupied housing.

[d] Reclamation would not require additional local community employment.

It is difficult to estimate the impact of any activity on recreation because it is not always clear how it could affect recreational visitation and nonmarket values (i.e., the value of recreational resources for potential or future visits). Impacts on recreation in the area that would result from reclamation activities are likely to be minor. Because reclamation would require such a small workforce, it is unlikely that traffic would affect recreational activities in the area. Reclamation does not require tall structures; therefore, the visual impacts would be limited. Reclamation ground-disturbing activities are estimated to last only 22 weeks. The shortened timeline, small workforce, and absence of uranium mining would likely result in a minor impact on recreation and tourism in the ROI.

4.9 ENVIRONMENTAL JUSTICE

For potential impacts on environmental justice, the ROI analyzed is for a 25 mi (40 km) radius of the Burro Mines Complex.

4.9.1 Alternative 1: No Action

Under Alternative 1, no environmental justice impacts are expected as no reclamation activities would be conducted.

4.9.2 Alternative 2: Reclamation of Burro Mines Complex

As discussed in Section 3.9, there are no disproportionate low-income or minority populations within the 10-mi radius of the Borrow Mines Complex. Therefore, reclamation of the Burro Mines Complex under Alternative 2 would have no disproportionate socioeconomic or human health and safety impacts on low-income and minority populations. Similarly, there would be no environmental justice impacts associated with water use, subsistence use, or visual resources.

4.10 TRANSPORTATION

For transportation, the ROI analyzed accounted for the haul roads including county and state roads associated with the reclamation of the Burro Mines Complex.

4.10.1 Alternative 1: No Action

Under Alternative 1, no impacts on transportation are expected as no reclamation activities would be conducted.

4.10.2 Alternative 2: Reclamation of Burro Mines Complex

For Alternative 2, no changes in current traffic trends near the uranium lease tract are anticipated because no significant supporting truck traffic or equipment moves would occur, and only about 10 reclamation workers would be commuting to the site on a regular basis during reclamation activities. This additional traffic is not a significant increase in the average annual daily traffic of 220 vehicles on SH 141 and will not lead to any issues with traffic flow in the area.

The transportation impacts (injuries and fatalities) associated with waste rock material transportation would be vehicle-related as a result of the truck traffic on affected routes. However, the roadways to be used will be improved gravel haul roads that do not normally experience regular commercial or passenger vehicle traffic. A rough approximation of the potential injuries and fatalities due to the waste rock material transportation can be estimated using statistics from the surface-mining industry. Ten-year averages from annual estimates compiled by NIOSH from MSHA data were used.

For the period from 2008 through 2017, the injury and fatality rates for the entire surface mining industry in the United States were 1.53 per 100 FTE and 10.2 per 100,000 FTE, respectively, where 1 FTE represents 2,000 hr (NIOSH 2019a,b). The fractions of the impacts related to haulage averaged over the same 10-year period were 0.308 and 0.353 for injuries and fatalities, respectively (NIOSH 2019c,d).

The work on the transportation of the waste rock material from the Burro Tunnel Mine and Burro No. 3 and No. 5 is estimated to involve approximately 10 workers over a 22-week period. Based on this information, the total number of estimated worker hours during transportation of the waste rock material to the relocation site from the Burro Tunnel Mine and Burro No. 3 and No. 5 is 8,800 hr. The estimated number of injuries and fatalities due to haulage of the waste rock materials is less than one person (i.e., 0.006 and 0.0001, respectively). Thus, no transportation-related injuries or fatalities are expected during the proposed action.

4.11 CULTURAL RESOURCES

As discussed in Section 3.11, the ROI evaluated included the Burro Mines Complex and any other areas on adjacent lands that could be affected by the reclamation activities.

4.11.1 Alternative 1: No Action

Impacts on cultural resources are not expected under this alternative. The historic metal ore-bin load-out structure that is considered a historic property will be left in place, and no ground-disturbing activities are proposed. As is the case with cultural resources in any location, adverse impacts from vandalism, whether accidental or on purpose, could occur in areas used for recreation. Cultural resources are also at risk from erosion from natural weather events or recreational activities; however, the degree to which these indirect impacts currently occur and are expected to occur under this alternative is negligible.

4.11.2 Alternative 2: Reclamation of Burro Mines Complex

The waste rock that is proposed to be reclaimed constitutes a contributing element to a historic district at this location. Therefore, the loss of integrity of location, setting, feeling, and association associated with the reclamation of the waste rock piles could have an adverse effect on historic property if mitigating conditions were not applied to the proposed activity. DOE and the BLM will work with SHPO to develop measures to mitigate adverse effects to this historic property. It is DOE's intent to conduct reclamation of the Burro Mines Complex to maintain historic significance that preserves the potential for future use in some form of interpretive manner. The Section 106 process will be completed before the proposed work is undertaken.

The key features of the historic mining district would be avoided by the proposed work. The work proposed on the waste rock piles to remain in place would preserve them long term by minimizing their potential for erosion. Meanwhile, the removal of some of the most recently deposited waste rock (circa 1970s and 1980s) from the Burro Tunnel mine site would be done in such a way that there would be no adverse effect to the historic significance of the district and its associated landscape because of the conditions DOE would be applying during the development of the preferred alternative.

4.12 VISUAL RESOURCES

As indicated in Section 3.12, the ROI evaluated for potential impacts to visual resources is within the 25 mi (40 km) radius of the Burro Mines Complex. The viewshed analysis showed very few areas that may be subject to visual impacts from reclamation activities conducted at the Burro Mines Complex. The actual acreage would likely be even smaller than that indicated by the analysis because of potential screening of views of the lease tracts by vegetation, structures or topography. In addition, a viewer would have to be present within the percentage of the SVRA that has visibility of the activities being conducted at the Burro Mines Complex.

A total of 1,381ac (559 ha; 0.2%) of the Dolores River SRMA has visibility of the Burro Mines Complex, mostly at a distance of 0–5 mi (0–8 km). Individuals within this acreage will likely have detailed views of any activity taking place at the Burro Mines Complex. However no part of the Burro Mines Complex is visible from the Slick Rock Boat Launch KOP.

Over the years, mining activities have altered and modified the landscape throughout the Burro Mines Complex. Impacts include land scarring, the modification of landforms, construction of mining structures and roadways, and the increase of activity in mine locations.

4.12.1 Alternative 1: No Action

Under this alternative, there would be no change to the current levels of contrast or visibility of the Burro Mines Complex from the Dolores River SRMA.

4.12.2 Alternative 2: Reclamation of Burro Mines Complex

Recontouring of the waste rock piles would modify the general form, line, and texture of the manmade debris pile. This effort is meant to make the waste rock piles blend in better with the surrounding landform. Although pocking may be initially visually unappealing, over the long term (2 to 5 yrs), alternative contrasts in line, color, and texture associated with the erosion control and seeding and revegetation efforts would begin to decrease as vegetation became established in reclaimed areas. There is a chance that invasive species may colonize reclaimed areas; this occurrence likely would produce contrasts of color and texture over the short term, until infestations were controlled. This alternative also includes the collection and disposition of trash and debris.

Reclamation activity requires work crews, vehicles, and equipment, each of which might produce temporary visual impacts. For instance, traffic involving small vehicles to allow worker access and traffic involving large equipment used for reclamation activities would occur. The movement of workers and heavy machinery would produce visible activity and dust in dry soils. The suspension and visibility of dust would be influenced by the frequency and density of traffic, vehicle speeds and weights, road surface materials, and weather conditions. Visual impacts from truck-created dust typically would be localized to the unpaved roads (BLM 2011).

Temporary parking for vehicles would be needed at or near work locations. Unplanned and unmonitored parking could expand these areas, producing visual contrast from suspended dust and loss of vegetation. Some of the reclamation equipment could also produce emissions during operation and thereby create visible exhaust. In addition, lighting might be needed around

work areas. Security and other lighting around and on support structures (e.g., temporary trailers) could contribute to light pollution. These impacts are expected to be temporary but could influence recreationists' or travelers' perception of the area if they are present during reclamation activities.

The construction of a new road might introduce minor visual contrasts to the landscape, depending on the route selected relative to surface contours and on the width, length, and surface treatment of the road. The reclamation of the waste rock piles and expansion of the relocation site area would create greater contrast of line, form, and texture against the surrounding landscape. However, the impacts would be confined to this one area rather than spread throughout the site.

Minimal contrasts may be visible from the Dolores River SRMA, if observers happen to be within the 1,381 ac (559 ha) of the Dolores River SRMA that have views of the Burro Mines Complex. These locations are less than 0.2% of the total acreage of the Dolores SRMA. Visible contrasts from the Slick Rock Boat Launch are non-existent.

In addition, although reclamation of the Burro Mines Complex may not replicate pre-mining conditions or the historic nature that it has recently been determined to be, this effort is meant to make the complex blend in better with the surrounding landform. Reclamation of the Burro Mines Complex would meet the objectives for VRM Class II.

4.13 WASTE MANAGEMENT

As described in Section 3.13, waste other than the waste rock piles that are the subject of reclamation activities could be generated. Such waste would generally be in the category of non-hazardous solid waste such as debris, miscellaneous trash, and sanitary waste from portable facilities.

4.13.1 Alternative 1: No Action

Alternative 1 is not expected to generate waste as no activity would be conducted.

4.13.2 Alternative 2: Reclamation of Burro Mines Complex

Potential impacts on waste management practices (described in Section 3.13) for non-hazardous solid waste (e.g., miscellaneous trash and sanitary waste from portable facilities) generated during reclamation activities under Alternative 2 are expected to be minor. Disposal capacity at permitted landfills would be adequate to accommodate any waste generated that would need to be transported off-site. A spill prevention and response plan would be followed to minimize the potential for, and the impacts from, fuel stored and used onsite for the various equipment needed for the reclamation activities.

5 MEASURES TO MINIMIZE ENVIRONMENTAL IMPACTS

Table 5-1 presents compliance measures needed to fulfill regulatory requirements associated with the reclamation of the Burro Mines Complex. Mitigation measures and BMPs are also listed in Table 5-1 to provide additional measures that would further reduce the potential impacts discussed in Chapter 4 of this report. These measures would be considered during the design or planning of the reclamation project.

TABLE 5-1 Measures Identified to Minimize Potential Impacts from Reclamation of the Burro Mines Complex

Measure Description	Compliance Measure	Mitigation Measure	BMP
Reduce dust emissions and air emissions.			
• Apply water or chemical suppressants on unpaved haul roads, disturbed surfaces, and temporary stockpiles, and during dust generating activities.	X		
• Ensure all heavy equipment meets emission standards as required.	X		
• Limit idle time of vehicles and motorized equipment. Wheeled and tracked vehicles and existing roads shall be used when practical to limit soil disturbance.			X
Identify and protect paleontological resources.			
• Immediately notify the BLM authorized officer of any paleontological resources discovered as a result of reclamation activities so that appropriate measures to mitigate adverse effects on significant paleontological resources can be determined and implemented. Operations may continue if activities can avoid further impacts on the fossil discovery or can be continued elsewhere.		X	
Reduce noise-related impacts.			
• Maintain noise level below Colorado maximum permissible limits of 55 dBA during the day (7 a.m.–7 p.m.) and of 50 dBA at night (7 p.m.–7 a.m.), and below EPA guideline level of 55 dBA L_{dn} at receptor location.	X		
• Maintain equipment in good working order in accordance with manufacturer specifications.			X
Protect soils from erosion; protect local surface waterbodies from contamination and sedimentation; and protect local aquifers from contamination.			
• Avoid creating excessive slopes during excavation; use special construction techniques, where applicable, in areas of steep slopes, erodible soil, and stream channel crossings.		X	
• Apply all dust control in accordance with appropriate laws and regulations; ensure that dust suppression chemicals are not sprayed in or near surface waters.		X	
• Ensure that applicable local or state permits and stormwater management plan associated with land disturbance and discharges are completed.	X		
• Ensure that all dredge and fill requirements and applicable permits are fulfilled for drainage crossing.	X		
• Ensure operators comply with DRMS and CDPHE requirements regarding surface water and groundwater contamination.	X		
• New access roads shall be constructed to meet applicable standards and shall be designed in accordance with their intended function.	X		
• Ensure all sedimentation and erosion controls are in place to protect drainages and surface waters as needed.	X		

TABLE 5-1 (Cont.)

Measure Description	Compliance Measure	Mitigation Measure	BMP
Minimize the extent of ground disturbance and the duration of ground-disturbing activities.			
• Minimize the duration of ground-disturbing activities, especially during periods of heavy rainfall.			X
• Minimize new disturbance to soils.		X	
• Use existing roads and disturbed areas to the extent possible before construction new roads or disturbing new areas.		X	
• Avoid clearing and disturbing sensitive areas (e.g., steep slopes and natural drainages), and minimize the potential for erosion.		X	
• Minimize disturbance to vegetation, soils, drainage channels, and stream banks to extent possible.		X	
Restore grade and reclaim soil and vegetation.			
• Use native seed mixture identified through coordination with cooperating agencies.	X		
• Reestablish the original drainage pattern of all disturbed areas before final reclamation to the extent practicable.		X	
• Monitor seeded areas for some period following seeding to ensure vegetation is reestablished.	X		
• Grade waste rock piles to create a gently sloping (more stable) surface.		X	
• Recontour soil areas and cut and fill slopes, berms, and other disturbed areas to approximate naturally occurring slopes.		X	
Protect wildlife and wildlife habitats from ground disturbance and general site activities.			
• Establish buffer zones around sensitive habitats, and either exclude reclamation activities from those areas or modify them within those areas, to the extent practicable.			X
• If any federally listed threatened and endangered species are found during any phase of the project, consult with the USFWS as required by Section 7 of the ESA and determine an appropriate course of action to avoid or mitigate impacts.	X		
• Conduct pre-disturbance surveys for threatened, endangered, and sensitive species within all areas that would be disturbed by reclamation activities. These surveys would be used to determine the presence of sensitive species on the Burro Mines Complex and to develop the appropriate measures to avoid, minimize, or mitigate impacts on these species. If sensitive species are located in the area that might be reclaimed, coordination with the USFWS and CPW would be necessary to determine the appropriate species-specific measures.		X	
• Conduct raptor nest surveys to ensure compliance with the Migratory Bird Treaty Act; follow the recommended buffer zones and seasonal restrictions for Colorado's raptors (BLM 2015; CPW 2020).	X		
• Relocate wildlife found in harm's way away from the area of the activity when safe to do so.			X
• Exclude reclamation activities within 0.25 mi (0.4 km) of the Dolores River to avoid impacts on wildlife including the desert bighorn sheep movement corridor. However, since the project location is within 0.25 mi (0.4 km) of the Dolores River, reclamation activities would be scheduled to avoid impacts on a desert bighorn sheep movement corridor (and other wildlife).		X	

TABLE 5-1 (Cont.)

Measure Description	Compliance Measure	Mitigation Measure	BMP
Minimize the establishment and spread of invasive (vegetative) species.			
• Monitor the area regularly and eradicate invasive species during the appropriate life-cycle stage of the species.	X		
• Use native seed mixture identified through coordination with cooperating agencies. .	X		
• Pressure wash equipment prior to arriving on site to avoid introducing invasive weeds.			X
Identify and protect cultural and historic resources.			
• Ensure that all activities comply with Section 106 of the NHPA.	X		
• Identify through searches of records, field surveys, and consultation with tribes, as necessary, all cultural resources in the area of potential effects, and evaluate them for eligibility for inclusion on the NRHP. Implement mitigation measures agreed to with the SHPO to avoid adverse effects to historical properties	X		
Minimize contrast with surrounding areas.			
• Avoid installing gravel and pavement wherever possible to reduce contrasts in color and texture with the existing landscape to the extent practicable.			X
Ensure safe and proper transportation.			
• Use a gravel track pad or similar method to minimize tracking of mud and dirt from any mine site onto the local public and county roads that provide site access.			X
• Ensure that drivers meet applicable U.S. Department of Transportation training and qualification requirements.	X		
• Ensure road improvements and construction of new haul route is in accordance with applicable transportation permits and requirements.	X		
• Ensure that waste rock transport vehicles meet applicable U.S. Department of Transportation requirements.	X		
Ensure safe and proper fuel handling and spill management.			
• Follow a fuel spill prevention and response plan.			X

6 CUMULATIVE IMPACTS

Cumulative impacts are defined as the incremental environmental impact or effect of the proposed action, together with impacts of past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7). Geographic boundaries for cumulative impacts can vary by resource and can be affected by the amount of time an impact remains in the environment, the extent to which such an impact can migrate, and the magnitude of that impact. For this analysis, the ROI is conservatively defined as 10 mi (16 km) or less (Figure 6-1). This ROI includes the lease tracts within the Slick Rock area (Lease Tracts 10, 11, 11A, 12, 13, 13A, 14, 15, 15A, 16, and 16A), as well as Lease Tract 17, which occurs near the Montrose County–San Miguel County border. Effective January 6, 2020, DOE executed new 10-year lease agreements for these and all other lease tracts (excluding Lease Tracts 8A and 14). DOE's action allows its lessees to submit exploration and mining plans to DOE for review and approval. Most of the land within the ROI is administered by the BLM (Figure 6-1).

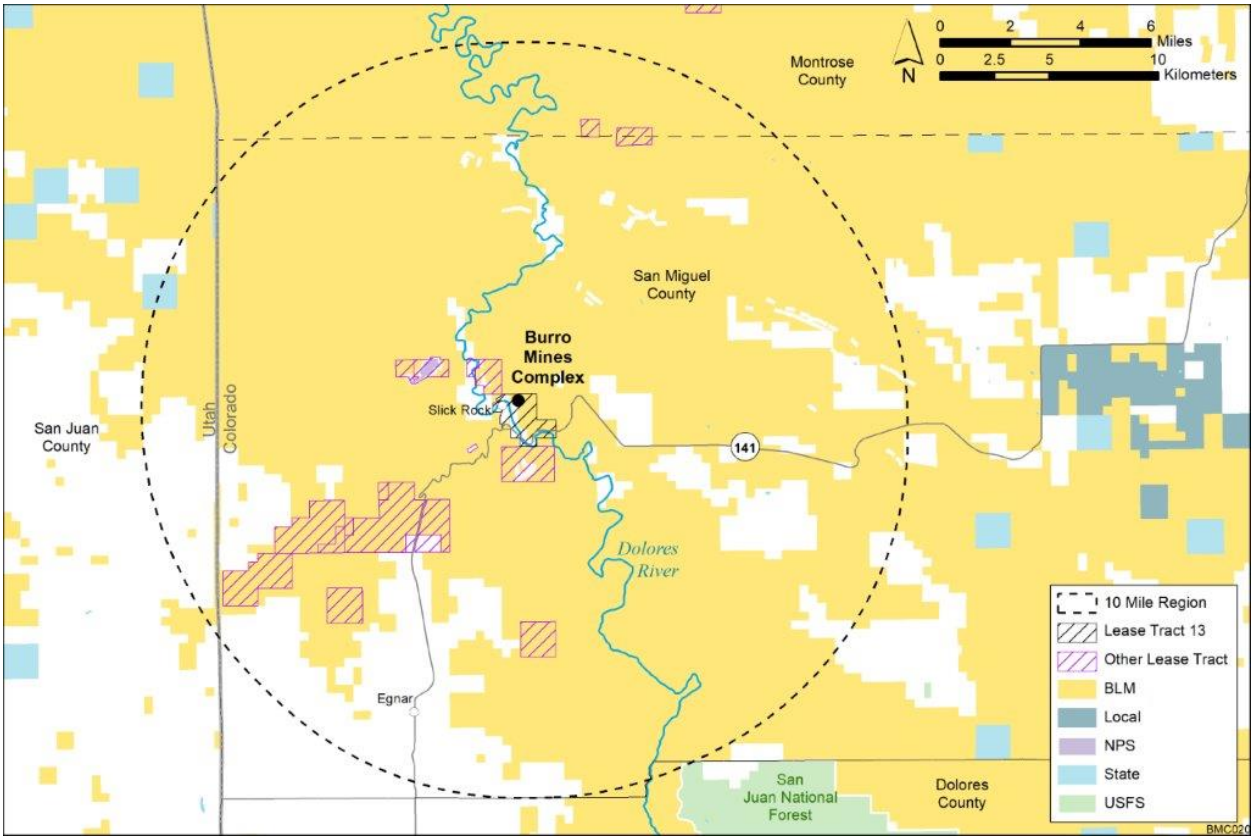

FIGURE 6-1 Land Areas Evaluated in the ROI

6.1 REASONABLY FORESEEABLE, ONGOING, AND PAST ACTIONS

The following paragraphs address the reasonably foreseeable, ongoing, and past actions within the ROI that potentially contribute to cumulative impacts.

6.1.1 Slick Rock Processing and Disposal Sites

Among the UMTRCA Title 1 disposal sites addressed in the ULP PEIS (DOE 2014) are the Slick Rock processing and disposal sites near the Burro Mines Complex area. The Slick Rock processing sites consist of two former uranium and vanadium ore processing facilities (Slick Rock East and Slick Rock West). Both sites are adjacent to the Dolores River and have been recontoured and seeded with native grasses. The 12-acre (4-ha) Slick Rock disposal cell, located about 5 mi (8 km) east of the processing sites (1.2 mi [1.9 km] northeast of Burro No. 5), contains about 129,000 yd^3 of tailings and other contaminated materials removed from the Slick Rock processing sites (DOE 2019b).

DOE monitors groundwater and surface water to verify that natural flushing at the Slick Rock sites is protective of human health and the environment (DOE 2019b). Historical milling operations at the Slick Rock processing sites created contamination in alluvial groundwater (selenium and uranium are main contaminants in groundwater at the Slick Rock East site, and benzene, manganese, molybdenum, nitrate, Ra-226, Ra-228, selenium, toluene, and uranium at the Slick Rock West site). Past milling operations have had no detectable effect on water quality of the Dolores River (DOE 2019a).

6.1.2 Mine Exploration, Development, Mining, and Reclamation

Within the Slick Rock Mining District, there are 862 active claims covering 17,798 ac (7,202 ha), including 369 mines. The major commodities mined in San Miguel County are uranium, vanadium, gold, silver, lead, zinc, and copper (The Diggings 2019). Impacts from mine exploration, development, mining, and reclamation would be like those addressed in the ULP PEIS (DOE 2014). There are potentially fewer radiological concerns for commodities mined other than uranium. There are uranium/vanadium mines in need of reclamation on ULP Lease Tracts 11, 13, and 15 (DOE 2014). Within the immediate Burro Mines Complex, reclamation at Burro No. 7 was completed in the late 1990s, while the New Ellison Mine waste rock pile is currently a permitted mining operation.

Within the ROI, exploration plans identified for Lease Tracts 13A, 15A, and 17 (DOE 2014) are no longer approved; they were withdrawn by the respective lessees in 2011. Therefore, cumulative impacts associated with exploration activities within the ROI would not occur.

Impacts associated with mine development and mining activities include altered visual resources, dust generation, particulate and criteria pollutant emissions, radioactive dust and gas emissions, soil disturbance, vegetation clearing, wildlife displacement, habitat degradation, health impacts on mine workers and the general public related to radiation or other hazardous materials exposure, increased traffic, potential damage to cultural and paleontological resources, and decreases in recreation and tourism-related recreation (DOE 2014). Impacts are expected to be minimal to negligible with adherence to mitigation measures, BMPs, and regulatory requirements.

Reclamation has been completed for areas disturbed by mining on Lease Tracts 10, 11, 11A, 12, 13, 16, 16A, and 17. Impacts from reclamation of other mines within the ROI would have be comparable to those described for the Burro Mines Complex sites (Chapter 4). In

addition, there could have been impacts related to the closure of mine entrances. Over the last 30 years or so, where adits or portals are completely closed – foam has been typically applied to completely close the opening. The foam is then covered by rocks and/or soils. Mine portal openings and adits have been also reclaimed by closing the opening with large rocks and then backfilling them with available materials from the waste rock piles. Some mine actions may have included the use of mine gates to exclude people but also to conserve potential bat habitat.

6.1.3 Existing and Proposed Utility Corridors

The only existing major utility corridor within the ROI is the existing Rocky Mountain natural gas pipeline. Within the immediate Burro Mines Complex area, the pipeline is located between CR S8 and the Burro Tunnel Mine waste rock pile. At the Slick Rock gravel pit road, the pipeline heads to the northeast along a line that is just south of the Burro No. 7. There are no planned major utilities planned within the ROI.

6.1.4 Tres Rios Field Office Resource Management Plan

The Tres Rios RMP provides strategic guidance for future management of BLM-administered lands within the Tres Rios Field Office. It guides the restoration or maintenance of the health of the lands to provide sustainable uses, benefits, products, services, and visitor opportunities. Various objectives, standards, and/or guidelines are provided in the RMP for managing the lands and resources within the Tres Rios Field Office (BLM 2015). The Tres Rios Field Office prepared an RMP amendment and associated EA (BLM 2019) to evaluate and consider management prescriptions for ACECs nominated during development of the Tres Rios Field Office RMP, with a Decision Record for the amendment published in January 2020 (BLM 2020). Among the three ACECs addressed in the RMP amendment and EA, the Gypsum Valley ACEC is within the ROI. The closest portion of the ACEC is over 4 mi (6 km) northeast of the Burro Mines Complex area.

6.1.5 Oil and Gas Exploration and Extraction

The BLM routinely offers land parcels for competitive oil and gas leasing to allow exploration and development of oil and gas resources for public sale. The contribution to cumulative impacts from oil and gas exploration would be like those listed for mining, except that exposure to oil and gas emissions would be a greater concern than radiological exposure. The Tres Rios Field Office RMP addresses the orderly and environmentally responsible development of oil and gas deposits within the ROI (BLM 2015).

6.1.6 Grazing

Both cattle and sheep grazing occur within the ROI. Impacts potentially associated with grazing include localized gaseous emissions from livestock digestive processes, fugitive dust, reduced vegetative cover and biological soil crusts, reduction in native vegetation, upland soil and stream channel erosion, competition with wildlife, destruction or alteration of wildlife habitat, destruction of cultural resources or historic properties, and introduction of solid and hazardous wastes. The Tres Rios Field office RMP addresses livestock and rangeland management within the ROI (BLM 2015).

6.1.7 Other Reasonably Foreseeable, Ongoing, and Past Actions

Several other reasonably foreseeable, ongoing, and past actions could contribute to cumulative impacts on one or more resources within the ROI. Some of these may be a net benefit, while others could be considered adverse. Beneficial actions include wildlife habitat improvements, wildlife conservation, and vegetation and forest (fuels) management. These meet the objectives, standards, and/or guidelines listed in the Tres Rios Field office RMP (BLM 2015). The Dolores River Restoration Partnership (2019) conducts invasive plant removal activities within the river's riparian areas to improve native plant communities, wildlife habitat and forage, and recreational opportunities, as well as to reduce the risks associated with wildfire.

The Paradox Valley Desalination Plant, operated by the Bureau of Reclamation (BOR), is located outside of the ROI but is applicable when cumulative impacts within the ROI are being considered as it improves water quality in the Dolores River. Located near Bedrock in Montrose County, the plant prevents natural salt loads in the groundwater from entering the Dolores River by intercepting and disposing of brine via deep-well injection. However, the high-pressure brine injection has been known to trigger small earthquakes in the area (Duke 2019). As the injection well is nearing the end of its useful life, the BOR has prepared a draft Environmental Impact Statement (EIS) to investigate alternatives for disposing of brine in order to enhance and protect the quality of water available in the Colorado River for use in the U.S. and Mexico (BOR 2019). Alternatives being considered in the EIS include no action (no salinity control in the Paradox Valley), a new injection well, evaporation ponds, and zero liquid discharge technology.

The BOR built and operates the McPhee Dam on the Dolores River, which was built in 1984 as a part of the Dolores Project (BOR 2009). The stream flow in the Dolores River near Slick Rock has been regulated by the water release from the McPhee Dam since then. The Dolores Project provides water for irrigation (90,900 ac-ft/yr) and municipal and industrial use (8,700 ac-ft/yr). In addition, the McPhee Dam provides water for recreation and hydroelectric power generation (BOR 2011).

Reasonably foreseeable trends that would result in cumulative impacts on recreation include continued demand for all recreation opportunities currently available on BLM lands, especially increased demand for close-to-home recreation opportunities for residents. Increased visitation is assumed due to a growing regional population, the outdoor-oriented lifestyle of Colorado residents, and increases in tourism due to promotion and increased popularity of BLM and USFS lands. Recreational activities near the Burro Mines Complex area include hunting, fishing, and boating (e.g., canoeing and kayaking). The Slick Rock boat launch is located just south of the Burro Mines Complex area. The Burro Mines Complex area occurs within the Dolores River SRMA. The SRMA is managed to provide a broad range of recreational benefits, particularly to river users (BLM 2015).

Climate change is primarily associated with human-induced emissions of heat-trapping gases, so-called GHGs. These emissions come mostly from the burning of fossil fuels (e.g., coal, oil, and natural gas), with considerable contributions from land use changes, such as deforestation or agricultural practices. GHGs include CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorine-containing halogenated substances—hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Some GHGs (CO_2, CH_4, and N_2O) are both naturally occurring and the product of industrial activities, while fluorine-containing halogenated

substances are manmade and are present in the atmosphere exclusively due to human activities (EPA 2019a). By 2020, electricity use (28%), followed by transportation (24%), will be the primary contributor to GHG emissions in Colorado (Arnold et al. 2014). Fossil fuel combustion and natural gas and oil systems will account for about 20% and 10%, respectively, of total state GHG emissions. Non-energy-related emissions from agriculture, mining, industrial processes, and waste management account for the rest of the GHG emissions (Arnold et al. 2014).

6.2 CONTRIBUTION TO CUMULATIVE IMPACTS FROM THE RECLAMATION OF THE BURRO MINES COMPLEX

Table 6-1 summarizes the contributions to cumulative impacts in the ROI from reclamation of the Burro Mines Complex (Alternative 2). For Alternative 1 (the No Action Alternative), information provided in Section 3 represents current conditions in the Burro Mines Complex area that would essentially represent ongoing and past actions in the area that contribute to overall cumulative impacts in the ROI.

It is expected that the contribution of impacts from reclamation of the Burro Mines Complex to cumulative impacts would be negligible. There could be a temporary and localized minor contribution for a few resources (Table 6-1).

TABLE 6-1 Contributions to Cumulative Impacts from the Reclamation of the Burro Mines Complex

Resource Area	Anticipated Level of Impacts	Comments
Air quality	Negligible	No measurable impacts on regional ozone or AQRVs at Class 1 areas.
Noise	Negligible	Noise levels are not expected to exceed daytime maximum permissible limits in a residential zone.
Soils	Negligible	Impacts would be localized and short in duration.
Water Resources	Positive long-term impacts	Future erosion to the Dolores River from the waste rock piles would be prevented or minimized. Limited and short-term impacts on surface water use (e.g., for dust control) and water quality.
Human health	Negligible	Waste rock pile(s) to be reclaimed do not currently present a health risk. Disposal, recontouring, covering with soil, and seeding (eventually leading to vegetative cover) will further reduce any radiological exposures over the long-term.
Ecological resources (vegetation and wetlands)	Negligible to minor	Short-term loss of existing sparse vegetation cover, but long-term establishment of native plant communities. No wetland impacts expected.
Ecological resources (wildlife)	Negligible to minor	Short-term loss of low-quality wildlife habitat, but long-term establishment of higher quality wildlife habitat; also, short-term disturbance to wildlife within and near areas of reclamation.

TABLE 6-1 (Cont.)

Resource Area	Anticipated Level of Impacts	Comments
Ecological resources (aquatic biota)	Negligible	Areas being reclaimed would become less prone to erosion over time because site grading would be completed, and vegetative cover would be established. Following reclamation, the potential for erosion from the reclaimed mine sites would be less than what currently exists for the unreclaimed mine site areas.
Ecological resources (threatened, endangered, and sensitive species)	Negligible	Impacts could occur on those special status species that may occur at or near the mine site(s) through direct effects such as mortality or disturbance of habitat resulting from reclamation activities. Overall, no adverse population-level impacts anticipated for any special status species; long-term beneficial impacts may occur from improved habitats once reclamation sites become vegetated. Water depletions from the Dolores River (0.05 ac-ft/month) would result in negligible impacts to the ESA-listed fish species (bonytail chub, Colorado pikeminnow, humpback chub, and razorback sucker).
Land use	Negligible	Reclamation activities would not affect current land use in nearby areas. Post-reclamation, other land use activities within the immediate area could occur at the Burro Mines Complex, including the potential for mining to occur at the Burro Tunnel Mine.
Socioeconomics and environmental justice	Negligible	Reclamation activities could produce a short-term, very small increase in total employment in San Miguel County. There would be no disproportionately high and adverse impacts on minority or low-income populations.
Transportation	Negligible	Daily increase in traffic on major roads would be limited. Most reclamation-related traffic would occur on haul roads. A portion of one county road would be modified to function as a haul road between the Burro Tunnel Mine and the relocation site (for Alternative 2).
Cultural and paleontological resources	Negligible	Reclamation would apply comply with agreed upon measures to retain onsite features that contributes to the historic significance of the Burro Mines Complex including an ore bin, a tunnel sized for trackless vehicles, multiple vertical shafts, support structures, support building foundations, an air and water line, major portions of a large ventilation system, and one steel headframe with associated ore and waste rock bins.
Visual resources	Negligible	Reclamation activities could alter vegetation and landform conditions creating a localized, short-term visual impact. In the long-term, revegetation of the Burro Mines Complex area would establish vegetation and landform conditions to those of surrounding areas.
Waste management	Negligible	Wastes (sanitary waste and miscellaneous trash) generated from reclamation activities would be limited and would be disposed of at a licensed off-site location.

APPENDIX A:
REFERENCES CITED

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APPENDIX B:
DOE AND BLM NOTIFICATION RECIPIENTS AND SCOPING COMMENTS RECEIVED

In accordance with NEPA, DOE sent notification letters to applicable federal, state, and local agencies, local residents, affected organizations, and interested tribes regarding its preparation of this EA for the proposed reclamation of the Burro Mines Complex in San Miguel County, Colorado. Table B-1 provides a list of the recipients of the notification letters sent by DOE; and Table B-2 provides a list of the correspondence received by DOE in response to its notification. The correspondence listed in Table B-2 contained scoping comments for which responses from DOE are provided in Appendix C, Table C-1.

Similarly, the BLM also sent notification letters and emails regarding its connected action for determining whether it could grant the ROW being requested by DOE. Table B-3 lists the recipients of the notification letters and emails sent by BLM. Table B-4 lists the scoping comment correspondence received by BLM in response to its notification.

TABLE B-1 DOE Notification Recipients

#	Recipient	Job Title	Name	City	State	Date Transmitted
1	Black Hills Corporation	Resident land owner	No name provided	Rapid City	SD	1/7/2020
2	Colorado Department of Public Health and Environment	Director of Environmental Programs	Rudolph, Martha E.	Denver	CO	1/7/2020
3	Colorado Division of Reclamation, Mining and Safety[a]	Minerals Program Director	Means, Russ	Grand Junction	CO	1/7/2020
4	Colorado Parks and Wildlife Southwest Region	–[b]	No name provided	Montrose	CO	1/7/2020
5	Dolores River Coalition	Coordinator	Hill, Lee-Ann	Cortez	CO	1/7/2020
6	Dolores River Boating Advocates	Executive Director	Clark, Amber	Dolores	CO	1/7/2020
7	Gold Eagle Mining, Inc.	President	Coram, Don	Montrose	CO	1/7/2020
8	James Ranch Agriprises, LLC	Resident land owner	James, David	Durango	CO	1/7/2020
9	Montrose County Land Use Department	Director	White, Steve	Montrose	CO	1/7/2020
10	Pueblo of Zuni	Governor	Panteah, Val	Zuni	NM	1/7/2020
11	San Miguel County Clerk & Recorder's Office	County Clerk	Van Damme, Stephanie	Telluride	CO	1/7/2020

TABLE B-1 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
12	San Miguel County Commission	Board of County Commissioners	No name provided	Telluride	CO	1/7/2020
13	San Miguel Power Association	Manager of Engineering	Riley, Bill	Nucla	CO	1/7/2020
14	State of Colorado	U.S. Senate	Bennet, Michael	Washington	DC	1/7/2020
15	State of Colorado	State Senator	Coram, Don	Denver	CO	1/7/2020
16	State of Colorado	U.S. Senate	Gardner, Cory	Washington	DC	1/7/2020
17	State of Colorado	U.S. House of Representatives	Tipton, Scott	Washington	DC	1/7/2020
18	State of Colorado	State Representative	Soper, Matt	Denver	CO	1/7/2020
19	U.S. Army Corp of Engineers	Sacramento	No name provided	Sacramento	CA	1/7/2020
20	U.S. Bureau of Land Management Southwest District Office[a]	NEPA Program Coordinator	Phillips, Gina	Montrose	CO	1/7/2020
21	U.S. Environmental Protection Agency – Region	Staff Director	Houston, Robert	–	–	1/7/2020
22	U.S. Environmental Protection Agency	NEPA Program Director	Strobel, Philip	Denver	CO	1/7/2020
23	Umetco Minerals Corporation	Remediation Leader	Gieck, Tom	Grand Junction	CO	1/7/2020
24	Uranium Energy Corporation	Vice President of Exploration	Yancy, Clyde	Corpus Christi	TX	1/7/2020
25	Western Governors' Association	Policy Advisor	Beckstead, Britta	Denver	CO	1/7/2020
26	–	Resident land owner	Brownlee, Scott	Montrose	CO	1/7/2020
27	–	Resident land owner	Crocker-Bedford, Cole and Kara-Lynn	Slick Rock	CO	1/7/2020
28	–	Resident land owner - location 1	Dufficy, John	Slick Rock	CO	1/7/2020
29	–	Resident land owner - location 2	Dufficy, John	Aspen	CO	1/7/2020
30	–	Resident land owner	Randolf, Mary	Egnar	CO	1/7/2020
31	Ute Indian Tribe of Unitah and Ouray Reservation	Chairman	Duncan, Luke	–	–	3/3/2020

TABLE B-1 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
32	The Hopi Tribe	Chairman	Honanie, Herman	–	–	3/3/2020
33	Pueblo of Acoma	Governor	Vallo, Brian D.	–	–	3/3/2020
34	Pueblo of Cochiti	Governor	Naranjo, Charles D.	–	–	3/3/2020
35	Southern Ute Indian Tribe	Chairman	Sage, Christine	–	–	3/3/2020
36	The Navajo Nation	President	Nez, Jonathan	–	–	3/3/2020
37	Pueblo of Isleta	Governor	Zuni, Max	–	–	3/3/2020
38	Ute Mountain Tribe of the UT	Chairperson	Heart, Manuel	–	–	3/3/2020
39	Pueblo of Jemez	Governor	Toledo, David M.	–	–	3/3/2020
40	Pueblo of Pojoaque	Governor	Talachy, Joseph	Santa Fe	NM	3/3/2020
41	Pueblo of San Felipe	Governor	Ortiz, Anthony	San Felipe Pueblo	NM	3/3/2020
42	Pueblo of Santa Clara	Governor	Chavarria, J. Michael	Espanola	NM	3/3/2020
43	Pueblo of Taos	Governor	Concha, Edwin	Taos	NM	3/3/2020
44	The Zuni Tribe of the Zuni Reservation	Governor	Panteah, Val	Zuni	NM	3/3/2020

[a] Invitation letters to be a cooperating agency in the preparation of the EA.

[b] "–"means not available or not applicable.

TABLE B-2 Correspondence Received by DOE in Response to Its Notification

#	Date of Letter	Sender	Recipient
1	January 19, 2020	Mary Randolph (Resident, Slick Rock, Colorado)	U.S. Department of Energy, Office of Legacy Management (D.L. Barr, Uranium Leasing Program Manager) U.S. Department of Energy, Office of Legacy Management (D.S. Shafer, Director, Office of Site Operations)
2	January 24, 2020	San Miguel County, Colorado, Board of Commissioners (H. Cooper, Chair, L. Waring, Vice Chair, K. Holstrom, Commissioner)	U.S. Department of Energy, Office of Legacy Management (D.S. Shafer, Director, Office of Site Operations) U.S. Department of Energy, Office of Legacy Management (D.L. Barr, Uranium Leasing Program Manager)
3	January 24, 2019	Information Network for Responsible Mining (J. Thurston, Executive Director) Sheep Mountain Alliance (K. (Lexi) Tuddenham, Executive Director)	U.S. Department of Energy, Office of Legacy Management (D.S. Shafer, Director, Office of Site Operations) U.S. Department of Energy, Office of Legacy Management (D.L. Barr, Uranium Leasing Program Manager)
4	February 4, 2020	San Miguel County, Colorado, Board of Commissioners (H. Cooper, Chair, L. Waring, Vice Chair, K. Holstrom, Commissioner)	U.S. Department of Energy, Office of Legacy Management (D.S. Shafer, Director, Office of Site Operations) U.S. Department of Energy, Office of Legacy Management (D.L. Barr, Uranium Leasing Program Manager)
5	February 7, 2020	Uranium Energy Corp (UEC) (C.L. Yancey, PG | VP Exploration)	U.S. Department of Energy, Office of Legacy Management (D.S. Shafer, Director, Office of Site Operations)

TABLE B-3 BLM Notification Recipients

#	Recipient	Job Title	Name	City	State	Date Transmitted
1	Black Hills Corporation	Resident land owner	No name provided	Rapid City	SD	6/16/2020
2	Colorado Department of Public Health and Environment	Director of Environmental Programs	Rudolph, Martha E.	Denver	CO	6/16/2020
3	Colorado Division of Reclamation, Mining and Safety	Minerals Program Director	Means, Russ	Grand Junction	CO	6/16/2020
4	Colorado Parks and Wildlife Southwest Region	–[a]	No name provided	Montrose	CO	6/16/2020
5	Dolores River Coalition	Coordinator	Hill, Lee-Ann	Cortez	CO	6/16/2020
6	Dolores River Boating Advocates	Executive Director	Clark, Amber	Dolores	CO	6/16/2020
7	Gold Eagle Mining, Inc.	President	Coram, Don	Montrose	CO	6/16/2020
8	James Ranch Agriprises, LLC	Resident land owner	James, David	Durango	CO	6/16/2020
9	Montrose County Land Use Department	Director	White. Steve	Montrose	CO	6/16/2020
10	San Miguel County Clerk & Recorder's Office	County Clerk	Van Damme, Stephanie	Telluride	CO	6/16/2020
11	San Miguel County Commission	Board of County Commissioners	No name provided	Telluride	CO	6/16/2020
12	San Miguel Power Association	Manager of Engineering	Riley, Bill	Nucla	CO	6/16/2020
13	State of Colorado	U.S. Senate	Bennet, Michael	Washington	DC	6/16/2020
14	State of Colorado	State Senator	Coram, Don	Denver	CO	6/16/2020
15	State of Colorado	U.S. Senate	Gardner, Cory	Washington	DC	6/16/2020
16	State of Colorado	U.S. House of Representatives	Tipton, Scott	Washington	DC	6/16/2020
17	State of Colorado	State Representative	Soper, Matt	Denver	CO	6/16/2020
18	U.S. Army Corp of Engineers	Sacramento	No name provided	Sacramento	CA	6/16/2020

TABLE B-3 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
19	U.S. Environmental Protection Agency – Region	Staff Director	Houston, Robert	–	–	6/16/2020
20	U.S. Environmental Protection Agency	NEPA Program Director	Strobel, Philip	Denver	CO	6/16/2020
21	Umetco Minerals Corporation	Remediation Leader	Gieck, Tom	Grand Junction	CO	6/16/2020
22	Uranium Energy Corporation	Vice President of Exploration	Yancy, Clyde	Corpus Christi	TX	6/16/2020
23	Western Governors' Association	Policy Advisor	Beckstead, Britta	Denver	CO	6/16/2020
24	–	Resident land owner	Brownlee, Scott	Montrose	CO	6/16/2020
25	–	Resident land owner	Crocker-Bedford, Cole and Kara-Lynn	Slick Rock	CO	6/16/2020
26	–	Resident land owner - location 1	Dufficy, John	Slick Rock	CO	6/16/2020
27	–	Resident land owner - location 2	Dufficy, John	Aspen	CO	6/16/2020
28	–	Resident land owner	Randolf, Mary	Egnar	CO	6/16/2020
29	–	–	Blackburn, Fred M.	Cortez	CO	6/16/2020
30	–	–	Ferguson, Elise R.	Oakland	CA	6/16/2020
31	–	–	Meyers, Terry E.	Grand Junction	CO	6/16/2020
32	–	–	Shaw, Gary	Mancos	CO	6/16/2020
33	–	–	Thurston, Jennifer	Paradox	CO	6/16/2020
34	–	–	Belt, Chris P.	Dolores	CO	6/16/2020
35	–	–	Church, Clyde	–	–	6/16/2020
36	–	–	Davis, Richard P.	Cortez	CO	6/16/2020
37	–	–	Foster, Ellen	–	–	6/16/2020
38	–	–	Foster, Ric	Pocatello	ID	6/16/2020
39	–	–	Garchar, Steve	Dove Creek	CO	6/16/2020
40	–	–	Goff, Deana M.	Mancos	CO	6/16/2020
41	–	–	Jakoby, Leslie	–	–	6/16/2020

TABLE B-3 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
42	–	–	Kleinert, James	Telluride	CO	6/16/2020
43	–	–	Kolner, Betty Ann	–	–	6/16/2020
44	–	–	Kukuk, Janelle	Creede	CO	6/16/2020
45	–	–	Lachelt, Gwen	–	–	6/16/2020
46	–	–	Lanier, Timothy A.	Pleasant View	CO	6/16/2020
47	–	–	Magee, Brian	Durango	CO	6/16/2020
48	–	–	Mayer-Gawlik, Jan	–	–	6/16/2020
49	–	–	McAfee, Chuck	Lewis	CO	6/16/2020
50	–	–	Noyes, Ron D.	Cortez	CO	6/16/2020
51	–	–	Pargin, Steve	Ignacio	CO	6/16/2020
52	–	–	Pearson, Mark,	Durango	CO	6/16/2020
53	–	–	Pennington, Roger A.	Bayfield	CO	6/16/2020
54	–	–	Popejoy, Mike	–	–	6/16/2020
55	–	–	Richard, Robin E.	Cortez	CO	6/16/2020
56	–	–	Robb, Arlo R.	Cortez	CO	6/16/2020
57	–	–	Taylor, Tracy E.	Rico	CO	6/16/2020
58	–	–	Thorpe, Matt	Durango	CO	6/16/2020
59	–	–	Westendorff, Julie	–	–	6/16/2020
60	–	–	Williams, Bill K.	Dolores	CO	6/16/2020
61	–	–	Williams, Scott	Cortez	CO	6/16/2020
62	Ute Indian Tribe of Uintah and Ouray Reservation	Chairman	Duncan, Luke	Ft. Duchesne	UT	6/17/2020
63	The Hopi Tribe	Chairman	Honanie, Herman	–	–	6/17/2020
64	Pueblo of Acoma	Governor	Vallo, Brian D.	Acoma	NM	6/17/2020
65	Pueblo of Cochiti	Governor	Naranjo, Charles D.	–	–	6/17/2020
66	Southern Ute Indian Tribe	Chairman	Sage, Christine	Ignacio	CO	6/17/2020
67	The Navajo Nation	President	Nez, Jonathan	Window Rock	AZ	6/17/2020

TABLE B-3 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
68	Pueblo of Isleta	Governor	Zuni, Max	Isleta	NM	6/17/2020
69	Pueblo of Jemez	Governor	Toledo, David M.	Jemez Pueblo	NM	6/17/2020
70	Pueblo of Pojoaque	Governor	Talachy, Joseph	Santa Fe	NM	6/17/2020
71	Pueblo of San Felipe	Governor	Ortiz, Anthony	San Felipe Pueblo	NM	6/17/2020
72	Pueblo of Santa Clara	Governor	Chavarria, J. Michael	Espanola	NM	6/17/2020
73	Pueblo of Taos	Governor	Concha, Edwin	Taos	NM	6/17/2020
74	The Zuni Tribe of the Zuni Reservation	Governor	Panteah, Val	Zuni	NM	6/17/2020
75	Jicarilla Apache Nation	President	Paiz, Darrell	Dulce	NM	6/17/2020
76	Kewa Pueblo	Governor	Moquino, Thomas	Santo Domingo	NM	6/17/2020
77	Ohkay Owingeh	Governor	Lovato, Ron	Ohkay Owingeh	NM	6/17/2020
78	Pueblo de Cochiti	Governor	Narnjo, Charles	Cochiti Pueblo	NM	6/17/2020
79	Pueblo de San Ildefonso	Governor	Martinez, Perry	Santa Fe	NM	6/17/2020
80	Pueblo of Laguna	Governor	Herrera, Jr, Wilfred	Laguna Pueblo	NM	6/17/2020
81	Pueblo of Nambe	Governor	Perez, Phillip A.	Santa Fe	NM	6/17/2020
82	Pueblo of Picuris	Governor	Quanchello, Craig	Penasco	NM	6/17/2020
83	Pueblo of Pojoaque	Governor	Talachy, Joseph M.	Santa Fe	NM	6/17/2020
84	Pueblo of Sandia	Governor	Paisano, Stuart	Bernalillo	NM	6/17/2020
85	Pueblo of Santa Ana	Governor	Montoya, Lawrence	Santa Ana Pueblo	NM	6/17/2020
86	Pueblo of Tesuque	Governor	Mora, Robert	Santa Fe	NM	6/17/2020
87	Pueblo of Zia	Governor	Medina, Fred	Zia Pueblo	NM	6/17/2020
88	The Hopi Tribe	Chairman	Nuvangyao, Timothy L.	Kykotsmovi	AZ	6/17/2020
89	Ute Mountain Ute Tribe	Chairman	Heart, Manuel	Towaoc	CO	6/17/2020
90	Ysleta del Sur Pueblo	Governor	Silvas, Michael	El Paso	TX	6/17/2020
91	Jicarilla Apache Nation	THPO/NAGPRA Contact	Blythe, Jeff	Dulce	NM	6/17/2020
92	The Navajo Nation	Navajo Cultural Specialist	Begay, Timothy	Window Rock	AZ	6/17/2020

TABLE B-3 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
93	The Navajo Nation	Department Manager III	Begay, Richard	Window Rock	AZ	6/17/2020
94	Ohkay Owingeh	THPO	Montoya, Michael	Ohkay Owingeh	NM	6/17/2020
95	Ohkay Owingeh	Natural Resources Director	Phillips, Larry	Ohkay Owingeh	NM	6/17/2020
96	Pueblo de Cochiti	NAGPRA Representative	Pecos, Jay	Cochiti	NM	6/17/2020
97	Pueblo de San Ildefonso	Tribal Historic Preservation Officer	Aguillar, Joseph	Santa Fe	NM	6/17/2020
98	Pueblo of Acoma	Director	Scissons, Todd	Pueblo of Acoma	NM	6/17/2020
99	Pueblo of Isleta	Tribal Historic Preservation Officer	Walt, Henry	Isleta Pueblo	NM	6/17/2020
100	Pueblo of Jemez	THPO	Toya, Christopher	Jemez Pueblo	NM	6/17/2020
101	Pueblo of Laguna	Governor	Herrera, Jr., Wilfred	Laguna Pueblo	NM	6/17/2020
102	Pueblo of Laguna	THPO	Smith Sr, Richard	Laguna Pueblo	NM	6/17/2020
103	Pueblo of Nambe	NAGPRA Contact	Garcia, Arnold J.	Santa Fe	NM	6/17/2020
104	Pueblo of Picuris	NAGPRA Contact	Shields, Cecilia	Penasco	NM	6/17/2020
105	Pueblo of Picuris	Administrator	Tenorio, Shannon	Penasco	NM	6/17/2020
106	Pueblo of Pojoaque	Tribal Historic Preservation Officer	Bernstein, Bruce	Santa Fe	NM	6/17/2020
107	Pueblo of San Felipe	Acting THPO	Duran, Ruben	San Felipe Pueblo	NM	6/17/2020
108	Pueblo of Sandia	Environmental Director	Tracy, Jessica	Bernalillo	NM	6/17/2020
109	Pueblo of Santa Ana	THPO	Menchengo, Timothy	Santa Ana Pueblo	NM	6/17/2020
110	Pueblo of Santa Clara	Acting THPO	Naranjo, Danny	Espanola	NM	6/17/2020
111	Pueblo of Taos	Executive Assistant	Romero, Tina	Taos	NM	6/17/2020
112	Pueblo of Tesuque	THPO	Mitchell, Mark	Santa Fe	NM	6/17/2020
113	Pueblo of Tesuque	Assistant THPO	Mora, Bernard	Santa Fe	NM	6/17/2020
114	Pueblo of Zia	Interim Director	Young, Jesse	Zia Pueblo	NM	6/17/2020

TABLE B-3 (Cont.)

#	Recipient	Job Title	Name	City	State	Date Transmitted
115	Southern Ute Indian Tribe	NAGPRA Coordinator	Atencio, Cassandra	Ignacio	CO	6/17/2020
116	Southern Ute Indian Tribe	NAGPRA Apprentice	Briggs, Garrett	Ignacio	CO	6/17/2020
117	The Hopi Tribe	Chairman	Nuvangyaoma, Timothy L.	Kykotsmovi	AZ	6/17/2020
118	The Hopi Tribe	Interim Director	Koyiyumptewa, Stuart	Kykotsmovi	AZ	6/17/2020
119	The Hopi Tribe	Repatriation Coordinator	Lomayestewa, Lee Wayne	Kykotsmovi	AZ	6/17/2020
120	Ute Indian Tribe (Uintah & Ouray Reservation)	Director	Chapoose, Betsy	Ft. Duchesne	UT	6/17/2020
121	Ute Mountain Ute Tribe	NAGPRA Representative/THPO	Knight, Sr., Terry	Towaoc	CO	6/17/2020
122	Ute Mountain Ute Tribe	Tribal Administrator	Shurack, Nikki	Towaoc	CO	6/17/2020
123	Ysleta del Sur Pueblo	NAGPRA Representative	Quezada, Rick	El Paso	TX	6/17/2020
124	The Zuni Tribe of the Zuni Reservation	Acting Director	Dongoske, Kurt	Zuni	NM	6/17/2020

[a] "–"means not available or not applicable.

TABLE B-4 Correspondence Received by BLM in Response to Its Notification

#	Date of Letter	Sender	Recipient
1	June 28, 2020	Leon and Mary Randolph (Resident, Slick Rock, Colorado)	U.S. Bureau of Land Management (J. Blair, Tres Rios Field office, Geologist)
2	July 6, 2020	San Miguel County, Colorado, Board of Commissioners (H. Cooper, Chair, L. Waring, Vice Chair, K. Holstrom, Commissioner)	Bureau of Land Management (J. Blair, Tres Rios Field Office, Geologist)
3	July 6, 2020	Information Network for Responsible Mining (J. Thurston, Executive Director) Sheep Mountain Alliance (K. (Lexi) Tuddenham, Executive Director)	Bureau of Land Management (J. Blair, Tres Rios Field Office, Geologist)

APPENDIX C:
DOE RESPONSES TO SCOPING COMMENTS

DOE received scoping comments in response to its notification regarding its proposed action of reclamation of the Burro Mines Complex (see Appendix B, Tables B-1 and B-2 for lists of notification correspondence sent and received). Table C-1 below presents the comments and DOE's responses.

TABLE C-1 Scoping Comments and DOE Responses

#	Comment	Response
1.[a]	We would like to state that we are very much "against" the option 3. Relocating the mine waste material from the Burro Mine Complex to an abandoned gravel pit located approx. 0.5 miles south of the Burro Tunnel mine and reclaiming the Burro Mine Complex site. That site is adjacent to our property and definitely do NOT want the clean up there. We feel that would definitely cause our land to have a lower appraisal value. At some point in time we may wish to open a gravel pit site on our side of the property and feel that would be hazardous being that close, or another possibility is that we would sell that property and someone would wish to build a home at that site. So again we state we are VERY much against the option #3. Please consider our serious reservations in this matter.	The waste rock relocation and final reclaimed state would be conducted in accordance with Colorado Division of Reclamation, Mining, and Safety requirements. Viable ore was removed during the mining process, leaving behind the waste rock that is currently at the Burro Mines Complex. Waste rock are exempt from Resource Conservation and Recovery Act hazardous waste requirements which state that solid waste from the extraction, beneficiation, and processing of ores and minerals are not hazardous waste. The potential impacts to human health were evaluated in this EA. The evaluation included that for a resident living on land near the relocation site after the waste rock have been placed (see Section 4.5 of this EA). The visual aesthetics at the relocation site after the reclamation project is completed would bring the site closer to its original topography and provide stabilization and vegetation. DOE carefully considered the results of the impact evaluation discussed in the EA in deciding that the preferred alternative meets the purpose and need; and that it would provide an approach that is environmentally protective, but also fiscally responsible and efficient from an engineering standpoint.
2.[b]	We are concerned about the number of unreclaimed or abandoned uranium mines in the west end of our County and the risks they pose to public safety and the environment. We support efforts to reclaim these contaminated lands as long as reclamation actions are conducted with best management practices and with containment engineering that is built to last.	DOE evaluates abandoned uranium mines as part of its Defense-Related Uranium Mines (DRUM) Program. DOE works with the responsible land management agencies to mitigate safety and environmental hazards associated with them. The Burro Mines Complex that is the subject of the proposed action for this EA is not part of the DRUM program. DOE employs best management practices and validates permanent engineering structures for all reclamation projects and will do the same for the proposed reclamation of the Burro Mines Complex.

TABLE C-1 (Cont.)

#	Comment	Response
3.[b]	Consult with San Miguel County Road & Bridge Department. The road labels identified on the map included with the notice are not correct. We ask that you consult with the San Miguel County Road & Bridge Department to confirm the location and name of the roads which will be used for construction and hauling activities during the reclamation. Permits and bonds may be required and even if the DOE is exempted from these requirements, we ask that you work with our Road & Bridge Department to adequately address our local land use regulations.	DOE has contacted San Miguel County's Road and Bridge Department to confirm locations and names of roads to be used in this project. DOE has also contacted San Miguel County's Planning Department to determine necessary permitting and surety requirements.
4.[b]	Consult with Colorado Parks and Wildlife (CPW). We ask that you consult with CPW to ensure that there are no adverse impacts to wildlife including native fish, desert bighorn sheep, mule deer, raptors or any other species identified by CPW as important or sensitive.	Potential impacts to wildlife and their habitat, including species listed under the state of Colorado, the BLM, and the Endangered Species Act (ESA) were evaluated in this EA (see Section 4.6). DOE has notified CPW about this project and would continue coordination and communication throughout this project.
5.[b]	Monitoring is needed to ensure effective reclamation. The Burro Tunnel Mines Complex has documented stormwater runoff, sedimentation and erosion issues. We are aware of concerns that uranium concentrations in the Dolores River increase downstream of this complex. All EA alternatives should include a robust analysis of present conditions and ensure that onsite reclamation and/or relocation of mine dumps or waste rock are hydrologically isolated from the Dolores River with no potential to mobilize contaminants through surface water runoff or groundwater discharge. We ask that a baseline characterization and post-reclamation monitoring be conducted and available to the County and the general public.	The purpose of this project is to mitigate sediment run-off from the waste rock piles located at the Burro Mines Complex into the Dolores River and thus, avoid the associated impacts to the Dolores River. As previously stated, this reclamation project would be conducted in accordance with Colorado Division of Reclamation, Mining, and Safety requirements. Characterization and monitoring of surface water runoff would not be needed to implement the proposed action. However, the evaluation presented in this EA does include the affected environment pertinent to the proposed action and the associated potential impacts (see Sections 3.4 and 4.4). Post-reclamation monitoring would be conducted for five years following the completion of the reclamation project to ensure that adequate revegetation of disturbed areas occur and to control invasive species.

TABLE C-1 (Cont.)

#	Comment	Response
6.[b]	Reclamation actions should produce a complete clean up and restoration of the complex. We ask that all mine features associated with this complex are reclaimed and restored to their natural pre-mining condition as closely as possible, including land cover type, vegetation and contours. All of the related mine buildings should be removed. The reclamation alternatives considered in the EA should incorporate eradication of invasive species and require post-reclamation monitoring and treatment if invasive species are found. The Dolores River riparian area is an area of growing recreational and ecological importance to the entire region. The river has been negatively impacted by related mining activities in this area and should be restored as part of this project. In order to ensure transparency and the local, state and federal coordination needed for adequate remediation, we ask for consistent identification and labeling of mine features between the DOE and the Colorado Division of Reclamation, Mining and Safety (DRMS).	ULP Lease Tract C-SR-13 contains an active mine under lease by DOE. Waste rock being addressed by the proposed action are mostly pre-law [pre-permitting by Colorado DRMS]. Reclamation efforts are intended to relocate waste rock away from the Dolores River. In accordance with the Colorado State Historic Preservation Office (SHPO), the buildings and other structures associated with the Burro Mines Complex would be left in place to preserve their historical significance. Reclamation activities would include revegetation of disturbed areas and post-reclamation activities would include monitoring of those areas for at least 5 years after the construction activities are complete. Monitoring would include control of invasive species. DOE is coordinating this reclamation project with the Bureau of Land Management (BLM), Colorado SHPO, and Colorado DRMS to ensure that each agencies' concerns are adequately addressed. To the extent possible, consistency with identification and labeling of mine features between DOE and DRMS is coordinated.
7.[b]	Include the Gold Eagle Mining Company site in remediation activities. DOE's notice for an EA mentions three mine sites, but DRMS has received a recent site map showing four (1). It is our understanding from Don Coram the owner of Gold Eagle Mining Company which owns the surface estate of the Burro Mine tunnel that he supports the remediation activities, which will include the mining activities on his land.	The Reclamation of the Burro Mines Complex involves three mines: the Burro Tunnel mine and the Burro Nos. 3 and 5 Shaft mines. The Burro Tunnel No. 7 mine has already been reclaimed and is not part of the proposed action. The New Ellison mine is currently permitted with DRMS by Gold Eagle Mining, Inc. (GEMI). DOE will continue to coordinate with GEMI throughout this project.
8.[b]	Avoid impacts to adjacent private property. Alternative #3 includes a plan to consolidate mine waste to an abandoned gravel pit. We understand that this gravel pit is located adjacent to private property and this could significantly impact the use and value of this private property in San Miguel County. We ask that you consider another location if it is determined that the mine waste needs to be moved off site.	DOE has considered two other locations for the relocation of the waste rock from the Burro Mines Complex (see Section 2.3 of this EA). Based on the evaluation presented for these two locations and compared with the preferred relocation site, the preferred alternative would be best to address the purpose and need for DOE's action and would be protective of human health and the environment. Should this reclamation activity take place adjacent to a private property, DOE will coordinate with the landowner(s) throughout the project.

TABLE C-1 (Cont.)

#	Comment	Response
9.[b]	Adequate bonding is needed for post-reclamation monitoring. We understand that DRMS holds a $100 financial assurance bond, but that DOE has jurisdiction over the financial warranty for this project. We ask that the alternatives include at least five years of post-reclamation monitoring, including water quality testing upstream and downstream of the mine complex and a new repository if that alternative is implemented. The DOE should require a meaningful financial warranty that will cover the entire cost of the project including the post-reclamation monitoring.	DOE is undertaking this project and thus, no financial warranty is required for this Federal project. DOE will conduct post-reclamation monitoring as included in the design plans for the preferred alternative. See also responses to comments #5 and #6.
10.[c]	These comments are submitted on behalf of Information Network for Responsible Mining (INFORM) and Sheep Mountain Alliance (SMA). Our organizations were co-plaintiffs in the case CEC v. Office of Legacy Management (08- CV-01624-WJM-MJW). As such, we respectfully request that you provide notice to us of all future comment opportunities related to the implementation of the court decision in that case and all other opportunities, including site-specific EAs, related to the Uranium Leasing Program.	As requested, DOE will include INFORM and SMA in future notices pertaining to this EA and future activities associated with the Uranium Leasing Program, as warranted. With regards to this EA, DOE would like to clarify that the proposed action is not associated with the ULP PEIS as the waste rock piles being proposed for reclamation are legacy (pre-law) materials that resulted from private, non-lease related mining activities. This is also why the proposed project is a DOE federally funded action rather than one proposed by the lessee under their lease agreement and in accordance with the ULP PEIS.
11.[c]	Although LM is required under NEPA to develop a No Action Alternative, we urge you not to consider it as a final action when the NEPA process is concluded. It is our position that reclamation of C-SR-13 must occur as a matter of environmental necessity, that future uranium mining at that location is unnecessary and economically feasible, and by extension that all leasing should be ended entirely and all lease tracts fully reclaimed. However, the No Action Alternative should be fully analyzed in order to provide a useful understanding of the comprehensive impacts of existing conditions at the Burro Tunnel Mine Complex. To date, a comprehensive analysis of the ongoing impacts and damages to the environment have not been properly understood or disclosed, and therefore we look forward to DOE's analysis and careful documentation of the existing problems on the tract, the cumulative impacts to surrounding public lands, and impacts to the Dolores River, among others. Only by thoroughly understanding existing problems caused by the mines can an appropriate reclamation plan be developed. We hope that this occurs as part of the final outcome of this site-specific process and that LM will ultimately do the same for all the lease tracts.	As required under NEPA, this EA has included a No Action Alternative as Alternative 1. DOE has identified Alternative 2, Reclamation of the Burro Mines Complex, as the preferred alternative. The evaluation included in the EA addresses the affected environment and associated potential impacts to support DOE's identification of the preferred alternative (see Chapters 3 and 4). Currently, mining at the Burro Tunnel lease tract is a legal operation permitted by Colorado DRMS.

TABLE C-1 (Cont.)

#	Comment	Response
12.[c]	On the map that accompanies the scoping notice, a new haul road is indicated but no additional information about that is provided. It is our position that a new haul road, especially one that crosses Burros Canyon, is unnecessary. If a new haul road is selected in a final alternative, it should only be a temporary road used for cleanup and then ultimately reclaimed. An access road already exists that connects to the county road, which can be used for hauling materials to a new depository. This road is located on the patented land inholding that is owned by the lessee, Gold Eagle Mining Inc., and there is no reason to believe that Gold Eagle Mining Inc. would not allow LM to use it for this purpose, especially considering that a legal business relationship between you already exists. LM should do everything possible to avoid new road construction.	The need for the new haul road and its construction and post-reclamation management has been incorporated into the evaluations discussed in this EA. The EA evaluations also included analysis of potential impacts associated with using the existing county roads as the haul route. The canyon crossing would also be constructed in accordance with the Clean Water Act and U.S. Army Corps of Engineers nationwide permits, as applicable.
13.[c]	The Proposed Action that would relocate the waste material just south of the mines and further away from the river is also our preferred outcome, depending, of course, on the final analysis and anticipated impacts that will be disclosed in the EA. In addition to the old gravel site indicated on the map, LM should also consider the possibility of a disposal site located on the mesa above Burros Canyon near the existing UMTRCA tailings depository for the Slick Rock Mill. It is possible there would be fewer impacts and that waste could be more easily managed and monitored there in the future.	In addition to the existing gravel pit site, DOE considered two other relocation sites as discussed in Section 2.3 of this EA.
14.[c]	The Burro Tunnel Mine Complex is located both on public and private lands with clear lines of demarcation, but the environmental impacts are not so easily dissected. LM must consider the impacts of reclaiming the lease tract on the adjacent patented claims, and the significant need for reclaiming the entire area comprehensively in order to protect the watershed. In 2014, the Colorado Mined Land Reclamation Board ordered Gold Eagle Mining Inc. to reclaim its entire state-permitted area, which includes both the patented claims and the areas leased by LM within 180 days of approval of the reclamation plan. However, since that time, LM has blocked the implementation of that state order by declining to approve the reclamation plan submitted by Gold Eagle Mining. Now that site-specific NEPA analysis for reclamation has initiated, we request that you cooperate with the state so that it can meet its obligation to implement the 2014 order and allow a complete cleanup to proceed. (See enclosed attachment of the board order.) The aspects of reclamation that will occur on private land should be considered in conjunction with LM's plan for the sections of mine that are on public land.	The scope of the proposed action as evaluated in this EA is consistent with the purpose and need identified in Section 1.3. DOE's proposed action in this EA is to mitigate potential future sediment runoff to the nearby Dolores River from the waste rock piles at the Burro Mines Complex. As such, the alternatives and the evaluations in the EA have been identified and adequately scoped to provide the information needed to support selection of the preferred alternative. The implementation of the proposed action would affect GEMI's Burro Tunnel mine permit. DOE would coordinate with GEMI and the Colorado DRMS to ensure both parties obligations under the Stipulated Agreement are satisfied. After the injunction was lifted, DOE contacted GEMI to provide them the opportunity to review/revise their submitted reclamation plans before DOE proceeds to conduct its review of these plans.

TABLE C-1 (Cont.)

#	Comment	Response
15.[c]	In the previous decade, LM allowed Gold Eagle Mining to conduct reclamation work on the lease tract in lieu of paying royalties under the RILOR program. That was a mistake, and we continue to oppose the practice of waiving public revenues in this manner. Tamarisk was removed along the banks of the Dolores River at that time but the riverbanks adjacent to the mining areas remain in very poor condition, further exacerbated by the presence of eroding waste piles. LM should consider the benefits of completely restoring the river corridor as it passes through the lease tract and include this in a final reclamation plan. The river corridor was healthy and in its natural state prior to mining, and now that mining is concluded those impacts should be addressed and original conditions restored. LM should also consider the necessity of protecting the river corridor in the future and should develop an alternative that re-draws the boundaries of C-SR-13 to entirely exclude the river corridor. A fully engineered stormwater management system is necessary in order to fully protect the river.	The activities mentioned in this comment are outside the scope of this EA. See also response to comment #14. As far as activities that are associated with the ULP lease tracts, future lease holder activities would follow mitigation measures identified in the ULP PEIS (including those to protect the river corridor).
16.[c]	LM must also consider the impacts to wildlife habitat and the presence of species listed under the Endangered Species Act. Species of special concern in the Slick Rock Area include the willow flycatcher, Yellow-billed cuckoo, bats, desert bighorn, river otter and endangered Colorado River fish, and the canyon also provides important winter habitat for game species such as deer, elk and pronghorn.	To address potential impacts on the affected environment for ecological resources identified in this EA (see Section 3.6), potential impacts to wildlife and their habitat, including species listed under the Endangered Species Act were evaluated (see Section 4.6). Reclamation activities would not begin during winter; therefore, winter habitat use by big game and other wildlife species would not be affected.
17.[c]	The cultural and historic significance of the area must also be analyzed in the EA in order to comply with the National Historic Preservation Act. At the Hawkeye Mine (which is part of the Burro Complex) the operator damaged a historic load out structure with a bulldozer, and it has been allowed to remain in its leaning position in a manner that creates a public safety hazard. This structure should either be stabilized or removed, and if its historic value is going to be asserted, then documentation should be provided in order to support that. In addition, the significance of the area and the presence of Indigenous Peoples and their involvement in mining the area has not been adequately documented in the past and has been routinely overlooked in regional histories. Despite that, the Navajo people in particular have strong connection to the area and should be considered in the EA analysis. (See attached Gallup Independent story.)	The EA evaluated potential impacts to culturally significant features, both archeological and architectural in accordance with the National Historic Preservation Act (NHPA) (see Section 4.11). Native American Tribes have been notified about this reclamation project as requested to identify any culturally significant religious properties. Although not part of this project, DOE consulted with the SHPO regarding removal of the Hawkeye ore bin because drainage has eroded the footing. DOE has subsequently instructed GEMI to remove and relocate the Hawkeye ore bin.

TABLE C-1 (Cont.)

#	Comment	Response
18.[c]	LM must also consider the specific impacts and problems associated with the mining or uranium and the best alternative for reclaiming areas now covered with radioactive materials. LM should establish a radium standard for soils, and should follow EPA's guidance that limits the amount of radium in topsoils to 5 picocuries per gram. In addition, radon that is exhaled by the mines should be sequestered with adequate controls in place at the mines' adits in order to limit those emissions. Although there are only a few residences in Slick Rock, the people who live there experience much higher risks of diseases and poor health outcomes related to exposure to radioactive materials, and the Slick Rock area is a destination for rafters, hikers, climbers, hunters and other recreationists. Any final remedy developed for the lease tract must limit the public health impacts of radioactivity as much as possible.	The scope of the proposed action as evaluated in this EA is consistent with the purpose and need identified in Section 1.3. DOE's proposed action in this EA is to mitigate potential future sediment runoff to the nearby Dolores River from the waste rock piles at the Burro Mines Complex. As such, the alternatives and the evaluations in the EA have been identified and adequately scoped to provide the information needed to support selection of a preferred alternative that would be protective of human health and the environment.
19.[c]	In addition, a comprehensive understanding and analysis of the water quality impacts to the river must be included in the EA. Because of the size and history of the mining complex, extensive underground development and significant waste piles that have been left unreclaimed for many decades, groundwater infiltration and downgradient contamination is likely. The EA must determine what those impacts are and address them. Historically, water quality monitoring for the Dolores River has indicated elevated levels of uranium in the surface water as well, including data reported as part of the UMTRCA site monitoring, and this adverse water quality impact is very likely exacerbated by the mines' existing waste piles. Reducing the release of radioactive constituents as well as other toxins into the river and groundwater systems is vitally important.	The affected environment for water resources (including groundwater) and the potential impacts from the two alternatives considered were evaluated in this EA (see Sections 3.4 and 4.4).
20.[c]	Lastly, LM should expand the project area under consideration and include the entire lease tract, not just the limited area around the existing mine complex. Impacts of uranium mines extend far beyond the permit boundaries and the entire lease tract experiences those impacts. LM should develop an EA that includes the entire tract area, fully document and disclose all existing conditions, and reclaim the entire area. It is finally time to begin resolving the extensive environmental problems created by uranium mining at the direction of the U.S. government.	See response to comment # 14.

TABLE C-1 (Cont.)

#	Comment	Response
21.[d]	Remediation of County Roads and Ditches Considering the history of mining activity and the lack of remediation, we have concerns about potential radioactivity on all public and private roads throughout the Slick Rock area and the uranium mining district in general. As part of these remediation actions we ask that testing be conducted on county roads throughout the Slick Rock area and clean-up activities include county roads and ditches determined to have above acceptable levels of radioactivity. We also ask that all remediation activities include actions that will contain tailings away from county roads and ditches to prevent further distributions of these materials as our roads are graded in the future.	The roads and ditches that exist throughout the Slick Rock area are beyond the scope of this project. The purpose of this project is to mitigate sediment run-off from the waste rock piles located at the Burro Mines Complex into the Dolores River and thus, avoid the associated impacts to the Dolores River.
22.[d]	Impacts to Adjacent Private Property Owners The environmental assessment should prevent adverse health, safety and environmental impacts to nearby private property that could also negatively impact property values or uses.	The two alternatives discussed in this EA were each evaluated for potential impacts to human health, safety and various environmental resources in accordance with NEPA requirements (see Chapter 4). See also response to comment #1.
23.[e]	I just received your January 6, 2020 letter addressing DOE's proposed reclamation on their lease tracts C-SR-13 and 13A. Not sure where the letter has been for the past month? As you are aware UEC holds the mining claims to the north and east of the DOE lease tracts, including the claims covering the three Burro shafts shown on your map. FYI, some historic maps show the Burro #3 shaft labeled as the Burro #1 shaft. Is it DOE's intent to close the Burro Adit (or tunnel as you letter refers to it)? At this time I have no substantive questions or comments, and look forward to reviewing the document.	DOE is aware that UEC holds mining claims in the immediate area. DOE is not proposing to close the Burro Tunnel portal as part of this reclamation project, as it is part of the lessee's permitted infrastructure.

[a] From correspondence listed as #1 on Table B-2.

[b] From correspondence listed as #2 on Table B-2.

[c] From correspondence listed as #3 on Table B-2.

[d] From correspondence listed as #4 on Table B-2.

[e] From correspondence listed as #5 on Table B-2.

APPENDIX D:
DISTRIBUTION FOR THE DRAFT EA

Tables D-1 and D-2 provide DOE's and BLM's distribution lists for the Draft EA, respectively.

TABLE D-1 DOE Distribution List for the Draft EA

Counties:
Montrose County Land Use Department
San Miguel County Clerk & Recorder's Office
San Miguel County Commission
San Miguel Power Association

Federal Agencies:
U.S. Army Corp of Engineers
U.S. Bureau of Land Management Southwest District Office
U.S. Bureau of Land Management Tres Rios Field Office
U.S. Environmental Protection Agency

Individuals:
Brownlee, Scott
Crocker-Bedford, Cole and Kara-Lynn
Dufficy, John
Randolph, Mary

Interested Tribes:
The Hopi Tribe
The Navajo Nation
Pueblo of Acoma
Pueblo of Cochiti
Pueblo of Isleta
Pueblo of Jemez
Pueblo of Pojoaque
Pueblo of San Felipe
Pueblo of Santa Clara
Pueblo of Taos
Pueblo of Zuni
Southern Ute Indian Tribe
Ute Indian Tribe of Uintah and Ouray Reservation
Ute Mountain Tribe of the Ute
The Zuni Tribe of the Zuni Reservation

Members of Congress:
State of Colorado, U.S. House of Representatives
State of Colorado, U.S. Senator

Members of State Legislature:
State of Colorado, State Representative
State of Colorado, State Senator

Organizations:
Dolores River Boating Advocates
Dolores River Coalition
Information Network for Responsible Mining (INFORM)
Sheep Mountain Alliance (SMA)
Western Governors' Association

Private Companies:
Black Hills Corporation
Gold Eagle Mining, Inc.
James Ranch Agriprises, LLC
Umetco Minerals Corporation
Uranium Energy Corporation

State Agencies:
Colorado Department of Public Health and Environment
Colorado Division of Reclamation, Mining and Safety
Colorado Parks and Wildlife Southwest Region

TABLE D-2 BLM Distribution List for the Draft EA

Counties:
Montrose County Land Use Department
San Miguel County Clerk & Recorder's Office
San Miguel County Commission
San Miguel Power Association

Federal Agencies:
U.S. Army Corp of Engineers
U.S. Bureau of Land Management Southwest District Office
U.S. Bureau of Land Management Tres Rios Field Office
U.S. Environmental Protection Agency

Individuals:
Belt, Chris P.
Blackburn, Fred M.
Brownlee, Scott
Church, Clyde
Crocker-Bedford, Cole and Kara-Lynn
Davis, Richard P.
Dufficy, John
Ferguson, Elise R.
Foster, Ellen
Foster, Ric
Garchar, Steve
Goff, Deana M.
Jakoby, Leslie
Kleinert, James
Kolner, Betty Ann
Kukuk, Janelle
Lachelt, Gwen
Lanier, Timothy A.
Magee, Brian
Mayer-Gawlik, Jan
McAfee, Chuck
Meyers, Terry E.
Noyes, Ron D.
Pargin, Steve
Pearson, Mark,
Pennington, Roger A.
Popejoy, Mike
Randolph, Leon and Mary
Richard, Robin E.
Robb, Arlo R.
Shaw, Gary
Taylor, Tracy E.
Thorpe, Matt
Thurston, Jennifer
Westendorff, Julie
Williams, Bill K.
Williams, Scott

Interested Tribes:
The Hopi Tribe
Jicarilla Apache Nation
Kewa Pueblo
The Navajo Nation
Ohkay Owingeh
Pueblo de Cochiti
Pueblo de San Ildefonso
Pueblo of Acoma
Pueblo of Cochiti
Pueblo of Isleta
Pueblo of Jemez
Pueblo of Laguna
Pueblo of Nambe
Pueblo of Picuris
Pueblo of Pojoaque
Pueblo of San Felipe
Pueblo of Sandia
Pueblo of Santa Ana
Pueblo of Santa Clara
Pueblo of Taos
Pueblo of Tesuque
Pueblo of Zia
Southern Ute Indian Tribe
Ute Indian Tribe of Uintah and Ouray Reservation
Ute Mountain Ute Tribe
Ysleta del Sur Pueblo
The Zuni Tribe of the Zuni Reservation

Members of Congress:
State of Colorado, U.S. House of Representatives
State of Colorado, U.S. Senator

TABLE D-2 (Cont.)

Members of State Legislature:
State of Colorado, State Representative
State of Colorado, State Senator

Organizations:
Dolores River Boating Advocates
Dolores River Coalition
Information Network for Responsible Mining (INFORM)
Sheep Mountain Alliance (SMA)
Western Governors' Association

Private Companies:
Black Hills Corporation
Gold Eagle Mining, Inc.
James Ranch Agriprises, LLC
Umetco Minerals Corporation
Uranium Energy Corporation

State Agencies:
Colorado Department of Public Health and Environment
Colorado Division of Reclamation, Mining and Safety
Colorado Parks and Wildlife Southwest Region

APPENDIX E:
LIST OF PREPARERS

Table E-1 lists the DOE managers for the Burro Mines Complex EA; Table E-2 lists the EA preparers (all are at Argonne National Laboratory).

TABLE E-1 DOE Management Team

Name	Office	Title
U.S. Department of Energy		
Deborah Barr	DOE Office of Legacy Management	Program Manager
Tracy A. Ribeiro	DOE Office of Legacy Management	NEPA Compliance Officer

TABLE E-2 Burro Mines Complex EA Preparers

Name	Contribution/Education
Jennifer Abplanalp	Cultural and visual resources/Anthropology
Bruce Biwer	Transportation/Chemistry
Young-Soo Chang	Air quality and noise/Chemical Engineering
Jing-Jy Cheng	Human health and safety/Polymer Science and Engineering
Terri Patton	Geology and land use/Geology
Mary Picel	Project and document manager, human health, and waste management/Environmental Chemistry and Health Sciences
William S. Vinikour	Ecological resources and cumulative impacts/Biology with environmental emphasis
Leroy J. Walston, Jr.	Ecological resources/Biology
Ellen White	Socioeconomics and environmental justice/Environmental Studies
Eugene Yan	Water resources/Hydrogeology
Emily A. Zvolanek	GIS/Environmental Science

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