U.S. Department of the Interior
Bureau of Land Management

U.S. Department of the Interior
Office of Surface Mining
Reclamation and Enforcement

Lila Canyon Federal Coal Lease Modifications
Draft Environmental Assessment
Emery County, Utah
DOI-BLM-UT-G020-2018-0039-EA

April 2020

Photo: Tetra Tech 2016

The BLM's multiple-use mission is to sustain the health and productivity of the public lands for the use and enjoyment of present and future generations. The Bureau accomplishes this by managing such activities as outdoor recreation, livestock grazing, mineral development, and energy production, and by conserving natural, historical, cultural, and other resources on public lands.

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ABBREVIATIONS

μg/m^3: micrograms per cubic meter

AERMOD: American Meteorological Society/Environmental Protection Agency Regulatory Model

ASLM: Assistant Secretary of Land and Minerals Management

AQRV: air quality–related value

BLM: Bureau of Land Management

CAA: Clean Air Act

CEQ: Council on Environmental Quality

CFR: Code of Federal Regulations

cfs: cubic feet per second

CH_4: methane

CHIA: Cumulative Hydrologic Impact Assessment

CIA: cumulative impact area

CM: continuous miners

CO: carbon monoxide

CO_2: carbon dioxide

CO_2e: carbon dioxide equivalent

DAT: Deposition Analysis Thresholds

DAQ: Utah Division of Air Quality

DOI: U.S. Department of the Interior

DOGM: Utah Division of Oil, Gas and Mining

EA: environmental assessment

EIS: environmental impact statement

EPA: U.S. Environmental Protection Agency

°F: degrees Fahrenheit

FLPMA: Federal Land Policy and Management Act

FONSI: Finding of No Significant Impact

GHG: greenhouse gas

gpm: gallon per minute

GWP: global warming potential

H_2SO_4: sulfuric acid mist

H6H: 6th-highest daily maximum

H8H: 8th-highest daily maximum

HAP: hazardous air pollutant

HI: Hazard Index

HQ: Hazard Quotient

ID: interdisciplinary

km: kilometers

LBA: lease by application

LMA: lease modification application

MEI: most likely exposure (MLE)

MERP: Modeled Emission Rates for Precursors

mg/L: milligrams per liter

MLA: Mineral Leasing Act

MLE: most likely exposure

MMT: million metric tons

MRP: mining and reclamation plan

MSHA: Mine Safety and Health Administration

N_2O: nitrous oxide

NAAQS: National Ambient Air Quality Standards

NEPA: National Environmental Policy Act

NESHAPs: National Emissions Standards for Hazardous Air Pollutants

NO_2: nitrogen dioxide

NSPS: New Source Performance Standards

ONRR: Office of Natural Resources Revenue

OSMRE: Office of Surface Mining Reclamation and Enforcement

PAP: permit application package

PFO: Price Field Office

PM: particulate matter

ppb: parts per billion

ppm: parts per million

PSD: Prevention of Significant Deterioration

RCP: representative concentration pathways

RCRA: Resource Conservation and Recovery Act

RfC: Reference Concentrations

REL: Reference Exposure Levels

RMP: resource management plan

R2P2: resource recovery and protection plan

SCC: Social Cost of Carbon

SCT: Savage Coal Terminal

SITLA: School and Institutional Trust Lands Administration

SMCRA: Surface Mining Control and Reclamation Act of 1977

SO: Secretarial Order

SO_2: sulfur dioxide

TDS: total dissolved solids

tpy: tons per year

TSL: toxic screening levels

UAC: Utah Administrative Code

UDEQ: Utah Department of Environmental Quality

UDWQ: Utah Division of Water Quality

UDWS: Utah Department of Workforce Services

UEI: UtahAmerican Energy, Inc.

UPDES: Utah Pollutant Discharge Elimination System

U.S.: United States

USGCRP: U.S. Global Change Research Program

USGS: U.S. Geological Survey

USC: United States Code

WSA: Wilderness study area

VOC: volatile organic compound

CHAPTER 1. PURPOSE AND NEED

1.1 Introduction

This environmental assessment (EA) has been prepared to analyze the potential impacts of UtahAmerican Energy, Inc.'s (UEI) proposed modifications to federal coal leases UTU-014218 and UTU-0126947 in Emery County, Utah (Figure 1-1). UEI is the lessee of these federal leases which are being developed as part of the Lila Canyon Mine (Mine), an underground coal mine approximately 9 miles southeast of East Carbon, Utah. The proposed lease modification areas are composed of surface lands and federal minerals managed by the U.S. Department of the Interior (DOI), Bureau of Land Management (BLM). A small tract of surface land within the proposed lease modification areas is held by the State of Utah. Under federal law, a lease modification is an addition of lands to an existing lease that is limited to no more than 960 acres or limited to the size of the lease, if less than 960 acres, for the term of the lease. Following approval of an application, lease modifications are issued on a non-competitive basis to the lease holder. UEI's application for federal coal lease modifications was received at the BLM Utah State Office on November 10, 2017 and revised on December 13, 2017. The two proposed lease modification areas, if approved, would add 1,272.64 acres to UEI's federal coal leases and would be mined by underground methods (the project).

This EA is a site-specific analysis of potential impacts that could result from the implementation of the Proposed Action or its alternatives. An EA assists the BLM in project planning, ensuring compliance with the National Environmental Policy Act (NEPA), and determining whether any significant impacts could result from the analyzed actions. (*Significance* is defined by Council on Environmental Quality [CEQ] regulations for implementing NEPA and is found in 40 Code of Federal Regulations [CFR] 1508.27). An EA provides evidence for determining whether to prepare a finding of no significant impact (FONSI) or an environmental impact statement (EIS). A FONSI would document the reasons why implementation of the selected alternative would not result in significant environmental impacts beyond those already addressed in the BLM's October 2008 *Price Field Office Record of Decision and Approved Resource Management Plan*, hereinafter referred to as the PFO RMP (BLM 2008a). If the agency determines that leasing the proposed Lila Canyon modification areas would result in significant impacts, then an EIS would be prepared for the leasing action. If not, a decision record (DR) may be issued based on the findings and alternatives.

1.2 Background

On November 10, 2017, UEI submitted a lease modification application (LMA) to the BLM for the modification of its existing federal coal leases (UTU-014218 and UTU-0126947) in Emery County, Utah. The application was revised to respond to the BLM's decision to amend the legal descriptions of the modified lease tracts to reflect aliquot parts of not less than 10 acres, as defined in 43 CFR 3471.1-1. The revised application was received on December 13, 2017. The application was further revised when it was determined that the acreage limitation for modifying federal coal lease UTU-0126947 (not to exceed 960 acres) had in fact been exceeded by roughly 5 acres. This resulted in the removal of 10 acres from this proposed lease modification on March 8, 2019.

The lease modification areas are contiguous to UEI's existing coal leases and have been determined by the BLM to be qualified for consideration under 43 CFR 3432.2(a). Figure 1-2 shows the location of the proposed Lila Canyon lease modification areas in relation to the existing lease areas. UEI currently holds 5,549.01 acres of federal coal contained in six federal leases and 1,280 acres of coal from a Utah School and Institutional Trust Lands Administration (SITLA) lease. The Lila Canyon Mine and Lila Canyon portals are located in T. 16 S., R. 14 E., secs. 10 thru 15 and secs. 22 thru 26, and T. 16 S., R. 15 E., secs. 19 and 30. The Lila Canyon Mine development was approved by the Utah Division of Oil, Gas and Mining (DOGM) in 2007 as an extension to the Horse Canyon Mine. The current DOGM permit area (DOGM Permit # C/007/0013) encompasses 4,663.6 acres. The mining and reclamation plan (MRP) is known as the Horse Canyon MRP in DOGM files. Since 2007, all coal reserves have been accessed through the Lila Canyon portals and UEI would continue to use these portals to access reserves in the proposed lease modification areas. For the remainder of this EA, the mine is referred to as the Lila Canyon Mine, and the MRP as the Lila Canyon Mine plan.

UEI's purpose in applying for the lease modification areas is to obtain the adjacent coal reserves, thereby 1) satisfying underlying needs of continued coal extraction consistent with applicable company, state, federal, and local environmental permitting and operational requirements; 2) providing a sufficient return to its investors; and 3) preventing the bypass of valuable federal coal reserves. It should be noted that while the overall resource will increase by approximately 9.1 million tons of recoverable coal reserves, the annual coal production is not anticipated to increase.

1.2.1 Current Coal Market

In 2018, U.S. coal production decreased 2.4% from 2017 production levels (U.S. Energy Information Administration 2019). Coal production in the Western region (Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington, and Wyoming) decreased 2.8% from 2017 production levels (U.S. Energy Information Administration 2019). The number of producing mines also decreased to 679 mines from 680 mines in 2017 (U.S. Energy Information Administration 2019). U.S. coal consumption in 2018 declined 4.0% from 2017 consumption levels (U.S. Energy Information Administration 2019). Exports of U.S.-produced coal in 2018 increased 19.3% from 2017 export levels (U.S. Energy Information Administration 2019).

Most of the coal produced at the Lila Canyon Mine is currently shipped to the Hunter Power Plant in Castle Dale, Utah, and Huntington Power Plant in Huntington, Utah. A portion of the coal produced at the Lila Canyon Mine also currently gets shipped to the Intermountain Power Plant in Delta, Utah. An additional portion of the Lila Canyon Mine coal is shipped to other mines in the area for blending purposes to support their contracts. However, market conditions can change, resulting in the coal going to different end users, including the potential for export.

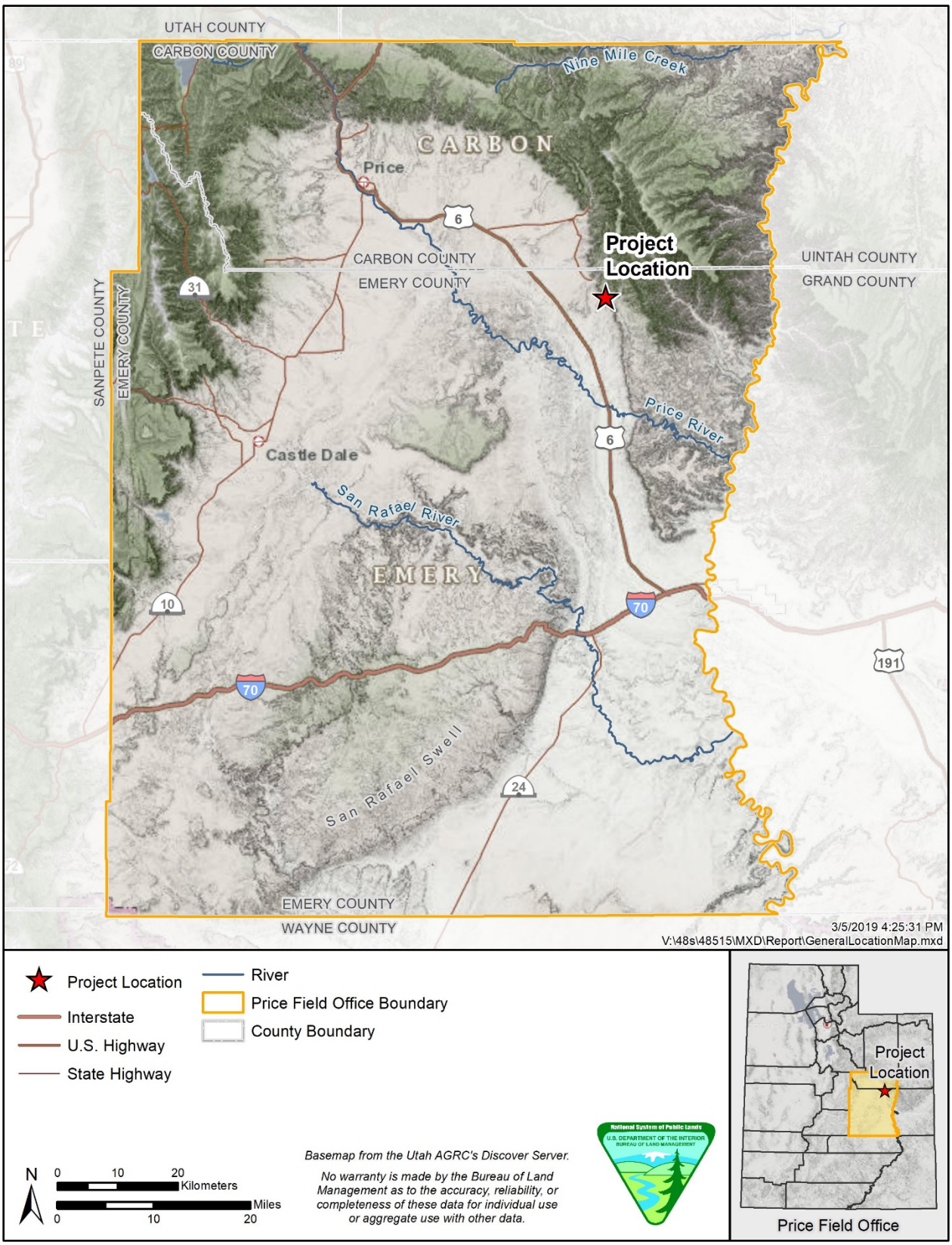

Figure 1-1. General location map.

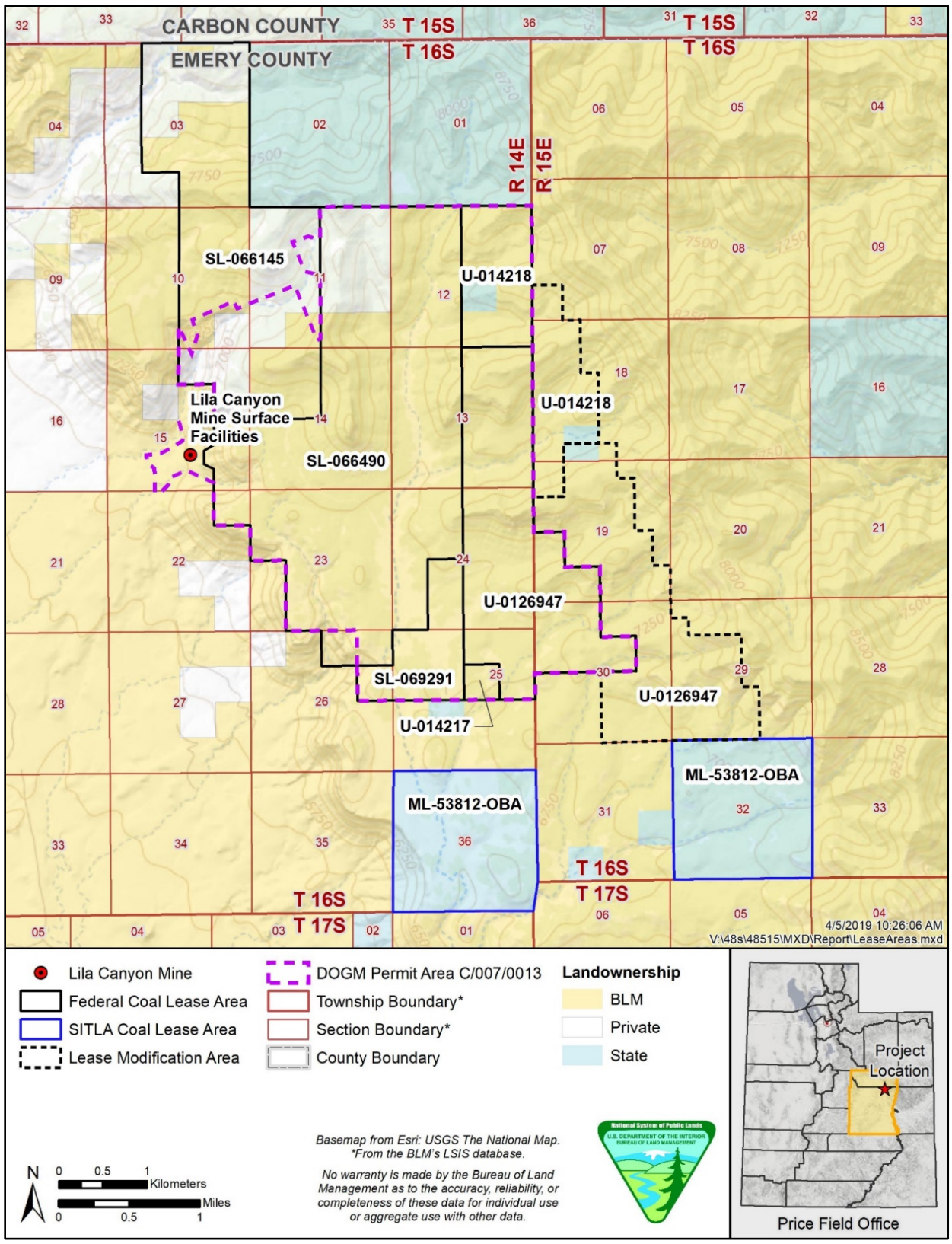

Figure 1-2. Lease modification areas and existing coal leases.

1.3 Purpose and Need for the Action

The purpose of the federal action is to respond to UEI's application to expand two existing leases to add new federal coal reserves on 1,272.64 acres (317.84 acres added to lease UTU-014218 and 954.80 acres added to lease UTU-0126947) of BLM-administered minerals beneath BLM-administered surface lands (other than 39.2 acres where the surface is owned by State of Utah) in Emery County, Utah (see Figure 1-2). The proposed lease modification areas would be added to the Lila Canyon Mine. The need for the action is established by the BLM's responsibility under the Mineral Leasing Act of 1920 (MLA), as amended by the Federal Coal Leasing Amendments Act of 1976, and the Federal Land Policy and Management Act of 1976 (FLPMA), which states that public lands shall be managed in a manner that recognizes the nation's need for domestic sources of minerals (43 United States Code [USC] 1701(a)(12)).

1.4 Decision to be Made

The decision the BLM will make based on this NEPA analysis is whether to lease the federal coal reserves in the proposed modification areas and, if the BLM's decision is to lease, to determine the terms, conditions, and stipulations for issuance of the modified leases. As noted above, lease modifications are issued on a non-competitive basis to the applicant.

1.5 Conformance with BLM Land Use Plan

The PFO RMP was approved in October 2008 and includes goals to provide opportunities for mineral extraction and development to support the need for domestic energy resources (BLM 2008a). The PFO RMP allows for such development under mining and mineral leasing laws subject to legal requirements to protect other resource values, including the protection of the long-term health and diversity of public lands. The PFO RMP also includes the objective to "[m]aintain coal leasing, exploration, and development within the planning area while minimizing impacts to other resource values" (BLM 2008a:123). The federal coal reserves included in the proposed Lila Canyon lease modification areas are by definition available for leasing and coal mining consideration per 43 CFR 3461.1(a), which states, "federal lands with coal deposits that would be mined by underground mining methods shall not be assessed as unsuitable where there would be no surface coal mining operations." Surface coal mining operations are defined in 43 CFR 3400.0-5 (mm) as "activities conducted on the surface of lands in connection with a surface coal mine or surface operations and surface impacts incident to an underground mine." Decision MLE-2 in the PFO RMP relies upon Map R-24 to show areas available for further coal leasing considerations. Portions of the lease modification areas were not mapped at that time due to RMP Decision MLE-3, which removes wilderness study areas (WSAs) from consideration for coal leasing. At the time the LMA was submitted to BLM, the Turtle Canyon WSA extended into the lease modification areas. With enactment on March 12, 2019, of the John D. Dingell, Jr. Conservation, Management, and Recreation Act (P.L. 116-9) (see Section 3.1.3), there is no longer a Turtle Canyon WSA. The Act designated a new Turtle Canyon Wilderness Area which is not contiguous to and does not encumber the proposed lease modification areas.

The PFO RMP will require modification to remove reference to the Turtle Canyon WSA. The PFO RMP Management Decision WSA-7 specifies that:

> Should any WSA, in whole or in part, be released from wilderness consideration, such released lands will be managed in accordance with the goals, objectives, and management prescriptions established in this RMP, unless otherwise specified by Congress in its releasing legislation. (BLM 2008a)

The John D. Dingell, Jr. Conservation, Management, and Recreation Act (Act) released WSA lands not designated as wilderness under the Act; this release of WSA lands included the portion of the Turtle Canyon WSA that overlapped the proposed lease modifications. The Act specified that WSA lands not designated as wilderness shall be managed in accordance with any applicable management plan adopted under section 202 of FLPMA. The PFO RMP Management Decision MLE-3 specifies that "areas (other than WSAs) will be suitable for leasing." Therefore, the proposed lease modifications are in conformance with the PFO RMP.

1.6 Relationship to Statutes, Regulations, or Other Plans

The application for the lease modification areas submitted by UEI will be processed and evaluated under the BLM's statutory mandates and authority governing federal coal leasing and other federal authorities listed below:

- MLA of 1920, as amended by the Federal Coal Leasing Act Amendments of 1976
- Multiple-Use Sustained Yield Act of 1960
- NEPA of 1969, as amended
- FLPMA of 1976 (BLM's multiple-use mandate)
- Surface Mining Control and Reclamation Act (SMCRA) of 1977
- Energy Policy Act of 2005

The coal leasing program was paused in January 2016 under the Jewel Order (Secretarial Order (SO) 3338) until completion of a programmatic environmental impact statement (PEIS); this affected the processing of certain federal leases and restricted the issuance of new leases, with several exemptions and exceptions allowing for such leases to be issued as lease modifications, thereby limiting the number of lease applications impacted (BLM 2019).

On March 28, 2017, Executive Order 13783, the Trump Order, directed agency heads to rescind or revise agency actions viewed as burdensome, with attention placed upon coal and other fossil fuels. On March 29, 2017, then-Secretary Ryan Zinke issued SO 3348, the Zinke Order, which rescinded the Jewell Order and effectively restored the previous status quo.

The BLM, in cooperation with the Office of Surface Mining Reclamation and Enforcement (OSMRE), recently prepared the Lifting the Pause on the Issuance of New Federal Coal Leases for Thermal (Steam) Coal Environmental Assessment (DOI-BLM-WO-WO02100-2019-0001-EA). The EA responds to the U.S. District Court of Montana's order issued April 19, 2019, in *Citizens for Clean Energy et al. v. U.S. Department of the Interior et al*., 384 F.Supp.3d 1264, 2019 WL 1756296 (D. Mont.), indicating that the Zinke Order constituted a major federal action

triggering NEPA compliance. A public comment period was completed on the EA; public comments were considered, and the EA was finalized in early 2020 with a finding that "lifting the Pause and resuming normal leasing practices created no significant, unstudied impacts" (BLM 2020). The FONSI was signed February 26, 2020.

The BLM has general responsibility to administer the MLA and regulates coal mining operations consistent with approved resource recovery and protection plans (R2P2s) primarily to ensure that conservation of the coal resource is achieved (43 CFR 3480) while maintaining compliance with other applicable laws and regulations. The R2P2 addresses leased coal reserves, including geologic conditions, coal quality, mining methods and operations (43 CFR 3482). The SMCRA authorizes the OSMRE to oversee state and federal programs that approve mine and reclamation plans and regulate the surface effects of coal mining operations.

Utah has an approved SMCRA permitting program that is implemented by DOGM. Under Section 503 of SMCRA, DOGM developed a permanent program authorizing it to regulate coal mining operations on non-federal lands in Utah (30 CFR 944, Utah Program, including parts 700 and 800). The Secretary of the Interior approved this program in January 1981. In March 1987, pursuant to Section 523(c) of SMCRA, the governor of Utah entered into a cooperative agreement with the Secretary of the Interior authorizing DOGM to regulate coal mining operations on federal lands in the state of Utah (30 CFR Section 944.30). The Lila Canyon Mine Permit (DOGM Permit # C/007/0013) is currently located on federal lands and was approved in accordance with the cooperative agreement. If the proposed lease modifications are approved, the operator shall be required to submit a permit application package (PAP) to amend the existing DOGM Permit to add the modified lease areas. DOGM will review the amendment under the State Program and will also submit the permit amendment application to OSMRE. In turn, OSMRE will determine whether the SMCRA permit revision requires a federal Mine Plan modification under the MLA. Under the criteria set forth at 30 CFR 746.18, if the lease modification results in more than a minor change in the amount of federal coal mined, an MLA Mine Plan modification will be required and ASLM approval will be required. OSMRE, BLM, and other federal agencies, as appropriate, review the MLA Mine Plan Modification (provided to them by DOGM) to ensure that it complies with the terms of the coal lease (which are based on the disclosures in this NEPA analysis), the MLA, and other federal laws and their attendant regulations (30 CFR 944.30).

The modified lease areas PAP will be submitted to the Assistant Secretary of Land and Minerals Management (ASLM) if OSMRE decides that this is a significant revision and that a federal mine plan approval via the ASLM is required. OSMRE will recommend approval, conditional approval, or disapproval of the MLA mining plan to the ASLM. OSMRE's recommendation must be based, at a minimum, on the following:

- The PAP, including the R2P2, which must be recommended for approval by the BLM, in order for the ASLM to approve.
- Information prepared in compliance with NEPA.
- Documentation ensuring compliance with the applicable requirements of other federal laws, regulations, and executive orders.

- Comments and recommendations or concurrence of other federal agencies, as applicable, and the public.
- The findings and recommendations of the BLM with respect to the R2P2 and other requirements of the lease and the MLA.
- The findings and recommendations of DOGM with respect to the PAP and the state program.
- The findings and recommendations of OSMRE with respect to the requirements under Chapter VII Subchapter D, 30 CFR 746.13 (a–g).

If a decision is made to issue a modified lease, the lessee must obtain mine plan approval and a permit to conduct coal mining operations, including a detailed MRP, before mining can begin on the modification areas. As discussed above, this MRP and overall PAP would undergo detailed review by state and federal agencies as part of the approval process. The detailed PAP would be required to conform to the stipulations and conditions attached to the lease modification through the land use plan and the decision record that would follow this EA. At a minimum, the lease modifications would contain the stipulations which are contained in the two parent leases. While there could be new stipulations specific to the lease modifications, the parent lease stipulations would apply to each associated lease modification.

The conceptual plans for development described in this EA are not final plans but represent reasonably foreseeable development for use in analyzing the potential environmental consequences of issuing a lease for the modification areas, based on current coal markets and current standard coal mining industry operating practices. If the actual mining proposal is different than what is analyzed in this EA, additional NEPA analysis may be necessary. It should be noted, however, that this EA assumes total extraction of the mineable reserve.

If a proposed modification area is leased to the applicant, the lessee is required to revise its coal mining permit (following the processes outlined above) and obtain mining plan approval from the Assistant Secretary prior to mining the newly leased coal. As a part of that process, a new, detailed plan would be developed to outline how the newly leased lands would be mined and reclaimed. Specific impacts that would occur during the mining and reclamation of the modification area would be addressed in the permit approval process, and specific mitigation measures for anticipated impacts would be described in detail at that time.

DOGM enforces the performance standards and permit requirements for reclamation during a mine's operation and reclamation and has primary authority in environmental emergencies (e.g., accidental spills). OSMRE retains oversight responsibility for this permitting and enforcement. Where federal surface or coal resources are involved, the BLM has authority in environmental emergency situations if DOGM or OSMRE cannot act before environmental harm and damage occurs.

The Mine Safety and Health Administration (MSHA) monitors and regulates all safety factors related to coal mining on federal and non-federal lands. In preparing this EA, the BLM has a responsibility to consult with and obtain the comments and assistance of other state and federal agencies that have jurisdiction by law or that have special expertise with respect to potential environmental impacts. Depending on the surface involvement of the federal surface

management agency (or agencies), concurrence or consent is required from the federal surface agency (or agencies).

Although the BLM makes the decision on whether to lease the modification areas, DOGM has the authority to approve or reject MRPs for coal mines. Thus, if the modification areas are leased, the lessee would still need a DOGM-approved mine plan before mining could begin. Additionally, MSHA could also require necessary safety measures that could render a coal lease uneconomic. The BLM's primary role is to ensure that maximum economic recovery of the coal is achieved within the requirements of DOGM for protection of resources such as water, wildlife, etc., and within MSHA's safety requirements, and within current, available technology.

Other than the BLM's relevant land use planning decisions in the PFO RMP, no other federal land use plans apply to the alternatives presented in Chapter 2. The State of Utah does not maintain planning documents, nor does it conduct planning processes relating to the alternatives. However, the alternatives would be consistent with the State of Utah Public Lands Policy and Coordination Office's position on 1) uses of public lands for multiple-use, sustained-yield natural resource extraction; 2) support of the specific plans, programs, processes, and policies of state agencies and local governments; and 3) development of the solid mineral resources of the state as an important part of the state economy and of local regions in the state (Utah Code 63-38d-401). The Proposed Action is also consistent with Emery County's *General Plan* in that it addresses the *General Plan*'s support for the development of extraction industries (Emery County 2016). Federal lease rentals and production royalty on the gross proceed from coal developed in the proposed modification areas would be paid by the mining company to the U.S. Department of Interior, Office of Natural Resources Revenue (ONRR). ONRR then distributes 50% of the federal royalty revenue to the state where the mining occurs. The state shares this revenue with the county or counties in which the mining takes place. Additional overriding royalties on federal coal reserves are limited to 50% of the federal royalty.

1.7 Identification of Issues

1.7.1 Internal Scoping

The BLM held an introductory interdisciplinary (ID) team meeting in June 2018. It was determined at that time that additional information would be needed to proceed with processing the application. The BLM ID team formulated potential issues associated with the Proposed Action (lease modifications and anticipated full extraction of coal resource) during internal scoping conducted from July through September and finalized an ID team checklist on October 30, 2018 (Appendix A).

1.7.2 Public Scoping

The BLM listed the Proposed Action on its ePlanning website on May 14, 2018. No public inquiries were received regarding the Proposed Action. The BLM initiated Tribal consultation in October 2018 to determine if leasing and mining the proposed lease modification areas would affect cultural resources or Native American religious concerns. A response letter dated October 18, 2018, was received from the Hopi Tribe requesting copies of any cultural resources reports or

treatment plans should adverse effects be anticipated as a result of the development of the proposed lease modification areas. There were no other responses.

1.7.3 Issues

The following potential issues were identified during the internal scoping process:

- Air quality and greenhouse gas emissions.
    - How would leasing and mining of the proposed lease modification areas contribute to criteria pollutant, volatile organic compound (VOC), hazardous air pollutant (HAP), and greenhouse gas (GHG) emissions?
    - What are the potential impacts to air resources from the combustion of coal mined from the proposed lease modifications?
    - Would the impacts of the Proposed Action exceed National Ambient Air Quality Standards (NAAQS) or Class I significant impact levels?
- Socioeconomics
    - How would leasing and mining the proposed lease modification areas affect jobs, income, and tax revenues in Emery County, Utah?
- Water Resources
    - How would leasing and mining the proposed lease modification areas affect groundwater resources in the analysis area (watershed)?

CHAPTER 2. DESCRIPTION OF THE ALTERNATIVES

2.1 Introduction

This EA analyzes the potential effects of implementing Alternative A (No Action) and Alternative B (Proposed Action). The No Action Alternative is considered and analyzed to provide a baseline against which to compare the impacts of the Proposed Action. Based upon BLM's internal scoping, no other alternatives were brought forward for detailed analysis.

If a decision is made to issue a modified lease, the lessee must obtain federal mine plan approval and amend its current DOGM permit to conduct coal mining operations, including a detailed MRP, before mining can begin in the modification areas. As discussed in Chapter 1, this MRP and overall PAP would undergo detailed review by state and federal agencies as part of the approval process. The detailed PAP would be required to conform to the stipulations and conditions attached to the lease modification consistent with the PFO RMP and to conform to the decision that would follow this EA. At a minimum, the lease modifications would contain the stipulations that are contained in the two parent leases. While there could be new stipulations specific to the lease modifications, the parent lease stipulations would apply to each associated lease modification.

The conceptual plans for development described in this EA are not final plans but represent reasonably foreseeable development for use in analyzing the potential environmental consequences of approving lease modifications for the two tracts based on current coal markets and current standard coal mining industry operating practices. Again, full extraction of the coal resource is anticipated if the Proposed Action is selected.

2.2 Alternatives Development

No alternatives other than the No Action and Proposed Action were developed with respect to the proposed lease modification because there are no unresolved conflicts concerning alternative uses of the available coal resource. The alternatives are described below.

2.3 Alternative A: No Action

Under the No Action Alternative, the BLM would not offer the modification areas for leasing at this time, and the federal coal reserves within the modification areas would not be mined at this time. The choice on the part of the BLM not to lease the modification areas would not preclude leasing and mining of the areas sometime in the future. However, to consider leasing and mining these modification areas in the future, another application would have to be submitted and another NEPA process would need to be completed.

2.4 Alternative B: Proposed Action

Under the Proposed Action, the BLM would offer the Lila Canyon modification areas for lease to UEI, subject to standard and special lease stipulations developed for the tracts. In the case of federal coal lease modifications, the stipulations attached to the "Parent" lease, at a minimum,

always are included as stipulations in the modified area. This does not in any way preclude new stipulations resulting from this action either by the BLM or (not in this case) the surface management agency other than the BLM. The boundaries of the proposed modification areas would be consistent with the location description in Section 2.4.1. The BLM estimates that there are approximately 9.1 million tons of salable coal in these two areas, which are projected to extend the life of the Lila Canyon Mine by approximately 3 years.

Under the Proposed Action, all coal would be mined using underground methods from the existing Lila Canyon Mine as described in Section 2.4.2. UEI would develop these coal reserves by adding, or extending, up to five longwall panels to its mining plan. The location of these reserves, immediately adjacent to the existing Lila Canyon Mine, makes it virtually impossible, physically, that any future mine in this part of the Book Cliffs Coal Field could attempt to access these coal reserves. Given the depth of cover (2,500 to 3,000 feet) and adverse geological conditions (faulting, etc.) in the proposed modification areas, the possibility of mining into these areas from *any* other direction would be prevented. The only possible scenario would be if another mining company besides UEI were to acquire the Williams Draw Federal Coal Lease by Application, start a new mine with all new surface facilities and portal access, and then ultimately access the proposed lease modification areas from the south rather than from the west (Lila Canyon Mine). Because that hypothetical action would also require all new NEPA and all new MRP/PAP analysis, the timing and cost of the activity would render it unfeasible.

2.4.1 Location and Overview

The two Lila Canyon proposed lease modification areas are located in the Book Cliffs coal field in Emery County, Utah, closest to the towns of East Carbon (aka Dragerton) and Sunnyside (see Figure 1-2). From the Lila Canyon Mine portal site, East Carbon, Utah, is roughly 10 miles north- northwest; Green River, Utah, is 32 miles south-southeast; and the Emery County seat of Castle Dale, Utah, is 40 miles west-southwest, across the Castle Valley. The Carbon County seat of Price, Utah, is 25 miles directly west-northwest. The closest coal-loading terminal (unit-train) is the Savage Brothers–owned Savage Coal Terminal (SCT) between Wellington and Price, Utah, on the mainline of the Union Pacific Railroad. The haulage distance to the SCT from the Lila Canyon Mine is approximately 32 miles, and it is another 12 miles to the Wildcat Unit-Train Loadout, located on the Utah Railway near Helper, Utah. For the most part, the Lila coal is shipped through the SCT, where there is also a heavy media wash plant facility. The lease modification areas encompass 1,233.44 acres of BLM-administered land and 39.2 acres State of Utah-administered land. The total 1,272.64 acres overlay federal (BLM) mineral estate. The two delineated modification areas are contiguous to two of UEI's existing federal coal leases, are contiguous to each other (north to south), and are as described below.

<u>If added to federal lease UTU-014218</u>

- Township 16 South, Range 15 East, Salt Lake Base and Meridian, Utah
  - Section 7: lot 4
  - Section 18: lots 1–4, W1/2 1/2NE1/4 NW1/4, W1/2SE1/2NW1/4, SE1/4SE1/4NW1/4, NE1/4SW1/4, N1/2SE1/4SW1/4
  - Section 19: lot 1

  Total area added to lease UTU-014218: 317.84 acres

If added to federal lease UTU-0126947

- Township 16 South, Range 15 East, Salt Lake Base and Meridian, Utah
  - Section 18: S1/2SE1/4SW1/4, SW1/4SW/4SE1/4
  - Section 19: lot 2, W1/2NW1/4NE1/4, SE1/4NW1/4NE1/4, SW1/4NE1/4, E1/2NW1/4, W1/2SE1/4, SE1/4SE1/4, W1/2NE1/4SE1/4, NE1/4SW1/4
  - Section 29: S1/2NW1/4, SW1/4, W1/2SW1/4SE1/4, SW1/4NW1/4SE1/4, SW1/4NW1/4NW1/4
  - Section 30: SE1/4, N1/2NE1/4, SE1/4NE1/4

  Total area added to lease UTU-0126947: 954.80 acres

In the Lila Canyon area, there are primarily two coal seams located in the Blackhawk Formation: the Upper Sunnyside and the Lower Sunnyside. The two seams have merged in some places within the Lila Canyon holdings but in most areas are separate. Where separate, only one split is mineable due to the thin separation between the two splits; the separation averages 0 to 30 feet. The Upper Sunnyside seam averages 12.4 feet thick according to estimates in the Lila Canyon Mine R2P2 and in the MRP. The Lower Sunnyside seam is much thinner (0 to 5.7 feet) (BLM 2000). Therefore, the Upper Sunnyside is the seam of interest on this property. The seam is considered to be moderately gassy (i.e., methane) and is excellent quality, at 8% ash, 0.8% sulfur, and in excess of 12,000 British thermal units per pound, as-mined.

If mining occurs as proposed, based on UEI's plans, it is expected that UEI would use existing surface facilities currently included in the DOGM-approved mine plan for the Lila Canyon Mine (C/007/0013), with no additional surface disturbance (see Figure 1-2).

2.4.2 Conceptual Mine Plan

If the modified leases are issued to UEI, the conceptual mine plan would use the same mine facilities and the same or similar mining methods, reclamation, water requirements, and other mining activities/requirements, as described in the mine plan for the existing Lila Canyon Mine. Surface-support facilities that would be used in conjunction with the proposed operations on the modification areas would consist of those for the most part already in place and in use for the Lila Canyon Mine area. No new surface facilities would be constructed.

The conceptual mining plans described for the lease modification areas are based on the Lila Canyon Mine plan and other common coal mining practices; these are not final plans but represent reasonably foreseeable development for use in analyzing the potential environmental consequences of modifying leases to develop the projected recoverable coal tonnage.

2.4.2.1 Mining Methods and Mine Facilities

Existing surface-support facilities would provide the necessary infrastructure for personnel, equipment, materials and supplies, and handling and loading of coal production. These facilities are located primarily within a BLM right-of-way issued for this purpose and include structures specifically designed to minimize surface disturbances and/or to control or mitigate impacts to other non-coal resources, such as air, surface water, wildlife, and soils.

Surface facilities include the following (Note: some surface facilities are located at the nearby West Ridge Mine [West Ridge] facility [DOGM ACT 007/041]):

- Small administration office (main administration office at West Ridge)
- Bathhouse/lamphouse
- Mine fan
- Shop/warehouse (West Ridge)
- Coal stockpiling facilities
- Coal reclaiming facilities Electrical power/substation
- Water facilities
- Telephone service
- Water tank(s)
- Other structures (i.e., storage sheds, pump house, aboveground storage tanks, powder magazines, rock dust storage tanks, and trash containment structures) (Lila Canyon and West Ridge)

Initial mine development was completed in Lila Canyon in conjunction with prior approvals to access coal reserves and construct the Lila Canyon portals. Because of the stratigraphic location of the Upper Sunnyside coal seam where it meets the surface in Lila Canyon, the seam was accessed by 1,100-foot rock slopes. The main Lila Canyon entries are the primary "Man and Material" mine access and supply routes for the economically minable portions of the coal seam(s). The entries provide ventilation routes for all other underground workings and the principal coal haulage system (conveyer beltlines).

If the modification areas are leased, continuous miners (CM) would be used to support the longwall mining methods for coal extraction. Longwall mining is used where the coal seam is reasonably continuous in order to create large enough blocks to support longwall. Continuous miners first outline a large block of coal to be mined by longwall methods. Figure 2-1 shows a typical longwall mining scenario where CMs have already developed the longwall block with gate-roads on either side. These gates provide worker and material access, airways, and haulage-ways. The following primary equipment is required to support longwall mining operations:

- Longwall mining system (face conveyor, shearer, shields, etc.) (see Figure 2-1)
- Section power center
- Section coal conveyer
- High-pressure hydraulic pumps Crew vehicle
- Rock dust system (fire protection)
- Miscellaneous support equipment, such as diesel tractors, trailers, battery or diesel supply haulers, etc.

To construct the gate-roads, the CMs cut the coal, and the coal is hauled from the face by electric shuttle cars and dumped into the feeder-breaker, which crushes large blocks and ratio-feeds the coal to the conveyor belts. Following the CM's 10-to-20-foot cuts, roof bolters come into the area and provide roof support in a variety of ways, depending on specific conditions. Additional maintenance and support equipment and systems include personnel carriers, supply tractors and trailers, lubrication trailers, rock dust and electrical distribution systems, underground communication systems, water pumps, and mine ventilation.

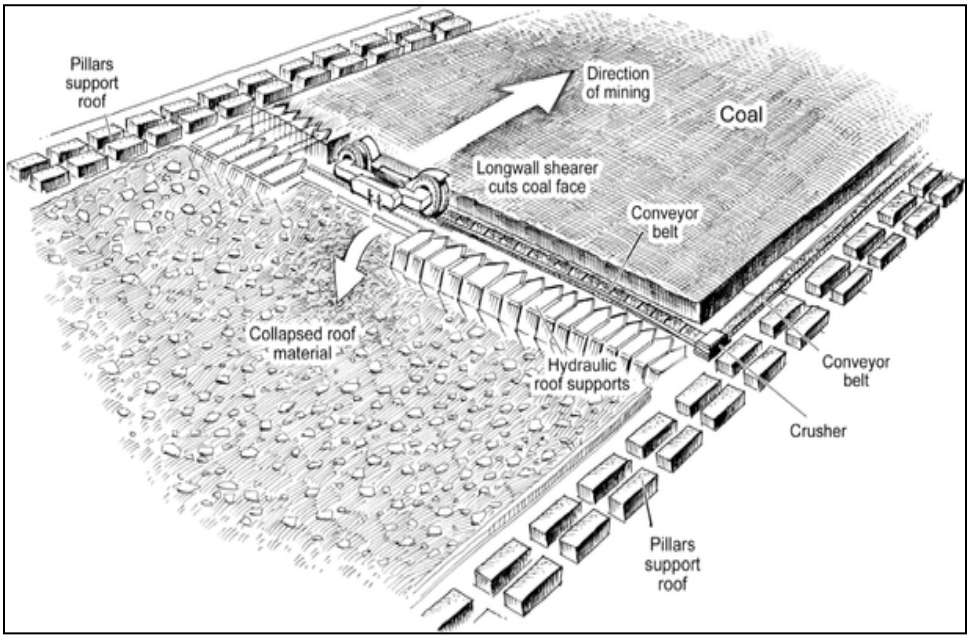

Figure 2-1. Typical longwall mining scenario.
Source: Securities and Exchange Commission (2011).

2.4.2.2 Mine Coal Haulage System

The current underground mining system at Lila Canyon Mine uses a conveyor belt system to transport coal from the underground workings to the surface. The mine coal haulage system consists of several interconnected belt components (feeder breakers, take-ups, drives) to transport coal to the surface. These conveyer belts transport the coal all the way outside to a stockpile. A multi-plate reclaim tunnel is located underneath the coal stockpile for processing and loading trucks.

Two reclaim draw-down ports located at the end of the tunnel allow coal to be reclaimed from the bottom of the pile directly onto a reclaim conveyor located within the tunnel. Each reclaim port contains a pile activator, a hydraulically operated single-bladed shut-off gate, and a discharge chute leading to the reclaim conveyor. Once the coal has been loaded onto the reclaim conveyor, it is transported out from underneath the pile. The reclaim conveyor brings the coal out of the tunnel and transports it to an enclosed crushing/screening building.

From the crusher building, the crushed and screened 2-inch coal is loaded onto a covered loadout conveyor and passed to one of three product piles or transport storage pile. The coal is then transported to an automated truck loadout station. The feed conveyors (i.e., loadout conveyor and

reclaim conveyor) start and stop automatically to load the individual truck trailers with a predetermined amount of coal (BLM 2000).

2.4.2.3 Subsidence

No surface expression of subsidence is anticipated above the two proposed lease modifications. The proposed lease modifications cover an area that has very deep cover over the top of the coal seam to be mined. The Lower Sunnyside seam in this area is at least 2,000 feet deep and up to 3,000 feet deep. While there are differing thoughts on calculating maximum subsidence, the BLM uses a calculation that is conservative when compared with other estimates. It says that for every 1 foot in depth of coal mined, there is a possibility for 60 feet (depth) of overburden to shift downward in response. In other words, assuming that the coal seam is 18 feet thick, this would make an upward-caving feature of around 1,100 feet, far beneath the ground surface. This represents a worst-case scenario; although coal seam thickness may reach 18 feet in some areas, longwall equipment used at the Lila Canyon Mine will reach a maximum of 12 feet.

This “worst-case scenario” also assumes longwall panels are mined side-by-side and that the overburden is composed of relatively weak material. In fact, the longwall panels will be mined in a panel-barrier-panel configuration. This means that rather than having two or even three panels adjacent to each other, creating a mined-out area 3,000 feet wide, there would sequentially be a panel-barrier mining sequence - whereas the panel and barrier dimensions would depend upon MSHA requirements. In addition, the overburden at the Lila Canyon Mine contains three massive, very rigid sandstone members totaling approximately 400 feet in thickness.

Three professional mining engineers, from BLM and outside consulting firms, have conducted surveys of the ground cover above the Lila Canyon Mine, as well as above the nearby West Ridge Mine, which had very similar conditions and overburden features. Subsidence was not visible on the surface. The conclusion made from these factors is that surface expression of subsidence should not be evident or measurable.

UEI conducted a color infrared aerial photography study as part of its monitoring commitments under the Lila Canyon Mine DOGM permit approval. The study was conducted to monitor impacts of subsidence on surface vegetation communities. The baseline data was gathered in 2011, and the study was repeated in 2016 per the 5-year interval requirement. No differences were observed between years, suggesting that if subsidence occurred, it has had little impact to the plant communities at the Lila Canyon Mine (UEI 2019a).

2.4.2.4 Post-Mine Reclamation

Under the existing Lila Canyon Mine plan, DOGM would approve, and monitor reclamation of surface facilities and reclamation bond release at the end of the mine life, after the economically recoverable coal reserves have been mined. UEI has posted a bond with DOGM to secure reclamation costs for existing surface facilities at the Lila Canyon Mine. Complete reclamation would include removing all surface facilities, re-grading the surface to achieve approximate original contour, and restoring the area to the approved pre-mining land use. Revegetation would be done with an approved mixture of compatible grasses, forbs, shrubs, and trees. Seed mixes would contain an approved, diverse mixture of species to control erosion and to provide forage

for wildlife species. No surface disturbance is planned in the lease modification areas and, thus, no surface reclamation would be required.[1]

2.4.2.5 Water Requirements

- Water usage, based on 1 million tons of coal per year production, would be:
    - Bath house/office (culinary water): 1,260,000 gallons per year
    - Mining: 4,500,000 gallons per year
    - Fan evaporation: 1,183,000 gallons per year

  Total: 6,943,000 gallons per year (BLM 2000)

As coal production increases to 2 million tons per year (tpy), the water used would increase to approximately 11,443,885 gallons per year. Water usage would increase to approximately 15,943,887 gallons per year at 3 million tons of coal annually before peaking at approximately 20,443,888 gallons per year at 4 million tons of coal at full production. Potable water is hauled to the bath house facilities while underground mine water is generally adequate to be used and recycled for underground dust control and fire suppression. (MSHA requirements). UEI has a State of Utah Department of Environmental Quality discharge permit (Utah Pollutant Discharge Elimination System [UPDES] General Permit for Coal Mine Operations) should the mine produce more water from the underground mining process than can be used for the MSHA requirements.

2.4.2.6 Electrical Power Supply

Electrical power for the Lila Canyon proposed lease modification areas development and mining activities would come from an existing 46-kilovolt (kV) overhead power line that terminates at a substation at the existing Lila Canyon Mine. Power would be taken underground, working at 12.5 kV, where section transformers convert the power to equipment-friendly 1,000, 440 and 220 volts.

2.4.2.7 Underground Development Rock

Mine development, ongoing mining production operations, and ancillary operations such as development of overcasts for mine ventilation and coal haulage would result in the production of underground development rock, including carbonaceous shale, weathered coal, floor clay, some sandstone, and parting materials. Where it is operationally feasible to separate these materials from the coal during development and mining, the underground development rock would be removed and handled separately from the coal and placed underground in permanent storage. Where separation is not feasible, underground development rock would be handled with the coal, removed in the surface facilities, separated from the coal product (becoming coal processing waste), and temporarily stockpiled. Stockpiled underground development rock could be sold as a low-quality coal product or deposited in approved facilities, as permitted by DOGM. Most commonly at Lila Canyon and other mines, waste rock is simply placed permanently in underground storage.

[1] DOGM does not simply observe reclamation and move on. The company's reclamation bond cannot be released without achieving reclamation success, and it is then only released in phases for certain accomplishments (e.g., for achieving approximate original contour, phase I can be released). For achieving good sediment control, phase II can be released, but the final release (phase III) will not occur until a minimum of 10 years has passed to ensure successful revegetation.

Generally, the same mining equipment and haulage systems used for coal production would be used to remove and handle underground development rock. However, specialized rock mining and handling equipment could be used.

2.4.2.8 Hazardous Materials and Hazardous and Solid Waste

Potentially hazardous materials used or produced under the current Lila Canyon Mine plan may include fuels (e.g., gasoline and diesel fuel), coolants/antifreezes, lubricants (e.g., grease and motor oil), paints, solvents, resin cartridges, shop rags, lubricant containers, welding rod ends, metal shavings, worn tires, packing material, used filters, and office and food wastes. These are all identified as solid wastes under the Resource Conservation and Recovery Act (RCRA)(42 USC 6901 et seq.). No RCRA chemicals or wastes in excess of regulated amounts would be stored on-site. All wastes would be disposed of in a proper manner as prescribed by law. It should also be noted that under U.S. Environmental Protection Agency (EPA) regulations (40 CFR 372), all coal mining companies are required to maintain a toxic release inventory and produce the documentation of "No Spills" or "Minor Spills" with volume and threshold information for each spill, when requested by EPA.

Most maintenance and major oil changes for the diesel mobile equipment (if any) would take place inside the surface shops. Used oil would be contained and disposed of or recycled in accordance with guidelines administered by the Utah Department of Environmental Quality's Division of Solid and Hazardous Waste. All fuel storage facilities and equipment would be constructed and operated in accordance with all applicable state and federal regulations, including a toxic release inventory.

All solid and liquid wastes would be contained, stored, and disposed of in accordance with applicable local, state, and federal rules and regulations. Specific containment, storage, and disposal techniques would depend on the type and quantity of waste according to applicable rules and regulations. Typically, non-hazardous solid and liquid waste would be contained on-site in dumpsters and transported periodically to a landfill. Some used equipment could be left in place underground after oils and hazardous materials have been removed and only when approval is received from DOGM and BLM.

Any hazardous solid or liquid wastes would typically be separated and stored in appropriately labeled (according to type of waste) barrels that meet the requirements in the RCRA. Barrels would typically be stored temporarily under cover before being hauled to a hazardous waste disposal facility. A spill prevention plan and other plans are currently in place at the Lila Canyon Mine.

In 2015, the Mine constructed a package plant for treatment of biosolids and constructed a new bath house. The Mine obtained a UPDES Minor Industrial Permit (No. UT0026018) for collection and treatment of wastes transported through a sewer system. Discharge of the treated wastewater is from the package plant to a drainage ditch to Lila Canyon Wash.

2.4.2.9 Normal Operating Hours

As with the current production, it is anticipated that production from the Lila Canyon proposed lease modification areas could occur 24 hours per day, 7 days per week. Most commonly, however, production takes place 16 hours per day and maintenance the other 8 hours per day. In order to maintain cost effective operations, overtime is kept to a minimum.

2.4.2.10 Signage

Required signs and markers in compliance with the applicable regulatory provisions of Utah Administrative Code R645-301-521.200 and MSHA are in place at the existing Lila Canyon Mine. All required signs and markers would be maintained or replaced during the period of active operations, site reclamation, and until final bond release is approved for all areas within the permit boundaries.

2.4.2.11 Estimated Employment Requirements

Leasing the Lila Canyon proposed modification tracts would extend the life of the Mine, but neither the workforce of approximately 238 nor the annual production, which "shall not exceed 4.5 million tons per rolling 12-month period" (Utah Division of Air Quality [DAQ] 2013), would be expected to increase.

2.4.2.12 Traffic Estimates

Coal from the proposed modification areas would be transported using existing haul roads to reach U.S. Highway 191/6, and then transported to an existing loadout site on Ridge Road near Wellington, Utah. At a coal production level of 4.5 MM tpy, haul trucks (at full capacity of 46 tons) at the Lila Canyon Mine would make approximately 268 round trips per day from the mine to the loadout. The distance between the Mine and the loadout is approximately 32 miles (64 miles round trip). There are also approximately 88 round trips per day made by personal and delivery vehicles to the Lila Canyon Mine (BLM 2000).

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter presents the existing environment and the environmental consequences on resources that could be affected by the Proposed Action or No Action alternatives. Environmental data collected on the proposed lease modifications were used to describe the affected environment and to evaluate potential environmental impacts. The analysis is intended to allow comparison of alternatives and to provide a method to determine whether activities proposed would be expected to comply with applicable federal, state, and local regulations.

The analysis of impacts is based on the scope of the proposal, which includes about 3 years of underground mining of 9.1 million tons of coal (in the lease modification areas) and aboveground processing and shipping operations at a currently operating facility. No additional surface disturbance would be required to conduct activities and recover the coal.

The impacts from ongoing mining operations and cumulative impacts are largely described in the Lila Canyon Project EA (BLM 2000).

3.1.1 Setting

The lease modification areas are east of and adjacent to currently developed federal coal leases at the Lila Canyon Mine in Emery County, Utah, located in the Book Cliffs region of the Colorado Plateau Physiographic Province of east-central Utah. This area is approximately 120 miles southeast of Salt Lake City, Utah, and approximately 10 miles south of East Carbon, Utah.

Elevations in the lease modification areas range from approximately 8,113 feet above mean sea level (amsl) near the northern portion of lease modification area U-014218 to 6,800 feet amsl at the southern boundary of lease modification area U-0126947 (see Figure 1-2). Characteristic vegetation includes Douglas fir (*Pseudotsuga menziesii*) at the highest elevations, pinyon-juniper forests over most of the bench areas, and a mixture of shrubs and grasses in the low areas (BLM 2000).

Climate data from the Sunnyside, Utah, National Oceanic and Atmospheric (NOAA) weather station (428474) is provided in the Lila Canyon Mine MRP as being generally representative of conditions at the Lila Canyon Mine (Cirrus and Petersen 2017). The average annual mean monthly temperature at Sunnyside, Utah, is 47.55 degrees Fahrenheit (°F), with an annual high temperature of 59.6 °F and an annual low temperature of 35.5°F (U.S. Climate Data 2019).

3.1.2 Past, Present, and Reasonably Foreseeable Future Actions

The past and present actions that would affect the resources analyzed in this EA are underground mining operations. None of the past, present, or reasonably foreseeable future actions described in this section are considered connected actions to the Proposed Action analyzed in this EA (Appendix B). Reasonably foreseeable future actions in the vicinity of the lease modification areas are identified as follows:

- UEI was granted a lease by the State of Utah through the SITLA for the exclusive right to explore for, drill for, mine, remove, transport, convey, cross-haul, commingle, and sell the coal contained within the boundaries of T. 16 S., R. 14 E., sec. 36 and T. 16 S., R. 15 E., sec. 32 (see Figure 1-2). It is reasonably foreseeable that UEI will include the extraction of the coal in these sections in future plans.
- UEI submitted a coal lease by application (LBA) for approximately 4,232 acres in the Williams Draw area, south of current UEI reserves (Figure 3-1). The LBA delineation and recoverable reserves have been determined by the BLM. The BLM is currently assessing whether to lease the LBA coal. If the LBA is leased by UEI, then mining in the leased area may occur while the Lila Canyon Mine reserves are being mined or after the Lila Canyon Mine reserves are exhausted. Under P.L 116-9 (see next bullet), the BLM will no longer manage the land surface, or the coal described in the Williams Draw LBA; both will be controlled by SITLA. It should be noted that depending on the timing of exchange parcels between BLM and SITLA, that BLM may issue the Williams Draw lease to the successful bidder prior to it being turned over to SITLA. In any case, the mining of the resource is the subject here.
- The John D. Dingell, Jr. Conservation, Management, and Recreation Act (S.47) was signed by the President in March 2019 and became P.L. 116-9. Under this law, an area to the east of the proposed lease modification areas, but not adjacent to or overlapping the lease modification areas, was designated as the Turtle Canyon Wilderness Area (see Figure 3-1). The Turtle Canyon Wilderness Area will be administered by the Secretary in accordance with the Wilderness Act (16 USC 1131 et seq.) with exceptions as noted in P.L. 116-9. In addition, the lands that have been adequately studied for wilderness values but not designated as wilderness will be managed in accordance with applicable law and any applicable land management plan. In particular relation to this EA, the latter statement applies to those lands previously considered as part of the Turtle Canyon WSA, which are no longer part of a WSA under this law (see Section 1.6).
- Bronco Utah Reserves, Inc. (Bronco) submitted a coal LBA in March 2018 for 2,956 acres in the Walker Flat area of Emery County, Utah, located approximately 62 miles or 100 kilometers (km) southwest of the Lila Canyon Mine. If this area is leased and developed, then mining in the Walker Flat area may occur while the Lila Canyon Mine and proposed Williams Draw LBA are being mined. The need for additional NEPA analysis to support any proposed surface facilities associated with the development of the Walker Flat LBA is not known. Mining the Walker Flat LBA would extend the life of the Bronco Utah Mine, which produced approximately 760,000 tons of coal in calendar year 2018. Depending upon demand and regulatory agencies' ability to process its request, Bronco could begin mining on Walker Flat within the next 3 years. The Bronco Utah Mine is permitted to produce up to 2 million tons of coal per year (rolling 12-month period).

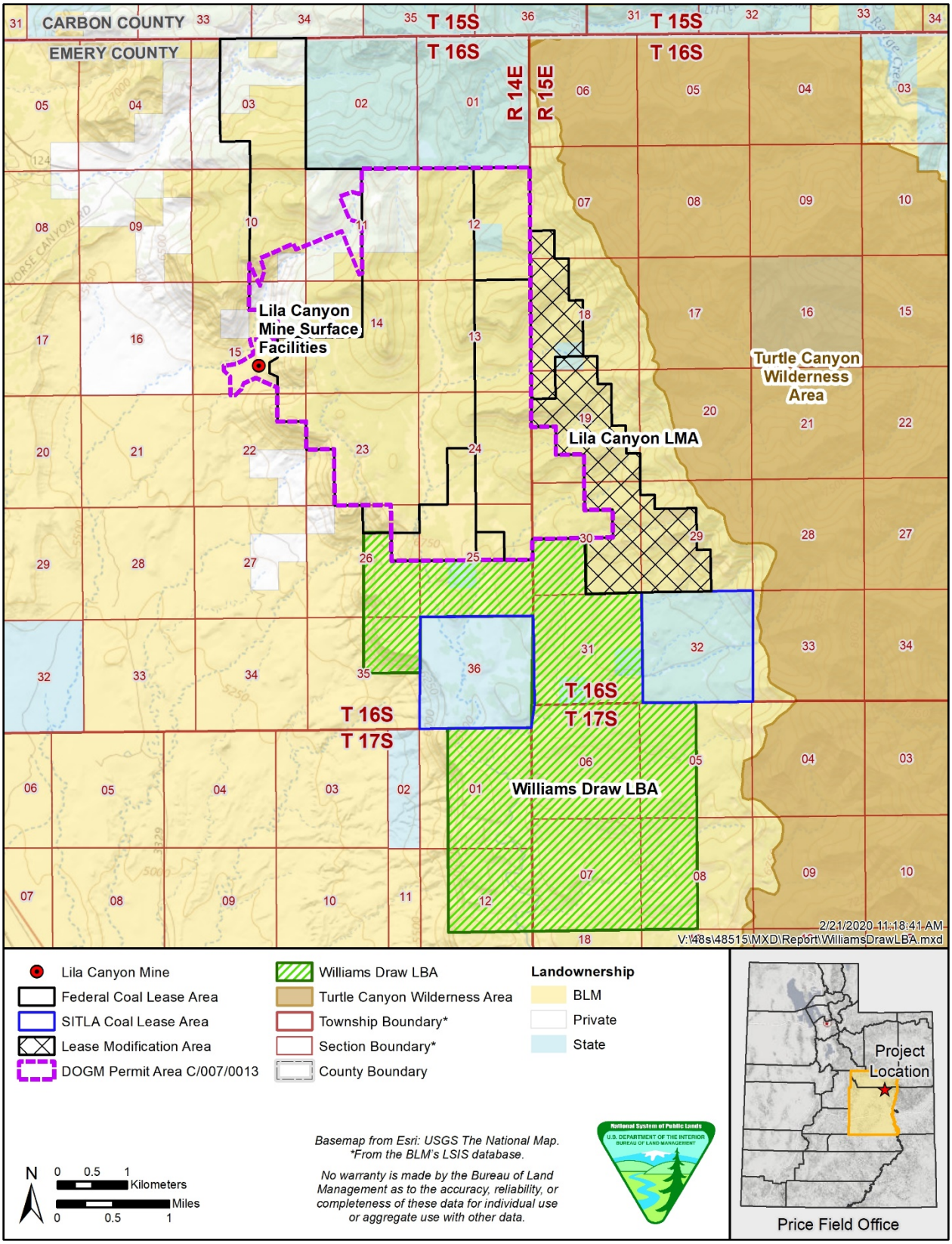

Figure 3-1. Nearby wilderness and proposed LBA.

3.2 Air Quality and Greenhouse Gas Emissions

In accordance with CEQ regulation 40 CFR 1502.21, the air quality analysis in this EA incorporates by reference the air technical report (SWCA 2019). This document is incorporated by reference because the Williams Draw LBA is located adjacent to the Lila Canyon Mine (to the south) and, like the proposed lease modification areas, would most likely use the existing Lila Canyon Mine surface facilities and coal movement operations if UEI is the successful bidder for the Williams Draw LBA. Production from the Williams Draw LBA is anticipated to be 3.0 to 3.5 million tons per year, extending the life of Lila Canyon Mine by approximately 10 to 15 years. There is an estimated 32 million tons of recoverable coal in the Williams Draw tract, with another 4 to 5 million tons on a SITLA coal lease (SWCA 2019). The air technical report includes an emission inventory for the Williams Draw LBA, which is generally based on production limits established in the DAQ approval order for Lila Canyon Mine. The impact analysis modeling was based on the DAQ approval order limit of 4.5 million tpy, which is higher than what is anticipated. The air technical report also includes a near-field modeling analysis.

Because the same facility production limits would remain in effect for the processing of coal from the proposed lease modification areas, the Williams Draw emissions and modeling data can be used as a proxy analysis for the proposed LMAs.

The analysis area for air quality comprises the 50-kilometer near-field modeling analysis area delineated in the *Williams Draw Coal NEPA Analysis: Air Technical Report* (air technical report) (SWCA 2018). This analysis area was selected because the Williams Draw coal tract lease is located adjacent to the Lila Canyon Mine (to the south) and its impacts would be similar to those from development of the proposed lease modification areas. Because of the global nature of climate change, the cumulative effects analysis area includes the county, state, and nation.

3.2.1 Affected Environment

3.2.1.1 Regulatory Requirements

Mining operations, coal transportation, and other elements of the Proposed Action would emit air pollutants regulated under the Clean Air Act (CAA). CAA provisions that are relevant to the Proposed Action include the NAAQS, the Prevention of Significant Deterioration (PSD), Class I and Class II areas, Air Quality-Related Values, General Conformity, and New Source Performance Standards (NSPS), Non-Road Engine Tier Standards, and National Emission Standards for Hazardous Air Pollutants (NESHAPs).

National Ambient Air Quality Standards

The EPA has established NAAQS to limit the amount of air pollutant emissions considered harmful to public health and the environment. Primary and secondary standards have been set for six criteria pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO_2),[2] ozone,[3] sulfur dioxide (SO_2), and particulate matter (PM). The NAAQS are summarized in Table 3-1.

[2] EPA uses NO_2 as the indicator for the larger group of oxides of nitrogen or NO_x. However, emissions are usually reported as NO_x.

[3] Ozone is not directly emitted into the air but is created by chemical reactions between NO_x and volatile organic compounds in the presence of sunlight.

Any state can promulgate ambient air quality standards that are more stringent than those of the national program; however, air quality standards cannot be less stringent. Utah has adopted the federal primary and secondary NAAQS and has not established any state level standards.

Table 3-1. National Ambient Air Quality Standards

Pollutant		Primary or Secondary	Form	Averaging Time	NAAQS
CO		Primary	Not to be exceeded more than once per year	8 hours	9 parts per million (ppm)
				1 hour	35 ppm
Lead		Primary and secondary	Not to be exceeded	Rolling 3-month average	0.15 micrograms per cubic meter (µg/m^3)
NO_2		Primary	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years	1 hour	100 parts per billion (ppb)
		Primary and secondary	Annual mean	1 year	53 ppb
Ozone		Primary and secondary	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years	8 hours	0.070 ppm
Particulate matter	$PM_{2.5}$*	Primary	Annual mean, averaged over 3 years	1 year	12.0 µg/m^3
		Secondary	Annual mean, averaged over 3 years	1 year	15.0 µg/m^3
		Primary and secondary	98th percentile, averaged over 3 years	24 hours	35 µg/m^3
	PM_{10}*	Primary and secondary	Not to be exceeded more than once per year on average over 3 years	24 hours	150 µg/m^3
SO_2		Primary	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years	1 hour	75 ppb
		Secondary	Not to be exceeded more than once per year	3 hours	0.5 ppm

Source: EPA (2016a).

* PM_{10} is PM that is 10 micrometers in diameter or less; $PM_{2.5}$ is PM that is 2.5 micrometers in diameter or less.

The EPA assigns classifications to geographic areas based on monitored NAAQS concentrations. If the air quality in a geographic area meets or is cleaner than the primary and secondary NAAQS for a criteria pollutant, it is called an attainment area (designated unclassifiable / attainment) for that pollutant. If the air quality in a geographic area does not meet the primary and secondary NAAQS for a criteria pollutant, it is called a nonattainment area for that pollutant. A particular geographic region may be designated an attainment area for some pollutants and a nonattainment area for other pollutants. Maintenance areas are previously designated areas for one of the NAAQS that have since met the NAAQS standards. Emery County is in unclassifiable/attainment for all criteria pollutants (SWCA 2019).

Other Regulations

Prevention of Significant Deterioration

The PSD is a permitting program for new major sources or major modifications of existing sources of air pollution located in attainment areas. The program applies to new (or modified) major stationary sources in attainment areas; major sources are defined as those sources that emit

100 tons per year or more of any criteria pollutant for specifically listed source categories or that emit 250 tons per year of any criteria pollutant and are not in a specifically listed source category. The Proposed Action would not be in a listed source category and does not qualify as a major PSD source based on the emission inventory in Section 3.2.3.1.

Class I Areas and Class II Areas

Under PSD regulations, the EPA classifies airsheds as Class I, Class II, or Class III. Class I areas are those areas where the most stringent standards for changes to air quality are in effect. These are areas of special national or regional natural, scenic, recreational, or historic value, for which PSD regulations provide special protection. Moderate pollution increases are allowed in Class II areas. In Class III areas, substantial industrial or other growth is allowed, and increases in concentrations up to the NAAQS are considered insignificant. No Class III areas have been designated to date; therefore, all areas not designated as Class I areas are known as Class II areas. If a source is subject to the PSD permitting program, it must perform air quality monitoring and modeling analyses, in addition to installing best-available control technology, performing an additional impacts analysis, and public involvement. A proposed source can demonstrate that it does not cause or contribute to a violation by demonstrating that the ambient air quality impacts resulting from the emissions would be less than the significant impact levels.

In conducting an air quality modeling analysis, PSD increment consumption must also be evaluated for a major source. A PSD increment is the maximum allowable increase in ambient concentrations allowed to occur above a designated baseline concentration; in contrast, the NAAQS establishes maximum total ambient concentrations for air pollutants. Significant deterioration is said to occur when the amount of new pollution would exceed the applicable PSD increment. PSD increments have been established for Class I, II, and III areas.

Based on the modeling protocol, the nearest Class I area to the proposed lease modification areas is Arches National Park, which is approximately 53 miles to the southeast (Figure 3-2). Other nearby Class I areas are Canyonlands National Park (approximately 68 miles south-southeast) and Capitol Reef National Park (approximately 77 miles southwest). Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry, a Class II area of interest/special consideration, is located approximately 19 miles west-southwest of the proposed lease modification areas. Two wilderness areas are also located near the proposed lease modification areas: Turtle Canyon Wilderness (approximately 1.5 miles to the east) and Desolation Canyon Wilderness (approximately 5.2 miles to the east). The Turtle Canyon and Desolation Canyon Wilderness areas are Class II areas under the PSD program.

Air Quality–Related Values

An air quality–related value (AQRV) is defined as a resource "for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by a federal land manager for a particular area" (U.S. Forest Service et al. 2010). The requirement to assess impacts to AQRVs is established in the PSD rules. The federal land manager for each Class I area has the responsibility to define and protect the AQRVs at such areas and to consider whether new emissions from proposed major facilities (or modifications to major facilities) would have an adverse impact on those values. For example, increased nitrogen or sulfur

deposition from new or modified facilities could have a negative impact on AQRVs sensitive to such deposition, including lakes, streams, soils, vegetation, and wildlife.

General Conformity

The General Conformity Rule, established under 40 CFR 51(w) and 40 CFR 93(b), mandates a general conformity analysis for projects that require federal action. It applies to emission units or emission-generating activities resulting from a project that are not already covered by permitting and that are located in a nonattainment area. This regulation ensures that federal actions conform to the State Implementation Plan and state attainment plans. Because Emery County is an unclassifiable/attainment area, the General Conformity Rule does not apply to the LMA areas.

New Source Performance Standards

The EPA has also promulgated technology-based standards for specific sources of air pollution, known as the New Source Performance Standards (NSPS) (40 CFR 60). NSPS Subpart Y, Standards of Performance for Coal Preparation and Processing Plants, applies to the Lila Canyon Mine and affects coal production emission sources. NSPS regulations also apply to the SCT (Subparts A, Dc, and Y). NSPS regulations also require new engines of various horsepower classes to meet increasingly stringent NO_X and VOC emission standards over the phase-in period of the regulations. In the air technical report emission inventory, NSPS are assumed to apply to all stationary engines (SWCA 2019).

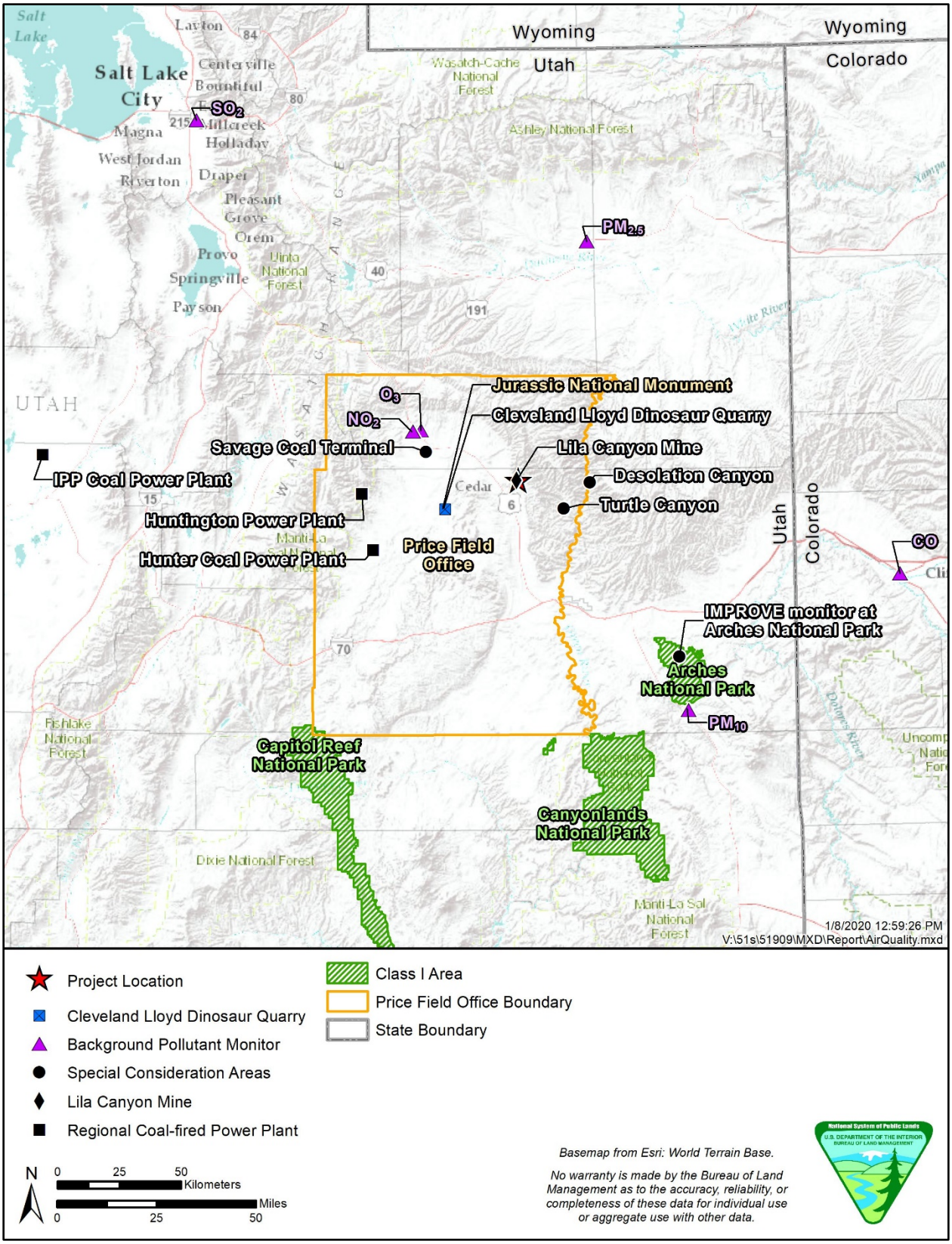

Figure 3-2. Air quality resources.

Non-Road Engine Tier Standards

The EPA also sets emissions standards for non-road diesel engines for hydrocarbons (i.e., VOC), NO_X, CO, and PM. The emissions standards are implemented in tiers by year, with different standards and start years for various engine power ratings. The new standards do not apply to existing non-road equipment. Only equipment manufactured after the start date for an engine category (1999–2006, depending on the category) is affected by the rule. Over the life of the reasonably foreseeable development activities, the fleet of non-road equipment is expected to turn over, and higher-emitting engines will be replaced with lower-emitting engines. Non-road fleet turnover is not accounted for in the air technical report emission inventory; therefore, the emissions represent a conservative estimate for this source category.

The EPA engine tier standards do not apply to the underground mining equipment. In accordance with 40 CFR 1039.5(c), engines used in underground mining or in underground mining equipment and regulated by the MSHA in 30 CFR. Specifically, the MSHA standards at 30 CFR 72.500–72.502 establishes exhaust diesel PM emissions for permissible and non-permissible diesel-powered equipment, and 30 CFR 57.5060 establishes limits on miner exposure to diesel particulate matter. In addition to DPM standards, the concentration of NO_2 in underground mining environments may not exceed a ceiling value of 5 parts per million (ppm) as established in MSHA standards at 30 CFR 75.322. Furthermore, 30 CFR 70.100 establishes concentration limits for respirable coal mine dust to 1.5 mg/m^3 at underground coal mines.

National Emission Standards for Hazardous Air Pollutants

Section 112 of the CAA requires the EPA to promulgate regulations establishing emission standards for each category or subcategory of major sources and area sources of hazardous air pollutants (HAPs); these are known as the National Emissions Standards for Hazardous Air Pollutants (NESHAPs). HAPs (e.g., benzene, perchloroethylene, mercury) are known or suspected to cause cancer or other serious health effects. There are no NESHAP regulations that are applicable specifically to coal mining. Therefore, NESHAPs and maximum achievable control technology regulations do not apply to the Lila Canyon Mine or SCT.

Current Permitting

Lila Canyon Mine

Stationary pollutant sources at the existing Lila Canyon Mine are regulated by the DAQ and are subject to Utah Administrative Code R307-401-8, which requires an approval order prior to constructing, installing, establishing, operating, or modifying air pollution-producing sources. The existing Lila Canyon Mine operates under Utah approval order number DAQE-AN121850003-13, dated May 10, 2013. The approval order establishes a production limitation of 4.5 million tons of coal per rolling 12-month period. Approved equipment at the Lila Canyon Mine consists of the underground coal mine, an enclosed crusher, a screen, truck loading facility, stacking tube associated with the coal stockpile, underpile reclaim system, rock dust silo, conveyors and mobile equipment, and diesel and gasoline storage tanks. The approval order establishes opacity limitations for particular emission sources such as conveyor transfer points. Opacity monitoring conducted in October 2018 observed no emissions from any of the emission sources (Barr Engineering Co. 2018). Water sprays or chemical dust suppression sprays are

required at the enclosed crusher exhaust, at all conveyor transfer points, on unpaved roads and operational areas, and on storage piles to minimize fugitive dust generation.

Savage Coal Terminal

Stationary sources at the existing SCT are authorized by Utah approval order number DAQE-AN117930009-17 (last revised on June 21, 2017). The approval order establishes the following production limits: 9,500,000 tons of coal per rolling 12-month period and 1,000,000 tons of coal screened per rolling 12-month period.

Approved equipment at the SCT consists of coal truck unloading facilities, stacking tubes with associated coal stockpiles, covered radial stackers, a material processing crusher, underpile reclaim systems, an underground reclaim, a wash plant, material handling conveyors, a silo, diesel fuel tanks, antifreeze storage tanks, a fuel dispensing station, oil transloading racks, condensate collectors, vapor capture systems, a natural gas-fired boiler, a diesel generator, and on-site haul roads. The approval order establishes opacity limitations for particular emission sources such as crushers and screens. Water sprays or chemical dust suppression sprays are required at all crushers and screens, on repeatedly disturbed areas, on unpaved roads and operational areas, and on storage piles to minimize fugitive dust generation. The approval order also requires enclosure of each conveyor transfer or drop point, all aboveground conveyors, the reclaim conveyor from the primary coal stockpile to the stacking tube, and the wash plant screens, crushers, and conveyors.

3.2.1.2 Existing Conditions

Climate

The climate in the vicinity of the proposed lease modification areas is discussed in detail in the air technical report and summarized briefly here. Generally, the climate is arid and influenced by both the Sierra Nevada and the Wasatch Mountains. Summers tend to be hot and dry, and winters are usually cold. Temperatures depend on elevation and latitude and can range from an average low of 15°F in January to an average high of 90°F in July (SWCA 2019). Wide ranges in temperature may occur over 24 hours as heat quickly builds during the day and rapidly dissipates at night. The average wind speed in the Lila Canyon Mine area is 7 miles per hour (mph) and it usually comes from the north-northeast. The area has an average annual precipitation of 10 inches, with August and September being the wettest months by average precipitation (SWCA 2019).

Background Air Quality

Background air quality in the Lila Canyon Mine area is provided in the air technical report and summarized briefly here. Background levels of criteria pollutants are provided in Table 3-2. The monitored concentrations in Table 3-2 are generally the averages of three years of data from pollutant monitors closest to the proposed lease modification areas. Monitors and averaging periods were selected by their relative distance to these areas and by recommendation of the DAQ.

Table 3-2. Background Levels of Criteria Pollutants

Pollutant	Monitoring Station ID	City, State	Approximate Distance from Proposed Project (miles)	Averaging Period	Monitored Concentration		
					(ppm)	(ppb)	($\mu g/m^3$)
CO*	08-077-0018	Grand Junction, Colorado	101	1-hour	1.50	–	–
				8-hour	1.30	–	–
NO_2†	49-007-1003	Price, Utah	27	1-hour	–	18.00**	–
				Annual	–	6.40††	–
Ozone‡	49-007-1003	Price, Utah	27	8-hour	0.067	–	–
$PM_{2.5}$§	49-013-0002	Roosevelt, Utah	65	24-hour	–	–	24.00
				Annual	–	–	6.10
PM_{10}¶	49-019-0006	Moab, Utah	73	24-hour	–	–	42.00
SO_2#	49-035-3006	Salt Lake City, Utah	121	1-hour	–	7.00	–
				3-hour	–	6.33	–

Source: SWCA (2019).
ppm = parts per million; ppb = parts per billion; $\mu g/m^3$ = micrograms per liter
*Data from Grand Junction-Pitkin monitor for the years 2015–2017.
†Data from monitor on private property for the years 2012–2014.
‡Data from monitor on private property for the years 2015–2017.
§Data from Roosevelt monitor for the years 2015–2017.
¶Data from Moab monitor for the years 2000–2003.
#Data from Hawthorne monitor for the years 2015–2017.
**Design value from AQS, H8H, for the years 2015–2017.
††Two-year average of annual mean; 2015 did not have complete data.

Emission inventories provide a summary of the type and amount of pollutants emitted on an annual basis from a particular source. Total emissions from the most recent emission inventories for Emery County and Carbon County are summarized in Table 3-3. While the Lila Canyon Mine is in Emery County, it is near the border and close to emission sources in Carbon County.

Table 3-3. 2014 Emission Inventory for Emery County and Carbon County

Pollutant	Emery County Emissions (tons per year)	Carbon County Emissions (tons per year)
CO	17,854	8,045
NO_x	20,397	6,318
PM_{10}	4,891	4,928
$PM_{2.5}$	1,257	866
SO_2	6,427	10,334
Volatile organic compounds	36,111	17,014
Hazardous air pollutants	127	78

Source: DAQ (2014).

Climate Change

Global warming refers to the ongoing rise in global average temperature near the Earth's surface. It is caused mostly by increasing concentrations of GHGs (primarily carbon dioxide [CO_2],

methane [CH_4], nitrous oxide [N_2O], and fluorinated gases) in the atmosphere, and it is changing global climate patterns. Climate change refers to any significant change in the measures of climate (e.g., temperature, precipitation, and wind patterns) lasting for an extended period of time (EPA 2017a). Estimates of GHG emissions are usually reported in terms of carbon dioxide equivalent (CO_2e) to account for the relative global warming potential (GWP) of each pollutant and to allow comparison between different greenhouse gases. GWP is a measure of a given pollutant's ability to trap heat and depends on how well the gas absorbs energy and how long the gas stays in the atmosphere. Both CH_4 and N_2O emissions are converted to CO_2e emissions using GWP factors. GWP is calculated over a specific time, typically 100 years. The EPA uses the 100-year time horizon in its GHG Reporting Rule requirements under 40 CFR 98(a); the 100-year GWP will be used in this EA for consistency with the rule (CO_2 GWP of 1; CH_4 GWP of 28; and N_2O GWP of 265).

Because GHGs circulate freely throughout Earth's atmosphere, climate change is a global issue. The largest component of global anthropogenic GHG emissions is CO_2 (EPA 2016b). Fossil fuel use is the primary source of global CO_2 (EPA 2016b). Overall, U.S. energy-related emissions from the U.S. energy sector (fossil fuel combustion, natural gas systems, coal mining, mobile combustion, waste incineration, and other sources) accounted for a combined 84.0% of total U.S. greenhouse gas emissions in 2017 (EPA 2019a).

In 2017, total gross U.S. greenhouse gas emissions were 6,456.7 million metric tons (MMT) of CO_2e (Table 3-13). Total U.S. emissions increased by 1.3% from 1990 to 2017, while emissions decreased from 2016 to 2017 by 0.5% (EPA 2019a). The decrease from 2016 to 2017 was driven in large part by a decrease in fossil fuel combustion CO_2 emissions (EPA 2019a). Factors contributing to this decrease include a continued shift from coal to natural gas, increased use of renewable energy, and milder weather that contributed to less overall electricity use (EPA 2019a). The Global Change Research Act of 1990 mandates that the U.S. Global Change Research Program (USGCRP) deliver a report to Congress and the president every four years that analyzes the effects of global change on the natural environment and other systems, as well as provide current trends in global change. The recently released second volume of the Fourth National Climate Assessment focuses on the human welfare, societal, and environmental elements of climate change and variability for 10 regions of the United States (USGCRP 2018). Global climate is changing rapidly compared to the pace of natural climate variations that have occurred throughout Earth's history. Evidence for these changes consistently points to human activities, especially emission of GHGs, as the dominant cause. Global average temperature has increased by approximately 1.8°F from 1901 to 2016. Without significant emission reductions, annual average global temperatures could increase by 9°F or more by the end of this century (compared to preindustrial temperatures) (Hayhoe et al. 2018).

A recent study identified climate change issues relevant to resource management in all of Utah and Nevada, a small part of eastern California, a small part of western Colorado, southern Idaho, and western Wyoming (the Intermountain Region) (Halofsky et al. 2018). In the Plateaus subregion of the Intermountain Region (which covers the southern half of Utah, a small portion of western Colorado, and includes the proposed lease modification areas), median maximum temperature and median minimum temperature are projected to rise between 5°F to 10°F and 5°F to 12°F by 2100, respectively, depending on the climate model scenario (Halofsky et al. 2018). The greatest departure from historical temperatures by 2100 is projected to occur in summer.

Projected median maximum temperatures for winter, spring, and autumn also move outside of historical ranges by 2100. Precipitation projections in the Plateaus subregion are highly variable with no discernible trend (Halofsky et al. 2018).

3.2.2 Environmental Impacts – Alternative A: No Action

Under the No Action Alternative, the BLM would not approve UEI's application for federal coal reserves on approximately 1,272.64 acres (317.84 acres added to lease UTU-014218 and 954.80 acres added to lease UTU-0126947) and the federal coal resources contained in the two lease modifications would not be mined. The coal reserves in the lease modifications would most likely be permanently bypassed.

Lila Canyon Mine would continue to operate at current production levels and emit air pollutants. Emissions of air pollutants would be limited by the production rate condition established in its 2013 approval order. The projected mine life and operating plans of the Lila Canyon Mine are anticipated to extend through the year 2026. Other existing sources of air pollution (e.g., SCT, mobile sources) would continue to impact air quality in the analysis area.

3.2.2.1 Cumulative Effects

A choice of No Action would not contribute incrementally to the impacts of past, present, and reasonably foreseeable future actions, because under the No Action Alternative, the BLM would not approve UEI's application for federal coal reserves and would not allow extraction of the additional recoverable coal at this time. As a result, a No Action Alternative cumulative impacts analysis is not included.

3.2.3 Environmental Impacts – Alternative B: Proposed Action

Emissions of air pollutants at the Lila Canyon Mine are currently limited by a production rate condition established in its 2013 approval order. The mining of the proposed lease modification areas would extend by approximately 3 years the mining activities currently allowed under the 2013 approval order but would not increase the annual permitted emissions. The Proposed Action would not authorize a change in already permitted actions, in the maximum production limitation, or in annual emissions.

As previously stated, the Williams Draw LBA is contiguous with the Lila Canyon Mine and would use the Lila Canyon Mine surface facilities and infrastructure if UEI is the successful bidder. The proposed lease modification areas are also contiguous to the Lila Canyon Mine and would use Lila Canyon Mine facilities and infrastructure. Coal from both projects would follow the same potential paths from the Lila Canyon Mine to the SCT to its end destination. Both projects would occur under the Lila Canyon Mine's existing approval order (which limits annual production to 4.5 million tons of coal) and SCT's existing approval order (which limits coal throughput to 9.5 million tons of coal per rolling 12-month period). The Williams Draw LBA emission inventory is generally based on these approval order limits. Because the same facility production limits would remain in effect for the processing of coal from the proposed lease modification areas, the Williams Draw emissions data from the modeling protocol is used here as a proxy analysis for the proposed LMAs.

3.2.3.1 Direct Emissions

Under the Proposed Action, direct emissions would result from the mining of the coal in the lease modification areas and the hauling of the mined coal to the existing Savage Coal Terminal. These emissions would include CO, VOCs, NO_x, SO_2, PM_{10}, $PM_{2.5}$, HAPs, and GHGs.

Stationary sources of direct emissions at the Lila Canyon Mine include material handling conveyors, mine ventilation shafts, internal combustion engines, fuel storage tanks, a material processing screen and crusher, and surface operations. Except for particulate matter, all of the directly emitted criteria pollutants from mine operations would be from fuel combustion sources, such as mobile mining equipment, haul trucks, and stationary sources (e.g., emergency generators, firewater pump engines). Methane would be emitted by the ventilation air handling system required by the Mine Safety and Health Administration to reduce the combustion/explosion potential of the Mine's underground atmosphere (also known as ventilation-air methane or VAM). According to information provided by the Lila Canyon Mine, methane and VOC concentrations are below detectable limits in the ventilation exhaust air (BLM 2018).

Mobile sources include underground mining equipment (specialized industry-specific equipment designed for underground mining), aboveground sources such as heavy construction equipment for material handling and stockpile management, and light-duty gasoline trucks and light- and heavy-duty diesel trucks. On-road vehicles would include coal haul trucks and employee vehicles. Coal haul trucks would travel 30 miles each way to and from Lila Canyon Mine and the SCT. Emissions would also result from worker trips to and from the Mine. The average employee would travel 34 miles each way from the Lila Canyon Mine to Price, Utah (SWCA 2019).

At the Lila Canyon Mine, coal dust associated with mine surface operations is controlled on the conveyor system and at transfer points by enclosures and sprays. Dust from unpaved mine access roads is controlled by applying water or a dust-suppressing solution. Coal is reclaimed from the bottom of the coal stockpile directly onto a conveyor belt in an enclosed tunnel located under the pile. The coal moisture level in the coal pile is maintained at approximately 6.5% or greater by water sprays located on the main mine conveyor. The speed is also limited to 15 miles per hour along on-site haul roads. The following control measures were assumed in the development of the emission inventory:

- Coal bulldozing: Continuous water spray during material handling with a control efficiency of 62%.
- Coal handling and storage piles: Assumed best practice of chemical treatment and watering with a control efficiency of 90%.
- On-site haul roads: Assumed best practice of chemical treatment and watering and reduced speeds on roads to 15 miles per hour with a control efficiency of 95%.
- Underground nonroad engines: All engines are Tier 2 based on age, except mantrips which are Tier 3.
- Aboveground nonroad engines: All engines are Tier 1.
- Disturbed surface areas: Assumed best practice of chemical treatment and watering with a control efficiency of 50%.

Maximum annual direct emissions for the Proposed Action are summarized in Tables 3-4, 3-5, and 3-6. Emission calculations were based on the assumption of a maximum production rate of 4.5 million tons per year and coal loading and hauling operating hours of 24 hours per day, 365 days per year. Additional assumptions can be found in the air technical report (SWCA 2019).

Mobile source HAP emissions result from fuel combustion in both road and non-road vehicles. However, because VOC emissions from coal mine venting are poorly understood, a gas analysis of vented air at the Lila Canyon Mine was unavailable, and the Colorado Underground Coal Mine Emission Inventory Tool (V1.0) does not include any HAP speciation emission factors, only HAP emissions from mobile sources were analyzed.

Table 3-4. Direct Criteria Pollutant Emissions

Emission Source	Annual Criteria Pollutant Emissions (tons per year)					
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$
Conveyor transfers and drops	—	—	—	—	0.08	0.01
Crushing and screening*	—	—	—	—	1.11	1.11
Coal pile	—	—	—	—	2.20	0.33
Haul road – paved	—	—	—	—	1.33	0.33
Rock dust silo	—	—	—	—	<0.01	<0.01
Diesel storage tanks	—	—	0.09	—	—	—
Mine vents (includes underground equipment)	21.14	30.55	1.61	0.03	13.10	2.43
Aboveground equipment	28.63	23.44	3.10	0.02	1.43	1.31
On-road vehicles: coal haul trucks to Savage Coal Terminal (fugitive dust and exhaust)	13.21	48.29	2.64	0.09	10.49	4.07
On-road vehicles: worker commute (fugitive dust and exhaust)	11.41	1.01	0.29	0.01	5.75	1.41
Total	**74.39**	**103.29**	**7.73**	**0.15**	**35.49**	**11.01**

Source: SWCA (2019).

*There is no emission factor for $PM_{2.5}$. However, AP-42 suggests that the emission factors for PM_{10} may be used as an upper limit for $PM_{2.5}$ emissions from crushing. Conservatively, it was assumed that the emission factors for PM_{10} would also be an upper limit for $PM_{2.5}$ emissions from screening.

Table 3-5. Direct GHG Emissions

Emission Source	Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Conveyor transfers and drops	—	—	—	—
Crushing and screening	—	—	—	—
Coal pile	—	—	—	—
Haul road – paved	—	—	—	—
Rock dust silo	—	—	—	—
Diesel storage tanks	—	—	—	—
Mine vents (includes underground equipment)	67,883	1,622	2	113,769

Emission Source	Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Aboveground equipment	37,734	2	1	38,050
On-road vehicles: Coal haul trucks to Savage Coal Terminal (fugitive dust and exhaust)	n/a	n/a	n/a	10,306
On-road vehicles: Worker commute (fugitive dust and exhaust)	n/a	n/a	n/a	1,696
Total	**117,618**	**1,625**	**3**	**163,821**

Source: SWCA (2019).

n/a: Not applicable. On-road vehicles' CO_2e emissions were obtained from existing MOBILE 6 emissions factors. CO_2, CH_4, and N_2O emissions are listed as n/a for on-road vehicles even though CO_2e is calculated and listed. The totals do not currently include the emissions from source categories listed n/a.

Notes: GHG emissions are reported in short (U.S.) tons (1 metric ton = 1.10231 U.S. tons), and CO_2e is based on 100-year values. The global warming potential for each GHG is 1 for CO_2, 28 for CH_4, and 265 for N_20 (based on 100-year GHP AR 5 values).

Table 3-6. Direct HAP Emissions

Emission Source	Annual HAP Emissions (tons per year)					
	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Aldehydes
Conveyor transfers and drops	—	—	—	—	—	—
Crushing and screening	—	—	—	—	—	—
Coal pile	—	—	—	—	—	—
Haul road – paved	—	—	—	—	—	—
Rock dust silo	—	—	—	—	—	—
Diesel storage tanks	—	—	—	—	—	—
Mine vents	0.020	—	—	—	—	0.041
Aboveground equipment	0.009	—	—	—	—	0.010
On-road vehicles: Coal haul trucks to Savage Coal Terminal (fugitive dust and exhaust)	0.022	—	—	—	—	0.341
On-road vehicles: Worker commute (fugitive dust and exhaust)	0.007	—	—	—	—	0.005
Total	0.058	—	—	—	—	0.396

Source: SWCA (2019).

3.2.3.2 Indirect Emissions

Savage Coal Terminal and Coal Hauling Indirect Emissions

Under the Proposed Action, indirect emissions would result from handling the mined coal at the SCT; hauling the coal from the SCT to a regional coal-fired power plant via haul trucks or to a generic U.S. port located along the Gulf of Mexico via locomotive for export; and the combustion of coal. It is not expected that the SCT's approval order would need to be modified in response to the proposed project.

When combusted at a power plant, the coal mined from the proposed LMA areas would indirectly contribute to criteria pollutant, HAP, GHG, and other toxic air pollutant emissions.

Domestic power plants are required to obtain air permits to operate; these permits restrict criteria and HAP pollutant emissions and require pollutant control technology to protect public health and the environment. Power plants must also ensure compliance with the NAAQS and any other applicable regulations (e.g., mercury). If a power plant accepts coal from a new source such as the proposed LMA areas, it would still have to maintain compliance with its air permit, any associated requirements, and emission limitations. Because the Proposed Action is a leasing action, the lessee and ultimate disposition of the coal are unknown. It is reasonable to assume that the coal would be combusted at a power plant under the limitations of its existing air permit and with appropriate pollutant control technology.

Stationary sources of emissions at the SCT include coal truck unloading facilities, material handling conveyors, a wash plant, internal combustion engines, a natural gas-fired boiler, fuel storage tanks, a fuel dispensing station, a material processing screen and crusher, and onsite haul roads. On-road vehicles would include coal haul trucks and employee vehicles. Locomotive emissions from hauling mined and processed coal are currently occurring in the analysis area and would continue under the Proposed Action.

The following assumptions were used in the development of the emission inventory:

- A 64-mile round trip along designated truck routes from the SCT to a regional coal-fired power plant, with an average capacity of 46 tons of coal per truck and a maximum of 11.2 trucks per hour (4.5 million tons of coal per year).
- A 3,200-mile round trip along designated rail routes from the SCT to a generic U.S. export port (the exact port of export is not known; a gulf port was selected as a reasonable approximation for emissions), with an average capacity of 120 tons of coal per railcar, 120 cars per unit train, and a maximum of 312.5-unit trains per year (4.5 million tons of coal per year).

Additional assumptions can be found in the air technical report (SWCA 2019). Tables 3-7, 3-8, and 3-9 summarize the indirect emissions from the handling of coal at the SCT and transporting the coal to its final destination. The totals in Table 3-7 and Table 3-8 represent the maximum indirect emissions if all project coal was shipped via locomotive to a generic U.S. export port located along the Gulf of Mexico.

Table 3-7. Indirect Criteria Pollutant Emissions

Emission Source	Annual Criteria Pollutant Emissions (tons per year)					
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$
Savage Coal Terminal: Coal handling	4.35	9.25	7.27	0.28	42.39	6.21
On-road vehicles: Hauling coal from Savage Coal Terminal to regional power plant (fugitive dust and exhaust)	14.09	51.51	2.82	0.09	11.19	4.35
Locomotives: Hauling coal from the Savage Coal Terminal to a U.S. port along the Gulf of Mexico	873.15	3,246.77	124.32	3.10	75.43	73.17
Total indirect emissions when all coal is exported	**877.51**	**3,256.02**	**131.59**	**3.38**	**117.82**	**79.37**

Source: SWCA (2019).

Table 3-8. Indirect GHG Emissions

Emission Source	Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Savage Coal Terminal: Coal handling	6,383	<1	<1	6,506
On-road vehicles: Hauling coal from Savage Coal Terminal to regional power plant (fugitive dust and exhaust)	n/a	n/a	n/a	10,993
Locomotives: Hauling coal from the Savage Coal Terminal to a U.S. port along the Gulf of Mexico	336,951	26	9	339,945
Total indirect emissions when all coal is exported	**343,334**	**27**	**10**	**357,444**

Source: SWCA (2019).

n/a: Not applicable. On-road vehicles' CO_2e emissions were obtained from existing MOBILE 6 emissions factors. CO_2, CH_4, and N_2O emissions are listed as n/a for on-road vehicles even though CO_2e is calculated and listed. The totals do not currently include the emissions from source categories listed n/a.

Note: GHG emissions are reported in short (U.S.) tons, and CO_2e is based on 100-year values (the global warming potential for each GHG is 1 for CO_2; 28 for CH_4; and 265 for N_20).

Table 3-9. Indirect HAP Emissions from Mobile Sources

Emission Source	Annual HAP Emissions (tons per year)					
	Benzene	Toluene	Ethylbenzene	Xylene	n-Hexane	Aldehydes
Transloading of crude oil	0.012	0.004	–	–	0.294	–
Fugitive component leaks	<0.001	<0.001	–	–	0.119	–
Railcar crude oil storage	<0.001	<0.001	–	–	0.038	–
Railcar boiler	–	–	–	–	–	–
Fuel storage tanks	–	–	–	–	–	–
Gasoline fueling	–	–	–	–	–	–
Emergency generator	0.082	0.036	–	0.025	–	0.170
Haul roads	–	–	–	–	–	–
Coal truck unloading	–	–	–	–	–	–
Coal crushing	–	–	–	–	–	–
Coal conveyor transfers and drops	–	–	–	–	–	–
Coal railcar loading	–	–	–	–	–	–
Coal pile	–	–	–	–	–	–
Potash unloading	–	–	–	–	–	–
Potash rail car loading	–	–	–	–	–	–
Locomotives	0.802	–	–	–	–	0.108
Total	**0.897**	**0.040**	–	**0.025**	**0.451**	**0.278**

Source: SWCA (2019).

Coal Combustion Indirect Emissions

Coal combustion is considered an indirect impact because it is a reasonable end result of mining activity in the proposed LMA areas. If issued a modified lease for the Proposed Action, UEI could continue to provide coal to regional plants, or the coal could be transported to a U.S. port

for export and combusted outside of the United States. UEI could also continue providing coal to the lime cement market and the spot market, or it could expand its customer base to other markets.

Combustion of the mined and processed coal would produce indirect emissions of criteria pollutants, HAPs, and GHGs. A hypothetical coal-fired power plant was used in the emission calculations because it is not known at this time where all the coal mined from the proposed lease modification areas would be shipped if the lease modifications were approved. Permitted emissions from regional power plants are provided in the air technical report (SWCA 2019:Tables 14 and 15).

To estimate emissions from the combustion of the mined coal, criteria and HAP emission factors from U.S. EPA AP-42, Section 1.1., Bituminous and Subbituminous Coal Combustion, were obtained (EPA 1998). The analysis assumes a maximum of 4.5 million tons of coal would be combusted per year. The heat content of the coal is assumed to be 11,695 British thermal units/pound, the sulfur content is assumed to be 1% by weight, and the ash content is assumed to be 11.25% by weight (SWCA 2019). Indirect annual criteria pollutant, GHG, and select HAP emissions from the combustion of the coal are summarized in Tables 3-10 and 3-11.

Table 3-10. Combustion of Coal Criteria Pollutant and HAP Emissions

Emission Source	Annual Criteria Pollutant and HAP Emissions (tons per year)								
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	Hydrochloric Acid (HCl)	Hydrofluoric Acid (HF)	Mercury
Coal combustion	1,125	18,900	37,463	65,813	78,750	135	2,700	338	0.84

Source: SWCA (2019).

Table 3-11. Combustion of Coal GHG Emissions

Emission Source	Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Coal combustion	11,274,017	1,276	186	11,652,486

Source: SWCA (2019).

3.2.3.3 Greenhouse Gas Emissions Assessment

The GHG emissions assessment assumes that 100% of the coal produced would be combusted. Regional GHG impacts from the Proposed Action include transport to the regional power plant (a fully loaded trip to the plant and an empty return trip) and combustion of all the produced coal by the regional power plant. Global GHG impacts from the Proposed Action include transporting the coal to a generic U.S. port (a fully loaded trip to the port and an empty return trip) and combustion of all coal produced. Calculated emissions of CO_2, methane, and N_2O were converted to CO_2e by the appropriate GWP factor. Table 3-12 summarizes the total direct and indirect GHG emissions that would be generated by the Proposed Action. The emissions in these tables are from Tables 3-5, 3-8, and 3-11.

Table 3-12. Summary of Estimated Direct and Indirect GHG Emissions

Emission Source	Total Annual GHG Emissions (tons per year)			
	CO_2	CH_4	N_2O	CO_2e
Direct operations (all direct mine emission sources, including coal haul trucks to Savage Coal Terminal and worker commute vehicles)	117,618	1,625	3	163,821
Indirect operations (i.e., Savage Coal Terminal, vehicles hauling coal to a regional power plant, and locomotives)	343,334	26	9	357,444
Indirect combustion of produced coal	11,274,017	1,276	186	11,652,486
Total	**11,734,969**	**2,927**	**198**	**12,173,751**

Note: CO_2e emissions based on 100-year GWP for CO_2, CH_4, and N_2O.

Estimated GHG emissions for the Proposed Action (lease modification areas) are compared with local, state, and national totals reported by the EPA in Table 3-13.

Table 3-13. Project, Local, and National Greenhouse Gas Emissions

Project, Local, and National Greenhouse Gas Emission Comparison (million metric tons of CO_2e per year)			
Estimated Lease Modification Areas Emissions	Emery County GHG Emissions in 2018*	State of Utah GHG Emissions in 2018*	U.S. GHG Emissions in 2017†
12.2	13.5	35.1	6,456.7

* EPA (2018)
† EPA (2019a)

The Proposed Action–related CO_2e GHG emissions are approximately 90% of Emery County's 2018 GHG emissions, approximately 35% of statewide GHG emissions, and approximately 0.2% of U.S. GHG emissions in 2017. The statewide emissions are from major industrial sources only. Statewide GHG emissions from other sectors (e.g., residential/commercial, transportation, and agriculture) are not currently available for 2018; the project percentage of statewide GHG emissions would be lower if all sectors were included.

Although this EA presents a quantified estimate of potential GHG emissions associated with the proposed LMA coal development, there is uncertainty in GHG emission estimates due to variations in production volumes, mining methods, and transportation. Additionally, it is difficult to discern what end uses for the coal extracted from a particular leasehold might be reasonably foreseeable. The BLM does not exercise control over the specific end use of the coal produced from any individual federal lease and has no authority to direct or regulate the end use of the produced products. As a result, the BLM can only provide an estimate of potential GHG emissions by assuming that all produced products would eventually be combusted.

The climate change research community has not yet developed tools specifically intended for evaluating or quantifying end-point impacts attributable to the emissions of GHGs from a single source and has not identified any scientific literature to draw from regarding the climate effects of individual, facility-level GHG emissions. The current tools for simulating climate change generally focus on global and regional-scale modeling. Global and regional-scale models lack the capability to accurately represent many important small-scale processes. As a result,

confidence in the accuracy of regional- and sub-regional-scale projections is lower than at the global scale. While climate models account for global emissions, they do not provide estimates for impacts from a single source in isolation of other sources.

There are no federal or state GHG emission standards to assist in evaluating a single source's potential impacts on climate. Thus, the GHG emissions estimates are presented here as a proxy for the potential climate change impact from the Proposed Action. The direct and indirect emission estimates previously provided are an estimate of the maximum potential for GHGs released into the atmosphere from mining to end use. Such emissions would incrementally add to the national and global emissions driving climate change (see Other Regulations in Section 3.2.1.1).

3.2.3.4 Near-Field Modeling Analysis

As previously stated, the Williams Draw LBA is contiguous with the Lila Canyon Mine and it is assumed that the Lila Canyon Mine surface facilities and infrastructure would be used if UEI is the successful bidder. The LMA areas are also contiguous to the Lila Canyon Mine and it is assumed that UEI would use Lila Canyon Mine facilities and infrastructure. Coal from both projects would follow the same potential paths from the Lila Canyon Mine to the SCT to its end destination. Both projects would occur under the Lila Canyon Mine's existing approval order (which limits annual production to 4.5 million tons of coal) and SCT's existing approval order (which limits coal throughput to 9.5 million tons of coal per rolling 12-month period). A near-field ambient air quality assessment was completed for the Williams Draw LBA to estimate maximum impacts within and near the Williams Draw LBA project area and nearby Class I and II areas resulting from reasonably foreseeable development-related construction and production emissions (SWCA 2019). Because the same facility production limits would remain in effect for the processing of coal from the proposed LMA areas, the Williams Draw near-field modeling analysis is used here as a proxy analysis for the proposed LMAs. The modeling methodology, model configuration, meteorological data used, receptor placement, and other inputs and assumptions are described in the air technical report (SWCA 2019).

Air Quality Modeling Impact Assessment

A near-field criteria pollutant assessment was performed to estimate maximum potential impacts of criteria pollutants from Proposed Action emission sources. Predicted (modeled) maximum criteria pollutant concentrations are presented in Table 3-14. The maximum predicted concentrations vary based on the form of the NAAQS and the pollutant averaging period. For each criteria pollutant, the maximum predicted concentration is defined as:

- NO_2 and $PM_{2.5}$ annual average: The highest modeled annual averaged values over all 5 years.
- CO 1-hour and 8-hour, and SO_2 3-hour: The highest 2nd high (H2H) over 5 years.
- NO_2 1-hour: The 5-year mean of the 8th-highest (H8H) daily 1-hour maximum (average H8H of daily maxima)
- SO_2 1-hour: The 5-year mean of the 4th-highest (H4H) daily maximum.
- $PM_{2.5}$ 24-hour: The 5-year mean of the highest 8th high (H8H).

- PM_{10} 24-hour: The high 6th high (H6H) averaged over 5 years.

The modeling was performed using 5 years of hourly meteorological input data. The modeled impacts were also assessed at receptors within the modeled domain that are within the following three areas: Turtle Canyon Wilderness, Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry, and Desolation Canyon Wilderness (SWCA 2019).

Table 3-14. Maximum Ambient Concentrations from Modeling

Pollutant	Averaging Period	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Maximum Ambient Concentration (µg/m³)	NAAQS (µg/m³)	Percent of Standard (%)
CO	1-hour*	14,643.4	1,718.0	16,361.4	40,000	40.9
	8-hour*	2,634.0	1,489.0	4,123.0	10,000	41.2
NO_2	Scenario 1 1-hour†	890.8	34.0	924.8	188.7	491.9
	Scenario 2 1-hour†	1,344.5	34.0	1,378.5	188.7	733.3
	Annual	53.6	12.0	65.6	100	65.6
PM_{10}	24-hour‡	535.6	42.0	577.6	150	385.1
$PM_{2.5}$	24-hour§	112.5	24.0	136.5	35	390.1
	Annual	24.2	6.1	30.3	15	252.9
SO_2	1-hour¶	20.0	18.0	38.0	195	19.4
	3-hour*	7.6	17.0	24.6	1,300	1.9

Source: SWCA (2019).

* Represents the high 2nd high concentration.

† Represents the 98th percentile concentration over a 3-year period.

‡ Represents the 4th-highest concentration over a 3-year period.

§ Represents the average of the highest 24-hour concentrations over a 3-year period.

¶ Represents the 99th percentile concentration over a 3-year period.

As shown in Table 3-14, the modeled plus background values for CO (1-hour and 8-hour), NO_2 (annual), and SO_2 (1-hour and 3-hour) are less than the NAAQS. Modeled concentrations of NO_2 (1-hour), PM_{10} (24-hour), and $PM_{2.5}$ (24-hour and annual) show potential exceedances of the NAAQS and are discussed in more detail below.

NO_2 Evaluation

Potential exceedances of the 1-hour NO_2 NAAQS are predicted to occur within 200 meters of the existing Lila Canyon Mine adits, but within the Lila Canyon Mine lease boundary. The relatively large contribution of mine vent emissions to the maximum 1-hour impact is explained by the receptor's very close proximity to the adits. Potential exceedances of the 1-hour NO_2 NAAQS are also expected to occur within 20 meters of the southern Lila Canyon Mine property boundary. They are expected to occur in areas that are difficult for the public to access due to terrain and vegetation. The relatively large contribution of mine vent emissions to the maximum 1-hour impact is explained by the receptor's very close proximity to the ambient air quality boundary used for the modeling analysis, the low exit velocity, the rugged terrain, and the elevated emissions associated with these activities (SWCA 2019).

Modeled ambient concentrations of NO_2 (1-hour and annual) at the three Class II special consideration areas (Turtle Canyon Wilderness; the Jurassic National Monument at the site of the Cleveland Lloyd Dinosaur Quarry; and Desolation Canyon Wilderness are all expected to be below the NAAQS. The 1-hour and annual NO_2 impacts at the closest Class II area are about 21.1% and 12.1% of their respective NAAQS (SWCA 2019).

PM_{10} Evaluation

The predicted H6H 24-hour PM_{10} concentrations indicate potential NAAQS exceedances within approximately 10 meters of the SCT's fence line and within 68 meters from the existing mine adits. The elevated impact near the mine adits can be attributed to emissions associated with underground mine activities, but the predicted exceedances are located within the lease boundary (SWCA 2019).

Conditions in the mine are cool and damp. A humid environment, combined with the moisture content of ore and development rock, is not conducive to dust generation. In addition, on August 1,2016, Phase III of MSHA's respirable dust rule went into effect. This lowering of the concentration of respirable coal mine dust in the air that miners breathe is the most effective means of preventing diseases caused by excessive exposure to such dust (MSHA 2014). In addition, it would also limit the amount of PM_{10} emissions to the atmosphere from the mine adits. The PM_{10} modeling results can be considered conservative because no control was assumed for the humid conditions in the mine, nor was the MSHA respirable dust limit accounted for in the modeling demonstration (SWCA 2019).

In accordance with 30 CFR 7.84(e), exhaust PM emissions would be diluted to 1 mg/m^3. In addition, 30 CFR 70.100 establishes concentration limits for respirable coal mine dust of 1.5 mg/m^3 at underground coal mines. A dilution of 1 mg/m^3 is equivalent to 1,000 ug/m^3, which is higher than the predicted PM_{10} and $PM_{2.5}$ modeled maximums at the adit exits (535.6 ug/m^3 for 24-hour PM_{10} and 112.5 ug/m^3 for 24-hour $PM_{2.5}$).

The modeled PM_{10} impacts from project emissions, in combination with conservative background concentrations, would not cause an exceedance of the 24-hour NAAQS.

$PM_{2.5}$ Evaluation

The predicted H8H 24-hour average $PM_{2.5}$ concentration indicates a potential NAAQS exceedance. This potential exceedance is partially due to the high background ambient concentration of 24.0 $\mu g/m^3$, which is already 68.6% of the NAAQS (SWCA 2019). The predicted maximum impacts and potential exceedances of the 24-hour $PM_{2.5}$ NAAQS are expected to occur within 88 meters south and 50 meters north of the Lila Canyon Mine ambient air boundary and within 100 meters of the existing mine adits. Similarly, at the SCT, the area of potential exceedance is located within 59 meters of the southwest boundary.

Potential annual $PM_{2.5}$ exceedances are located at a maximum distance of 25 meters south of the Lila Canyon Mine, 35 meters from the existing mine adits, and 32 meters southwest of the SCT. Potential exceedances would occur in areas that are difficult for the public to access because of challenging terrain and vegetation. Furthermore, respirable dust emissions exiting the adits are those legally allowed in the mine atmosphere (an average concentration of respirable dust at or

below 1.5 mg/m^3 in accordance with 30 CFR 70.100). The predicted exceedances around the existing adits occur and remain within the lease boundary (SWCA 2019).

As discussed for PM_{10}, because of the cool and damp mine conditions and the implementation of Phase III of MSHA's respirable dust rule, the $PM_{2.5}$ modeling results can be considered conservative because no control was assumed for the humid conditions in the mine, nor was the MSHA respirable dust limit accounted for in the modeling demonstration (SWCA 2019).

The modeled average daily and annual $PM_{2.5}$ concentrations do not exceed the NAAQS at any of the receptors within the modeled domain in the three Class II areas considered (SWCA 2019).

PSD Increment and Evaluation

The American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) was used to model impacts at the Class I areas and Class II areas within the 50-km near-field domain. No Class I areas are located within 50 km of the proposed lease modification areas. The nearest Class I area is Arches National Park, which is approximately 53 miles (85 km) to the southeast. Other nearby Class I areas and their respective distances from the proposed LMA areas are Canyonlands National Park (68 miles [109.5 km]) and Capitol Reef National Park (77 miles [124 km]). The potential PSD impacts were modeled at the edges of the modeling domain (geographic area covered by the model) in the direction of and closest to the Class I areas and compared to PSD increments (SWCA 2019).

The Class II areas within the modeling domain that were modeled are Turtle Canyon Wilderness (approximately 1.5 miles to the east of the proposed LMA areas), Desolation Canyon Wilderness (approximately 5.2 miles to the east), and Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry (approximately 19 miles to the west-southwest). Impacts predicted at these three areas were well below the NAAQS and PSD increments (the maximum predicted impact is projected to be less than 1.44% of the PSD increment) (SWCA 2019).

Four pollutants (PM_{10}, $PM_{2.5}$, SO_2, and NO_2) were modeled with respect to the maximum allowable PSD increments in Class I areas. For all three Class I areas (Arches National Park, Canyonlands National Park, and Capitol Reef National Park) analyzed, none of the Class I PSD increments were exceeded (SWCA 2019). Detailed modeling results can be found in the air technical report.

Secondary $PM_{2.5}$ Analysis

NO_X and SO_2 gases have the potential to form secondary $PM_{2.5}$. $PM_{2.5}$ formation from these precursors is highly uncertain and varies both regionally and seasonally due to atmospheric conditions. Assessing the Proposed Action's potential to form secondary $PM_{2.5}$ includes the analysis of monitoring data and the inclusion of EPA's Modeled Emission Rates for Precursors (MERPs) approach (SWCA 2019).

For $PM_{2.5}$, the critical air quality thresholds are assumed to be equal to significant impact levels (i.e., $PM_{2.5}$ daily = 1.2 µg/m^3, $PM_{2.5}$ annual = 0.2 g/µm^3). The estimated annual NO_X and SO_2 direct emissions from the Proposed Action were compared against the lowest (most

conservative) illustrative $PM_{2.5}$ MERP value for these pollutants shown in the EPA's MERPs guidance of any source modeled by the EPA in the western United States (SWCA 2019).

NO_X and SO_2 precursor contributions to both daily average $PM_{2.5}$ are considered together to determine if the Proposed Action's air quality impact to secondary $PM_{2.5}$ would exceed the critical air quality threshold. In this case, the proposed emissions increases are expressed as a percent of the lowest MERP for each precursor and have been summed. A value less than 100% indicates that the critical air quality threshold would not be exceeded when considering the combined impacts of these precursors on daily and/or annual $PM_{2.5}$. The additive secondary impacts on daily $PM_{2.5}$ was calculated to be 9.33%.[4]

The presented method indicates that the proposed project's emissions would not cause increases to secondary $PM_{2.5}$ concentrations in the area that exceed the critical air quality thresholds (SWCA 2019).

Ozone Analysis

To address whether the Proposed Action may cause or contribute to an exceedance of the ozone NAAQS, the ozone precursors, NO_x and VOC, were evaluated. The EPA guidance memorandum *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program* (EPA 2019b) was followed to determine the potential secondary pollutant impact resulting from the Proposed Action (SWCA 2019).

Using this methodology, potential ozone air quality impacts from the Proposed Action were compared against the applicable critical air quality threshold (1 ppb). The estimated annual NO_X and VOC emissions were compared against the lowest illustrative ozone MERP value shown in the EPA's guidance for any source modeled by the EPA in the western United States. A value less than 100% indicates that the critical air quality threshold would not be exceeded when considering the combined impacts of these precursors on daily and/or annual ozone. The additive secondary impacts on 8-hour ozone were calculated to be 56.87%.[5]

The presented method indicates that likely emissions from the Proposed Action would not cause increases to secondary 8-hour ozone concentrations in the area that exceed the critical air quality thresholds (SWCA 2019).

Modeling for Visibility Impact Assessment

Federal land managers have developed a technique to screen small or distant sources so they would not cause or contribute to visibility impairment in Class I areas. The Federal Land Managers' Air Quality Related Values Work Group (FLAG) Report provides guidance on the protection of AQRVs and on how to assess potential visibility impairment from sources proposed near Class I airsheds (U.S. Forest Service et al. 2010). Because the proposed lease modification areas are more than 50 miles from the closest Class I area (Arches National Park),

[4] (103.29 tpy NO_x project /1,115 tpy NO_X daily $PM_{2.5}$ MERP) + (0.15 tpy SO_2 project/225 tpy SO_2 daily $PM_{2.5}$ MERP) = 0.092637 + 0.000667 = 0.093303 * 100 = 9.33%

[5] (103.29 tpy NO_X project /184 tpy NO_X MERP) + (7.73 tpy VOC project/1,049 TPY VOCMERP) =0.5613 + 0.00737 = 0.5687 * 100 = 56.87%

the FLAG 2010 initial screening guidance suggests summing the Proposed Action's tons per year emission rates for NO_X, SO_2, PM_{10}, and sulfuric acid mist (H_2SO_4), and dividing this value by the distance (km) from the proposed project to the nearest Class I area to evaluate potential impacts to AQRVs at that nearest Class I area. If this value (the Q/D value) is less than or equal to 10, no further analysis is required.

The distance from the proposed project to the closest border of the Class I area is 53 miles (85 km). Based on the estimated direct emissions from the Proposed Action in Table 3-4 and an estimated 0 tons per year of H_2SO_4 emissions, there would be a total of 139 tons per year of SO_2, NO_X, PM_{10}, and H_2SO_4. Dividing 139 by 85 results in a Q/D value of 1.54, which is less than 10. Therefore, the Proposed Action is not expected to adversely affect the nearest Class I area (or the other two farther away Class II areas). No additional visibility assessment is required (SWCA 2019).

Deposition Impact Assessment

A Level 1 deposition analysis was conducted for the Proposed Action to evaluate the possible effects of its emissions on AQRVs in Class I and special consideration Class II areas. Results for the maximum deposition at each Class I and special consideration Class II area are provided in Table 3-15 for both nitrogen and sulfur (SWCA 2019). These results are compared to Deposition Analysis Thresholds (DATs). A DAT is defined as the additional amount of nitrogen or sulfur deposition below which estimated impacts from a proposed new or modified source are considered negligible (U.S. Forest Service et al. 2010).

Table 3-15. Estimated Maximum Sulfur and Nitrogen Deposition at Class I and Special Consideration Class II Areas (Level 1 analysis)

Constituent	DAT Value (kg/ha/year)	Arches National Park	Canyonlands National Park	Capitol Reef National Park	Turtle Canyon Wilderness	Jurassic National Monument at the Site of the Cleveland Lloyd Dinosaur Quarry	Desolation Canyon Wilderness
Sulfur	0.005	0.00005	0.0022	0.0002	0.00025	0.0007	0.0005
Nitrogen	0.005	0.00615	0.0984	0.0096	0.2399	0.0431	0.1980

Source: SWCA (2019).

Maximum deposition values for sulfur were all below the DAT. Since nitrogen was unable to pass the Level 1 analysis (i.e., the maximum modeled deposition values at Class I and special consideration Class II areas were above the applicable DAT), a Level 2 deposition analysis was then conducted for this constituent. The Level 2 analysis uses AERMOD's deposition algorithms to provide an additional level of refinement beyond the Level 1 analysis (SWCA 2019). Level 2 results for the maximum nitrogen deposition at each Class I and special consideration Class II area are provided in Table 3-16.

Table 3-16. Estimated Maximum Nitrogen Deposition at Class I and Special Consideration Class II Areas (Level 2 analysis)

Constituent	DAT Value (kg/ha/year)	Arches National Park	Canyonlands National Park	Capitol Reef National Park	Turtle Canyon (then) Wilderness Study Area	Jurassic National Monument at the Site of the Cleveland Lloyd Dinosaur Quarry	Desolation Canyon (then) Wilderness Study Area
Nitrogen	0.005	3.4E-07	2.02E-06	4.6E-07	1.3E-05	1.6E-06	4.0E-06

Source: SWCA (2019).

Maximum deposition values for nitrogen were all below the DAT in the Level 2 analysis.

Hazardous Air Pollutants Impact Assessment

Small amounts of HAPs would be emitted as a result of Proposed Action sources, as indicated in the emission inventory. HAPs can cause various adverse health effects, and high levels at the lease boundary could indicate the need for further analysis or mitigation strategies. Therefore, HAPs have been modeled in the AERMOD near-field analysis (SWCA 2019).

The HAP impact assessment compares modeled HAPs concentrations to the following health exposure levels:

- Reference Exposure Levels (RELs): Used to assess acute inhalation exposures (i.e., 1-hour averages) and represent the concentrations at or below which no adverse health effects are expected.
- State of Utah's Toxic Screening Levels (TSLs): Derived from the Threshold Limit Values published in the American Conference of Government Industrial Hygienists *Threshold Limit Values for Chemical Substances and Physical Agents* and based on exposure limits to a healthy adult in the workplace.
- Reference Concentrations (RfC): Represent an estimate of chronic inhalation exposure (i.e., annual average) rate to humans, including sensitive subgroups (children and elderly), without an appreciable risk of harmful effects.

Modeled results for HAPs are shown in Table 3-17. Short-term (1-hour) maximum HAP concentrations are compared to acute (1-hour) RELs and TSLs; long-term (annual) maximum HAP concentrations are compared to chronic (annual) RfCs.

Table 3-17 shows no exceedances of RELs, TSLs, or RfCs.

The potential for non-cancer effects was evaluated by dividing the air exposure concentration by the RfC for each pollutant. This results in what is known as the non-cancer Hazard Quotient (HQ). The HQ for each of the pollutants shown in Table 3-17 is less than 0.03. The total Hazard Index (HI) is calculated by summing the individual HQs for each pollutant. The total HI is compared to the acceptable HI, defined by the EPA as 1. For the proposed project, the total HI is 0.045532512. Therefore, non-cancer risks from the proposed project are not expected from any chemical, alone or in combination with others (SWCA 2019).

Table 3-17. Highest Modeled Results with Acute RELs and Chronic RfCs (1-hour and annual exposure)

HAP	Acute Analysis				Chronic Analysis		
	1-hour REL (µg/m³)	TSL (µg/m³)*	Maximum Modeled 1-hour Concentration (µg/m³)	Complies with REL and TSL?	RfC (µg/m³)†	Maximum Modeled Annual Concentration (µg/m³)	Complies with RfC?
Acetaldehyde	470‡	4,504	11.68	Yes	9	0.09	Yes
Benzene	27‡	18	14.15	Yes	30	0.14	Yes
Formaldehyde	55‡	36.8	17.44	Yes	9.8§	0.27	Yes
n-Hexane	180,000¶	5,875	64.76	Yes	700	2.43	Yes
Toluene	37,000‡	2,512	1.57	Yes	5,000	0.04	Yes
Xylenes	22,000‡	14,473	1.10	Yes	100	0.02	Yes

Source: SWCA (2019).

* Utah Department of Environmental Quality (UDEQ) (2013).

† EPA (2019c).

‡ California Office of Environmental Health Hazard Assessment (2016).

§ The U.S. Agency for Toxic Substances and Disease Registry (ATSDR) chronic MRL of 0.008 ppm was used and converted to µg/m³ where 1 ppm = 1,230 µg/m³ for formaldehyde.

¶ National Institute for Occupational Safety and Health (2019).

To better characterize the risk associated with the modeled concentrations of HAPs, two estimates of cancer risk were performed (Table 3-18); one that corresponds to a most likely exposure (MLE), and one reflective of the maximally exposed individual (MEI). The analysis shows the potential for increased cancer risk for the MEI. The radius needed to predict below one-in-one-million cancer risk for the duration of MEI exposure period of 45 years was estimated at 31 meters from the existing mine adits.

The individual cancer risks for acetaldehyde and benzene are below one-in-one-million cancer risk for the MEI. Estimated cancer risk for formaldehyde is above the lower end of the threshold range of EPA's presumptively acceptable risks (1.0×10^{-4} to 1.0×10^{-6}), representing one excess cancer per 1 million people to one excess cancer per 10,000 people, respectively (SWCA 2019).

Table 3-18. Cancer Highest Risk Assessment: Carcinogenic HAP RfCs, Exposure Adjustment Factors, and Adjusted Exposure Risk

HAP	Carcinogenic Inhalation Unit Risk 1/(µg/m³)*	MLE Assessment			MEI Assessment		
		Exposure Adjustment Factor	Cancer Risk	Within Acceptable Limits?	Exposure Adjustment Factor	Cancer Risk	Within Acceptable Limits?
Formaldehyde	1.300E-05	0.095	3.35E-07	Yes	0.643	2.27E-06	Yes
Acetaldehyde	2.200E-06	0.095	1.81E-08	Yes	0.643	1.22E-07	Yes
Benzene	7.800E-06	0.095	1.02E-07	Yes	0.643	6.89E-07	Yes
Total			4.55E-07	Yes		3.08E-06	Yes

Source: SWCA (2019).

* Annual average concentration

The results in Table 3-18 show that modeled long-term risk from acetaldehyde and benzene for the MLE and MEI are below $1x10^{-6}$. The MLE risk for formaldehyde is also below $1x10^{-6}$. The MEI risk for formaldehyde is within the acceptable range of 1 to $1x10^{-4}$. When benzene, acetaldehyde, and formaldehyde risks are added together, risks are below MLE and within the acceptable risk range (MEI) (SWCA 2019). The MEI analysis shows the potential for increased risk of cancer. Estimated cancer risk for formaldehyde is above the lower end of the threshold range of EPA's presumptively acceptable risks (1.0 × 10-4 to 1.0 × 10-6), representing 1 excess cancer per 1 million people to 1 excess cancer per 10,000 people, respectively. It should be noted that the maximum predicted concentrations and incremental risk estimates are very localized. The radius needed to predict below 1-in-1-million cancer risk for the duration of MEI exposure period of 45 years was estimated at 31 meters from the existing mine adits (SWCA 2019). It is highly unlikely that this MEI exposure situation could occur in reality; therefore, this risk is considered negligible.

3.2.3.5 Social Cost of Carbon

The Social Cost of Carbon (SCC) is an estimate of the economic impacts associated with an increase in carbon dioxide emissions (typically expressed as the cost in dollars per metric tons of emissions). A protocol to estimate the SCC associated with GHG emissions was developed by a federal Interagency Working Group to assist agencies in addressing Executive Order 12866, which requires assessment of the cost and the benefits of proposed regulations as part of their regulatory impact analyses. As explained in the Executive Summary of the 2015 *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866*, "the purpose of the 'social cost of carbon' (SCC) estimates…is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that impact cumulative global emissions." While the SCC protocol was created to meet the requirements for regulatory impact analyses during rulemakings, there have been requests by public commenters to expand the use of SCC estimates to project-level NEPA analyses.

The decision was made not to expand the use of the SCC protocol for this EA for a number of reasons. First, this action is not a rulemaking for which the SCC protocol was originally developed. Second, on March 28, 2017, the President issued Executive Order 13783, which, among other actions, withdrew the technical support documents on which the SCC protocol was based and disbanded the Interagency Working Group. The Executive Order further directed agencies to ensure that estimates of the social cost of GHGs used in regulatory analyses "are based on the best available science and economics" and are consistent with the guidance contained in Office of Management and Budget (OMB) Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates." In compliance with OMB Circular A-4, interim protocols have been developed for use in the rulemaking context. However, Circular A-4 does not apply to analyses of proposed projects.

Further, NEPA does not require a cost-benefit analysis (40 CFR 1502.23), although it does require consideration of "effects" that include "economic" and "social" effects (40 CFR 1508.8(b)). Without a complete monetary cost-benefit analysis, which would include the social benefits of the Proposed Action to society as a whole, and other potential positive benefits, inclusion of a SCC cost analysis solely would be unbalanced, potentially inaccurate, and not

useful in facilitating the authorized officer's decision on the Proposed Action. Any increased economic activity, in terms of revenue, employment, labor income, total value added, and output that is expected to occur as a result of the Proposed Action is simply an economic impact, rather than an economic benefit, because such impacts might be viewed by another person as negative or undesirable impacts due to potential increases in local population, competition for jobs, and concerns that changes in population will change the quality of the local community. Economic impact is distinct from "economic benefit" as defined in economic theory and methodology, and the socioeconomic impact analysis required under NEPA is distinct from cost-benefit analysis, which, as mentioned above, is not required.

Finally, the SCC protocol does not measure the actual incremental impacts of a project on the environment and does not include all the positive or negative effects of carbon emissions. The SCC protocol estimates economic damages associated with an increase in CO_2 emissions and includes, but is not limited to, potential changes in net agricultural productivity, human health, and property damages from increased flood risk over hundreds of years. The estimate is developed by aggregating results "across models, over time, across regions and impact categories, and across 150,000 scenarios" (Rose et al. 2014). The dollar cost figure arrived at based on the SCC calculation represents the value of damages avoided if, ultimately, there is no increase in carbon emissions. But the dollar cost figure is generated in a range and provides little benefit in assisting the authorized officer's decision for project level analyses. For example, in a recent environmental impact statement, OSMRE estimated that the selected alternative had a total SCC ranging from approximately $4.2 billion to $22.1 billion depending on dollar value and the discount rate used (OSMRE 2019). Further, OSMRE estimated that the total SCC for the No Action Alternative ranged from $2.0 billion to $10.7 billion (OSMRE 2019). As applied to the proposed lease modification areas, given the uncertainties associated with assigning an accurate SCC resulting from 3 additional years of operation under the Proposed Action, and given that the SCC protocol and similar models were developed to estimate impacts of regulations over long time frames, this EA quantifies direct and indirect GHG emissions and evaluates these emissions in the context of county, state, and U.S. GHG emissions as discussed in Section 3.2.3.3 of this EA.

To summarize, this EA does not undertake an analysis of SCC because 1) it is not engaged in a rulemaking for which the protocol was originally developed; 2) the Interagency Working Group, technical supporting documents, and associated guidance have been withdrawn; 3) NEPA does not require cost-benefit analysis; and 4) the full social benefits of coal-fired energy production have not been monetized, and quantifying only the costs of GHG emissions but not the benefits would yield information that is incomplete, potentially inaccurate, and not useful.

3.2.3.6 Cumulative Effects

Past, present, and reasonably foreseeable future actions affecting air quality and greenhouse gas emissions are described in Section 3.1.3.

Current emissions in the air quality analysis area are reflected in the ambient air quality data shown in Table 3-2. Mining of the proposed lease modification areas would not increase annual emissions currently occurring from the Lila Canyon Mine because it would be a continuation of existing mining operations (there would be no change in annual production). However, the life of

the Mine would be extended for approximately 3 years. The proportion of emissions over the 3-year period that would be directly attributable to the mining of the proposed LMA areas is unknown. However, the emissions from the proposed LMA areas during this 3-year period would add incrementally to any emissions in the analysis area from reasonably foreseeable future actions, such as underground coal mining in the Williams Draw area or the SITLA leases (T. 16 S., R. 14 E., sec. 36 and T. 16 S., R. 15 E., sec. 32). These future actions would require environmental analysis and UDEQ-issued air quality permits to ensure that emissions do not exceed the NAAQS before any mining begins.

The Lifting the Pause on the Issuance of New Federal Coal Leases for Thermal (Steam) Coal EA (Lifting the Pause EA) (BLM 2019) analyzes the potential effects on GHG emissions from the mining and combustion of federal coal. The Lifting the Pause EA estimates that the cumulative GHG emissions from combustion of federal coal that has been applied for or authorized would be approximately 6,903.6 MMT of CO_2e (20-year GWP) and 6,859.2 MMT of CO_2e (100-year GWP). This estimate includes coal tonnages from the proposed Lila Canyon Mine LMA, the Williams Draw LBA, and the Walker Flat LBA. Total expected emissions resulting from the combustion of coal extracted from the approximately 1,280-acre SITLA lease areas are not included in the Lifting the Pause EA and have not yet been calculated.

The Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (IPCC) (AR5) (IPCC 2014) includes a summary of data from 30 different global climate models that evaluate the natural systems and feedback mechanisms contributing to climate variability. A range of global GHG emissions scenarios known as representative concentration pathways (RCP) were considered in the modeling analysis to assess potential degrees of climate change impacts. A stringent mitigation scenario (RCP2.6), a low emissions scenario (RCP4.5), an intermediate emissions scenario (RCP 6.0), and an aggressive emissions scenario (RCP8.5) are evaluated in the report. These scenarios correspond to atmospheric concentrations of CO_2 by the year 2100 of 421 ppm for RCP2.6, 538 ppm for RCP4.5, 670 ppm for RCP6.0, and 936 ppm for RCP8.5. The range of likely change in global surface temperature by 2050 ranges from 0.3 to 1 degree Celsius for the RCP2.6 scenario and from 0.5 to 2.0 degrees Celsius for the RCP8.5 scenario. Generally, the more stringent climate change mitigation, the lower the projected change in global surface temperatures. When discussing regional impacts, however, it is important to note that degrees of surface temperature increases vary from region to region. To discuss the cumulative impacts of GHG emissions for the project area, regional-scale projected impacts are discussed for the state of Utah.

The U.S. Geological Survey (USGS) has produced GHG estimates from the extraction, mid-stream (processing, transportation and distribution) and end-use combustion of fossil fuels produced on federal lands in the United States over a 10-year period (2005–2014) (Merrill et al. 2018). In 2014, nationwide gross GHG emissions from fossil fuels extracted from federal lands were 1,332.1 MMT CO_2e. Emissions from fossil fuels produced on federal lands represent, on average, 23.7% of national emissions for CO_2, 7.3% for CH_4, and 1.5% for N_2O over the 10 years included in this estimate (Merrill et al. 2018). Trends and relative magnitude of emissions are roughly parallel to production volumes.

GHG emissions in the United States in 2017 totaled 6,456.7 MMT CO_2e (EPA 2019a). GHG emissions in the state of Utah in 2018 totaled 35.1 MMT CO_2e (EPA 2018). GHG emissions in

Emery County in 2018 totaled 13.5 MMT CO_2e (EPA 2018). Because all the reasonably foreseeable future actions that involve coal mining are existing mining operations for which the future actions would extend production rather than increase production, the average annual GHG emissions from these mines are captured in these totals. The 12.2 MMT of direct and indirect CO_2e emissions from the coal mined from the proposed LMA areas over approximately 3 years (see Table 3-13) would contribute to statewide, regional, and national GHG emissions totals. Over that 3-year period, 12.2 MMT of CO_2e would average 4.1 MMT of CO_2e per year, representing approximately 0.06% of the total 2017 GHG emissions in the United States; approximately 11.7% of the total 2018 GHG emissions in the state of Utah; and approximately 30.4% of the total 2018 GHG emissions in Emery County. GHGs, regardless of the source, contribute incrementally to climate change. Although GHG emissions resulting from individual decisions can certainly be modified or potentially prevented by analyzing and selecting reasonable alternatives that appropriately respond to the action's purpose and need, the BLM has limited decision authority to meaningfully or measurably prevent the cumulative climate change impacts that result from global emissions.

The BLM prepared the Colorado Plateau Rapid Ecological Assessment (CPREA) to provide regional scale information and assessment analysis on current and future conditions for the Colorado Plateau. This modeling analysis includes an assessment of potential climate change impacts (BLM 2012b). In general, this modeling predicts future average annual temperature increases. Average annual precipitation is generally predicted to decrease (drier) through 2030 and increase (wetter) through 2060.

The USGS National Climate Change Viewer (USGS 2019) can be used to evaluate potential climate change at the state level. The viewer provides data showing projections of future climate trends under RCP emission scenarios RCP4.5 and RCP8.5. Data presented in the USGS Climate Change Viewer data can also be extrapolated to get a general understanding of impacts under RCP2.6 and RCP6.0. Generally, the RCP2.6 scenario can be assumed to contribute to a lesser degree of climate change impacts in the region, while the RCP6.0 can be assumed to contribute to impacts that are of lesser magnitude than RCP8.5 but of greater magnitude than RCP4.5. The USGS National Climate Change Viewer (USGS 2019) can be used to evaluate potential climate change at the state and county level. Projected changes to maximum and minimum temperatures in Utah resulting under a moderate GHG emissions scenario show both the maximum and minimum temperatures leveling off at approximately 5°F warmer than historical temperatures by the year 2100, while an aggressive GHG emissions scenario (RCP8.5) shows an increasing trend (approximately 5°F higher than the RCP4.5 scenario) at year 2100 (USGS 2019). The RCP4.5 and RCP8.5 scenarios forecast similar levels of climate impacts in the region over the next few decades; however, impacts over the next century diverge significantly. Because of uncertainties in the climate models, especially toward the end of the century, the impacts projected represent a forecast but are not certain to occur at the magnitudes projected. It is important to note that the high-end nature of the RCP8.5 scenario assumes a baseline without any future climate policy rather than the most likely "business as usual" outcome. Therefore, RCP8.5 could be considered unlikely to happen, while RCP4.5 and RCP6.0 would be more likely the representative scenarios.

3.3 Socioeconomics

The analysis area for potential direct, indirect, and cumulative socioeconomics effects comprises Emery County and communities within Emery and Carbon Counties that are located near the Lila Canyon Mine (i.e., East Carbon, Sunnyside, Price, Wellington, and Green River). This analysis area was chosen because it is the area where potential impacts from employment, taxes, and revenue resulting from the development of the proposed lease modification areas would occur. This includes direct employment and income from mining jobs; indirect employment and income from coal transportation; the purchasing of mining equipment, fuel, and other vendor services and products; and royalties and tax revenues from coal production and sales.

3.3.1 Affected Environment

3.3.1.1 Employment

In 2017, total employment in Emery County was approximately 3,052 jobs (Utah Department of Workforce Services [UDWS] 2018). Trade, transportation, and utilities was the largest employment sector of Emery County, representing approximately 941 jobs (UDWS 2018). The second- and third-largest employment sectors in the county were government (approximately 884 jobs) and construction (approximately 299 jobs). Mining accounted for approximately 224 jobs in Emery County in 2017, or approximately 7% of total employment (UDWS 2018).

According to UDWS, the average monthly wage in Emery County in the mining sector was $6,446 in 2017 (UDWS 2018). The average monthly wage for all employment sectors in the county was $3,594 in 2017.

In 2017, total employment in Carbon County was approximately 8,414 jobs (UDWS 2018). Government was the largest employment sector of Carbon County, representing approximately 2,158 jobs (UDWS 2018). The second- and third-largest employment sectors in the county were trade, transportation, and utilities (approximately 1,793 jobs), and education and health services (approximately 1,321 jobs). Mining accounted for approximately 612 jobs in Carbon County in 2017, or approximately 7% of total employment (UDWS 2018).

According to UDWS, the average monthly wage in Carbon County in the mining sector was $7,875 in 2017 (UDWS 2018). The average monthly wage for all employment sectors in the county was $3,211 in 2017.

3.3.1.2 Taxes and Revenues

Fiscal effects from mining industry activities come in the form of various taxes and revenues paid by mining companies and the federal government to state and local governments where coal production occurs. Income taxes from coal mining wages are one of these fiscal effects because income taxes from jobs in the mining sector are collected by and paid to counties.

In addition to fiscal effects from taxing income, state and local governments receive other types of taxes, royalties, and funds as a result of mining activities in Emery County, such as:

- Property taxes paid on coal mines in Emery County.
- Property taxes paid on coal-fired power plants in Emery County (Hunter Plant and Huntington Plant).
- Rents and royalties paid for coal production on SITLA lands in Emery County.
- Federal coal royalty payments and disbursements to the State of Utah.

There are currently four active coal mines in Emery County. These mines and their recent production rates are listed in Table 3-19. Lila Canyon Mine reported 2,815,678 tons of coal production in 2018 (UEI 2019b).

Table 3-19. Emery County Coal Mine Production (tons)

Mine	2013	2014	2015	2016	2017*
Emery II	4,000	–	–	–	129,000
Castle Valley #3	–	–	218,000	170,000	175,000
Castle Valley #4	875,000	1,061,000	757,000	724,000	783,000
Lila Canyon	257,000	335,000	350,000	1,587,000	1,629,000

Source: Boden et al. (2018).
* Preliminary

According to the ONRR, 2,671,777 tons of coal were produced from federal lands in Emery County in 2017 (ONRR 2019). The Department of the Interior applies an 8% royalty rate to coal extracted from underground mines on federal lands. Federal revenues from coal mining on federal lands in Emery County amounted to approximately $6.2 million in 2017 (ONRR 2018a, 2018b). Half of the revenue collected from royalties is disbursed back to the state of Utah, and half of the revenue disbursed to the state is typically disbursed to the county where the coal was extracted.

3.3.2 Environmental Impacts – Alternative A: No Action

Under the No Action Alternative, the BLM would not approve the proposed lease modifications and there would be no extraction of recoverable coal in the proposed lease modification areas. Therefore, there would be no direct or indirect impacts to the social and economic conditions of the analysis area. The local population, employment, housing conditions, and revenue would remain similar to current conditions because mining would continue in other areas of the Lila Canyon Mine. However, changes in other local industries could impact the socioeconomics of the analysis area. The extension of mining operations at the Lila Canyon Mine for an additional 3 years and associated employment and economic impacts would not occur under the No Action Alternative.

3.3.2.1 Cumulative Effects

Under the No Action Alternative, the BLM would not approve the proposed lease modifications. The current rates of employment, taxes, and revenue at the Lila Canyon Mine would continue

under the No Action Alternative, but there would be no cumulative effect on socioeconomics in the analysis area from the approximately 3-year extension in the life of the Mine that would result from the Proposed Action, if it had been approved.

3.3.3 Environmental Impacts – Alternative B: Proposed Action

3.3.3.1 Employment

Under the Proposed Action, coal production and employment levels at the Lila Canyon Mine would not increase but would be extended for an additional 3 years. As of early 2020, the Lila Canyon Mine employs 238 people. This approximate level of employment would be expected to continue during the additional 3-year time period. The continuation of direct employment effects would be minor over the extended life of the Mine because it would represent an estimated 2% of total employment in Emery and Carbon Counties.

The Proposed Action would also support secondary mining support jobs for an additional 3 years. Based upon 2017 Utah coal mining employment numbers, for every direct coal mining job in Utah, there are approximately 2.3 indirect/induced jobs (National Mining Association 2018). This translates to approximately 547 indirect jobs in place for the additional 3-year period of mine operation. Other indirect effects to the local economy would continue through the purchase and use of goods and services needed for mine operations, vehicles, and employees. The continuation of indirect employment effects would be minor over the extended life of the Lila Canyon Mine because it would represent an estimated 4% of total employment in Emery and Carbon Counties.

Under the Proposed Action, the mining sector's share of the workforce in Emery and Carbon Counties would not change. However, geographies with economies that focus narrowly on resource extraction, particularly on fossil-fuel development, can be subject to boom-and-bust cycles, as well as other economic challenges, such as slower long-term economic growth. Because of changes in external market pressures, natural resource economies are often vulnerable to unpredictable cycles of economic growth and recession. This can present challenges to communities in the form of fluctuating tax bases, demands for public infrastructure and social services, employment numbers, housing prices, and migration of workers into and out of a particular area.

3.3.3.2 Taxes and Revenues

Taxes and royalty payments from the mining of coal in the proposed lease modification areas would provide direct revenue to the state of Utah and federal government at approximately the same rate that currently occurs because the Proposed Action is a continuation of mining. However, the Proposed Action would add approximately 3 additional years to the life of the Lila Canyon Mine, which would extend the amount of time revenue is provided to the state and federal government.

In 2017, the average sales price for Utah coal was $35.28 per ton (U.S. Energy Information Administration 2019). Assuming the coal mined from the proposed lease modification areas area would be priced similarly, the 9.1 million tons of total coal produced from the proposed modification areas would result in approximately $321 million in total revenue. At a royalty rate of 8% for coal removed from an underground mine (Federal Coal Lease stipulations and 25 CFR

211.43), this would result in approximately $25.7 million in total federal royalty revenues, approximately $12.9 million in total state revenue from royalty disbursement, and approximately $6.5 million in total Emery County revenue from royalty disbursement. This Emery County disbursement is generally used for community impacts funds resulting from coal mining activities. The disbursement is commonly used for road maintenance, utility maintenance, and so forth. The approximately $6.5 million in total royalty disbursement to Emery County would result in an approximately $2.2 million in royalty disbursement to the county each year over 3 years of mining coal from the proposed lease modification areas.

3.3.3.3 Cumulative Effects

The Proposed Action would increase the life of the Lila Canyon Mine but would not affect employment levels at the Mine. The cumulative effects on demographics and housing in the socioeconomics analysis area would result from a 3-year extension of employment. The Proposed Action would incrementally add to the revenue and royalties of other active coal mines in the analysis area, including Emery II, Castle Valley #3, and Castle Valley #4. As shown in Table 3-19, total annual coal production at these three mines was approximately 1.1 million tons in 2017. Assuming these three mines were to produce at a similar rate over the 3 years during which coal would be mined from the proposed lease modification areas, these three mines would produce approximately 3.3 million tons of coal during those 3 years. Combined with the 9.1 million tons produced from the proposed lease modification areas over those 3 years, this would be approximately 12.4 million tons. At $35.28 per ton, the total production from these four mines over 3 years would sell for approximately $437.5 million. The royalties paid to the federal government at an 8% royalty rate would be approximately $35.0 million over those 3 years, or approximately $11.7 million per year. The state would receive approximately $5.9 million per year from these royalties, half of which (approximately $3.0 million) would go to Emery County.

3.4 Water Resources

3.4.1 Affected Environment

The analysis area for examining potential direct, indirect, and cumulative impacts to water resources is the analysis area for the Cumulative Hydrologic Impact Assessment (CHIA) for the Lila Canyon Mine (DOGM 2007). This analysis area was chosen because the hydrogeology and hydrology of the areas surrounding the proposed lease modification areas has been studied extensively as part of investigations related to mine permitting activities over the years (BLM 2000; Cirrus and Petersen 2017; DOGM 2007, 2010). The proposed lease modification areas lie within the area analyzed in the Lila Canyon MRP and the CHIA for the Lila Canyon Mine (DOGM 2007). The area analyzed in the Final Hydrology Assessment for Williams Draw Coal Tract (Cirrus and Petersen 2017) is within the cumulative impact area (CIA) defined in the CHIA and adjacent to the proposed lease modification areas. According to the CHIA, “the CIA is a designated area surrounding mining activity within which past, present, and anticipated or foreseeable coal mining activities may interact to affect the surface and groundwater” (DOGM 2007). The CIA of the CHIA is approximately 73,000 acres and extends from the Patmos Ridge on the east side to the Price River on the west side. Water resources in these areas are evaluated by use and interpretation of existing field monitoring data and reports. The analysis of effects includes the potential of 1) the direct interception of groundwater resources through mine

dewatering, and 2) the alteration of groundwater recharge areas, flowpath areas, or discharge areas as a result of mining-induced fracturing from sub-surface subsidence.

Surface water resources in the proposed lease modification areas include ephemeral streams and two springs. There are no perennial streams in these areas. The closest perennial stream is Range Creek, located outside of the CIA identified in the CHIA, and beyond the Patmos Ridge to the east of the proposed lease modification areas. The Patmos Ridge defines the eastern boundary of the CIA evaluated in the CHIA. Groundwater resources in the proposed lease modification areas include active-zone and inactive-zone groundwater systems.

3.4.1.1 Groundwater

Groundwater in the proposed lease modification areas is extremely limited due to low precipitation and low recharge rates; it exists in two different geologic formations: the upper zone, Wasatch Group, and the lower zone, Mesaverde Group. The Wasatch Group consists of the North Horn—Flagstaff, and Colton Formations and extends throughout the eastern portion of the Lila Canyon Mine area (DOGM 2007). Some saturated zones of the North Horn Formation of the Wasatch Group are considered to be true aquifers using the definition as stated in Utah Administrative Code (UAC) R645-100 (as in effect February 1, 2019) where an aquifer "means a zone, stratum, or group of strata that can store and transmit water in sufficient quantities for a specific use" (UAC 645-100 2019). Groundwater in the Wasatch Group is an active-zone groundwater system because shallow-depth rock units are connected to a recharge area, the soils have sufficient capacity to store water and discharge it to springs, and groundwater migration to deeper inactive systems is mostly prevented by the presence of impermeable rock formations such as clay layers (DOGM 2007).

Groundwater in the Blackhawk Formation of the Mesaverde Group does not reside in a true aquifer using the above definition because "although a considerable volume of water may be stored, the water is not developed for a specific use, the strata do not transmit ground water to supply any water sources, and the water has no potential to be used or developed nor is it elemental to preserving the hydrologic balance in the permit and adjacent areas" (DOGM 2007). Further, the groundwater system is described as being inactive because it does not respond to seasonal and climatological variability. There is minimal interaction between groundwater in the Wasatch Group and Mesaverde Group as they are generally lenticular and perched or separated by impermeable clay layers. There are no groundwater discharge points from the Mesaverde Group anywhere in the CIA of the CHIA (DOGM 2007). A geologic section is shown in Figure 3-3.

Because the Blackhawk Formation is confined by low permeability shales and siltstones, where groundwater exists, groundwater movement is more likely to be horizontal rather than vertical. Horizontal flow in the deep, inactive-zone groundwater system, if it exists at all, is from higher elevation areas of the West Tavaputs Plateau and Range Creek toward lower elevations (DOGM 2007). Groundwater flow direction (perpendicular to the equipotential lines of hydraulic head) is to the northeast, which approximates the bedrock dip in the area (Cirrus and Petersen 2017).

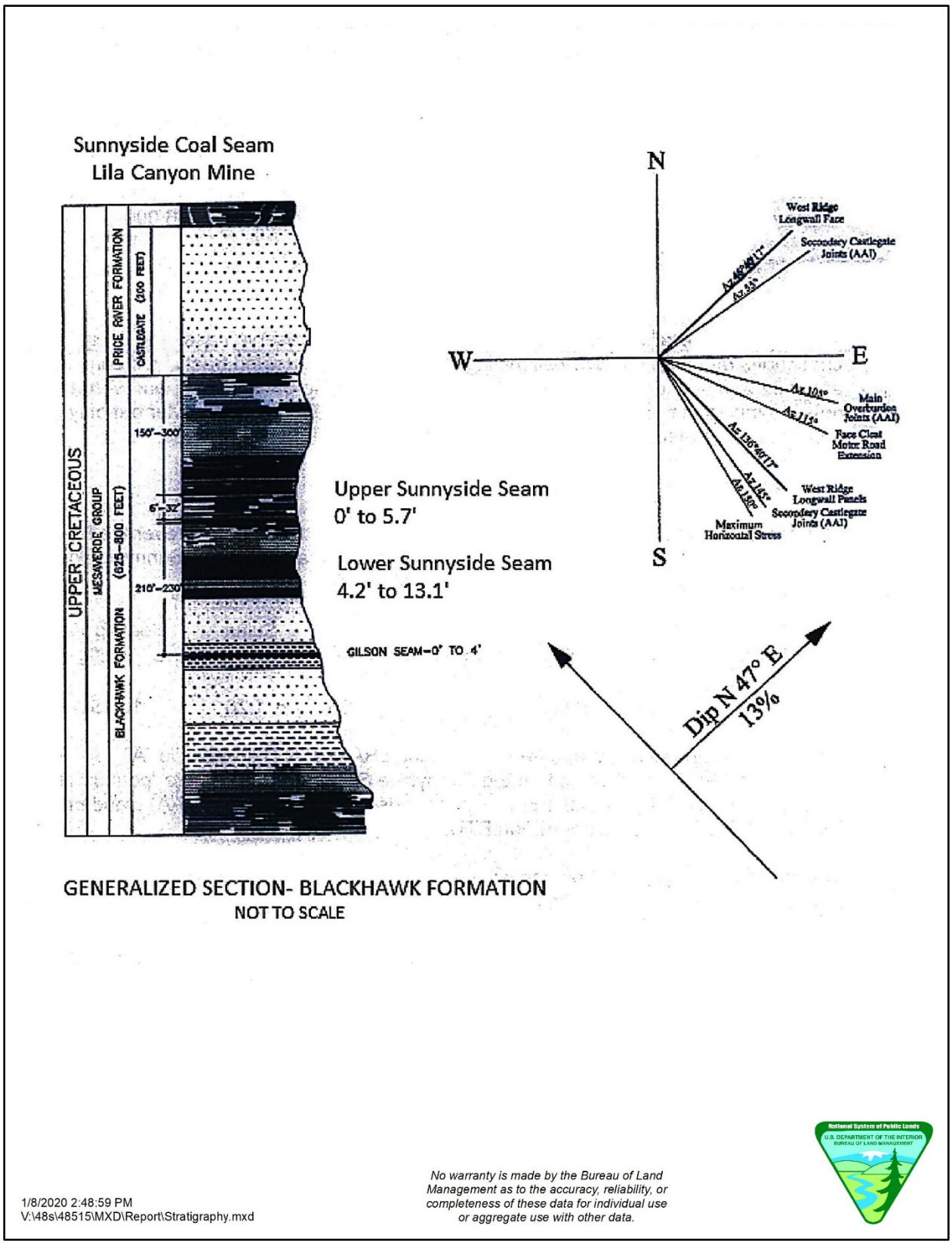

Figure 3-3. General geologic section.

Groundwater in the North Horn Formation of the Wasatch Group, the active-zone system, is primarily recharged by precipitation in the form of snowmelt, and discharges from springs at the surface. According to the CHIA, groundwater recharge in the Book Cliffs region has been estimated to be between 3% to 8% (Danielson and Sylla 1983) and 9% (Waddell et al. 1986) of the average annual precipitation. Recharge from precipitation is variable as the groundwater recharge rate is also influenced by timing and rate of precipitation, as well as soil type. Groundwater flow in the Wasatch Group is influenced by gravity and local geologic features such as bedrock fractures. In general, groundwater flows from areas of recharge toward areas of discharge.

Groundwater quality in the Wasatch Group can be measured by analysis of water samples collected from springs that discharge at the surface or by drilling wells. UEI has sampled several water monitoring stations on a quarterly basis since 2007, per conditions of the C/007/0013 Lila Canyon Mine permit approval. That information is reported electronically to the DOGM and summarized in reports to the DOGM permit supervisor.

Groundwater quality varies greatly in the Book Cliffs region and is mostly dependent on geologic formation and elevation. Total dissolved solids (TDS) is a measure of the total amount of dissolved constituents in water and is a commonly used indicator of groundwater quality. TDS concentrations in shallow groundwater in the Book Cliffs region range from 250 milligrams per liter (mg/L) to 2,000 mg/L and are driven by the type and amount of soluble minerals in the geologic formation (DOGM 2007). In addition, groundwater quality is typically better near areas of mountain recharge and diminished in lowland areas (DOGM 2007).

Three piezometers (IPA-1, IPA-2, and IPA-3), devices used to monitor the pressure or depth of groundwater, were installed in the Lila Canyon Mine DOGM permit area in the 1990s to monitor groundwater levels in the Blackhawk Formation of deep groundwater zone. Groundwater level data from the piezometers between 1994 and 2016 are summarized in the Final Hydrology Assessment (Cirrus and Petersen 2017). IPA-2 and IPA-3 are located in the same fault block. Water levels in the monitoring wells are monitored quarterly according to DOGM permit requirements. Water levels in these three wells remained relatively stable over more than two decades of monitoring—from installation in 1994 until approximately 2015 (Cirrus and Petersen 2017). Monitoring well IPA-3 was destroyed as a result of mining activities; it was sealed in October 2017. Water levels in the remaining two wells have generally decreased since 2015 (Figure 3-4).

IPA-1 is located in a different fault block than IPA-2 and IPA-3. DOGM noted in 2007 that water levels had risen continually at this location during the period of record (DOGM 2007). The rise in water level at IPA-1 is not understood, although the potential explanations offered by DOGM in 2007 (a leaking annular seal allowing surface water to reach the monitored zone, a bore-hole that had not yet reached equilibrium, and a Horse Canyon Mine exploration tunnel) were not related to mining activity (DOGM 2007).

Water levels lowered steadily in IPA-1 from the winter of 2016–2017 until the spring of 2019, compared with a more rapid decrease in IPA-2 from the summer of 2015 through the spring of 2017. IPA-2 then recorded a short-lived recharge that again rapidly depleted. Water levels in

both wells appear to have leveled off at a water elevation of approximately 5,775 feet during the summer and fall of 2019.

The monitoring wells were installed to monitor potentiometric levels in the deep groundwater systems near the Sunnyside coal seam (Cirrus and Petersen 2017). The two wells are showing different responses to the mining activity as shown in Figure 3-4. IPA-1 is approximately 1.5 mile to the northeast of the IPA-2 and the two wells are separated by a fault (DOGM 2007), with screened intervals separated by approximately 600 feet in elevation differences. The screened intervals are the segments of the well equipped with filtering devices to allow intake of groundwater while keeping sand and gravel out of the well. IPA-1 is screened from 1,700 to 1,730 feet and IPA-2 from 1,101 to 1,116 feet below ground surface (Cirrus and Petersen 2017).

The monitoring wells are screened within the deeper aquifer described as an Inactive Groundwater Flow System by Mayo et al. (2003). Groundwater in this aquifer is characterized as old (2,000 to 20,000 years) with a general lack of hydraulic communication with the ground surface and active recharge zones (Cirrus and Petersen 2017). The system's general lack of communication, both vertically and horizontally, has been attributed to:

- an abundance of low-permeability rocks in the sequence;
- faults and fractures in the system that can provide for the movement of water in this system can be sealed by swelling clays (DOGM 2007); and
- the lenticular, discontinuous nature of the interbedded, more permeable, horizons that limit the extent of potential groundwater movement.

Generally, during the advancement of longwall mining in the region, little groundwater is encountered. Both roof and floor inflows are generally from sandstone channels within the supporting units, with occasional substantial inflows from fault-related drainage zones (Mayo et al. 2003). Longer-term mine inflows show a rapid decline in flow rates and ultimate extinction. Dewatering and subsidence related to mining have the greatest potential for impacting groundwater resources (DOGM 2007). Underground mining removes the support to overlying strata, and the subsequent fracturing and subsidence-induced caving can create conduits that allow groundwater to enter the mine.

Review of water quality memos from the DOGM database indicates that there was an initial low discharge recorded in the first quarter 2017 around the time of the initial lowering of water levels (see Figure 3-4). A period of greater discharge (approximately 880 gallons per minute [gpm]) was recorded in the fourth quarter 2018 to first quarter 2019, corresponding to what appears to be the final lowering of the potentiometric surface.

The two wells are showing different responses to the mining activity. IPA-1 is located approximately 1 mile north of IPA-2, and the two wells are separated by a fault (DOGM 2007). Although the mine plan has not been reviewed, it is inferred that IPA-2 is closer to the mine operations, as the third monitoring well, IPA-3, is located approximately 1 mile farther to the southeast of IPA-2. In addition to the potential difference in lithologies described above, its closer proximity to mine operations may explain the more rapid lowering of the potentiometric surface in IPA-2. Additionally, different responses to subsidence within the mine may also produce differing hydrographs.

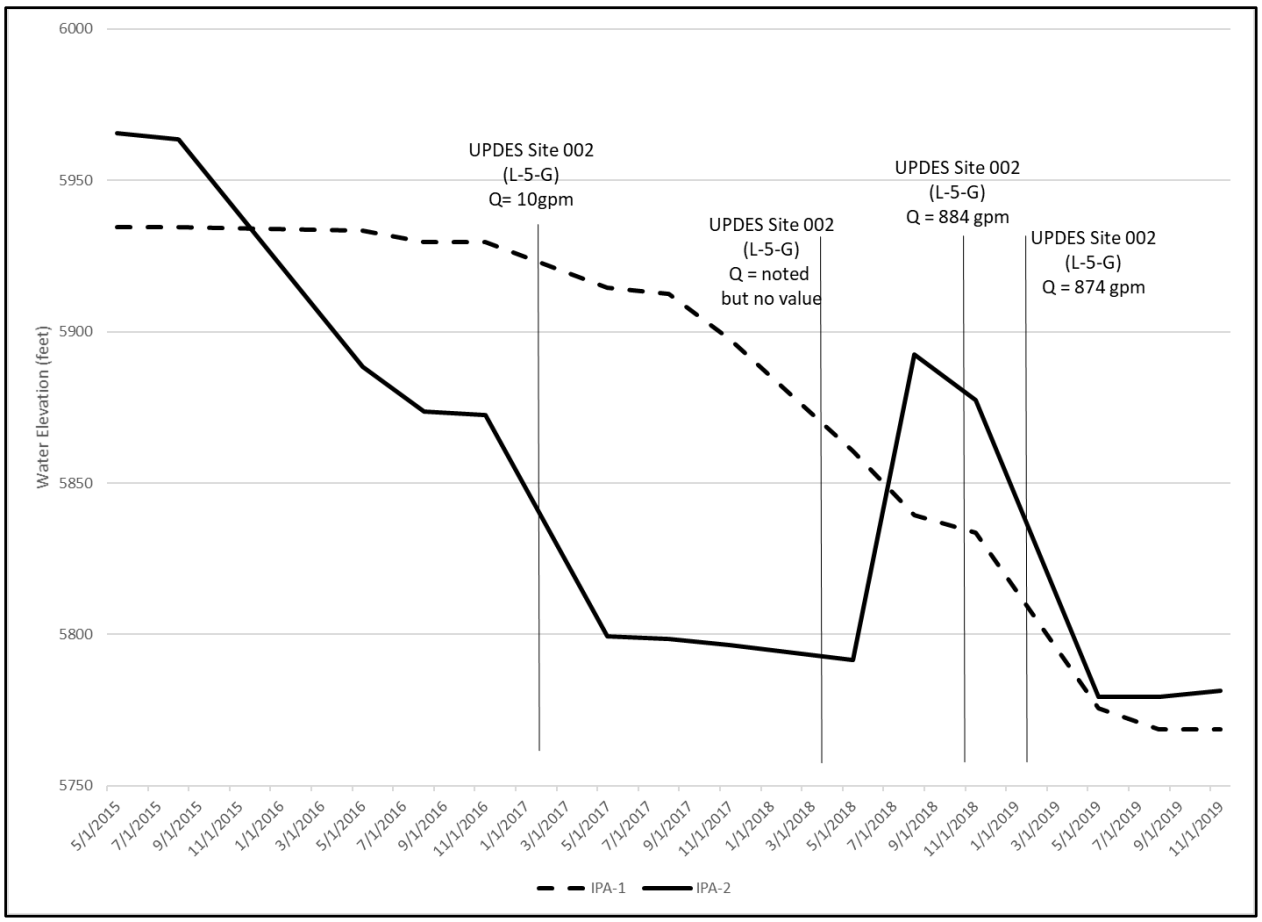

Figure 3-4. Hydrographs for monitoring wells IPA-1 and IPA-2 for the period Q2 2015 to Q4 2019 shown with discharge data from DOGM database.
Discharge data source: DOGM (2020).

Under Rule R645-301-751 of Utah Administrative Code, water that is discharged from a coal mine must meet applicable water quality standards. Any groundwater that exceeds the amount needed for mining operations would be stored, treated, then discharged in compliance with UPDES Permit No. UTG040000: General Permit for Coal Mining, which has effluent limitations so that discharged water will meet applicable state water quality standards (Utah Division of Water Quality [UDWQ] 2013). Permit limitations would not change under the Proposed Action. Water quality of the mine discharge is monitored on a monthly basis by UEI; results are reviewed by UEI and provided to UDWQ. The UPDES permit for the Lila Canyon Mine contains daily maximum concentration limitations for individual pollutants, as well as a discharge limit of 1 ton per day of TDS from all discharge points combined.

The Lila Canyon Mine UPDES permit identifies two discharges: 001 is discharge from the sediment pond and 002 is discharge from the underground mine. These discharges are being monitored as sites L-4-S and L-5-G, respectively. The UPDES permit specifies monitoring frequency and required parameters.

3.4.1.2 Surface Water

The proposed lease modification areas are in the Little Park Wash subwatershed (Hydrologic Unit Code [HUC] 140600071107), which is part of the larger Price River watershed. The proposed lease modification areas lie to the east of the Little Park Wash and contain several tributary drainages that carry ephemeral surface flows from the Patmos Ridge toward the Little Park Wash (Figure 3-5). Little Park Wash is the largest surface water feature in the vicinity and is an ephemeral stream channel that runs for approximately 14 miles before joining with Trail Canyon. Trail Canyon is connected to the Price River by a dry wash. The Price River ultimately joins the Green River about 19 miles south of Trail Canyon (Cirrus and Petersen 2017).

Tributary channels in in the proposed lease modification areas are mostly narrow, incised channels with coarse substrate. The tributary drainages enter the proposed lease modification areas at about 6,800 to 7,100 feet and enter the Little Park Wash at about 6,200 to 6,400 feet with a slope that ranges from 2% to 10%. The tributary channels are "generally narrow, somewhat incised, with relatively coarse substrate or bedrock" (Cirrus and Petersen 2017).

Surface flows in the tributary drainages are driven by precipitation events and seasonal runoff, which is typical of other arid watersheds in the Book Cliffs region. Field monitoring data collected from 2016 to 2017 indicates that "rain events have a greater influence on surface hydrology in comparison to snowmelt runoff" (Cirrus and Petersen 2017). Surface flows in the tributary drainages from low precipitation events rapidly infiltrate channel substrate and are unlikely to reach Little Park Wash (Cirrus and Petersen 2017). Flow data to characterize the amount of surface flow from tributary drainages in the proposed lease modification areas are not available.

According to the CHIA for the Lila Canyon Mine, "some of the draws that supply these stream channels contain springs, which flow perennially for short distances then filter into the channel deposits. All the springs on the CIA flow less than 10 gpm [gallons per minute] and most flow only one or two gpm" (DOGM 2007). Springs that discharge from the active-zone groundwater system in the North Horn Formation are generally located in existing stream channels. As indicated above, surface flow from springs only travels for a short distance in the stream channels before infiltrating into the ground. In general, springs discharging from the North Horn Formation are active in the spring and early summer and are dry for the remainder of the year (Cirrus and Petersen 2017).

Beneficial uses for surface waters of the state are assigned by the UDWQ for each assessment unit in Utah. Assessment units are discrete sub-watershed units delineated by UDWQ. The proposed lease modification areas lie within the Grassy Trail Creek Lower assessment unit, which includes Grassy Trail Creek and tributaries from the Price River confluence to Grassy Trail Creek Reservoir. UDWQ has classified surface waters in this assessment unit with the following designated beneficial uses (UDEQ 2019):

- Class 2B: Protected for infrequent primary contact recreation
- Class 3C: Protected for nongame fish and other aquatic life
- Class 4: Agricultural uses

Water quality criteria consist of numeric thresholds for individual pollutants and narrative descriptions of desired conditions. Numeric criteria for individual pollutants are found in UAC R317-2 (Standards of Quality for Waters of the State). Numeric criteria for established beneficial uses as described in UAC R317-2 serve as a baseline for understanding results of water quality monitoring. The following narrative criteria applies to surface waters in the proposed lease modification areas:

> It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3 (UAC R317-2 2019).

Waters protected for infrequent primary contact recreation (beneficial use Class 2) and aquatic-life uses (Class 3) do not have a TDS numeric criterion. The numeric criterion for agricultural uses (Class 4) is typically 1,200 mg/L; however, UDWQ has developed a site-specific TDS standard of 3,000 mg/L for the Price River and tributaries from the confluence with the Green River to the confluence with Soldier Creek.

There are two springs in the proposed lease modification areas: L-8-G and L-9-G (Pine Spring) (see Figure 3-5). The water rights associated with springs L-8-G and L-9-G are 91-2538 and 91-2539 respectively (DOGM 2010). The water right associated with L-8-G is used for stock watering and is owned by the State of Utah (DOGM 2010). The water right for L-9-G is owned by the BLM (Utah Division of Water Rights 2019). According to the CHIA, L-9-G has been used for cattle and wildlife in the past, although the metal spring box has been washed downstream (DOGM 2007).

Water samples have been collected from the two springs in the proposed lease modification areas since the 1990s. The first sampling efforts were conducted in the early 1990s to establish baseline conditions. UEI has collected samples from the two springs in the proposed lease modification areas (which discharge from the North Horn Formation) on a quarterly basis since 2007 per conditions of the C/007/0013 Lila Canyon Mine permit. Results are reported to DOGM. Water quality data for the two springs was not readily available prior to 2015. TDS concentrations measured at spring L-8-G between 2015 and 2018 range between 376 mg/L and 648 mg/L with an average concentration of 540.8 mg/L (UEI 2019c). TDS concentrations measured at spring L-9-G since 2015 range between 629 mg/L and 901 mg/L with an average concentration of 750 mg/L. Spring L-9-G does not flow year-round according to discharge data received from UEI (UEI 2019c). Other water quality parameters monitored by UEI at springs L-8-G and L-9-G, including alkalinity, hardness, cations, and chloride, do not have State of Utah numeric criteria.

Discharge at springs L-8-G and L-9-G was measured at the same time as the water quality samples. The average discharge at spring L-8-G between 2015 and 2018 was 0.436 gpm, or

0.0009 cubic feet per second (cfs). Average discharge at spring L-9-G during the same time period was 0.886 gpm, or 0.001 cfs.

There is no evidence to suggest that the springs in the proposed lease modification areas have impaired water quality with regard to State of Utah numeric criteria for designated beneficial uses. UDWQ assessed water quality data collected within the Grassy Trail Creek Lower assessment unit (UT14060007-012) in the most recent Integrated Report and determined there was insufficient data to make an assessment determination for the assessment unit (UDWQ 2016). Springs L-8-G and L-9-G were not assessed by UDWQ.

Water quality of springs that discharge from the North Horn Formation in the nearby Williams Draw Coal Tract is assumed to be similar to water quality of springs that discharge from the North Horn Formation in the proposed lease modification areas. Water samples were collected on a quarterly basis from springs that discharge from the North Horn Formation in the Williams Draw Coal Tract as part of a comprehensive hydrological survey conducted by Cirrus from September 2016 to June 2017.

Water quality parameters measured by Cirrus and Petersen (2017) in the 2016–2017 hydrologic survey indicate that springs discharging from the North Horn Formation in the Williams Draw Coal Tract typically flow less than 1 gpm and have water quality that is supporting beneficial uses. Field measurements of dissolved oxygen, pH, and temperature were within acceptable limits as set forth in UAC R317-2, as are measurements of TDS and other water quality constituents (Cirrus and Petersen 2017). TDS values were variable and ranged from 560 mg/L to 3,706 mg/L, with an average value of 1,504 mg/L (Cirrus and Petersen 2017).

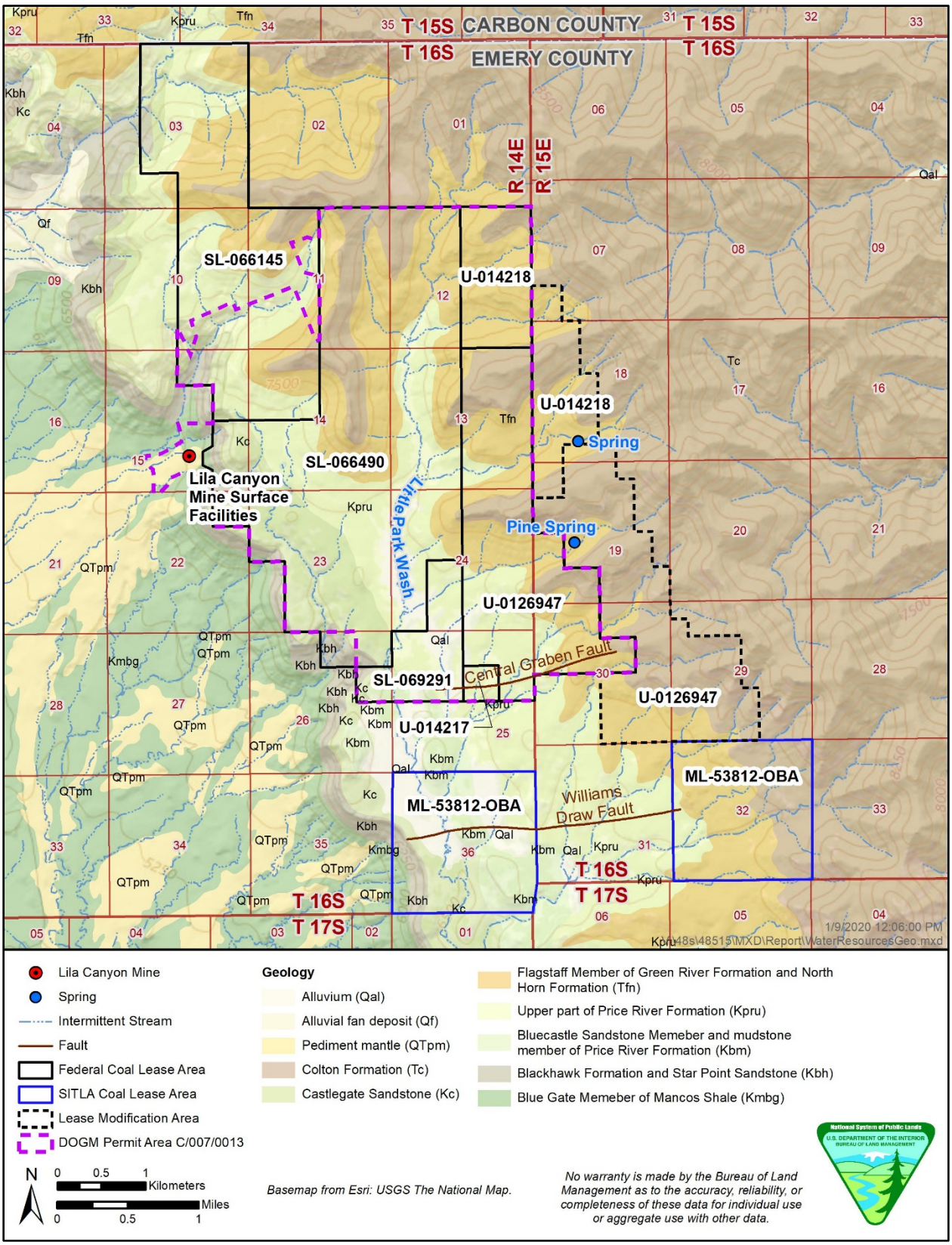

Figure 3-5. Geology and water resources.

3.4.2 Environmental Impacts – Alternative A: No Action

Under the No Action Alternative, the effects of mining UEI's federal coal leases on surface water and groundwater would continue as described in approval documents for ongoing activities in the Lila Canyon Mine. There would be no direct or indirect impacts to surface water or groundwater resulting from mining of the proposed lease modification areas as the BLM would not approve modification of the existing leases.

3.4.2.1 Cumulative Effects

There would be no cumulative effects to water resources under the No Action Alternative, as the existing coal leases would not be modified to include the proposed lease modification areas.

3.4.3 Environmental Impacts – Alternative B: Proposed Action

As with the discussion of water resources, existing information from investigations related to mine permitting activities is used for analysis of potential impacts to water resources from mining coal resources in the proposed lease modification areas of the Lila Canyon Mine.

Under the Proposed Action, coal in the proposed lease modification areas would be mined using the existing infrastructure from the Lila Canyon Mine, and no additional surface disturbances are expected. Under the Proposed Action, there exists the potential for 1) the direct interception of groundwater resources through mine dewatering, and 2) the alteration of groundwater recharge areas, flowpath areas, or discharge areas as a result of mining-induced fracturing from subsidence. Because of the depth of the mining operation and lack of surface disturbance, no impacts to surface water resources are expected. It should be noted, however, that DOGM (SMCRA) permits require water replacement stipulations, should any surface water be disrupted.

3.4.3.1 Groundwater

Under the Proposed Action, impacts to groundwater resources from mine dewatering are expected to be minimal because coal mining production would not increase beyond currently permitted levels. Water encountered during mining is typically stored and used within the Mine for dust suppression or for other uses; it may be stored and re-used several times prior to any discharge. As mining shifts into the proposed lease modification areas, this cycle of water use would continue. Mine dewatering is the removal and discharge of excess groundwater that has infiltrated into a mine or has been intercepted by mining processes. Because mining at the Lila Canyon Mine would occur at a depth of 2,500 to 3,000 feet below the surface, the only groundwater likely to be encountered would exist in the deep, inactive-zone groundwater system (lenticular and perched). As discussed in Section 3.4.1.1 of this EA, DOGM concluded that groundwater in the inactive-zone groundwater system of the Blackhawk Formation of the Mesaverde Group is not hydrologically connected to the shallow recharge aquifers (DOGM 2007). Therefore, mine dewatering rates would naturally decline over time after the first encounter with groundwater (BLM 2013). "No impacts are expected from dewatering, unless an exceptional volume of groundwater is contacted" (DOGM 2007).

In a typical underground mining scenario, mining-related subsidence generally has the potential to affect water resources through the formation of new fissures, or in the case of the Lila Canyon

Mine, both new fissures and the expansion of existing fissures that can alter the flow of groundwater and change the surface water and groundwater interaction. Subsidence has the potential to connect aquifers that were previously disconnected, change the rate and direction of groundwater movement, and change groundwater recharge and discharge rates. Discharge rates of the two springs in the proposed lease modification areas are monitored by UEI and reported to DOGM.

As discussed in Section 2.4.2.3 of this EA, mining-related subsidence is unlikely in coal mining operations with deep cover as is found in the proposed lease modification areas, and any mining-related subsidence effects to water resources would be mitigated by the physical properties of the geologic formations in the lease modification areas. According to the CHIA, "It is very unlikely that subsidence or subsidence fractures would reach the springs or recharge sources to cause any impacts" (DOGM 2007).

The proposed mining in the proposed lease modification areas would take place under 2,500 to 3,000 feet of cover, making subsidence-related effects to springs unlikely. This assessment comes from existing hydrogeologic investigations associated with nearby mine permitting activities. According to the Williams Draw Hydrologic Assessment, "visual observations over the Book Cliff mines…indicate little potential for any permanent fracturing at cover exceeding 1,000 feet" (Cirrus and Petersen 2017). The CHIA for the Book Cliffs Area V states that, "the areas of upper zone ground-water recharge and discharge on the Little Park Wash side of Patmos Ridge are outside the limits of projected subsidence" (DOGM 2007) (MRP-Part B, Plate 7-1A). Finally, according to the Lila Canyon Project Environmental Assessment, "the presence of a generally thick overburden serves to dampen subsidence" (BLM 2000).

Mining would occur at approximately 1,900 feet below Pine Spring, and between 1,500 to 2,200 feet below spring L-8-G (DOGM 2007). At this depth of cover, mining-related subsidence is not anticipated to impact surface water or shallow groundwater. As previously mentioned, the springs are connected to the shallow recharge area, which is well above the zone where any coal mining would take place; therefore, it is unlikely that water quantity would be affected by the Proposed Action. Fractures at the surface can be filled in rapidly because the natural erosion process will wash fine substrate over cracks during rainstorms or snowmelt.

Any potential impacts to groundwater resources under the Proposed Action from mining-related subsidence would be mitigated by characteristics of the geologic formations in the proposed lease modification areas. Fractures and fissures introduced by subsidence from mining activity can be sealed by clays that are highly plastic and have the tendency to swell. Clays are abundant in the geologic formations surrounding the active-zone and inactive-zone groundwater systems in the proposed lease modification areas. When groundwater is present, any surrounding shale layers tend to swell and seal subsidence fractures. Water movement through newly created fractures or fissures is restricted by this phenomenon (DOGM 2007).

3.4.3.2 Surface Water

No impacts to surface water resources in the proposed lease modification areas are expected from mining-related subsidence due to the depth of the mining operations and lack of surface disturbances. Furthermore, there is no reasonably foreseeable mechanism for surface water

quality in the proposed lease modification areas to be impacted by mining operations under the Proposed Action.

There would be no impacts to surface water resources in the proposed lease modification areas due to mine dewatering because the Lila Canyon Mine typically reuses and recycles water within the Mine, the discharge point is an ephemeral wash, and based upon calculations of a continuous flow, water from the Mine would not reach the Price River approximately 12.7 miles away.

Water not used or stored in the Lila Canyon Mine or lost to evaporation will be discharged to the Right Fork of Lila Wash via UPDES 002 (Site L-5-G). Rule R645-301-751 requires that a coal mine discharge must meet state and federal water quality and discharge standards. According to the CHIA, potential discharges of 500 gpm (1.1cfs) and a maximum discharge rate of 2,080 gpm were evaluated. With a constant flow rate of 2,080 gpm, (4.63 cfs), the mine discharge effect would be limited to a distance of 8.5 miles. At 500 gpm (1.1 cfs), the mine discharge would flow for 3.4 miles before completely infiltrating into the alluvium (DOGM 2007). The discharge was compared to the bankfull channel level. It was found that the Mine discharge is significantly less than the bankfull level and that a continuous discharge would not reach a perennial stream (DOGM 2007).

According to the CHIA, no impacts are expected if mine water is discharged. Groundwater intercepted in the Mine is stored in sumps and treated prior to any discharges. Discharges are monitored by the state under the UPDES program.

3.4.3.3 Cumulative Effects

The past and present actions that would affect water resources are underground mining operations. Reasonably foreseeable future actions in the vicinity of the proposed lease modification areas are discussed in Section 3.1.3 of this document.

The spatial analysis area to examine cumulative effects to water resources extends to the CIA boundary from the CHIA (DOGM 2007). The CIA of the CHIA is approximately 73,000 acres and extends from the Patmos Ridge on the east side to the Price River on the west side. The large area of land from the base of the Book Cliffs to the Price River will not be affected by mining activity but was included in the CIA because nearby waterways that form part of the CIA boundary are included in the CHIA (DOGM 2007).

Cumulative impacts to groundwater resources with the addition of the proposed lease modification areas to the existing Lila Canyon Mine would occur as the result of the anticipated increase of 3 years to the life of the Mine. Any potential impacts to groundwater resources from mining-related subsidence would be mitigated by characteristics of the geologic formations in the proposed lease modification areas. Surface water and groundwater monitoring and subsidence monitoring would continue per permit conditions.

There would be no cumulative effects to surface water resources in the CHIA from mining-related subsidence or from mine dewatering other than the continuation of potential for discharge during the additional 3 years of mining. Effluent limitations of the General Permit for Coal Mining (UTG040000) would remain in effect. Discharge monitoring would continue.

According to the Lila Canyon MRP, "Waddell et al. (1986) conclude that the perched nature of the upper zone formations protects them from the influence of dewatering of the coal-bearing zone unless the upper zone is influenced by subsidence" (DOGM 2010). Mining-related subsidence is not likely to affect the shallow groundwater given the depth of cover in the proposed lease modification areas, "as the strains from subsidence are not expected to reach the level of the upper groundwater zone" (DOGM 2010).

Groundwater in saturated zones of the Blackhawk Formation is isolated and relatively immobile due to surrounding impermeable layers and extremely low hydraulic conductivity (DOGM 2010). The average hydraulic conductivity for the Blackhawk Sandstone (3.0×10^{-6} centimeter per second [cm/sec] or 0.01 inch per day) was used to estimate the groundwater travel time in this formation and determined it would take 1,736 years for groundwater to travel 1 mile. Additionally, "the water encountered and used underground would not reach the Colorado Drainage in any reasonable time, if ever, and thus water consumed underground cannot negatively affect the Colorado River Basin" (DOGM 2010). Therefore, the proposed lease modification areas would extend the duration of mining activity in the CIA but would not result in cumulative impacts to groundwater and surface water resources when added to other past, present, and reasonably foreseeable future actions in the CIA.

CHAPTER 4. CONSULTATION AND COORDINATION AND LIST OF PREPARERS

4.1 Tribes, Individuals, Organizations, or Agencies Consulted

As described above in Chapter 1, the BLM listed the Proposed Action on its ePlanning website on May 14, 2018. The BLM initiated tribal consultation in October 2018 with tribal representatives. A response letter dated October 18, 2018, was received from the Hopi Tribe requesting copies of any cultural resources reports or treatment plans should adverse effects be anticipated as a result of the development of the proposed lease modification areas.

The Office of Surface Mining Reclamation and Enforcement participated in this EA process as a cooperating agency.

4.2 List of Preparers

Table 4-1. List of BLM and Non-BLM Preparers and Reviewers

Name	Title	EA Document Responsibility
BLM Preparers and Reviewers		
Michael Glasson	Geologist, Solid Minerals Lead, PFO	Project management, document review, geology/minerals/ energy production
Rebecca Anderson	Geologist, PFO	Document review and geology
Chris Conrad	Field Office Manager, PFO	Document review
Jake Palma	NEPA Specialist, PFO	NEPA compliance, document review
Joe Rodarme	NEPA Specialist, PFO	NEPA compliance, document review
Stephanie Howard	NEPA Lead, Vernal FO	Socioeconomics, air quality and greenhouse gas emissions
Erik Vernon	Air Quality Specialist, BLM State Office	Air quality and greenhouse gas emissions
Non-BLM Preparers and Reviewers		
Office of Surface Mining Reclamation and Enforcement		
Gretchen Pinkham	Natural Resources Specialist	Document review
SWCA Environmental Consultants		
David Steed	Director - Mining	Project management and QA/QC
Jeremy Eyre	Planner/NEPA Specialist	Chapters 1-2 and Socioeconomics
Linda Gottschalk	Permitting/NEPA Specialist	Project management support and document review
Andrew Harley, PhD	Senior Mining Lead	Water resources review
Kerri Linehan	Technical Editor	Technical editing
Gretchen Semerad	Environmental Scientist	Air quality and greenhouse gas emissions
Debbi Smith	Desktop Publishing Production Coordinator	Formatting
Brad Sohm, P.E.	Senior Air Quality Specialist	Air quality review
Calah Worthen	Water Resources Specialist	Water resources

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APPENDIX A

BLM Interdisciplinary Team Checklist

APPENDIX A: INTERDISCIPLINARY TEAM CHECKLIST

INTERDISCIPLINARY TEAM CHECKLIST

RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)

Project Title: Lila Canyon Two Lease Mods

NEPA Log Number: DOI-BLM-UT-G020-2018-0039-EA

File/Serial Number: U-014218(M), U-0126947(M)

Project Leader: M Glasson

Determination of STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Determination	Resource/Issue	Rationale for Determination	Signature	Date
PI	Air Quality & Greenhouse Gas Emissions	Impacts from this proposed lease modification could extend the life of the Mine by 3+ years, resulting in continued operational emissions (including GHG) from equipment operation. In addition, downstream use of the coal would result in emissions. The EA will assess the effects of operational and downstream emissions.	Stephanie Howard	5/25/2018
NP	BLM Outstanding Natural Areas	There are no BLM Natural Areas in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Cultural: Archaeological Resources	The Proposed Action is determined to be a federal undertaking, per Title 36 CFR Chapter VIII Part 800.16(y). In accordance with Title 36 CFR 800.3(a)(1), the agency has determined this undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties are present. Therefore, the agency has no further obligations under Section 106 of the National Historic Preservation Act regarding the proposed lease modifications. The BLM is applying Waiver #7 to the Proposed Action: the nature of the proposed subsurface action is such that no impact to significant cultural resources is expected. In accordance with Title 36 Code of Federal Regulations Chapter VIII Part 800, the BLM will not approve any ground disturbing activities that have the potential to cause effects on historic properties until the areas of potential effect have been analyzed and processed according to Section 106 of the National Historic Preservation Act and related authorities. The modification of a lease does not authorize any surface disturbing activities, including, but not limited to, development of surface facilities, vents, portals, or planned subsidence with the potential to effect ground surface. The BLM may require modifications to facility development proposals to protect historic properties or disapprove any activity that is likely to result in adverse effect to historic properties that cannot be successfully avoided, minimized, or mitigated.	Natalie Fewings	7/11/2018
NI	Cultural: Native American Religious Concerns	Tribal consultation letter was sent 10/12/18. The consultation process will be concluded before the decision record is signed.	Natalie Fewings Joseph Rodarme	7/11/2018 2/24/2020
NP	Designated Areas: National Historic Trails	There are no National Historic Trails in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Designated Areas: Areas of Critical Environmental Concern	There are no Areas of Critical Environmental Concern in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Designated Areas: Wild and Scenic Rivers	There are no Wild and Scenic Rivers in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Designated Areas: WSA/Wilderness	There are no Designated Areas, Wilderness Study Areas, or Wilderness Areas in the proposed lease modification areas per review of the RMP and GIS.	Blake Baker	2/21/2020
NP	Environmental Justice	No low income or minority communities exist in or near the proposed lease modification areas. Therefore, no disproportionate impacts will occur.	Stephanie Howard	5/25/2018
NP	Farmlands (prime/unique)	According the NRCS soil survey and knowledge of the area, there are no prime/unique farmlands above the proposed lease modification areas. The Proposed Action will occur underground and there are no prime/unique farmlands that would be affected by proposed lease modification or subsequent mining.	Stephanie Bauer	7/2/2018
NP	Fuels/Fire Management	There are no current impacts to Fuels/Fire Management (both direct and indirect) at this time. Future impacts would be negligible.	Stuart Bedke	4/5/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Geology / Minerals / Energy Production	The two proposed lease modification areas are exclusively underground, with no surface disturbance proposed.	Mike Glasson	5/14/2018
NI	Invasive Plants / Noxious Weeds / Vegetation	The spread and introduction of invasive species/noxious weeds are not anticipated to occur because of the Proposed Action. The proposed lease modification areas are underground, and no subsidence is expected, therefore no surface disturbance is expected.	Stephanie Bauer	7/2/2018
NI	Lands/Access	With no surface use or disturbance, lands and access will not be impacted. A review of LR2000 and the Master Title Plats showed that the Proposed Action is compatible with the existing land use and authorized right-of-ways. There are no conflicts with other land use authorizations.	Connie Leschin	4/9/2018
NI	Lands with Wilderness Characteristics	The proposed project area overlaps the Turtle Canyon LWC unit. However, with no surface use or disturbance, Lands with Wilderness Characteristics will not be impacted.	Blake Baker	2/21/2020
NI	Livestock Grazing	With no surface disturbance, livestock grazing will not be impacted.	Jason Carlile	4/23/2018
NI	Paleontology	While there is some potential for vertebrate fossils being present, with no surface disturbance there is no risk of damage to them.	Michael Leschin	4/10/2018
NI	Plants: BLM Sensitive	Suitable or occupied habitat for the following UT BLM Sensitive plant species has been previously documented or is expected to occur within Emery County, UT. *Alicella tenuis, Astragalus pubentissimus peabodianus, Camissonia bolanderi, Cryptantha creutzfeldtii, Eriogonum corybosum smithii, Erigeron maguirei, Lygodesmia grandiflora entrada, Mentzelia multicaulis var librina, Oreoxis trotteri, Psorothamnus polydenius jonesii, Sphaeralcea psoraloides, Talinum thompsonii* Analysis of soils, geology, elevation and ecological systems, overlying the proposed lease modification areas indicates potential that suitable habitat for *Mentzelia multicaulis var librina* occurs there. There are possible exposures of suitable geology, Price River Formations, and it is close to the typical elevation. Although suitable habitat for this plant occurs, there would be no impacts to habitat because no surface disturbance is proposed or anticipated. For the other species, there is not suitable geology or elevation within the proposed lease modification areas, and there are no records of occurrences. Because suitable habitat is not present, these species are unlikely to be present. For these reasons and because no surface disturbance is proposed or anticipated, a detailed analysis of BLM sensitive plants is not required.	Dana Truman	08/24/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Plants: Threatened, Endangered, Proposed, or Candidate	Several Federally listed plant species occur within Emery County. *Cycladenia jonesii (humilis)* *Pediocactus despainii* *Pediocactus winkleri* *Schoenocrambe barnebyi* *Sclerocactus glaucus* *Sclerocactus wrightiae* *Townsendia aprica* Analysis of soils, geology, elevation and ecological systems, within the proposed lease modification areas indicates that suitable habitat for the identified species is not present. Since suitable habitat is not present, these species are unlikely to be present. Since these species are unlikely to be present and no surface disturbance is proposed or anticipated, detailed analysis of threatened, endangered, proposed, or candidate plants is not required.	Dana Truman	5/16/2018
NI	Rangeland Health Standards	Rangeland Health standards reflects hydrology, soils and biotic components of the rangeland. No impacts to soils, hydrology or biology are anticipated due to lack of surface disturbance in the proposed lease modification areas. Impacts to these resources, if any, will be addressed in their respective sections.	Jason Carlile	4/23/2018
NI	Recreation	The Proposed Action is in an Extensive Recreation Management Area (ERMA) where recreation opportunities are limited, and explicit recreation management is not required. The ERMA receives only custodial management for recreation opportunities. With no surface disturbance, no impacts to this resource are anticipated.	Blake Baker	2/21/2020
PI	Socio-Economics	Issuance of the proposed lease modifications could extend the life of the Lila Canyon Mine by 3+ years. The analysis of extension of operations will be assessed, including the effects upon the Emery and Carbon County economies.	Stephanie Howard	5/25/2018
NP	Soils: Physical / Biological	There is no new surface disturbance proposed or anticipated. Therefore, detailed analysis is not required.	Peter Kauss	7/13/2018
NI	Vegetation: Vegetation Excluding USFW Designated Species and BLM Sensitive Species	There is no new surface disturbance proposed or anticipated. Therefore, detailed analysis is not required.	Jason Carlile	4/23/2018
NI	Visual Resources	The proposed lease modification areas are within a VRM Class I. The Class I management objective is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention. Since no surface disturbance is proposed or anticipated, there will be no impact to visual resources and the existing character of the landscape will be maintained. Detailed analysis of visual resources is not required.	Blake Baker	2/21/2020

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Wastes (hazardous/solid)	No chemicals subject to reporting under SARA Title III will be used, produced, stored, transported, or disposed of annually in association with the Proposed Action. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, will be used, produced, stored, transported, or disposed of in association with the Proposed Action. Trash would be confined in a covered container and disposed of in an approved landfill. No burning of any waste will occur due to this project. Human waste will be disposed of in an appropriate manner in an approved sewage treatment center.	Bill Civish	5/11/2018
PI	Water: Groundwater Quality	Spatial analysis of the proposed lease modification application and proposed lease modification areas indicates no interaction with subsurface horizons containing usable water. The proposed mining of the proposed lease modification areas is approximately 2,500 feet below the ground surface. Additional groundwater information will be reviewed to determine the potential for impacts.	Rebecca Anderson	10/26/2018
NI	Water: Hydrologic Conditions (stormwater)	The proposed mining associated with the proposed lease modification areas would not alter the topography; therefore, detailed analysis is not required.	Peter Kauss	7/13/2018
NP	Water: Municipal Watershed / Drinking Water Source Protection	GIS review indicate no drinking water source areas or beneficial uses of watersheds from UDEQ-DWQ.	Peter Kauss	7/13/2018
NI	Water: Streams, Riparian Wetlands, Floodplains	Due to the depth of the mining operation, and lack of surface disturbance, no impacts to these resources are expected. Detailed analysis is not required.	Jerrad Goodell	4/13/2018
NP	Water: Surface Water Quality	There is no new surface disturbance; therefore, detailed analysis is not required.	Peter Kauss	7/13/2018
NP	Water: Water Rights	Mining of the proposed lease modification areas would not affect any water rights or the ability to use any water rights. Detailed analysis is not required.	Peter Kauss	7/13/2018
NP	Water: Waters of the U.S.	GIS review indicates no navigable waters or waters of the U.S. are within the proposed lease modification areas. Detailed analysis is not required.	Peter Kauss	7/13/2018
NP	Wild Horses and Burros	The proposed lease modification areas are not within a Wild Horse or Burro Herd Management Area. Detailed analysis is not required.	Mike Twedell	4/2/2018
NI	Wildlife: Migratory Birds (including raptors)	Migratory birds could use the area above the proposed lease modification areas foraging and nesting. There are known golden eagle nests within 3 miles of the proposed lease modification areas, but not within surface habitat overlying the areas. Due to the depth of the mining operation, and lack of surface disturbance, no impacts to bird populations or their habitat is expected. Detailed analysis is not required.	Dana Truman	5/16/2018
NI	Wildlife: Fish (designated or non-designated)	Due to the depth of the mining operation, and lack of surface disturbance, no impacts to fish populations or their habitat is expected. Detailed analysis is not required.	Jerrad Goodell	4/13/2018

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Wildlife: Non-USFWS Designated	There are no UDWR designated crucial habitats for big game within the proposed lease modification areas. Mining activities have been occurring on the adjacent leases for the past several years. There have been no measurable changes to the wildlife populations. The wildlife guzzlers and habitat treatments for the big horn sheep have been effective mitigation for the past mining activities. Due to the depth of the mining operation and lack of surface disturbance, no impacts are expected to the surface habitat for general wildlife. Detailed analysis is not required.	Dana Truman	5/16/2018
NI	Wildlife: BLM Sensitive	Several BLM sensitive species could use the proposed lease modification areas for foraging, resting, or nesting. Mining on the adjacent leases has been occurring without measurable impacts to wildlife. The springs have been and will be consistently monitored for change in quantity and quality. According to the Approved Resource Management Plan Amendments (BLM 2015), designated sage-grouse GHMA habitat is approximately 7 miles away. Due to the existing monitoring and response plan and the expected lack of surface disturbance, no impacts to sensitive wildlife populations or their habitat is expected. Detailed analysis is not required.	Dana Truman	5/16/2018
NI	Wildlife: Threatened, Endangered, Proposed or Candidate	Suitable or occupied habitat for the following Federally listed species has been previously documented or is expected to occur within Emery County (IPaC5/16/18). 1. California condor (*Gymnogyps californianus*) [CACO] -Would be an unlikely visitor to the proposed lease modification areas due to the elevation, and other habitat considerations. 2. Mexican spotted owl (*Strix occidentalis lucida*) [MSO]– Designated critical occurs within the proposed lease modification areas 3. Southwestern willow flycatcher (*Empidonax traillii extimus*) [SWFL]– Designated critical habitat greater than 30 miles away. 4. Yellow billed cuckoo (*Coccyzus americanus*) [YBCC] – Suitable habitat greater than 10 miles away associated with the Green River or Price River. Analysis of elevation and habitat requirements, overlying the proposed lease modification areas indicates that suitable habitat for the CACO, SWFL, and YBCC is not present. Since suitable habitat is not present, these species are unlikely to be present in habitat overlying the proposed lease modification areas. Since these species are unlikely to be present and since no surface disturbance is proposed or anticipated, detailed analysis is not required. A small portion of the proposed lease modification areas falls within the designated Critical Habitat For MSO. No surface disturbance is proposed or anticipated; therefore, there would be no impact to the designated Critical Habitat for MSO. Detailed analysis is not required.	Dana Truman	8/24/2018
NI	Woodlands/ Forestry	Woodlands/Forestry occur on the surface within the proposed lease modification areas. However, no subsidence is anticipated. Detailed analysis is not required.	Stephanie Bauer	7/2/2018

FINAL REVIEWS

Reviewer Title	Signature	Date	Comments
Environmental Coordinator	JOSEPH RODARME Digitally signed by JOSEPH RODARME Date: 2020.04.14 12:07:10 -06'00'	4/14/2020	
Authorized Officer		4/15/2020	

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APPENDIX B

Description of Connected Actions

As defined in the BLM NEPA Handbook (H-1790-1) Section 6.5.2.1 (page numbers 45–48) established by Permanent Instruction Memorandum (PIM 2018-023), connected actions are

> those proposed Federal actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR 1508.25 (a)(1)). Proposed actions are connected if they automatically trigger other actions that may require an environmental impact statement; cannot or will not proceed unless other actions are taken previously or simultaneously; or if the actions are interdependent parts of a larger action and depend upon the larger action for their justification (40 CFR 1508.25 (a)(1)). Connected actions are limited to Federal actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not connected actions but may need to be analyzed in the cumulative effects analysis if they are reasonably foreseeable.
>
> If the connected action is also a proposed BLM action, we recommend that you include both actions as aspects of a broader "proposal" (40 CFR 1508.23), analyzed in a single NEPA document. You may either construct an integrated purpose and need statement for both your proposed action and the connected action, or you may present separate purpose and need statements for your proposed action and the connected action. Regardless of the structure of the purpose and need statement(s), you must develop alternatives and mitigation measures for both actions (40 CFR 1508.25(b)), and analyze the direct, indirect, and cumulative effects of both actions (40 CFR 1508.25(c)).

None of the past, present, and reasonably foreseeable future actions described in Section 3.1.2 are considered connected actions to the Proposed Action analyzed in this EA for reasons described below.

- UEI SITLA coal lease – This action is not a connected action because the SITLA coal leases have already been granted to UEI and the mining of this leased coal does not rely upon leasing or mining of the Lila Canyon Mine.
- Williams Draw LBA – This action is not a connected action because the leasing or mining of the Williams Draw tract is not reliant upon approval of the proposed lease modifications.
- Bronco LBA –- This action is not a connected action because the operation of the Bronco Mine is not reliant upon the Lila Canyon Mine or the leasing or mining of the Williams Draw tract.

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