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

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

Williams Draw Lease by Application UTU-80043 Draft Environmental Assessment
Emery County, Utah
September 2020
DOI-BLM-UT-G020-2020-0007-EA

Photo: Tetra Tech 2016

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DOI-BLM-UT-G020-2020-0007-EA

WILLIAMS DRAW LEASE BY APPLICATION
UTU-80043
DRAFT ENVIRONMENTAL ASSESSMENT
EMERY COUNTY, UTAH

Prepared for

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Table of Contents

Appendices

Figures

Tables

ABBREVIATIONS

μg/m^3: micrograms per cubic meter

APD: applications for permit to drill

ASLM: Assistant Secretary of Land and Minerals

AR5: *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*

AQRV: air quality–related value

BBL: barrels

BLM: Bureau of Land Management

CFR: Code of Federal Regulations

CH_4: methane

CHIA: Cumulative Hydrologic Impact Assessment

CIA: cumulative impact assessment

CO: carbon monoxide

CO_2: carbon dioxide

DAQ: Utah Division of Air Quality

DAT: deposition analysis thresholds

DOGM: Utah Division of Oil, Gas and Mining

DR: decision record

EA: environmental assessment

EIS: environmental impact statement

ENBB: Utah BLM Environmental Notification Bulletin Board

EPA: U.S. Environmental Protection Agency

°F: degrees Fahrenheit

FLAG: Federal Land Managers' Air Quality Related Values Work Group

FLPMA: Federal Land Policy and Management Act

FONSI: finding of no significant impact

GHG: greenhouse gas

gpm: gallon per minute

GWP: global warming potential

HAP: hazardous air pollutant

HI: hazard index

HQ: hazard quotient

ID: interdisciplinary

IPCC: Intergovernmental Panel on Climate Change

km: kilometer

LBA: lease by application

LMA: lease modification application

LMU: Logical Mining Unit

MEI: maximally exposed individual

MER: maximum economic recovery

MERPs: Modeled Emission Rates for Precursors

mg/L: milligrams per liter

MLA: Mineral Leasing Act

MLE: most likely exposure

MM: million

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

NSPS: New Source Performance Standards

NO_2: nitrogen dioxide

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

RELs: reference exposure levels

RfC: reference concentrations

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

SPCC: spill prevention control and countermeasure plan

SUWA: Southern Utah Wilderness Alliance

TDS: total dissolved solids

tpy: tons per year

TSL: toxic screening levels

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

USC: United States Code

USDI: U.S. Department of the Interior

USFWS: U.S. Fish and Wildlife Service

USGS: U.S. Geological Survey

WSA: wilderness study area

VOC: volatile organic compound

CHAPTER 1. PURPOSE AND NEED

1.1 Introduction

This environmental assessment (EA) analyzes the potential environmental consequences of leasing the Williams Draw federal coal tract (Williams Draw tract), located in Emery County, Utah (Figure 1-1), approximately 10 miles south of the town of East Carbon (approximately 30 highway miles). A lease by application (LBA) was submitted by UtahAmerican Energy, Inc. (UEI) to the U.S. Department of the Interior (USDI), Bureau of Land Management (BLM) for the 4,231.40-acre Williams Draw tract (or LBA area [both terms are used interchangeably]), which is contiguous with currently leased federal coal reserves at the existing UEI Lila Canyon Mine. The LBA was assigned case number UTU-80043.

The LBA area is located in the central Book Cliffs, Book Cliffs coal field, in the Book Cliffs Known Recoverable Coal Resource Area. All of the coal reserves in the Williams Draw tract, estimated at approximately 32 million tons of recoverable coal, are administered by the BLM. Of the 4,231.40 total surface acres of the tract, all but 120 surface acres are administered by the BLM, with the remaining 120 surface acres being administered by the State of Utah School and Institutional Trust Lands Administration (SITLA). The BLM and SITLA are the only entities controlling the surface ownership of lands above or adjacent to the tract.

The LBA is a competitive coal leasing process whereby an expression of interest is made in a particular coal tract or tracts by a qualified party. Once the determination has been made by the BLM to continue with the application process, the BLM prepares an EA (or environmental impact statement [EIS]) as required under 43 Code of Federal Regulations (CFR) § 3425.3. 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 action. *Significance* is defined by Council on Environmental Quality regulations for implementing NEPA and is found in 40 CFR § 1508.27.

An EA provides evidence for determining whether to prepare an EIS or a finding of no significant impact (FONSI). 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 *Price Field Office Record of Decision and Approved Resource Management Plan*, hereinafter referred to as the Price Field Office Resource Management Plan (PFO RMP) (BLM 2008). If the agency determines that leasing the tract would result in significant effects, 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.

Because this is a competitive leasing process, UEI may or may not be issued the lease. If the BLM decides to lease the coal and if UEI is the successful bidder at the lease sale and is issued the lease, the Williams Draw tract coal reserves would add approximately 10 to 15 years to the life of the Lila Canyon Mine, which is currently projected to be active through 2025. Because UEI is an established coal producer in areas adjacent to the tract, the likelihood is small that a new bidder could economically access and mine the coal in the tract. If any additional new surface disturbing activities are proposed to develop the coal, additional NEPA analysis may be necessary.

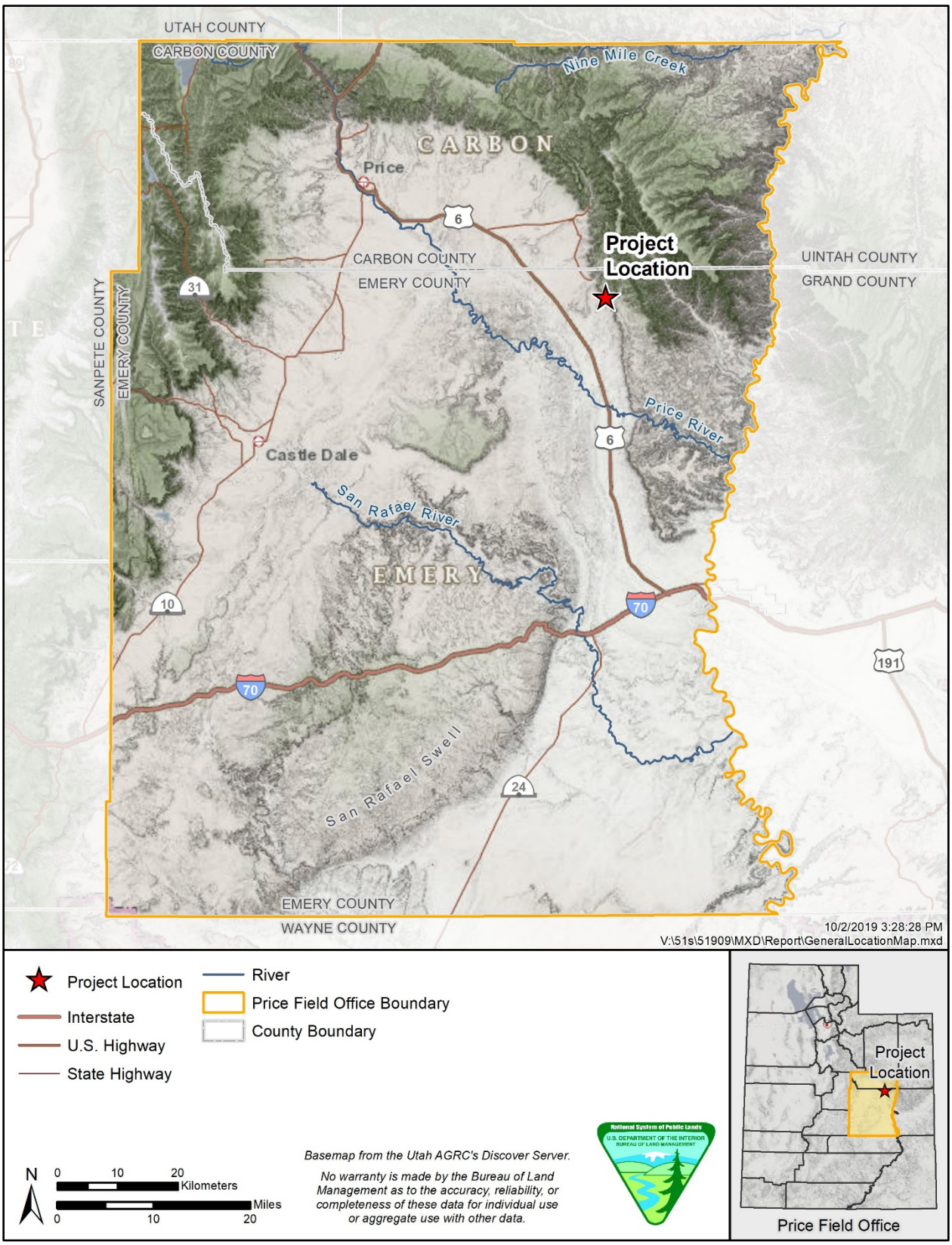

Figure 1-1. General location map.

1.2 Background

On March 1, 2002, the BLM's Utah State Office (SO) received an LBA from UEI, a subsidiary of Murray Energy Corporation, to lease BLM-administered unleased federal coal lands south of UEI's existing Lila Canyon Mine. The LBA was assigned case number UTU-80043 and called the Williams Draw tract. Historically, the entire Williams Draw tract acreage was leased by Kaiser Steel Corporation in 1954. Later, the Intermountain Power Agency acquired the leases from Kaiser and submitted a Logical Mining Unit (LMU) application to the BLM. The LMU application was withdrawn in 1999, reverting control of the unleased coal back to the federal government. UEI then submitted a proposal for this tract. Adjacent UEI coal leases and rights-of-way were approved by the BLM and permitted by the Utah Division of Oil, Gas and Mining (DOGM), but their operations were put in suspension until several court cases could be resolved. A 2008 ruling by the Interior Board of Land Appeals upheld earlier decisions made by the BLM and DOGM to issue permits to mine at the Lila Canyon Mine. The permits allowed UEI to mine onto the previously suspended lease block in order to meet the diligent development requirement prior to the diligence "clock" running past its 10-year limit. In May 2019, the BLM SO provided the LBA tract description and 60-day comment notice to the Governor of Utah, the Utah Public Lands Policy Coordinating Office, and DOGM. No comments were recorded in the DOGM files as a result of this notification.

The LBA tract is contiguous to UEI's existing coal leases and will be processed under 43 CFR Subpart 3425. Figure 1-2 shows the location of the Williams Draw LBA area in relation to UEI's existing federal and state 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 lease issued by SITLA. 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 DOGM in 2007 as an extension to the Horse Canyon Mine. The current permit area for the Lila Canyon Mine (DOGM Permit C/007/0013) encompasses 4,663.6 acres. The mining and reclamation plan (MRP) for the Lila Canyon Mine is known as the Horse Canyon Extension MRP (UEI 2007) 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 new reserves within the LBA if issued the lease. UEI's purpose in applying for the LBA is to obtain the additional 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.

1.2.1 Current Coal Market

In 2018, United States coal production decreased 2.4% from 2017 production levels (U.S. Energy Information Administration [EIA] 2019a). Coal production in the western region decreased 2.8% from 2017 production levels (EIA 2019a). The number of producing mines also decreased to 679 mines from 680 mines in 2017 (EIA 2019a). United States coal consumption in 2018 declined 4.0% from 2017 consumption levels (EIA 2019a). Exports of United States–produced coal in 2018 increased 19.3% from 2017 export levels (EIA 2019a).

Most of the coal produced at the Lila Canyon Mine is currently shipped to the Hunter Power Plant in Castle Dale, Utah, and to the 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. However, market conditions can change, resulting in the coal going to different end users, including the potential for export. Approximately one-fifth of Utah's annual coal production is exported to other countries, with some coal shipped to Pacific Rim nations (EIA 2019b).

1.3 Purpose of and Need for the Action

The purpose of the BLM's federal action is to respond to UEI's application indicating interest in leasing the federal coal reserves beneath 4,231.40 acres of BLM- and SITLA-administered surface lands in Emery County, Utah (see Figure 1-2). The proposed LBA is adjacent to the Lila Canyon Mine. The LBA would allow for 1) an increase in total recoverable tons of coal, 2) an extension of the projected lifespan of the Lila Canyon Mine, and 3) improved access to the leased SITLA coal reserves adjacent to the Williams Draw tract.

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)).

The BLM needs to respond to mineral lease applications and is obligated under FLPMA to review lease proposals that would allow the mining of federal coal resources that may otherwise be bypassed and left unutilized. As defined by the Mining and Mineral Policy Act of 1970, it is the federal government's policy to provide domestic sources of mineral commodities. If authorized, this lease would prevent bypassing of federal coal resources. As the mineral estate manager, the BLM reviews and considers LBAs and proposes environmentally sound alternatives to be considered (BLM 2008).

1.4 Decision to be Made

The decision the BLM will make based on the NEPA analysis is whether to lease the coal in the LBA tract. If the decision is made to lease the coal, the BLM would offer the lease by competitive sale and would determine the terms, conditions, and stipulations for issuance of the lease. Once a federal coal lease is issued, granting right-of-entry, it is then the company's responsibility to permit the development and mining of the coal through its application of the permit application package (PAP) to DOGM. This PAP is reviewed under the Utah permanent program reflecting its primacy over the Office of Surface Mining Reclamation and Enforcement (OSMRE) pursuant to the Surface Mine Control and Reclamation Act of 1977 (SMCRA).

1.5 Conformance with Bureau of Land Management 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 2008). 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 2008:123).

The federal coal reserves included in the LBA are by definition available for leasing and coal mining consideration per 43 CFR § 3461.1(a), which states that "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, as defined in § 3400.0-5 of this title, on any lease, if issued." 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 in the RMP to show areas

available for further coal leasing considerations. A 40-acre portion of the LBA area was not mapped at that time (T. 16 S., R 14 E., sec. 35, SW¼NE ¼). Under 43 CFR § 3425.1-5, "A lease sale may be held in response to an application under this subpart if the application covers coal deposits which are outside coal production regions identified under § 3400.5 of this title."

The PFO RMP Management Decision MLE-3 specifies that "areas (other than WSAs) will be suitable for leasing." The entire LBA area is therefore considered to be in conformance with the PFO RMP.

The Proposed Action, i.e., the leasing of the Williams Draw tract, is in conformance with the PFO RMP (BLM 2008) mineral and energy resources goal of providing opportunities for mineral development under the mining and mineral leasing laws. The Proposed Action is consistent with FLPMA (43 CFR Part 2800); the MLA, as amended (30 USC § 185); and regulations found within 43 CFR Subpart 3425. The Proposed Action is in conformance with the fundamentals of rangeland health (43 CFR Subpart 4180) and the *Emery County General Plan* (Emery County Planning Commission 2016). The Emery County Building and Zoning Office has designated the area as MG & R-1, Mining, Grazing and Recreation, and the Proposed Action is in conformance with current land use policies.

1.6 Relationship to Statutes, Regulations, or Other Plans

The LBA was submitted and is being processed and evaluated under the following BLM statutory mandates and authority governing federal coal leasing and other federal authorities:

- MLA of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976
- NEPA of 1969, as amended
- FLPMA of 1976 (BLM's multiple-use mandate)
- SMCRA of 1977
- Mining and Minerals Policy Act of 1970
- Energy Policy Act of 2005

Federal Coal Leasing

The federal coal leasing program also includes a requirement that operators mining federal coal achieve maximum economic recovery (MER) of coal from federal leases. The MER requirement has its legislative origins in the Federal Coal Leasing Amendments Act of 1976, which directs that "the Secretary (of Interior) shall evaluate and compare the effects of recovering coal by deep mining, by surface mining, and by any other method to determine which method or sequence of methods achieves the maximum economic recovery of the coal within the proposed leasing tract ... no mining operating plan shall be approved which is not found to achieve the maximum economic recovery of the coal within the tract." The Williams Draw tract configuration will ensure that MER is achieved.

The federal coal leasing program was paused in January 2016 under the Jewel Order (Secretarial Order [SO] 3338) until completion of a programmatic EIS; 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).

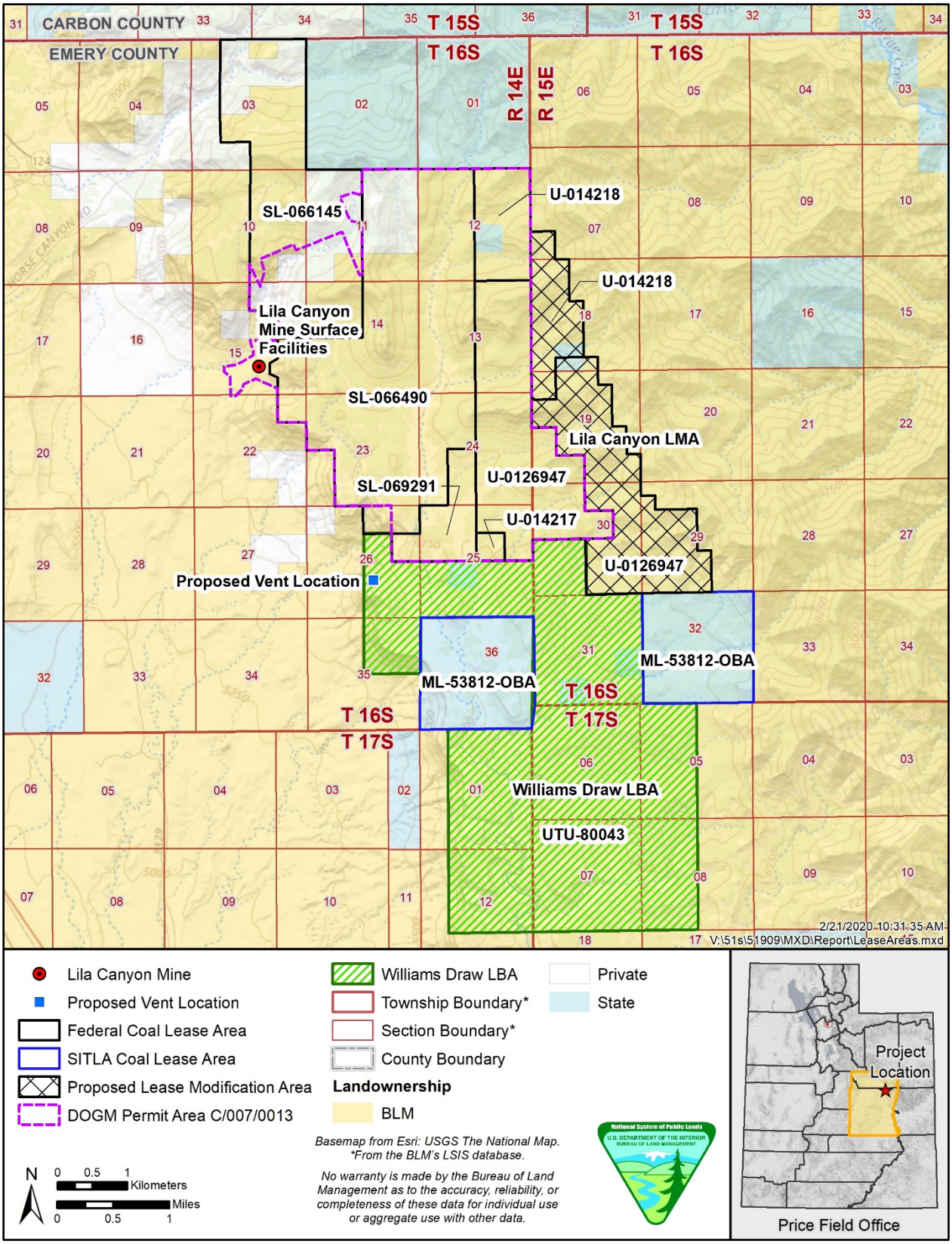

Figure 1-2. Williams Draw LBA and Lila Canyon Mine coal leases.

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 OSMRE, 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) (Lifting the Pause EA) (BLM 2019). The Lifting the Pause EA was prepared as a result of the U.S. District Court of Montana's order issued on April 19, 2019, in *Citizens for Clean Energy et al. v. U.S. Department of the Interior et al*., No. CV-17-30-GF-BMM, 384 F.Supp.3d 1264) (D. Mont.), indicating that the Zinke Order constituted a major federal action triggering NEPA compliance. A public comment period was completed on the Lifting the Pause EA; public comments were considered, and the Lifting the Pause EA was finalized in early 2020 with a finding that "lifting the Pause and resuming normal leasing practices created no significant, unstudied impacts" (BLM 2020a:10). The FONSI was signed on February 26, 2020 (BLM 2020a).

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 Part 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 Subpart 3482). SMCRA authorizes the OSMRE to oversee state and federal programs that approve MRPs and that regulate the surface effects of coal mining operations.

Utah Division of Oil, Gas and Mining Permitting

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 Part 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 § 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 Williams Draw LBA is approved and issued to UEI, the operator is required to submit a PAP to amend the existing DOGM permit to add the LBA area. 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 LBA would be addressed in the permit approval process, and specific mitigation measures for anticipated impacts would be described in detail at that time. DOGM will review the amendment/PAP under the state program and will also submit the amendment/PAP to OSMRE. In turn, OSMRE will determine whether the SMCRA permit amendment requires a federal mine plan modification under the MLA. Under the criteria set forth at 30 CFR § 746.18, if the addition of the Williams Draw tract to the Lila Canyon Mine results in more than a minor change in the amount of federal coal mined, an MLA mine plan modification will be required and Assistant Secretary of Land and Minerals Management (ASLM) approval will be required.

If the Williams Draw LBA is approved and an operator other than UEI is the successful bidder, that operator is required to submit a PAP to DOGM for review, which would then be submitted by DOGM to OSMRE as noted above. OSMRE, the BLM, and other federal agencies, as appropriate, will review the MLA mine plan or modification (provided to them by DOGM) to ensure 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 PAP will be submitted to the ASLM if OSMRE decides that this is a significant revision and that a federal mine plan approval via ASLM is required. OSMRE recommends 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 the BLM decides to lease the coal, the BLM will conduct a competitive lease sale, and a lease would be issued to the successful bidder. The lessee must obtain mine plan approval and a permit to conduct coal mining operations, including a detailed MRP, before mining can begin in the LBA area. 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 from the land use plan and the decision record that would follow this EA.

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.

Mine Safety and Health Administration

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. For example, in preparation of this EA, OSMRE is a cooperating agency. 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). Most of the surface over the 4,231.40-acre Williams Draw tract is managed by the BLM. SITLA is the surface managing agency on 120 acres of the tract.

Although the BLM makes the decision on whether to lease the LBA tract, DOGM has the authority to approve or reject MRPs for coal mines. Therefore, if the LBA area is 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 Planning Documents

Other than BLM land use planning, 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 Proposed Action would be consistent with the State of Utah Public Lands Policy 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 the *Emery County 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 proceeds from coal developed in the LBA area would be paid by the operator to the USDI, 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 (if present) are limited to 50% of the federal royalty.

John D. Dingell, Jr. Conservation, Management, and Recreation Act

The John D. Dingell, Jr. Conservation, Management, and Recreation Act (S. 47) (the Dingell Act) was signed by the President of the United States in March 2019 and became Public Law 116-9. Under this law, areas east and south of the Williams Draw LBA area, but not adjacent to or overlapping the LBA area, are designated as wilderness. The Desolation Canyon Wilderness is directly south of the Williams Draw LBA area. The Turtle Canyon Wilderness is east of the Williams Draw LBA area (see Figure 1-3). Both wilderness areas will be administered by the Secretary of the Interior in accordance with the Wilderness Act (16 USC § 1131 et seq.) with exceptions as noted in Public Law 116-9. In addition, the lands that were not designated as wilderness in the Dingell Act 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 and Desolation WSA, which occur on the south and east sides of the Williams Draw tract separating it from the wilderness boundary. The air quality analysis in this EA used the former WSA boundaries for analysis purposes.

The Dingell Act also provides for an exchange of lands. BLM-administered surface and mineral lands that would be transferred to SITLA and BLM-administered mineral lands that would be transferred to SITLA are shown on Figure 1-3. Under the exchange, most of the BLM-administered land that makes up the Williams Draw tract would be transferred to SITLA. The completion of this land exchange hinges on land appraisals, title approvals, and additional agreements, and it would be subject to valid existing rights. Federal underground coal mining rules, federal oversight, and the requirement for DOGM approval to proceed with mining would apply whether the BLM or SITLA administer the coal.

1.7 Identification of Issues

1.7.1 Internal Scoping

Internal scoping by the PFO was initially conducted in early February 2013. PFO staff reviewed the proposal and the PFO RMP; consulted maps, reports, and the *Lila Canyon Project Emery County, Utah Environmental Assessment* (hereafter the *Lila Canyon Project EA*) (BLM 2000), which analyzes a lease adjacent to the proposed LBA and full extraction of the federal coal; and discussed varying alternatives and potential issues associated with the proposal. The BLM Interdisciplinary (ID) Team began to formulate a checklist of potential issues associated with the proposal.

Internal scoping was conducted again by the PFO in April 2019. The ID Team checklist that was initially drafted in 2012 was updated in August 2019.

The results of these scoping efforts are documented in Appendix A in the ID Team checklist. The BLM determined that several resources are present in the area affected by the Proposed Action and the potential impacts to such resources need to be analyzed in detail in the EA.

The BLM also determined that the potential impacts of underground mining–related subsidence on associated resources should be evaluated further. This evaluation is found in Chapter 3 of this EA.

1.7.2 Public Scoping

Public (external) scoping began in January 2013 when the LBA proposal was posted on the (then) Utah BLM Environmental Notification Bulletin Board (ENBB) for public review. The same day, Southern Utah Wilderness Alliance (SUWA) was invited to send comments by e-mail. Native American tribal consultation was initiated on February 1, 2013 by letter. The public scoping period closed on March 16, 2013.

The BLM received a response letter dated March 6, 2013, from the Navajo Nation concluding that leasing the Williams Draw tract would not impact Navajo traditional cultural values and that the Navajo Nation had no present concerns. Scoping comments were received from SUWA on June 15, 2013, and from WildEarth Guardians and the Office of the Governor on June 17, 2013. The public comments submitted in 2013 applied to the project as proposed at that time, which included surface development. For this reason, the 2013 comments are in some cases no longer applicable.

Public notification efforts include the November 18, 2019, listing of the proposed LBA on the BLM's ePlanning website. Additional opportunity for public comment will be provided upon the release of the 2020 draft EA on BLM's ePlanning website.

1.7.3 Issues

The following issues involving potential impacts to resources were identified during the internal (Appendix A) and public (external) (Appendix B) scoping processes:

Air quality and greenhouse gas emissions: How would leasing and mining of the LBA area contribute to criteria pollutants, hazardous air pollutants (HAPs), and greenhouse gas (GHG) emissions?

Geology, minerals, and energy production: How would leasing and mining of the LBA area affect oil and gas leasing in the area? How would this potential resource use conflict be managed?

Socioeconomics: How would leasing and mining of the LBA area with the resulting 10- to 15-year increase in mine life affect jobs, income, and tax revenues in Emery County, Utah?

Groundwater quality: What is the likelihood that water quality within the small aquifers near the LBA area could be affected, particularly with respect to turbidity and suspended solids?

Hydrologic conditions: A required spill prevention control and countermeasure plan (SPCC) included with the MRP will identify measures to reduce or eliminate impacts from stormwater. How would leasing and mining of the LBA area affect hydrology, including surface water flow, and what additional measures might be needed to reduce or eliminate impacts from stormwater?

Migratory birds (including raptors): What is the potential for impacts to nesting raptors within 0.5 mile of the LBA area? What is the potential for impacts to nesting migratory birds in the LBA area?

Wildlife species (non-USFWS-designated): What is the potential for impacts to Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*), mule deer (*Odocoileus hemionus*), or elk (*Cervus canadensis*) or their habitats?

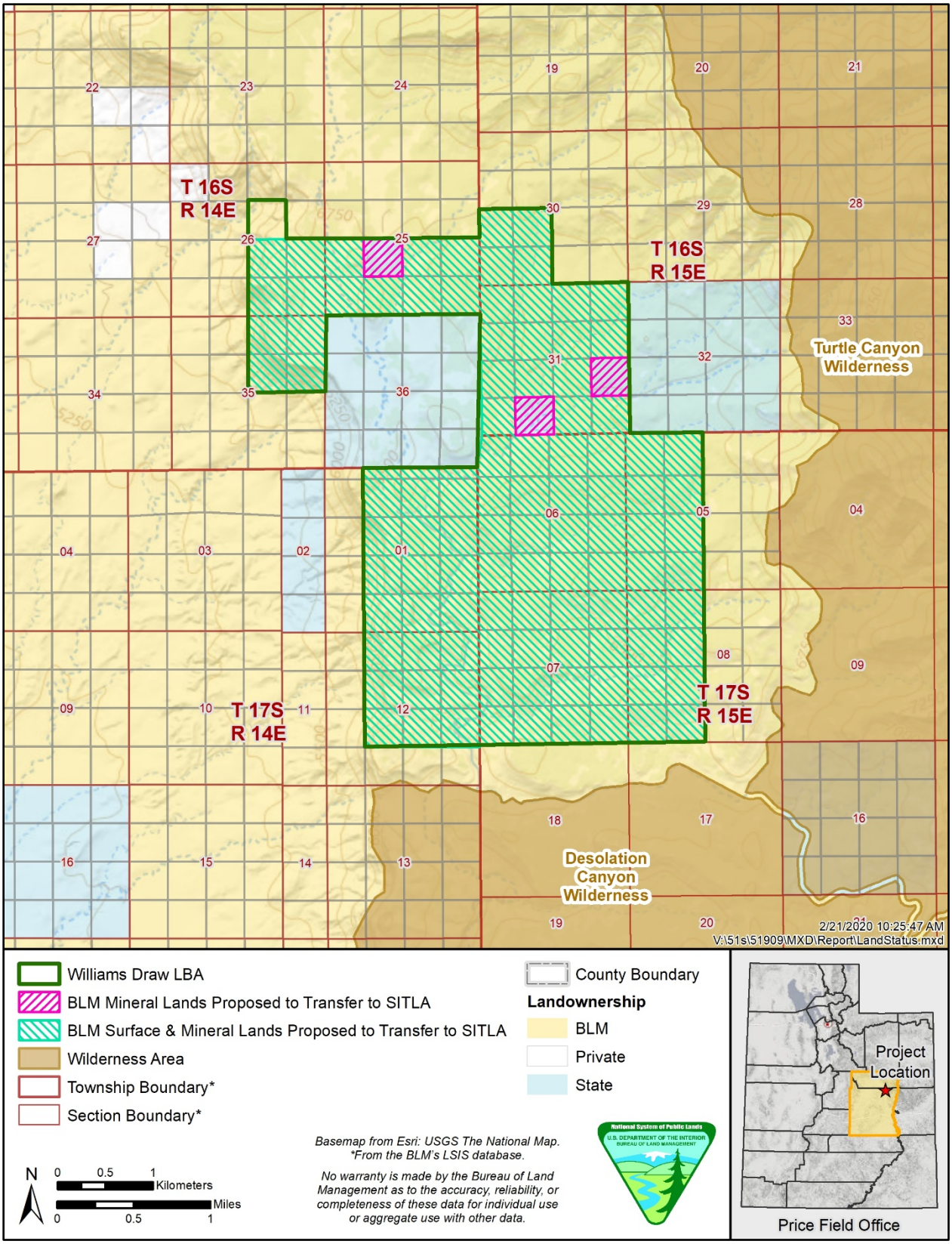

Figure 1-3. Wilderness and land exchange parcels.

CHAPTER 2. DESCRIPTION OF THE ALTERNATIVES

2.1 Introduction

This EA analyzes the potential impacts 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 potential impacts of the Proposed Action. Based on the scoping process, no other alternatives were brought forward for detailed analysis.

If a decision is made to issue a lease for the Williams Draw tract, 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 LBA area. As discussed in Chapter 1, this MRP and overall PAP would be required to conform to the stipulations and conditions attached to the lease required by the PFO RMP and to conform to the decision based on the analysis in this EA.

2.2 Alternatives Development

No alternatives other than the No Action and Proposed Action alternatives were developed for this leasing proposal 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 Williams Draw LBA area for leasing by competitive sale at this time, and the federal coal reserves within the LBA area would not be mined at this time. Such a decision by the BLM not to lease the LBA at this time would not preclude the leasing and mining of this area sometime in the future. However, for the BLM to consider the leasing and mining the LBA 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 by competitive sale the Williams Draw tract for lease, subject to standard and special lease stipulations developed for the tract. The boundaries of the tract would be consistent with the location description in Section 2.4.1. The BLM estimates that there is approximately 32 million tons of recoverable coal in the tract. This area, if leased by the BLM and successfully bid upon by UEI, is projected to extend the life of the existing Lila Canyon Mine by approximately 10 to 15 years. Under current conditions, the end of foreseeable mining is in 2025. The location of these reserves, immediately south of the Lila Canyon Mine, makes independent access to the coal within this tract unlikely. Under the Proposed Action, all economically recoverable coal reserves would be mined using underground methods from the Lila Canyon Mine as described in Section 2.4.2. The operator would develop these coal reserves by adding, or extending, up to 16 longwall panels to its mining plan. The mineable coal seam in the tract varies from a thickness of approximately 6 to 11 feet. The coal cover, or depth to the coal layer from the surface, varies from approximately 100 feet on the west side of the tract to 2,200 feet on the east side of the tract.

2.4.1 Location and Overview

The Williams Draw tract is located in Emery County, Utah, accessed via U.S. Route 6, and is located approximately 10 miles from the closest municipality, East Carbon, Utah (see Figure 1-2). From the LBA area, 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 Canyon Mine coal is shipped through the SCT, where there is also a heavy media wash plant facility. The SCT operates under its own set of permits, separate from the coal mine operators.

The tract area is 4,231.40 acres. Figure 1-2 shows the tract location and land management status. The BLM and SITLA oversee the surface and mineral estate; DOGM is the permitting agency. UEI currently holds 5,549.01 acres of federal coal contained in six federal leases and 1,280 acres of non-federal coal in a SITLA lease (ML-53812-OBA). In addition, UEI has applied for lease modifications totaling 1,272.64 acres to two of their federal coal leases (UTU-014218 and UTU-0126947). The location description of the Williams Draw tract is as follows:

Salt Lake Meridian, Utah

T. 16 S., R.14 E.,
sec. 25, S½;
sec. 26, SE¼ and SW¼NE¼;
sec. 35, NE¼.

T. 16 S., R. 15 E.,
sec. 30, lots 3 and 4, E½SW¼;
sec. 31.

T. 17 S., R. 14 E.,
sec. 1, lots 1 thru 3, lots 6 thru 8, S½NE¼, SE¼NW¼, E½SW¼ and SE¼;
sec. 12, NE¼, E½NW¼, NE¼SW¼, and N½SE¼;

T. 17 S., R. 15 E.,
sec. 5, lots 3 and 4, S½NW¼ and SW¼;
secs. 6 and 7;
sec. 8, W½.

The areas described contain 4,231.40 acres, according to the official plats of the surveys of the said lands, on file with the BLM.

A tract delineation report was produced by the BLM PFO recommending the tract (BLM 2012), which was adjudicated and adjusted to include those lands as shown above, based on evaluation of the geologic setting, coal resources, and coal-quality data. Full extraction of the economically mineable coal would be expected under the conceptual mining plan.

2.4.2 Conceptual Mine Plan

The conceptual plan for mining the federal coal in the LBA area is based upon UEI's plans to use existing surface facilities currently included in the DOGM-approved mine plan for the Lila Canyon Mine (DOGM Permit C/007/0013), with the addition of a ventilation breakout as described below. The conceptual

mining plans are not final plans but represent reasonably foreseeable development for use in developing the projected recoverable coal tonnage and for analyzing the potential environmental consequences of leasing the LBA coal, based on current coal markets and current standard coal mining industry operating practices. This EA assumes full extraction of all economically mineable coal.

The conceptual mining plan for the LBA area is presented in Alternative B. All mining would be underground. No roads or power lines are proposed or anticipated. If the lease is successfully bid upon and issued to UEI, the same mine facilities and the same or similar mining methods, reclamation, water requirements, and other mining activities/requirements would be used as described in the mine plan for the Lila Canyon Mine. Surface-support facilities that would be used in conjunction with the proposed operations in the LBA area would likely consist of those for the most part already constructed for the Lila Canyon Mine. As mentioned above, one new ventilation breakout is proposed in UEI's conceptual mining plan. It would be located on the cliff face near the location shown on Figure 2-1.

Based on ventilation projections, a breakout vent would be needed on or near the outcrop of the coal seam near the Central Graben Fault in the northwest corner of the LBA area (see Figure 2-1). The breakout would be approximately 20 feet wide and 9 to 10 feet high and would be on a rock cliff face. It would be developed from inside the underground mine workings.

Construction of the breakout vent is essentially the process of mining out to daylight. This would take 1 week at most. Additional roof and rib supports may be installed near the opening and approximately 50 feet back into the mine from the opening. Such steel support sets would be made in advance and installed quickly at the opening. All excavated material would remain underground and/or be transported to the existing Lila Canyon portals and disposed of at an approved site. The vent opening would be high on a rock face and considered virtually inaccessible to the public. It would be screened with a wire grid.

2.4.2.1 Mining Methods and Mine Facilities

Existing surface-support facilities would provide the necessary infrastructure for personnel, equipment, materials and supplies, ventilation, and handling and loading of coal production. These existing facilities include a number of structures specifically designed to control or mitigate surface disturbances by providing the proper permitted approaches for such things as disturbed area runoff, wildlife, and soils.

Surface facilities include the following[1]:

- Administration office/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, above-ground 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 Mine entries are the primary mine access and supply routes for the economically minable portions of the coal seam(s), providing access and ventilation for all other underground workings and the principal coal haulage system.

[1] Note that some surface facilities are located at the nearby West Ridge Mine (West Ridge) facility (DOGM ACT 007/041).

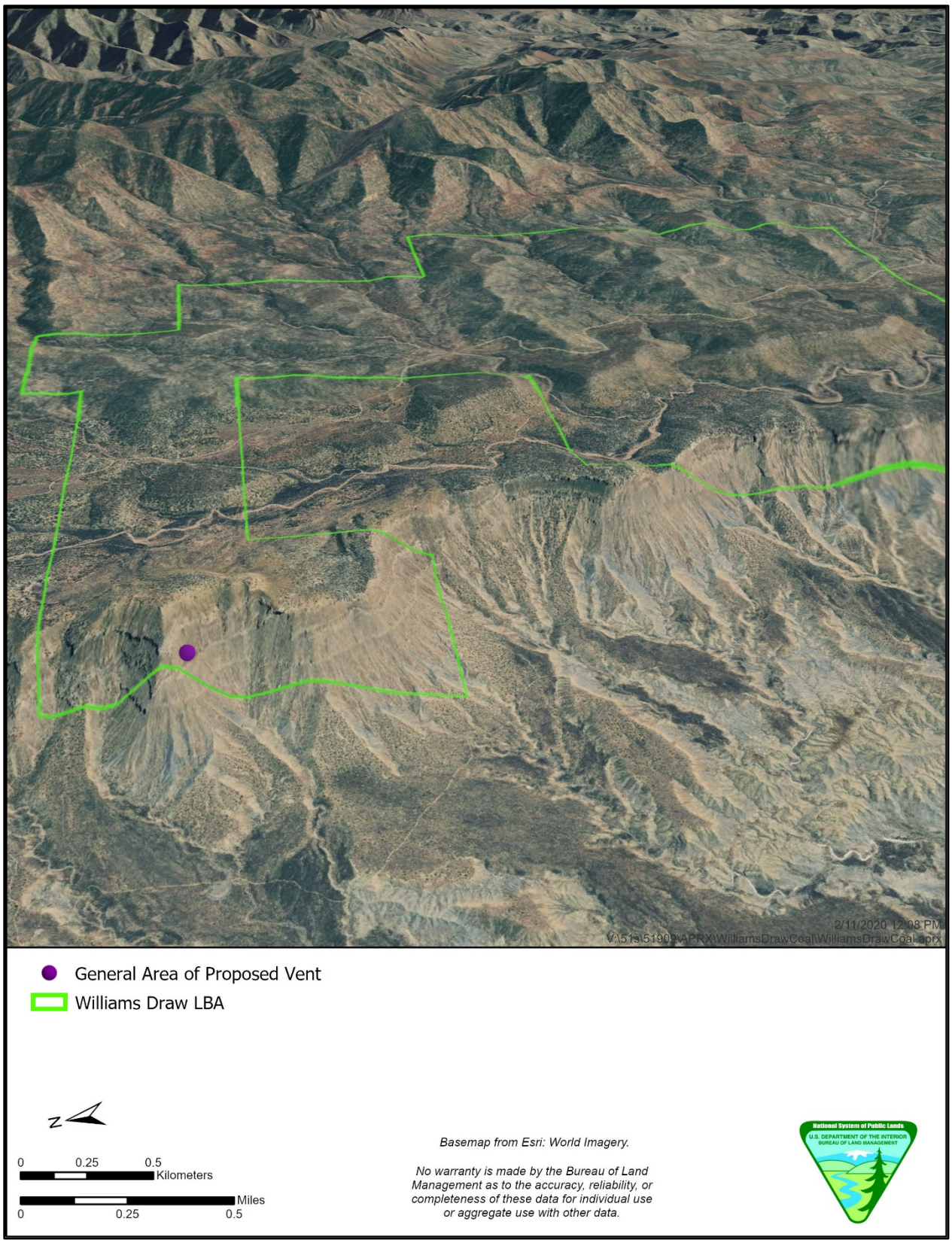

Figure 2-1. Approximate location of proposed mine vent, view facing east. Green outline represents Williams Draw LBA.

If the Williams Draw tract is leased, continuous miners (industrial mineral cutting machines with conveying and loading systems) would be used to support the longwall mining methods used to extract the coal; this is the current method used at the Lila Canyon Mine. Longwall mining is used where the coal seam is reasonably continuous and the longwall system is economically viable. Continuous miners first outline a large block of coal to be mined by longwall methods. Figure 2-2 shows a typical longwall mining scenario where continuous miners have already developed the longwall block. This development of the two or three entries surrounding the block provide access, ventilation, and coal haulage (conveyor belts). The following primary equipment is required to support longwall mining operations:

- Longwall mining system
- 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, and battery or diesel supply haulers

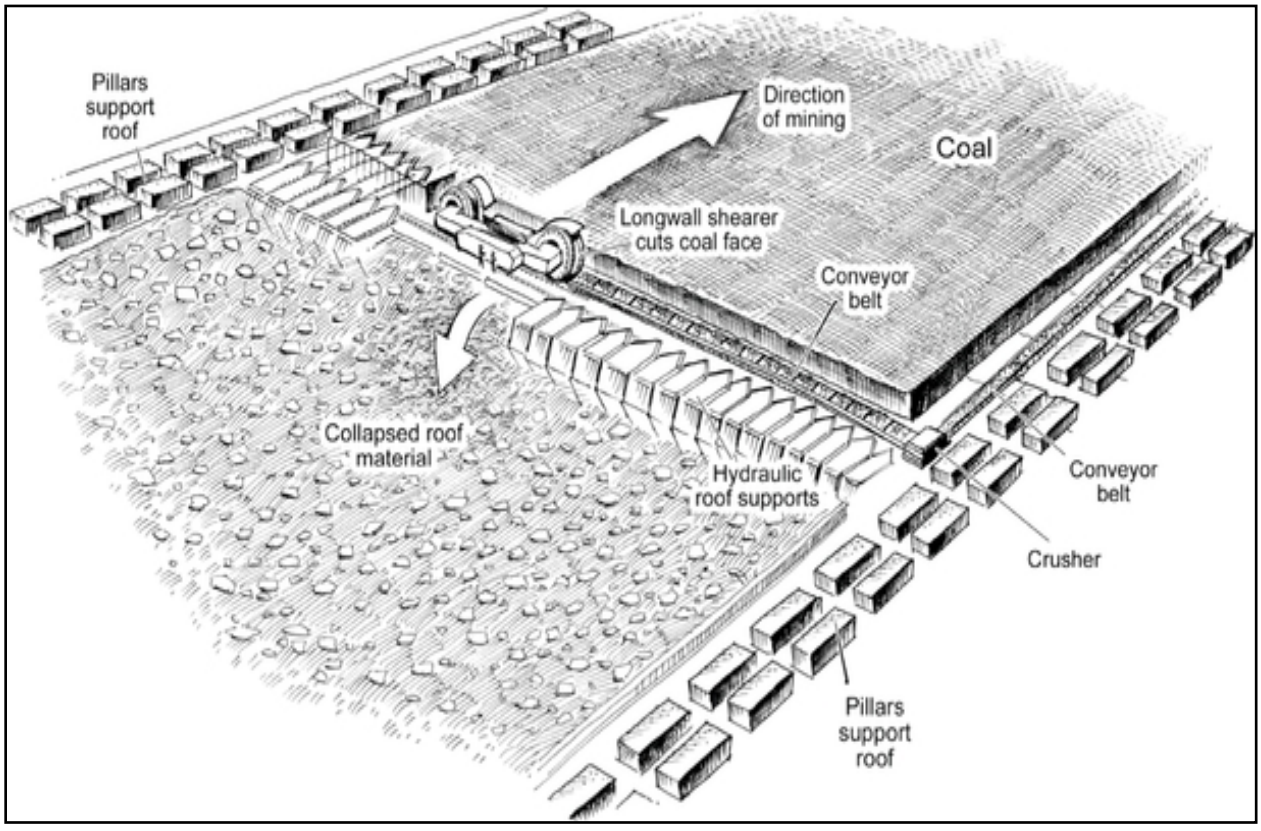

Figure 2-2. Typical longwall mining scenario.
(U.S. Securities and Exchange Commission 2011).

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, and mine ventilation.

2.4.2.2 Mine Coal Haulage System

The current underground mining production system at the Lila Canyon Mine uses a mine coal haulage system to transport coal from the underground workings to the surface. The mine coal haulage system consists of several interconnected components. Coal is cut from the face and transported to the conveyor system either by electric shuttle cars (continuous miner sections) or by an armored face conveyor (longwall face). Coal is brought out of the mine and delivered to the surface via a conveyor belt. These conveyer belts then transport the coal 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 a crushing/screening building.

From the crusher/screening building, the crushed and screened 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 or 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), making the trucks legally loaded for highway transport.

2.4.2.3 Subsidence

This section contains a discussion of mining-induced subsidence from the Proposed Action. It is based primarily on the geology and subsidence report prepared by Maleki Technologies, Inc. (Maleki 2017).

To achieve maximum economic recovery, it is anticipated that both longwall and room-and-pillar methods would be used to extract coal from the Williams Draw tract; however, longwall mining is the focus of the Maleki (2017) report. According to Maleki, "Longwall mining is generally the most environmentally attractive method to mine coal. It minimizes damage to the surface by allowing overburden strata to subside gradually over the mined-out areas while satisfying [B]LM's requirements that economic recovery of coal resources be maximized" (Maleki 2017). Room-and-pillar mining may be used in small areas that are not conducive to longwall methods. Pillars are initially left in place to support overburden loads, and once fully developed and if approved by MSHA, they would be removed with the use of mobile roof support systems, thereby maximizing economic recovery of coal.

The Proposed Action would result in a trough type of subsidence over the extraction area in the Williams Draw tract (Maleki 2017). Trough-type subsidence is associated with longwall mining and is less damaging than other types of subsidence, such as sink-type. Sink-type subsidence is not expected with the assumed use of stable pillars and depth of cover exceeding 400 feet.

Subsidence strains increase with coal thickness and decrease with overburden thickness. Therefore, areas with shallower depth of cover and thicker coal seems will be subjected to higher strains (Maleki 2017). Subsidence is expected to occur in the longwall areas with less than 1,000 feet of cover as are found in the north-central part of the LBA area and in the western part of the LBA area between the Williams Draw Fault and the Southern Boundary Fault.

"The potential for damage from 'permanent' tensile strains will be greatest at longwall block boundaries, particularly at shallow depths." (Maleki 2017:6). There are some areas of shallow overburden (< 200 feet in some areas), localized thinning of coal (< 6 feet), and either underlaying or near surface drainages of

interest such as the Little Park Wash. Maleki notes that "it is considered prudent and conservative to exclude full seam extraction mining in such areas" (Maleki 2017:7).

Changes in surface slopes as a result of subsidence are expected to be less than 2% to 3%. Vertical subsidence would not be visually discernable because of the gradual changes in surface slopes and overall large areas that have subsided. Generally, this type of subsidence is detectable only with survey instruments. However, the consequences of subsidence, such as ponding, may be noticeable depending on hydrogeological conditions. Annual surface subsidence monitoring would be conducted each spring for mined areas of the LBA area. If monitoring results suggest the potential for habitat changes, UEI or the successful bidder/operator would work with surface management agencies to provide 1) habitat enhancement (through selected manipulation of existing undisturbed areas to increase productivity of preferred forage species) and/or 2) off-site water sources such as construction of guzzlers and stock water impoundments.

Assuming the use of elastic mains pillars, sinkholes are not expected to form over the mains (main underground conveyance routes/tunnels) of the Williams Draw tract because of the thickness of the overburden (approximately 400–2,000 feet). A study conducted in the Hanna Basin in Wyoming established that most sinkholes (98% probability) occurred at depths of less than 160 feet (Karfakis 1987).

The Maleki report recommended the following resource protection measures:

- Exclude full seam extraction in areas with shallow overburden that underly the Little Park Wash
- Limit mining to within 550 feet of the Williams Draw Spring (spring LS008)

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, regrading the surface to achieve approximate original contour, and restoring the area to the approved pre-mining land use, unless a post-mining land use change is approved by DOGM. 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 LBA area other than at the rock face where the underground workings meet the atmosphere at the vent location. At this location, materials would remain inside the mine. Overall, no surface reclamation other than sealing of the ventilation opening from inside the mine would be anticipated in conjunction with development of the LBA coal reserves.

2.4.2.5 Water Requirements

Water usage at the Lila Canyon Mine, based on 1 million tons per year (tpy) of coal production, would be as follows:

- 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

As coal production increases to 2 million 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 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.

UEI is required under its DOGM permit to report water depletion for the Upper Colorado River Endangered Fish Recovery Program. Water use in 2018 (in-mine), as reported by UEI in its annual report to DOGM, for approximately 2.8 million tons of coal produced was 13,372,835 gallons for coal production and 2,190,000 gallons for dust suppression (in-mine) (UEI 2019).

2.4.2.6 Electrical Power Supply

Electrical power for the Williams Draw tract's development and mining activities would come from an existing 46-kilovolt overhead power line that was built for and terminates at a substation at the Lila Canyon Mine. Power would be distributed to underground workings by a high-voltage 12.5-kilovolt cable.

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, result in the production of underground development rock, including carbonaceous shale, weathered coal, floor clay, and parting materials. Where it is operationally feasible to separate these materials from the coal during development and mining, the underground development rock is removed and handled separately from the coal and placed underground or taken to the surface and disposed of at an approved location. Most commonly at the Lila Canyon Mine and other mines, waste rock is simply placed permanently in underground storage.

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 waste such as 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. Before permanently sealing any portion of the mine, the BLM is required to inspect the area to be sealed to the extent possible to ensure that there is no hazardous material remaining behind the seals. This is required by the Comprehensive Environmental Response, Compensation and Liability Act, and the operator is also required to submit a certification, under penalty of law, that no such material is remaining behind said area.

Most maintenance and major oil changes for some of the mobile equipment 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 (UDEQ) 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.

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 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; these plans are updated as required and would apply to coal produced from the Williams Draw tract via the Lila Canyon Mine.

All coal mine facilities are required under the U.S. Environmental Protection Agency (EPA) to maintain a toxic release inventory and record any and all spills associated with hazardous wastes. Generally and historically, underground mines do not have spills associated with hazardous wastes, but their operators are required in any case to maintain this toxic release inventory and provide it to EPA inspectors upon request.

2.4.2.9 Normal Operating Hours

As with the current production at the Lila Canyon Mine, production from the Williams Draw tract could occur 24 hours per day and 7 days per week; however, production would likely occur 16 hours per day and normally 5 days per week, and maintenance would occur the other 8 hours per day.

2.4.2.10 Signage

Required signs and markers in compliance with the applicable regulatory provisions of Utah Administrative Code R645-301-521.200 are in place at the Lila Canyon Mine. All required signs and markers would be maintained or replaced during active operations, site reclamation, and until final bond release is approved for all areas within the permit boundaries. Also, as suggested in the *Williams Draw Coal NEPA Analysis: Air Technical Report Emery County, Utah* (hereafter the *air technical report*), signs may be used to warn the public of possible hazardous conditions at specific locations, such as nearby ventilation fans or ventilation breakouts (SWCA 2019).

2.4.2.11 Estimated Employment Requirements

Leasing the tract would extend the life of the mine by 10 to 15 years, but neither the workforce of approximately 238 nor the annual production, which "shall not exceed 4.5 million tons per rolling 12-month period" (UDEQ 2013a) would be expected to increase.

2.4.2.12 Traffic Estimates

Coal from the tract would be transported using existing haul roads to reach U.S. Route 191-U.S. Route 6 and then transported to an existing loadout site on Ridge Road near Wellington, Utah. At a coal production level of 4.5 million (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 describes the existing environment and the environmental consequences (i.e., impacts) on resources that could be affected by the Proposed Action or No Action alternatives. Environmental data available or collected on the LBA area 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 term *significantly*, as used in NEPA, requires considerations of both context and intensity, as follows (40 CFR § 1508.27):

- *Context* means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short-term and long-term effects are relevant.
- *Intensity* refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action.

In this light, the BLM requested that a Williams Draw air technical report be prepared to support the EA by evaluating the potential air quality impacts within a near-field study area (see Section 3.2.1) from the conceptual mining of coal in the Williams Draw tract. To accomplish this evaluation, a conservative model was built and run with input from the BLM, the EPA, and UDEQ. Note that modeling outputs rely on modeling inputs; in a *conceptual* mining scenario, the model results do not necessarily translate to real world conditions. Studies and resulting reports on hydrology, geology, rock mechanics, and cultural resources were also prepared in support of this EA by independent consultants.

The analysis of impacts to air quality is based on the scope of the Proposed Action, which includes an estimated 10 to 15 years of underground mining of approximately 32 million tons of coal (in the LBA area) and aboveground processing and shipping operations at a currently operating facility. A ventilation breakout would be constructed in the LBA area on the cliff face at a location where the underground workings meet daylight.

The impacts from ongoing mining operations at the Lila Canyon Mine and cumulative impacts are described in the Lila Canyon Project EA (BLM 2000). The air quality assessment and cumulative emissions assessment for the PFO are summarized in the Utah BLM *Air Resource Management Strategy 2020 Monitoring Report* (BLM 2020b).

3.1.1 Setting

The Williams Draw tract (LBA area) is in the Book Cliffs region of the Colorado Plateau physiographic province of east-central Utah. The LBA area is in Emery County, Utah, approximately 120 miles southeast of Salt Lake City, Utah, and approximately 10 miles south of the town of East Carbon, Utah. The LBA area is south of and adjacent to currently developed federal coal leases at the Lila Canyon Mine, which is owned and operated by UEI.

The LBA area is in rugged, mountainous terrain along the western flanks of the Book Cliffs escarpment. The Book Cliffs escarpment rises abruptly above the valley and divide the lower and upper elevations of the LBA tract (Figure 3-1). This escarpment consists of sandstone-capped cliffs, which are oriented in a northwest–southeast direction through the tract. All of the tract is within the Price River drainage. To the east of the tract are the steep mountainous areas that are part of the Range Creek drainage. To the west of the tract is the broad expanse of rolling lowland topography developed on the highly erodible Mancos Shale that occupies the Price River valley.

Topographic relief in the tract exceeds 1,500 feet, ranging from a minimum elevation of 5,520 feet in Marsh Flat Wash near the base of the Book Cliffs escarpment to a maximum elevation of 7,097 feet on hilltops on the Book Cliffs plateau. The climate in the area is characterized by hot, dry summers and cold winters.

The lower elevations in the LBA area consist of a mixture of shrublands, including salt desert scrub, mat saltbush, greasewood flats, shale badland, and juniper shrubland. Sagebrush shrublands and grasslands are interspersed with pinyon-juniper woodlands at mid-elevations. At higher elevations up on the plateau, particularly in drainages, there are pockets of mixed coniferous forests dominated by Douglas-fir (*Pseudotsuga menziesii*). Rocky cliff habitat is present along the Book Cliffs, and rock outcrop and short cliffs are present in the dry, open canyons in the eastern part of the LBA area.

Figure 3-1. Southern end of the Williams Draw tract, view facing northeast (Tetra Tech 2016).

Ephemeral washes drain the valley basin area on the western side of the LBA area, and generally flow south or southwest toward the Price River. The Price River is approximately 8 miles west of the tract, and Range Creek is 4 miles east of the tract.

3.1.2 Past, Present, and Reasonably Foreseeable Future Actions

Past and present actions near the LBA area are mainly underground mining and underground mining–related operations. Past and present actions may influence the environmental setting for analysis of site-specific effects of the Proposed Action. Reasonably foreseeable future actions are actively proposed events that may affect the same resource(s) during the timeline of the Proposed Action.

3.1.2.1 Past and Present Actions

Table B-1 (Appendix B) lists the past and present actions in the resource-specific analysis areas that are considered in the analysis of cumulative effects.

3.1.2.2 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions in the resource analysis areas defined in this chapter are identified below and listed in Table B-2 (Appendix B). The UEI and Bronco Utah Reserves, Inc. (Bronco) coal leasing actions are independent federal actions that do not rely upon the Proposed Action for implementation and as such are not "connected actions" to the Proposed Action.

SITLA Coal Lease: UEI was granted a lease in October 2018 by the State of Utah through 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) in Emery County. The SITLA lease has an initial 10-year term. It is reasonably foreseeable that UEI will include the extraction of the coal in these sections in future plans. The Williams Draw LBA is required to access the SITLA leases unless they are accessed either from the outcrop or via a shaft. Although the Proposed Action is a federal action, the two actions are not connected because the state leases have been granted by the state and do not involve a federal action, thus these are not two federal actions that rely on the Proposed Action for implementation.

Lila Canyon Mine Lease Modification Application: UEI submitted a lease modification application (LMA) for modification of two federal coal leases in Emery County. This modification would add 1,272.64 acres east of and adjacent to the Lila Canyon Mine to the permit area, which is north of the Williams Draw LBA area. The BLM analyzed this proposal in the *Lila Canyon Coal Lease Modifications Draft Environmental Assessment, Emery County, Utah, DOI-BLM-UT-G020-2018-0039-EA* (the LMA EA) (BLM 2020c), which was available for public review and comment from April 24 to June 8, 2020. The BLM is in the process of reviewing public comments on the proposal. If the proposed LMA is approved, mining in the LMA areas may occur prior to or while the Williams Draw reserves are being mined, in the event the BLM approves the Proposed Action. The LMA is not a connected action because the possible leasing or mining of the Williams Draw tract is not dependent upon approval of the LMA.

Walker Flat LBA: Bronco submitted a coal LBA in March 2018 for 2,956 acres in the Walker Flat area of Emery County, Utah, approximately 62 miles southwest of the Lila Canyon Mine. If this area is leased and developed, mining in the Walker Flat area may occur while the Lila Canyon Mine and the proposed Williams Draw LBA area are being mined. The BLM is preparing a draft EA to describe the potential environmental impacts of leasing the Walker Flat coal tract. Mining the Walker Flat LBA area would extend the life of the Bronco Utah Mine, which produced approximately 760,000 tons of coal in calendar year 2018. Annual production would be expected to increase assuming that Bronco is the successful bidder. Depending on demand and regulatory agencies' ability to process their 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 (on a rolling 12-month period); additional permitting would be required to increase production above this amount. This action is not a connected action because the operation of the Bronco Utah Mine is not dependent on the Lila Canyon Mine or the possible leasing or mining of the Williams Draw tract.

Little Eccles Coal LBA and LMA: Canyon Fuel Company, LLC provided applications to the BLM Utah State Office to modify coal lease UTU-77114 in Sanpete County and to lease the Little Eccles Tract in Emery County located near the Skyline Mine. Surface ownership is managed by the U.S. Forest Service. The BLM, U.S. Forest Service, and OSMRE will prepare an EIS to inform decision-making for these applications.

Uinta Basin Railway: The Utah Surface Transportation Board is currently analyzing a request filed by the Seven County Infrastructure Coalition for authority to construct and operate an approximately 85-mile common-carrier rail line connecting two termini in the Uinta Basin near South Myton Bench, Utah, and Leland Bench, Utah, to the national rail network via an existing rail line owned by Union Pacific Railway Company near Kyune, Utah. The proposed rail line would be used to transport crude oil, fracturing sand, machinery, and mineral and agricultural products and commodities. Three alternative routes are being considered in an EIS. All of these routes dip into northern Carbon County, Utah, for an approximate 5-mile stretch north of Helper. The BLM is participating as a cooperating agency in the EIS process. The three build alternatives may cross BLM-administered lands, and if so, a rail right-of-way would be needed.

BLM Quarterly Oil and Gas Lease Sales: Leasing of public lands for oil and gas exploration and production is required by the Mineral Leasing Act of 1920, as amended, and the BLM's current policy is to apply the least restrictive management constraints to the principal uses of the public lands necessary to achieve resource goals and objectives. Parcels to be offered would be leased subject to stipulations prescribed by the RMP. Before any surface-disturbing operations may be authorized, an additional site-specific analysis would be completed through the NEPA process. Further mitigation (if warranted and consistent with standard lease terms, notices, and stipulations) to reduce impacts to the environment and other uses of the public lands could be required through the application for permit to drill (APD) or right-of-way processes.

December 2017 Competitive Oil and Gas Lease Sale: The BLM offered 74 parcels, totaling approximately 94,000 acres in Duchesne, Uintah and Emery Counties, at its December quarterly oil and gas lease sale. The impacts of offering 15 of the 74 parcels were analyzed in the EA prepared by the PFO. The BLM held the lease sale online at www.energynet.com on December 12, 2017. None of the 15 parcels offered in the PFO received bids at the competitive sale. Three parcels were sold non-competitively after that sale.

3.2 Air Quality and Greenhouse Gas Emissions

The analysis area for potential direct, indirect, and cumulative effects on air quality comprises the 50-kilometer (km) near-field modeling analysis area delineated in the air technical report (SWCA 2019). The air technical report was developed to evaluate the potential air quality impacts of the Proposed Action. It includes a summary of the Proposed Action; reasonably foreseeable developments and modeling components; existing conditions, climate of the LBA area, current air quality regulations; an emission inventory of direct and indirect criteria air pollutants, HAPs, and GHGs; a near-field modeling analysis; and an analysis of GHGs and climate change.

In accordance with Council on Environmental Quality regulation 40 CFR § 1502.21, the air quality analysis in this EA incorporates by reference the air technical report (SWCA 2019, available on the BLM's ePlanning site). Production from the LBA area is anticipated to be 3.0 to 3.5 million tpy during an estimated 10 to 15 years of coal extraction, depending upon market conditions. The impact analysis modeling was based on the air quality permit production limit of 4.5 million tpy, which is higher than what is anticipated. There is an estimated 32 million tons of recoverable coal in the Williams Draw tract, with another 4 to 5 million tons on a state coal lease (SWCA 2019).

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. Clean Air Act provisions that are relevant to the Proposed Action include the National Ambient Air Quality Standards (NAAQS), the Prevention of Significant Deterioration (PSD), Class I and Class II areas, air quality–related values, General Conformity, 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), ozone, sulfur dioxide (SO_2), and particulate matter (PM). The NAAQS are summarized in Table 3-1.

Table 3-1. National Ambient Air Quality Standards

Pollutant	Averaging Period	Primary*		Secondary†		Form of Standard
		(ppm)	(µg/m^3)	(ppm)	(µg/m^3)	
CO	1-hour	35	40,000	–	–	Not to be exceeded more than once per year
	8-hour	9	10,000	–	–	Not to be exceeded more than once per year
NO_2	1-hour	0.1	188	–	–	98th percentile of annual 1-hour daily maximum concentrations, averaged over 3 years
	Annual	0.053	100	0.053	100	Annual mean
O_3	8-hour	0.070	–	0.07	–	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
$PM_{2.5}$	24-hour	–	35	–	35	Annual 98th percentile of 24-hour maximum concentrations, averaged over 3 years
	Annual	–	12.0	–	15.0	Annual mean averaged over 3 years
PM_{10}	24-hour	–	150	–	150	Not to be exceeded more than once per year on average over 3 years
Pb	Rolling 3-month	–	0.15	–	0.15	Not to be exceeded
SO_2	1-hour	0.075	196	–	–	99th percentile of annual 1-hour daily maximum concentrations, averaged over 3 years
	3-hour	–	–	0.5	1,300	Not to be exceeded more than once per year

Source: EPA (2016a).

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.

* Primary standards: Provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.

† Secondary standards: Provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

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

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, the area is called an attainment area (designated unclassifiable/attainment) for that pollutant. Areas that do not comply with a NAAQS for a criteria pollutant are called nonattainment areas for that pollutant. A particular geographic region may be designated as an attainment area for some pollutants and a nonattainment area for other pollutants. Maintenance areas are previously designated nonattainment areas for one of the NAAQS that have since met the NAAQS standards. Emery County is currently designated as unclassifiable/attainment for all criteria pollutants (SWCA 2019).

Prevention of Significant Deterioration

The PSD is an EPA permitting program that applies to new or modified major stationary sources of air pollution that are located in attainment areas. sources are defined as those sources that emit 100 tpy or more of any criteria pollutant for specifically listed source categories or that emit 250 tpy of any criteria pollutant and are not in a specifically listed source category. The Proposed Action would not be in a listed source category; therefore, the major PSD threshold is 250 tpy of any criteria pollutant.

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 involving 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 in the United States; therefore, all areas not designated as Class I areas are known as Class II areas.

If a major stationary source is subject to the PSD permitting program, it must perform air quality monitoring and modeling analyses. A proposed major stationary source can demonstrate that it does not cause or contribute to a violation by demonstrating that the ambient air quality impacts resulting from its emissions would be less than the significant impact levels (air quality concentration values). In conducting an air quality modeling analysis, PSD increment consumption must also be evaluated for a major source. A PSD increment is the maximum 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.

The nearest Class I area to the LBA area 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 to the south-southeast) and Capitol Reef National Park (approximately 77 miles to the southwest). Three areas were assessed in the air technical report for potential impacts from the Proposed Action: Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry (approximately 19 miles west-southwest of the LBA area); Turtle Canyon Wilderness (approximately 1.5 miles east of the LBA area); and Desolation Canyon Wilderness (approximately 5.2 miles east of the LBA area). All are located in Class II airsheds.

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). A 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 stationary sources (or modifications to major stationary sources) 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, such as lakes, soils, vegetation, and wildlife.

General Conformity

The General Conformity Rule, established under 40 CFR Part 51 Subpart W and 40 CFR Part 93, Subpart 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 relevant state implementation plan and state attainment plans. Because Emery County is an unclassifiable/attainment area, the General Conformity Rule does not apply to the Proposed Action.

New Source Performance Standards

The EPA has also promulgated technology-based standards, known as the NSPS, for specific sources of air pollution (40 CFR Part 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 volatile organic compound (VOC) emission standards over the phase-in period of the regulations, i.e., emission standards vary according to date of manufacture, and newer engines must meet more stringent standards. In the air technical report emission inventory, the NSPS are assumed to apply to all stationary engines (SWCA 2019).

Non-Road Engine Tier Standards

The EPA 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 regulated under these standards. Over the life of the project's 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 estimates in the report represent a conservative estimate for this source category.

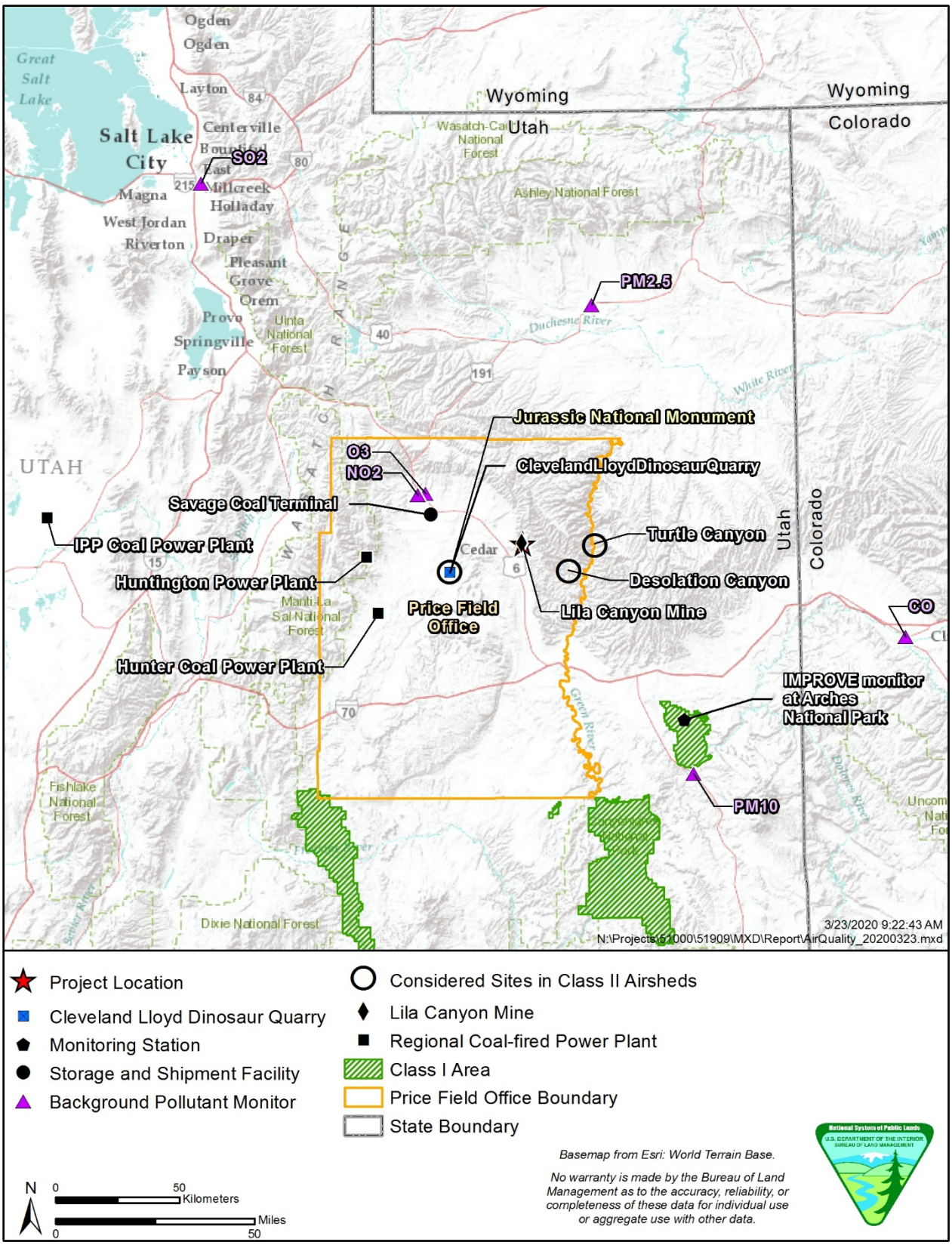

Figure 3-2. Air quality–related sites in and near the Williams Draw tract.

The EPA engine tier standards do not apply to underground mining equipment. In accordance with 40 CFR § 1039.5(c), engines used in underground mining or in underground mining equipment are regulated by the MSHA in 30 CFR. Specifically, the MSHA standards at 30 CFR §§ 72.500–72.502 establish exhaust diesel PM emissions for permissible and nonpermissible diesel-powered equipment, and standards at 30 CFR § 57.5060 establish limits on miner exposure to diesel PM. In accordance with 30 CFR § 7.84(e), exhaust PM emissions would be diluted to 1 milligram per cubic meter (mg/m^3). In addition to diesel particulate matter 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. Also, 30 CFR § 70.100 establishes concentration limits for respirable coal mine dust at 1.5 mg/m^3 for underground coal mines.

National Emission Standards for Hazardous Air Pollutants

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

3.2.1.2 State Permitting

Lila Canyon Mine

Stationary pollutant sources at the existing Lila Canyon Mine are regulated by the Utah Division of Air Quality (DAQ) and are subject to Utah Administrative Code R307-401-8, which requires an approval order prior to constructing, installing, 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 (UDEQ 2013a). 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 (UDEQ 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.

3.2.1.3 Existing Conditions

Climate

The climate in and near the Williams Draw tract 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 Range. 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 degrees Fahrenheit (°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 LBA area is 7 miles per hour, 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 LBA area and surrounding areas is provided in the air technical report and summarized briefly here. Background levels of criteria pollutants are provided in Table 3-2. The monitored concentration values in Table 3-2 are the averages of the 2015–2017 data from pollutant monitors closest to the LBA area. Monitors and averaging periods were selected by their relative distance to the LBA area and by recommendation of the DAQ.

Table 3-2. Background Levels of Criteria Pollutants

Pollutant	Averaging Period	Location		Observation	Monitored Concentration		
		City/State	Distance from the LBA Area (miles)		(ppm)	(ppb)	(µg/m³)
CO*	1-hour	Grand Junction, Colorado	101	2nd high max. avg.	1.50	–	–
	8-hour	Grand Junction, Colorado	101	2nd high max. avg.	1.30	–	–
NO_2†	1-hour	Price, Utah	27	98th percentile avg.	–	18.00**	–
	Annual	Price, Utah	27	2-year annual avg.	–	6.40††	–
O_3‡	8-hour	Price, Utah	27	4th high max. avg.	0.067	–	–
$PM_{2.5}$§	24-hour	Roosevelt, Utah	65	98th percentile avg.	–	–	24.00
	Annual	Roosevelt, Utah	65	3-year annual avg.	–	–	6.10
PM_{10}¶	24-hour	Moab, Utah	73	2nd high max. avg.	–	–	42.00
SO_2#	1-hour	Salt Lake City, Utah	121	99th percentile avg.	–	7.00	–
	3-hour	Salt Lake City, Utah	121	2nd high max. avg.	–	6.33	–

Source: SWCA (2019).

Notes: ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter; max. = maximum, avg. = average

* 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 Air Quality System, highest-eighth-high (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 for Emery County and Carbon County are summarized from the 2014 National Emission Inventory in Table 3-3. Although 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 (tpy)	Carbon County Emissions (tpy)
CO	19,094	9,815
NO_x	20,586	5,823
PM_{10}	5,394	3,863
$PM_{2.5}$	1,328	729
SO_2	6,425	10,323
VOCs	37,152	19,364
HAPs	7,641	3,710

Source: SWCA (2019).

Climate Change

Global warming refers to the ongoing rise in global average temperature near the Earth's surface. Global warming 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 GHGs. 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. GWP is calculated over a specific time, typically 100 years. In the air technical report, GHG emissions are presented in short tons, and CO_2e is based on the following 100-year values from the Intergovernmental Panel on Climate Change (IPCC) *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (AR5) (IPCC 2014): CO_2 GWP of 1, CH_4 GWP of 28, and N_2O GWP of 265 (SWCA 2019).

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, energy-related emissions from the United States 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 United States GHG emissions in 2017 (EPA 2019a).

In 2017, total gross United States GHG emissions were 6,456.7 million metric tons (MMT) of CO_2e. Total United States emissions increased by 1.3% from 1990 to 2017, whereas emissions decreased by 0.5% from 2016 to 2017 (EPA 2019a). The decrease from 2016 to 2017 was driven partly 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).

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 the Intermountain Region, which includes all of Utah (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 LBA area), 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 offer the Williams Draw LBA area for leasing by competitive sale at this time, approve UEI's application for federal coal reserves beneath 4,231.40 acres of BLM- and SITLA-administered surface lands, and the federal coal resources contained in the LBA area would not be mined. The coal reserves in the Williams Draw tract would most likely be permanently bypassed.

The 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 the 2013 approval order. The projected mine life of the Lila Canyon Mine would not be extended. Other existing sources of air pollution (e.g., SCT, mobile sources) would continue to impact air quality in the area.

3.2.2.1 Cumulative Effects

The No Action alternative 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 offer the Williams Draw LBA area for leasing by competitive sale 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

The Williams Draw tract is contiguous with the Lila Canyon Mine, and it is anticipated that Lila Canyon Mine's surface facilities and infrastructure would be used for this project if UEI is the successful bidder at a competitive lease sale involving the tract. Emissions of air pollutants at the Lila Canyon Mine are currently limited by a production rate condition established in its 2013 approval order. Annual permitted emissions at the Lila Canyon Mine would not increase with the Proposed Action. The Proposed Action would not authorize a change in already permitted actions, in the maximum production limitation, or in annual emissions. However, the mining of the Williams Draw tract coal reserves would add approximately 10 to 15 years to the operating life of the Lila Canyon Mine, which is currently projected to be actively mining through 2025.

3.2.3.1 Direct Emissions

Under the Proposed Action, direct emissions would result from the mining of the coal in the LBA area and the hauling of the mined coal to the existing SCT. 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 PM, 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). HAPs and GHGs are also emitted from fuel combustion sources, but in de minimis amounts. CH_4 would be emitted by the ventilation air handling system required by the MSHA 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, CH_4 and VOC concentrations are below detectable limits in the ventilation exhaust air (SWCA 2019).

Mobile sources of direct emissions 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 the 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 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. Vehicle 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 emissions 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 non-road engines: All engines are Tier 2 based on age, except mantrips which are Tier 3
- Aboveground non-road 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 tpy 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).

Table 3-4. Direct Criteria Pollutant Emissions

Emission Source	Maximum Annual Criteria Pollutant Emissions (tpy)					
	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 SCT (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, the EPA suggests that the emission factors for PM_{10} may be used as an upper limit for $PM_{2.5}$ emissions from crushing (EPA 1998). 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 Greenhouse Gas Emissions

Emission Source	Maximum Annual GHG Emissions (tpy)			
	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
Aboveground equipment	37,734	2	1	38,050
On-road vehicles: coal haul trucks to SCT (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).

Notes: 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.

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 AR5 GWP values (IPCC 2014).

Table 3-6. Direct Hazardous Air Pollutant Emissions

Emission Source	Maximum Annual HAP Emissions (tpy)					
	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 SCT (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).

Mobile source HAP emissions would result from fuel combustion in both road and non-road vehicles. Only HAP emissions from mobile sources (direct and indirect) were analyzed for the following reasons: VOC emissions from coal mine venting are poorly understood, a gas analysis of vented air at the Lila Canyon Mine is not available, and the Colorado Underground Coal Mine Emission Inventory Tool (V1.0) does not include any HAP speciation emission factors. For vehicle operations associated with aboveground and underground mining activities, worker commuting, coal haul trucks, and locomotives, the speciated HAPs include compounds such as aldehydes, formaldehyde, n-hexane, benzene, toluene, and xylene.

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 United States port located along the Gulf of Mexico via locomotive for export, and combusting coal. The SCT's approval order would not likely need to be modified in response to the Proposed Action.

When combusted at a power plant, the coal mined from the LBA area 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 Williams Draw tract, 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 on-site 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 area and would continue under the Proposed Action.

The following assumptions were used in the development of the emissions 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 United States export port (the exact port of export is not known; a gulf port was selected as a reasonable approximate 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 LBA area coal was shipped via locomotive to a generic United States export port located along the Gulf of Mexico.

Table 3-7. Indirect Criteria Pollutant Emissions

Emission Source	Modeled Portion of Annual Criteria Pollutant Emissions (tpy)					
	CO	NO_x	VOC	SO_2	PM_{10}	$PM_{2.5}$
SCT: coal handling	4.35	9.25	7.27	0.28	42.39	6.21
On-road vehicles: hauling coal from SCT 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 SCT to a United States 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[1]	**877.51**	**3,256.02**	**131.59**	**3.38**	**117.82**	**79.37**

Source: SWCA (2019).

1 Totals do not include on-road vehicle portion because no coal would be hauled to a regional plant if all coal is exported.

Table 3-8. Indirect Greenhouse Gas Emissions

Emission Source	Maximum Annual GHG Emissions (tpy)			
	CO_2	CH_4	N_2O	CO_2e
SCT: coal handling	6,383	< 1	< 1	6,506
On-road vehicles: hauling coal from SCT to regional power plant (fugitive dust and exhaust)	N/A	N/A	N/A	10,993
Locomotives: hauling coal from the SCT to a United States 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).

Notes: 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.

GHG emissions are reported in short (U.S.) tons, and CO_2e is based on 100-year AR5 GWP values (IPCC 2014).

Table 3-9. Indirect Hazardous Air Pollutant Emissions from Mobile Sources

Emission Source	Annual HAP Emissions (tpy)					
	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 the proposed mining activity in the LBA area. If issued a lease for the Williams Draw tract, the successful bidder/operator could continue to provide coal to regional plants, or the coal could be transported to a United States port for export and combusted outside of the United States. The successful bidder/operator could also continue providing coal to the lime cement market and the spot market, or it could expand its customer base to other markets. This analysis assumes that all LBA area coal that is mined will be combusted.

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 emissions calculations because it is not known at this time where all the coal mined from the LBA area would be shipped if a lease is issued. To estimate emissions from the combustion of the mined coal, criteria and HAP emission factors from EPA's AP-42 report for bituminous and subbituminous coal combustion were obtained. Emission factors for pulverized coal, dry bottom, tangentially fired, bituminous, and pre-NSPS firing configuration were used to estimate worst-case combustion emissions from the combustion of the mined coal. 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 based on the coal shipments between the Lila Canyon Mine and the Hunter Power Plant and Huntington Power Plant (EIA 2020).

Indirect annual criteria pollutant, GHG, and select HAP emissions from the combustion of the coal are summarized in Tables 3-10 and 3-11.

Similarly, indirect annual GHG emissions associated with the combustion of the coal that would be extracted from the Williams Draw tract were estimated. GHG coal combustion emissions are based on emission factors for bituminous coal combustion obtained from 40 CFR Part 98, Subpart C, Tables C1 and C2. Estimates of GHG emissions are also reported in terms of CO_2e to account for the relative GWP. Based on the IPCC's AR5, CH_4 has a lifetime of 12.4 years, a GWP of 28 over 100 years, and a GWP of 84 over 20 years. N_2O has a lifetime of 121 years, a GWP of 265 over 100 years, and a GWP of 264 over 20 years (IPCC 2014). For this analysis, GHG emissions have been presented in short tons, and CO_2e is based on 100-year AR5 values. Table 3-11 lists the indirect annual GHG emissions associated with the combustion of the coal extracted from the Williams Draw tract.

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

Emission Source	Annual Criteria Pollutant and HAP Emissions (tpy)								
	CO	NO_x	$PM_{2.5}$	PM_{10}	SO_2	VOC	Hydrochloric Acid	Hydrofluoric Acid	Mercury
Coal combustion	1,125	33,750	15,188	58,219	85,500	21	2,700	338	0.84

Source: SWCA (2019).

Table 3-11. Combustion of Coal Greenhouse Gas Emissions

Emission Source	Annual GHG Emissions (tpy)			
	CO_2	CH_4	N_2O	CO_2e
Coal combustion	10,822,685	1,276	186	10,907,614

Source: SWCA (2019).

Note: CO_2e is based on 100-year AR5 GWP values for CO_2, CH_4, and N_2O (IPCC 2014).

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 would include transporting the coal to a generic United States port (a fully loaded trip to the port and an empty return trip) and combustion of all coal produced. Table 3-12 summarizes the total direct and indirect GHG emissions that would be generated under 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 Greenhouse Gas Emissions

Emission Source	Total Annual GHG Emissions (tpy)			
	CO_2	CH_4	N_2O	CO_2e
Direct operations (all direct mine emission sources, including coal haul trucks to SCT and worker commute vehicles)	117,618	1,625	3	163,821
Indirect operations when all coal is exported (i.e., SCT, locomotives)	343,334	27	10	357,444

Emission Source	Total Annual GHG Emissions (tpy)			
	CO_2	CH_4	N_2O	CO_2e
Indirect combustion of produced coal	11,274,017	1,276	186	11,652,486
Total	**11,734,969**	**2,928**	**198**	**12,173,751**

Note: CO_2e is based on 100-year AR5 GWP (IPCC 2014).

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

Table 3-13. Proposed Action, Local, State, and National Greenhouse Gas Emissions

Proposed Action, Estimated (MMT of CO_2e per year)	Emery County, 2018 (MMT of CO_2e per year)*	State of Utah, 2018 (MMT of CO_2e per year)*	United States, 2017 (MMT of CO_2e per year)†
12.2	13.5	35.1	6,456.7

* Data from EPA (2018).

† Data from EPA (2019a).

CO_2e GHG emissions under the Proposed Action would be approximately 90% of Emery County's 2017 GHG emissions, approximately 35% of statewide GHG emissions, and approximately 0.2% of United States GHG emissions in 2017.

Although this EA presents a quantified estimate of potential GHG emissions associated with the proposed LBA area coal development, there is uncertainty in GHG emissions estimates because of 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 estimate the effects of many small-scale processes. At present, there are no scientifically proven methods for assigning a "significance" value to a single source's contribution to global or regional climate change. GHG emissions are presented here as a proxy for the potential effects on climate change 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 Proposed Action emissions would incrementally add to the national and global emissions driving climate change (see Section 3.2.1.3.3).

3.2.3.4 Near-Field Modeling Analysis

As previously discussed, the Williams Draw tract is contiguous to the Lila Canyon Mine and would use Lila Canyon Mine surface facilities and infrastructure if a competitive lease sale is held for the tract and UEI is the successful bidder. In such case, the Proposed Action would occur under 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 LBA area to estimate maximum impacts within and near the LBA area, nearby Class I and II areas, and population centers resulting from reasonably foreseeable development-related construction and production emissions. Ground-level concentrations of criteria pollutant emissions and HAP emissions (aldehydes, formaldehyde, n-hexane, benzene, toluene, and xylene) were evaluated as part of the near-field assessment (SWCA 2019). Modeling methodology, model configuration, meteorological data used, receptor placement, and other inputs and assumptions are described in the air technical report (SWCA 2019). The assessment was performed in accordance with an air quality impact assessment modeling protocol developed for the tract (the protocol can be found in Appendix C of the air technical report).

Air Quality Modeling Impact Assessment Results

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 follows:

- 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 maximum)
- 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)	Percentage 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%

Pollutant	Averaging Period	Modeled Concentration (µg/m³)	Background Concentration (µg/m³)	Maximum Ambient Concentration (µg/m³)	NAAQS (µg/m³)	Percentage of Standard (%)
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) potentially exceed 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 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 ambient air quality boundary used for the modeling analysis, the low exit velocity, the rugged terrain, and the high emissions associated with these activities. Potential exceedances of the 1-hour NO_2 NAAQS are also expected to occur within 20 meters south of the Lila Canyon Mine's surface facilities area (see Figure 1-2). These potential exceedances are expected to occur in areas that are difficult for the public to access because of challenging terrain and vegetation (SWCA 2019).

Modeled ambient concentrations of NO_2 (1-hour and annual) at the 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 approximately 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 concentrations near the mine adits can be attributed to emissions associated with underground mine activities; these emissions would remain 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 significant 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 can breathe is the most effective means of preventing diseases caused by excessive exposure to such dust (MSHA 2016). In addition, it would also limit the amount of PM_{10} emissions to the atmosphere from the mine adits. As a result, 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 (SWCA 2019).

In accordance with 30 CFR § 7.84(e), exhaust PM emissions would be diluted to 1 mg/m³. In addition, 30 CFR § 70.100 establishes concentration limits for respirable coal mine dust of 1.5 mg/m³ at underground coal mines. A dilution of 1 mg/m³ is equivalent to 1,000 ug/m³, which is higher than the predicted PM_{10} and $PM_{2.5}$ modeled maximums at the adit exits (535.6 ug/m³ for 24-hour PM_{10} and 112.5 ug/m³ for 24-hour $PM_{2.5}$).

The modeled PM_{10} concentrations from Proposed Action emissions, in combination with the conservatively modeled background concentrations, would not cause an exceedance of the 24-hour NAAQS and are not expected to affect the existing exceedances of the federal PM_{10} air quality standards at any of the special consideration Class II areas considered in this EA (SWCA 2019).

$PM_{2.5}$ 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 micrograms per cubic meter ($\mu g/m^3$), which is already 68.6% of the NAAQS. The 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 within 59 meters of the southwest boundary. As noted above in Section 2.4.2.10, measures (e.g., signs) may be taken to notify the public of the potential for unhealthy conditions in certain areas, such as those predicted by the modeling to show potential exceedances of the NAAQS.

Potential annual $PM_{2.5}$ exceedances are located at a maximum distance of 25 meters south of the Lila Canyon Mine surface facilities area, 35 meters from the existing mine adits, and 32 meters southwest of the SCT. Potential exceedances around Lila Canyon Mine would occur within the mine lease boundary (SWCA 2019) in areas that are difficult for the public to access because of challenging terrain and vegetation. Furthermore, respirable dust emissions exiting the adits are legally allowed to emit emissions diluted to 1.5 mg/m^3 in accordance with 30 CFR § 70.100. The predicted potential exceedances around the existing adits are thus allowed because of the exemption for underground mining equipment.

As previously mentioned, 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 significant dust generation. In addition, on August 1, 2016, Phase III of MSHA's respirable dust rule went into effect. This rule lowered the concentration of respirable coal mine dust in the air that miners can breathe and is the most effective means of preventing diseases caused by excessive exposure to such dust (MSHA 2014). In addition, this rule would also limit the amount of $PM_{2.5}$ emissions to the atmosphere from the mine adits. As a result, 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 (SWCA 2019).

The modeled average daily and annual $PM_{2.5}$ concentrations do not exceed the NAAQS at all the receptors within the modeled domain that are within the three Class II areas considered in this EA (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 Williams Draw tract. The nearest Class I area to the tract is Arches National Park, which is approximately 53 miles (85 km) to the southeast. Other nearby Class I 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; Desolation Canyon Wilderness; and Jurassic National Monument, at the site of the Cleveland Lloyd Dinosaur Quarry. Predicted pollutant levels 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 Class II increment) (SWCA 2019).

Four pollutants (PM_{10}, $PM_{2.5}$, SO_2, and NO_2) were further 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 because of atmospheric conditions. Assessing the Proposed Action's effect on formation of secondary $PM_{2.5}$ includes the analysis of monitoring data and the inclusion of the EPA's Modeled Emission Rates for Precursors (MERPs) approach (SWCA 2019).

For $PM_{2.5}$, the critical air quality thresholds are assumed to be (i.e., $PM_{2.5}$ daily = 1.2 μg/m^3, $PM_{2.5}$ annual = 0.2 grams (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 as shown in the EPA's 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 and average $PM_{2.5}$ are considered together to determine if the Proposed Action would exceed the critical air quality threshold for $PM_{2.5}$. In this case, the modeled emissions increases are expressed as a percentage 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 contributions of these precursors on daily and/or annual $PM_{2.5}$. The additive secondary contribution to daily $PM_{2.5}$ was calculated to be 9.33%.[2]

This indicates that the Proposed Action's emissions would not cause increases to secondary $PM_{2.5}$ concentrations in the LBA area that exceed the critical air quality thresholds (SWCA 2019).

Ozone Analysis

To address whether the Proposed Action could 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 effect to secondary pollutants resulting from the Proposed Action (SWCA 2019).

Using this guidance, potential ozone air quality effects from the Proposed Action were compared against the applicable critical air quality threshold (1 part per billion). 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 contributions of these precursors on daily and/or annual ozone. Such contributions as applied to secondary 8-hour ozone concentrations were calculated to be 56/7%.[3]

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

[2] (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%

[3] (103.29 tpy $NO_{X\ project}$ /184 tpy $NO_{X\ MERP}$) + (7.73 tpy $VOC_{project}$/1,049 tpy VOC_{MERP}) = 0.5613 + 0.00737 = 0.5687 * 100 = 56.87%

Modeling for Visibility Impact Assessment

Federal land managers have developed a technique to screen small or distant sources so that 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 Williams Draw tract is more than 50 miles from the closest Class I area (Arches National Park), the FLAG 2010 initial screening guidance suggests summing the Proposed Action's tpy emission rates for NO_X, SO_2, PM_{10}, and sulfuric acid mist (H_2SO_4) and dividing this value by the distance from the Lila Canyon Mine to the nearest Class I area (Arches National Park) to evaluate the potential impacts to AQRVs at the Class I area. If this value (the Q/D value) is less than or equal to 10, no further analysis is required.

As indicated above, the distance from the tract to the closest border of the Class I area is 53 miles (85 km). Based on the direct emissions for the Proposed Action in Table 3-4 and an estimated 0 tpy of H_2SO_4 emissions, there would be a total of 139 tpy of SO_2, NO_X, PM_{10}, and H_2SO_4. Dividing 139 by 85 results in a Q/D value of 1.64, which is less than 10. Therefore, the Proposed Action is not expected to adversely affect AQRVs at the nearest Class I areas. (SWCA 2019).

Deposition Impact Assessment

A Level 1 deposition analysis was conducted for the Proposed Action to evaluate the potential 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 effects of 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 / hectare / 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).

As shown in Table 3-15, maximum deposition values for sulfur were all below the DAT. Because 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). The 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 / hectare / 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
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 the Proposed Action, as indicated in the emission inventory. HAPs can cause various adverse health effects, and high levels at the mine property 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. Highest Modeled Results with Acute Reference Exposure Levels and Chronic Reference Concentrations (1-hour and annual exposure)

HAP	Acute Analysis				Chronic Analysis		
	1-hour REL (µg/m^3)	TSL (µg/m^3)‡	Maximum Modeled 1-hour Concentration (µg/m^3)	Complies with REL and TSL?	RfC (µg/m^3)§	Maximum Modeled Annual Concentration (µg/m^3)	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

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?
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).

* Data from California Office of Environmental Health Hazard Assessment (2016).

† Data from National Institute for Occupational Safety and Health (2016).

‡ Data from UDEQ (2013b).

§ Data from EPA (2018).

¶ The U.S. Agency for Toxic Substances and Disease Registry chronic minimal risk level of 0.008 parts per million was used and converted to µg/m³ where 1 parts per million = 1,230 µg/m³ for formaldehyde.

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 Action, the total HI is 0.045532512. Therefore, non-cancer risks from the Proposed Action are not expected from any chemical, alone or in combination with others (SWCA 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 Hazardous Air Pollutant Reference Concentrations, 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 1×10^{-6}. The MLE risk for formaldehyde is also below 1×10^{-6}. The MEI risk for formaldehyde is above 1×10^{-6}. When benzene, acetaldehyde, and formaldehyde risks are added together, risks are below MLE. 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 CO_2 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 the federal Interagency Working Group on Social Cost of Greenhouse Gases 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 2016 *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" (Interagency Working Group on Social Cost of Greenhouse Gases 2016). Although the SCC protocol was created to meet the requirements for regulatory impact analyses during rulemakings, there have at times been requests by some 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, the Proposed 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 protocol was based and disbanded the Interagency Working Group on Social Cost of Greenhouse Gases. 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 Circular A-4, "including with respect to the consideration of domestic versus international impacts and the consideration of appropriate discount rates." In compliance with Office of Management and Budget Circular A-4, interim protocols have been developed for use in the rulemaking context. However, Budget Circular A-4 does not apply to NEPA analyses of proposed projects, so there is no executive order requirement to apply the SCC protocol to such analyses.

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 a proposed action to society as a whole and other potential positive benefits, inclusion of only a SCC analysis in a NEPA document would be unbalanced, potentially inaccurate, and not useful in facilitating an authorized officer's decision. 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 a proposed action like 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 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 a SCC calculation represents the value of damages avoided if, ultimately, there is no increase in carbon emissions. However, 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 EIS, 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. The total SCC for the No Action alternative ranged from $2.0 billion to $10.7 billion. Given the uncertainties associated with assigning an accurate SCC resulting from the potential 13 to 15 additional years of mining operations in connection with the Williams Draw tract, 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 United States 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 on Social Cost of Greenhouse Gases, 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 GHG emissions are listed in Appendix B and discussed in Section 3.1.2.

Current emissions in the air quality analysis area are reflected in the ambient air quality data shown in Table 3-2. Mining of the LBA area 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 10 to 15 years, and criteria pollutant emissions from the mining and combustion of coal from the Williams Draw tract would add to the other currently permitted emissions in the area during this time. The proportion of the tract-related emissions to the currently permitted emissions over the 10- to 15-year period is unknown. In addition, the emissions from the mining and combustion of coal from the Williams Draw tract during this 10- to 15-year period would add to emissions from other reasonably foreseeable future actions, such as mining in 1) the two federal coal leases east of and adjacent to Lila Canyon Mine (Lila Canyon Mine LMA); 2) the SITLA leases in the boundaries of Section 36, Township 16 South, Range 14 East, and Section 32, Township 16 South, Range 15 East; and/or 3) the Walker Flat LBA area. As with the Proposed Action involving the Williams Draw tract, the coal mined from these reasonably foreseeable future actions would be mined from already existing mines, with the result that the annual production and life of the Bronco Mine would be expected to increase, and the life (but not the annual production) of the Lila Canyon Mine would increase. Overall, the period of time during which emissions would result from coal mining activities would be extended. These future actions would have to comply with the respective operators' existing air permit requirements or any required new permits based on new environmental analysis. The proposed Uinta Basin Railway would also contribute to air quality effects and GHG emissions through increased rail line traffic in the region. However, at this very early stage of that proposal, it is not possible to estimate such effects and/or emissions.

Other reasonably foreseeable future actions (see Appendix B) that could contribute criteria pollutant emissions include oil and gas leasing (if APDs are approved subsequent to the BLM's quarterly oil and gas lease sales), the IACX Woodside Dome 1 APD, the Chalk Hills Mine Expansion, and projects that may cause temporary disturbances such as the East Carbon Junction Fiber project. These future actions would have to comply with their respective approval conditions, requirements, and permits.

The Lifting the Pause EA analyzes the potential effects on GHG emissions from the mining and combustion of federal coal (BLM 2019). 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 Williams Draw tract, the proposed Walker Flat LBA, and the proposed Lila Canyon Mine LMA. Total expected emissions resulting from the combustion of coal extracted from the SITLA lease areas are not included in the Lifting the Pause EA and have not yet been calculated.

The IPCC's (AR5) includes a summary of data from 30 different global climate models that evaluate the natural systems and feedback mechanisms contributing to climate variability (IPCC 2014). 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. Specifically, 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) were considered in the modeling analysis and 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 1.0 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 scenario, 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.

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 2017 totaled 35.1 MMT CO_2e (EPA 2017b). GHG emissions in Emery County, Utah, in 2017 totaled 13.5 MMT CO_2e (EPA 2017b). For the reasonably foreseeable future coal mining actions that involve 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 the 2017 totals listed above. GHG emissions from the Bronco Mine, which is expected to increase production, would be expected to increase, which would contribute to statewide, regional, and national GHG emissions totals. The 12.2 MMT of direct and indirect CO_2e emissions from the coal mined from the Williams Draw tract over 10 to 15 years would contribute to statewide, regional, and national GHG emissions totals. Over that 10- to 15-year period, the total 12.2 MMT of CO_2e would average 1.0 to 1.2 MMT of CO_2e per year, representing approximately 0.02% of the total 2017 GHG emissions in the United States, approximately 2.8% of the total 2017 GHG emissions in the State of Utah, and approximately 7.4% of the total 2017 GHG emissions in Emery County. GHGs, regardless of the source, contribute incrementally to the climate change phenomenon. 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 would result from global emissions.

The BLM prepared the Colorado Plateau Rapid Ecological Assessment to provide regional scale information and assessment analysis on current and future conditions for the Colorado Plateau. This analysis includes an assessment of potential climate change impacts (BLM 2012). 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 obtain a general understanding of potential impacts under RCP2.6 and RCP6.0. Generally, the RCP2.6 scenario can be assumed to contribute to a lesser degree of climate change in the region, while the RCP6.0 can be assumed to contribute to climate change of lesser magnitude than RCP8.5 but of greater magnitude than RCP4.5. 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 at year 2100. The RCP4.5 and RCP8.5 scenarios both 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 projected climate change represents a forecast of possible effects that are not certain to occur at the magnitudes projected. It is important to note that the aggressive, 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 (Hausfather 2019). Therefore, the projections based on RCP8.5 could be considered unlikely to happen, while RCP4.5 and RCP6.0 would be more likely the representative scenarios.

3.3 Geology, Minerals, and Energy Production

The analysis area for potential direct, indirect, and cumulative effects on geology is the LBA area. The analysis area for minerals and energy production is Emery and Carbon Counties as the data are summarized by each county. Leasing for oil and gas or other mineral resources, however, would only be affected within the LBA area. The BLM's PFO RMP objectives for minerals and energy resources are to maintain coal leasing, exploration, and development; maintain opportunities to lease other solid minerals; and manage oil and gas leasing all while minimizing impacts to other resource values (BLM 2008).

3.3.1 Affected Environment

The Williams Draw tract is within the Book Cliffs coal field along the southwestern edge of the Uinta Basin. The stratigraphy in the tract consists of rock formations of Upper Cretaceous and Lower Tertiary age (Figure 3-3). The Mesaverde Group's Blackhawk Formation contains the important coal bearing zones within the region and lies atop the Mancos Shale. The Mancos Shale occurs mostly below drainage within the tract but is widely exposed at the surface in areas to the west at the base of the Book Cliffs. The overlying Mesaverde Group is characterized by multiple thick sandstone beds with intervening shales and siltstone and locally thick coals (Cirrus and Petersen 2017).

A major system of transverse easterly trending normal faults exists within the tract. Vertical displacements of the faults range from 15 feet to more than 200 feet. The Central Graben Fault is the effective boundary between the existing Lila Canyon Mine and the tract. The Williams Draw Fault divides the north one-third of the tract from the south two-thirds and has an estimated displacement of 200 feet on the western end down to 50 feet on the eastern end. The South Boundary Fault forms the southern boundary of the tract (Figure 3-4).

The only coal of mineable thickness within the Williams Draw tract occurs within the Sunnyside Coal Zone. The Sunnyside Coal Zone outcrops near the top of the Book Cliffs escarpment and dips eastward at 7–8 degrees between N75°E and N90°E. Because the surface topography rises in the direction of dip, the overburden thickness above the Sunnyside Coal Zone increases rapidly to the east within the tract from less than 200 feet to more than 2,000 feet. The areas of lowest cover (< 200 feet overburden above coal seam) occur beneath the Little Park Wash stream bed and in areas to the west (Cirrus and Petersen 2017).

The uppermost coal in the tract is the thickest and most widely distributed. This coal layer is locally called the Sunnyside Coal Bed, with the thinner and more erratic underlying coal bed called the Lower Sunnyside. The Sunnyside Coal Bed varies from 4 to 11 feet thick within the tract. This main seam of the Sunnyside Coal Bed occurs as a single coal bed from 10 to 11 feet thick in the northern portions of the tract between the Central Graben and Williams Draw Faults. This coal is generally of high quality with relatively few thin rock partings (flat planes of weakness where there exists a higher tendency of rock to split). The coal bed thins south of the Williams Draw Fault to 8.5 feet thick or less. Further south, the coal bed remains mostly greater than 7 feet thick down the center of the tract but thins both eastward and westward to less than 6 feet thick. Initial results suggest that these thin coal areas of the Sunnyside Coal Bed might not be economically recoverable (Cirrus and Petersen 2017).

The Lower Sunnyside Coal Bed varies from 0 to 7 feet thick. This coal bed is thickest locally in the western portion of the tract but thins in all directions away from this location. This coal bed does not appear to be economically mineable within the tract, based on initial results (Cirrus and Petersen 2017). Although the Sunnyside and Lower Sunnyside Coal Beds may merge elsewhere, they do not appear to join in the Williams Draw tract. The Sunnyside and Lower Sunnyside Coal Beds are most often separated by 5 to 15 feet of rock within the tract (Cirrus and Petersen 2017).

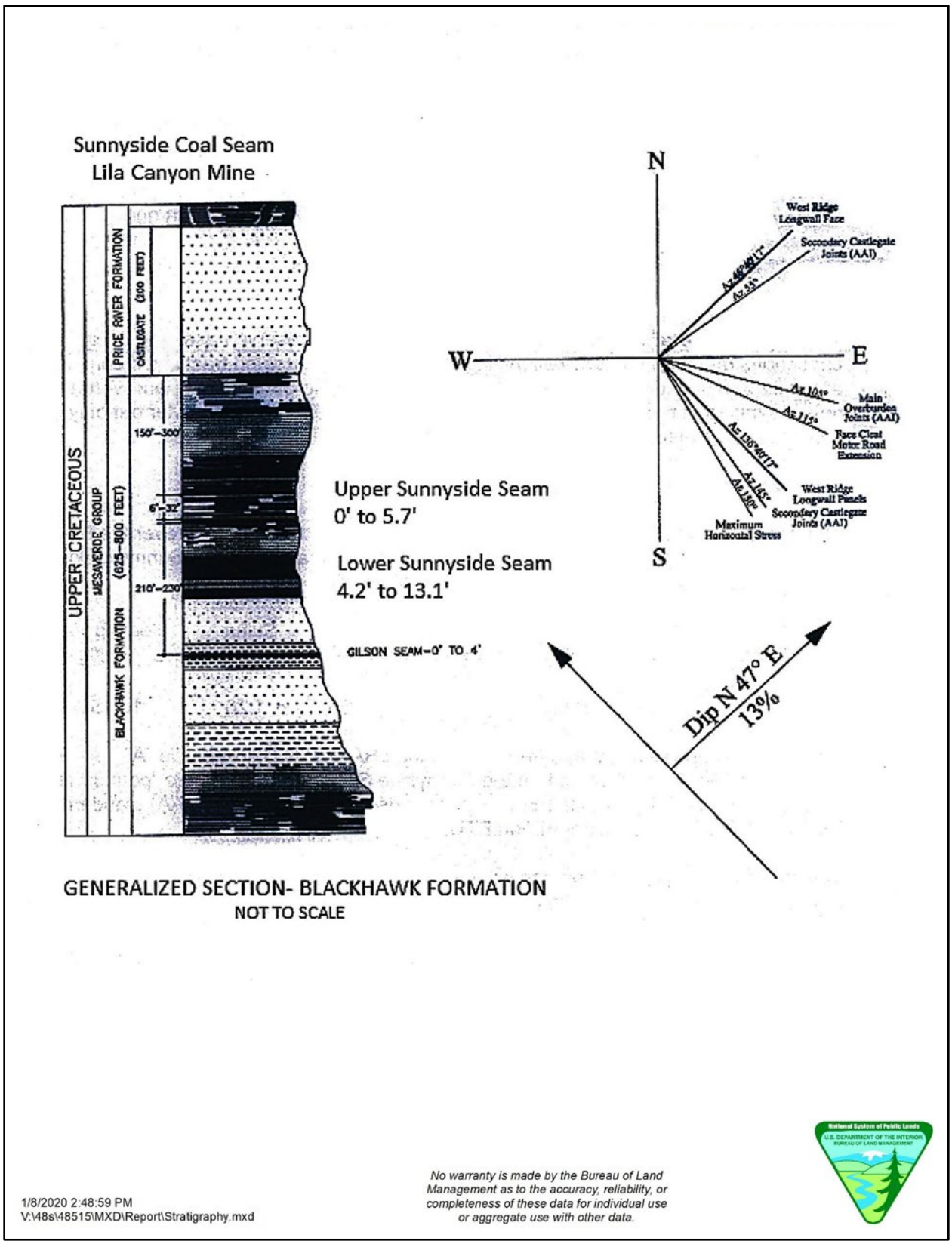

Figure 3-3. Williams Draw tract general geologic column.

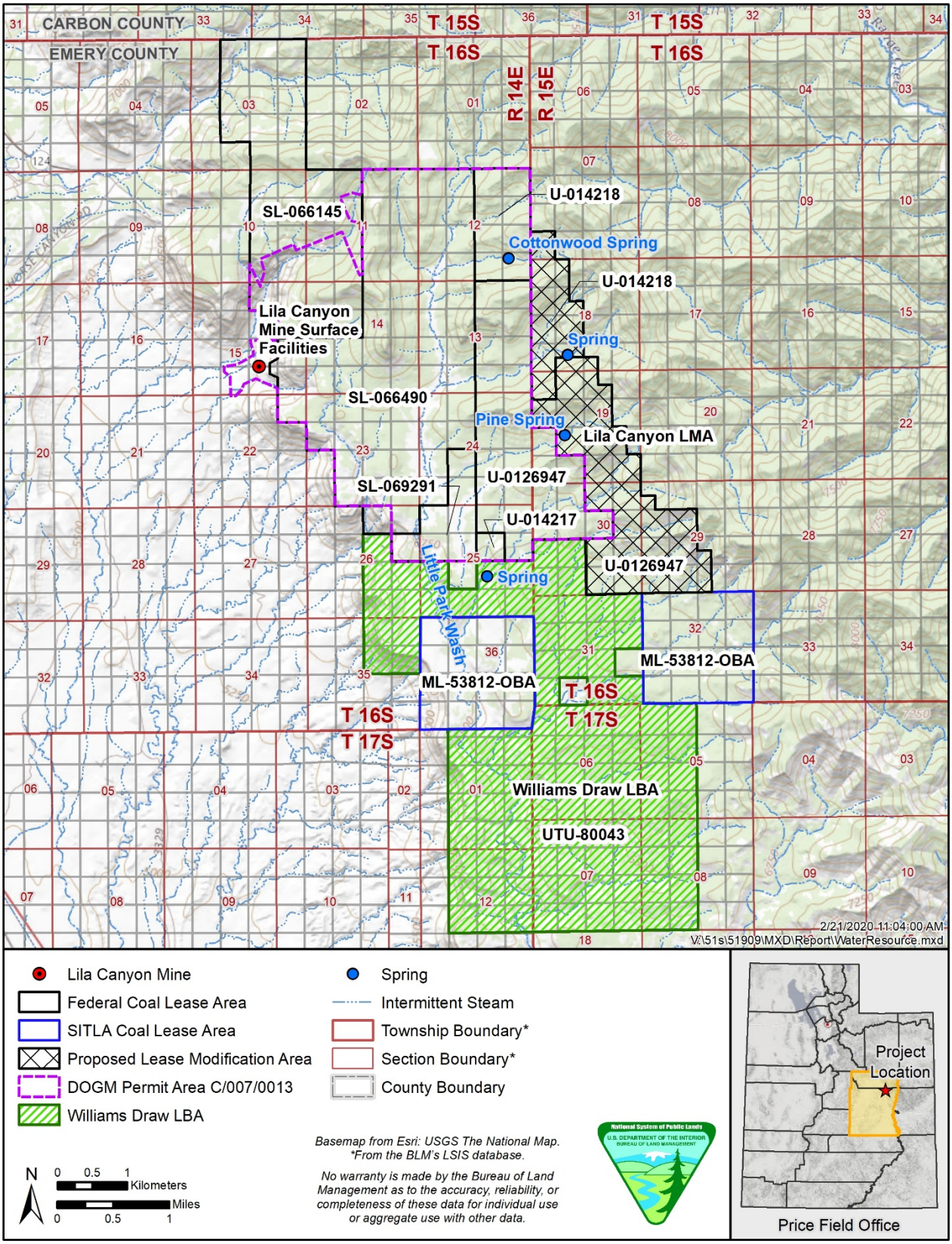

Figure 3-4. Geology and water resources.

The LBA area is open to oil and gas leasing subject to minor constraints (timing limitations, controlled surface use, lease notices) (BLM 2008: Map R-25). However, there are no existing federal oil and gas leases in the LBA area. The PFO RMP Management Decision MLE-4 states that the BLM must identify the priority energy resource in conflict areas to promote safe and efficient extraction of energy resources (BLM 2008).

DOGM oil and gas production data for the last 5 years show that as of September 2019, there were no APDs in Emery County in 2019, there was one APD in 2018, there was one APD in 2017, and there were no APDs in 2016 and 2015 (DOGM 2019a). During that same period in Carbon County, there were a total of 36 APDs. Additionally, there have been four APDs on federal lands in Emery County with helium as the objective.

Oil production in Emery County was 608 barrels (BBL) or less each year from 2015 to 2019. In Carbon County, oil production ranged from nearly 28,000 BBL in 2019 (partial year) to nearly 88,000 BBL in 2015. Oil and gas production were at least four times higher in Carbon County than in Emery County for each year shown in Table 3-19.

Table 3-19. Emery and Carbon Counties Oil and Gas Production 2015–2019

	County	2015	2016	2017	2018	2019*
Oil (in BBL)	Emery	184	608	571	347	157
	Carbon	87,968	79,247	57,792	47,386	27,868
Natural gas (in MCF) (includes coalbed CH_4)	Emery	8,630,719	8,143,306	7,466,663	6,952,008	3,966,722
	Carbon	69,382,875	55,684,110	46,883,601	42,229,697	24,889,453
Coalbed CH_4	Emery	6,533,904	6,058,638	5,553,126	5,211,245	2,026,546
	Carbon	32,160,461	29,959,808	27,517,370	25,661,224	9,980,625

Source: DOGM (2019a).

Note: 1 BBL = 42 U.S. gallons; 1 MCF = 1,000 cubic feet.

* 2019 data as of October 2, 2019, through last complete reporting period.

There are no active mineral mines in or near the LBA area. According to DOGM records, the closest active mineral mines are for clay, gypsum, or humic shale, and these are in the western part of Emery County (DOGM 2019b), approximately 50 miles southwest of the Lila Canyon Mine. There are no gravel extraction pits in the LBA area or contiguous to it. Within approximately 10 miles of the LBA area there are two permitted gravel pits, one on the Lila Canyon Mine road 3 miles west of the mine entrance and another approximately 10 miles north-northwest.

3.3.2 Environmental Impacts – Alternative A: No Action

Under the No Action alternative, the BLM would not offer the Williams Draw LBA area for leasing by competitive sale at this time and there would be no mining in the Williams Draw tract. Therefore, the 4,231.40-acre LBA area would continue to be available for oil and gas leasing.

3.3.2.1 Cumulative Impacts

There are no existing oil and gas leases or other mineral resource leases in the LBA area. Ongoing oil and gas production in Carbon and Emery Counties (see Table 3-19) would be expected to continue based on economics and demand. The availability of the LBA area for oil and gas leasing would add 4,231.40 acres to the areas in Emery and Carbon Counties currently available for oil and gas leasing. Present mineral or

coal mining activities in Emery and Carbon Counties (see Appendix B) would be expected to continue. Because the Williams Draw LBA would not be leased under the No Action alternative, there would be no impacts to geology, minerals, or energy production from mining in the LBA. Therefore, there would be no cumulative impacts to geology, minerals, and energy production under the No Action alternative.

3.3.3 Environmental Impacts – Alternative B: Proposed Action

Under the Proposed Action, all of the economically mineable coal would be removed from the LBA area. There would be no other impacts to the tract geology other than the areas of subsidence above the mined-out coal seam and associated potential interruptions to stratigraphy. Oil and gas exploration and development, as well as other mineral resource development, would not be feasible while active mining is ongoing. Therefore, the 4,231.40-acre LBA area would be unavailable for oil and gas leasing and other mineral resources development during the 10 to 15 years of mining in the Williams Draw tract. Based on the current lack of non-coal mineral activity in the LBA area, this would have minimal impact upon mineral resource development in Emery County during the life of the mine. There would be no impact on the development viability of gravel extraction pits near the LBA.

Oil and gas development is presently not occurring in the LBA, and production is considerably lower in Emery County as compared to Carbon County (see Table 3-19). Based on this, the loss in availability of the LBA area for oil and gas development would have minimal impact on the overall development of oil and gas resources in the region during the life of the mine. Once mining operations and reclamation are completed, the LBA area would again be available for oil and gas leasing.

3.3.3.1 Cumulative Impacts

There are no existing oil and gas leases or other mineral resources leases in the LBA area or in this part of Emery County. Under the conceptual mine plan, the mining of coal in the LBA area, in addition to the proposed Lila Canyon Mine LMA, SITLA leases, and existing Lila Canyon Mine, would not be likely to change the currently permitted not-to-exceed production level of 4.5 MM tpy. The total 2019 coal production in Carbon and Emery Counties was 9,734,000 tons (Table B-1); the Lila Canyon Mine permitted not-to-exceed production level is 46% of this total 2019 coal production.

The future addition of mining in the proposed Bronco coal leases may add up to 2 MM tpy. The economically mineable coal would be removed from these tracts and unavailable for future leasing. Other than coal extraction, there would be no cumulative effects to geology other than potential subsidence of layers above the mined coal seams and associated potential interruptions to stratigraphy (which would not impact future oil and/or gas development due to their relative stratigraphic location in the geologic column).

Restrictions on oil and gas activity or mineral exploration or production would be implemented in all areas in Utah including the LBA (if leased) leased for coal development. The cumulative impacts to minerals and oil and energy activity would be a delay in the availability for such exploration or development in all areas leased for coal development for the duration of that coal development. Mineral mining in other areas of Carbon and Emery Counties (see Appendix B) would be expected to continue.

3.4 Socioeconomics

The analysis area for potential direct, indirect, and cumulative socioeconomics effects comprises Emery County and communities within Emery and Carbon Counties that are 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 mining of the

LBA area would occur. These impacts include 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.

3.4.1 Affected Environment

3.4.1.1 Employment

In 2017, total employment in Emery County was approximately 3,052 jobs (Utah Department of Workforce Services [UDWS] 2018). Trade, transportation, and utilities made up the largest employment sector of Emery County, representing approximately 941 jobs (UDWS 2018). The second- and third-largest employment sectors in Emery 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 Emery County's total employment (UDWS 2018).

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

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 Carbon 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 Carbon County's total employment (UDWS 2018).

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

3.4.1.2 Taxes and Revenues

Fiscal effects from mining industry activities are 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, as follows:

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

Emery County currently has four active coal mines. These mines and their recent production rates are listed in Table 3-20. Lila Canyon Mine reported 2,815,678 tons of coal production in 2018 (UEI 2019).

Table 3-20. Emery County Coal Mine Production (tons)

Mine	2013	2014	2015	2016	2017	2018
Emery II	4,000	–	–	–	135,000	442,000
Castle Valley #3	–	–	218,000	170,000	205,000	102,000
Castle Valley #4	875,000	1,061,000	757,000	724,000	754,000	893,000
Lila Canyon	257,000	335,000	350,000	1,587,000	1,638,000	2,816,000

Source: Utah Geological Survey (2020)

According to the USDI ONRR, 2,671,777 tons of coal was produced from federal lands in Emery County in 2017, increasing to 4,981,606 tons in 2018 (ONRR 2019). The USDI applies an 8% royalty rate to coal extracted from underground mines on federal lands. Federal revenue royalties from coal mining on federal lands in Emery County amounted to approximately $7.9 million in 2017 and $12.2 million in 2018 (ONRR 2019). Half of the revenue collected from royalties is disbursed back to the state, and half of the revenue disbursed to the state of Utah is typically disbursed in the form of community impact funds to the county where the coal was extracted.

3.4.2 Environmental Impacts – Alternative A: No Action

Under the No Action alternative, the BLM would not offer the Williams Draw tract for leasing by competitive sale at this time and there would be no extraction of recoverable coal in the Williams Draw tract. Therefore, there would be no direct or indirect impacts to the social and economic conditions of the analysis area from underground mining activities in the Williams Draw tract. 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 10 to 15 years and associated employment and economic impacts would not occur under the No Action alternative.

3.4.2.1 Cumulative Effects

Under the No Action alternative, the BLM would not offer the Williams Draw tract for leasing by competitive sale at this time. 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 10- to 15-year extension in the life of the mine that would result from the Proposed Action if it had been approved.

3.4.3 Environmental Impacts – Alternative B: Proposed Action

3.4.3.1 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 10 to 15 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 10- to 15-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 10 to 15 years. Based on 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). The estimate of indirect/induced jobs is conservative in that it does not include electricity generation jobs or other coal

end use jobs. This translates to approximately 547 indirect jobs in place for the 10- to 15-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 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.

3.4.3.2 Taxes and Revenues

Taxes and royalty payments from the mining of coal in the LBA area would provide direct revenue to the state 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 10 to 15 additional years to the life of the 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 (EIA 2019a). Assuming the coal mined from the LBA area would be priced similarly, the 32 million tons of total coal produced from the LBA area would result in approximately $1.1 billion 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 $90.3 million in total federal royalty revenues, approximately $45.2 million in total state revenue from royalty disbursement, and approximately $22.6 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 $22.6 million in total royalty disbursement to Emery County would result in approximately $2.3 million in royalty disbursement to the county each year over 10 to 15 years of mining coal from the LBA area. The royalty disbursement from the Williams Draw LBA area would represent a continuation of the existing rates of royalty disbursements to the county over the extended life of the mine. The effects would be moderate over the extended life of the mine because they would represent an estimated 37% of all royalties disbursed to the county each year as a result of coal mining.

3.4.3.3 Cumulative Effects

Because the Proposed Action would not affect employment levels at the Lila Canyon Mine, it would have no cumulative impacts on employment, demographics, or housing in the socioeconomics analysis area. However, the Proposed Action would add cumulatively 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 3-20, total annual coal production at these three mines was approximately 1.1 million tons in 2017. Although the production rates at these mines may vary over time, for the purposes of this analysis, it is assumed that coal production at these mines would continue at a similar rate over the 10 to 15 years when coal is mined from the Williams Draw tract, resulting in approximately 11 million tons of coal produced during those 10 to 15 years. Combined with the 32 million tons produced from the Williams Draw tract over those 10 to 15 years, this would be approximately 43 million tons. At $35.28 per ton, the total coal production from the mines in the analysis area over 10 to 15 years would sell for approximately $1.5 billion. The royalties paid to the federal government at an 8% royalty rate would be approximately $121.4

million over those 10 to 15 years, or approximately $8.1 million to $12.1 million per year. The state would receive approximately $4.0 million to $6.1 million per year from these royalties, half of which (approximately $2.0 million to $3.0 million) would go to Emery County. These federal royalties, however, would cease in the event SITLA obtains ownership of the tract, and it is likely the total would end up being less than $121.4 million. Other reasonably foreseeable future actions include the Lila Canyon Mine LMA and the SITLA leases. The coal mined from the Lila Canyon LMA tracts would be mined over 3 years. If the coal from these lease modification tracts is mined within the 10- to 15-year time period that the coal would be mined under the Proposed Action, the Lila Canyon Mine LMA tracts would add cumulatively to socioeconomic impacts in the analysis area. The LMA tracts would result in approximately $25.7 million in total federal royalty revenues from the 9 million recoverable tons, approximately $12.9 million in total state revenue from royalty disbursement, and approximately $6.5 million in total Emery County revenue from royalty disbursement. 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 LMA tracts. The SITLA leases include approximately 4 to 5 million tons of recoverable coal, which at $35.28 per ton would sell for approximately $141.1 million to $178.4 million. Because these are SITLA leases, there would be no royalties paid to the federal government.

Other actions that, if approved, could contribute cumulatively to the employment and revenues in the analysis area include the Chalk Hills Mine Expansion, approved oil and gas APDs subsequent to the BLM's quarterly oil and gas lease sales, IACX Woodside Dome 1 APD, Twin Bridges Bowknot Helium project, EnerVest Peters Point APDs, E. Carbon Junction Fiber project, and the Uinta Basin Railway (see Appendix B).

3.5 Groundwater Resources

The analysis area for potential direct, indirect, and cumulative effects on water resources is the cumulative impact assessment (CIA) boundary from the Cumulative Hydrologic Impact Assessment (CHIA) (DOGM 2007). 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. 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).

The LBA area is on the east edge of the Price River Basin, near the divide between the Price River Basin and the adjacent Range Creek Basin. The hydrogeology and hydrology of the areas surrounding the LBA area have been studied extensively as part of investigations related to mine permitting activities over the years (BLM 2000; Cirrus and Petersen 2017; DOGM 2007; UEI 1991). The LBA area is within the area analyzed in the Horse Canyon Extension MRP and the CHIA for the Lila Canyon Mine (DOGM 2007). The LBA is analyzed in the *Final Hydrology Assessment Williams Draw Coal Tract Lease by Application UTU-80043* (Williams Draw tract hydrology assessment) (Cirrus and Petersen 2017). Water resources in the LBA area are evaluated by use and interpretation of existing field monitoring data and reports.

3.5.1 Affected Environment

Groundwater Sources and Monitoring

Groundwater in the Williams Draw tract is present in two different multi-layered zones. The upper zone, the Wasatch Zone, consists of the North Horn, Flagstaff, and Colton Formations, and overlies the proposed coal seam, primarily in perched, discontinuous saturated zones. The movement of both groundwater and surface water fluctuates with seasonal rain and snow events.

The lower zone, the Mesaverde Group, consists of the Blackhawk Formation, Castlegate Sandstone, and the Price River Formation. The Blackhawk Formation is the likely source for water encountered in the Lila Canyon Mine. Water in the mine workings is usually produced as mining advances and is pumped out. Once the initial water is pumped out, most areas in the active mine workings remain fairly dry. It should be noted, however, that water produced as a result of mining is generally pumped and stored underground for future use in a reasonably closed-circuit system. Recharge in this area is slow, and because of the overlying mudstone and shale units interbedded with small perched sandstones, water does not migrate up or down with any distance. The Price River Formation is the uppermost formation in the Mesaverde Group; in the LBA area, it is said to be 275 to 300 feet thick.

Although water is present, no formation in the Mesaverde Group is considered an aquifer under the definition found in Utah Coal Regulations R645-100-200 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). There are no groundwater discharge points from the Mesaverde Group anywhere in the CIA of the CHIA (DOGM 2007).

Because the Blackhawk Formation is confined by low permeability shales and siltstones, where groundwater exists, groundwater movement is more likely to be horizontal 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).

Three monitoring wells (IPA-1, IPA-2, and IPA-3) were installed in Little Park Wash north of the Williams Draw tract (see Figure 3-4) to monitor deep groundwater during development of the Horse Canyon Mine (DOGM 2007). 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 around the same time. Water levels in the remaining two wells have generally decreased since 2015 (Figure 3-5).

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 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 3-5. 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 (BGS) (Cirrus and Petersen 2017).

The monitoring wells are screened within the deeper aquifer described as an Inactive Groundwater Flow Systems 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 limits the extent of potential groundwater movement.

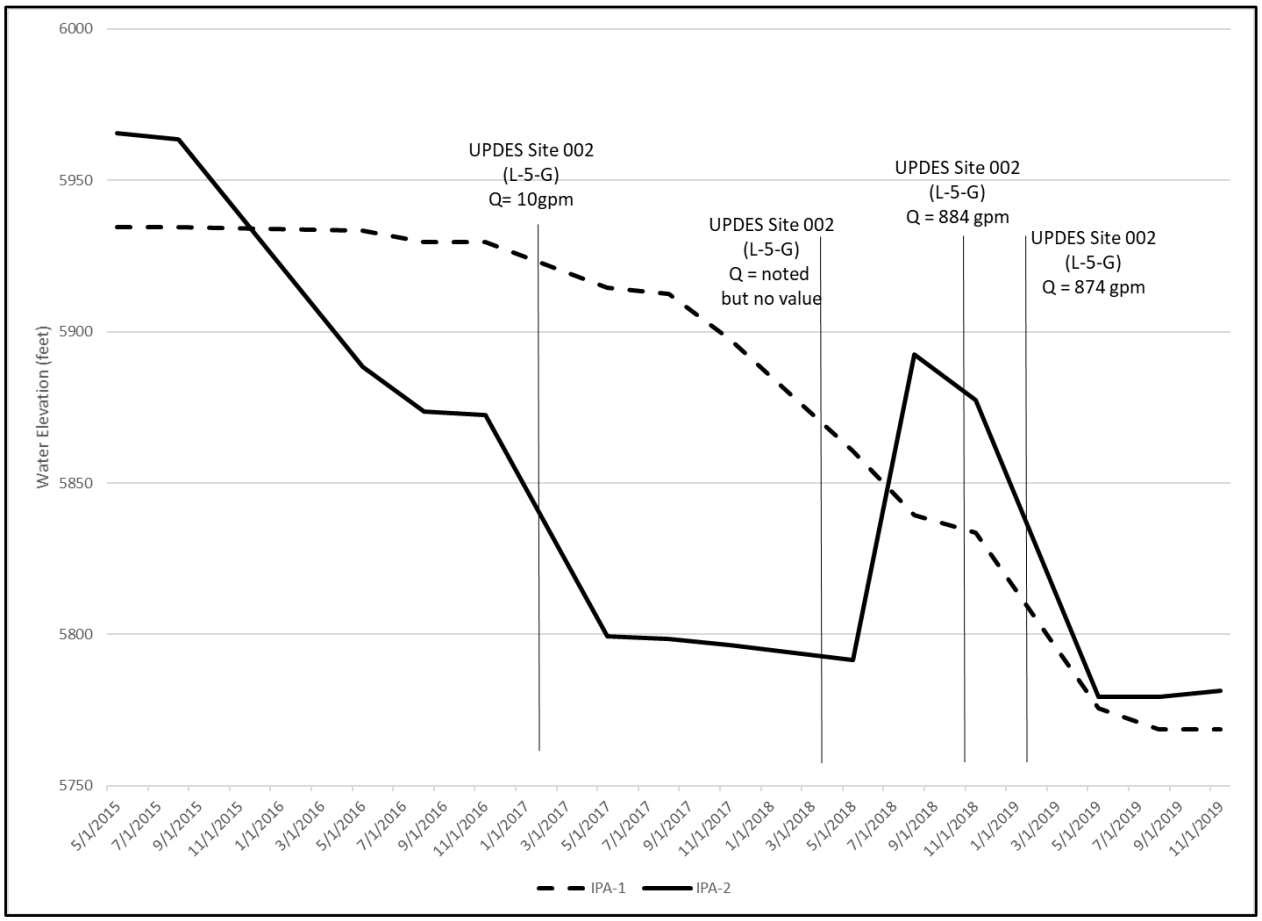

Figure 3-5. Hydrographs for monitoring wells IPA-1 and IPA-2 for the period Quarter (Q)2 2015 to Q4 2019 shown with discharge data from DOGM database.
Discharge data source: DOGM (2020).

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 (cessation of flow). 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 Utah DOGM database indicates that there was an initial low discharge recorded in Quarter (Q)1 2017 around the time of the initial lowering of water levels (see Figure 3-5). A period of greater discharge (approximately 880 gallons per minute [gpm]) was recorded in Q4 2018 to Q1 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.

Groundwater Quality

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 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 formations (DOGM 2007). In addition, groundwater quality is typically better near areas of mountain recharge and is diminished in lowland areas (DOGM 2007).

From the Williams Draw tract hydrology assessment, "Groundwater naturally discharges from the Colton and North Horn Formations in the Tract and surrounding areas. No spring discharge has been identified in either the Price River Formation or the Castlegate Sandstone. A single groundwater seep that discharges at a rate of about 0.01 gpm from the Mancos Shale has been identified (LS-018)" (Cirrus and Petersen 2017:40).

Groundwater quality in the Wasatch Group can be measured by analyzing 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 DOGM Permit C/007/0013 approval. The average TDS concentration of the North Horn Formation springs is 1,504 mg/L. The solute geochemical type of spring LS-008 (Williams Draw Spring) is generally similar to springs LS-005, LS-013, LS-014, and LS-017 (sodium magnesium- sulfate-bicarbonate geochemical type), although the sulfate and TDS concentrations at LS-008 are somewhat elevated relative to those springs (Cirrus and Petersen 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 recorded 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 9 3,706 mg/L, with an average value of 1,504 mg/L (Cirrus and Petersen 2017).

State of Utah coal rules (R645-301-751) require that a coal mine discharge must meet state and federal water quality and discharge standards. The Lila Canyon Mine operates under the limitations of the General Permit for Coal Mining (UTG040000). Section 3.6 describes surface water flow and Mine discharge monitoring. Section 3.6 describes surface water flow and Mine discharge monitoring.

3.5.2 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 the 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 LBA area because the BLM would not offer the Williams Draw LBA area for leasing by competitive sale at this time.

3.5.2.1 Cumulative Effects

There would be no cumulative effects to surface water or groundwater resources under the No Action alternative because the LBA area would not be leased at this time.

3.5.3 Environmental Impacts – Alternative B: Proposed Action

Under the Proposed Action, degradation to groundwater quality could occur as a result of interactions between groundwater and minerals exposed in freshly cracked rock surfaces. However, assuming that the chemical and mineralogical compositions of rocks potentially fractured from subsidence fracturing would be similar to the compositions of rocks in contact with groundwaters along pre-mining flow paths, substantial effects to groundwater quality would not be anticipated because the mineralogical composition of the water would not be affected. Mining-related surface cracking is a near-surface phenomenon (MSHA 2009). Because the surface cracking is a localized, near-surface phenomenon, the distances through which shallow groundwaters could flow through potential near-surface, permeable cracked zones would be small. Similarly, the residence time in potential cracked zones would be short. Therefore, the groundwater would not be lost to the deep, inactive-zone groundwater system.

Because the groundwater systems that support the limited quantities of groundwater discharge to springs in the Williams Draw tract are perched systems, the direct interception of these groundwater systems as a result of the proposed underground coal mining activities is unlikely (Cirrus and Petersen 2017).

Potential subsidence impacts on surface water quality would be negligible. Existing flow events that occur in stream channels on the Williams Draw tract are highly turbid and likely contain elevated levels of TDS and other constituents. These water quality conditions are considered typical for the watershed conditions and climate in the Book Cliffs region. Potential subsidence impacts would not improve or degrade existing water quality (Cirrus and Petersen 2017).

Because subsidence-related impacts on springs in the Williams Draw tract are expected to be minimal, impacts on groundwater quality are unlikely. Additionally, there is no reasonably foreseeable mechanism identified that would result in appreciable impacts on water quality at these springs in the unlikely event that impacts on groundwater discharge rates at the springs occur (Cirrus and Petersen 2017). Because the groundwater systems in the tract are perched systems that are highly turbid and have elevated levels of TDS and other constituents, potential impacts on groundwater quality in the analysis area are expected to be minimal over the extended life of the mine.

3.5.3.1 Cumulative Effects

The past, present, and reasonably foreseeable future actions near the Williams Draw tract that would affect water resources are underground mining operations (see Section 3.1.2 and Appendix B). The existing Lila Canyon Mine underground mining operations are analyzed in the CHIA (DOGM 2007). The proposed Lila Canyon Mine LMA would be expected to have similar groundwater conditions as those encountered in the Lila Canyon Mine and thus similar impacts to water resources. The SITLA lease areas are along the Williams Draw Fault. Mining impacts to water resources from the SITLA lease areas would be assessed in conjunction with review of a mining plan. Because there would be negligible impacts to groundwater resources as a result of the mining of the Williams Draw tract, there would be negligible cumulative impacts to groundwater resources as a result of mining the tract in addition to other past, current, or foreseeable mining activities.

3.6 Hydrologic Conditions

3.6.1 Affected Environment

Hydrologic conditions are the physical, structural, and meteorological conditions that affect water quality, quantity, and flow patterns and cycles in a given area. Hydrology for the LBA area is described in the Williams Draw tract hydrology assessment (Cirrus and Petersen 2017). The following are direct excerpts from the assessment:

> The Williams Draw LBA is situated in rugged, mountainous terrain along the western flanks of the Book Cliffs. The LBA area includes the precipitous Book Cliffs escarpment and the upland plateau, hills, and steep, narrow stream valleys that extend eastward from the escarpment. All of the Williams Draw LBA area is within the Price River drainage. To the east of the LBA are the steep mountainous areas that are part of the Range Creek drainage. To the west of the LBA lies the broad expanse of rolling lowland topography developed on the highly erodible Mancos Shale that occupies the Price River valley. (Cirrus and Petersen 2017:4)
>
> Topographic relief in the Williams Draw LBA exceeds 1,500 feet, ranging from a minimum elevation of about 5,520 feet in Marsh Flat Wash near the base of the Book Cliffs escarpment to a maximum elevation of 7,097 feet on hilltops on the upland plateau. (Cirrus and Petersen 2017:4)
>
> The Little Park Wash flows generally from north to south across the western portions of the Williams Draw LBA [see Figure 3-4]. Little Park Wash is a strike valley that is developed where the stream has eroded the less-resistant Mudstone Member of the Price River Formation, while the erosion resistant Castlegate Sandstone bounds the strike valley on the west. Little Park Wash intercepts tributary streams originating from the upland areas to the east and routes these surface flows southward through the wash parallel to the escarpment. Little Park Wash flows into the Green River about 7 miles south of the Williams Draw where the Price River crosses the Book Cliffs near the Town of Woodside, Utah. (Cirrus and Petersen 2017:4)
>
> The existing hydrology regime in the Tract is typical of arid watersheds in the Book Cliffs region. A total of 13 were identified in the Tract [or within ¼ -mile outside of the Tract boundary] and all are characterized by low average discharge less than 1 gallon per minute (gpm). Flow from most springs occurs in the second quarter (April–June) and is influenced by annual climate conditions. Spring LS-008 (Williams Draw spring) has the most consistent discharge of any spring in the Tract with an average flow of 0.68 gpm. This spring has been monitored a total of 43 times beginning in 1993 and flow has been measured during each visit. Four of the 13 springs have one measured flow event during the past eight years and six of the 13 springs have an average discharge of 0.25 gpm or less. (Cirrus and Petersen 2017:1)
>
> In addition to the springs, one livestock watering trough and one wildlife guzzler were identified in the Tract. The livestock watering trough is filled by discharge from Williams Draw spring. The wildlife guzzler is filled directly from precipitation (i.e. no surface runoff) and located on the Book Cliffs escarpment near the west portion of the Tract. (Cirrus and Petersen 2017:2)
>
> Surface flow in stream channels is seasonal and occurs primarily in response to intense rain events. A precipitation event measured on September 22, 2016, at the nearby Lila Canyon Mine showed nearly 4 inches of rain in less than 24 hours. Visual evidence of stream flow was observed during the October field visit following this storm event,

> including erosion and deposition, but no water was observed in stream channels. Field surveys in May 2017 identified small amounts of water collected in some upper elevation channels, extending no more than 200 feet near points of spring discharge. These areas were all observed to be dry during the June 2017 field visit. Three long-term stream monitoring sites are located in the Tract including one site on the main channel in Little Park Wash and two sites on tributary channels to the Wash. No surface flow was identified during routine monitoring on stream channels beginning in December 2000. (Cirrus and Petersen 2017:1–4)

The UPDES is the Utah version of the National Pollutant Discharge Elimination System mandated by Section 402 of the Clean Water Act to control pollutants in waters of the United States, including stormwater. The UPDES is in place to prevent harmful stormwater runoff from washing harmful pollutants into local surface waters such as streams, lakes, or rivers. The Lila Canyon Mine has a UPDES Permit General for Coal Mine Operations UTG-04000 (Utah Division of Water Quality 2013) with two associated outfalls or discharge points. One of these is for a sediment pond and the other is for mine water discharge. The permit is in effect from April 2019 to March 31, 2024.

Five water rights are in the LBA area. Three are associated with springs (91-809, 91-2518, and 91-2535), one is associated with a reservoir reportedly on the Little Park Wash (91-4516), and one is associated with wildlife guzzlers (91-5151). With the exception of water right 91-809, these water rights are owned by the BLM and SITLA and are in place to provide livestock water and may also be used by wildlife. Water right 91-809 is owned by UEI, and based on its location, it is associated with Williams Draw Spring (spring LS-008). The USGS mapped location of the Williams Draw Fault is near Williams Draw Spring.

The closest spring to water right 91-2518 is spring LS-015, which is approximately 0.5 mile north. No evidence of water was observed in this area. Water right 91-2535 is approximately 0.25 mile below spring LS-005 (Cirrus and Petersen 2017).

Water right 91-809, associated with Williams Draw Spring, allows diverted water to be stored overnight in a 0.10-acre-foot tank at the place of use. The owner (UEI) is able to divert additional water from other water rights with points of diversion on the Price River.

3.6.2 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 LBA area because it would not be leased at this time.

3.6.2.1 Cumulative Effects

There would be no cumulative effects to water resources under the No Action alternative because the LBA area would not be leased at this time.

3.6.3 Environmental Impacts – Alternative B: Proposed Action

Under the Proposed Action, mine-related ground subsidence in the LBA area could affect water discharging from the springs associated with water rights 91-809, 91-2518, and 91-2535 as well as surface runoff collected at 91-4516. Water right 91-5151 is precipitation-dependent and would not likely be affected by ground subsidence (Cirrus and Petersen 2017).

Surface subsidence cracks related to zones of tension in transition areas have commonly been observed along the ends and lateral margins of previously mined longwall mining panels in the Wasatch Plateau mining district of Utah. Surface cracks can be created in dry clayey soil, and joints can open in massive sandstones (MSHA 2009). Surface cracking can cause the downward migration of surface water and groundwater into deep strata. However, the presence of interbedded low-permeability strata and the overall poor water-transmitting potential of the Blackhawk Formation would likely prevent the downward migration of groundwater into deep strata (i.e., a spring location might move but the groundwater would likely discharge at a nearby location). Potential subsidence impacts on surface water quality would be negligible. Existing flow events that occur in stream channels on the Williams Draw tract are highly turbid and likely contain elevated levels of TDS and other constituents. These water quality conditions are considered typical for the watershed conditions and climate in the Book Cliffs region. Potential subsidence impacts would not improve or degrade existing water quality in the tract (Cirrus and Petersen 2017).

Where shallow surface fracturing occurs in the regions overlying the Williams Draw tract, precipitation and snowmelt runoff waters could enter these cracked zones. Water entering these cracks may cause increased recharge to bedrock groundwater systems while decreasing the amount of water that would otherwise flow to the local surface water drainage. However, the bedrock strata overlying mining areas are known to contain clays that swell when wetted. Consequently, subsidence fractures that may form at the surface in the clay-rich lithologies should heal rapidly (DOGM 2007). Accordingly, intense permanent fracturing at the land surface of a nature and magnitude that would appreciably alter the pre-mining competence of near-surface bedrock is not anticipated. Consequently, the potential for substantially increased recharge rates to groundwater systems as a result of mining-induced fracturing is low.

If the discharge rates or water quality at the springs or seeps that provide baseflow discharge to streams are affected, there would be a corresponding effect to the associated surface water system. As discussed above, because of the disconnect between the deep, inactive-zone groundwater and the low permeability of the strata overlying the areas to be mined, effects to groundwater quantity and quality are not anticipated from mining operations on the Williams Draw tract. Because mining is not expected to affect active-zone groundwater quantity or quality, effects to water quantity or water quality of surface waters that receive groundwater contributions to baseflow should not be affected from the proposed mining operations.

To investigate the response of a mountain stream system in the Blackhawk Formation to multiple-seam longwall undermining, Canyon Fuel Company, LLC extensively monitored stream discharge rates in the Burnout Creek drainage. A nearby spring was also routinely monitored to detect potential effects to the adjacent shallow groundwater system. The monitoring in the drainage was performed for several years, which included two undermining events using full extraction longwall mining techniques. To date, no effects to discharge rates or water quality in the drainage have been observed that could be attributed to the mining activity (Canyon Fuel Company, LLC 2002–2010). Because the geologic and hydrologic characteristics of the Williams Draw tract are similar to those in the Burnout Creek drainage, similar effects are expected from mining the Williams Draw tract.

Similar findings were noted by Sidel et al. (2000) in his investigation of discharge rates and stream morphology in Burnout Canyon. Sidel et al.'s 2000 investigation was performed after only the first seam had been mined. Sidel et al. (2000) compared baseflow discharge rates at the mouth of Burnout Creek from 1981 to 1991 with discharge measured in 1992–1994 (a period of direct longwall undermining of the stream). Sidel et al. (2000) found that the baseflow discharge in 1981–1991 (193 gallons per minute) was essentially the same as that measured in 1992–1994 (179 gallons per minute).

If subsidence of stream drainages overlying the Williams Draw tract occur, localized changes in stream gradients would be anticipated (i.e., pools may form in subsidence trough areas, whereas areas of increased stream gradients may occur along the transition zones between subsided and un-subsided areas). Such changes to the river system are usually temporary because the stream gradually erodes areas of increased gradient, while depositing sediment in the low-gradient (pool) areas, thus gradually returning the stream to a more stable condition. As a result of the erosion of areas of increased gradient, temporary increases in the suspended solids concentration of the stream water can occur. Because subsidence is expected to result in gradual changes in stream gradients, potential impacts to hydrological conditions are expected to be minor and temporary until the streams return to a more stable condition.

No impacts on Utah state-appropriated groundwater rights are expected to occur as a consequence of the proposed mining activity (Cirrus and Petersen 2017). Any and all water lost from mining, if proven, must be replaced under Utah law.

3.6.3.1 Cumulative Effects

The past, present, and reasonably foreseeable future actions near the LBA area that would affect water resources are underground mining operations (see Section 3.1.2 and Appendix B). The existing Lila Canyon underground mining operations are analyzed in the CHIA (DOGM 2007). The spatial analysis area to examine cumulative effects to water resources extends to the CIA boundary (DOGM 2007). 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 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). Surface water and groundwater monitoring and subsidence monitoring would be expected to continue as permit conditions.

Mining impacts to surface water resources for the LBA and state lease areas would be assessed in conjunction with review of mining plans. Cumulative impacts to stream drainages as a result of subsidence in the Williams Draw tract in addition to past, present, and reasonably foreseeable future actions could include localized changes in stream gradients and areas of increased stream gradients; however, these changes would likely be temporary. Any and all water lost from mining, if proven, must be replaced under Utah law.

3.7 Migratory Birds (including raptors)

The analysis area for potential direct, indirect, and cumulative effects on migratory birds is the LBA area with a 0.5-mile buffer. This area was chosen based on the U.S. Fish and Wildlife Service (USFWS)–recommended spatial buffer for diurnal raptors (other than the prairie falcon [*Falco mexicanus*]) in the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (Romin and Muck 2002). The analysis area provides a reasonable boundary for analysis of the potential direct, indirect, and cumulative effects on migratory birds (including raptors) and their habitat from the proposed mining activities.

3.7.1 Affected Environment

As described in Section 3.1.1 (Setting), the lower valley and upper elevations of the LBA area are divided by the Book Cliffs escarpment. This escarpment consists of sandstone-capped cliffs, which are oriented in

a northwest to southeast direction through the LBA area. Elevations in the LBA area range from approximately 5,280 to 7,620 feet.

The lower valley of the LBA area is a mixture of shrublands, including salt desert scrub, mat saltbush, greasewood flats, shale badland, and juniper shrubland. Sagebrush shrublands and grasslands are interspersed with pinyon-juniper woodlands at mid-elevations. At higher elevations up on the plateau, particularly in drainages, there are pockets of mixed coniferous forests dominated by Douglas-fir. Rocky cliff habitat is present along the Book Cliffs, and rock outcrop and short cliffs are present in the dry, open canyons in the eastern half of the LBA area.

The DOGM permit for Lila Canyon Mine (C/007/0013) requires that UEI conduct annual raptor surveys to identify and monitor all raptor nests, as well as to maintain an escarpment barrier of at least 200 feet to prevent cliff habitat loss. For possible subsidence impacts to raptor nests, UEI must develop a mitigation plan that must be submitted and approved by DOGM. Any possible subsidence impacts to raptor nests requires application for a take permit through USFWS 2 years prior to subsidence beneath the area of the nests. The permit also requires that UEI adhere to an exclusionary period of February 1 to July 1 for raptors before construction of any new facility projects, structures, and roads, and before reclamation. It is reasonable to expect that these conditions would be applied to an amended or a new DOGM permit for the Williams Draw tract.

Habitat for migratory birds occurs throughout the LBA area in pinyon-juniper shrublands, desert scrub, forests, and in/along cliffs (Figure 3-6). Raptors in the LBA area typically nest on cliffs, rock pedestals, and rocky outcrops located along the Book Cliffs and associated canyons. Rocky areas up on the plateau are limited to short cliff bands and rock outcrops that are accessible to ground predators and are therefore less likely to be used for nesting. Available trees for nesting are pinyon pine (*Pinus* sp.), juniper (*Juniperus* sp.), and some small stands of Douglas-fir.

Several migratory birds, including raptor species, have been observed or have the potential to occur in the Williams Draw tract and surrounding areas. Raptor nest surveys were conducted in 2016 for an area including the tract, a 0.5-mile buffer, and additional areas to the north (in total, the analysis area). One nest, a great horned owl (*Bubo virginianus*) nest, was documented in the tract area (Tetra Tech 2016). The BLM ID Team also determined that suitable golden eagle (*Aquila chrysaetos*) habitat, including known nests, occurs in the analysis area. Table 3-21 lists the migratory birds, including raptor species, with the potential to occur in the analysis area.

Figure 3-6. View facing south along Book Cliffs from area north of the Williams Draw tract (Tetra Tech 2016).

Table 3-21. Migratory Birds, including Raptors, with the Potential to Occur in or Near the Analysis Area

Common Name	Scientific Name	Season	Potential to Occur in the Wildlife Impact Analysis Area
Ash-throated flycatcher	*Myiarchus cinerascens*	Breeding	There have been observations of this species in the analysis area.
Black-billed magpie	*Pica hudsonia*	Year-round	There have been observations of this species in the analysis area.
Black-throated gray warbler	*Setophaga nigrescens*	Breeding	There have been observations of this species in the analysis area.
Black-throated sparrow	*Amphispiza bilineata*	Breeding	There have been observations of this species in the analysis area.
Black rosy-finch	*Leucosticte atrata*	Breeding	USFWS habitat data indicate that there is potential for this species to occur in the analysis area.
Blue gray gnatcatcher	*Polioptila caerulea*	Breeding	There have been observations of this species in the analysis area.
Brewer's sparrow	*Spizella breweri*	Breeding	USFWS habitat data indicate that there is potential for this species to occur in the analysis area.
Burrowing owl	*Athene cunicularia*	Breeding	USFWS habitat data indicate that there is potential for this species to occur in the analysis area.
Canyon wren	*Catherpes mexicanus*	Year-round	There have been observations of this species in the analysis area.
Chipping sparrow	*Spizella passerine*	Breeding	There have been observations of this species in the analysis area.

Common Name	Scientific Name	Season	Potential to Occur in the Wildlife Impact Analysis Area
Cliff swallow	*Petrochelidon pyrrhonota*	Breeding	There have been observations of this species in the analysis area.
Common raven	*Corvus corax*	Year-round	There have been observations of this species in the analysis area.
Cooper's hawk	*Accipiter cooperii*	Year-round	There have been observations of this species in the analysis area.
Golden eagle	*Aquila chrysaetos*	Year-round	USFWS habitat data indicate that there is potential for this species to occur in the analysis area. There are known nests within 0.5 mile of the project area.
Gray flycatcher	*Empidonax wrightii*	Breeding	There have been observations of this species in the analysis area.
Gray vireo	*Vireo vicinior*	Breeding	USFWS habitat data indicate that there is potential for this species to occur in the analysis area.
Great horned owl	*Bubo virginianus*	Year-round	There have been observations of this species in the analysis area.
Horned lark	*Eremophila alpestris*	Year-round	There have been observations of this species in the analysis area.
Lark sparrow	*Chondestes grammacus*	Breeding	There have been observations of this species in the analysis area.
Mountain bluebird	*Sialia currucoides*	Breeding	There have been observations of this species in the analysis area.
Mountain chickadee	*Poecile gambeli*	Year-round	There have been observations of this species in the analysis area.
Mourning dove	*Zenaida macroura*	Year-round	There have been observations of this species in the analysis area.
Pinyon jay	*Gymnorhinus cyanocephalus*	Year-round	USFWS habitat data indicate that there is potential for this species to occur in the analysis area.
Spotted towhee	*Pipilo maculatus*	Year-round	There have been observations of this species in the analysis area.
Red-tailed hawk	*Buteo jamaicensis*	Year-round	There have been observations of this species in the analysis area.
Rock wren	*Salpinctes obsoletus*	Breeding	There have been observations of this species in the analysis area.
Vesper sparrow	*Pooecetes gramineus*	Breeding	There have been observations of this species in the analysis area.
Virginia's warbler	*Leiothlypis virginiae*	Breeding	There have been observations of this species in the analysis area.
Western tanager	*Piranga ludoviciana*	Breeding	There have been observations of this species in the analysis area.
White-crowned sparrow	*Zonotrichia leucophrys*	Year-round	There have been observations of this species in the analysis area.
Wilson's warbler	*Cardellina pusilla*	Migratory	There have been observations of this species in the analysis area.

Source: Tetra Tech (2016); USFWS (2019).

3.7.2 Environmental Impacts – Alternative A: No Action

Under the No Action alternative, the BLM would not offer the Williams Draw LBA area for leasing by competitive sale at this time and there would be no extraction of recoverable coal in the Williams Draw tract. Therefore, there would be no direct or indirect impacts to migratory birds, including raptor species, in the analysis area. Existing permit conditions requiring raptor surveys and exclusionary periods would remain in effect.

3.7.2.1 Cumulative Effects

Under the No Action alternative, the BLM would not offer the Williams Draw LBA area for leasing by competitive sale at this time, and there would be no extraction of recoverable coal in the Williams Draw tract. The current level of activities would continue under the No Action alternative, but there would be no cumulative effect of the Proposed Action on migratory birds, including raptor species, in the analysis area. Existing permit conditions requiring raptor surveys and exclusionary periods would remain in effect.

3.7.3 Environmental Impacts – Alternative B: Proposed Action

This surface disturbance on the cliff face as a result of vent construction would result in the loss of potential nesting habitat for some species of migratory birds, including raptor species.

The proposed breakout vent would have temporary direct impacts on wildlife species through increased noise during construction. This could cause localized avoidance of areas adjacent to the vent, which could affect foraging and nesting behaviors (Lynch et al. 2011). If permit conditions include compliance with the raptor exclusionary period, nesting should not be affected because construction would take place outside the nesting season. The proposed breakout vent could alter airflow patterns during subsequent mining operations, which could cause localized avoidance of areas adjacent to the vent.

These impacts are expected to be localized, and species within the area are likely to acclimate to the change in surface conditions and air flow patterns; therefore, construction associated with the vent as well as potential changes to airflow patterns resulting from the vent are anticipated to have short-term and minor effects on raptor and migratory bird individuals and populations.

Changes in surface slopes as a result of subsidence are expected to be less than 2% to 3%. Vertical subsidence would not be visually discernable because of the gradual changes in surface slopes and overall large areas that have subsided. Generally, this type of subsidence is detectable only with survey instruments. However, the consequences of subsidence, such as ponding, may be noticeable depending on hydrogeological conditions. Ground surface nesting habitat is not expected to be noticeably affected.

Impacts to wildlife species, including prey species for raptors, from day-to-day mining operations at the Lila Canyon Mine include direct mortality associated with coal haul traffic as well as human-related intrusions/disturbance into wildlife habitats, which can cause loss of habitat suitability. These potential impacts are disclosed in the Lila Canyon Project EA (BLM 2000).

3.7.3.1 Cumulative Effects

The past, present, and reasonably foreseeable future actions near the LBA area that could affect migratory birds, including raptors, are underground mining operations (see Section 3.1.2 and Appendix B). Any surface facilities proposed to support underground mining of the LMA or state lease areas would likely be required by DOGM to adhere to the exclusionary period imposed on the existing Lila Canyon Mine operation before construction of any new facility projects, structures, and roads, and before reclamation. The exclusionary period is from February 1 to July 1.

Because of the anticipated permit requirements for protection of raptors, the minor amount of habitat loss with vent construction, and lack of other surface facilities proposed in or near the LBA, there would be minor cumulative effects to migratory birds, including raptors, as a result of the Proposed Action in addition to past, present, and reasonably foreseeable future actions.

3.8 Wildlife Species (non-USFWS-designated)

The analysis area for potential direct, indirect, and cumulative effects on non-USFWS-designated species is the LBA area plus a 0.5-mile buffer. This area was chosen because it provides a reasonable boundary for analysis of the potential direct, indirect, and cumulative effects on certain big game species and their habitat from the proposed mining activities.

3.8.1 Affected Environment

As described in Section 3.1.1 (Setting), the lower valley and upper elevations of the LBA area are divided by the Book Cliffs escarpment. This escarpment consists of sandstone-capped cliffs, which are oriented in a northwest to southeast direction through the LBA area. The lower valley is a mixture of shrublands, including salt desert scrub, mat saltbush, greasewood flats, shale badland, and juniper shrubland. Sagebrush shrublands and grasslands are interspersed with pinyon-juniper woodlands at mid-elevations. At higher elevations up on the plateau, particularly in drainages, there are pockets of mixed coniferous forests dominated by Douglas-fir. Rocky cliff habitat is present along the Book Cliffs, and rock outcrop and short cliffs are present in the dry, open canyons in the eastern half of the LBA area.

The DOGM permit for Lila Canyon Mine (C/007/0013) requires that the Mine operator adhere to exclusionary periods of May 1 to June 15 for Rocky Mountain bighorn sheep lambing, and May 15 to June 20 for pronghorn (*Antilocapra americana*) before construction of any new facility projects, structures, and roads, and before reclamation. In addition, C/007/0013 requires that the mined portion of the permit area be monitored visually each spring for evidence of subsidence. These conditions would likely be applied to an amended or a new DOGM permit for the Williams Draw tract.

3.8.1.1 Rocky Mountain Bighorn Sheep

Rocky Mountain bighorn sheep are yearlong residents of their range and do not have seasonal ranges like other big game species. However, some seasonal movements within their range occur, such as when ewes move to reliable watercourses or sources during the lambing season. Rocky Mountain bighorn sheep prefer steep rocky slopes and may migrate from higher elevations to lower valleys in the winter. Their diet consists of a variety of shrubs, forbs, and grasses, which vary with the season. Bighorn sheep lambing occurs on steep talus slopes typically within 1 to 2 miles of reliable water sources. The analysis area is located on the eastern edge of an area of crucial value, year-long range for this species that extends east to the Green River, south nearly to the town of Green River, Utah, and north to East Carbon, Utah, and north along the Green River (BLM 2008: Map 3-11). During wildlife surveys in 2016, Rocky Mountain bighorn sheep were observed in the analysis area (Tetra Tech 2016).

The Utah Division of Wildlife Resources (UDWR) updated all bighorn sheep unit management plans in 2019. The LBA area is within the Gray Canyon subunit of the Nine Mile bighorn sheep management unit in eastern Carbon and Emery Counties. In this 156,785-acre subunit, 132,401 acres are BLM-administered lands in the PFO planning area. The LBA area occupies approximately 3% of the BLM-administered lands in the subunit. In 2016, the estimated bighorn sheep population in the Gray Canyon subunit was 345 individuals. While the population ranges as far north as the town of Sunnyside, approximately 10 miles north of the LBA, the majority of the bighorn sheep in this subunit reside in the lower reaches of Gray Canyon near the town of Green River (UDWR 2019), which is approximately 32 miles south of the LBA area.

3.8.1.2 Mule Deer

Mule deer move seasonally between summer and winter ranges. They summer at higher elevation ranges in aspen and conifer and mountain browse vegetation types and winter at lower elevation ranges, occupying sagebrush and pinyon-juniper woodlands vegetation types. Mule deer winter diets consist primarily of sagebrush, specifically Wyoming big and basin big sagebrush. Other shrubs, such as true mountain mahogany (*Cercocarpus ledifolius*), fourwing saltbush (*Atriplex canescens*), and antelope bitterbrush (*Purshia tridentata*), are also important winter forage species. Pinyon-juniper woodlands are considered important emergency forage during severe winters with deep snow conditions that cover other forage species. Mule deer have a high degree of fidelity to specific winter ranges, where they concentrate

on relatively small areas at high population densities. The analysis area is located in high value winter range for this species (BLM 2008: Map R-8).

The size and condition of mule deer populations are primarily determined by the quantity and quality of their habitat. Summer range is limiting in some areas and portions of winter ranger are in poor condition because of drought and overuse by wildlife, feral horses, and domestic livestock (UDWR 2016). The winter population estimate for mule deer in the Nine Mile Unit was 7,300 in 2017, which is below the management objective of 8,500 (Bernales et al. 2017). During wildlife surveys in 2016, mule deer were observed in the analysis area (Tetra Tech 2016).

3.8.1.3 Elk

Elk are migratory and move seasonally between summer and winter ranges. They summer at higher elevation ranges in aspen and conifer and mountain browse vegetation types and winter at mid- to lower elevation ranges occupying the mountain browse (such as aspen and snowberry), sagebrush, and pinyon-juniper woodlands vegetation types. Wind-swept higher ridges in some areas, such as the high ridgetops of Castle Valley Ridge, above Price Canyon, and along some areas of the Book Cliffs, are important for this species. The analysis area is in high value winter and substantial value winter ranges for this species (BLM 2008: Map R-8).

Elk exhibit a high degree of mobility on both summer and winter ranges to seek out habitats that provide the best forage conditions. Summer range is limited in the Nine Mile Unit but is in stable condition. Winter range in the Nine Mile Unit is stable and in fair to good condition (UDWR 2016). The winter population estimate for elk in the Nine Mile Unit was 2,400 in 2017, which is just below the management objective of 2,500 (Bernales et al. 2017).

No elk were documented in the analysis area during the 2016 wildlife surveys (Tetra Tech 2016).

3.8.2 Environmental Impacts – Alternative A: No Action

Under the No Action alternative, the BLM would not offer the Williams Draw LBA area for leasing by competitive sale at this time and there would be no extraction of recoverable coal in the Williams Draw tract. Therefore, there would be no direct or indirect impacts to Rocky Mountain bighorn sheep, mule deer, or elk in the analysis area.

3.8.2.1 Cumulative Effects

Under the No Action alternative, the BLM would not offer the Williams Draw LBA area for leasing by competitive sale at this time. Current levels of activities would continue under the No Action alternative, but there would be no cumulative effect on bighorn sheep, mule deer, or elk in the analysis area.

3.8.3 Environmental Impacts – Alternative B: Proposed Action

Because the breakout vent would be placed on a steep sandstone slope, no direct impacts to Rocky Mountain bighorn sheep, mule deer, or elk habitat would occur. Under construction timing restrictions, there would be no construction-related impact to the Rocky Mountain bighorn sheep lambing season. Additionally, changes in surface slopes as a result of subsidence are expected to be less than 2% to 3% (Maleki 2017), which is not expected to impact these three species. A maximum of 3% of BLM lands in the Gray Canyon subunit of the Nine Mile bighorn sheep management unit have the potential to be impacted by subsidence-related habitat changes. If subsidence-related habitat impacts did occur, the effect to the area Rocky Mountain bighorn sheep population would be minimal due to the local herd's strong

historical preference for other areas in the subunit (UDWR 2019) and because of habitat and/or water source enhancement measures as described in Section 2.4.2.3.

The breakout vent may have temporary direct impacts on these three species, if present, through increased noise during the 1-week construction period. Increased noise levels could cause some localized avoidance of areas adjacent to the vent, which could affect species' behaviors (Lynch et al. 2011). In the winter, mule deer and elk are vulnerable to added stress caused by human activity. Mule deer are known to be displaced on average 600 feet from areas of human activity, and elk can be displaced from 0.5 mile to 1.0 mile from areas of human activity (BLM 2004). However, all human activity would occur underground, and the noise is expected to be low level and temporary; therefore, any localized avoidance or stress would be temporary. Because construction activities would be temporary and human activity and noise would be underground and at a low level, potential impacts to these species are expected to be short term and minor.

3.8.3.1 Cumulative Effects

Under the Proposed Action, there would be minor cumulative effects on Rocky Mountain bighorn sheep, mule deer, and elk habitats, individuals, and populations. These impacts are expected to be localized, and mule deer, elk, or Rocky Mountain bighorn sheep in the area are likely to tolerate temporary low-level noise. Under construction timing restrictions, there would be no impact to the Rocky Mountain bighorn sheep lambing season.

CHAPTER 4. CONSULTATION AND COORDINATION AND LIST OF PREPARERS

4.1 Tribes, Individuals, Organizations, or Agencies Consulted

As described in Chapter 1, the BLM initially listed the proposed LBA on its ENBB in January 2013. The BLM conducted Tribal consultation and public scoping from January to June 2013. Because of various delays (see Section 1.2), the proposal was removed from the ePlanning site thereafter.

The BLM again listed the LBA proposal on its ePlanning website in November 2019. The draft EA will be made available for public review and comment.

The BLM consulted with EPA and National Park Service representatives during preparation of the air technical report (SWCA 2019). OSMRE has agreed to participate in this EA process as a cooperating agency.

4.2 List of Preparers

Table 4-1. List of Preparers and Reviewers

Name	Title	EA Document Responsibility
BLM Preparers and Reviewers		
Jared Dalebout	BLM SO hydrologist	–
Michael Glasson	Consulting geologist, former BLM solid minerals lead, PFO	Project lead, project management, document review, geology/minerals/ energy production
Steve Falk	Former Mining engineer, PFO	Project management
Don Stephens	Assistant field manager, PFO	Project oversight
Steve Rigby	Consulting mining engineer,	Project oversight and review
Rebecca Anderson	Geologist, PFO	Geology, solid minerals
Chris Conrad	Field office manager, PFO	Project oversight and review, hydrology
Joe Rodarme	NEPA lead, P FO	Review
Erik Vernon	Air quality specialist, BLM SO	Air quality and GHG emissions
Non-BLM Preparers and Reviewers		
OSMRE		
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	Document review and geology/minerals/energy production; project management and QA/QC
Amanda Nicodemus	Environmental scientist	Wildlife
Gretchen Semerad	Environmental scientist	Air quality and GHG emissions
Brad Sohm, P.E.	Senior air quality specialist	Air quality review
Calah Worthen	Water resources specialist	Water resources review

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: Williams Draw LBA

NEPA Log Number: DOI-BLM-UT-G020-2020-0007-EA

File/Serial Number: UTU-80043

Project Leader: Michael 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	No impacts will occur from the sale of the lease. However, future mining of the coal and process (combustion) could affect air quality.	Stephanie Howard	8/1/2019
NP	BLM natural areas	There are no BLM Natural Areas within the proposed project area as per GIS and RMP review	Ben Kraja	8/21/18
NI	Cultural: Archaeological Resources	A Class III cultural resources inventory performed by Cultural Resource Analyst, Inc. did not identify any historic properties within the proposed action's area of potential effect. Pursuant to 36 CFR § 800.5(b), BLM determined a finding of "no adverse effect." The Utah State Historic Preservation Office concurred with these findings on February 8, 2017. There have been no issues or concerns raised since this concurrence.	William Brant	7/9/20
NI	Cultural: Native American Religious Concerns	Tribal consultation letters were mailed February 1, 2013. The Navajo Nation responded on April 1, 2013 stating that the proposed action would not impact Navajo traditional cultural resources.	William Brant	9/5/18
NP	Designated Areas: National Historic Trails	There are no National Historic Trails within the proposed project area as per GIS and RMP review	Ben Kraja	8/21/18
NP	Designated Areas: Areas of Critical Environmental Concern	There are no Areas of Critical Environmental Concern within the proposed project area as per GIS and RMP review	Ben Kraja	8/21/18
NP	Designated Areas: Wild and Scenic Rivers	There are no designated Wild and Scenic Rivers within the proposed project area as per GIS and RMP review	Ben Kraja	8/21/18

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NP	Designated Areas: Wilderness Study Areas	There are no WSAs present near the proposed project area because the WSA was congressionally designated as Wilderness in the spring of 2019.	Myron Jeffs	5/30/2019
NI	Designated Areas: Wilderness Areas	In the spring of 2019, the Dingell Act designated what was the Desolation Canyon and Turtle Canyon WSAs to Wilderness and changed the boundary of the units in some places. Both Turtle Canyon Wilderness and Desolation Canyon Wilderness areas are near the proposed lease; within ¼ mile at points along the southern and eastern sides of the proposed lease area. In these particular areas, there is also an elevation difference between the proposed lease and the Wilderness. Wilderness is considered to be present, due to its proximity to the proposal. However, because of the distance between the two and elevation difference, no impacts are expected.	Myron Jeffs	5/30/2019
NI	Environmental Justice	No minority or economically disadvantaged communities or populations would be disproportionately adversely affected (physically or economically) by the proposed action or alternatives because none are present in or adjacent to the project area.	Jake Palma	9/7/2018
NP	Farmlands (prime/unique)	According to the NRCS soil survey and knowledge of the area, there are no prime/unique farmlands within the project area.	Stephanie Bauer	8/1/18
NI	Fuels/Fire Management	There are no impacts to Fuels/Fire Management from leasing. Impacts (both direct and indirect). Fuels projects are most often done on slopes less than 30% and in heavier fuel types with dense fuel loading. This lease is not in an area where fuels projects are likely to happen. Fuels vary from lease to lease but generally consist of Pinyon Pine, Utah Juniper, Sage Brush, small shrubs, and grasses. Impacts to Fire are minimal. Location will be recorded and added to the FMP to brief suppression resources. Follow seasonal fire restrictions at https://utahfireinfo.gov/.	Stuart Bedke	15 JULY 2019
PI	Geology / Minerals / Energy Production	This proposal is a beneficial use of the mineral at the site. It is consistent with the goals and objectives of the BLM Price Field Office as documented in the PFO Resource Management Plan. The sub-surface extraction of coal would not remove any surface deposits. There are no federal oil & gas leases in the project area. The project area is open to oil & gas leasing subject to minor constraints. It would not be feasible for exploration or production of oil and gas while active mining is ongoing.	Rebecca Anderson	8/16/18
NI	Invasive Plants / Noxious Weeds / Vegetation	Surface disturbing activities have the potential to introduce/spread invasive species/noxious weeds. Canada thistle, musk thistle, houndstongue and salt cedar are noxious weeds that occur within the project area or directly adjacent to the project area. However, since no surface occupancy is expected, there should be no impacts to invasive species/noxious weeds. Subsidence could create niches for weed seeds to get established, however impacts are expected to be negligible since surface expression of subsidence is only anticipated if the mine approaches the cliff face. The area should be monitored for any new infestations resulting from this project.	Stephanie Bauer	8/1/18

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Lands/Access	Implementing the proposed action would not conflict with any existing land uses or ROWs in the Project Area as shown by review of LR2000 and the Master Title Plats because no subsidence is anticipated and there are no ROWs present within these Legal Land Descriptions.	Veronica Kratman	8/19/19
NI	Lands with Wilderness Characteristics	The proposed project is located within the Turtle Canyon and Desolation Canyon LWC inventory units. These units have been found to possess wilderness characteristics but were identified in the 2008 RMP to be managed for multiple uses, not to maintain their wilderness characteristics. The proposed LBA includes subsurface mining activities. One consideration is the possibility of subsidence which may create some surface changes if it were to occur. Subsidence of the neighboring Lila Canyon Mine is nearly immeasurable and difficult to identify. It's expected that the same minor degree of subsidence may occur within the Williams Draw LBA area. If so, subsidence would not impact LWC to the degree that additional analysis is necessary. There is discussion on the expectations and assumptions of subsidence made by subject matter experts in the proposed action. This discussion alleviates any concern of potential impacts to LWC as a result of subsidence.	Myron Jeffs	9/7/2018
NI	Livestock Grazing	Portions of the Proposed lease area are located in the Cove and Little Park grazing allotments. Livestock grazing would not be impacted because there would be no above ground activities/disturbance other than the vent located in a rock face. Therefore, no further analysis is needed.	Jason Carlile	8/5/19
NI	Rangeland Health Standards	Rangeland Health standards reflect hydrology, soils and biotic components of the rangeland. Impacts, if any, to these components will be addressed in their respective sections and not analyzed as its own section in the NEPA document.	Jason Carlile	8/5/19
NI	Paleontology	In the Paleontological Resources Preservation Act, coal is specifically exempted from being considered a paleontological resource: Section 6311 Savings Provisions. nothing in this subtitle shall be construed to-- (1) invalidate, modify, or impose any additional restrictions or permitting requirements on any activities permitted at any time under the general mining laws, the mineral or geothermal leasing laws, laws providing for minerals materials disposal, or laws providing for the management or regulation of the activities authorized by the aforementioned laws including but not limited to the Federal Land Policy Management Act (43 U.S.C. 1701-1784), Public Law 94-429 (commonly known as the `Mining in the Parks Act') (16 U.S.C. 1901 et seq.), the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201-1358), and the Organic Administration Act (16 U.S.C. 478, 482, 551);	Rebecca Anderson	8/12/2019

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Plants: BLM Sensitive	No plant species currently designated as BLM Sensitive have been identified within the project area, per BLM records, GIS data, and Utah Natural Heritage Program data. However, suitable habitat for these species may be present in the project area, and two of these species, Book Cliffs blazingstar (*Mentzelia multicaulis* var. *librina*) and Creutzfeldt's cryptantha (*Cryptantha creutzfelddtii*) have been identified within 1 mile of the project area. If these species or suitable habitat for these species are present in the project area, then surface disturbing activities have the potential to impact these species. An inventory survey of the project area was completed in 2016 by Tetra Tech; no BLM Sensitive plant species nor suitable habitat for these species was identified in the project area. Therefore, it is unlikely that these species would be impacted by the proposed action.	Christine Cimiluca	08/07/2018; updated 8/1/2019
NP	Plants: Threatened, Endangered, Proposed, or Candidate	No federally listed plants, nor candidate / proposed listed plant species have been identified within the proposed lease area and expected area of disturbance, per BLM records and GIS location data. A new population of White River beardtongue (*Penstemon albifluvis*), currently proposed for listing, was documented in the Book Cliffs approximately 48 miles to the east of the project area. However, this population occurred on Green River shale, and this species is known to be Green River shale obligate. Suitable habitat for this species is not present in the project area.	Christine Cimiluca	08/07/2018
NI	Recreation	The proposed project is located in an ERMA (Extensive Recreation Management Area) where recreation opportunities and problems are limited and explicit recreation management is not required. The proposed action would not change or alter the existing recreation opportunities.	Ben Kraja	8/21/18
PI	Socio-Economics	Leasing may impact the economics of the County. The most likely development scenario is for the existing mine to extend into the LBA area. Under this scenario no new jobs would be created and annual production would not be increased, although the life of the mine would be extended for 10 years, which would nearly double the foreseeable life of the mine.	Stephanie Howard	8/1/19
NI	Soils: Physical / Biological	If subsidence occurs, it could cause changes to overland flows and runoff from precipitation events, which could increase soil loss and erosion created by concentrated water flow patterns. Since no surface occupancy is planned and subsidence is expected to be minimal, no impacts to soils is expected. A vent constructed inside the mine will not have impacts to the soil because the vent will be in the cliff ledge or rock face.	Stephanie Bauer	8/19/18
NI	Vegetation: Vegetation Excluding USFW Designated Species and BLM Sensitive Species	If subsidence occurs, there could be minor changes to the vegetation community. With the vent being located in the rock face, no vegetation is expected to be impacted by the proposed project.	Jason Carlile	8/5/19

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Visual Resources	The proposed action include the potential for one vent. If installed, the vent would be installed high on the ledges above Highway 6, out of the viewshed of the general public and casual visitors. Due to its location significantly elevated from the valley floor, the distance from the valley floor to the possible vent location, it's highly likely the vent would not be seen. If it is, it would still be consistent with the management objectives of VRM Class II because the character of the landscape would be retained and the level of change to the landscape would be low. Subsidence was also identified as a possible impact to visual resources. It is no longer considered to be a potential impact. There is discussion on the expectations and assumptions of subsidence made by subject matter experts in the proposed action. This discussion alleviates any concern of potential impacts to visual resources as a result of subsidence.	Myron Jeffs	7/29/2019
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 project. 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 project. 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.	Jake Palma	9/7/2018
PI	Water: Groundwater Quality	Subsidence as a result from second mining can interrupt stratigraphy above the mined out coal seam. Generally water in the Blackhawk formation is contained in perched aquifers which are lenticular and do not migrate up or down with any distance due to mudstones and siltstones interbedded with the small perched sandstones. The sandstones are fairly tight and do not lend to migration within the aquifers either. Water quality within the small aquifers could be affected, particularly with respect to turbidity and suspended solids, but will also settle readily. Refer also to hydrology technical report written by Cirrus Ecological Solutions.	Michael Glasson	09/06/18
PI	Water: Hydrologic Conditions (storm water)	The State of Utah, Division of Oil, Gas and Mining (UDOGM), during the Mine permitting process will require a Storm Water Prevention Control and Countermeasure Plan (SPCC) to be included with their Mining and reclamation Plan (MRP). The SPCC will identify measures to reduce or eliminate impacts from stormwater	Michael Glasson	09/06/18
NI	Water: Municipal Watershed / Drinking Water Source Protection	The Williams Draw LBA is not in any proximity to municipal watersheds or drinking water. While there are springs (2) on the tract, these do not supply drinking water to any municipality. All potable water for the cities of Sunnyside and east Carbon are stored in the Grassy Trail reservoir, which is supplied by the Grassy Trail creek and is not associated with the two springs on the lease tract.	Michael Glasson	09/06/18
NI	Water: Streams, Riparian Wetlands, Floodplains	There are no streams, riparian, wetlands or floodplains within the Williams Draw lease tract per GIS mapping and onsite inspection of the tract.	Michael Glasson	09/06/18

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Water: Surface Water Quality	Surface water within the Williams Draw tract is only present for a short distance downstream from the two springs and is a very low volume (generally a seep). In any case, surface water, should it be impacted negatively in any way must be replaced by the mine operator (if proven) for the owner of the water at these two springs, under Utah law.	Michael Glasson	09/06/18
NI	Water: Water Rights	No water rights will be impacted permanently, as all water lost due to mining, if proven, must be replaced under Utah law.	Michael Glasson	09/06/18
NP	Water: Waters of the U.S.	All water at the Williams Draw lease tract are owned by the State of Utah, none by the United States.	Michael Glasson	09/06/18
NP	Wild Horses and Burros	The Proposed Action is Not within a Wild Horse or Burro Herd Management Area per the RMP. As such it will not affect WHB management.	Mike Tweddell	8/1/2018
PI	Wildlife: Migratory Birds (including raptors)	Raptors including eagles are known to occur in the area. BLM records indicate known nests within 0.5-mile of the Project area. Suitable habitat present throughout the Project area. Active nests within and near the project area were observed during the 2016 surveys. In addition, several migratory birds including blue gray gnatcatchers were observed within the project area. Pre-construction surveys for raptors and migratory birds are required before construction of the vent.	Dana Truman	7/16/19
NI	Wildlife: Fish (designated or non-designated)	There are no fish species (including their associated habitats) within or near the project area per GIS mapping of streams and sensitive fish species occurrences. Water used during the mining process will come from sources that do not deplete from the Green River system, therefore detailed analysis is not required.	Jerrad Goodell	9/7/2018
PI	Wildlife: Non-USFWS Designated	Portions of the project are located within crucial year-long habitat for Rocky Mountain Bighorn sheep. The project is also located within substantial winter habitat for both deer and elk. If a vent is required to implement the project, timing stipulation to restrict construction activities would have to be applied to the project to protect lambing success for R.M. Bighorn sheep. Construction activities would be outside the 4-15 to 6-15 lambing window.	Dana Truman	7/16/19
NI	Wildlife: BLM Sensitive	Burrowing Owl and White-tailed prairie dog have potential to occur within the project area - UNHP occurrence records show within two miles of the Project area. Bats including the Towsends big ear bag could be present within the project area. UNHP occurrence records within one mile of the Project area. Surveys were conducted in 2016, refer to the 2016 TES and other plant and Wildlife Species Report in BLM files for more information. The LBA proposes only 1 vent for surface facilities. The minimal disturbance required for the 1 vent combined with the expectation of minimal subsidence will result in no measurable impacts to the populations of burrowing owls, prairie dogs, and bats as foraging and roosting habitat will not be disturbed.	Dana Truman	7/16/19

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Wildlife: Threatened, Endangered, Proposed or Candidate	USFWS ESA list obtained for the Project area includes the following threatened and endangered species: Birds Mexican spotted owl (*Strix occidentalis lucida*) - Threatened Southwestern willow flycatcher (*Empidonax traillii extimus*) - Endangered Yellow-billed cuckoo (*Coccyzus americanus*) – Threatened The southwestern willow flycatcher and yellow-billed cuckoo do not occur in the Project area because there is no willow or cottonwood riparian habitat that would support these species. Mexican spotted owl - Designated critical habitat Unit CP-15 (West Tavaputs Plateau) is located 0.25 mile to the east of the Project area (USFWS 2004). The majority of this unit is centered around Range Creek and on cliffs along the Green River. This species may occur in the cliff and forested areas within or near the Project area. The wildlife surveys in 2016 determine that no suitable habitat occurred within the project area. Surface disturbance will be limited to one vent located on the west side of the project area. Because minimal surface disturbance is expected and because of the lack of suitable habitat, no effects expected to the MSO (For more information refer to the 2016 TES and other plant and Wildlife Species Report in BLM files)	Dana Truman Kegen Benson	7/16/19 9/3/19
NI	Woodlands/Forestry	The project is located within pinyon/juniper woodlands. Since no surface occupancy will occur, there will be no impact to woodlands/forestry. Subsidence would cause the loss of some pinyon/juniper, however the loss should be negligible because the project is small in scope and trees do not normally grow on cliff faces.	Stephanie Bauer	8/19/18

FINAL REVIEW:

Reviewer Title	Signature	Date	Comments
Environmental Coordinator			
Authorized Officer			

APPENDIX B

Past, Present, and Reasonably Foreseeable Future Actions

Table B-1. Past and Present Actions in the Williams Draw Tract Resource Analysis Areas

Action	Location	Specific	Past, Present	Measure	Resource considered (based upon location in/out of defined analysis area)
Coal mining					
	Emery County	UEI - Lila Canyon Mine	Past, present	2019 production 3,664,000 tons	Energy production
		Canyon Fuel/Wolverine - Skyline #3 Mine	Past, present	2019 production 3,896,000 tons	Energy production
		Bronco - Emery Mine	Past, present	2019 production 694,000 tons	Energy production
		Castle Valley/Rhino Resources – Castle Valley #1 Mine	Past	(inactive since 2004)	N/A
		Castle Valley/Rhino Resources – Castle Valley #3 Mine	Past, present	2019 production 562,000 short tons	Energy production
		Castle Valley/Rhino Resources – Castle Valley #4 Mine	Past, present	2019 production 488,000 short tons	Energy production
		East Mountain Energy -Deer Creek Mine	Past	(inactive since 2016)	N/A
		Genwal/UEI - Crandall Canyon Mine	Past	(inactive since 2008)	N/A
		Genwal/UEI - South Crandall Canyon	Past	(inactive since 2007)	N/A
	Carbon County	UEI – Aberdeen Mine	Past	(inactive since 2009)	N/A
		UEI – Pinnacle Mine	Past	(inactive since 2007)	N/A
		Canyon Fuel/Wolverine - Dugout Canyon Mine	Past, present	2019 production 430,000 short tons	Energy production
		Hidden Splendor – Horizon Mine	Past	(inactive since 2013)	N/A
		Lodestar – Whisky Creek #1	Past	(inactive since 2004)	N/A
		West Ridge/UEI/ Murray – West Ridge Mine	Past	(inactive since 2016)	N/A
Mineral mining					
	Emery County	Clay, humic shale, gypsum, U308&V205, boulders, riprap, gold, septarians, sandstone, flagstone, bentonite/zeolite	Past, present	Total 21 active mines; four are large mining operations, 17 are small mining operations or iode claims. The nearest active mine is approximately 19 miles northwest of the LBA.	Minerals
	Carbon County	Sandstone	Past, present	Total 1 active mine	Minerals

Action	Location	Specific	Past, Present	Measure	Resource considered (based upon location in/out of defined analysis area)
Oil and gas production					
	Emery County	Oil Natural gas	Past, present	See EA Table 3-19	
	Carbon County	Oil Natural gas	Past, present	See EA Table 3-19	

Table B-2. Reasonably Foreseeable Future Actions in the Williams Draw Tract Resource Analysis Areas

Action	Location	Specific	RFFA	Measure	Resource considered (based upon location in/out of defined analysis area)
Coal mining					
	Emery County	UEI Lila LMA	RFFA	Approximately 9 MM tons recoverable coal; permitted maximum production 4.5 MM tpy	Air quality Socioeconomics Water resources Migratory birds Wildlife (-within 50 km -in Emery Co. -within CHIA CIA -within wildlife buffer)
		SITLA coal lease	RFFA	Approximately 4-5 MM tons recoverable coal	Air quality Socioeconomics Water resources Migratory birds Wildlife (-within 50 km -in Emery Co. -within CHIA CIA -within wildlife buffer)
		Bronco Walker Flat LBA	RFFA	Approximately 8.2 MM recoverable tons as stated in the application	Socioeconomics (-in Emery Co. -outside 50 km -outside CHIA CIA -outside wildlife buffer)
		Canyon Fuel/Wolverine Little Eccles LBA	RFFA	(approx. 80 km away from the LBA)	None (located outside all defined resource analysis areas)

Action	Location	Specific	RFFA	Measure	Resource considered (based upon location in/out of defined analysis area)
Mineral mining					
	Emery County	Chalk Hills Expansion	RFFA	Active mining disturbance ≤ 10 acres at any given time over nearly 40 years; DOGM permit required prior to mining in expansion area	Air quality Socioeconomics (-within 50 km -in Emery Co. -outside CHIA CIA -outside wildlife buffer)
Oil and gas leasing/production					
	Carbon and Emery Counties	Quarterly oil and gas lease sales	RFFA once APD process is completed	Production, once operating	Socioeconomics
		IACX Woodside Dome 1 APD	RFFA once APD process is completed	Production, once operating	Air quality Socioeconomics (-within 50 km -in Emery Co. -outside CHIA CIA -outside wildlife buffer)
		Twin Bridges Bowknot Helium	RFFA once APD process is completed	Production, once operating	Socioeconomics (-outside 50 km -in Emery Co. -outside CHIA CIA -outside wildlife buffer)
	Carbon Co.	EnerVest Peters Point APDs	RFFA once APD process is completed	Production, once operating	Socioeconomics (-outside 50 km -in Emery Co. -outside CHIA CIA -outside wildlife buffer)
Transportation					
7-County Coalition	Carbon Co.	Uinta Basin Railway	RFFA		None (located outside all defined resource analysis areas) (-outside Emery Co. -outside 50 km -outside CHIA CIA -outside wildlife buffer)
Other					
	Emery Co.	E Carbon junction fiber	RFFA	Temporary disturbance, socioeconomic benefit	Air quality Socioeconomics (-within 50 km -in Emery Co. -outside CHIA CIA -outside wildlife buffer)

APPENDIX C

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