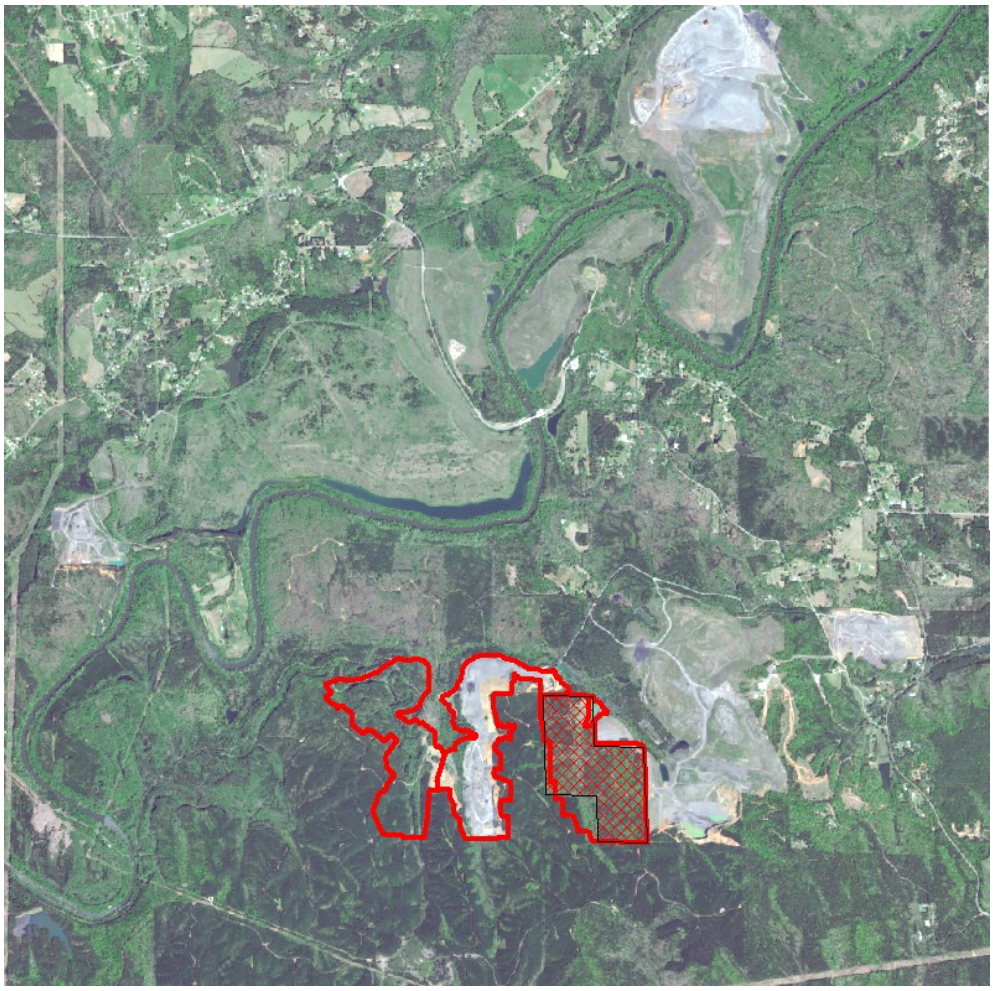
Environmental Assessment

Narley Mine No. 3

Best Coal, Inc.
Federal Coal Lease ALES-55199
ASMC Permit P-3990
Jefferson County, Alabama



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Chapter 1. Purpose and Need for Action

Introduction

The Office of Surface Mining Reclamation and Enforcement (OSMRE), Interior Regions 3, 4, and 6, is conducting an environmental review and preparing this environmental assessment (EA) to evaluate the environmental impacts that might result from the mining plan proposed by Best Coal, Inc. (the project). Under that plan, the permittee would recover resources from federal coal lease ALES-55199 at their Narley Mine No. 3 in Alabama. Best Coal, Inc. has added approximately 160 acres and 469,000 tons of recoverable federal coal to its state-issued mining permit. Leased federal coal in Permit P-3990 is in Section 24, Township 15 South, Range 4 West, in Jefferson County, Alabama (see *Figure 1.1 Location of Narley Mine No. 3*).

The presence of leased federal coal means that the 160-acre tract qualifies as federal lands. The term *federal lands*, as defined in 30 CFR 700.5, means any land, including mineral interests, owned by the United States. In order to mine federal coal, the permittee is required to adhere to the federal lands program in accordance with the Surface Mining Control and Reclamation Act of 1977 (SMCRA) and the Mineral Leasing Act of 1920 (MLA), while ensuring compliance with the National Environmental Policy Act of 1969 (NEPA).

OSMRE has prepared this EA to comply with NEPA. This EA incorporates by reference and summarizes relevant analyses from the 2014 Bureau of Land Management (BLM) leasing EA regarding the affected environment, environmental impacts and mitigation, and cumulative effects. In some cases in this EA, where there is new or relevant additional information available, OSMRE supplements or replaces BLM analyses with its own analyses.

The environmental review and this EA have been conducted in accordance with NEPA, as amended, the President's Council on Environmental Quality (CEQ) regulations for implementation of NEPA (40 CFR 1500-1508), the Department of the Interior (DOI) regulations for implementation of NEPA (43 CFR Part 46), the DOI Departmental Manual Part 516, and OSMRE guidance on implementation of NEPA, including the OSMRE Handbook on Procedures for Implementing the National Environmental Policy Act (OSMRE, 2019).

The NEPA requires federal agencies to consider the potential environmental impacts of proposed federal actions and make a determination as to whether the analyzed actions would "significantly" impact the environment, as defined in 40 CFR 1508.27. If OSMRE's EA finds that the project would have significant impacts, then an environmental impact statement (EIS) would be prepared. If, on the other hand, OSMRE determines that the potential impacts would not be significant, then OSMRE would prepare a "finding of no significant impact" (FONSI), and an EIS would not be necessary.

Background

In December 2007 Best Coal, Inc. filed a lease-by-application for federal coal lease ALES-55199 with the BLM Eastern States Office. That tract of federal coal would eventually comprise the eastern part of Narley Mine No. 3, which is adjacent to Narley Mine, Permit P-3850. The

Alabama Surface Mining Commission (ASMC) issued these two Narley permits. Surface mining operations recovering privately owned coal at Narley Mine began in 2004 and used standard truck-and-shovel mining practices. Coal recovery at Narley Mine is complete, and permittee Best Coal, Inc. has graded most of the mined ground to final contours and established vegetation.

BLM issued the *Narley Mine No. 3 Coal Lease Resource Management Plan Amendment, Land Use Analysis and Environmental Assessment*, along with a FONSI for the lease on June 16, 2014. OSMRE participated in the development of the EA as a cooperating agency (Bureau of Land Management [BLM], 2014). The bid—submitted under the lease by application process—was unsuccessful and BLM did not award the lease. On September 21, 2017, ASMC received an application for Permit P-3990 to include mining portions of federal lease ALES-55199. ASMC issued Permit P-3990 to Best Coal, Inc. on December 19, 2017, in accordance with their state-federal cooperative agreement (30 CFR 901.30). Permit P-3990 covers 535 acres (Alabama Surface Mining Commission [ASMC], 2017). Most of the private coal in Permit P-3990 has been mined. Mine-disturbed ground under permit has roads, impoundments, stockpiles, equipment storage areas, and diversion ditches. However, without an awarded federal coal lease, state-permitted mining disturbance could not extend to the federal coal resource.

BLM issued a supplemental EA with signed FONSI on June 25, 2018. On November 29, 2018, BLM held competitive lease sale for 160.82 acres and 469,000 tons of recoverable high-volatile bituminous coal. BLM accepted the high bid submitted by Best Coal, Inc. on December 6, 2018. A BLM letter dated March 8, 2019, recommended that the DOI's Assistant Secretary for Land and Minerals Management (ASLM) approve the Resource Recovery and Protection Plan (R2P2). That plan addresses how Best Coal, Inc. would produce about 469,000 tons of federal coal beneath 160 acres of privately owned surface.

In its most recent permitting action for Narley Mine No. 3, ASMC approved Revision R-3 on October 11, 2019. The original approved Permit P-3990 would have allowed mining the 160 acres of leased federal coal as a single unit, referred to as Increment 3. Increment 3 contained jurisdictional waters of the United States which were covered under a Nationwide Permit 21 (NWP-21) issued by the U.S. Army Corps of Engineers (USACE). However, that permit has expired. Obtaining a new USACE permit that would allow disturbance of these jurisdictional waters could take an additional 12 to 18 months. Revision R-3 alters the sequence of mining to avoid affecting any protected streams until the mine permittee has obtained a valid USACE permit. To accomplish this, Revision R-3 splits the land containing federal coal into two increments—Increment 3 and Increment 4. The revised Increment 3 could be mined without affecting any jurisdictional waters because those waters are now wholly contained in the adjoining Increment 4 to the west.

In a letter dated September 6, 2019, USACE confirmed that revised Increment 3 contains no federally regulated wetlands or other waters of the United States. Consequently, a USACE permit is not required to mine revised Increment 3. The ASMC's approval of Revision R-3 includes the condition that the permittee must obtain a valid USACE permit prior to conducting any mining activities in any federally regulated wetlands or other waters of the United States that occur within the boundary of Increment 4. This EA analyzes the environmental impacts of

mining federal coal from Increment 3 and Increment 4 with the assumption that the permittee will have to obtain a valid USACE permit before disturbing any part of Increment 4. An additional component of Revision R-3 was the transfer of 16 acres of mined ground from adjacent Narley Mine (Permit P-3850) to Narley Mine No. 3 for a total of 551 acres under Permit P-3990.

Purpose and Need for Action

Best Coal, Inc. can only recover leased federal coal from Permit P-3990 if the ASLM approves their mining plan. A decision whether to approve the mining plan is the federal action that requires an environmental analysis under NEPA. Acting in accordance with the MLA as directed by SMCRA, OSMRE is the agency responsible for recommending that the ASLM make a particular decision regarding the mining plan. The ASLM will decide whether to approve, disapprove, or approve with conditions the proposal to mine federally owned coal.

If the ASLM approves the mining plan, operations at the Narley Mine No. 3 would continue for about 6 more years as estimated in the R2P2. The need for federal action is to allow Best Coal, Inc. the opportunity to exercise its rights to extract federal coal as granted under the MLA, federal coal lease ALES-55199, and ASMC-issued Permit P-3990.

Decisions to be Made

OSMRE will prepare a mining plan decision document (MPDD), as outlined in 30 CFR 746.13, and make a recommendation to the ASLM in compliance with federal laws, regulations, and executive orders and with consideration of the environmental consequences of the proposal for mining federal coal. OSMRE will make the following decisions based on information documented in this EA:

- Whether the proposed activities and alternatives are responsive to the issues raised from other involved agencies and the public while meeting the purpose and need for coal extraction and reclamation operations.
- Which action alternative to recommend for approval and implementation.
- Whether the information in the mining permit application and in this assessment support avoidance and minimization of environmental impacts under NEPA.
- Whether the analysis of effects on the human environment supports a FONSI, and therefore does not require analysis through an EIS (40 CFR 1508.13).

Regulatory Framework

The following laws, as amended, establish the primary authorities, responsibilities, and requirements for developing federal coal resources:

- Mineral Leasing Act of 1920
- National Historic Preservation Act of 1966
- National Environmental Policy Act of 1969

- Clean Air Act of 1970
- Clean Water Act of 1972
- Endangered Species Act of 1973
- Surface Mining Control and Reclamation Act of 1977

SMCRA provides the legal framework for the federal government to regulate coal mining by balancing the need for continued domestic coal production with protection of the environment and society, while also ensuring the mined land returns to beneficial use when mining is complete. OSMRE implements its responsibilities for the MLA and SMCRA under regulations at CFR Title 30 Mineral Resources, Chapter VII OSMRE, Department of the Interior, Subchapters A-T, Parts 700-955.

SMCRA initially gave OSMRE primary responsibility for regulating surface coal mining operations in the United States. Section 503 of SMCRA (30 U.S.C. 1253) outlines the process by which the State of Alabama developed, and the Secretary of the Interior approved, that state's permanent regulatory program which authorizes ASMC to regulate surface coal mining operations on private and state lands within Alabama. Section 523 of SMCRA (30 U.S.C. 1273) allowed the State of Alabama to enter into a cooperative agreement with the Secretary of the Interior. By that agreement, ASMC regulates surface coal mining operations on federal lands within the state (30 CFR 901.30). OSMRE retains oversight responsibility of the state coal program and is the federal agency responsible for preparing and submitting a MPDD to the DOI ASLM.

Under the cooperative agreement, the ASMC is responsible for providing OSMRE with the federal coal leaseholder's permit application package (PAP). The PAP is to include any supporting information required by OSMRE such as the BLM-approved R2P2. On December 19, 2017, ASMC issued Best Coal, Inc. a permit to conduct coal-mining operations (Permit P-3990); however, mining disturbance on federal coal land cannot begin without ASLM approval of the mining plan.

Once a state that has a cooperative agreement issues a mining permit for federal lands, OSMRE prepares a MPDD supporting OSMRE's mining plan recommendation to the ASLM. That recommendation could take any of three forms: deny the mining plan, approve the mining plan, or approve the mining plan with conditions. OSMRE is to consider multiple factors under 30 CFR 746.13 when making its recommendation:

- The PAP, including the R2P2.
- Information prepared in compliance with NEPA, including this EA.
- Documentation assuring compliance with the applicable requirements of federal laws, regulations, and executive orders other than SMCRA.
- Comments, recommendations, or concurrence from other federal agencies and the public.
- Findings and recommendations of BLM with respect to the R2P2, federal lease requirements, and the MLA.
- Findings and recommendations of ASMC with respect to the permit application and the state program.

- Findings and recommendations of OSMRE regarding additional requirements of 30 CFR Chapter VII, Subchapter D.

Scoping and Outreach

BLM's Southeastern States Field Office held a public scoping period on the leasing EA from November 3 to 20, 2014, and another public scoping period on the supplemental EA from May 21 to June 21, 2018. As part of the NEPA process for the original EA, BLM conducted a public hearing on November 14, 2014, after advertising the meeting in the Federal Register (79 FR 65238) and in a local newspaper, *The Birmingham News* (on March 16, 23, and 30, 2016). The BLM received no comments at the public hearing or during the subsequent 30-day public comment period. BLM consulted with ASMC, DOI Fish and Wildlife Service (USFWS), Alabama Department of Conservation and Natural Resources (ADCNR), State of Alabama Historical Commission (AHC), USACE, and the Region 4 office of the U.S. Environmental Protection Agency (USEPA). Additionally, BLM sent scoping letters to 15 tribes. The two tribes that responded expressed no objection to the proposed lease sale but requested notification should the permittee discover any artifacts during construction or mining operations.

For its part, OSMRE provided public notice of the start of study for its EA through three avenues: (1) an announcement posted February 22, 2019, on the Regional Office's website <https://www.mcrcc.osmre.gov/programs/federal-lands.shtm>; (2) letters sent to government agencies, tribes, organizations, and individuals; and (3) a newspaper advertisement placed in *The Birmingham News*. Each of these three types of start-of-study notice solicited comments over a 30-day period. Responses consisted of an email from a tribe requesting the EA and cultural survey when completed, a letter from the Alabama Historical Commission concurring with the project but noting that a change in the scope of the work might require further consultation, and a phone call from USEPA Region 4 in which there was a general discussion of the federal lands permitting process and the roles played by BLM, the state, and OSMRE.

OSMRE released the EA and unsigned FONSI on the Regional Office's website on June 8, 2020, for a 30-day public comment period. Additionally, OSMRE gave public notice of availability and asked for comments through letters sent to government agencies, tribes, organizations, and individuals. The public comment period ended on July 8, 2020. One comment letter was received from an adjoining landowner in support of the project. A second comment letter was received from an environmental group, Black Warrior Riverkeeper, Inc. The letter expressed concern over the analysis of cumulative impacts of surface mining to water quality and federally listed aquatic species and critical habitat of Locust Fork and Trouble Creek (see Appendix A—Part I). A comment from USEPA was also received asking OSMRE to provide additional clarification on the USACE Section 404 permit, mitigation requirements, and downstream water quality (see Appendix A—Part II). OSMRE has provided a response to both comments regarding downstream water quality, which can be found in Appendix A—Part III. OSMRE has also added clarifying information on the USACE Section 404 permitting process and mitigation requirements to sections 3.4 and 4.4 of this EA. In a letter dated July 29, 2020, USFWS concurred with OSMRE's determination that the proposed action is not likely to adversely affect any of the 13 protected species that are known to occur in the project area watershed. This information has been added to section 4.6 of this EA.

Related Environmental Documents

As required by NEPA, an EA should be a concise public document which has three defined functions: (1) to briefly provide sufficient evidence and analysis for determining whether to prepare an EIS; (2) to aide an agency's compliance with NEPA as a decision making tool when no EIS is necessary, helping to identify better alternatives and mitigation measures; and (3) to facilitate the preparation of an EIS when one is necessary. Since the EA is a concise document, it should not contain long descriptions or detailed data that the agency may have gathered. Rather, it should contain a brief discussion of the need for the proposal, alternatives to the proposal, the environmental impacts of the proposed action and alternatives, and a list of agencies and persons consulted. To avoid undue length, the EA may incorporate by reference relevant background data and previous analyses to support its concise discussion of the proposal and relevant issues.

BLM prepared the *Narley Mine No. 3 Coal Lease Resource Management Plan Amendment, Land Use Analysis, and Environmental Assessment* in June 2014 (BLM, 2014) and a supplement environmental assessment in June 2018 (BLM, 2018). BLM's EA and supplemental EA evaluated the environmental, social, and economic impacts of offering the coal mineral rights of the approximately 160-acre tract of federal coal. This OSMRE EA incorporates by reference these BLM EAs where indicated.

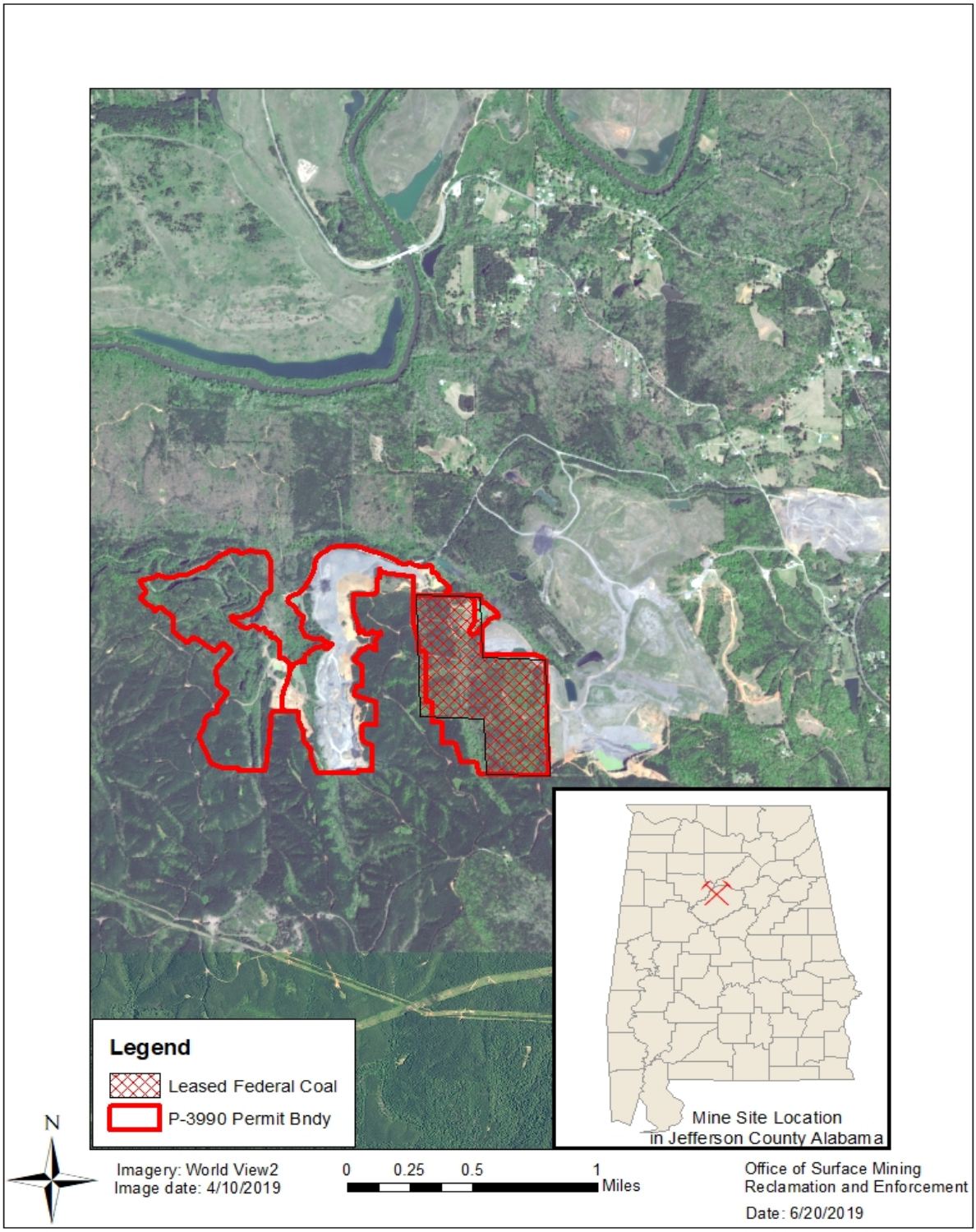

Figure 1.1. Narley Mine No. 3.

Chapter 2. Proposed Action and Appropriate Alternatives

Introduction

Under the requirements of NEPA, an EA must evaluate the environmental impacts of a proposed project and consider environmental impacts from a reasonable range of alternatives to that project. The DOI's NEPA implementing regulations define reasonable alternatives as those that are "technically and economically practical or feasible and meet the purpose and need of the proposed action" (43 CFR 46.420).

The 2014 BLM leasing EA identifies alternatives considered but eliminated from detailed analysis, describes the current operations, and addresses the continuation of activities under the proposed action and under the no-action alternative. This section of the OSMRE EA gives the no-action alternative and describes the proposed-action alternative as it relates to OSMRE's assessment of the environmental impacts that might result from the approval or disapproval of the proposed mining plan for the leased federal coal.

Alternative Analysis

Alternative 1: Recommend Disapproval of the Permittee's Proposed Mining Plan

Both BLM and OSMRE use the term *no action* in a way that would produce a similar result— an alternative to the project proponent's (Best Coal's) concept to mine federal coal.

Alternative 1—the no-action alternative in this EA—considers the potential environmental and economic consequences of not mining the federally owned coal. The assumption here is that Best Coal, Inc. would continue to mine the privately-owned coal reserves adjoining the proposed project area in accordance with ASMC-issued Permit P-3990. Coal production at Narley Mine No. 3 would end once private coal reserves under the existing permit are recovered. Under the no-action alternative, there would be no new surface disturbance, removal of coal, or other impacts associated with the state-approved mining plan. Current uses of the land would likely continue. Site conditions such as vegetation composition, soil properties, and surface drainage patterns could change over time but not because of mining disturbance.

The no-action alternative provides a useful baseline for comparison of environmental effects (including cumulative effects) and demonstrates the consequences of not meeting the need for action. Under the no-action alternative, OSMRE would recommend that the ASLM not approve the permittee's proposed mining plan. Without ASLM's approval, Best Coal, Inc. could not recover the leased federal coal reserves within ASMC Permit P-3990. That federally owned coal would likely be rendered non-recoverable for the foreseeable future because it would be a relatively small area of coal-bearing ground surrounded by mined-out private coal and, as such, its economic value would be diminished.

Alternative 2: Recommend Approval of the Permittee's Proposed Mining Plan

Chapter II of the 2014 BLM leasing EA uses the term *proposed action* in a way that essentially corresponds to what OSMRE would consider to be alternative 2. In their 2014 EA, BLM logically linked the proposed action (which, for BLM was a decision to lease the federal coal) to the subsequent environmental effects of the approval or disapproval of mining that coal in the manner proposed by the lease applicant. That BLM decision was the federal action that triggered their NEPA analysis. For OSMRE, a decision by the ASLM whether to approve the mining plan is the federal action that triggers the need for our environmental analysis under NEPA. OSMRE is the agency responsible for recommending that the ASLM make a particular decision regarding the mining plan.

Alternative 2—the proposed-action alternative in this EA—would have OSMRE recommend that the ASLM approve the mining plan as presented by the project proponent. Approval would allow the surface mining of federal coal from lease ALES-55199 using truck-and-shovel methods. Recovery of federal coal would take place as authorized under ASMC Permit P-3990, as allowed by the approved R2P2 from BLM, and in compliance with lease stipulations of ALES-55199 thereby maximizing the economic value of the federally owned mineral.

This alternative covers operations for which a complete PAP was submitted, unless otherwise indicated. ASMC will review and act upon requested permitting actions involving federal lands in accordance with the state-federal cooperative agreement. OSMRE is responsible for determining whether a permitting action constitutes a mining plan modification. Criteria for making that determination are found in 30 CFR 746.18(d). A mining plan modification requires a decision by ASLM and may require additional NEPA analysis.

Activities covered under the approved permit revision shall not commence until OSMRE determines that the permit revision does not constitute a mining plan modification or, if the permit revision does constitute a mining plan modification, such modification has been subject to NEPA analysis and approved by the ASLM.

Alternatives Considered but Eliminated from Detailed Analysis

Another alternative would have OSMRE recommend that the ASLM approve the mining plan with conditions. By this alternative, the ASLM could add conditions that would be in addition to those of the approved SMCRA permit, the R2P2, the federal coal lease, and the standard conditions applied to each mining plan approval. OSMRE and BLM have not identified any additional conditions to the mining plan approval; therefore, this alternative is not discussed in the following assessment.

Only the alternatives to approve or disapprove the mining plan to recover leased federal coal by surface mining methods were considered in both this and the BLM environmental analyses. Underground mining was not examined as a viable alternative. One of the coal seams was mined by underground methods in the past; however, the remaining federal coal seams are too thin and too limited in aerial extent to be economically recovered by underground methods.

Environmental Impacts of the Proposed-Action and No-Action Alternatives

OSMRE evaluated the impacts of the proposed project under two alternatives to gain an informed recommendation for the ASLM. The no-action alternative (alternative 1) recommends disapproval of the mining plan. Disapproval would be inconsistent with federal coal lease ALES-55199 and would deny mining as proposed in the ASMC-issued Permit P-3990. There would be no additional direct impacts to the environment in the project area associated with the no-action alternative, but the economic benefits of mining the federal coal would be lost.

The proposed-action alternative (alternative 2) recommends approval of the mining plan as presented in the ASMC-issued Permit P-3990 and the BLM-approved R2P2. Alternative 2 would result in about 469,000 tons of federal coal being eligible for mining. OSMRE carries forward the proposed-action alternative as a reasonable alternative to evaluate the greatest extent of impact to resources within the proposed action area.

Chapter 3. Affected Environment

Introduction

This chapter summarizes the physical, biological, social, and economic environments of the proposed mining plan area. This chapter, where appropriate, incorporates by reference sections of Chapter III of the BLM leasing EA entitled *Narley Mine No. 3 Coal Lease Resource Management Plan Amendment, Land Use Analysis and Environmental Assessment,* dated June 2, 2014.

3.1 Physiography/Geology and Land Use

This section incorporates by reference information about the current land use and the physiographic and geologic setting presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the headings "General Description/Current Land Use" (p. 18) and "Physiography / Geology" (p. 19–20).

The project area is in the Warrior Coal Basin, the southernmost structural basin of the Appalachian Plateau. Rocks are sandstone, siltstone, shale, clay, and coal that were deposited during the Pennsylvanian Period and subsequently gently folded and faulted. Three beds of high-volatile bituminous coal—New Castle, Mary Lee, and Blue Creek—would be mined. Leased federal coal has an energy content of just over 15,000 British thermal units per pound on a moisture- and ash-free basis. Dominant landscape features of the 160-acre project area are steep-sided ridges, a ridge top, and a stream valley. Local relief—the vertical distance between the ridge top and the stream bottom—is about 200 feet.

Narley Mine No. 3 is in rural north central Alabama about 5 miles north of the Jefferson County community of Mt. Olive. Leased federal coal at the mine is in the SW 1/4 of the NW 1/4, the N 1/2 of the SW 1/4, and the SE 1/4 of the SW 1/4 of Section 24, Township 15 South, Range 4 West. The lease area is approximately 160 acres, with a project boundary of approximately 228 acres and a ground elevation of approximately 600 feet above mean sea level. The entire surface of Permit P-3990 is privately owned. Best Coal, Inc. leases private lands adjacent to the federal lease area and mines those lands under ASMC Permit P-3850 (Narley Mine).

Current land use both within the federal lease area and surrounding privately leased property is unmanaged timberland (categorized as *undeveloped/no current land use*). Alabama designates a land use based on a specific use or management-related activities rather than vegetation cover. Land classified as *undeveloped/no current land use* is, "land that is undeveloped or, if previously developed, land that has been allowed to return naturally to an undeveloped state or has been allowed to return to forest through natural succession" (Ala. Admin. Code 88-X-2A.06). The project area has been zoned by the Jefferson County Zoning Commission as I-3(S) surface mining district (Jefferson County Department of Land Planning and Development Services, 2015).

3.2 Soil Resources

The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) has mapped the soils within the proposed project area. A custom soil resources report obtained from the NRCS Web Soil Survey on April 10, 2019, named two soil map units within the proposed permit boundary: the *Montevallo-Nauvoo association* and the *Nauvoo fine sandy loam*.

Much of the soil, about 96 percent, has been mapped as the Montevallo-Nauvoo association. Soils are mapped as an association when there are two or more geographically associated soils and present or anticipated uses make it impractical or unnecessary to map them separately. The composition of the Montevallo-Nauvoo map unit is 45 percent Montevallo and 35 percent Nauvoo, with other similar soils making up the remaining 20 percent. Soils are interspersed within the delineated map unit. The Montevallo-Nauvoo association occurs on hill sides having 6 to 45 percent slope. Weathered bedrock is 10 to 20 inches below the surface of the shallow Montevallo soil. Topsoil and subsoil have a large amount of thin flat rock fragments. This soil has a low base saturation and capability is limited to grazing, woodland, and wildlife land uses. Erosion potential is high when left unprotected due to steep slopes and a silt-loam surface texture.

About 4 percent of the proposed project area has been mapped as *Nauvoo fine sandy loam*. The Nauvoo fine sandy loam soil, with weathered bedrock about 40 inches below the surface, is deeper than the Montevallo. Nauvoo soil is found on slopes of 8 to 15 percent. This soil has an argillic clay-loam horizon that is absent in the Montevallo soil. The capability of this soil is such that the choice of plants is limited, and very careful management is required to achieve successful reclamation. Erosion potential is moderate to high, given the slope and surface texture.

Neither Nauvoo nor Montevallo soil is classified as prime farmland. These soils have very severe limitations in terms of capability due to features such as shallow soil, steep slopes and susceptibility to erosion. As described in section 3.1, the current land use for the project area is undeveloped/no current use. The soils adjacent to the project area either have been previously disturbed or are currently being disturbed from other coal mining operations. Soils have also been disturbed by logging and recreation activities.

3.3 Surface and Groundwater Resources

This section incorporates by reference information about water resources that is contained in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the heading "Water Quality, Ground and Surface" (p. 29–35).

Groundwater in the Warrior Basin mostly occurs in, and moves through, fractures and openings along bedding planes. Local aquifers tend to be sandstone, but sandy shale might form water-bearing bodies too. In either case, local aquifers above the deepest coal to be mined are not continuous over the project area and may be perched on beds of impervious shale. Sandstone below the Blue Creek seam is probably a more viable local aquifer. According to the BLM

leasing EA, three residences, presumably relying on groundwater, are within a half mile of the project area. Groundwater at Narley Mine No. 3 has lower pH, higher level of mineralization, and higher concentrations of sulfate than water produced regionally from similar rocks of the Pottsville Formation.

Mining the project area will destroy any local water-bearing bodies of rock above the lowest coal bed to be recovered. Given the apparent limited potential of undisturbed overburden in the project area to function as an aquifer in any but a hit-or-miss fashion, surface mining the leased federal coal would not greatly affect the quantity or quality of shallow groundwater in surrounding undisturbed areas.

Surface runoff from the project area flows into Locust Fork by way of Trouble Creek. Locust Fork, a perennial tributary of the Black Warrior River, is suitable for use by wildlife, for fishing, and for propagation of fish and other aquatic life but not suitable for drinking or food processing. Surface mining can foul streams with sediment. However, multiple constructed sediment basins will intercept and contain sediment that would be washed off the project area should it be mined.

In addition to the information provided in BLM's leasing EA, OSMRE performed the following supplemental quantitative analysis of some of the water-monitoring data that are relevant to the proposed plan to recover leased federal coal from Narley Mine No. 3.

Narley Mine No. 3 is not an isolated coal mine. Two other Best Coal, Inc. operations are close by—Narley Mine (Permit P-3850) on the other side of Trouble Creek to the northeast and Jagger Mine (Permit P-3932) to the north between Trouble Creek and Locust Fork. Excavation has not yet started at Jagger Mine, but coal recovery from Narley Mine is essentially complete and most of the permit area has been graded and vegetated. At Narley Mine No. 3, most of the private coal beneath about 70 percent of the 551-acre Permit P-3990 has been recovered.

Table 3.1. Stream water-monitoring stations and their respective monitoring periods with counts of sampling events.

Station	Monitoring Period	Count
BCNMSW-1	JUL 2003–DEC 2018	68
BCNMSW-2	JUL 2003–DEC 2018	68
BCN3SW-3	OCT 2009–OCT 2018[1]	9
BCJMSW-5	MAR 2014–OCT 2018	20

[1]No monitoring between March 2010 and March 2018.

Table 3.2. Groundwater-monitoring stations and their respective monitoring periods with counts of sampling events.

Station	Monitoring Period	Count
BCNMMW-1	JUL 2003–NOV 2018	66
BCNMMW-2	JUL 2003–NOV 2018	65

Multiple water-monitoring stations (stream water and groundwater) are associated with the permits for Narley Mine, Jagger Mine, and Narley Mine No. 3. A number of these stations were only monitored for a brief period from late 2009 to early 2010. Six stations with the most extensive water monitoring records were selected for this quantitative analysis (Fig. 3.1). Tables 3.1 and 3.2 list the six stations and give their respective monitoring periods and counts of sampling events. A sampling event is a visit to a monitoring station with the intent to take measurements and collect water for laboratory testing. Not all sampling events produced water samples. This would be the case, for example, when a stream was not flowing at the time of a sampling event.

Trouble Creek, a tributary of Locust Fork, receives surface runoff from all or some portion of the three adjacent permit areas. Narley Mine No. 3 station BCN3SW-3 is the furthest upstream monitoring point on Trouble Creek. The furthest downstream station on Trouble Creek is BCJMSW-5. Station BCJMSW-5 was established for Jagger Mine but its exact location on Trouble Creek is in question. The point where BCJMSW-5 is marked on the Hydro-Geo Map and the Hydrogeologic Monitoring Map in Permit P-3990 would put it about 0.4 stream mile from the confluence with Locust Fork. However, federal and state participants attending a mine site visit on March 26, 2019, saw the field location of BCJMSW-5 to be within about 50 feet of Locust Fork in that larger stream's backwater. Orange flagging with "BCJMSW-5" written on it marked the sampling station; similar flagging, but labeled "BCNM3SW-3," was observed at the upstream Trouble Creek station that day. Unlike station BCJMSW-5, the BCN3SW-3 mapped location matched the field location.

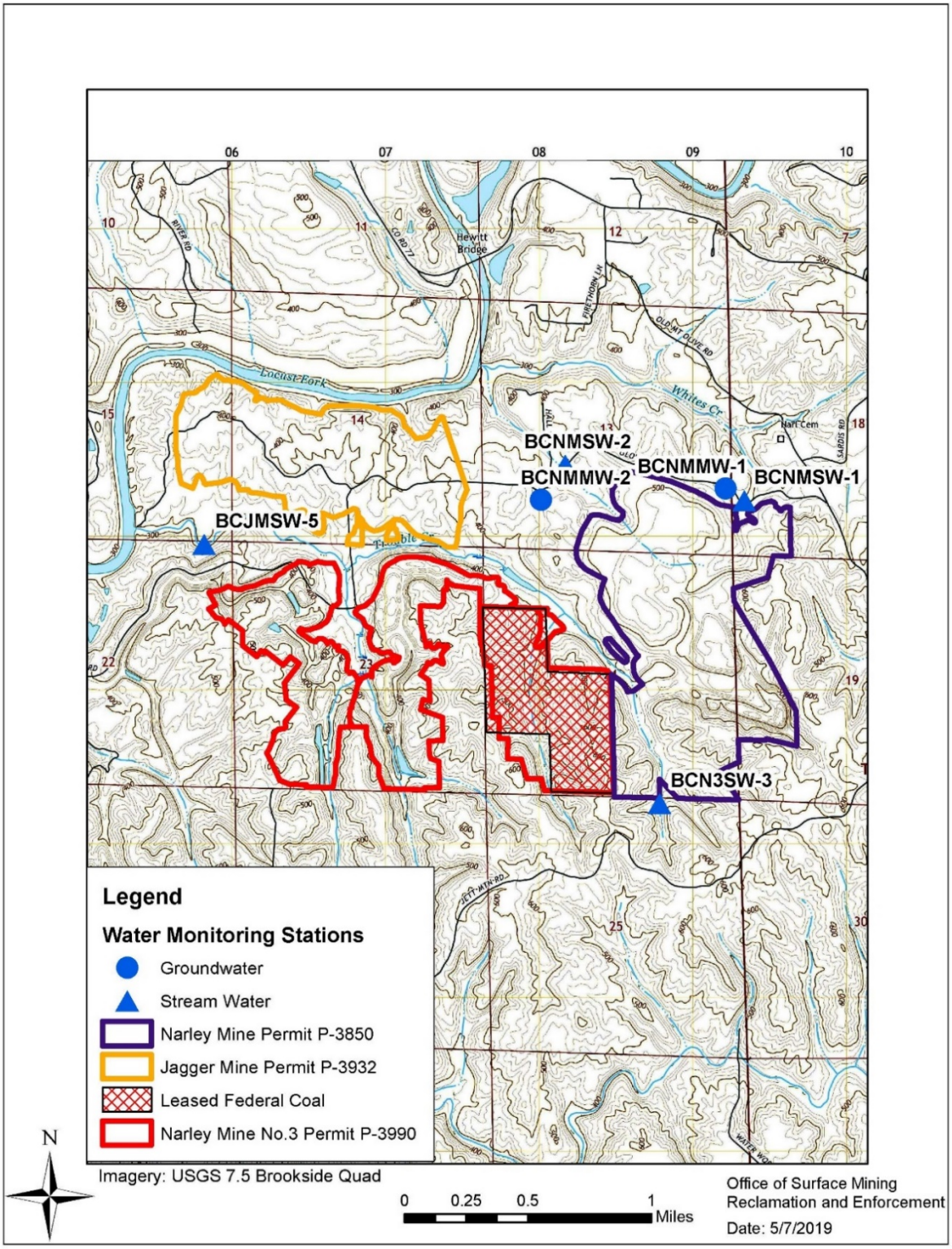

Figure 3.1. Monitoring stations for stream water and groundwater near Narley Mine No. 3.

Among the three Best Coal, Inc. mines considered in this EA, the longest-term water-monitoring records are for a pair of stream stations (BCNMSW-1 and BCNMSW-2) and a pair of wells (BCNMMW-1 and BCNMMW-2) associated with Narley Mine. Runoff from the northern part of Narley Mine passes through BCNMSW-1 and BCNMSW-2, which are on water courses flowing into Whites Creek. Whites Creek is a tributary of Locust Fork and its confluence is about 2.2 stream miles above where Trouble Creek joins Locust Fork.

Monitoring wells BCNMMW-1 and BCNMMW-2 are open-hole completions to a depth of 40 feet. Both wells are on the up-dip side of Narley Mine. Only BCNMMW-2 penetrates a coal bed. It is located to the northwest of Narley Mine near residential wells. BLM's leasing EA gives the general direction of groundwater flow as south-southeast based on water levels in three monitoring wells installed for Narley Mine No. 3. Those wells varied in depth from 48 feet to 320 feet, and each was an open-hole completion. If the calculated groundwater flow direction is correct, then the two Narley Mine monitoring wells would be upgradient from mine disturbance.

Narley Mine qualifies as a surrogate for predicting how mining leased federal coal at Narley Mine No. 3 might affect local water resources. Best Coal, Inc. recovered coal of the Mary Lee Group from Narley Mine using the same surface mining methods and equipment that this company has been using at adjacent Narley Mine No. 3 and would use to recover leased federal coal from Permit P-3990. Both sites have similar topography developed on similar underlying geology. Local geology controls overburden chemistry and the extent and distribution of water-bearing zones. Adjacent permit areas have been, and will continue to be, subject to the same weather conditions.

Table 3.3 is a summary of flow-rate data and water quality characteristics of Trouble Creek. Monitoring periods for upstream station BCN3SW-3 and downstream station BCJMSW-5 are different (Table 3.1). Concurrent sampling events only occurred April to November in 2018. Furthermore, four of those sampling events at the upstream station were reported as no flow. This lack of contemporaneous data makes meaningful comparisons between upstream and downstream conditions difficult.

Water data for station BCN3SW-3 represent the chemistry of Trouble Creek unaffected by surface mining. Moving downstream from BCN3SW-3, the volumetric flow of Trouble Creek increases because the area of surface runoff increases in that direction. Some of that increasing runoff is from land already affected by abandoned unreclaimed mine ground, permitted operations at Narley Mine, and ongoing recovery of private coal at Narley Mine No. 3. Other than conductivity, prevailing quality of Trouble Creek water does not show a strong influence from mining.

Stream stations BCN3SW-3 and BCJMSW-5 will be regularly monitored during mining and reclamation operations at Narley Mine No. 3. Permit P-3990 requires quarterly monitoring for

flow rate, pH, total suspended solids, total iron, and total manganese. In addition, Trouble Creek water, as sampled from upstream and downstream stations, is to be tested twice each year for aluminum, antimony, arsenic, beryllium, cadmium, chromium, copper, mercury, nickel, selenium, silver, thallium, and zinc. Water quality variables sulfate, acidity, and alkalinity for a time had been measured in BCN3SW-3 samples, but these variables are not included in the long-term monitoring program for Trouble Creek.

Table 3.3. Summary data for two stream stations on Trouble Creek.

[N, number of samples; mg/L, milligrams per liter; ft^3/s, cubic feet per second; mmhos/cm, millimhos per centimeter]

	BCN3SW-3 (upstream)			**BCJMSW-5 (downstream)**		
Parameter	N	*Range*	*Median*	N	*Range*	*Median*
Flow (ft^3/s)	9	0–0.38	0.2	20	0.01–30.6	1.4
Total Suspended Solids (mg/L)	6	2.0–9.0	5.0	20	1.0–6.0	3.0
pH (standard units)	6	6.8–7.7	7.2	20	6.4–8.1	7.5
Conductivity (mmhos/cm)	6	38–62	44	20	433–3217	2252
Total Iron (mg/L)	6	0.23–0.61	0.38	20	0.05–0.48	0.12
Total Manganese (mg/L)	6	0.01–0.09	0.02	20	0.01–1.04	0.05
Sulfate (mg/L)	5	1.0–9.0	7.0	0		
Acidity (mg $CaCO_3$/L)	5	6.0–8.0	6.0	0		
Alkalinity (mg $CaCO_3$/L)	5	8.0–70.0	12.0	0		

Existing groundwater conditions for Permit P-3990 are discussed in the BLM leasing EA, which has been incorporated by reference. Best Coal, Inc. had six monitoring wells installed in 2009 for their application for Permit P-3990. However, there were only four or, in the case of one well, three sampling events per well. These sampling events occurred over a brief period starting in the fourth quarter 2009 and running through the first quarter of 2010. Approved Permit P-3990 states that the permittee will request a groundwater monitoring waiver based on two considerations: (1) the permittee believes that the nearest private wells are upgradient from Narley Mine No. 3 and (2) local groundwater has already been affected by historic mining around Permit P-3990.

As stated above, Narley Mine qualifies as a surrogate for Narley Mine No. 3 in terms of how mining leased federal coal from this newer operation might affect local water resources. Table 3.4 shows stream-water conditions at two monitoring stations in the Whites Creek drainage basin. These stations have received runoff from part of Permit P-3850 for many years.

Table 3.4. Summary data for two stream stations on tributaries to Whites Creek.

[N, number of samples; mg/L, milligrams per liter; ft^3/s, cubic feet per second; mmhos/cm, millimhos per centimeter]

	BCNMSW-1			**BCNMSW-2**		
Parameter	N	*Range*	*Median*	N	*Range*	*Median*
Flow (ft^3/s)	68	0–64.1	0.06	68	0–1.8	0.03
Total Suspended Solids (mg/L)	59	0.1–223.0	8.0	51	0.01–56.0	5.0
pH (standard units)	59	6.3–8.4	7.1	51	6.1–8.5	6.7
Conductivity (mmhos/cm)	59	7–7260	699	51	112–1317	765
Total Iron (mg/L)	59	0.06–7.04	1.47	51	0.08–27.0	1.62
Total Manganese (mg/L)	58	0.02–3.36	0.78	51	0.13–20.6	2.07

Table 3.5 gives groundwater levels and chemistry for two monitoring wells up-dip from Permit P-3850. This table summarizes measurements taken over a 15-year period. Groundwater here tends to be more acidic than stream water but with a lower conductivity.

Table 3.5. Summary data for monitoring wells at Narley Mine, Permit P-3850.

[N, number of samples; msl, mean sea level; mg/L, milligrams per liter; mmhos/cm, millimhos per centimeter]

	BCNMMW-1			**BCNMMW-2**		
Parameter	N	*Range*	*Median*	N	*Range*	*Median*
Water Level (feet above msl)	66	270.3–418.6	406.1	65	407.5–418.1	412.7
pH (standard units)	66	4.7–8.7	6.5	65	4.9–8.5	6.3
Conductivity (mmhos/cm)	66	38–1524	466	65	116–1212	229
Total Iron (mg/L)	66	0.06–48.08	4.12	65	0.04–24.15	0.76
Total Manganese (mg/L)	66	0.01–3.70	0.56	65	0.01–2.79	0.13

3.4 Wetlands, Floodplains, and Streams

This section incorporates by reference information about wetlands and floodplains that is contained in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the heading "Wetlands and Floodplains" (p. 35–36).

This section also incorporates material from Appendix I and Appendix II, "Report 8—U.S. Army Corps of Engineers Nationwide Permit 21 Compensatory Mitigation Plan."

The project area, as described in the 2014 leasing EA, had a small, one hundredth of an acre wetland. That small wetland was eliminated by the construction of sediment pond 002 for the adjacent Narley Mine; however, the loss would be compensated for under an approved mitigation plan associated with a valid USACE permit.

The USACE previously made a jurisdictional determination regarding water bodies in the project area and the permittee obtained a Nationwide Permit (NWP) 21; however, the jurisdictional determination expired in 2018 and the NWP expired in 2017. More recently the USACE made a jurisdictional determination that no permit is needed for Increment 3. Increment 4 was not analyzed in that determination even though it contains a stream that the USACE previously considered jurisdictional. As a condition on their state-approved mining permit, the permittee

must obtain a Clean Water Act (CWA) Section 404 individual permit from the USACE before disturbing any jurisdictional waters in the Increment 4 project area.

The BLM leasing EA states that the project is not within a floodplain. To clarify, the project area is not in a 100-year floodplain. Watercourses consist of several thousand linear feet of intermittent and ephemeral streams. The main intermittent stream channel which bisects the project area has a floodplain. That floodplain is classified by the Federal Emergency Management Agency (FEMA) as an area with minimal flood hazard because it is outside areas identified as a Special Flood Hazard Area and is at a higher elevation than the 500-year flood zone.

According to ASMC coal mining regulations, the stream that bisects the area of leased federal coal would not be classified as intermittent. Those regulations define the term *intermittent stream* to mean a stream or reach of a stream that is below the local water table for at least some part of the year, obtains its flow from both surface runoff and groundwater discharge, and drains a watershed of at least one square mile or greater. This stream has a drainage area of about 0.4 square mile; therefore, it does not have a 100-foot-wide stream buffer. However, because the USACE considers the stream to be a jurisdictional water that is intermittent, any impacts to it will have to be mitigated under a CWA Section 404 permit. This stream will be treated as if it warrants a 100-foot buffer under SMCRA.

3.5 Air Quality

This section of the EA contains various estimates of emissions to the atmosphere that would be directly and indirectly related to mining operations on Permit P-3990. Emission estimates are given under two categories—non-greenhouse gasses and greenhouse gasses. Both categories consider emission sources incidental to the coal production, including truck and rail coal transport and coal combustion. Calculations show that coal combustion would likely account for more air pollutants and greenhouse gases than would come from the actual mining operation.

Non-Greenhouse Gases

The USEPA established National Ambient Air Quality Standards (NAAQS) in 1971. The ADEM has an air quality monitoring system designed to determine whether areas of the state meet NAAQS. Air quality planning classifies an area with the terms *attainment* or *nonattainment*. Nonattainment refers to those areas that do not presently meet the national air quality standards. Jefferson County has not had a nonattainment year since 2012, when the issue was particulate matter 2.5 micrometers in diameter and smaller (U.S. Environmental Protection Agency [USEPA], 2019a).

Greenhouse Gases

Weather is the state of the atmosphere at any given time. Climate is the compilation of all statistical weather conditions that help describe a place or region. Current climate is the average of conditions for the past 30 years.

The climate of Alabama is characterized by very hot summers and mild winters, with high precipitation levels throughout the year. Thunderstorms are common year-round but are most severe during the spring. Destructive winds and tornadoes frequently occur in the spring and fall months, particularly in the northern and central parts of the state. Alabama is also prone to tropical storms and hurricanes. The annual average temperature ranges from approximately 60 degrees Fahrenheit (°F) along most of the northern border to over 68°F in the southwestern part of the state. Annual average precipitation ranges from about 52 to 64 inches. From 1950 to 2019 in Jefferson County, the maximum yearly temperature was 77.1°F. The minimum yearly temperature was 46.6°F, with an average yearly temperature falling between 58.6°F and 65.4°F (National Oceanic and Atmospheric Administration [NOAA], 2020). During the same period, yearly precipitation ranged from 30.47 to 79.33 inches, with an average of 55.69 inches (NOAA, 2020).

Global warming refers to the ongoing rise in global average temperature near the Earth's surface. Certain atmospheric gas (greenhouse gas, or GHG) can trap and hold heat in the atmosphere by absorbing infrared radiation. Absorbed infrared radiation is heat that otherwise would be emitted into space. Increasing concentrations of GHGs (primarily carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O], and fluorinated gases) in the atmosphere is the primary cause of global warming, and it is changing global climate patterns. Climate change refers to any significant change in the measures of climate (for example, temperature, precipitation, and wind patterns) lasting for an extended period (USEPA, 2017b). Fossil fuels burned to operate vehicles and to power industrial processes are a primary producer of GHGs. Mined coal itself can be an additional source of GHG.

The Global Change Research Act of 1990 mandates that the U.S. Global Change Research Program (USGCRP) deliver a report to Congress and the president every four years that analyzes the effects of global climate change on the natural environment and other systems, as well as provides current trends in global climate change. The recently released second volume of the Fourth National Climate Assessment focuses on the human welfare, societal, and environmental elements of climate change and variability for ten regions of the United States (USGCRP, 2018).Global climate is changing rapidly compared to the pace of natural climate variations that have occurred throughout Earth's history. Evidence for these changes consistently points to human activities, especially emission of GHGs, as the dominant cause. Global average temperature has increased by approximately 1.8°F from 1901 to 2016. Without significant emission reductions, annual average global temperatures could increase by 9°F or more by the end of this century (compared to preindustrial temperatures) (Hayhoe et al., 2018).

Uneven warming has been observed in the Southeast region (consisting of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia) since the mid-20century, with average daily minimum temperatures increasing three times faster than average daily maximum temperatures. Climate model projections indicate increases in both temperature and extreme precipitation (Carter et al., 2018). This warming is predicted to occur along with more and longer summer heat waves (with maximum daytime temperatures above 100°F becoming commonplace), putting cities with high population densities at risk of impacts from poor air quality and vector-borne diseases. Rural communities and agricultural systems are increasingly vulnerable to the effects of rising temperatures, water stress,

freeze-free days, drought, and wildfire risks. Predicted increases in the number and severity of extreme rainfall events (events with greater than three inches per day) and coastal flooding poses risks to the region's businesses, neighborhoods, infrastructure, and transportation, as well as the ecological resources that people depend on for their livelihoods and protection (Carter et al., 2018).

Carbon dioxide is the primary GHG emitted through human activities that contributes to climate change (81% of total U.S. GHG emissions in 2016); it is followed by CH_4 (10% of total 2016 emissions), N_2O (6% of total 2016 emissions), and fluorinated gases (3% of total 2016 emissions) (USEPA, 2018c). The combustion of fossil fuels for electricity, heat, and transportation is the main human activity contributing to the emission of CO_2 (USEPA, 2018d). Methane, which is created during coal formation, is released from coal after it has been uncovered during surface mining operations. In addition, minor amounts of CH_4 are released during coal extraction, storing, loading, and transport. Methane is also released during postmining operations as the coal is processed, transported, and stored for use. Methane is emitted from the production and transport of natural gas and oil, as well as from livestock, other agricultural practices, and the decay of organic waste in municipal solid waste landfills (USEPA, 2018c). Nitrous oxide is emitted from agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste. Fluorinated gases, which are synthetic, are emitted from a variety of industrial processes (USEPA, 2018c).

The global warming potential (GWP) of gases was developed to allow comparisons of global warming impacts between different gases. The GWP of a gas depends on how well the gas absorbs energy and how long the gas stays in the atmosphere. It is a measure of the total energy that a gas absorbs over a period (usually 100 years) compared with CO_2, which has a GWP of 1. The larger the GWP, the more warming the gas causes. Methane, for example, has a 100-year GWP estimated to be 28 to 36, meaning CH_4 will cause 28 to 36 times as much warming as an equivalent mass of CO_2 over a 100-year time period (USEPA, 2017c). The GWP for N_2O is estimated to be 265 to 298.

The term *carbon dioxide equivalent* (CO_2e) is used to describe different GHGs in a common unit. For any quantity and type of GHG, CO_2e represents the amount of CO_2 that would have the equivalent global warming impact (Brander, 2012). Surface coal mines in the United States reported CH_4 emissions of 7.2 million metric tons (MT) CO_2e in 2017. That amount would be out of a total of 55.7 million MT of CO_2e emissions from all coal mining and 6,456.7 million MT of CO_2e emissions from all sources across the country (USEPA, 2019c). These surface coal mine emissions represent 13% of all coal mining CO_2e emissions and 0.1% of all CO_2e emissions in the United States for 2017.

The EPA's Mandatory Greenhouse Gas Reporting rule requires industrial facilities and suppliers of fossil fuels or industrial gases that result in greater than 25,000 MT of CO_2e of GHG emissions per year to report their emissions. Table 3.6 lists the industry sector, number of reporting facilities, and total GHG emissions for the United States and the state of Alabama for reporting year 2018 from EPA's Facility Level Information on Greenhouse Gases tool (FLIGHT) (USEPA, 2019b). These data are useful to understand which large sources of anthropogenic emissions are contributing to GHG emissions both at the national and state levels.

Table 3.6. 2018 Greenhouse gas emissions by sector.

Industry Sector	Number of Reporting Facilities (US)	Number of Reporting Facilities (AL)	US-Reported GHG Emissions (MMT CO_2e)	AL-Reported GHG Emissions (MMT CO_2e)	Global Anthropogenic GHG Emissions (MMT CO_2e)
Power plants	1,389	24	1,815	57	-
Petroleum and natural gas systems	2,319	38	316	2.5	-
Refineries	140	3	181	1.1	-
Chemicals	457	15	191	2.8	-
Other	1,316	17	130	5.1	-
Minerals	383	18	116	7.4	-
Waste	1,498	46	109	4.3	-
Metals	304	23	94	4	-
Pulp and paper	218	14	36	3	-
Total[1]	**7,655**	**182**	**2,987**	**87**	**49,000**[2]

[1]Total reporters shown may be less than the sum of the number of reporters in the selected source categories because some facilities fall within more than one source category.
[2]Intergovernmental Panel on Climate Change (IPCC) (2014).

Further insight into trends in GHG emissions in the state of Alabama can be seen in Figure 3.2. FLIGHT data from 2011 through 2018 shows variation in GHG emissions year over year, with an overall 22% decrease in emissions in the state of Alabama from 2011 through 2018 (USEPA, 2019b).

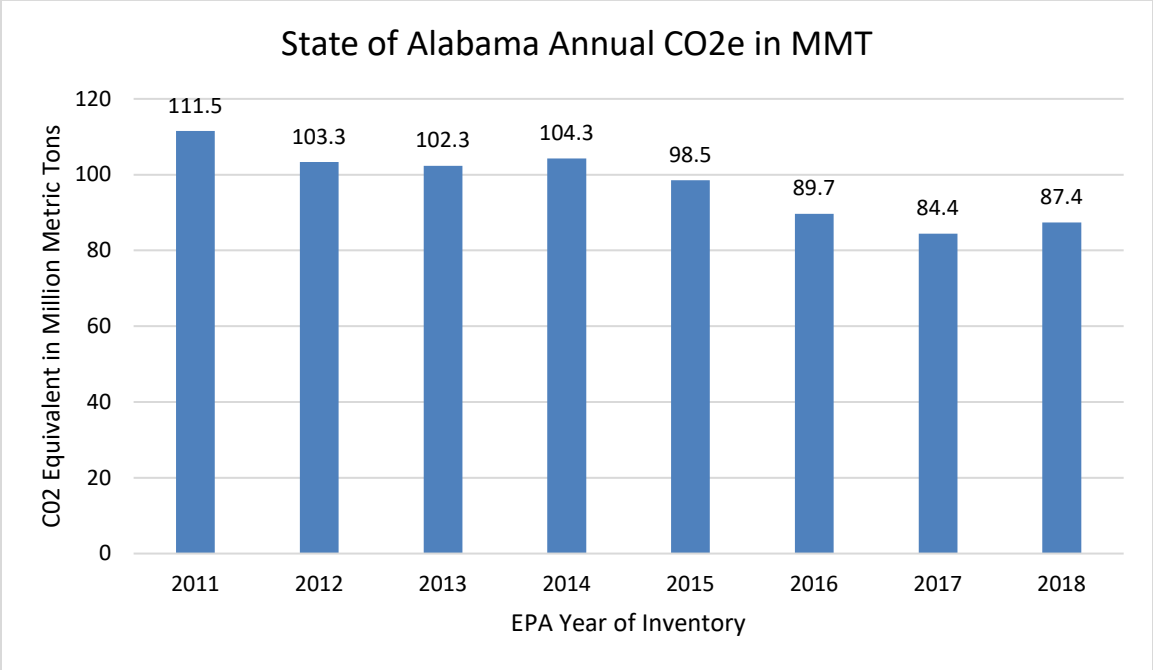

Figure 3.2. State of Alabama annual CO_2e in millions of metric tons (MMT).

Federal actions must be evaluated in accordance with NEPA and the CEQ Regulations Implementing the Procedural Provisions of NEPA. The CEQ issued final guidance to help federal agencies decide when and how to consider the effects of GHG emissions and climate

change in their evaluation of all proposed actions. In this guidance, CEQ recommended that agencies such as OSMRE should consider the following factors when addressing climate change:

1. Potential effects of a proposed action on climate change as indicated by its GHG emissions.
2. Environmental implications of climate change over the life of the proposed project.

An Executive Order signed on March 28, 2017, entitled "Promoting Energy Independence and Economic Growth" rescinded this CEQ guidance; however, GHG emissions are still viewed by OSMRE as an issue that must be analyzed for impacts because these emissions are tied to air quality impacts.

3.6 Biological Resources

This section incorporates by reference information about the wildlife and vegetation resources, and the threatened, endangered, and candidate species presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the headings "Wildlife and Vegetation" (p. 36–40) and "Threatened, Endangered, and Candidate Species" (p. 22–28).

This section also incorporates material from "Report 6—Biological Habitat Assessment" and "Report 9—Biological Habitat Assessment—Trouble Creek." In 2012 the permittee conducted a biological habitat assessment covering approximately 228 acres, 160 acres of which include the proposed federal coal project area (*see* Report 6). In 2013 the permittee conducted a separate biological habitat assessment on 17,240 linear feet of Trouble Creek, a named tributary to Locust Fork (*see* Report 9). These biological habitat assessment surveys focused on the general habitat, terrestrial and aquatic species, and the possible presence of any threatened, endangered, and candidate species listed in Jefferson County.

Vegetation Resources

Most of the proposed project area is undeveloped timberland and previously disturbed mined land consisting of steep slopes vegetated with pines, hardwoods, invasive species, grasses, annual and perennial herbs, and vines. Vegetation has been affected by previous human activity such as recreation, mining, and timber harvest.

A 2012 biological habitat survey of the mine site identified some 70 plant species (McGehee, 2012). The upland slope areas of the project area were harvested for commercially viable pine and hardwood timber approximately 15 years ago. A dense groundcover of sage and various grasses, weeds, vines, briars, and pine and hardwood seedlings developed after the removal of the overstory and understory. In the mostly undisturbed lower areas of the project area, vegetation includes pine and hardwood species. Overgrown, abandoned green fields on the permit site are vegetated with herbs, grasses, brambles, and young hardwoods.

Fish and Wildlife Resources

Existing wildlife habitat within the project area is primarily undeveloped woodlands as described in the previous section. Wooded areas within the permit boundary have a variety of tree and shrub species in differing age classes. These wooded areas are connectivity routes and travel matrices that can be used by resident and migratory animal species. In addition to providing landscape connectivity, these wooded corridors enhance wildlife habitat viability by providing cover, nesting, and brood habitat.

The variety of structure and species composition within the woodland areas and a lack of recent grazing enhance the wildlife habitat values of the site. Various game and nongame wildlife species would respond to the physical structure of the woodlands. Areas with larger diameter hard mast producing trees provide a physical structure required by canopy nesting songbirds, cavity nesting species, canopy foraging birds, and mast consuming wildlife such as wild turkey *(Meleagris gallopavo)* and white-tail deer *(Odocoileus virginianus)*.

The regrowth of small-diameter woody trees, shrubs, and vines provides foraging habitat for insect-gleaning birds, nesting habitat for shrubland bird species, and a dense understory and herbaceous layer preferred by small mammals, reptiles, and amphibians. The presence of roaming feral hogs, an introduced species with negative impacts on native wildlife species, observed in the 2012 biological habitat survey, lowers the potential value of the site's wildlife habitat (McGehee, 2012).

Surface runoff from the project area flows into Locust Fork by way of Trouble Creek. Locust Fork, a perennial tributary of the Black Warrior River, is suitable for use by wildlife, for fishing, and for propagation of fish and other aquatic life. The Trouble Creek biological habitat study found that a portion of the creek's downstream area was impounded by pre-law mining operations, and that most of the creek has been impacted by off-road vehicles, leading to an excessive amount of sedimentation (McGehee, 2013a).

Threatened and Endangered Species

USFWS lists 31 threatened or endangered species found in Jefferson County. These organisms are protected by the Endangered Species Act of 1973. The Alabama Department of Conservation and Natural Resources (ADCNR) also provided a list of 14 additional sensitive species from the Alabama Natural Heritage Inventory known to occur in Jefferson County. The USFWS Alabama Ecological Services Field Office also provided a list of 13 protected species that are known or expected to be on or near the project area.

On July 5, 2017, USFWS provided comments to the permittee stating that the project area contains suitable roosting habitat for both the Indiana bat and the northern long-eared bat (NLEB). USFWS also stated that no other federally listed or critical habitat species are known to occur in the project area.

A biological habitat assessment survey was conducted in the fall of 2012 on the proposed Narley Mine No. 3 project area to determine the presence or absence of any potential Indiana bat habitat

(McGehee, 2013b). The survey report yielded negative results for Indiana bat habitat. Potential summer roost habitat for the Indiana bat was not found to exist in the project area. No perennial waterways are on or adjacent to the project area, and there are no limestone caves or abandoned underground mines that would provide suitable winter hibernacula. The survey found no evidence for the presence or possible presence of the Indiana bat.

The Indiana bat and NLEB share similar life ecologies and habitat requirements with a few differentiating qualities. Compared to the Indiana bat, the NLEB's wintering habitat, summer roost, and maternity colony requirements are more generalized. Suitable hibernacula for the NLEB include underground caves and cave-like structures (for example, abandoned or active mines, railroad tunnels). The NLEB will roost and form maternity colonies in live, dead, dying or snag trees with a diameter at breast height of 3 inches or greater that exhibit any of the following characteristics: exfoliating bark, crevices, cavity, or cracks (USFWS, 2013). In Alabama, the NLEB is known from two hibernacula where typically they are observed in low numbers (1 to 20 individuals). Surveys conducted in 2008 found the NLEB to be common in late summer and early fall at known bat caves in Alabama (80 FR 17982, May 2, 2015).

The permittee conducted an acoustic bat survey within the project area during the summer of 2017 in order to determine the presence or absence of the Indiana bat or the NLEB. The survey did not detect either the Indiana bat or the NLEB. After reviewing the findings of the acoustic survey, USFWS concurred that the proposed project is not likely to adversely affect the Indiana bat or the NLEB. As a precautionary measure, Best Coal, Inc. will not conduct any tree removal on the project site outside the recommended timber harvesting timeframe of October 15 through March 31.

The Trouble Creek biological habitat study found that a portion of the creek's downstream area was impounded by pre-law mining operations and that most of the creek has been affected by off-road vehicles, leading to an excessive amount of sedimentation (McGehee, 2013a). These stream impairments likely contribute to the absence of critical habitat and the lack of any evidence for the presence or possible presence of any federally listed threatened or endangered species along Trouble Creek.3.7.

Cultural and Tribal Resources

This section incorporates by reference information about the cultural and tribal resources presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the headings "Cultural Resources" (p. 22) and "Native American Religious Concerns" (p. 22).

This section also incorporates material prepared by P.E. Lamoreaux & Associates, Inc. (PELA) that appears in Appendix II, "Report 1—PELA 2003 Phase I Cultural Resource Assessment," "Report 2—PELA 2009 Phase I Cultural Resource Assessment," and "Report 10—PELA 2012 Phase I Cultural Resource Assessment."

Historic and Cultural Resources

Public Law 102-575, the National Historic Preservation Act (NHPA), was enacted with the intent to preserve historical and archaeological sites in the United States. Section 106 of the NHPA requires any federal agency, having authority to license any undertaking, consider the effect of the undertaking on cultural resources that are included or eligible for inclusion in the National Register of Historic Places. Section 106 also requires that the Advisory Council on Historic Preservation (ACHP) be given opportunity to comment on the undertaking; this role is carried out by the State Historic Preservation Officer (SHPO) of state programs that have been approved by the Secretary of the Interior, in accordance with section 101 of the NHPA.

The proposed mine is in an area that has been historically mined for coal. A Phase I Cultural Resources Assessment was conducted by a consulting firm in April 2012 (*see* Report 10). The purpose of a Phase I study is to identify and record all cultural resources. Literature review and fieldwork were utilized to complete the survey. Cultural resource assessments were also conducted for those areas and are included in the BLM's EA as Reports 1 and 2. Report 10 references the other two reports and provides an overall assessment of the area.

The SHPO gave concurrence in 2017, and the concurrence letter is included in the PAP. The SHPO has previously concurred with mining projects on adjacent areas several times dating back to 2004, and those concurrence letters are included in Appendix 2 of the BLM's leasing EA.

Tribal Trust Resources

The U.S. government has a fiduciary obligation to uphold tribal rights and to protect tribal trust resources given to Native American tribes by various peace treaties. That obligation is mandated by case law, presidential executive orders, DOI policy, and OSMRE policy. The mandate is carried out through the consultation process whenever a federal undertaking has potential to impact tribal rights and trust resources, including ancestral rights and religious concerns.

The Poarch Band of Creek is the only federally recognized tribe in Alabama. Eighteen other tribes were identified during the scoping process as potentially having ancestral rights in Alabama: the Cherokee Nation, the Alabama-Quassarte Tribal Town, the United Keetoowah Band of Cherokee Indians in Oklahoma, the Jena Band of Choctaw Indians, the Choctaw Nation of Oklahoma, the Alabama-Coushatta Tribe of Texas, the Coushatta Tribe of Louisiana, the Eastern Band of Cherokee Indians, the Chickasaw Nation, the Mississippi Band of Choctaw Indians, the Muscogee (Creek) Nation, the Absentee-Shawnee Tribe of Indians of Oklahoma, the Eastern Shawnee Tribe of Oklahoma, Thlopthlocco Tribal Town, the Seminole Tribe of Florida, the Shawnee Tribe, the Kialegee Tribal Town, and the Seminole Nation of Oklahoma. These tribes were identified using information from the Bureau of Indian Affairs website and from researching tribes with known or suspected historical ties to Alabama.

The proposed mine site is not located on land owned by a federally recognized tribe. The Phase I cultural resources assessments, conducted in accordance with section 106 of the NHPA, did not identify the presence of Native American artifacts; the AHC concurred with those findings. On February 22, 2019, OSMRE sent consultation letters to the tribes. To date, none of the tribes

listed above have expressed concerns about the proposed project. During the leasing EA phase, the BLM also sent consultation letters to the tribes and did not receive any objections. Two tribes did request to be notified n should the permittee discover any cultural resources or artifacts during construction or mining operations. The federal coal lease includes a stipulation that requires the operator to cease work and engage in further consultation if any artifacts, prehistoric cultural material, human remains, or archaeological features are discovered during mining operations.

Tribes will continue to have the opportunity to comment throughout the EA and MPPD process, until the ASLM either approves or disapproves the mining plan.

3.8 Visual Resources

This document incorporates by reference information about the visual resources presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the heading "Visual Resource" (p. 36).

The lease area, characterized by wooded hills, stream corridors, and previously mined ground, is generally not visible from residences or public roads.

3.9 Recreation Resources

There are no national, state, county, or municipal parks near the proposed project. Designated wilderness, trails, wild and scenic rivers, or lands with other special environmental or recreational classifications do not exist within or near the project area. Therefore, no public lands would be affected by either federal-action alternative.

As observed in the Trouble Creek biological habitat assessment, the Trouble Creek area is used recreationally as a hunting club and as a place where challenging trails have been laid out for four-wheel-drive vehicles (McGehee, 2013a). These trails cross streams, run along stream beds, and go up and down steep valley slopes.

3.10 Environmental Justice

Executive Order 12898, "*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*," was issued on February 11, 1994. The purpose of the order is to identify and address, as appropriate, disproportionally high and adverse human health and environmental effects of programs, policies, or activities on minority populations, low-income populations, and indigenous peoples. Relevant census data for Jefferson County was collected to determine whether county residents near the project area constituted "environmental justice populations."

According to the CEQ and USEPA guidelines established to assist federal and state agencies, a minority population is present in a project area if either of the following conditions hold:

- The minority population of the affected area exceeds 50 percent.

- The percentage of the minority population in the affected area is meaningfully greater than the percentage in the general population.

For Jefferson County, 53.2 percent of the population is white or Caucasian descent and 43.4 percent are persons of black or African American descent. The other 3.4 percent of the population reported as having some other racial or ethnic diversity. These data indicate that there is not a minority population present in the project area that would be disproportionally affected by the proposed project.

The U.S. Census Bureau estimates poverty levels using a set of income thresholds that vary by family size and composition. If a household's income is below certain thresholds, the family and all the individuals of that household are considered to be in poverty. Using this criterion, the Census Bureau provides estimates of the percentage of individuals that fall below the poverty level for each county in the United States. Within Jefferson County, the median household income for 2013-2017 was $49,321, and the poverty rate was 16.7 percent. By comparison, the 2013-2017 census demographics for the state of Alabama demonstrated a median household income of $46,472 and a poverty rate of 16.9 percent. Jefferson County is below the state poverty average and above median household income levels. Census data indicate that there is not a low-income population that would be disproportionally affected by the proposed project.

3.11 Socioeconomics

This section incorporates by reference information about the socioeconomic values presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER III - AFFECTED ENVIRONMENT under the heading "Socio-economic Values" (p. 36).

In 2015 coal was the third-most traded product for the state of Alabama, accounting for approximately 9 percent of the state's overall domestic trade.

As stated in the environmental justice analysis in section 3.10, census data demonstrate that Jefferson County is below the Alabama state poverty average and above median household income levels. The highest-employing industries in Jefferson County are health care, retail trade, and educational services. Employment in the mining, quarrying, and oil and gas extraction industries accounts for only 1 percent of employment in Jefferson County, but is among the most specialized and highest paying industries in the county.

Narley Mine currently employs about 31 people at an average salary of $90,000 per year, including benefits. The mine also supports the jobs of approximately 20 suppliers at an average salary of $75,000 per year.

3.12 Noise and Transportation

Mining activities are currently being conducted on property adjacent to the project area. The forested 160-acre tract is about one half mile from the nearest resident and domesticated animals. Operational noise from mining operations on the permit site would not change from current levels if mining were to move into the area of leased federal coal.

Primary travel routes near the Narley Mine No. 3 include improved county roadways and highways. Noise from mining equipment will be noticeable to the few residences near the mine site, and continued truck traffic for coal transportation will be noticeable for rural residences along the haul route to the rail loadout. Other activities along the haul route such as forestry operations and other coal mines contribute to truck traffic.

Chapter 4. Environmental Consequences

Introduction

This chapter summarizes the effects of implementing the alternatives described in Chapter 2 as they relate to the MPDD for Narley Mine No. 3. This chapter, where appropriate, incorporates by reference sections Chapter IV of the BLM leasing EA entitled *Narley Mine No. 3 Coal Lease Resource Management Plan Amendment, Land Use Analysis and Environmental Assessment,* dated June 2, 2014.

4.1 Physiography/Geology and Land Use

This section incorporates by reference information about the current land use and the physiographic and geologic setting presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV - ENVIRONMENTAL CONSEQUENCES under the heading "Physiography and Geology" (p. 42).

Alternative 1: No-Action Alternative

With no surface disturbance allowed, the area of Permit P-3990 would remain in its current condition characterized by unmanaged timberland and previously mined land.

Alternative 2: Proposed-Action Alternative

The overall configuration of the reclaimed land surface of Permit P-3990 would not appreciatively change from the premining state. The permittee has proposed no changes to the current land use of unmanaged timberland for most of the area of surface disturbance after mining and reclamation are completed. The permittee proposes to revegetate any areas of surface disturbance immediately following the mineral extraction operation.

Table 4.1 below gives land use figures provided by the PAP. Of the 551.0 acres within the P-3990 permit boundary, some 18.0 acres of permanent water impoundments would remain, as well as 9.0 acres of permanent haul and access roads. The remaining 524.0 acres within the permit boundary would remain classified as *undeveloped/no current land use.* Landowners have approved leaving the sediment basins as permanent water impoundments on their properties and retaining all primary and ancillary mine roads for property access. Those approvals are included in the PAP.

During the mining operation, ten sediment basins would be constructed. The proposed reclamation plan would leave seven of these structures as permanent impoundments, adding 18.0 acres under the land-use category *water resources.* All impoundments and their associated diversions would help ensure that the quality of effluent leaving the permit area meets applicable state and federal water quality standards. The Alabama Department of Environmental Management (ADEM), under National Pollutant Discharge Elimination Systems (NPDES) Permit AL0075752, requires the permittee to test sediment-pond discharge once each quarter. This systematic monitoring of NPDES outfalls ensures that runoff from mining-affected ground

meets applicable effluent limitations and will not degrade the quality of receiving water below state and federal water quality standards (Alabama Department of Environmental Management [ADEM], 2017).

Additional acreage of permanent water impoundments would directly benefit fish and other wildlife. Wildlife, including medium to large mammals, would have access to clean, readily available water. Migratory birds, such as waterfowl would have enough water resources for nesting, foraging habitat, and layover points on migration routes. The sediment basins would initially provide shallow water habitat. As ponds accumulate sediment, the habitat would change, perhaps attracting marsh, wetland, and shorebirds. Impoundments would be suitable for the approved postmining land uses and for other reasonably foreseeable uses.

Within the permit boundary, the land-use category *industrial/commercial* would increase by 9.0 acres with the construction of mine roads. Sediment control measures for mine roads would include all or some combination of features such as silt fences, hay-bale berms, rock check dams, and excavated sumps.

Once the state coal regulatory authority, in conjunction with OSMRE, relieves the permittee of all reclamation liability upon a demonstration of successful reclamation, landowners resume full control of the mined ground. Landowners would then solely be responsible for maintaining the land in a manner that continues the quality of those reclaimed resources. Land management may include removal of invasive species, reseeding, limiting sedimentation to ponds, or other activities that promote wise stewardship of the land. Although the project area is relatively small and the land use changes under the proposed mining plan would have a minor impact on the local area, the changes could have long-term impacts depending on surface landowner management. The duration of impacts cannot be resolved, and those impacts are outside the scope of this EA because the landowner, after Best Coal, Inc. no longer has reclamation liability, has the right to manage their land for their needs. Having already approved the postmining land use during the permitting process, changes to the land made by the landowner after reclamation liability release would likely be minor and fit naturally within the surrounding landscape.

Table 4.1. Land-use accounting for Permit P-3990 (MEC, 2017).

Land Use	Premine (acres)	Postmine (acres)	Change (acres)
Undeveloped	551.0	524.0	-27.0
Water Resources	0.0	18.0	+18.0
Industrial/Commercial	0.0	9.0	+9.0
Total Acres	**551.0**	**551.0**	

4.2 Soil Resources

Alternative 1: No-Action Alternative

Under the no-action alternative, there would be no surface mining disturbance allowed in the portion of Permit P-3990 containing leased federal coal. Soils would remain in their current

state, unaffected by mining but still subject to disturbance from other activity, mostly off-road recreational vehicle traffic.

Alternative 2: Proposed-Action Alternative

Topsoil—defined at 30 CFR 701.5 as the A and E soil horizons—of the *Nauvoo fine sandy loam* will be salvaged and redistributed during reclamation. The Nauvoo soil mapping unit accounts for about 7 acres of the proposed project area and is interspersed throughout the other 176 acres as a component of the Montevallo-Nauvoo association. There will be a loss of subsoil in these areas. All other native soils (both topsoil and subsoil) will be lost entirely.

Regulations found at 30 CFR 816.22(b) allow coal permittees an exemption from segregating and replacing topsoil if they can prove overburden material will be as good as, or better than, the native topsoil. Alabama regulations mirror the federal regulations, although the state colloquially refers to the exemption as a topsoil variance.

The permittee has applied for a topsoil variance. That application includes a study meant to prove that a heterogeneous mix of selected overburden materials would result in a growth medium more suitable for sustaining vegetation than the available topsoil and that the substitute material is the best available. The study contains information about the native soils, a geologic description, and overburden analysis data related to acid-base accounting. The permittee sampled topsoil and mine spoil from previously mined overburden for a comparative analysis of the physical and chemical properties. Samples sent to the Auburn University Soil Testing Laboratory were analyzed for the following parameters: soil fertility; pH; percentages of sand, silt, and clay; available water capacity; neutralization potential; maximum potential acidity; percent organic matter; and parts per million nitrate. Results indicated that measured overburden characteristics are comparable to those of native soil.

Alabama approved the topsoil variance application. Emplaced overburden intended to be root-growth material would be systematically sampled and tested to ensure that this substitute soil meets standards set forth in the approved PAP. Auburn University soils lab would do the testing and provide recommendations for soil amendments.

Loss of native subsoil could alter the substitute soil's ecological function and capability. Precipitation infiltration, water storage capacity and the amount of plant available water could change, for better or worse, during periods of rain and drought. With the loss of soil structure, the ability to convey and transmit ground and surface water could be altered, depending on the texture, structure, and level of compaction of the replaced overburden materials. The loss of clay in the subsoil could reduce the cation exchange capacity and buffer capacity.

Soils classified as Montevallo-Nauvoo association and the Nauvoo fine sandy loam are on the Jefferson County list of highly water-erodible lands. Mining operations could intensify soil erosion due to loss of soil structure, creation of steep slopes, and exposure of reclaimed material until vegetation is established. Use of mulch coupled with the timely establishment of temporary vegetation during reclamation would reduce the potential for erosion. Previously placed overburden at this mine has tended to be sandier than the native soil it replaced. This situation

could increase infiltration and reduce erosion potential, although steep slopes could limit that effect. Nearby mined ground has been reclaimed using the washboard method that creates a rolling surface that reduces the velocity of overland flow and so limits erosion.

Mined ground would be reclaimed to a postmining land use of undeveloped/no current use. The revegetation plan calls for planting grasses. Substitute soil material will need to be compacted to some degree in order to hold its contour and prevent loss of material but still allow the growth of grasses. Deeper rooting plants such as trees and shrubs may encounter more compacted zones and have difficulty becoming established.

Impacts to soil resources are inherent to coal mining. The impacts to soil on this project will be moderate and permanent. Native soils are severely limited as far as capability is concerned, so the degree to which the impacts are detrimental will depend on the physical and chemical characteristics of the substitute material. Essentially, a soil with limited capability is being replaced by a substitute material that will likely be equally limited. The replacement and performance of the substitute material will have to be satisfactory to the state regulatory authority. Reclamation using a topsoil variance is a common practice in Alabama, and it occurred on lands adjacent to the proposed project. OSMRE staff visited the site on March 26, 2019 and did not see any major issues with previously mined and reclaimed ground. Staff did not see erosion problems and noted that the reclaimed ground was vegetated.

4.3 Surface and Groundwater Resources

This section incorporates by reference information about water resources that is contained in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV-ENVIRONMENTAL CONSEQUENCES under the heading "Water Quality, Ground and Surface" (p. 48–49).

Alternative 1: No-Action Alternative

Under the no-action alternative, since there would be no surface disturbance to access leased federal coal and consequently no need for reclamation operations, there would be no change in surface-water or groundwater quality or quantity under this alternative beyond that resulting from current land management activities.

Alternative 2: Proposed-Action Alternative

Surface mining always carries the risk of adversely affecting local water resources. With proper planning and management, the size and duration of these effects can be minimized. Analysis of water-monitoring records for Narley Mine indicates how mining and reclamation operations for leased federal coal at the adjacent Narley Mine No. 3 might affect local water resources under the proposed-action alternative.

Two statistical methods were used to analyze water data—seasonal Kendall test for trend and Mann-Whitney comparison-of-medians test. The seasonal Kendall test looked at the entire monitoring record to determine whether a measured variable such as flow rate, pH, etc. changes

in a consistent direction over time. The Mann-Whitney test was applied to a given station to determine whether the two sampling periods (baseline and operations) of the monitoring record produced significantly different median values for a given measurement variable.

Each of the Narley Mine water-monitoring stations used in this statistical analysis has a monitoring record that is divided between the baseline sampling period and the subsequent operations (mining and reclamation) monitoring period. The term *baseline* refers to that period before Best Coal, Inc. initiated ground disturbance at Narley Mine. Baseline samples do not necessarily represent the state of water unaffected by coal mining. For example, a mine might be proposed for an area where local water resources have been heavily polluted by past mining; that polluted water would, nonetheless, represent baseline conditions for the proposed operation.

Results of the seasonal Kendall test for Narley Mine (and Trouble Creek) stream water and Narley Mine groundwater are graphically displayed in Table 4.2 by arrows. Statistical test results reported in this EA are identified as being either significant or not significant. By convention, values are assumed to be neither rising nor falling over time (the null hypothesis). The statistical test calculates the slope in the data when arranged chronologically and gives the probability of calculating a certain test statistic if the null hypothesis were in fact true.

Filled arrows of Table 4.2 signify trends that are significant at the 95% level of confidence (0.05 probability that the test statistic came from data with no trend). Most trends in Table 4.2 are not statistically significant, but among those that are, stream water at station BCNMSW-1 exhibits a significant drop in flow rate and significant increase in conductivity and concentrations of iron and manganese. Conductivity in groundwater at BCNMMW-2 significantly dropped over time while pH exhibited a significant upward trend at BCNMMW-1. Strata at Narley Mine dip to the south. Narley Mine monitoring wells are up-dip from mining disturbance. There are insufficient data to calculate the direction of groundwater movement at Narley Mine, but it is reasonable to assume that groundwater here moves in the general direction of dip. Consequently, the displayed trends, whether statistically significant or not, simply reflect natural long-term variation in water level and chemistry.

Table 4.2. Trend in water quality and quantity at stream- and groundwater-monitoring stations as calculated by the seasonal Kendall test.

[⇨ = increasing trend; ⇘ = decreasing trend; ⇔ = no trend; solid arrows show statistically significant trend at the 95% confidence level]

	Stream Water			Groundwater	
Parameter	BCNMSW-1	BCNMSW-2	BCJMSW-5	BCNMMW-1	BCNMMW-2
Flow rate	⬊	⇨	⇨		
Water level				⇨	⇨
Suspended solids	⇔	⇨	⇔		
Conductivity	➡	⇨	⇨	⇨	⬊
pH	⇨	⇨	⇨	➡	⇨
Total iron	➡	⇨	⇨	⇨	⇨
Total manganese	➡	⇨	⇨	⇨	⇨

Like the trend test, the comparison-of-medians test has a null hypothesis. Here, the null hypothesis states that there is no difference in the median value of a given measured variable between the baseline and operations monitoring periods. A term called *p-value* is the probability of the null hypothesis being true; p-values less than 0.05 indicate that medians are different at the 95% confidence level.

Again, using Narley Mine as a surrogate for federal coal extraction from Narley Mine No. 3, Table 4.3 shows how mining may affect the quality of stream water. Operations monitoring at BCNMSW-1 revealed water that had significantly higher conductivity and higher concentrations of total suspended solids, total iron, and total manganese than was the case before mining operations began on Permit P-3850.

Table 4.3. Comparison of medians (Mann-Whitney test) between monitoring periods for two stream stations on tributaries to Whites Creek.

[BL, baseline monitoring period; OP, operations monitoring period; mg/L, milligrams per liter; ft^3/s, cubic feet per second; mmhos/cm, millimhos per centimeter]

	BCNMSW-1			BCNMSW-2		
Parameter	*BL*	*OP*	*p-value*	*BL*	*OP*	*p-value*
Flow (ft^3/s)	0.205	0.045	0.1053	0.010	0.046	0.1412
Total Suspended Solids (mg/L)	1.0	9.0	0.0210	16.5	5.0	0.0621
pH (standard units)	7.2	7.1	0.6418	6.4	6.8	0.0892
Conductivity (mmhos/cm)	455.5	824.0	0.0067	660	765	0.7927
Total Iron (mg/L)	0.235	1.620	0.0002	6.045	1.380	0.2267
Total Manganese (mg/L)	0.120	0.860	0.0002	7.515	2.070	0.5400

A comparison of baseline and operations flow rate and water quality characteristics was also run for downstream station BCJMSW-5 on Trouble Creek (Table 4.4). The only variable for which there was a statistically significant difference between monitoring periods was conductivity. Median conductivity was significantly lower during the operations period than it had been during the baseline period. Station NCJMSW-5 had always passed at least some runoff from old

abandoned mine ground. Runoff from later permitted mining operations discharged to Trouble Creek from sediment ponds, but that should not have affected conductivity.

Table 4.4. Comparison of medians (Mann-Whitney test) between monitoring periods for downstream Trouble Creek station BCJMSW-5.

[BL, baseline monitoring period; OP, operations monitoring period; mg/L, milligrams per liter; ft^3/s, cubic feet per second; mmhos/cm, millimhos per centimeter]

	BCJMSW-5		
Parameter	*BL*	*OP*	*p-value*
Flow (ft^3/s)	2.68	0.46	0.3429
Total Suspended Solids (mg/L)	2.0	4.0	0.3230
pH (standard units)	7.7	7.5	0.5360
Conductivity (mmhos/cm)	2576	1040	0.0355
Total Iron (mg/L)	0.105	0.16	0.1067
Total Manganese (mg/L)	0.045	0.065	0.4995

The Mann-Whitney test was applied to test Narley Mine groundwater data from the two monitoring periods. Table 4.5 shows that among the five measured groundwater characteristics, there were no significant differences in the BCNMMW-1 data set. Water level at BCNMMW-2 was significantly higher during the operations period than it had been previously during the baseline sampling period. Medians of three of the four water quality variables for BCNMMW-2 significantly dropped after mining began. These changes mark an improvement in groundwater quality.

Table 4.5. Comparison of medians (Mann-Whitney test) between monitoring periods for two wells at Narley Mine, Permit P-3850.

[BL, baseline monitoring period; OP, operations monitoring period; msl, mean sea level; mg/L, milligrams per liter; mmhos/cm, millimhos per centimeter]

	BCNMMW-1			**BCNMMW-2**		
Parameter	*BL*	*OP*	*p-value*	*BL*	*OP*	*p-value*
Water Level (feet above msl)	406.2	406.1	0.7718	411.2	412.8	0.0401
pH (standard units)	6.3	6.5	0.4349	6.4	6.3	0.5787
Conductivity (mmhos/cm)	634	413	0.2416	509	221	0.0004
Total Iron (mg/L)	9.83	3.46	0.0625	10.30	0.6	0.0012
Total Manganese (mg/L)	0.96	0.36	0.0725	0.38	0.10	0.0010

An analysis of stream water, whether from downstream Trouble Creek or from the surrogate stations in the Whites Creek drainage basin, does not show consistent, unequivocal consequences of mining that would be anything other than minor. The recovery of leased federal coal from Permit P-3990 would probably have similar minor effects on stream-water resources associated with the project area. Statistical tests on groundwater have limited value for predicting how mining the leased federal coal from Permit P-3990 might affect local subsurface water. There is not an unambiguously downgradient well at Narley Mine. While Narley Mine No. 3 does have a downgradient well, its monitoring record is, to date, sparse and is all baseline data.

4.4 Wetlands, Floodplains, and Streams

This section incorporates by reference information about wetlands and floodplains that is contained in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV-ENVIRONMENTAL CONSEQUENCES under the heading "Wetlands and Floodplains" (p. 50).

This section also incorporates material from Appendix I and Appendix II, "Report 8—U.S. Army Corps of Engineers Nationwide Permit 21 Compensatory Mitigation Plan."

Alternative 1: No-Action Alternative

With this alternative, there would be no change in the wetland and floodplain values on the project area tract beyond that resulting from current land management activities. Those activities have left ground mostly undeveloped. However, commercial use of the land for four-wheel-drive recreational vehicles has affected stream beds, floodplains, and perhaps wetlands.

Alternative 2: Proposed-Action Alternative

The proposed project area contains waterbodies which the USACE previously found to be waters of the United States. That finding was documented in a formal jurisdictional determination that has since expired. A positive determination gives the USACE jurisdiction over the protection of the water bodies on the project area. OSMRE reached out to the appropriate USACE district on March 12, 2019, regarding the status of the expired permit. The USACE confirmed in a letter dated May 21, 2019, that any proposed discharge of dredged and/or fill material into waters of the United States on the Narley Mine No. 3 site will require a CWA Section 404 individual permit, as well as a new jurisdictional determination (JD). As described in Chapter 1, USACE provided an approved JD for Increment 3 on September 6, 2019, confirming that no permit is required to mine within that increment. Before any mining can occur in Increment 4, a separate JD and Section 404 permit will be required.

Stream disturbance cannot occur in Increment 4 until the USACE approves a plan to mitigate that disturbance. A mitigation plan found in Report 8 (U.S. Army Corps of Engineers, n.d.) identified about 10,000 feet of intermittent and ephemeral stream channel to be reconstructed in the mine area now identified as Increment 4. Report 8 gives a project overview, discusses baseline information, the determination of mitigation credits, and describes financial assurances. The mitigation plan also outlines a work plan, including performance standards and monitoring for stream-channel restoration, created wetlands, and riparian buffer zone establishment. A maintenance plan and long-term management plan are also included. Once the permittee obtains a Section 404 permit, any associated mitigation plan would likely be similar to the one found in Report 8 but would include an additional level of detail and quantitative performance measures. The mitigation plan would also be reviewed by USEPA during the USACE permitting process.

4.5 Air Quality

This section of the EA contains various estimates of emissions to the atmosphere that would be directly and indirectly related to mining operations on Permit P-3990. Emission estimates are

given under two categories—non-greenhouse gasses and greenhouse gasses. Both categories consider emission sources incidental to coal production, including truck and rail coal transport and coal combustion. Calculations show that coal combustion would likely account for more air pollutants and greenhouse gases than would come from the actual mining operation.

Non-Greenhouse Gases

Alternative 1: No-Action Alternative

Under this alternative, air quality in the local area would persist at the present level. Leased federal coal from Permit P-3990 would not be burned. The prospective end user of coal from Permit P-3990 would replace the energy content of that coal with coal mined and transported from elsewhere to meet a continuing demand for electricity. Consequently, power plant emissions would not change. Transitory local air quality effects from mining and coal transport would still occur somewhere, but not from mining leased federal coal at Permit P-3990.

Alternative 2: Proposed-Action Alternative

Under the proposed-action alternative, federal coal would be mined from a rural area. Narley Mine No. 3 is in an area of Jefferson County zoned I-3(S) Strip Mining District (Zoning, 2015). Emissions typical of mining operations would have a minor temporary impact on the local area. Operation of mining equipment, coal crushing and loading operations, and coal hauling by truck would stir up dust and release emissions from equipment engines. Attachment III-B-5 to the PAP, under Inspection and Maintenance Requirements, contains a plan to periodically spray water on mine roads to reduce dust. Dust impacts to air quality would be both localized and temporary; impacts to the residents living near Permit P-3990 would be minor. These impacts would end entirely once all coal has been recovered and the mined ground has been reclaimed.

Calculated air-quality emissions are for multiple sources—blasting, mining equipment, transport of coal to the end users, and combustion of that coal (Table 4.6). Those calculations used published conversion factors. In some cases, however, conversion factors were not available for a given pollutant from a given source.

Table 4.6. Estimated total amounts of non-greenhouse gas air-quality pollutants associated with the mining, transport, and burning of leased federal coal from Permit P-3990.

[CO, carbon monoxide; Pb, lead; NO_x, nitrogen oxides; $PM_{2.5}$, particulate matter ≤ 2.5 micrometer diameter; PM10, particulate matter ≤ 10 micrometer diameter; SO_2, sulfur dioxide; VOCs, volatile organic compounds]

Pollutant	Ton
CO	180.7
Pb	0.1
NO_x	1,645.8
PM2.5	2.5
PM10	116.6
SO_2	593.6
VOCs	4.2

The proposed action has the potential to emit all six of the NAAQS criteria pollutants. Criteria pollutants are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.

Carbon monoxide (CO) is the product of incomplete combustion of carbon-bearing matter. Combustion may take place internally, as with a diesel engine or externally as at a power plant, or upon detonation of blasting agent at the mine.

Leaded fuel is not used in mining equipment, heavy-duty highway trucks, locomotives, or mine employees' vehicles. Airborne lead would come from burning the coal. Table 1.1-18 in USEPA (1998) gives a factor of 4.2×10^{-4} pounds of lead per ton of coal burned. Using this factor, 469,005 tons of Narley Mine No. 3 leased federal coal would produce 197 pounds (0.10 ton) of lead.

Nitrogen oxides (NO_x) is a generic term for some combination of nitric oxide (NO) and nitrogen dioxide (NO_2). Volatile organic compounds (VOCs) are a large group of organic chemicals that include any compound of carbon (excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate). Evaporating fuel and incompletely combusted liquid fuel releases VOCs as does burning coal. VOCs are of interest because they participate in atmospheric photochemical reactions that contribute to ozone formation. Ozone is formed from chemical reactions involving airborne VOCs, airborne NO_x, and sunlight.

Particulate matter (PM) is an air-quality consideration. Particles 10 micrometers in diameter and smaller (PM10) are small enough to be inhaled. A subset of PM10 is a class of particles 2.5 micrometers in diameter and smaller (PM2.5). Much of the sulfur dioxide (SO_2) in power-plant stack gasses and in exhaust from internal combustion engines is in the form of PM2.5 droplets. These small particles contribute to atmospheric haze and can remain suspended in the air for days or weeks.

Another category of PM is fugitive dust. Fugitive dust means solid airborne particulate matter emitted from any source other than a stack or chimney. It is generated by the mechanical disturbance of granular material. In a surface-mine setting, wind picks up fugitive dust from dry bare ground; haul roads; blasting operations; and coal crushing, stacking, and loading facilities. Fugitive dust generally settles quickly near the source. Dust control on primary and ancillary mine roads of Permit P-3990 would be achieved by periodic application of water or chemical binders or other dust suppressants or some combination of these.

Blasting

Blasting operations at surface mines produce toxic gases, mainly CO and the NO_x gasses NO_2 and NO. Of these, NO_2 is the most toxic. Nitrogen oxides are emitted to the air above the blast zone, but CO tends to remain in the fractured overburden after the blast. This CO can be released during loading operations or may migrate underground to collect in confined spaces. Amounts of NO_x and CO from a blast depend on the formulation and age of the blasting agent, how that agent is confined in the drill hole, and whether or to what extent there is water in the

drill hole. These conditions at a mine can vary both with time and from place to place. Consequently, there is inherent uncertainty in calculated amounts of gas produced from blasting.

Blasting gas emissions for Permit P-3990 used factors from Table 13.3-1 in USEPA's AP-42, Volume I, Chapter 13, Explosives Detonation (USEPA, 2017a). Each ton of the blasting agent ammonium nitrate/fuel oil (ANFO) would emit 17 pounds of NO_x, 67 pounds of CO, and two pounds of SO_2. Total amount of ANFO to recover 469,005 tons of coal was calculated from a stripping ratio of 25 (that is, 25 cubic yards of overburden blasted and excavated to access one ton of coal) and a powder ratio of 0.85 pound of ANFO per cubic yard of overburden. Over the 6-year operational life of the mine, blasting would emit 42 tons of NO_x, 167 tons of CO, and 5 tons of SO_2.

Mining Equipment

Diesel fuel consumption was based on listed equipment operating over a 6.25-year period. Assumptions were that work would be done 48 weeks per year, five operating days per week, and two shifts (13 operating hours) per day. The EquipmentWatch publication *Cost Reference Guide for Construction Equipment* (2019) provided hourly fuel consumption per item of machinery. Total diesel fuel used to recover leased federal coal from Permit P-3990 would be 5,818,569 gallons.

Mining operations would be accomplished primarily with dozers, blast-hole drills, hydraulic excavators, and rock trucks. The equipment list and duration of mining operations came from the R2P2 (BLM, 2019).

Table 4.7 gives the amount of NO_x, PM10, and SO_2 that would be produced from the mining equipment. Conversion factors for two of the pollutants—46 grams NO_x per kilogram of fuel and 5.5 grams PM10 per kilogram of fuel—are from Kean and others (2000). Diesel fuel was assigned a density of 0.85 kilogram per liter. A sulfur dioxide emission factor of 0.09 grams per gallon of diesel was calculated by the method given in USEPA's *Emission Factors for Locomotives* (USEPA, 2009). That fact sheet notes that SO_2 emission rate can be applied to other diesel engines not just those of locomotives when operating on similar fuel. Total amount of low-sulfur (15 parts per million) diesel fuel consumed by mining equipment was estimated to be 5,818,569 gallons. That amount of fuel would yield 1,157 pounds (0.58 ton) of SO_2.

Table 4.7. Amount of pollutants emitted by diesel-powered equipment used to mine and reclaim ground containing leased federal coal at Permit P-3990.

[NO_x, nitrogen oxides; PM10, particulate matter ≤ 10 micrometer diameter; SO_2, sulfur dioxide]

Pollutant	Ton
NO_x	949
PM10	114
SO_2	0.58

Coal Transport

Leased federal coal produced from Narley Mine No. 3 would be sent to the Ernest C. Gaston Electric Generating Plant (Plant Gaston) in Shelby County near the town of Wilsonville. Plant Gaston, serving Alabama Power customers for more than 50 years, is about 27 miles (straight-line distance) southeast of Birmingham. Coal from Narley Mine No. 3 would be trucked due west to the Choctaw Mine in Walker County where it would be loaded into hopper cars for rail transport to Plant Gaston.

Over-The-Road Coal Transport

Fuel consumption of coal delivery trucks would be proportional to the distance those trucks travel. A minimum amount of truck pollutants can be calculated using an estimated roundtrip distance of 86 miles between the Narley Mine No. 3 and the rail loadout facility at Choctaw Mine.

Production from Permit P-3990 (about 469,000 tons) would require an estimated 18,760 trips by trucks having a 25-ton payload. Trucks are assumed Class VIIIb vehicles with gross vehicle weight greater than 60,000 pounds. Total distance traveled by all trucks—loaded to Choctaw Mine and empty back to Narley Mine No. 3—would be 1,613,360 miles. Factors for converting miles driven to grams of pollutants emitted are from USEPA fact sheet *Average In-Use Emissions from Heavy-Duty Trucks* (USEPA, 2008). These factors were applied to the total roundtrip travel distance of 1,613,360 miles with the result, converted to tons of pollutants, given in Table 4.8.

Table 4.8. Amount of pollutants emitted by heavy-duty diesel trucks shuttling between Narley Mine No. 3 and the Choctaw Mine rail loadout.

[VOCs, volatile organic compounds; CO, carbon monoxide; NO_x, nitrogen oxides; PM2.5, particulate matter ≤ 2.5 micrometer diameter; PM10, particulate matter ≤ 10 micrometer diameter; THC, total hydrocarbon, SO_2, sulfur dioxide]

Pollutant	Factor	Ton
VOCs	0.545 g/mi	0.97
CO	3.109 g/mi	5.53
NO_x	10.990 g/mi	19.54
PM2.5	0.238 g/mi	0.42
PM10	0.259 g/mi	0.46
THC	0.552 g/mi	0.98
SO_2	0.09 g/gal	0.02

An emission factor for SO_2 was calculated to be 0.09 grams per gallon of diesel by the method given in USEPA's *Emission Factors for Locomotives* (USEPA, 2009). That fact sheet notes that SO_2 emission rate can be applied to other diesel engines not just those of locomotives when operating on similar fuel. Total distance traveled by the heavy-duty trucks would be 1,613,360 miles. At a fuel economy of seven miles per gallon, trucking would consume 230,480 gallons of low-sulfur (15 parts per million) diesel fuel. Total SO_2 emissions would be 45.7 pounds (0.02 ton).

Railroad Coal Transport

Various assumptions figured into the estimate of emissions from railroad haulage of Narley Mine No. 3 coal, including that: (1) rail transport distance from Choctaw Mine to Plant Gaston is 95 miles with a travel time of 4.8 hours; (2) leased federal coal is shipped in 30-car unit trains pulled by a single locomotive of 4000 brake horsepower subject to Tier 1 emission standards; and (3) each coal hopper car carries 100 tons, so a unit train moves 3000 tons. Given these assumptions, all 469,005 tons of leased federal coal could be moved in 156 shipments requiring 748.8 hours of travel time. The empty hopper cars would have to be returned to the rail loadout in an assumed 156 shipments requiring another 748.8 hours of travel time.

The USEPA, in its *Emission Factors for Locomotives*, gives Tier 1 line-haul emission factors in terms of grams per brake horsepower-hour (g/bhp-hr). These factors are 0.32 for PM10, 6.70 for NO_x, 1.28 for CO, and 0.47 for hydrocarbons. Hydrocarbons (HC) are a component of VOC (USEPA, 2009).

Rail transport of Narley Mine No. 3 leased federal coal would produce 1.06 tons of PM10, 1.55 tons of HC, 22.12 tons of NO_x, and 4.23 tons of CO. The USEPA publication *Emission Factors for Locomotive* states that VOC emissions are about 1.053 times the HC emissions and PM2.5 emissions are about 0.97 times PM10 emissions (USEPA, 2009). Using these conversion factors, rail transport of Narley federal coal would emit 1.63 tons of VOC and 1.03 tons of PM2.5. Doubling pollutant amounts for round-trip travel gives the figures presented in Table 4.9.

Table 4.9. Amount of pollutants emitted by round-trip unit-train traffic between the Choctaw Mine rail loadout and Plant Gaston.

[HC, hydrocarbons; VOCs, volatile organic compounds; CO, carbon monoxide; NO_x, nitrogen oxides; PM2.5, particulate matter ≤ 2.5 micrometer diameter; PM10, particulate matter ≤ 10 micrometer diameter]

Pollutant	Ton
HC	3.10
VOC	3.26
CO	8.46
NO_x	44.24
PM2.5	2.06
PM10	2.12
SO_2	0.02

An emission factor for SO_2 was calculated to be 0.09 grams per gallon of diesel by the method given in USEPA's *Emission Factors for Locomotives* (USEPA, 2009). Railroad coal transport (round-trip) of 469,005 tons of federal coal would produce 35 pounds (0.02 ton) of SO_2 assuming a diesel fuel sulfur content of 15 parts per million, locomotive efficiency of 400 ton-mile per gallon of diesel, and 97.8 percent of the sulfur in the diesel fuel is converted to SO_2.

Coal Combustion

Federal coal recovered from Narley Mine No. 3 would weigh 469,005 tons and be burned at Plant Gaston. Plant Gaston has four natural gas-fired units and one coal-fired unit (Unit 5).

Emissions from Plant Gaston are reported in the USEPA Emissions & Generation Resource Integrated Database (eGRID). Most recent eGRID data are from 2016. Unadjusted annual heat input to Unit 5 was 45,211,439 million British thermal units (MBtu) in 2016 (USEPA, 2018a).

Average energy content (dry basis) of Narley Mine No. 3 coal is 15,305 Btu per pound of coal. Total heat content of 469,005 tons of coal is 1.44×10^{13} Btu (14,356,262 MBtu). Leased federal coal would be produced from Narley Mine No. 3 over a 6-year period. Average annual heat input to Gaston Plant from Narley Mine No. 3 coal would be 2,392,710 MBtu, which is 5.3 percent of the annual heat input for coal-fired Unit 5 of Plant Gaston.

Pollutants reported for Unit 5 in eGrid2016 are NO_x and SO_2. NAAQS include SO_2 plus five others as criteria pollutants— PM, lead, CO, ground-level ozone, and NO_2. Nitrogen dioxide is one of a group of gases called NO_x.

Coal from Narley Mine No. 3 that would be burned at Plant Gaston was assumed to account for 5.3 percent of that power plant's reported annual emissions. Table 4.10 gives the total emissions from the 6-year production of leased federal coal.

Table 4.10. Amount of pollutants emitted by the total production of Narley Mine No. 3 federal coal burned at Plant Gaston.

[NO_x, nitrogen oxides; SO_2, sulfur dioxide]

Pollutant	Ton
NO_x	591
SO_2	593

Greenhouse Gases

Alternative 1: No-Action Alternative

Under the no-action alternative, leased federal coal would not be mined from Permit P-3990. No emissions of air pollutants, including criteria pollutants or GHGs, from the mining or combustion of the federal coal would occur. No additional GHG emissions would occur under the no-action alternative above those that would have occurred when the mine was still producing private coal.

If coal-fired Unit 5 of Plant Gaston continues to operate at its current capacity to meet demand, coal not mined from Permit P-3990 likely would be replaced by coal from some other location. Emissions related to combustion of coal would not change, but emissions related to transportation of coal would change, perhaps increasing or decreasing depending on shipping mileage. On the other hand, a loss of Narley Mine No. 3 coal supply could contribute to a decision to switch Unit 5 of Plant Gaston to natural gas. Should coal no longer be burned at Plant Gaston, GHG emissions from that facility on a per kilowatt basis would decrease.

Alternative 2: Proposed-Action Alternative

Under the proposed-action alternative, the total GHG emissions from the production and use of leased federal coal from Permit P-3990 would be 1,415,875 metric tons of CO_2e. Ninety-five percent of those emissions would come from coal combustion at the power plant. The remaining

emissions sources include the operation of mining equipment, the methane gas released to the atmosphere as a byproduct of mining operations, and the transport of the coal by truck and rail.

USEPA fact sheet *Overview of Greenhouse Gases* lists the main GHGs as carbon dioxide, methane, nitrous oxide, and man-made fluorinated compounds—hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride (USEPA, 2017e). Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) are largely waste products of fossil fuel combustion. Fluorinated compounds are not included in the air analysis for Narley Mine No. 3 because their common sources are refrigeration gasses, aluminum production, electrical transmission and distribution systems, and magnesium production.

The EPA regulates GHG emissions under several initiatives, including the Mandatory Greenhouse Gas Reporting rule, the Final Greenhouse Gas Tailoring rule, geologic sequestration requirements, and EPA and National Highway Traffic Safety Administration standards for new motor vehicles. Under the Mandatory Greenhouse Gas Reporting Rule (40 CFR 98), coal mines subject to the rule are required to report emissions in accordance with the requirements of Subpart FF. Subpart FF is applicable only to underground coal mines and would not apply to the proposed action. Because no change to the production levels or annual emissions at Narley Mine No. 3 would occur under the proposed action, no other GHG reporting or permitting requirements would apply.

Mining Equipment

Mining operations would be accomplished primarily with dozers, blast-hole drills, hydraulic excavators, and rock trucks. The equipment list and duration of mining operations came from the R2P2, dated February 19, 2019.

Diesel fuel consumption was based on listed equipment operating over a 6.25-year period. Assumptions are that work would be done 48 weeks per year, five operating days per week, and two shifts (13 operating hours) per day. Where applicable, hourly fuel consumption per item of equipment came from *Caterpillar Performance Handbook* (2018, June).

A total of 5,818,569 gallons of diesel fuel would be consumed to recover leased federal coal from Permit P-3990. Mining and reclamation would emit 59,941 metric tons CO_2e based on CO_2, CH_4, and N_2O factors given in USEPA (2018b).

Coal Bed Methane

Surface mining operations at Narley Mine No. 3, would recover 469,005 tons of leased federal coal from the New Castle, Mary Lee, and Blue Creek beds. These three coal beds are part of the Mary Lee Group.

Coal in the ground contains methane gas that is released to the atmosphere when the coal is mined. Gas content varies with the geologic setting of the coal bed. The estimated average methane content of the Mary Lee Group, at overburden depths from zero to 500 feet, is 7.5 cubic feet per ton of coal (Murrie et al., 1976).

Methane content of 469,005 tons of leased federal coal would be 71.32 metric tons. Applying the GWP factor of 25, coal bed methane from the Narley Mine No. 3 operation would produce 1,783 metric tons of CO_2e.

Coal Transport

Over-The-Road Coal Transport

Fuel consumption of coal delivery trucks would be proportional to the distance those trucks travel from the mine to rail loadout. The roundtrip distance was estimated to be 86 miles.

Transporting 469,000 tons of federal coal from Narley Mine No. 3 to the Choctaw Mine rail loadout would require a total of 18,760 truckloads for vehicles having a 25-ton payload. Total round-trip distance traveled by coal trucks would be 1,613,360 miles. Using values from Table 9 in USEPA's March 2018 fact sheet *Emission Factors for Greenhouse Gas Inventories* (USEPA, 2018b), CO_2 would be produced at a rate of 1.456kg per vehicle-mile, CH_4 at 0.018g per vehicle-mile, and N_2O at 0.011g per vehicle-mile. Trucking coal to the Choctaw Mine rail loadout would emit 2,367 metric tons of CO_2, 0.02 metric ton of CH_4 (0.56 metric ton CO_2e), and 0.02 metric ton of N_2O (4.81 metric tons CO_2e) over the life of the mine.

Total GHG emission—CO_2, CH_4, and N_2O—for truck transport would be 2,372 metric tons CO_2e.

Railroad Coal Transport

Carbon dioxide emitted from a locomotive hauling Narley Mine No. 3 leased federal coal would be generated at a rate of 10,217 g/gal. This factor was derived from the method presented in USEPA fact sheet *Emission Factors for Locomotives* (USEPA, 2009). Diesel fuel was assumed to be 87 percent carbon by mass and have a density of 3200 g/gal. Total roundtrip locomotive fuel usage to transport about 469,000 tons of coal to Plant Gaston in 30-car unit trains is 177,840 gallons. This figure accounts for a 3900-ton loaded weight to Plant Gaston and a 900-ton empty weight back to the Choctaw Mine rail loadout. Total carbon dioxide produced by rail transport would be 2,003 tons (1,817 metric tons).

Table 5 in the USEPA fact sheet *Emission Factors for Greenhouse Gas Inventories* gives a CH_4 factor of 0.80g/gal, and a N_2O factor of 0.26g /gal (USEPA, 2018b). Applying these factors to the 177,840 gallons of diesel consumed and then multiplying the calculated values by their respective 100-year global warming potentials from Table 10a of the same fact sheet gives 3.56 metric tons CO_2e for CH_4 and 13.79 metric tons CO_2e for N_2O.

Total GHG emission—CO_2, CH_4, and N_2O—for rail transport would be about 1,834 metric tons CO_2e.

Coal Combustion

Table 1 of the USEPA fact sheet *Emission Factors for Greenhouse Gas Inventories* gives estimated amounts of CO_2, CH_4, and N_2O emitted from burning bituminous coal (USEPA, 2018b). These factors are stated in terms of the heating value of the coal in million British thermal units (MBtu). Average heat content (moisture- and ash-free) of Narley Mine No. 3 federal coal is 15,305.02 Btu per pound. This number was calculated from laboratory analyses of New Castle, Mary Lee, and Blue Creek coal, and adjusted for their relative proportions of the total 469,005 tons of federal coal production at the mine as given in the R2P2 (BLM, 2019). Total heat value of 469,005 tons of Narley Mine No. 3 federal coal is 1.44×10^{13} Btu. Carbon dioxide emission, using the factor of 93.28 kilograms CO_2 per MBtu, is estimated to be 1,339,152 metric tons.

For methane, the USEPA combustion factor is 11 grams per MBtu. Burning leased federal coal would emit 157.9 metric tons of CH_4 with a CO_2 equivalency of 3,948 metric tons. Bituminous coal has a N_2O factor of 1.6 grams per MBtu. Narley Mine No. 3 federal coal would emit 22.97 metric tons of N_2O. This amount of N_2O is equivalent to 6,845 metric tons of CO_2.

Total GHG emission from burning 469,005 tons of leased federal coal would be 1,349,945 metric tons CO_2e.

Social Cost of Carbon

A protocol to estimate what is referenced as the *social cost of carbon* (SCC) associated with GHG emissions was developed by a federal interagency working group to assist federal agencies in addressing Executive Order (EO) 12866, Regulatory Planning and Review, which requires the assessment of the cost and the benefits of proposed regulations as part of their regulatory impact analyses. The SCC is an estimate of the economic damages associated with an increase in carbon dioxide emissions and is intended to be used as part of a cost-benefit analysis for proposed rules. As explained in the Executive Summary of the 2010 SCC Technical Support Document "the purpose of the [SCC] estimates…is to allow agencies to incorporate the social benefits of reducing carbon dioxide (CO_2) emissions into cost-benefit analyses of regulatory actions that have small, or 'marginal,' impacts on cumulative global emissions" (USEPA, 2010). While the SCC protocol was created to meet the requirements for regulatory impact analyses during rulemakings, there have been requests by public commenters or project applicants 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 federal coal tracts for several reasons. Most notably, this action is not a rulemaking for which the SCC protocol was originally developed. Second, on March 28, 2017, President Donald Trump issued EO 13783 which, among other actions, withdrew the technical support documents upon which the protocol was based and disbanded the earlier Interagency Working Group on the Social Cost of Greenhouse Gases. The EO 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 the U.S. Office of Management and Budget (OMB) Circular A-4, "including with respect to the consideration of domestic versus

international impacts and the consideration of appropriate discount rates" (EO 13783, Section 5(c)). In compliance with OMB Circular A-4, interim protocols have been developed for use in the rulemaking context. However, OMB Circular A-4 does not apply to project decisions, so there is no EO requirement to apply the SCC protocol to project decisions.

Further, NEPA does not require a cost-benefit analysis (40 CFR. 1502.23), although it does require consideration of "effects" that include "economic" and "social" effects (40 CFR 1508.8(b)). Without a complete monetary cost-benefit analysis, which would include the social benefits of the proposed action to society as a whole and other potential positive benefits, sole inclusion of an SCC cost analysis 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 with the proposed action is simply an economic impact rather than an economic benefit, in as much as such impacts might be viewed by another person as negative or undesirable due to potential increases in local population, competition for jobs, and concerns that changes in population would 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 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 damages or benefits from carbon emissions. The SCC protocol estimates economic damages associated with an increase in CO_2 emissions—typically expressed as a 1 MT increase in a single year---and includes, but is not limited to, potential changes in net agricultural productivity, human health, and property damages from increased flood risk over hundreds of years. The estimate is developed by aggregating results "across models, over time, across regions and impact categories, and across 150,000 scenarios" (Rose et al. 2014). The dollar cost figure arrived at based on the SCC calculation represents the value of damages avoided if, ultimately, there is no increase in carbon emissions. But the dollar cost figure is generated in a range and provides little benefit in assisting the authorized officer's decision for project-level analyses because it is too uncertain. For example, in a previous EIS, OSMRE estimated that the selected alternative had a cumulative SCC ranging from approximately $4.2 billion to $22.1 billion depending on dollar value and the discount rate used. The cumulative SCC for the no-action alternative ranged from $2.0 billion to $10.7 billion.

Given the uncertainties associated with assigning a specific and accurate SCC resulting from mining the proposed federal coal tract, and that the SCC protocol and similar models were developed to estimate impacts of regulations over long time frames, OSMRE's ability to evaluate these impacts on a project-level would be doubtful [1] (Anthoff and Tol, 2013; Hope, 2013;

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[1] This conclusion is supported in the February 2018 BLM *Regulatory Impact Analysis for the Proposed Rule to Rescind or Revise Certain Requirements of the 2016 Waste Prevention Rule* (BLM, 2018), noting that "[t]he scientific and economics literature has further explored known sources of uncertainty related to estimates of the social cost of carbon and other greenhouse gases noting further that researchers have examined the sensitivity of Integrated Assessment Models (IAMs) and the resulting estimates to different assumptions embedded in the models (e.g., Anthoff and Tol, 2013; Hope, 2013; Nordhaus, 2014; Pindyck, 2013; Waldhoff et al., 2011, 2014). BLM further spoke to the "additional sources of uncertainty that have not been fully characterized and explored due to remaining data limitations", concluding that " [a]dditional research is needed to expand the quantification of various

Nordhaus, 2014; Pindvk, 2013; Waldhoff et al., 2011, 2014). Without a complete monetary cost-benefit analysis, which would include the social benefits of the proposed action to society as a whole and other potential positive benefits, inclusion solely of an SCC cost analysis would be unbalanced, potentially inaccurate, and not useful in facilitating an authorized officer's decision.

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) NEPA does not require cost-benefit analysis and one has not been conducted here; and 3) 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 both potentially inaccurate and not useful. On a global scale, the GHG emission contribution of any single geographic subunit (such as those subject to administration by SMCRA-delegated state regulatory authority or OSMRE regional office) or source (such as federal minerals) on a subnational scale is dwarfed by the large number of comparable national and subnational contributors. The relative contribution of GHG emissions from production and consumption of federal minerals will vary depending on contemporaneous changes in other sources of GHG emissions. A single subnational contributor is very unlikely to influence global cumulative emissions.

Climate Change Conclusions

In 2018 the U.S. Geological Survey (USGS) published a report titled *Federal Lands Greenhouse Gas Emissions and Sequestration in the United States: Estimates for 2005–14* (Merrill et al., 2018) on GHG emissions from extraction and use of fossil fuels produced on federal lands and GHG sinks (carbon storage by terrestrial ecosystems) on federal lands in the United States. The 2014 nationwide emissions from fossil fuels (oil, gas, and coal) extracted from federal lands were 1,279.0 MMT CO_2e of carbon dioxide, 47.6 MMT CO_2e of CH_4, and 5.5 MMT CO_2e of N_2O based on 100-year GWPs (Merrill et al., 2018). In 2014, carbon storage by terrestrial ecosystems on federal lands in the conterminous United States (excluding Alaska and Hawaii) was 83,600 MMT CO_2e. Soils stored 63 percent of carbon, with vegetation and dead organic matter storing 26 percent and 10 percent, respectively (Merrill et al., 2018). Between 2005 and 2014, the annual rate of net carbon uptake by terrestrial ecosystems in the conterminous United States ranged from a sink (sequestration) of 475 MMT CO_2e per year to a source (emission) of 51 MMT CO_2e per year due to changes in climate and weather, land use, land cover change, wildfire frequency, and other factors. Terrestrial ecosystems on federal lands sequestered an average of 195 MMT CO_2e per year nationally between 2005 and 2014 (Merrill et al., 2018).

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sources of uncertainty in estimates of the social cost of carbon and other greenhouse gases (e.g., developing explicit probability distributions for more inputs pertaining to climate impacts and their valuation)." BLM further states, "[o]n damage functions, other experts have found that those used in most IAMs have no theoretical or empirical foundation, claiming that the overall model is able to "obtain almost any result one desires (Pindyck, 2013). Naturally, the indeterminate amount of uncertainty surrounding the IAMs used to approximate social costs for specific greenhouse gas emissions merits additional research and analysis and further peer-review in order to better ascertain the best available science and economics in accordance with E.O. 13783." BLM's discussion is in the context of a rulemaking for which the SCC was developed. The uncertainties regarding the applicability of the social cost of carbon by OSMRE in the context of a specific project is even greater.

Table 4.11 summarizes GHG emissions from mining and handling the coal and off-site combustion of that coal under the proposed-action alternative. The values listed below represent total emissions over the approximate 6-year life of the project. GHG emissions in metric tons (one million grams) were estimated for five sources (Table 4.11). Calculations relied on data presented in the approved PAP and the BLM-approved R2P2.

Table 4.11. Total direct and indirect greenhouse gas production associated with leased federal coal at Permit P-3990.

Source	CO_2 equivalent (metric ton)
Mining equipment	59,941
Coal bed methane	1,783
Truck haulage	2,372
Railroad haulage	1,834
Coal combustion	1,349,945
Total	**1,415,875**

Coal combustion would account for 95 percent of the total carbon dioxide equivalent given in Table 4.11. Total GHG emissions for the U.S. in 2017 was 6,456.7 million metric tons CO_2e (USEPA, 2017d). Emissions from mining, transporting, and burning Narley Mine No. 3 federal coal would represent 0.02 percent of that U.S. annual total.

Table 4.12 compares the Narley Mine No. 3 emissions to global, national, and regional GHG emissions.

Table 4.12. Greenhouse gas emissions comparison.

Description	GHG Emissions (MMT CO_2e)[1]
Global GHG emissions for 2017[2]	53,500
Global GHG emissions from fossil fuel for 2017[3]	37,077
China GHG from fossil fuel for 2017[3]	10,877
Total U.S. estimated GHG emissions 2017[5]	6,457
U.S. GHG from fossil fuel combustion 2017[5]	4,912
U.S. electric power consumption 2017[5]	1,732
U.S. transportation sector 2017[5]	1,866
U.S. coal combustion for 2017[4]	1,316
Alabama GHG emissions reported 2018[7]	87
Combustion emissions from Plant Gaston reported 2018[7]	5.2
Indirect downstream combustion emissions from Narley Mine[6]	0.28
Narley Mine direct project emissions per year	0.07
CO_2 removal by forests and other lands in 2017[5]	-730

Note: EPA's U.S. and Alabama GHG emissions are from large facility emissions reported annually and do not include vehicles and smaller area sources. These emissions include fuel suppliers' fuel sale emissions.
[1]CO_2e is calculated by multiplying the mass emissions of the GHGs by the GWP for the GHGs. GWPs are based on the IPCC's *Climate Change 2014: Synthesis Report* (IPCC 2014).
[2]U.N. Environmental Programme (2018)
[3]Emissions Database for Global Atmospheric Research (2018)—values are for CO_2 only, not all GHGs
[4]USEIA (2017)
[5]USEPA (2017d)
[6]USEPA (2018a)
[7]USEPA (2019b)

Total GHG emissions for the U.S. in 2017 was 6,456.7 MMT CO_2e (USEPA, 2017d). The estimated CO_2e contribution of U.S. emissions would be approximately 13% of the total global CO_2e emissions. At the national level in the United States, the Narley Mine No. 3 direct and indirect emissions would contribute cumulatively 0.02% of total U.S. GHG emissions. While the emissions from the Narley Mine would not change from year to year because of production limits, it adds to the quantity of GHGs. Coal combustion in the United States resulted in 1,316 MMT of GHGs in 2017, and the Narley Mine's direct and indirect GHG emissions would be less than 1.5 MMT.

Greenhouse gas emission potential between the two alternatives—either recommending the approval of mining leased federal coal, or not recommending the approval of producing Narley Mine No. 3 leased federal coal—would likely be minimal because even under the no-action alternative, an equivalent amount of coal would likely be supplied to the coal end user by a different mining operation. Both alternatives would result in a similar GHG contribution to climate change. Any increased environmental or operational vulnerabilities attributable to changing climate would be addressed at the mine if the proposed-action alternative were implemented.

A changing climate, in part, may be locally expressed by a new pattern in the intensity and frequency of precipitation events. This alteration can have a direct bearing on the effectiveness of water-management structures, such as diversions and sediment ponds designed to handle a specified precipitation event of a given recurrence interval. Availability of water resources, particularly stream water and, to a lesser extent, shallow groundwater, can change over a relatively short period in response to precipitation (or lack of precipitation). However, it would be difficult to attribute any precipitation-related effect to climate change because it would take years if not decades to distinguish a new climatic pattern in precipitation from effects due to random variations in the local weather. The proposed project would be completed within about 6 years.

4.6 Biological Resources

This section incorporates by reference information about the wildlife and vegetation resources, and the threatened, endangered, and candidate species presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV - ENVIRONMENTAL CONSEQUENCES under the headings "Wildlife and Vegetation" (p. 50–52) and "Threatened, Endangered, and Candidate Species" (p. 45–47).

This section also incorporates material from "Report 6—Biological Habitat Assessment" and "Report 9—Biological Habitat Assessment—Trouble Creek."

Vegetation Resources

Alternative 1: No-Action Alternative

Under the no-action alternative, there would be no surface mining activity allowed and no mining induced changes in vegetation. Any changes to the vegetation would occur because of natural succession and impacts from any unrelated land use changes.

Alternative 2: Proposed-Action Alternative

The principal considerations associated with any disturbance from the proposed project include a decrease in biodiversity and a decrease in wildlife habitat. Under the proposed-action alternative, all but 27.0 acres of the disturbed area would return to an undeveloped land use. Some vegetative diversity within areas disturbed by mining would likely be lost. Best Coal, Inc. would contemporaneously revegetate disturbed areas following coal extraction, backfilling, and grading. Trees and shrubs would be planted in areas along drainage courses, along the permit boundary, and surrounding the proposed permanent water impoundments. Tree plantings—willow, loblolly pines, honeysuckle, and sawtooth oak—would increase diversity of food and cover for wildlife. Various herbaceous species closely resembling the premining condition would be planted in scattered locations to provide food and cover for wildlife. Temporary native vegetation would be seeded to provide soil stabilization. These plantings would provide short-term, minor benefits by ensuring that topsoil is not lost to erosion and the soil is stabilized to give a combination of hardwood and pine seedlings the greatest chance of survival.

Direct effects on vegetation include clearing and grubbing as the project proceeds through the start-up phase. These impacts would be short-term and moderate to major because disturbed ground will be revegetated contemporaneously with mining. Nevertheless, there may be periods when vegetation would be absent but at no time would the entire site be denuded. Like the premining land use, the postmining land use would remain *undeveloped.* However, the mix of vegetation, and consequently its associated wildlife habitat, would substantially change at least over the midterm. Land that used to be mostly covered in trees and shrubs would become grass covered after mining. However, with no land management, as implied by the term *undeveloped*, grassed areas could eventually revert to trees and shrubs.

Fish and Wildlife Resources

Alternative 1: No-Action Alternative

Under the no-action alternative, no changes would occur to the wildlife habitat characteristics and, therefore, site conditions would likely remain the same. No impacts such as removal of existing soil and vegetation from the proposed mining area would occur. Existing resident and migrant wildlife species and habitats would remain unaltered.

Alternative 2: Proposed-Action Alternative

The principal consideration associated with any disturbance from the proposed project is wildlife displacement during mining and reclamation operations. Under the proposed-action alternative, potential impacts to the bird community and to any mammal, reptile, and amphibian groups would be similar in that the primary effects would occur during the removal of vegetation in preparation for mining. Displaced individuals may move into available unoccupied habitat that may be of lesser quality. Those individuals may also find that unoccupied habitat is unavailable causing stress or mortality from increased competition for limited food and cover. Such a case would result in a more intense use of resources and some population losses.

In accordance with Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, all necessary precautions will be implemented to minimize any potential adverse impacts specific to the bird community. Impacts during active mining would be moderate, but temporary as soil and vegetation are removed. Best Coal, Inc. would revegetate any disturbed areas immediately following the mineral extraction operation. Impacts would diminish over time after the post-reclamation process is complete and revegetation has occurred; any displaced species could migrate back to the project area.

Potential impacts to fish and aquatic species are associated with soil erosion and stream impacts. The proposed project would leave a minimum 100-foot buffer zone between the project area and Trouble Creek, and any work that results in exposed earth or slopes leading to the surface waters would be done during periods when significant rainfall is not present. Best Coal, Inc. would also follow an erosion control plan developed with ASMC to maintain the minimum water-quality conditions approved in NPDES Permit AL0075752. Under the erosion control plan, Best Coal, Inc. would minimize soil erosion impacts using best management practices and sediment basins constructed along the outer perimeter of the project area prior to any disturbance. The sediment basins would absorb and filter any increase in runoff during mining operations, so the drainage area of Trouble Creek would remain unaffected. Sediment basins would provide 18.0 acres of permanent water impoundments post-reclamation, creating both aquatic habitat and providing a year-round water source for wildlife species.

Because of the relatively small size of the mine and the predominance of woodland and forest throughout the surrounding landscape, impacts of the proposed project to local wildlife resources would be minor and long-term. New impoundments would remain if future landowners maintain them.

<u>Threatened and Endangered Species</u>

Alternative 1: No-Action Alternative

There would be no surface disturbance under the no-action alternative, and, therefore, no potential for mining induced impacts to threatened or endangered species.

Alternative 2: Proposed-Action Alternative

Under the proposed-action alternative, protective measures would be implemented for the Indiana bat and the NLEB, if present. Since neither the Indiana bat nor the NLEB was detected by the acoustic survey, a bat habitat mitigation plan is not required. The USFWS concurrence that the proposed project is not likely to adversely affect either the Indiana bat or the NLEB is valid for 2 years from the date of completion of the survey, unless new information suggests otherwise. In April 2018, USFWS issued new survey guidelines, allowing these presence/absence surveys to be valid for a minimum of 5 years instead of the previous 2 years (USFWS, 2019). On November 21 2019, ASMC issued a revision to P-3990;the agency's permit finding 18 requires the permittee to conduct all tree removal activities between October 15 and March 31 and further requires a new acoustic presence/absence survey and concurrence with USFWS prior to any tree removal outside of the October 15 to March 31 timeframe.

Potential impacts to fish and aquatic species are associated with soil erosion and stream impacts. Efforts to minimize these impacts include four elements: (1) recognition of a minimum 100-foot buffer zone between the project area and Trouble Creek, (2) adherence to an erosion control plan that would maintain minimum NPDES water quality conditions, (3) construction of 18.0 acres of permanent water impoundments to capture runoff from mine-affected ground, and (4) creation of postmining aquatic habitat that provides a year-round water source for wildlife.

The project area would represent only a small percentage of available habitats. Activities on the site would not be expected to measurably affect species populations or range-wide status of threatened and endangered species. No threatened and endangered species have been detected or found within the project area.

Item 10 of the ASMC permit findings declared that the mining operation of Permit P-3990 would not affect the continued existence of endangered or threatened species or result in destruction or adverse modification of their critical habitats (ASMC, 2017). The permit approval/findings document also includes a condition that, if any listed species, newly listed species, or designated critical habitat is found within the permit area, the permittee will cease work and notify ASMC, OSMRE, and the USFWS for consultation. Work could not begin again until an appropriate course of action, including any restrictions imposed by USFWS, is determined by those agencies (ASMC, 2017).

In a letter dated July 29, 2020, USFWS concurred with OSMRE's determination that the proposed action is not likely to adversely affect any of the 13 protected species that are known to occur in the project area watershed.

4.7 Cultural and Tribal Resources

This section incorporates by reference information about the cultural and tribal resources presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV - ENVIRONMENTAL CONSEQUENCES under the headings "Cultural Resources" (p. 44–45) and "Native American Religious Concerns" (p. 45).

Historic and Cultural Resources

Alternative 1: No-Action Alternative

Under the no-action alternative, there would be no mining induced change in the condition of the proposed project area, so there would be no mining related effects to cultural resources.

Alternative 2: Proposed-Action Alternative

The 2012 Phase I Cultural Resources Assessment concluded that the proposed project would not impact any cultural resources that would be eligible for the National Register of Historic Places. The Alabama Historical Commission (AHC), in a letter signed by the deputy SHPO dated May 25, 2017, continued to concur with the project. Additionally, on February 22, 2019, OSMRE sent the AHC a notification of the start of the study for the EA. The letter was part of the NEPA scoping process and provided AHC another chance to review and comment on the project.

The federal coal lease includes a stipulation that if human remains, artifacts, or archaeological features are encountered, work must stop, and further consultations must take place before restarting work. Additionally, standard conditions found in the ASMC permit and ASLM mining plan approval for Narley Mine No. 3 would protect any future discoveries of archaeological, historic, cultural, or paleontological resources from impact; the permittee would be required to protect the resource and notify both ASMC and OSMRE when such resources are identified. Because no historic or cultural properties would be affected by the proposed action, unless artifacts are discovered during mining operations, direct or indirect impacts associated with cultural resources are not anticipated.

Tribal Trust Resources

Alternative 1: No-Action Alternative

Under the no-action alternative there would be no mining-induced change in the condition of the proposed project area, so there would be no mining-related effects to tribal trust resources.

Alternative 2: Proposed-Action Alternative

Based on concurrence from the AHC and lack of formal objections from any tribe, tribal trust resources are not expected to be impacted by the proposed-action alternative. There would not be any direct or indirect impacts unless cultural artifacts are discovered during the mining process. Were that to happen, the permittee would notify ASMC and OSMRE and take appropriate action.

4.8 Visual Resources

This document incorporates by reference information about the visual resources presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV - ENVIRONMENTAL CONSEQUENCES under the heading "Visual Resource" (p. 49–50).

Alternative 1: No-Action Alternative

Under the no-action alternative, there would be no mining induced change to the existing visual resources in the project area.

Alternative 2: Proposed-Action Alternative

Given the topography, vegetation, and rural location, the mining of leased federal coal would have little effect on visual resource values.

4.9 Recreation Resources

Alternative 1: No-Action Alternative

Under the no-action alternative, there would be no mining related change to the existing recreational resources in the proposed project area.

Alternative 2: Proposed-Action Alternative

Under the proposed-action alternative, surface mining activities may change the movement patterns and habitats of game species associated with hunting in this area. Impacts would decrease over time as vegetative cover and food sources are reestablished. With these changes, some displaced game species should migrate back to the project area.

About 18 acres of permanent water impoundments would remain post-reclamation, provided future landowners maintain them. Constructed impoundments would create both aquatic habitat and provide a year-round water source for wildlife and game species. Impacts to the recreational resource values of the mined area would be minor but long-term.

4.10 Environmental Justice

This section incorporates by reference information about environmental justice presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV - ENVIRONMENTAL CONSEQUENCES under the heading "Environmental Justice" (p. 52).

Based on census data and information provided during the scoping period, OSMRE has determined that there are no environmental justice populations here that would be affected by either the no-action or proposed-action alternative. There are no residences within one-half mile of the proposed project area.

4.11 Socioeconomics

This section incorporates by reference information about the socioeconomic values presented in the BLM leasing EA. Specifically, incorporated material is from CHAPTER IV - ENVIRONMENTAL CONSEQUENCES under the heading "Socio-economic Values" (p. 49).

Alternative 1: No-Action Alternative

Under the no-action alternative, mining operations would not continue at the Narley Mine No. 3 beyond the recovery of the private coal under ASMC Permit P-3990, and any ongoing impacts to employment and private income would likely end.

Alternative 2: Proposed-Action Alternative

Under the proposed-action alternative, the project would add about 160 acres and 469,000 tons of recoverable federal coal to ASMC Permit P-3990. This addition would extend the operational life of the mine by about 6 years. County-wide, impacts would be minor; however, the effects on the livelihood of individuals could be considerable. Mine employees would generally be paid above the Jefferson County average. A continuation of mining would also directly benefit those businesses that supply equipment and services to the operation. The United States would also realize income from royalties paid on coal recovered by this proposed project. If approved, operations at the Narley Mine No. 3 are expected to continue until all reserves in federal coal lease ALES-55199 are recovered. Economic stimulus, although local and short-term, would likely be positive under this alternative.

4.12 Noise and Transportation

Alternative 1: No-Action Alternative

Under the no-action alternative, mining operations would not continue at Narley Mine No. 3 beyond the recovery of private coal under ASMC Permit P-3990. Coal truck traffic would stop with the last shipment; equipment noise would taper off as the site transitions from coal recovery to final reclamation.

Alternative 2: Proposed-Action Alternative

Under the proposed-action alternative, coal recovery by surface mining methods would produce about 6 more years of industrial noise at levels the same as that when the mine was recovering only private coal. The mine would operate two shifts a day. The 160-acre tract is about a half mile from the nearest resident and domesticated animals. The site is surrounded by forest that serves as a buffer for the noise. Noise pollution would also be minimized through the proper care and maintenance of the equipment. A maintenance program keeps equipment in sound running condition thereby decreasing the amount of ambient noise generated by surface mining operations. The impacts associated with noise would be minor and short-term.

Coal from Narley Mine No. 3 would be trucked due west to the Choctaw Mine in Walker County where it would be loaded into hopper cars for rail transport to Plant Gaston. This transport, under the proposed-action alternative, would be the same as occurred when the mine was recovering private coal. The route would use improved county roadways (Horsecreek Blvd. to Mt. Olive Road) and primary highways (AL 5N/Hwy 78 W to AL-269S).

Mining activities would continue to contribute to an increased level of noise above the natural background of a sparsely populated rural area. Sources of noise pollution from coal mining activities include operation of heavy equipment such as bulldozers and haul trucks. These impacts would be temporary and would no longer exist after mining operations cease. Impacts upon residents could range from moderate for those living closest to the proposed project to minor or nonexistent for those living further from the mining operation.

Noise from equipment operations might also impact wildlife populations and nesting areas near the coal recovery operations. Noise could result in the displacement of numerous animal species in the immediate area, but this impact would be minor and cease after the close of mining operations.

There would be minor and temporary impacts to the county roads near the proposed project area due to continued coal truck traffic. The proposed action would generate approximately 13 roundtrips per day by over-the-road trucks capable of hauling 25 tons of coal in each trip. The hazards for passenger vehicles sharing the county roads with over-the-road coal trucks, and the probable damage to these county roads from the loaded trucks, are potential impacts of the proposed action. The county highway department is responsible for maintenance of the county roads. The potential for an individual passenger vehicle being involved with a collision with a coal truck has too many variables to be accurately predicted.

4.13 Cumulative Impacts

The CEQ's regulations for implementing NEPA at 40 CFR 1508.7 state that: "*Cumulative impact* is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time." Cumulative effects must be evaluated along with the direct effects and indirect effects (those that occur later in time or farther removed in distance) of each alternative.

Analysis Areas

For the purposes of this analysis, the temporal span of the proposed action represents the approximate 6-year period when the federal coal area of Narley Mine No. 3 would be mined. The geographic extent of cumulative impacts includes Jefferson County. No significant, adverse, or cumulative effects were identified in the cumulative-effects analysis.

Past, Present, and Reasonably Foreseeable Actions

Currently, there are 18 operating surface coal mines, 10 underground mines, 1 coal-preparation facility, and 1 coal-fines recovery operation in Alabama that produced about 12.9 million tons of coal in 2017 (EIA, 2018b). Two of the highest-producing underground mines—Shoal Creek Mine and Oak Grove Mine—are in Jefferson County; each of these operations produced between 1.4 and 2.1 million tons in 2017. Flat Top Mine in Jefferson County is among Alabama's most productive surface mines, having recovered about 307,000 tons of coal in 2017.

There are eight coal mines within the vicinity of the proposed Narley Mine No. 3 site that have an active or expired ASMC permit. Northeast of the permit area are the Black Warrior Minerals, Inc. Mine No 1 (ASMC Permit P-3950) and Mine No 2 (ASMC Permit P-3987), and the Kimberly Mine (ASMC Permit P-3982). Located north of the permit area across the Locust Fork is Sloan Mountain Mine (ASMC Permit P-3811) and Sloan Mountain Mine No. 2. Across the Locust Fork and west of the permit area is the Knob Mine (ASMC Permit P-3251). Narley Mine (ASMC Permit P-3850) is adjacent to the proposed federal lease area on the north and east boundaries. This mine is in the reclamation phase. Best Coal, Inc. also currently holds ASMC Permit P-3932 (Jagger Mine) which is just north of the proposed project area (see Figure 3.1). Operations have not yet begun at Jagger Mine. Estimated annual coal production at Narley Mine No. 3 (ASMC Permit P-3990), as given in the BLM R2P2, would range from about 16,000 to 101,000 tons over its projected 6.25-year productive life.

Currently there are 11 operating coal power plants in Alabama. The nearby Miller Steam Plant in western Jefferson County and other coal-fired power plants throughout the state are major stationary point sources for federally listed criteria pollutants (that is, more than 100 tons per year). These power plants will likely continue to be stable electricity generators for the foreseeable future and continue to be major stationary point sources for federally listed criteria pollutants (EIA, 2018c).

Impact Analysis

Alternative 1: No-Action Alternative

Under the no-action alternative, loss of revenue to the federal government from not recovering the federally owned coal would be an impact. Surface owners over the federal coal at Narley Mine No. 3 would not have their properties disturbed or the coal beneath removed under this scenario. The privately-owned coal permitted under P-3990, P-3850, and P-3932, however, would continue to be mined until recovery is completed. Overall economic impact to the county, whether the federal coal is mined, would be minor. There should be no impact on other commercial operations in the vicinity.

Alternative 2: Proposed-Action Alternative

The scope of cumulative effects under the proposed-action alternative was examined within the 551-acre area of Permit P-3990. Within this 551-acre area, cumulative effects on the physical and biological environment of the proposed action would be moderate because of past mining activities, surrounding land use patterns, and direct impacts of the proposed project. Past mining activities include pre-law surface and underground mining. The Republic Steel Sayre Mine was an underground operation along the west side of the 160-acre project area. Previous ASMC-issued permits in the immediate vicinity of the proposed area include Narley Mine (P-3850) and Jagger Mine (P-3932). Excavation has not yet started at Jagger Mine.

Surface mining operations recovering privately owned coal at Narley Mine began in 2004 and used standard truck-and-shovel mining practices. Coal recovery at Narley Mine is essentially complete, and most of the permit area has been graded and revegetated. Most activities,

including hauling of coal or materials, will have ceased at Narley Mine prior to excavation of the federal coal area at Narley Mine No. 3. About 70 percent of the 551-acre Narley Mine No. 3 had private coal, which has been recovered.

Additional cumulative impacts to the physiography would be unlikely beyond temporary modifications of the topography during mining operations. Grading and contouring would return the mined ground to its approximate original contours. Cumulative impacts to land use at most would be minimal because unmanaged timberland is not a rare ecotype in the area of the project, and the majority of the postmining land use would retain its premining status as "undeveloped."

Cumulative impacts to soils from other past, present, and reasonably foreseeable future projects would be negligible because the project area already has, and is surrounded by, soils disturbed from past coal mining, timber operations, and off-road vehicle use.

Stream functions and dynamics would be minimally affected outside the disturbance area or in the watershed located downstream of the project. Narley Mine No. 3 is not a hydrologically isolated coal mine. Trouble Creek, a tributary of Locust Fork, receives surface runoff from all or some portion of the three adjacent permit areas. The three permit areas have similar topography developed on similar underlying geology. The drainage area of Locust Fork at its confluence with Trouble Creek is approximately 850 square miles. Runoff from every acre of land surface within this drainage basin, whether undisturbed ground, mining-affected ground, farm field, logging site, roadway, residential lawn, industrial site, and so on, contributes to flow in Locust Fork. Consequently, water quality at any point in the stream integrates the pollution input from all runoff upstream from that point. Local geology controls overburden chemistry and the extent and distribution of water-bearing zones. The adjacent permit areas have been, and will continue to be, subject to the same weather conditions. Best Coal, Inc. recovered coal of the Mary Lee Group from Narley Mine using the same surface mining methods and equipment that this company has been using at adjacent Narley Mine No. 3 and would use to recover leased federal coal from Permit P-3990 and P-3932.

Water quality data from Narley Mine qualifies as a surrogate for predicting how mining leased federal coal at Narley Mine No. 3 and mining private coal at Jagger Mine might cumulatively affect local water resources. An analysis of stream water data presented above in section 4.3 does not show consistent, unequivocal consequences of mining that would be anything other than minor. Appendix B to this EA presents an additional qualitative analysis of the cumulative impacts to Locust Creek and Trouble Creek. In this analysis, OSMRE evaluated potential mining impacts to Locust Fork and Trouble Creek in terms of five water quality characteristics—specific conductivity, suspended solids, dissolved solids, sulfate, and selenium. This analysis concluded that the proposed action will not significantly degrade the quality of Locust Fork water downstream from Trouble Creek. Neither selenium nor total suspended solids would measurably increase in Locust Fork. A small increase in conductivity would be expected but may not be reliably measurable. As such, existing aquatic habitat for any listed species in Locust Fork would be unaffected. In Trouble Creek, the analysis concluded that the proposed action might increase sulfate by 5.7 percent, total dissolved solids by 0.9 percent, total suspended solids by 30 percent, and selenium by 111 percent. These potential increases, particularly the large percent increases in concentration of total suspended solids and selenium, nevertheless would

result in concentrations that would be well within USEPA's national recommendations and NPDES permit discharge limitations. Conductivity may increase by 6.5 percent near the mouth of Trouble Creek. No listed species or critical habitat are known to occur within Trouble Creek and, without knowing what aquatic life is present, it is not possible to predict what affect a 6 percent increase in conductivity from an already elevated baseline value might have.

The recovery of leased federal coal from Permit P-3990 and P-3932 would probably have similar minor cumulative effects on stream water resources associated with the project area. Additionally, no significant industrial or residential development is expected in the area for the foreseeable future, so no additional cumulative effects on water resources are anticipated.

There would be no cumulative impacts to floodplains, since no other projects (past, present or in the reasonably foreseeable future) have impacted the floodplains in the immediate vicinity of the proposed project. Executive Order 11988 requires federal agencies to avoid adverse impacts associated with the occupation and modification of flood plains. An examination of the floodplain map and analysis required for EO 11988 indicate that floodplains in the project area and vicinity would remain relatively intact.

The proposed action would extend mining operations at the site for an additional 6 years which would result in cumulative air quality impacts. Emissions of GHGs resulting from the proposed action would increase the atmosphere's concentrations of GHGs, and in combination with past, present, and future emissions from all other sources, they would contribute incrementally to the global warming that produces the adverse effects of climate change described previously.

The human and natural causes of climate change, and the impacts of climate change, are global. Greenhouse gas emissions do not remain localized but become mixed with the general composition of the Earth's atmosphere. On a global scale, the GHG emissions contribution of any single geographic subunit (such as a SMCRA-delegated state regulatory authority or OSMRE regional office) or source (such as federal minerals) on a subnational scale is dwarfed by the large number of comparable national and subnational contributors. The relative contribution of GHG emissions from production and consumption of federal minerals will vary depending on contemporaneous changes in other sources of GHG emissions. A single subnational contributor is very unlikely to influence global cumulative emissions. While GHG contribution from a given project can be quantified (as has been done above in section 4.5), it is simply not possible to separate the climate change effect of that calculated amount of GHG from the effects of GHG produced (or mitigated) by a multitude of other past, present, and reasonably foreseeable future actions. The climate change research community has not yet developed tools for evaluating or quantifying endpoint impacts attributable to the emissions of GHGs from a single source. The current tools for simulating climate change generally focus on global and regional scale modeling.

The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) 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. RCP

is based on a fundamental concept that sunlight is the primary energy source that warms the Earth's surface and its surrounding atmosphere. A portion of that solar energy is radiated back into space. If more energy is absorbed by the planet than is radiated into space, the planet warms. Each RCP is associated with a number. That number is a measurement of the solar energy gained by the planet minus the solar energy lost by the planet. This energy difference has units of watts per square meter of the Earth's surface.

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 evaluated in the report. These scenarios correspond to atmospheric concentrations of CO_2 by the year 2100 of 421 ppm for RCP2.6, 538 ppm for RCP4.5, 670 ppm for RCP6.0, and 936 ppm for RCP8.5. The range of likely change in global surface temperature by 2050 ranges from 0.3 to 1 degree Celsius for the RCP2.6 scenario and from 0.5 to 2.0 degrees Celsius for the RCP8.5 scenario. Generally, the more stringent climate change mitigation, the lower the projected change in global surface temperatures. When discussing regional impacts, however, it is important to note that degrees of surface temperature increases vary from region to region.

Rather than discuss the cumulative impacts of GHG emissions linked to the proposed mining activity, this EA employs a much broader view of GHG emissions to speculate how worldwide GHG emissions might affect the state of Alabama. The U.S. Geological Survey (USGS) National Climate Change Viewer (USGS, 2016) can be used to evaluate potential climate change at the state level. The viewer shows projections of future climate trends under RCP emission scenarios RCP4.5 and RCP8.5. Data presented in the USGS Climate Change Viewer data can also be extrapolated to get a general understanding of impacts under RCP2.6 and RCP6.0. Generally, the RCP2.6 scenario can be assumed to contribute to less climate change impacts in the region, while the RCP6.0 can be assumed to contribute to impacts that are of lesser magnitude than RCP8.5 but of greater magnitude than RCP4.5.

Projected changes to the maximum and minimum temperature and precipitation for Alabama are presented for RCP4.5 and RCP8.5 to assess regional cumulative impacts from global GHG emissions in Figures 5.1 through 5.3 below. The RCP4.5 and RCP8.5 scenarios forecast similar levels of climate impacts in the region over the next few decades, however, impacts over the next century diverge significantly. Because of uncertainties in the climate models, especially toward the end of the century, the impacts projected represent a forecast, but are not certain to occur at the magnitudes projected.

Figure 5.1 shows a seasonal average time series of maximum 2-meter air temperature for historical (black), RCP45 (blue), and RCP8.5 (red) for Alabama. Figure 5.2 shows a seasonal average time series of minimum 2-meter air temperature for historical (black), RCP4.5 (blue) and RCP8.5 (red) for Alabama. Figure 5.3 shows a seasonal average time series of precipitation for historical (black), RCP4.5 (blue), and RCP8.5 (red) for Alabama.

Solid lines trace the average of 30 global climate change models. Color-coded shaded bands indicate the amount of variation (one standard deviation) in these average values.

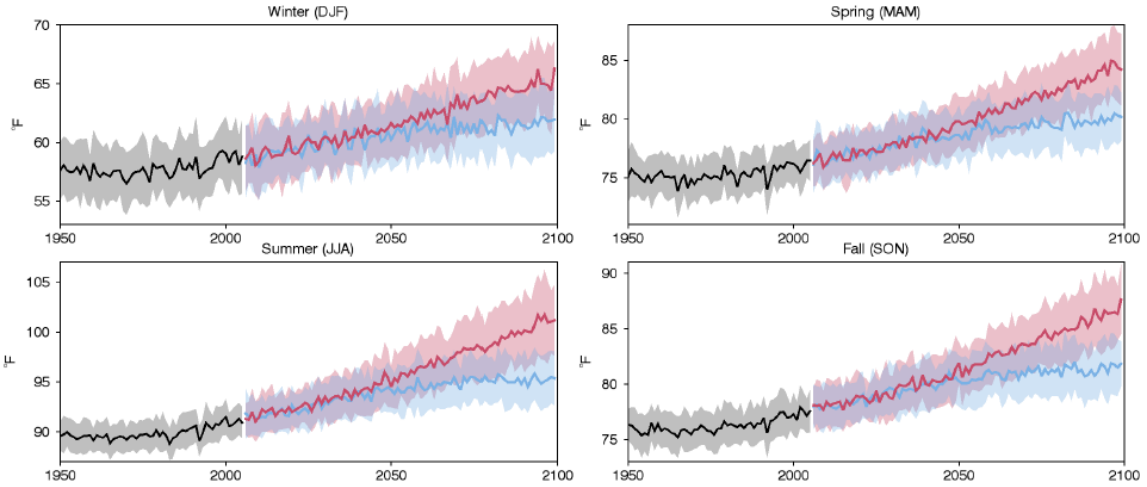

Figure 5.1. Alabama climate change viewer, maximum 2-meter air temperature.

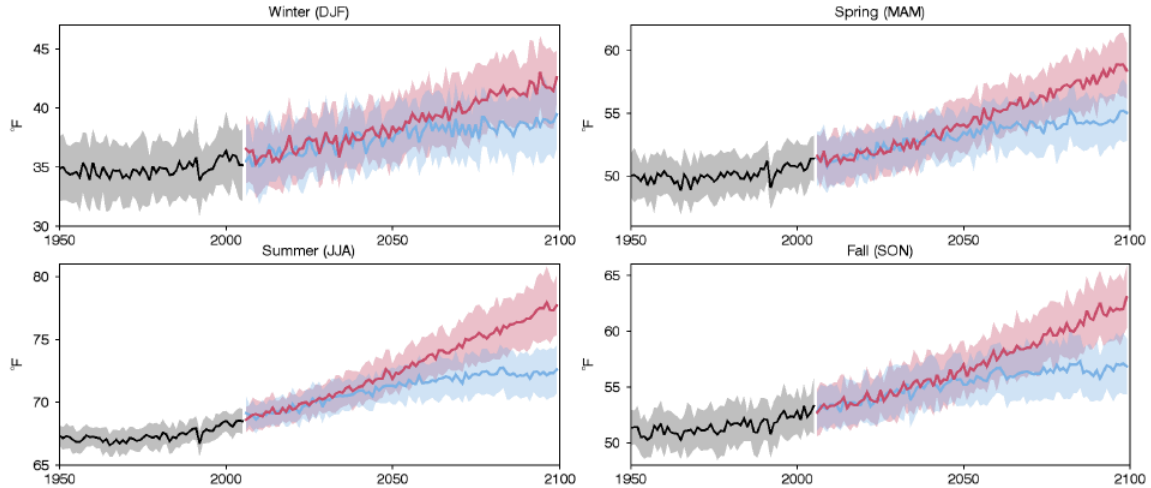

Figure 5.2. Alabama climate change viewer, minimum 2-meter air temperature.

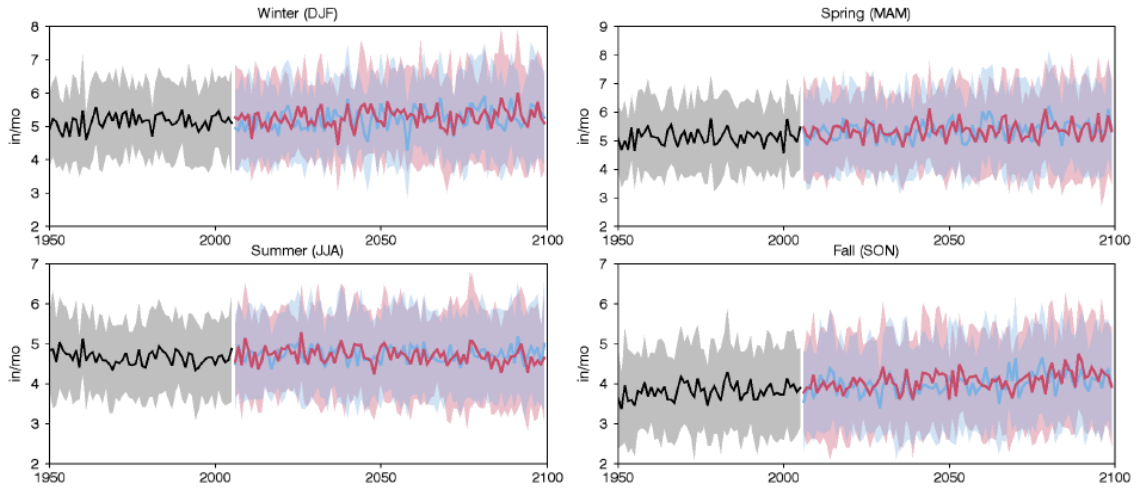

Figure 5.3. Alabama climate change viewer, precipitation.

Overall, the RCP8.5 scenario representing the aggressive emission scenario results in higher seasonal average maximum and minimum temperature projections over the century in comparison to the RCP4.5 scenario. However, both scenarios project an increase over the historical average over the next century. Temperature projections for both scenarios available in the USGS data around the mid-century are consistent with most of the divergence in the scenarios being realized in the latter half of the century. By 2050, the seasonal maximum and minimum temperatures in Alabama are projected to increase by roughly 2.5° based on the average of the global climate change models. However, the uncertainty in the estimates shown in the shaded areas of Figures 5.1 through 5.3 for both the RCP4.5 and RCP8.5 scenarios out to 2040 show that the level of uncertainty in the projections range from 5°F to 10°F depending on the season. Therefore, it is difficult to definitively state that the cumulative impacts at the mid-century mark will result in a specific magnitude of warming in the region. However, there is a definitive upward trend in seasonal minimum and maximum temperatures.

Precipitation data have a much less distinct trend, and the level of uncertainty over the next century shows that seasonal average rainfall may remain within the range that is currently typical for Alabama. However, based on the average projections of the climate change models, there is projected to be a slight increase in winter, spring, and fall average precipitation, with summer precipitation remaining at similar historical levels. Divergence in modeled precipitation between the RCP4.5 and RCR8.5 scenarios is less pronounced than temperature divergence.

The proposed action, by authorizing the mining activity, will increase atmospheric concentrations of GHG. However, the degree to which emissions from 6 additional years of project operations would contribute to climate change impacts is small compared to the impact from all other global emissions during this time period.

Currently the proposed project area has been classified as undeveloped land. That designation would carry over if the leased federal coal were to be mined. Mined ground would be revegetated immediately, and we anticipated no cumulative effects to vegetation resources. There is a potential cumulative impact to wildlife resources due to incremental habitat fragmentation and species displacement during continued mining operations. Any cumulative impact to wildlife resources would not result in measurable effects at a population level. We do not expect the loss of any species or natural community, nor do we expect delay in recovery of any threatened, endangered, or candidate species.

No additional cumulative impacts to historic, cultural, or tribal trust resources are anticipated beyond the direct and indirect effects mentioned in the previous chapter.

Extending the life of the mining operation would have some socioeconomic cumulative impacts, but those impacts would be temporary and minor at the county-level. There is also no potential for disproportionate cumulative impacts to minority or low-income communities because none have been identified in the vicinity the project area.

There are no anticipated cumulative impacts to recreation or visual resources beyond those discussed in the previous chapter.

No additional cumulative impacts to sensitive receptors from an incremental increase in noise levels would be anticipated beyond the localized short-term increase in mining and equipment related noise sources during the project operation.

Chapter 5. List of Preparers

The following OSMRE staff, BLM staff, and ASMC staff participated or were consulted during the preparation of this EA.

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APPENDIX A

I. **Black Warrior Riverkeeper, Inc. Comment**

II. **U.S. Environmental Protection Agency Comment**

III. **OSMRE Comment Response**

APPENDIX A—PART I

Black Warrior Riverkeeper, Inc. Letter

July 8, 2020

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July 8, 2020

ATTN: Narley Mine No. 3 EA
C/O: Allison Travers
OSMRE Interior Regions 3, 4 and 6
501 Belle Street, Suite 216
Alton, IL 62002-6169

Via electronic mail only to atravers@osmre.gov

Re: OSMRE, Narley Mine No. 3 EA

Dear Ms. Travers:

Thank you for the opportunity to provide comments to the Office of Surface Mining Reclamation and Enforcement ("OSMRE") on an Environmental Assessment ("EA") of a proposed federal coal lease to Best Coal at Narley Mine No. 3. We write on behalf of Black Warrior Riverkeeper, Inc. ("Riverkeeper"), a nonprofit organization located in Birmingham, Alabama, whose mission is to protect and restore the Black Warrior River and its tributaries. Narley Mine No. 3 discharges to Trouble Creek, a tributary of the Locust Fork of the Black Warrior River.

Our group exists to protect and improve water quality and aquatic habitat in the Black Warrior watershed as well as to ensure that regulatory permits comply with the mandates of the CWA, the National Environmental Policy Act ("NEPA"), 42 U.S.C. §§ 4321 through 4347, and the Endangered Species Act, 16 U.S.C. §§ 1531 through 1544. We have significant concerns, as described below, regarding the cumulative impacts of this proposed project on the Locust Fork subwatershed, the impairment of onsite (Trouble Creek) and downstream water quality (Locust Fork), the degradation of aquatic and riparian habitats, the potential harm to threatened, or endangered species and the potential destruction or adverse modification of designated critical habitat. As written, the EA confines its limited analysis to the small confines of the Narley/Jagger Mines, without examining the cumulatively significant impacts that these and other surface mines have on the Locust Fork.

We urge OSMRE to choose the "no action" alternative or, at a minimum, to undertake an Environmental Impact Statement ("EIS") to evaluate the cumulative impacts of this lease, together with other known and reasonably foreseeable future federal actions on the Locust Fork. When taken together with other federal actions to facilitate surface mining in the immediate area of Narley Mine No. 3 and

the Locust Fork, the proposed lease "significantly" impacts the environment as defined in 40 C.F.R. §

As acknowledged by the EA, surface runoff from the project area flows into Locust Fork by way of Trouble Creek. EA at 13. Trouble Creek is designated for use by wildlife, for fishing, and for propagation of fish and other aquatic life, as is the Locust Fork. Although "surface mining can foul streams with sediment," OSMRE believes that "multiple constructed sediment basins will intercept and contain sediment that would be washed off the project area should it be mined." EA at 13. However, OSMRE has failed to address the cumulative environmental impacts when the Narley Mine No. 3 lease is combined with other federal actions that already allow significant surface mining impacts to the Locust Fork and its tributaries.

Cumulative Impacts and Water Quality

In assessing the cumulative impacts of this project, OSMRE necessarily must analyze the potential contribution of sediment and other pollutants from all currently active, reclaimed, and abandoned coal mine in the vicinity of the Narley No. 3 Mine or upstream, as well as the lost stream function from each and every headwater, intermittent, or ephemeral stream that has been mined through or impounded at each of those mines. Here, OSMRE must look at the contributions from the Narley No. 3 Mine within the context of those cumulative impacts from the twelve active coal mining-related operations (ASMC and ADEM permit numbers provided) that have an impact on this portion of the Locust Fork, including:

1. Littleton Mine – P-3801; AL0072524
2. Sayre Prep Plant – P-3198; AL0030937
3. Knob Mine – P-3251; AL0024287
4. Jagger Mine – P-3932; AL0075752
5. Narley Mine – P-3850; AL0075752
6. Sloan Mountain Mine No. 2 – P-3913; AL0073067
7. Mine No. 1 (Black Warrior Minerals) – P-3950; AL0079707
8. Warrior Mine No. 1 – P-3953; AL0079928
9. Majestic Mine No. 2 – P3926; AL0063541
10. Trafford Mine No. 1 – P-3961; AL0080179
11. Reid School Mine – P-3921; AL0079731
12. Rosa Mine – P-3931; AL0080080

As part of this analysis, the OSMRE must also consider the impacts from each of the following former mining operations that have mined through and impounded numerous smaller order streams and continue to contribute pollutants to the Locust Fork and/or its upstream tributaries:

1. Bagley Bend Mine - P-3574; AL0023931
2. Sayre No. 8 Mine – P-3501; AL0045047
3. Black Creek No. 2 Mine – P-3609; AL0059145
4. Beltona II Mine – P-3193; AL0022900
5. Morris North Mine – P-3185; AL0029238
6. Capricorn Mine – P-3407; FOR
7. Mine No. 1 (Pilot Coal Inc.) – P-3463; AL0051934
8. Turkey Creek Underground Mine – P-3432; AL0028346
9. Majestic Mine – P-3691; AL0063541
10. Bradford Mine – P-3744; AL0068101
11. Masseyline Mine – P-3439; AL0049875
12. Gurley Creek Mine – P-3371; FOR
13. Arnold Pit – P-3371; FOR
14. Sherijen Mine – P3718; AL0066656
15. Locust Fork Mine – P-3572; AL0056588
16. Warrior Mine – P-3581; AL0056383
17. Long Branch Mine – P-3480; AL0053457
18. Mine No. 2 (Long Branch) – P-3480; AL0053457
19. Lehigh Mine – P-3715; AL0064688
20. Nyota Mine – P-3510; AL0050059
21. Nyota Mine No. 2 – P-3446; AL0050059
22. Sugar Creek Mine – P-3282; AL0047333
23. Sugar Creek Pit 2 – P-3188; AL0053449
24. Logan Mine – P-3309; AL0045314
25. Rosa Coal Washer – P-3363; AL0044831
26. Mine #1(B&B Mining Co) – P-3451; AL0050491
27. Five Points Mine – P-3475; AL0052990
28. Dry Creek Mine – P-3508; AL0054119
29. Hendrix Mine – P-3393; AL0028797
30. Friday’s Crossing Mine – P-3571; AL0056375
31. Scott Road Mine – P-3284; REL
32. Altoona Mine – P-3711; AL0065722
33. Bennett Mine – P-3348; AL0046884
34. Harvey Mine – P-3236; AL0042153
35. Straight Mountain Mine – P-3599: AL0058289
36. Straight Mountain Mine No. 2 – P-3614; AL0059412
37. Helms Pit – P-3654; AL0062120
38. Merritt Rogers Mine – P-3546; AL0054186
39. Sloan Mountain Mine – P-3811; AL0073067
40. Beltona #1570 Mine – P-3611; AL0022900

41. Royal Pit – P-3290; FOR
42. Mt Hebron Mine – P-3243; AL0045527

This interactive map (https://www.google.com/maps/d/edit?mid=1yMKLc-pwwZxX4bbMVzy38kxD-E8&usp=sharing) illustrates the mines closest to Narley Mine No. 3 and provides a compelling snapshot of how this area of the Locust Fork is inundated by surface mining. Yet no meaningful cumulative impacts analysis of the effects of these surface mines has ever been performed, despite the numerous federal actions (by the Corps of Engineers and here, OSMRE) necessary to facilitate mining at these sites.

It is essential that any cumulative impacts analysis include a proper accounting of all of these mine sites, current and former, especially in light of peer-reviewed research demonstrating that reclaimed surface mines "exert long-term impacts on stream chemistry with sustained high levels of conductivity, Al, and sulfate concentrations" even decades after reclamation. Hopkins, et al., *Exploring the legacy effects of surface coal mining on stream chemistry* (2013) at 5. Moreover,

> the efficacy of reclamation efforts . . . remains uncertain, specifically in terms of restoring natural stream function. While there is some evidence that reclamation efforts offer partial alleviation of sediment loading (Northington et al., 2011), the majority of studies show continued elevation of dissolved ions, increased conductivity, and modified flow regimes in streams downstream of reclaimed mine areas (Merricks et al., 2007; Pond et al., 2008; Johnson et al., 2010; Palmer et al., 2010; Lindberg et al., 2011; Northington et al., 2011). Thus, in spite of extensive reclamation efforts, surface coal mining may have a significant legacy effect on important parameters of stream chemistry and ecology.

Id. at p. 2.

The Hopkins study was conducted in southeastern Ohio, which like Alabama is on the edge of the central Appalachian coalfield. That study concluded that, comparable to the mountaintop removal and valley fill practices of central Appalachia, (see, e.g., Bernhardt and Palmer, 2011), surface coal mining appears to have a strong legacy effect on stream chemistry in other Appalachian coal mining regions outside the designated "central" region. Aquatic systems are highly sensitive to surface mining disturbances, and the negative effects on stream chemistry appear to persist over time, in spite of reclamation efforts. *See id.* at p. 7.

Here, rather than carefully evaluate those cumulative impacts and their effect on the Locust Fork subwatershed, the EA narrowly limits its analysis to Narley Mine, Jagger Mine and Narley Mine No. 3. That is so even though OSMRE acknowledges that "Narley Mine No. 3 is not an isolated coal mine." EA at 13. Two other Best Coal, Inc. operations are close by—Narley Mine (Permit P-3850) on the other side of Trouble Creek to the northeast and Jagger Mine (Permit P-3932) to the north between Trouble Creek and

Locust Fork. Excavation has not yet started at Jagger Mine, but coal recovery from Narley Mine is essentially complete. EA at 13.

A full accounting of the cumulative impacts is absolutely essential to ensure that these affected waterbodies can meet or exceed their designated use classifications. At some point, the loss of stream function and aggregated contributions of pollutants from all surface mining in the area will cause downstream creeks and the Locust Fork to exceed their carrying capacities for these contaminants and become impaired. That is precisely what has happened here, where several segments of the Locust Fork are designated as impaired due to the legacy and ongoing effects of surface mining. The stretch of the Locust Fork from Jefferson County Road 77 (a.k.a. Mt. Olive Road) to Blount County Road 30 was listed as impaired for siltation/habitat alteration for years and now has a siltation TMDL.

In addition to the increased contribution of sediment that would result from allowing the lease of Narley Mine No. 3, we are also extremely concerned with the potential that the mine poses to introduce other harmful contaminants common to surface mining. In the past, the Narley Mine was in consistent violation of its NPDES permit limits for total suspended solids, selenium, and toxicity as demonstrated by the table below, even though the mine had the sediment basins and NPDES permit that OSMRE suggests will now protect water quality below Narley Mine No. 3.

Narley Mine - Best Coal, Inc. - AL0075752 - NPDES Violations				
Date	**Outfall**	**Parameter**	**Permit Limit**	**Discharge**
Jan-2012	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	7.7 ug/L
1/12/2012	005-1	Toxicity	Pass/Fail	Fail
1/18/2012	005-1	Toxicity	Pass/Fail	Fail
1/19/2012	005-1	Toxicity	Pass/Fail	Fail
Nov-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	6.2 ug/L
Oct-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	11.0 ug/L
10/10/2011	005-1	Toxicity	Pass/Fail	Fail
Sep-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	31.6 ug/L
9/12/2011	005-1	Selenium, Daily Maximum Concentration	20.0 ug/L	31.6 ug/L
Aug-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	6.2 ug/L
Jun-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	7.7 ug/L
Apr-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	8.97 ug/L
Mar-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	15 ug/L
Mar-2011	007-1	Selenium, Monthly Average Concentration	5.0 ug/L	9.0 ug/L
Mar-2011	008-1	Total Suspended Solids, Monthly Average Concentration	35 mg/L	58 mg/L
3/15/2011	008-1	Total Suspended Solids, Daily Maximum Concentration	70 mg/L	78 mg/L
Feb-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	8.9 ug/L
Jan-2011	005-1	Selenium, Monthly Average Concentration	5.0 ug/L	22 ug/L

1/27/2011	005-1	Selenium, Daily Maximum Concentration	20.0 ug/L	22 ug/L
Jan-2011	007-1	Selenium, Monthly Average Concentration	5.0 ug/L	12 ug/L
Mar-2010	008-1	Total Suspended Solids, Monthly Average Concentration	35 mg/L	36 mg/L

Based on the proximity of these two mines, it can be reasonably assumed that the conditions that led to violations at the Narley Mine (e.g. chemical/geological makeup of coal seams and overburden, slopes, rainfall frequency and intensity) could also be present during active mining at Narley Mine No. 3.

Instead of analyzing these conditions or considering them in the context of multiple surface mines, OSMRE just glosses over them. EA at 13-14. OSMRE performed "supplemental quantitative analysis" of some of the water-monitoring data from Narley Mine (Permit P-3850) (to the northeast) as well as Jagger Mine (Permit P-3932) (to the north between Trouble Creek and Locust Fork). *Id.* at 13. OSMRE did not even look at selenium values or toxicity issues at the two mines, EA at 16-17, even though Narley Mine had problems with both during active mining. Moreover, as noted by OSMRE, excavation has not started at Jagger Mine while coal recovery is essentially complete at Narley Mine. So OSMRE is reviewing water quality monitoring from one mine that is moving to reclamation and another that has not begun excavation. OSMRE is not analyzing selenium or toxicity at all, despite past exceedances. This incomplete approach cannot accurately predict or analyze the potential water quality impacts during active mining at Narley Mine No. 3.

Even so, the conductivity values from OSMRE's analysis is alarming: measured conductivity is severely compromising the ability of aquatic life to live in Trouble Creek below Narley and Jagger Mines. EA at 17. EPA's July 21, *2011 Final Guidance on Improving EPA Review of Appalachian Surface Coal Mining Operations* establishes a conductivity benchmark of 300 µS/cm for surface waters below surface coal mines. Although EPA has yet to undertake field-based validation and/or studies to apply the benchmark in Alabama, it provides a useful standard of comparison here.[1]

OSMRE acknowledges that conductivity values in Trouble Creek show a "strong influence" from mining. EA at 16. But the agency fails to analyze or address what those values mean for water quality in Trouble Creek or the Locust Fork. Background levels in Trouble Creek above mined areas measure between 38–62 µS/cm, with a median value of 44 µS. EA at 17. Background levels in Trouble Creek below the areas mined measure between 433—3217 µS/cm, with a median value of 2252 µS/cm. EA at 17. That value is over 7 ½ times EPA's aquatic life benchmark. The EA then cites additional

[1] We question whether field validation studies are even necessary. According to EPA, "[r]ather than use toxicity test results, the adaptation uses field data to determine the loss of 5% of genera from streams. The method is applied to derive effect benchmarks for dissolved salts as measured by conductivity in Central Appalachian streams using data from West Virginia and Kentucky." *See* preface to *A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams*. Because Alabama, like Kentucky, is in Eco-region 68 we believe that if studies in West Virginia and Kentucky are adequate to support validation for the remaining four Central Appalachian states, they should be adequate to validate the studies for Alabama. Despite repeated requests, EPA has never offered a scientific basis to treat like states and ecoregions so differently.

sampling from two tributaries of Whites Creek at Narley Mine, which it characterizes as a "surrogate" for Narley Mine No. 3. *Id.* Conductivity at BCNMSW-1 measures between 7—7260 µS/cm, with a median value of 699, over twice EPA's aquatic life benchmark. EA at 18. Conductivity at BCNMSW-2 measures between 112—1317 µS/cm, with a median value of 765, again over twice EPA's aquatic life benchmark. Yet OSMRE does not address the effect of additional conductivity on water quality or aquatic habitat at Narley Mine No. 3.

The proposed project is located within the Locust Fork subwatershed in Jefferson County, Alabama, immediately adjacent to designated critical habitat for six species of listed mussels, *see* 69 Fed. Reg. 40,084 (July 1, 2004), and to the only remaining habitat for the endangered plicate rocksnail.

The plicate rocksnail is listed under the ESA and described by the IUCN as "critically endangered." *See* IUCN Red List 2013. Extensive surveys have located only one remaining population of plicate rocksnails, located only in this 20-mile reach of the Locust Fork below Narley Mine No. 3. *See id.*, citing Sirarchi, et al. 2004; USFWS 2000, 2004, 2005. Since the early 20th century, the species has disappeared from over 90% of its historic range where it formerly occurred in the Black Warrior River, Little Warrior River, and Tombigbee River (USFWS 2004, 2005). The remaining habitat of the plicate rocksnail includes streams that are "all small to moderate in size and volumes of flow, and their water and habitat quality can be rapidly affected by *local and offsite* pollution sources." *See* 63 Fed. Reg. 57,610, 57,616 (Oct. 28, 1998) (emphasis added).

Pollution is the main threat to this surviving population of the plicate rocksnail. *Id*. at 57,615. As explained by the FWS in its final rule listing the snail as endangered, "short-term and long term-impacts of point and nonpoint source water and habitat degradation continue to be a primary concern for the survival of [the plicate rocksnail], compounded by their isolation and localization." *Id.* at 57,616.

Despite this dire status of the plicate rocksnail, OSMRE has not evaluated the impacts of this project on sensitive species *below* Narley Mine No. 3. It has only evaluated endangered species *at* the mine site. This project unquestionably "may affect" the plicate rocksnail and the six mussel species in the Locust Fork downstream, particularly when combined with the effects of other adjacent mining. We believe that OSMRE has a duty to consult on any actions it takes – such as issuing a coal lease – that "may affect" listed species. *See, e.g.,* Thomas v. Peterson, 753 F.2d 754, 764 (9th Cir. 1985) (ESA's procedural requirements call for systematic determination of the effects of a federal project on endangered species; if project is allowed to proceed without substantial compliance with those procedural requirements, there can be no assurance that a violation of the ESA's substantive provisions will not result).

Because of its close proximity to the Locust Fork, the proposed lease also may affect the plicate rock snail and six species of listed mussels, including the Alabama moccasinshell (*Medionidus*

acutissimus),, the dark pigtoe (*Pleurobema furvum*), the orange-nacre mucket (*Lampsilis perovalis*), the ovate clubshell (*Pleurobema perovatum*), the triangular kidneyshell (*Ptychobranchus greenii*), and the upland combshell (*Epioblasma metastriata*).

As with the plicate rocksnail, OSMRE has a duty to consult on the impacts of this project on these mussel species, many of which are known to be sensitive to pollutants from coal mining. In its listing rule, the FWS itself noted that "water quality degradation" was one of the three major threats to these mussel species, *see* 58 Fed. Reg. 14,330, 14,335 (Mar. 17, 1993), and that "[p]ollution is a major problem in the Black Warrior River basin," with pollution sources "located throughout the area, but [] particularly concentrated in and around the Birmingham-Jefferson County area." *Id*. at 14,336. Further, the Service noted that "[s]urface coal mines have had a significant impact on the aquatic resources of the basin" with "[a]cidification, increased mineralization, and sediment loading from surface mines" resulting in "the local exclusion of fish species." *Id.* Studies of mussel species have routinely documented that mussels, and particularly juvenile mussels, are particularly susceptible to contaminants from coal mining. *See* Wang et al. (2013) *Toxicity of Sediments Potentially Contaminated by Coal Mining and Natural Gas Extraction to Unionid Mussels and Commonly Tested Benthic Invertebrates,* Envt'l Toxicology and Chem 32:1, pp 207-221.

These explicit statements in the listing rule provide another reason that OSMRE must not only conduct a robust cumulative impacts analysis: the agency must also determine whether the addition of pollution from Narley Mine No. 3 may affect listed species in the Locust Fork. Federal agencies cannot continue to permit multiple surface mines in a vacuum without understanding the full range of combined impacts on sensitive species.

The section of the Locust Fork where this mine is proposed contains designated critical habitat for the Alabama moccasinshell, the dark pigtoe, the orange-nacre mucket, the ovate clubshell, and the triangular kidneyshell. *See* 69 Fed. Reg. 40,084 (July 1, 2004). As explained in the Proposed Rule for designation of this critical habitat,

> Water pollution from coal mines [and other industrial sources] contributed to the demise of the species in certain portions of their historic ranges. Freshwater mussels, especially in their early life stages, are extremely sensitive to many pollutants (e.g., chlorine, ammonia, heavy metals, high concentrations of nutrients) commonly found in municipal and industrial wastewater effluents (Havlik and Marking 1987, Goudreau et al. 1988, Keller and Zam 1991). Stream discharges from these sources may result in decreased dissolved oxygen concentration, increased acidity and conductivity, and other changes in water chemistry, which may impact mussels or their host fish.

68 Fed. Reg. 14,756-7 (Mar. 26, 2003). Elements necessary for the survival of these species include "[w]ater quality, including temperature, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages" and "[s]and,

gravel, and/or cobble substrates with low to moderate amounts of fine sediment." 68 Fed. Reg. at 14,759. The EA fails to even mention the existence of this critical habitat or explain the potential impacts of this and other, similar projects on designated critical habitat, even though there is ample evidence documenting the adverse effects of surface mining on protected species and critical habitat in the area of Narley Mine No. 3.

As mentioned previously, some of the aquatic species affected exist only in the Locust Fork and nowhere else on earth. Instead of protecting these imperiled species, OSMRE is considering a lease that could further endanger them or alter critical habitat. Rather than narrowly confine the ESA analysis to the actual mine site, we ask OSMRE to consider impacts on the endangered species in the Locust Fork below Narley Mine No. 3.

Conclusion

When determining whether a project significantly affects the environment, agencies must consider a number of factors. Where, as here, an EA concludes that there are no potentially significant impacts, the agency must provide a detailed statement of reasons and issue a "finding of no significant impact" ("FONSI") on the environment. 40 C.F.R. § 1508.13. If a FONSI is made, "the agency must be able to make a convincing case for its finding." *See Hill v. Boy*, 144 F.3d 1446, 1450 (11th Cir. 1998).

Here, OSMRE has failed to make a convincing case for its findings in the EA. By failing to properly analyze the cumulative impacts of surface mining in the Locus Fork subwatershed, by failing to address the documented water quality impacts from Narley Mine No. 3 and similar action, and by failing to determine the impacts of the proposed lease on federally-protected species and critical habitat below the mine, OSMRE has not supported the FONSI nor complied with NEPA. We urge OSMRE to choose the "no action" alternative or, at a minimum, to undertake an Environmental Impact Statement ("EIS") to evaluate the cumulative impacts of this lease together with other known and reasonably foreseeable future federal actions on the Locust Fork.

Thank you for your consideration of our comments. Please do not hesitate to contact us if you have any questions or if you require any additional information.

For the River,

Nelson Brooke
Riverkeeper

John Kinney
Enforcement Coordinator

Eva Dillard
Staff Attorney

APPENDIX A—PART II

U.S. Environmental Protection Agency E-mail

July 24, 2020

[EXTERNAL] EA comments for Best Coal Inc. Narley Mine #3

Long, Larry <Long.Larry@epa.gov>

Fri 2020-07-24 1:53 PM

To: Travers, Allison M <atravers@osmre.gov>
Cc: Kajumba, Ntale <Kajumba.Ntale@epa.gov>; Martin, Molly <Martin.Molly@epa.gov>

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Allison Travers
U.S. Department of the Interior,
Regions 3,4, & 6
Office of Surface Mining Reclamation & Enforcement
William Betty Federal Bld.
501 Belle St. Suite 216
Alton, Illinois 62002

Re: Best Coal Inc. Federal Lease ALES-5519 Narley Mine #3

Dear Ms. Travers:

The U.S. Environmental Protection Agency has reviewed the Office of Surface Mining Reclamation & Enforcement (OSMRE) Knoxville Program Office Environmental Assessment (EA) pursuant to Section 309 of the Clean Air Act and the National Environmental Policy Act. OSMRE, I Regions 3, 4, and 6, prepared an EA to evaluate the environmental impacts that result from the mining plan proposed by Best Coal, Inc. Under that plan, the permittee would recover resources from federal coal lease ALES-55199 at their Narley Mine No. 3 in Alabama. Best Coal, Inc. has added approximately 160 acres and 469,000 tons of recoverable federal coal to its state-issued mining permit. Leased federal coal in Permit P-3990 is in Section 24, Township 15 South, Range 4 West, in Jefferson County, Alabama

The EPA recommends that the EA provide clarification on the U.S. Army Corps of Engineers (USACE) 404 permit, mitigation requirements, and downstream water quality. OSMRE may want to provide a more in-depth discussion to address financial assurance and downstream water quality.

The EPA understands that the proposed project area contains waterbodies which the USACE previously found to be waters of the United States. The draft EA states that the permittee will need to obtain a new Nationwide Permit 21 (NWP-21) permit. However, the project would not be eligible for an NWP-21, based on the amount of impacts proposed. NWP-21 (2017) provides a limitation 300 linear feet of impact to jurisdictional waters. The proposed project will impact approximately 11,186 linear feet of jurisdictional stream and impacts to 0.011 acres of wetlands. The EA also states any mitigation plan would be similar to the one found in Report 8. The “expired” NWP 21 mitigation plan in Report 8 lacks sufficient detail and quantitative performance measures. A more detailed and updated mitigation plan will be required which the EPA will review the during the permitting process.

The EPA request that these issues be addressed in the Final EA and during permitting. We appreciate the early collaboration efforts and the opportunity to provide comments for the proposed project.

Larry Long
Regional Mining Expert
Physical Scientist/Sr. Principle Reviewer
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Intelligence does not always define wisdom, but adaptability to change does

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APPENDIX A—PART III

Office of Surface Mining Reclamation and Enforcement Comment Response

OSMRE Comment Response

On June 8, 2020, the Office of Surface Mining Reclamation and Enforcement, Interior Regions 3, 4, and 6 (OSMRE) posted a preliminary environmental assessment (EA) for Narley Mine No. 3 on OSMRE's website and allowed the public to submit comments until July 8, 2020. Additionally, OSMRE gave public notice of availability and asked for comments through letters sent to government agencies, tribes, organizations, and individuals.

We received comments from Black Warrior Riverkeeper (Riverkeeper) (*Appendix A—Part I*) and U.S. Environmental Protection Agency (USEPA) (*Appendix A—Part II*), Region 4.

<u>RIVERKEEPER COMMENT 1</u> (*Page 2—Cumulative Impacts and Water Quality*)

The principal concern raised by Riverkeeper was an alleged lack of adequate consideration of the cumulative effect that the proposed action might have on Locust Fork and Trouble Creek, including the aquatic life that depends on those resources. Riverkeeper asserted that OSMRE should include an analysis of sediment and other pollutants from all currently active, reclaimed, and abandoned coal mines in the vicinity of Narley Mine No. 3 and any upstream mines that have an impact on the Locust Fork. Riverkeeper's count included 12 active mines and 42 former mining operations.

OSMRE Response

As explained in the EA, runoff from Narley Mine No. 3 drains to Trouble Creek, a tributary of the Locust Fork. See Section 3.3 and 4.13. The drainage area of Locust Fork at its confluence with Trouble Creek is approximately 850 square miles. Runoff from every acre of land surface within this drainage basin, whether undisturbed ground, mining-affected ground, farm field, logging site, roadway, residential lawn, industrial site, and so on, contributes to flow in Locust Fork. Consequently, water quality at any point in the stream integrates the pollution input from all runoff upstream from that point. This is a measure of cumulative input and, as such, is consistent with the cumulative effects provisions of the National Environmental Policy Act (NEPA). We have included additional analysis of the cumulative impacts to Locust Creek and Trouble Creek. Estimated concentrations of water-quality constituents at evaluation (critical) points in receiving streams are presented in Appendix B.

<u>RIVERKEEPER COMMENT 2</u> (*Page 2—Cumulative Impacts and Water Quality*)

Referring to their list of 54 mining operations in the Locust Fork drainage basin, Riverkeeper states that OSMRE should be looking at "lost stream function from each and every headwater, intermittent, or ephemeral stream that has been mined through or impounded at each of those mines."

OSMRE Response

While it is true that analysis of the type suggested by Riverkeeper may have scientific value, a NEPA analysis is not intended to be a retrospective study of environmental impacts to the extent

proposed by the commenter. The EA adequately considers the anticipated environmental impacts of the proposed action, including the cumulative effects of the proposed action.

<u>RIVERKEEPER COMMENT 3</u> (*Page 5—Cumulative Impacts and Water Quality*)

Riverkeeper states that "several segments of Locust Fork are designated as impaired due to the legacy and ongoing effects of surface mining. The stretch of the Locust Fork from Jefferson County Road (a.k.a Mt. Olive Road) to Blount County Road 30 was listed as impaired for siltation/habitat alteration for years and now has a siltation TMDL."

OSMRE Response

Segments of Locust Fork have previously been identified on the Alabama 303(d) List (a list of water bodies failing to meet their designated water use classifications) as impaired by siltation and nutrients. In February 2018, the Alabama Clean Water Act regulatory authority, the Alabama Department of Environmental Management (ADEM), published a draft delisting decision for Locust Fork. The information in that report supports the removal of the four siltation-impaired segments of Locust Fork from ADEM's 2016 303(d) list. In that report, ADEM concluded that 74.4 miles of Locust Fork, from Jefferson County Road 77 to Blount County Road 30, were fully supporting its designated uses with respect to siltation. Moreover, the 160 acres of leased federal coal proposed to be mined is within the drainage basin of Trouble Creek. Trouble Creek joins Locust Fork downstream from the reach of Locust Fork that was listed as impaired. Proposed mining would not affect water quality of Locust Fork upstream from its confluence with Trouble Creek.

<u>RIVERKEEPER COMMENT 4</u> (*Page 5-6—Cumulative Impacts and Water Quality*)

Riverkeeper expressed concern that OSMRE has inadequately analyzed the potential impacts of the proposed action on water quality and aquatic habitat, including the effects of increased contaminants, such as total suspended solids, selenium, and toxicity, and the effects of increased conductivity.

OSMRE Response

To address these concerns, we have included additional qualitative analysis of the cumulative impacts to Locust Creek and Trouble Creek, which is presented in Appendix B. In this analysis, OSMRE evaluated potential mining impacts to Locust Fork and Trouble Creek in terms of five water quality characteristics—specific conductivity, suspended solids, dissolved solids, sulfate, and selenium. This analysis concluded that the proposed action will not significantly degrade the quality of Locust Fork water downstream from Trouble Creek. In particular, neither selenium nor total suspended solids would measurably increase in Locust Fork. A small increase in conductivity would be expected but may not be reliably measurable. In Trouble Creek, the analysis concluded that the proposed action might increase sulfate by 5.7 percent, total dissolved solids by 0.9 percent, total suspended solids by 30 percent, and selenium by 111 percent. While these potential increases as percentages can be substantial, particularly for total suspended solids and selenium, the estimated concentrations of total suspended solids and selenium were found to be well within USEPA's national recommendations and National Pollutant Discharge Elimination System (NPDES) permit discharge limitations. Conductivity may increase by 6.5

percent near the mouth of Trouble Creek. The potential impacts of this increase in conductivity on aquatic life and habitat in Trouble Creek is discussed further in Appendix B, as well as in response to Riverkeeper Comment 5, below.

RIVERKEEPER COMMENT 5 (*Page 7—Threatened and Endangered Species; Critical Habitat*)

Riverkeeper also expressed concern that OSMRE has inadequately analyzed the impacts of the proposed action on threatened and endangered species and designated critical habitat. Specifically, they noted that the Locust Fork subwatershed in Jefferson County, Alabama is "immediately adjacent to designated critical habitat for six species of listed mussels [(the Alabama moccasinshell, the dark pigtoe, the orange-nacre mucket, the ovate clubshell, the triangular kidneyshell, and the upland combshell)] . . . and to the only remaining habitat for the endangered plicate rocksnail." Riverkeeper notes that the plicate rocksnail is only found in a 20-mile stretch of Locust Fork below the mine, and that pollution is the main threat to this species as well as the six species of listed mussels.

OSMRE Response

As discussed in Section 4.6 of the EA, OSMRE did analyze the potential effects of the proposed action on threatened and endangered species and critical habitat. Specifically, OSMRE evaluated the proposed action and determined that 13 threatened and endangered species "may be present within" the project area. Included within those 13 species were the six mussel species and the plicate rocksnail identified by the commenter.

The U.S. Fish and Wildlife Service (USFWS) final rule, which determined the plicate rocksnail to be endangered (63 FR 57610), specifies several activities unlikely to result in a violation of section 9 of the ESA. These activities include: (1) existing discharges into water supporting these species, provided these activities are carried out in accordance with existing regulations and permit requirements (e.g., activities subject to sections 402, 404, and 405 of the Clean Water Act and discharges regulated under the NPDES); and (2) actions that may affect the species and are authorized, funded or carried out by a Federal agency when the action is conducted in accordance with any reasonable and prudent measures given by USFWS in accordance with section 7 of the ESA.

As described in Appendix B, we analyzed the impacts of pollution, particularly selenium and conductivity, on listed aquatic species in Trouble Creek and Locust Fork. The Trouble Creek water quality analysis described in Appendix B concluded that potential selenium runoff and increased concentration of total suspended solids from the proposed action would be well within the limits of the NPDES permit and not materially damage any existing aquatic habitat. The analysis estimated that conductivity near the mouth of Trouble Creek could increase six percent as a result of the proposed action; however, no listed species are known to occur in Trouble Creek due to the absence of suitable habitat. The 2013 Biological Habitat Assessment attributes this lack of habitat to excessive siltation caused by off-road recreational vehicles. As mentioned previously, six listed mussel species and the plicate rocksnail are known to occur in the Locust Fork. The quantitative analysis described in Appendix B concluded that the proposed action would not significantly degrade the water quality of Locust Fork downstream from the

confluence of Trouble Creek as neither selenium nor total suspended solids would measurably increase as a result. A small increase in conductivity may occur but may not be reliably measurable. As such, existing aquatic habitat for those listed species in Locust Fork would not likely be adversely affected.

After analyzing the possible effects to those species and the critical habitat, OSMRE concluded that the proposed action is not likely to adversely affect those species or critical habitat. This conclusion is predicated on the operator's compliance with its ASMC permit conditions, the water quality standards required by its ADEM NPDES permit, and the permit conditions of the Clean Water Act Section 404 individual permit the operator will need to obtain from the U.S. Army Corps of Engineers before conducting any mining activities within Increment 4. On July 29, 2020, as part of OSMRE's section 7 consultation, the USFWS concurred with OSMRE's determination that the proposed action is not likely to adversely affect any of the 13 protected species that are known to occur in the project area watershed.

RIVERKEEPER COMMENT 6 (*Page 9—Conclusion*)

In its conclusion, Riverkeeper asserts that OSMRE has failed to make a convincing case for its findings in the EA and, in doing so, has not supported the finding of no significant impact nor complied with NEPA. Riverkeeper "urges OSMRE to choose the no action alternative or, at a minimum, to undertake an Environmental Impact Statement (EIS) to evaluate the cumulative impacts of this lease together with other known and reasonably foreseeable future federal actions on the Locust Fork."

OSMRE Response

The EA adequately and accurately assesses the anticipated environmental impacts of the proposed action, including the cumulative effects of the proposed action. OSMRE has also provided an additional cumulative impacts analysis in Appendix B. These analyses provide sufficient evidence and analysis for the finding of no significant impact. Therefore, an environmental impact statement is not required.

USEPA COMMENT 1

The USEPA Region 4 recommends that OSMRE's EA provide a more in-depth discussion of downstream water quality.

OSMRE Response

As noted above, estimated concentrations of water-quality constituents at evaluation (critical) points in receiving streams are presented in Appendix B.

APPENDIX B

Technical Analysis of Cumulative Impacts of Surface Mining to Locust Fork and Trouble Creek

Technical Analysis of Cumulative Impacts of Surface Mining to Locust Fork and Trouble Creek

Concentrations of water-quality constituents at an evaluation (critical) point in a receiving stream can be estimated using an equation given by Lumb:[1]

$$Cnc = \frac{Qp\ Cp + Qc\left(\frac{Ac-Ap}{Ac}\right)Cg}{Qp + Qc\left(\frac{Ac-Ap}{Ac}\right)} \quad (1)$$

where

Cnc = new concentration at the critical point;

Cg = concentration from the general area;

Cp = concentration from the permit area;

Ac = drainage area above the critical point;

Ap = permit area in the drainage basin;

Qp = flow from the permit area; and

Qc = flow at the critical point before operations begin at the permit area.

Locust Fork

The Locust Fork evaluation point (Cnc) for this analysis is a monitoring point in that stream below the confluence with Trouble Creek. The U.S. Geological Survey (USGS) has two monitoring stations on Locust Fork: station 02456500 at Sayre, Alabama, which is about 6.6 stream miles below the point where Trouble Creek enters Locust Fork; and station 02455000 at Cleveland, Alabama, which is about 55 stream miles above this confluence. Water-quality monitoring at station 02456500 ended after June 26, 2014, although USGS still takes flow measurements at that the station.

Since the end of USGS water-quality monitoring at station 02456500 in 2014, OSMRE is aware of only one sampling event for water-quality testing below the Locust Fork-Trouble Creek confluence. That event occurred on November 10, 2017, just over a month before the ASMC issued Permit P-3990 for Narley Mine No. 3. Test results are in the permit application package for Narley Mine No. 3 and are shown in the table below.

[1] Alan M. Lumb, *Procedures for the Assessment of Cumulative Impacts of Surface Mining on the Hydrologic Balance*, U.S. Geological Survey Open-File Report 82-334, 1982.

Table 1. Water-quality characteristics of Locust Fork as sampled on 11/10/2017 just below the confluence with Trouble Creek.

[Cfs, cubic feet per second; s. u., standard pH units; TSS, total suspended solids; TDS, total dissolved solids; SC, specific conductivity; mg/L, milligrams per liter; µS/cm, microSiemens per centimeter; µg/L, microgram per liter; BML, below measurement limit]

Flow cfs	pH s.u.	TSS mg/L	TDS mg/L	SC µS/cm	Sulfate mg/L	Total Fe mg/L	Total Mn mg/L	Total Ni µg/L	Total Se µg/L
344	6.7	4	114	244	28	0.29	0.06	BML*	BML*

*Best Coal's consultant has submitted laboratory test reports for other monitoring stations at Narley Mine No. 3. Those reports present "less-than" numeric values for low concentration of nickel or selenium rather than use the label "BML." Specifically, low concentrations of nickel have been given as <6.86 µg/L while low concentrations of selenium have been given as <0.95 µg/L.

Ideally (eq. 1) would only need to be solved once to directly address the hydrologic consequences of the federal action under consideration—a decision whether there will be additional disturbance at Narley Mine No. 3 to recover 160 acres leased federal coal. However, the timing of the 2017 Locust Fork water-monitoring event requires a two-step approach make the hydrologic assessment. After Locust Fork water was tested in 2017, essentially 374 acres of the 551-acre Narley No. 3 permit area have been mined. Effects of this mining will have been cumulatively added to the effects of all other land disturbance activity in Locust Fork drainage basin above the point where Trouble Creek flows into Locust Fork. In other words, the 2017 water test data needs to be "updated" before proceeding with an analysis of how mining 160 acres of leased federal coal might affect Locust Fork.

OSMRE took a two-step approach to evaluate mining impacts to Locust Fork. Step 1 uses (eq. 1) to estimate the "current" water quality out in Locust Fork in terms of five characteristics—specific conductivity, suspended solids, dissolved solids, sulfate, and selenium. Step 2 uses the results from step 1 when doing the calculation again, this time to evaluate the effects of mining 160 acres of leased federal coal.

Measured water quality at downstream Trouble Creek station BCJMSW-5 is used in Step 1. There have been seven monitoring events at BCJMSW-5 since ASMC issued Permit 3990. The period of record is March 7, 2018, through July 2, 2019. To solve (eq. 1), OSMRE uses mean values for the five water-quality indicator characteristics. Trouble Creek at station BCJMSW-5 has a drainage area of 3.6 square miles.

Discharge monitoring from sediment pond 002 at Narley Mine No. 3 is used in Step 2. Pond 002 is regulated under NPDES permit number AL0075752. Most runoff from the 160-acre federal coal parcel flows into Pond 002 by way of an unnamed tributary to Trouble Creek. Pond 002 has a drainage basin of 249 acres. The record for Pond 002 is sparse; monitoring events cover the period starting on January 6, 2018 and ending on February 7, 2019. There were 13 monitoring events with 9 of these reported as no discharge. One event of the 13 only involved sampling for whole effluent toxicity (WET) testing. That sample passed both the acute and chronic standards for C. *dubia* and P. *promelas*.

Step 1: Solve (eq. 1) to estimate "current" Locust Fork water quality. Use 2017 Locust Fork test results and reported water quality for station BCJMSW-5 at downstream Trouble Creek. Trouble Creek data are those from samples collected after ASMC issued Permit P-3990.

BCJMSW-5: Ap = 3.6 mi^2 Qp = 7.9 cfs
Locust Fork just below confluence with Trouble Creek: Ag = 850 mi^2 Qg = 344 cfs

Input values			Calculated new concentrations (Cnc) in Locust Fork just below confluence with Trouble Creek
variable	Cp	Cg	
SC, µS/cm	1250	244	266
Se, µg/L	<0.95	<0.95	<0.95
Sulfate, mg/L	646	28	41
TDS, mg/L	1114	114	136
TSS, mg/L	10	4	4

Step 2: Solve (eq. 1) to estimate future Locust Fork water quality based on cumulative input from 160 acres of mined ground. Use calculated "current" Locust Fork characteristics from Step 1. Area and flow rate are for Pond 002 at the 160-acre federal coal portion of Permit P-3990. NPDES Permit AL0075752 gives daily maximum discharge limits for selenium (20 µg/mL) and total suspended solids (70 mg/L). Values for the other three water characteristics—conductivity, sulfate, and total dissolved solids—are of a magnitude that might reasonably be expected to occur upon mining 160 acres of federal coal. These values are averages of numbers reported for NPDES discharge testing at sediment ponds 001, 026, 036, and 041. These four structures receive runoff from those portions of Permit P-3990 that have already been mined.

Pond 002: Ap = 0.389 mi^2 Qp = 0.415 cfs
Locust Fork just below confluence with Trouble Creek: Ag = 850 mi^2 Qg = 344 cfs

Input values			Calculated new concentrations (Cnc) in Locust Fork just below confluence with Trouble Creek
variable	Cp	Cg	
SC, µS/cm	2709	266	269
Se, µg/L	20	<0.95	<0.97
Sulfate, mg/L	1306	41	43
TDS, mg/L	1293	136	137
TSS, mg/L	70	4	4

Quantitative analysis, constrained by the limited available data, projects that the cumulative effect of mining and reclaiming 160 acres of Permit P-3990 to recover leased federal coal will not significantly degrade the quality of Locust Fork water downstream from Trouble Creek. In particular, neither selenium nor total suspended solids would measurably increase in Locust Fork. A small increase in conductivity from 266 µS/cm to 269 µS/cm might not even be reliably measurable.

Trouble Creek

OSMRE evaluated mining impacts to Trouble Creek using (eq. 1). Station BCJMSW-5 is the furthest downstream monitoring point on Trouble Creek. We estimated water quality in terms of

five characteristics—specific conductivity, suspended solids, dissolved solids, sulfate, and selenium. The "current" state of Trouble Creek comes from sampling events conducted at BCJMSW-5 after ASMC issued Permit P-3990. Refer to Step 2 above for the source of data used to characterize runoff from the 160 acres of land containing leased federal coal.

BCJMSW-5: Ag = 3.6 mi^2 Qg = 7.9 cfs
Pond 002: Ap = 0.389 mi^2 Qp = 0.415 cfs

Input values			Calculated new concentrations (Cnc) downstream Trouble Creek at monitoring station BCJMSW-5
variable	Cp	Cg	
SC, µS/cm	2709	1250	1331
Se, µg/L	20	<0.95	<2.0
Sulfate, mg/L	1306	646	683
TDS, mg/L	1293	1114	1124
TSS, mg/L	70	10	13

The estimated change in a given water characteristic with the addition of new mining can be expressed as a percent increase. Recovering leased federal coal from Narley Mine No. 3 might increase specific conductivity by 6.5 percent, sulfate by 5.7 percent, total dissolved solids by 0.9 percent, total suspended solids by 30 percent, and selenium by 111 percent. Because of the uncertainty in the "current" selenium concentration at BCJMSW-5 due to the preponderance of "less than" values in the monitoring record, the estimated change would be something less than 111%. That percentage change assumes Pond 002 discharges selenium right at the NPDES daily maximum limit of 20 µg/L. From April 9, 2013, through September 29, 2019, the maximum selenium concentration among 80 measurements reported for NPDES outfalls at Narley Mine and adjacent Narley Mine No. 3 was 7.58 µg/L.

Riverkeeper expresses concern about conductivity and selenium. The upstream monitoring station on Trouble Creek is BCN3SW-3. Reported conductivity values for water unaffected by mining range from 40 µS/cm to 62 µS/cm. Five sampling events occurred between October 19, 2009, and March 16, 2010. Clearly, mining has affected the electrical conductivity of downstream Trouble Creek.

The EPA came up with an aquatic life benchmark of 300 µS/cm for central Appalachian streams.[2] That number, designed to protect sensitive aquatic species, was not adopted as a national standard and the question remains whether a value based on field studies in central Appalachia would apply to the Black Warrior Coal Basin. Nevertheless, aquatic species sensitive to conductivity may have already been extirpated from the reach of Trouble Creek that receives mine runoff. As noted above, OSMRE estimates that conductivity near the mouth of Trouble Creek could increase some six percent due to mining leased federal coal on Permit P-3990.

A letter in the Narley Mine No. 3 permit application package from the Alabama Department of Conservation and Natural Resources dated May 2, 2017, states that their database contains no

[2] *A Field-Based Aquatic Life Benchmark for Conductivity in Central Appalachian Streams*, EPA/600/R-10/023F, March 2011.

record of a biological survey having been performed at the then proposed mine. However, BCI's consultant did a field survey for the BLM leasing EA. Report 9 by McGehee Engineering Corp. titled *Biological Habitat Assessment Trouble Creek* is in Appendix II of that leasing EA. Field work covered about 17,240 linear feet of Trouble Creek over the course of four days during the period from December 12, 2012, to February 28, 2013. The survey focused on the presence of 17 listed, threatened, or endangered species and their habitat. No individuals from this group of mussels, snails, and fish were observed in Trouble Creek nor was there suitable habitat for these animals. Report 9 attributes the absence of aquatic habitat or its degradation to excessive siltation caused by off-road recreational vehicles. These vehicles have been using stream beds in the area as trails.

The 2012/2013 survey did not look for aquatic arthropods. As Riverkeeper points out, certain sensitive insects are indicator species for water chemistry, particularly conductivity. Without knowing what aquatic life currently lives in Trouble Creek, it is not possible to predict how a 6 percent increase in conductivity over an already high value might affect inhabitants of that creek.

While there is baseline conductivity data, the same does not seem to be true for selenium. OSMRE knows of no selenium test data for stream station BCN3SW-3. This station does not now receive, and apparently never has received, runoff from mined ground. Measured selenium concentrations near the mouth of Trouble Creek have mostly been low. The full monitoring record for station BCJMSW-5 runs from June 25, 2013, to July 2, 2019. There have been 26 monitoring events; samples from eight of these were tested for selenium. Only one selenium concentration (16.36 µg/L) was above the reported measurement limit of 0.95 µg/L.

NPDES permit AL0075752 has a monthly average selenium limit of 5 µg/L for sediment-pond discharge. The 5 µg/L limit is the EPA's national recommended selenium Criterion Continuous Concentration (CCC). A CCC is "an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect." At an estimated concentration of <2 µg/L, OSMRE predicts that selenium in runoff from the 160 acres that might be mined to recover leased federal coal will not materially damage the Trouble Creek aquatic habitat.

The concentration of total suspended solids in Trouble Creek might increase 30 percent. Nevertheless, the cumulative effect to the creek would be negligible because the estimated amount of suspended solids (13 mg/L) would be low relative to the NPDES monthly average or daily maximum discharge limits of 35 mg/L and 70 mg/L, respectively.