Environmental Assessment

Kings Mountain Lithium Mine Project City of Kings Mountain, North Carolina

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PRIVACY ADVISORY

This draft Environmental Assessment (EA) has been provided for public comment in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality NEPA Implementing Regulations (Title 40 Code of Federal Regulations [CFR] §§ 1500–1508), and 32 CFR § 989, the Environmental Impact Analysis Process which provides an opportunity for public input on applicable federal decision-making, allows the public to offer input on alternative ways for federal agencies to accomplish a proposed action and solicits comments on the agencies' analysis of environmental effects.

Public input allows the federal agencies to make better-informed decisions. Letters or other written or verbal comments may be published in this EA. Providing personal information is voluntary. Private addresses will be compiled to develop a stakeholder inventory; however, only the names of the commenting individuals and their specific comments will be disclosed. Personal information, home addresses, telephone numbers, and email addresses will not be published in the EA.



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Acronyms and Abbreviations

Definition
degrees Fahrenheit
American Meteorological Society/Environmental Protection Agency Regulatory Model
Albemarle U.S., Inc.
above mean sea level
Bird of Conservation Concern
block group
Bipartisan Infrastructure Law
best management practice
Census Block Group
Council on Environmental Quality
Code of Federal Regulations
methane
carbon monoxide
carbon dioxide
census tract
Department of the Air Force
A-weighted decibel
North Carolina Division of Energy, Mineral, and Land Resources
dense media separation
U.S. Department of Energy
Defense Production Act
Department of Solid Waste Management
Environmental Assessment
environmental justice
Executive Order
environmental protection measure
Endangered Species Act
European Union
Federal Emergency Management Agency
Finding of No Significant Impact
Kings Mountain Gateway Trail
greenhouse gas
gallons per minute
hazardous air pollutant
Interstate 85
Information for Planning and Consultation



JD	jurisdictional determination
КММ	Kings Mountain Mine
KMSZ	Kings Mountain Shear Zone
KOP	key observation point
MBTA	Migratory Bird Treaty Act
MSHA	Mine Safety and Health Administration
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCAC	North Carolina Administrative Code
NCDEQ	North Carolina Department of Environmental Quality
NCDOT	North Carolina Department of Transportation
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
non-PAG	non-potentially acid generating
NPDES	National Pollutant Discharge Elimination System
NPI	non-process infrastructure
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OSF	overburden storage facility
OSHA	Occupational Safety and Health Administration
PAG	potentially acid generating
PAH	polycyclic aromatic hydrocarbons
PEM	palustrine emergent wetland
PFO	palustrine forested wetland
PM	particulate matter
PM ₁₀	Particulate matter with a diameter of less than 10 micrometers
PM _{2.5}	Particulate matter with a diameter of less than 2.5 micrometers
PPV	peak particle velocity
Proposed Project	Kings Mountain Lithium Mine Project/Preferred Site Alternative
PSS	palustrine scrub-shrub
PUB	palustrine unconsolidated bottom
RCRA	Resource Conservation and Recovery Act
ROM	run-of-mine
RSF	rock storage facility
RSF-A	rock storage facility for non-potentially acid generating rock
RSF-W	rock storage facility used to temporarily store potentially acid generating rock



RSF-X	rock storage facility for potentially acid generating rock
SHEM	safety, health, and environment manager
SHPO	North Carolina State Historic Preservation Office
SIP	State Implementation Plan
SOP	standard operating procedure
SO ₂	sulfur dioxide
SRK	SRK Consulting U.S., Inc.
SWCA	SWCA Environmental Consultants
TENORM	Technologically Enhanced Naturally Occurring Radioactive Material
Technology Center	Global Technology Center for Research and Development
TIA	traffic impact analysis
TNW	traditional navigable water
TSB	Tin-Spodumene Belt
TSF	tailings storage facility
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VIA	visual impact assessment
WOTUS	Waters of the United States
WSB	water storage basin
WTP	water treatment plant



1. INTRODUCTION

This draft Environmental Assessment (EA) was prepared by the United States (U.S.) Department of Energy (DOE) National Energy Technology Laboratory (NETL) pursuant to the National Environmental Policy Act of 1969 (NEPA) (U.S. Code, Title 42, Section 4321 et. Seq., [42 USC § 4321]) and DOE's NEPA implementing procedures (Code of Federal Regulations Chapter 10, Part 1021[10 CFR Part 1021]), to evaluate the potential environmental and social impacts of DOE's proposed action to provide funding to Albemarle U.S., Inc.'s (Albemarle's) proposed project as opposed to the No Action Alternative.

Albemarle, based in Charlotte, North Carolina, is a leading global producer of lithium-based chemicals. The company currently operates a lithium compound and metal production facility at the site of the legacy Kings Mountain Mine (KMM) in Cleveland County, North Carolina.

The DOE NETL is providing cost-shared funding to Albemarle US Inc to support the lithium material processing plant at the Kings Mountain Facility. This project aims to boost job creation and increase lithium production.

1.1. U.S. DEPARTMENT OF ENERGY'S PURPOSE AND NEED

The purpose and need for DOE action, pursuant to the Office of Manufacturing and Energy Supply Chains and in collaboration with the Office of Energy Efficiency and Renewable Energy program and the funding opportunity under the Bipartisan Infrastructure Law (BIL): Lithium Materials Processing and Lithium Manufacturing (DE-FOA-0002678), is to accelerate the development of a concentrator facility (also referred to as a "mineral processing plant"). Through a grant awarded to Albemarle, DOE proposes to partially fund the design, construction, and start of operations for a mineral processing plant that would produce approximately 420,000 metric tons of spodumene concentrate annually. DOE proposes to provide \$149,658,312, and Albemarle's private cost share would be at least \$244,407,734, for a total of \$394,066,046. The grant funding is intended to support a portion of the anticipated cost to construct a new, commercial-scale, U.S.-based lithium materials/spodumene mineral processing plant that uses sustainably extracted spodumene minerals from the reopened and expanded mine at Kings Mountain in North Carolina. The proposed project would support DOE's Energy Strategic Goal of "protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally sound energy."

BIL investments in the battery supply chain include five main steps: (i) raw material production;(ii) materials processing including material refinement;(iii) battery material/componentmanufacturing and cell fabrication; (iv) battery pack and end-use product manufacturing; and (v)battery end-of-life recycling.

DOE considers Albemarle's proposed project and location to be one that can meet the following BIL sections by: a) creating and retaining good-paying jobs; b) supporting inclusive and supportive workforce development efforts to strengthen America's competitive advantage; c) ensuring that the U.S. has a viable domestic battery materials processing industry to supply the



North American battery supply chain; d) expanding the U.S.'s capabilities in advanced battery manufacturing; e) enhancing national security by reducing the U.S.'s reliance on foreign competitors for critical materials and technologies; f) enhancing the domestic processing capacity of minerals necessary for battery materials and advanced batteries; and g) ensuring that the U.S. has the viable domestic manufacturing and recycling capability to support and sustain a North American battery supply chain. The proposed project site was selected due to its proximity to supporting industries and the availability of existing industrial facilities in the area, as well as the site's access to reliable green energy. The site has room for future expansion and exceptional access to transportation infrastructure and public utilities. The proposed project also has the potential to have a significant positive economic impact on the King's Mountain community.

DOE intends to further the above-described purpose and satisfy stated needs by providing financial assistance under cost-sharing arrangements to this and other projects selected under DE-FOA-0002678. These projects are needed to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis. Such projects meet the objective of recruiting, training, and retaining a skilled workforce in communities that have lost jobs due to displacement of fossil fuel-based energy jobs, including jobs in internal combustion, engine vehicle and components manufacturing, as well as workforce opportunities in low and moderate-income local and rural communities. The proposed project would also meaningfully assist with the nation's economic recovery by creating U.S. manufacturing jobs in accordance with the objectives of the BIL.

1.2. DEPARTMENT OF AIRFORCE'S PURPOSE AND NEED

To promote national security and reduce dependence on foreign supplies, Presidential Determination No. 2022-11 authorizes the Department of Defense to secure a reliable, sustainable supply of critical minerals within the U.S. This directive is pursuant to Section 303(a)(5) of the Defense Production Act (DPA) of 1950, which states the Secretary of Defense shall lead this effort and has assigned oversight of the DPA Title III Executive Agent Program Office within the Air Force Research Laboratory. Therefore, the purpose of the proposed action is for the DOE and the Department of the Air Force (DAF), as a cooperating agency, to address the capability gap in procuring lithium within the U.S. The need for the action is to provide a reliable, affordable domestic lithium stream to meet the nation's demands, essential for both the U.S. economy and national defense.

The DAF supports DOE as the lead agency for NEPA requirements as well as Section 7 consultations of the Endangered Species Act and Section 106 consultations of the National Historic Preservation Act, including consultations with federally recognized Tribes and other similar regulatory consultations or other coordination requirements (See Appendix A, Department of the Air Force Cooperating Agency Letter). Once the NEPA process is completed, separate cost-shared grant funding from DAF of \$225,967,885.38 would be awarded under DPA Title III to secure the domestic lithium source within the U.S. The cost share from Albemarle would be at least \$136,015,693.74 with a DAF contribution of \$89,952,191.64.



1.3. NATIONAL ENVIRONMENTAL POLICY ACT AND RELATED PROCEDURES

NEPA requires federal agencies to consider the potential consequences of their actions on both the natural and human environments as part of their planning and decision-making processes. This EA has been prepared in accordance with NEPA, as amended (42 USC § 4321), the President's Council on Environmental Quality's (CEQ) regulations for implementing NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR 1021). These statutes and the implementing regulations require that, as the lead federal agency, DOE perform the following:

- Assess the environmental impacts of the proposed action;
- Identify any adverse environmental effects that cannot be avoided, should the proposed action be implemented;
- Propose mitigation measures for adverse environmental effects, if appropriate;
- Evaluate alternatives to the proposed action, including a No Action Alternative; and
- Describe the cumulative impacts of the proposed action together with other past, present, and reasonably foreseeable future actions.

These provisions must be addressed before a final decision is made to proceed with a proposed federal action that has the potential to impact the human environment, including providing federal funding to a project. This EA is intended to meet DOE's and other federal agencies' regulatory and grant requirements under NEPA. Table 1: Laws, Regulations, and Executive Orders (EOs), provides a list of requirements applicable to the review of the proposed action. This EA also provides the DOE with the information needed to make an informed decision about providing financial assistance. In accordance with the regulations discussed above, this EA allows for public input into the federal decision-making process; provides federal decision-makers with an understanding of the potential environmental effects of their decisions; and documents the NEPA process.

Table 1: Laws, Regulations, and Executive Orders

National Environmental Policy Act and Laws, Regulations, and Executive Orders

Advancing Racial Equity and Support for Underserved Communities through the Federal Government (EO 13985)

Bald and Golden Eagle Protection Act

Clean Air Act

Clean Water Act

Comprehensive Environmental Response, Compensation, and Liability Act

Endangered Species Act

Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (EO 13690)



National Environmental Policy Act and Laws, Regulations, and Executive Orders

America's Supply Chains (EO 14017)

Federal Actions to Address Environmental Justice in Minority Population and Low-income Populations (EO 12898)

Floodplain Management (EO 11988)

Migratory Bird Treaty Act

Pollution Prevention Act of 1990

Protection of Wetlands (EO 11990)

Resource Conservation and Recovery Act

Revitalizing our Nation's Commitment to Environmental Justice for All (EO 14097)

Tackling the Climate Crisis at Home and Abroad (EO 14008)

The Noise Control Act of 1972, as amended

National Historic Preservation Act

The Native American Graves Protection and Repatriation Act

EO = Executive Order

1.4. SCOPE OF ENVIRONMENTAL ASSESSMENT AND PERMITTING

This EA will be reviewed by the DOE and DAF and other cooperating agencies to determine whether the proposed project constitutes a Finding of No Significant Impact (FONSI). The EA is a stand-alone document provided as a grant requirement to the DOE and the DAF and will be sent to other federal agencies responsible for NEPA reviews.

As the lead agency, the DOE has created an Interim Action Memorandum to authorize specific tasks that can be carried out before completing the EA for the proposed project or issuing a FONSI. Elements of the Proposed Project, such as land acquisition, construction, procurement, design, permitting, and select training and hiring practices were examined by DOE and determined not to have a significant effect on the environment nor to limit the range of reasonable alternatives for the project. DOE has determined that completing the tasks as outlined in the Interim Action Memorandum will not have an adverse environmental impact; nor will they limit the choice of reasonable alternatives for the proposed project. These tasks were documented in the memorandum titled, "RE: Interim Action(s) within the scope of an ongoing EA prior to issuance of a FONSI for the Project."

The scope of the proposed action (providing federal financial assistance for construction of the facility) has been reviewed to identify potentially significant issues that would warrant detailed review in the EA. In its review, DOE considered the scope of the proposed action, the location of the facility within the city of Kings Mountain, the existing industrial setting, and the status of the permits and approvals necessary for construction of the facility. In accordance with NEPA, this EA addresses the proposed project's construction and planned operations.

The following list is a summary of proposed project activities under NEPA review:

1. Construction of an offsite tailings storage facility (TSF).



- 2. Construction of support infrastructure for the activities described by the proposed action including haul roads, offices, fueling facilities, vehicle wash areas, and other non-process infrastructure (NPI).
- 3. Construction of a bridge to connect the two KMM facility areas located north and south of Interstate 85 (I-85).
- 4. Construction of conveyors to transport ore, concentrate, tails, and other materials.
- 5. Construction of concentrate and tailings loadout areas.
- 6. Construction of three rock storage facilities (RSFs): one for non-potentially acid generating (non-PAG) rock (RSF-A), one for potentially acid generating (PAG) rock (RSF-X), and one which will be used to temporarily store PAG material at the bottom of the open pit while construction of RSF-X is underway (RSF-W).
- 7. Construction of a water treatment facility to treat runoff water from the PAG RSF area and process water from the mineral processing plant.
- 8. Construction of a run-of-mine (ROM) pad where ore would be stored prior to feeding the crushing circuit.
- 9. Resumed mining of the spodumene pegmatite resource, which would increase the size of the open pit.
- 10. Separation of rock from ore.
- 11. Construction of three overburden storage facilities (OSFs) for storage of saprolite and overburden soils removed to improve foundation conditions and stability of other facilities.

Based on DOE's review of the scope of the proposed action, existing site conditions, and permit status, the elements of the DOE's review that have impacts analyzed by this EA include:

- Aesthetics and visual resources;
- Air quality;
- Biological resources including habitat vegetation and threatened and endangered species;
- Cultural resources;
- Geology and soils;
- Greenhouse gases (GHGs);
- Public health and safety;
- Land use;
- Parks, recreational areas, and fisheries;
- Coastal zone;
- Noise and blasting;
- Socioeconomics and environmental justice (EJ);



- Traffic and transportation;
- Waste management; and
- Water resources.

These resource areas were identified as being potentially affected by the proposed project, and each was assessed to determine the nature and extent of the impacts. This EA also examined the direct, indirect, and cumulative effects of the proposed project. The assessment combined desktop research and analysis of existing information along with select field studies including site assessments related to wetlands, flora, fauna, soils and geology, visual and aesthetic resources, and cultural resources.

Under the Endangered Species Act (ESA), DOE initiated consultations with the U.S. Fish and Wildlife Service (USFWS) and the North Carolina Wildlife Resources Commission, who will focus on wildlife and protected species, and the North Carolina Historical Commission at the State Historic Preservation Office (SHPO) under Section 106 of the National Historic Preservation Act (NHPA), who will assess historical, cultural, and archaeological resources. The U.S. Environmental Protection Agency (USEPA) will review drinking water resources, EJ, socioeconomics, and hazardous waste and pollution.

1.5. CONSULTATION WITH TRIBAL NATIONS

The DOE initiated consultations with the Catawba Indian Nation, Cherokee Nation, Eastern Band of Cherokee Nation, and Muscogee (Creek) Nation on March 13, 2024, and the United Keetoowah Band of Cherokee on September 4, 2024, through each Tribal Nation's Tribal Historic Preservation Office.

2. PROPOSED ACTION AND ALTERNATIVES

DOE makes preliminary determinations about the required level of NEPA review based on potentially significant impacts it identifies during evaluation of technically acceptable applications. DOE conducts these preliminary reviews pursuant to 10 CFR 1021.216 and prepares a synopsis for projects under the funding opportunity announcement. These preliminary NEPA determinations and environmental reviews are provided to the selection official, who considers them during the selection process. Because DOE's proposed actions are limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decisions are limited to either accepting or rejecting a project as proposed, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and a No Action Alternative for each selected project.

This EA considers two alternatives: the No Action Alternative and the Proposed Action Alternative. The No Action Alternative reflects conditions without the Proposed Action Alternative and serves as a basis of comparison for determining potential effects and the environmental consequences of implementing the Proposed Action Alternative.



2.1. ALBEMARLE'S PROPOSED ACTION

Albemarle is seeking approval and funding to resume operations at KMM including site preparation, construction, operations, and closure of facilities required to process mined ore into spodumene concentrate. Tailings produced during operations will be sorted and dry stacked at the Archdale TSF.

The proposed project consists of five major phases and a milestone including:

- Site preparation and access;
- Construction;
- Operations;
- Closure/cessation of mining operations; and
- Post-closure and final reclamation.

Site preparation activities will occur prior to infrastructure construction, which has been permitted by a separate state authorization. Mine closure and final reclamation will be performed after all mining and processing activities have ceased.

2.2. APPLICANT INTRODUCTION

Albemarle, headquartered in Charlotte, North Carolina, is a leading global producer of lithiumbased chemicals. Albemarle currently operates a lithium compound and metal production facility (Kings Mountain Facility) at the site of the legacy KMM (also the "legacy mine") located in the city of Kings Mountain in Cleveland County, North Carolina (Figure 1: Project Location Map). To meet current and expected demand for lithium products, Albemarle intends to reopen the legacy mine to produce spodumene concentrate from the resource at the site. The spodumene will be extracted by deepening and expanding the legacy mine footprint from an existing, inactive open pit. Non-ore bearing rock, ore sorting rejects, and dense media separation (DMS) of coarse tails generated during mining operations will be managed onsite, while tailings will be transported to an offsite TSF approximately 3 miles southwest of the KMM called the Archdale TSF. Together, the KMM site and Archdale TSF constitute the Kings Mountain Lithium Mine Project (hereafter the "Proposed Project").



Figure 1: Project Location Map





The proposed KMM will be located in the city of Kings Mountain, Cleveland County, North Carolina, approximately 30 miles west of Charlotte within the U.S. Geological Survey (USGS) Kings Mountain, 7.5-minute quadrangle (Figure 1: Project Location Map).

The KMM site is comprised of approximately 1,083.43 acres of disturbed, undisturbed, and developed land that is bisected by I-85, with a larger land area located on the northern side of the interstate, and a smaller land area south of the interstate. The larger area to the north is bordered by South Battleground Avenue (Highway 216), Tin Mine Road to the west, Quarry Road to the east, and I-85 to the south. The smaller southern area is bordered by I-85 to the north and York Road to the south. The northern area of the site currently includes a lithium metal and salts production facility as well as Albemarle's Global Technology Center for Research and Development (Technology Center). The existing lithium metal and salts production facility receives raw materials from other sites and is not capable of processing the spodumene concentrate product from the Proposed Project and the KMM site is impacted by previous mining activity (Figure 2: Existing and Proposed Mine Site – KMM).





Figure 2: Existing and Proposed Mine Site – KMM



The proposed Archdale TSF will be located in the city of Kings Mountain in Cleveland County, approximately 3 miles southwest of the KMM site (Figure 1: Project Location Map). The 143.8-acre Archdale TSF will be used to store filtered and compacted tailings from the spodumene concentrate process generated at the Kings Mountain Mineral Processing Plant. The tailings will be transferred from the KMM to the TSF via trucks using South Battleground Road (Highway 216) and U.S. Highway 29. This site is also impacted by previous mining activity (Figure 3: Historical Mining Activities – KMM, Figure 4: Historical Mining Activities – TSF).









Albemarle is seeking approval to resume mining operations and expand the mine footprint of the Kings Mountain Facility through the issuance of a major modification to the existing mine permit. Maintenance of the Proposed Project commenced with dewatering the existing open pit, which has filled with water over time to an elevation of 822 feet above mean sea level (amsl). Pit dewatering and associated discharge conditions were permitted under National Pollutant Discharge Elimination System (NPDES) Permit No. NC0090212. Open-pit mining will be used to deepen the existing pit and expand its footprint to the southwest. Saprolite will be removed first and transferred to one of three OSFs. The ore will be transferred to the concentrator which will process an average of 3.25 million short tons per annum (8,900 short tons per day) of ore to produce 420,000 to 440,000 short tons per annum of spodumene concentrate. The spodumene concentrate will be transported by rail to an offsite conversion plant for further refinement into lithium hydroxide monohydrate. Tailings from the spodumene concentrate process will be filtered to approximately 15 percent moisture content by weight and transported to the offsite Archdale TSF. A portion of the non-ore bearing rock with economic value as aggregate will be transported to the adjacent Martin Marietta quarry.

The Archdale TSF will be used to store filtered and compacted tailings generated from the spodumene concentrate process at the Kings Mountain Mineral Processing Plant. The tailings will be transferred to the offsite TSF via trucks using South Battleground Avenue (Highway 216) and U.S. Highway 29. Other activities associated with the Proposed Project include construction of new processing facilities, crushing circuit facilities, RSFs, NPI, haul roads, a water treatment plant (WTP), an ROM pad, a water storage basin (WSB) and sumps, fueling facilities, and stormwater management infrastructure. The individual components are described in more detail in the following sections of this document.

2.3. BACKGROUND

2.3.1. Kings Mountain

Mining at Kings Mountain started in 1883 with the discovery of cassiterite, a tin-bearing mineral, within the outcropping pegmatites. Subsequently, open-pit mining for tin occurred sporadically between 1903 and 1937. Between 1943 and 1945, under sponsorship by the U.S. government, a company named Solvay established a mineral processing plant and mined for spodumene from the outcroppings of pegmatites at Kings Mountain. In the early 1950s, Foote, a subsidiary of Newmont Mining Corporation, purchased the property and began open-pit mining to produce spodumene concentrate. In 1993, exploration and mining operations ceased. In early 1994, an open-pit lake started to form due to rebounding groundwater and precipitation. The resulting pit lake reached an elevation of 817 feet amsl. During the groundwater recovery period water was sporadically pumped from the Kings Mountain Pit Lake to an adjacent aggregate quarry to support quarry operations. In 2015, Albemarle acquired the site and resumed exploration and mine feasibility studies. Figure 3: Historical Mining Activities – KMM shows the approximate extent of historical mining activities and current aerial imagery from 1973 to 2023.



2.3.2. Archdale Tailings Storage Facility

The offsite Archdale TSF will be used for tailings storage. The Archdale TSF site has also previously been used for mining activities (Figure 4: Existing and Proposed Mine Site – TSF). Dating back to the 1970s, mica, feldspar, clay, and quartz were mined at this site by other mining companies. Prior to these mining operations, the TSF property was composed of undeveloped pastures and woodlands (Figure 5: Historical Mining Activities – TSF). Currently, the proposed Archdale TSF is comprised of approximately 143.8 acres, most of which is disturbed land as a result of mica mining operations performed by Imerys in the 1990s. Reclamation activities occurred sometime after 2014 and included slope regrading, disturbed ground revegetation, and allowing several of the open pits to flood with fresh water through natural hydrologic processes. The water was pumped and discharged. No legacy ore processing equipment or structures exist at the Archdale TSF site and approximately 15 acres of undisturbed area that has not been previously impacted remains. Remaining legacy mining features include:

- Access roads;
- Open pits, several of which currently contain water;
- Seven historical monitoring wells; and
- A water management system including a pit lake pump, pipes, pond, and culverts which facilitate a water discharge to an unnamed tributary to Dixon Branch.





Figure 4: Existing and Proposed Mine Site – TSF





Figure 5: Historical Mining Activities – TSF



2.3.3. Existing Legacy Features

In the 1990s, the legacy KMM was reclaimed to meet closure requirements. Reclamation activities included slope grading, revegetation of disturbed ground, and allowing the open pit to flood with freshwater through natural hydrologic processes. Much of the legacy ore processing equipment and the spodumene minerals processing plant were removed, though remnants of the mining operations still exist, including:

- An open pit, containing water from rainfall, runoff, and groundwater seepage;
- A tin mine excavation pit (known as PEG-25);
- The spur rail line;
- Two tailings disposal sites;
- Several RSFs;
- A mill pond;
- An existing drainage network consisting of Kings Creek, South Creek, a legacy tailings pond Water Storage Basin 1 (WSB-1) also called Executive Club Lake, and South Creek Reservoir;
- Several repurposed mine operation support buildings; and
- Storage of radioactive mining refuse (structural steel and vessels from the legacy processing mill) within the footprint of the KMM. The refuse was encased in a clay liner and has been buried in the legacy tailings area since 2001, in accordance with a plan approved by the North Carolina Department of Environmental Quality (NCDEQ). Note: this will be removed before construction commences.

2.3.4. Proposed Project Features

Key features that will either remain in place with modifications from the legacy mine, or that will be newly added for the Proposed Project are described on Figure 6: Kings Mountain Mine Site Layout and are described below.

- Conveyors—a conveyor system that will be used to transport material (including over I-85).
- Crushing and screening circuit—a three-stage crushing circuit where the ore will be reduced in size to facilitate separation of the spodumene from non-lithium-bearing materials.
- Growth media storage—an area where growth media will be stockpiled for future use as soil coverage for reclamation.
- Haul roads/service roads—internal roads that will either be modified or newly constructed to transport material across the KMM site. Haul roads may be relocated during mining operations, as the pit expands. Haul roads will primarily be used by onsite haul trucks.



Service roads on the site will have several uses. The transport of tailings to the TSF will be over public roads.

- Kings Creek—a natural creek that has been altered from legacy mine operations at the KMM site and from ongoing operations at the adjacent Martin Marietta quarry. The creek enters the KMM site from the adjacent Martin Marietta facility. It will receive discharge from the Proposed Project's stormwater and wastewater outfalls, South Creek Reservoir, and WSB-1 before ultimately discharging offsite.
- Mineral processing facility—a facility designed to physically separate spodumene from pegmatite ore (i.e., concentrator).
- Mobile equipment—equipment that will be used to perform operations.
- NPI—support infrastructure including, but not limited to, non-haul roads, offices, fueling facilities, hazardous material storage, and vehicle maintenance and wash areas. Two NPI areas will be located at the KMM site (north and south of I-85), to support mining and processing operations.
- Open pit—the existing open pit that was excavated during previous mining operations. The pit will be deepened, and its footprint expanded during operations.
- OSF—an area used to store saprolite and alluvium resulting from excavations at Archdale and sub-excavation under the RSFs during site preparation activities.
- Plant feed stockpile—an area used to stockpile ore produced from the crushing circuit, and to feed the mineral processing facility.
- Ponds—temporary ponds for retention of runoff and sedimentation control specific to the water source (contact water, non-contact stormwater, PAG runoff, and non-PAG runoff).
- ROM pad—an area used to stockpile ore mined from the open pit before processing.
- RSF—an area used to store non-ore-bearing rock excavated from the open pit.
 - RSF-A—an area used to store non-PAG rock, legacy tailings, and coarse embankment material to be removed from the legacy TSF at the KMM site.
 - RSF-W—an area used to temporarily store PAG material, and a small quantity of ore sorter rejects during RSF-X construction. Material in RSF-W will be relocated to RSF-X when construction is complete.
 - RSF-X—an area used to store PAG rock, sorted ore rejects, and DMS rejects.
- South Creek—a natural creek that was historically impounded to support legacy mine operations. It enters the KMM site from an adjacent property and flows generally south through the KMM site before discharging into South Creek Reservoir. The South Creek Reservoir dam contains culverts and pipelines that convey under the dam.
- TSF—the TSF will be used to store filtered and compacted tailings generated at the mineral processing facility.



- WSB-1—the legacy TSF pond that will be modified to serve as water storage for discharges from the WTP and all contact water (treated and untreated). It will also act as a sedimentation pond and supply makeup water (water that is lost during operations) to the mineral processing facility and other mining operations.
- WTP—a WTP that will be used to treat PAG contact water runoff from RSF-X, and excess water used at the mineral processing facility.



Figure 6: Kings Mountain Mine Site Layout





Site preparation activities will occur prior to construction of the infrastructure, which will be required for tailings storage and mining operations. Reclamation will run concurrently with site disturbing activities and be completed in the post-closure phase (Table 2: Project Phase Time Periods and General Activities).

Project Phase (approximate duration/timing)	Key Activities
Construction (2.5 years duration)	Infrastructure construction: ROM pad, crushing circuit, I-85 mineral processing facility bridge or conveyor, Kings Creek haul road culvert, RSF-A, RSF-X (initial phase), WSB-1, NPI, concentrate loadout, growth media storage, WTP.
Operations (Year 0)	Infrastructure in place (RSF-X still in initial phase configuration). Haul roads constructed including the in-pit haul road. Pit mining and mineral processing facility commences.
Operations (10 years duration)	Pit shell expanded to include consumption of the in-pit haul road. Rock continues to be stockpiled, concentrate produced, tailings generated and stored. Construction of new haul road along the pit rim to transport material.
Closure (Years 10-11)	Mining complete.
Post-closure/Final Reclamation	Removal or reclamation of surface mine facilities, relocation of PAG rock from RSF-X to the pit as backfill. Pit reflooding.

Table 2: Project Phase Time Periods and General Activities

NPI = non-process infrastructure; PAG = potentially acid generating; ROM = run-of-mine; RSF = rock storage facility; WSB = water storage basin; WTP = water treatment plant

The proposed KMM site layout illustrates the locations of the main Proposed Project facilities and associated infrastructure (Figure 6: Kings Mountain Mine Site Layout). The crushing circuit, RSFs, growth media storage, north NPI, and ROM pad will be constructed north of I-85 to support operations on the south side of I-85. Internal haul roads will connect the open pit to the ROM pad, Martin Marietta, and RSFs during operations for processing and storing mined materials. The tailings truck loadout area will be located at the north NPI area, and the concentrate loadout area will be located west of the open pit. A new bridge and conveyor will be constructed over I-85 to connect the ROM pad/crushing circuit to the concentrator and south NPI area located immediately south of I-85.

WSB-1 will be located south of the concentrator and will collect all contact water, portions of the non-contact water not directly discharged to Kings Creek and South Creek, and treated, recovered water from the WTP before it is discharged from the site. WSB-1 will provide surface water control, act as a sedimentation pond, and supply water to the concentrator and mine operations.

The proposed Archdale TSF site layout (Figure 7: TSF Site Map) shows the locations of the primary components of the Proposed Project (SRK 2024c; Hatch 2023c). Filtered tailings from the KMM will be transported to the Archdale TSF and placed and compacted in a legacy open pit at the site in a dry stack configuration. The Archdale TSF will include a starter embankment



and a perimeter berm that will have an initial embankment crest elevation of 885 feet amsl (SRK 2024c). The embankment will be constructed using non-PAG waste rock sourced from KMM. Over the life of the Proposed Project, the Archdale TSF embankment will be raised in six phases, and the filtered tailings will continue to be stored to a maximum embankment crest elevation of 960 feet amsl. Contact water from the interior of the Archdale TSF will be collected in an underdrain system and seepage collection drain and directed to a contact water management pond. Water in this pond will be monitored for water quality prior to being discharged into an unnamed tributary that flows under I-85 to the south where it joins Dixon Branch south of the Archdale TSF site. Stormwater will be collected in a series of perimeter stormwater management channels and one sediment retention basin. It will ultimately be discharged into several culverts and moved offsite to the south through existing culverts under I-85.









2.3.5. Environmental Protection Measures

Albemarle has incorporated various environmental protection measures (EPMs) into its Proposed Project design to avoid, minimize, or mitigate potential environmental impacts from the Proposed Project. Among others, Albemarle incorporated the following key EPMs into the Proposed Project design:

- Use of legacy and active mine sites—the Proposed Project is designed to use current and former mine sites (i.e., brownfields) as a part of the Proposed Project mine plan, thereby reducing the amount of land disturbance.
- Dry stack tailings—the Proposed Project will implement dry stack tailings via a filtration process prior to storage at the Archdale TSF. The use of dry stack tailings will reduce tailings seepage, water requirements, and improve TSF safety and stability.
- Visual buffers—the Proposed Project will be surrounded by a visual buffer, either by existing vegetation or earthen berms and newly planted vegetation.
- Liner and water treatment for PAG rock storage—RSF-X will be used for the storage of PAG rock and will be lined. Associated runoff water will be treated with a reverse osmosis treatment prior to discharge.

2.4. ALTERNATIVES

An evaluation of alternatives is required under NEPA for all jurisdictional activities. NEPA requires discussion of a reasonable range of alternatives, including a No Action Alternative, and the effects of those alternatives. The practicability of the alternatives is considered under the guidelines, and no alternative may be permitted if there is a less environmentally damaging practicable alternative.

2.4.1. Alternative Site Screening Summary

To be practicable, an alternative must be available, achieve the overall project purpose, and be feasible when considering cost, logistics, and existing technology. The screening criteria for evaluating alternatives is described in Table 3: Offsite Alternative Site Screening Definitions.



Screening Criteria	Description
Criteria A: Location	The alternative would only be considered practicable and achieve the overall Proposed Project's purpose if it is located within the Carolina TSB and if there was a history of previous exploration with positive identification of mineralized spodumene within the alternative identified. The TSB contains over half of the U.S. lithium supply. Spodumene-based lithium mines in the TSB were the world's leading producer of lithium from the 1950s to the 1980s. Historical knowledge of mineralized spodumene locations within the TSB narrows potential mine sites and saves capital exploration costs. Therefore, the Proposed Project should be located on previously explored properties within the TSB.
Criteria B: Mining Technology	The alternative would only be considered practicable and achieve the overall Proposed Project's purpose if it relied on open-pit, hardrock mining techniques. The TSB is a hardrock resource that can only be extracted using hardrock mining techniques. The presence of an existing open pit reduces waste handling and management costs supporting the Proposed Project's financial feasibility. Furthermore, the depth of the resource dictates the mining method. To achieve the Proposed Project's purpose of extracting spodumene-containing lithium, the alternative would only be considered practicable if it relied upon open-pit, hardrock mining techniques.
Criteria C: Historical Active Mine Sites	Historical/active mine sites are those areas with historical operations or existing mining operations. These areas typically have existing infrastructure such as roads, power, and in some cases, processing facilities. In addition, a sense of community (stakeholder) acceptance of the operation already exists. Greenfield sites refer to those areas that involve searching for mineral deposits in unexplored regions where no significant mining activities have taken place. There is typically no infrastructure in place and no previous community (stakeholder) engagement. Moreover, greenfield sites would necessarily have a greater adverse impact on natural resources than areas that have previously been disturbed by historical or existing mining operations. To achieve the Proposed Project's purpose, the alternative site would only be considered if there was historical or ongoing mining activity.
Criteria D: Minimum Mine Size	Few large parcels (≥120 acres) remain in the TSB. The alternative would only be considered practicable and achieve the Proposed Project's purpose if an initial core parcel of at least 120 acres was identified to warrant the assembly of other adjacent properties into a larger project area of approximately 800 to 1000 acres. This total mine area would be of sufficient size to extract the minimum amount of mineralized spodumene to produce sufficient lithium hydroxide needed to balance capital investment costs and to operate a mine designed to MSHA standards, while also observing state and local requirements, such as buffers.
Criteria E: Property Availability	The alternative would only be considered practicable and achieve the Proposed Project's purpose if the current landowner(s) would be willing to sell or lease the core parcel alternatives identified.
Criteria F: Environmental Impacts Minimization	The alternative would only be considered practicable and achieve the overall Proposed Project's purpose if minimal environmental impacts would occur. A desktop analysis of environmental impacts will be assessed for each alternative using publicly available NWI and NHD data. Additionally, those NWI and NHD features depicted within 100-year FEMA floodplains will be assumed to be avoided due to the additional permitting associated with impacting floodplains, allowing equal comparison across offsite alternatives of NWI and NHD features outside FEMA floodplains.

Table 3: Offsite Alternative Site Screening Definitions

FEMA = Federal Emergency Management Agency; MSHA = Mine Safety and Health Administration; NHD = National Hydrography Dataset; NWI = National Wetland Inventory; TSB = Tin-Spodumene Belt; U.S. = United States


2.4.2. No Action Alternative

Under the No Action Alternative, Albemarle would not construct a hardrock lithium mine in the Tin-Spodumene Belt (TSB), and battery-grade lithium hydroxide made from lithium-bearing spodumene concentrates produced from hardrock mining would not be brought to the U.S. market from a domestic source. Many lithium chemicals would still be imported from outside the U.S. to meet the domestic demand, continuing the U.S.'s reliance on lithium from other countries to safeguard its national security. It can also be assumed that there would be environmental impacts associated with mines located outside the U.S., especially in areas where environmental regulations may be less stringent, although the magnitude of impacts would be unknown. Due to this factor, the No Action Alternative is not considered a practicable alternative.

2.4.3. Action Alternative

Five Action Alternative sites were evaluated: the Hallman-Beam Mine, the Kings Mountain Quarry, the Imerys Mine, the Archdale Mine, and the Kings Mountain Lithium Mine Project (Preferred Site Alternative) (Proposed Project). Each site was screened to determine its practicability in implementing the Proposed Project's purpose.

2.4.4. Offsite Alternatives

Offsite alternatives for the Proposed Project outside of the Carolina TSB were eliminated as these alternatives would be unreasonable based on the Proposed Project's purpose and need and current known reserves within the TSB. The offsite location was evaluated for tailings storage, rock storage, spodumene resource availability, and the processing plant site. A comparison of the screening criteria for the No Action Alternative and the five offsite alternatives is summarized in Table 4: Offsite Alternatives Screening Summary. Based on the screening, the Preferred Alternative (Site 5) is the only viable option for the Proposed Project.



Screening Criteria	A Location	B Mining Technology	C Historic/Active Mine Sites	D Minimum Mine Size	E Property Availability	F Environmental Impacts Minimization
Alternative						
No Action	No	No	No	No	No	No
Site 1. Hallman- Beam Mine	Yes	Yes	Yes	Yes	No	Yes*
Site 2. Kings Mountain Quarry	No	Yes	Yes	Yes	No	Yes*
Site 3. Imerys Mine	No	Yes	Yes	Yes	No	Yes*
Site 4. Archdale Mine	No	Yes	Yes	Yes	No	Yes*
Site 5. Kings Mountain Lithium Mine (preferred)	Yes	Yes	Yes	Yes	Yes	Yes*

*Dependent on minimization of impacts and appropriate mitigation

The Preferred Alternative is to restart mining activities at the KMM and store tailings at the Archdale TSF. The site layout (Figure 6: Kings Mountain Mine Site Layout) was designed based on data collected during the drilling program.

Offsite Alternative 1: Hallman-Beam Mine

Between the 1950s and 1990s, the former Hallman-Beam Lithium Mine was one of the largest lithium producers where mineralized spodumene was mined from a hardrock open-pit mine. The lithium mine closed in 1998 and was purchased by Martin Marietta and continues to operate as a hardrock mine for construction aggregates (North Carolina Division of Energy, Mineral, and Land Resources [DEMLR] Mine Permit No.36-01). The parent parcel is approximately 627 acres and under one ownership. Additional parcels adjacent to this operation would need to be acquired for the site to be of sufficient size (approximately 383 acres) to extract the minimum amount of mineralized spodumene to produce sufficient lithium hydroxide to balance capital investment costs and operate a mine designed to Mine Safety and Health Administration (MSHA) standards (Figure 8: Offsite Alternative Locations). Desktop review of National Wetland Inventory (NWI) and National Hydrography Dataset (NHD) data indicates that aquatic resources occur on the parent parcel.





Figure 8: Offsite Alternative Locations



The parent parcels are not for sale, as Martin Marietta intends to continue processing construction aggregates. Impacts to aquatic resources would be variable depending on parcel availability and mine plan, but it is assumed they would be minimized to create the least possible impact. Table 5: Offsite Alternative 1 Summary details the analysis of this alternative against the screening criteria.

Screening Criteria	Criteria Satisfied	Explanation
Location (A)	Yes	The alternative satisfies the screening criteria as it is located within the TSB and is known to contain spodumene.
Mining technology (B)	Yes	This alternative satisfies the screening criteria as it was a former open-pit lithium mine and is currently an active open-pit aggregates mine. However, the infrastructure would need to be retrofitted for spodumene processing.
Historical active mine sites (C)	Yes	This alternative satisfies the screening criteria as the site contains previous hardrock mining operations.
Minimum mine size (D)	Yes	This alternative satisfies the screening criteria as the parent parcels are approximately 627 acres, and the identified Proposed Project area parcels are 383 acres for a total mine size of approximately 1100 acres.
Property availability (E)	No	This alternative does not satisfy the screening criteria as the parent parcels are not available for purchase or lease.
Environmental impacts minimization (F)	Yes	Based on review of the NHD and NWI databases, both wetland and stream resources can be found within the parent and adjacent parcels. This alternative may satisfy the screening criteria assuming minimization of impacts and appropriate mitigation were provided. The quantity of impacts would be dependent upon the resource (spodumene) location, mine pit design, waste rock and tailings requirements, and infrastructure support.

Table 5: Offsite Alternative 1 Summary

NHD = National Hydrography Dataset; NWI = National Wetland Inventory; TSB = Tin-Spodumene Belt

Offsite Alternative 2: Kings Mountain Quarry

The Kings Mountain Quarry, adjoining the King's Mountain Lithium Mine, is adjacent to the Preferred Alternative with a parent parcel of approximately 418 acres under one owner (Figure 8: Offsite Alternative Locations). The Kings Mountain Quarry, operated by Martin Marrietta, is a hardrock aggregate quarry under DEMLR Mine Permit N0. 23-02. Even though the Kings Mountain Quarry is located within the TSB, there is no evidence that the site contains mineralized spodumene. A minimum of an additional 234 acres would need to be acquired from multiple landowners to develop a mine of sufficient size for a lithium mining operation. The parent parcels are not for sale, as Martin Marietta intends to continue processing construction aggregates. This quarry has a history of impacts to aquatic resources would be variable depending on parcel availability and mine plan, but it is assumed that there would be impacts based on NWI and NHD datasets. Table 6: Offsite Alternative 2 Summary details the analysis of this alternative against the screening criteria.



Screening Criteria	Criteria Satisfied	Explanation
Location (A)	No	The alternative does not satisfy the screening criteria. Although it is located within the TSB, there is no evidence that spodumene exists in the mining parcel.
Mining technology (B)	Yes	This alternative satisfies the screening criteria due to previous mining activities. Although located within the TSB, there is no evidence that there is mineralized spodumene in the area.
Historical active mine sites (C)	Yes	This alternative satisfies the screening criteria as the site contains previous hardrock mining operations.
Minimum mine size (D)	Yes	This alternative satisfies the screening criteria as the parent parcels are approximately 412 acres and identified project area parcels are 234 acres, for a total mine size of 646 acres.
Property availability (E)	No	This alternative does not satisfy the screening criteria as the parent parcels are not available for purchase or lease.
Environmental impacts minimization (F)	Yes	Based on review of the NHD and NWI databases, both wetland and stream resources are within the parent and adjacent parcels. The quarry has a history of wetland and stream impacts and additional impacts to aquatic resources from mining activity are likely. This alternative may satisfy the screening criteria assuming minimization of impacts and appropriate mitigation were provided. The quantity of impacts would be dependent upon the resource (spodumene) location, mine pit design, waste rock and tailings requirements, and infrastructure support.

Table 6: Offsite Alternative 2 Summary

NHD = National Hydrography Dataset; NWI = National Wetland Inventory; TSB = Tin-Spodumene Belt

Offsite Alternative 3: Imerys Mine

The Imerys Mica Mine has been in operation since the 1960s and continues to operate as an open-pit mine (DEMLR Mine Permit No. 23-03). The parent parcels comprise approximately 423 acres located within the TSB under one owner (Figure 8: Offsite Alternative Locations). Even though the Imerys Mica Mine is located within the TSB, there is no evidence that the site contains mineralized spodumene. Additional parcels adjacent to this operation would need to be acquired to be of sufficient size for operation of an open-pit mine. The core parcel is not for sale, as Imerys intends to continue mining and processing mica at the site. A minimum of an additional 250 acres, for a total mine size of 673 acres, would need to be acquired from multiple landowners to develop a mine of sufficient size. Desktop review of NWI and NHD datasets indicates that aquatic resources occur on the site. Impacts to aquatic resources would be variable depending on parcel availability and mine plan, but it is assumed that there would be impacts based on the NWI and NHD datasets. Table 7: Offsite Alternative 3 Summary details the analysis of this alternative against the screening criteria.



Screening Criteria	Criteria Satisfied	Explanation
Location (A)	No	The alternative does not satisfy the screening criteria. Although it is located within the TSB, there is no evidence that spodumene exists in the mining parcel.
Mining technology (B)	Yes	This alternative satisfies the screening criteria as it is currently an active open-pit mine; however, the infrastructure would require retrofitting for processing spodumene.
Historical Active Mine Sites (C)	Yes	This alternative satisfies the screening criteria as the site contains previous hardrock mining operations.
Minimum mine size (D)	Yes	This alternative satisfies the screening criteria as the parent parcels are approximately 423 acres and identified Proposed Project area parcels are approximately 250 acres, for a total mine size of 673 acres.
Property availability (E)	No	This alternative does not satisfy the screening criteria as the parent parcels are not available for purchase or lease.
Environmental impacts minimization (F)	Yes	Based on review of the NHD and NWI databases, both wetland and stream resources are within the parent and adjacent parcels. This alternative may satisfy the screening criteria assuming minimization of impacts and appropriate mitigation were provided. The quantity of impacts would be dependent upon the resource (spodumene) location, mine pit design, waste rock and tailings requirements, and infrastructure support.

Table 7: Offsite Alternative 3 Summary

NHD = National Hydrography Dataset; NWI = National Wetland Inventory; TSB = Tin-Spodumene Belt

Offsite Alternative 4: Archdale Mine

The Archdale Mine is adjacent to the Imerys Mine and operates under the Imerys Mine permit (DEMLR Mine Permit No. 23-03). The parent parcel is approximately 643 acres within the TSB (Figure 8: Offsite Alternative Locations). Even though it is located within the TSB, there is no evidence that the site contains mineralized spodumene. Additional parcels adjacent to this operation would need to be acquired for the area to be of sufficient size for operation of an open-pit mine. Small portions of the parent parcel are known to be for sale—an additional 298 acres, for a total mine size of 992 acres—and would need to be acquired from multiple landowners. Desktop review of NWI and NHD datasets indicates that aquatic resources occur on the site. Impacts to aquatic resources would be variable depending on parcel availability and mine plan, but impacts are assumed based on the NWI and NHD datasets. Table 8: Offsite Alternative 4 Summary details the analysis of this alternative against the screening criteria.



Screening Criteria	Criteria Satisfied	Explanation
Location (A)	No	The alternative does not satisfy the screening criteria. Although it is located within the TSB, there is no evidence that spodumene exists in the mining parcel.
Mining technology (B)	Yes	This alternative satisfies the screening criteria as it is currently an active open-pit mine; however, the infrastructure would require retrofitting for processing spodumene.
Historical Active Mine Sites (C)	Yes	This alternative satisfies the screening criteria as the site contains previous hardrock mining operations.
Minimum mine size (D)	Yes	This alternative satisfies the screening criteria as the parent parcels are approximately 643 acres and identified Proposed Project area parcels are 298 acres, for a total mine size of 992 acres.
Property availability (E)	No	This alternative does not satisfy the screening criteria as the parent parcels are not available for purchase or lease.
Environmental impacts minimization (F)	Yes	Based on review of the NHD and NWI databases, both wetland and stream resources are within the parent and adjacent parcels. This alternative may satisfy the screening criteria assuming minimization of impacts and appropriate mitigation were provided. The quantity of impacts would be dependent upon the resource (spodumene) location, mine pit design, waste rock and tailings requirements, and infrastructure support.

Table 8: Offsite Alternative 4 Summary

NHD = National Hydrography Dataset; NWI = National Wetland Inventory; TSB = Tin-Spodumene Belt

2.4.5. Onsite Alternatives

Onsite Alternative 1: Kings Mountain Mine

This alternative would restart the legacy mine, maximizing the use of the property and keeping all operations and materials storage within the KMM. The additional land required to fulfill the purpose and need for the Proposed Project at the KMM location is approximately 240 acres. Attaining the 240 acres would be accomplished by either acquiring more properties and expanding the Proposed Project boundary, impacting more Waters of the United States (WOTUS) within the KMM, or a combination of both. Kings Creek would likely be the only WOTUS north of I-85 that would not be impacted. An additional 73 acres of adjacent land would be required to store the tailings onsite. If that land was not available to purchase, an additional approximately 107 acres offsite would need to be purchased to store the tailings. Since neither of those options were pursued, an updated site layout is not available to calculate the additional potential WOTUS impacts.

Onsite Alternative 2: Kings Mountain Mine and Archdale Tailings Storage Facility Site

Approximately 10,757,620 tons of tailings are anticipated to be generated during the permitted life of the mine. Approximately 10,000,000 tons of tailings are anticipated to be stored at the Archdale TSF site. The Archdale TSF site, as described above, was specifically purchased by



Albemarle to reduce the amount of material that would be discharged into WOTUS under Onsite Alternative 1. No jurisdictional WOTUS occur within the Archdale TSF site and acquiring the Archdale TSF site removes potential WOTUS impacts in the adjacent 73 acres of the Kings Mountain site (onsite Alternative 1) and other neighboring properties that might have WOTUS.

Onsite Alternative 3 (Final Design): Kings Mountain Mine, Archdale Tailings Storage Facility Site, and Partnership with Martin Marietta to Utilize the Aggregate Byproduct

To further reduce the amount of material that would be discharged into WOTUS, Albemarle has entered into an agreement with Martin Marietta to receive and sell aggregate byproducts of the mining operation that meet Martin Marietta's specifications. Approximately 42,000,000 tons of aggregate is anticipated to be delivered to Martin Marietta over the life of the permitted mine. Without the Martin Marietta agreement, a 300-feet-tall pile of aggregate, covering approximately 110 acres, would need to be built withing the KMM site. By removing the need for aggregate to be stored at the KMM, Albemarle will be able to avoid impacting most of South Creek and associated headwaters and wetlands, as well as the South Creek Reservoir. Avoiding these impacts will largely be accomplished by separating RSF-A and RSF-X in the design, which was made possible by the reduction in onsite tailings.

Archdale Tailings Storage Facility

Archdale is one of the offsite alternatives for the mining site itself, which led to its acquisition for the TSF. Since there are no WOTUS at Archdale and space is limited, no onsite alternatives were developed.

Onsite No Action Alternative

Under the No Action Alternative, a hardrock lithium mine would not be constructed and lithiumgrade lithium hydroxide made from lithium-bearing spodumene concentrates produced from hardrock mining would not be brought to the U.S. market from the Kings Mountain domestic source. Most lithium chemicals would continue to be imported from outside the U.S. to meet domestic demand. It can be assumed that there would be environmental impacts associated with mines located outside the U.S., especially in areas where environmental regulations may be less stringent, although the quantity of impacts is unknown.

2.4.6. Proposed Action—Preferred Alternative

Kings Mountain

Various alternative onsite layouts were considered during the Proposed Project's design and development. There have been three major iterations of the KMM design: Kings Mountain Tract Mine Site only; KMM with the Archdale Tract TSF Site; and Kings Mountain Tract Mine, Archdale Tract TSF Site, and a partnership with Martin Marietta to utilize the aggregate byproduct of the mining process instead of storing it onsite. The final site layout (Figure 6: Kings Mountain Mine Site Layout and Figure 7: TSF Site Map) was designed based on data collected



during the drilling program and various baseline studies evaluated in the EA. Each major iteration of the site design improved the avoidance and minimalization of NEPA impacts.

Kings Mountain Lithium Mine

The Preferred Alternative is to restart mining activities at the legacy Kings Mountain Lithium Mine. The Onsite Alternative is the former Foote Mineral Lithium Mine (Figure 2: Existing Proposed Mine Site – KMM). This open-pit mine operated from 1938 until the mid-1980s and was one of the largest producers of lithium in the world. In 2012, Rockwood Lithium acquired the land which was then acquired by Albemarle in 2015. The parent parcel is approximately 771 acres and is currently permitted for mining (DEMLR Permit Nos. 23-01 and 23-34) in accordance with the provisions of the North Carolina Mining Act of 1971. Prior to the development of this Proposed Project, approximately 509 acres were heavily disturbed by historical mining activities. The activities associated with the Proposed Project's resumption of open-pit mining at the KMM site will disturb an additional 574.43 acres, creating a total area of 1,083.43 acres.

Recent exploration has indicated that additional spodumene resources are available for extraction. Desktop review of the NHD and NWI features indicates that the site includes the headwaters of Kings Creek and South Creek.

Archdale Tailings Storage Facility

Concentrate and tailings from the concentrator will be transported by a conveyor on the I-85 bridge to a rail loadout facility for concentrate and a separate loadout facility for tailings, which will be transported by truck to the offsite Archdale TSF.

The KMM site is constrained due to available land and the need to accommodate necessary components for safe and efficient operation. The Archdale site provides some relief from the land constraints for use as a TSF, which results in decreasing the need for wetland and stream impacts. Figure 7: TSF Site Map provides an overview of the layout for the Archdale TSF facilities.

Proposed Project Construction

Kings Mountain

Many Proposed Project components will be constructed to start and sustain mining operations. Prior to construction activities, vegetation will be cleared, and growth media salvaged in approved disturbance areas. Diversion ditches will be installed to intercept non-contact surface water drainage and to convey the non-contact surface water to existing drainage outlets. Silt fences, or other best management practices (BMPs), will be installed downstream as required to prevent release of sediment to the environment.

Construction of the concentrator and associated Proposed Project infrastructure, including the crushing circuit, RSFs, OSFs, WSB-1, WTP, haul roads, access roads, I-85 bridge, NPI areas, concentrate and tailings loadouts, the railway, stormwater management system, and supporting



utilities will be completed in an anticipated 2- to 3-year period after receipt of regulatory approval.

Existing legacy tailings will be excavated and disposed of at RSF-A prior to the construction of RSF-X. RSF-A will be constructed from coarse rock sourced from the open pit and will grow as mine operations continue, reaching an ultimate height of 385 feet above surrounding grade.

The subgrade foundation for the RSF-X liner will be graded to achieve a positive drainage slope of approximately 2 percent to the perimeter drainage conveyance system. To install the high-density polyethylene liner geomembrane system, RSF-X will be constructed in two phases: Phase 1 (northeast) and Phase 2 (southwest), and construction will extend into operations. The high-density polyethylene geomembrane panels will be welded together by thermal methods (SRK 2023c). RSF-X will grow as mine operations continue, reaching an ultimate height of 210 feet above grade.

RSF-X Phase 1 will be constructed first to allow operational use in the first year of development mining (also referred to as preproduction mining or waste stripping). More Phase 1 and Phase 2 construction details and timing will be defined during the detailed design stage of the Proposed Project, prior to construction (SRK 2023b).

WSB-1 construction will involve removing legacy tailings and some coarse rock from the existing embankment to allow reconstruction of the existing concrete-lined spillway where necessary; constructing a gravel blanket drain along the downstream face of the embankment; and constructing a compacted fill buttress to improve stability (SRK 2023c). The WSB-1 embankment will consist of suitable fill materials sourced from the Proposed Project site.

During the construction period, concurrent reclamation of disturbed areas will occur where possible. Surface disturbances associated with roads, ditches, embankment faces, and the disturbed perimeter will be reclaimed after final grades are established. BMPs will be installed and maintained during construction to minimize erosion, sedimentation, and to control surface and stormwater runoff. Removal of vegetation, soil layers, legacy tailings, and embankment materials will be conducted using bulldozers, excavators, loaders, scrapers, and trucks. If bedrock is encountered during grading in preparation for the installation of the geomembrane, ripping, drilling, and/or blasting of bedrock may be required locally.

The construction of the KMM is expected to occur over a 2.5-year period. The initial construction schedule has been developed and is assumed to include the open pit, concentrator, ROM pad, crushing circuit, south NPI, north NPI, I-85 concentrator bridge/conveyor, Kings Creek haul road culvert, OSFs, RSF-X, RSF-A, and concentrate and tailings loadout.

The sequence of construction activities will be as follows:

- Implement sediment and erosion control measures.
- Execute clearing and grubbing activities. Stockpile vegetation and soil separately in designated areas.
- Develop access roads, temporary site service roads, and laydown areas.



- Commence grading to bulk cut and fill requirements.
- Place fill and install permanent drainage systems and erosion control structures (ROM pad wall).
- Develop utilities infrastructure.
- Develop permanent haul site service roads.
- Excavate for foundations and conduct piling as required.
- Construct permanent infrastructure.

Archdale Tailings Storage Facility

Initial Archdale TSF construction will consist of pit dewatering, site clearing and grubbing of existing vegetation, implementation of stormwater BMPs, and construction of access and haul roads and an embankment and perimeter berm around the former mine pit to allow storage of filtered tailings above the base topography in the area.

The footprint of the Archdale TSF will be cleared and grubbed of existing vegetation. Organic growth media will be stripped and hauled to a designated stockpile where it will be stored for reuse during the Proposed Project's post-closure phase. Unsuitable soils for lithium production, including weak saprolitic soils, will be removed and hauled from the Archdale TSF to a designated stockpile at KMM where they will be stored for reuse during facility reclamation. Based on information obtained during site characterization activities, the depth of required removal of unsuitable soils is highly variable across the site and will require direct oversight by the Archdale TSF design engineer during construction to remove and replace potential unsuitable soils. Where unsuitable soils are removed below design grade, waste rock or other suitable fill material, potentially generated through cut and fill operations within the pit base, will be used to backfill the excavations in compacted layers up to the design grade. Placement and compaction will be achieved in accordance with the technical specifications tailored to each material type.

Several legacy mica stockpiles are also present and will be removed from within the proposed excavation footprint during construction and salvaged for reclamation. These legacy micabearing stockpiles materials are estimated to total 0.45 million cubic yards and will be transported and stored at the growth media storage area located on the southern end of the Archdale TSF site or transported back to the KMM facility to be properly stored.

Initial construction of the Archdale TSF will include a perimeter access road constructed around the edge of the existing pit, grading for the plant site pad, and a starter embankment completely within the base of the existing pit with a 40-feet-wide crest to an elevation of 885 feet amsl. The embankment will be constructed with a 1.5 horizontal to 1 vertical interior side slope and 2.5 horizontal to 1 vertical exterior side slope. A 2-feet-thick (3-feet-wide, horizontally) layer of crushed sand filter will be placed along the interior slope face to prevent migration of tailings through the coarse waste rock outer embankment.



Waste rock hauling for embankment construction will be via over-the-highway haul trucks from the KMM pit and legacy tailings area. Only non-PAG waste rock will be used for embankment construction, as described by SRK Consulting U.S., Inc (SRK)(2024c). Temporary haul roads will be constructed as necessary within the Archdale TSF and tailings placement areas to allow all weather access for highway and site haul trucks during operations. Tailings haul trucks will access the interior of the Archdale TSF via temporary haul roads constructed off the main site haul road around the southwest corner of the Archdale TSF.

The saprolite at the base of the Archdale TSF interior will be excavated to an average depth of 10 feet and shaped to roughly mirror existing topography to provide a relatively smooth surface sloped to a single seepage collection sump at the southeastern corner of the TSF. Based on available site characterization and laboratory test data (SRK 2024c), low permeability saprolitic soils are likely to be available throughout the TSF footprint, and it is expected that moisture conditioning and compaction of in-situ soils during base preparation will provide a low permeability surface to reduce the potential for vertical migration of fluids and promote lateral flow to the TSF basal drain system described below.

The excavation base will not only provide a low permeability surface for seepage collection at the base of the tailings but cut-to-stockpile grading for base preparation will generate soil for other construction needs at the site and provide additional tailings storage capacity. Where possible, fine grained saprolitic soils excavated from the TSF base will be stockpiled for later use in facility reclamation.

Following base grading and compaction, a TSF basal drain system will be installed over the prepared TSF base to collect and remove infiltrating meteoric water and any collected seepage from upwelling groundwater. This basal drain system will consist of a series of various sizes of perforated corrugated polyethylene collection pipes placed along the existing and regraded natural flow lines and be covered with drain rock or sand. The basal drain system will convey fluids to a seepage and stormwater collection sump at the southeastern edge of the TSF interior. Collected water within the sump will be pumped from two drainpipes under the southern embankment and into a contact water management pond.

The waste rock for the starter embankment and annual raise construction is anticipated to be comprised of coarse 2-foot minus rockfill. As described above for the starter embankment, the design will include a layer of crushed sand filter along the interior slope face to form a zoned sand filter and prevent migration of tailings solids through the coarse waste rock outer embankment. Grain size distribution relationships for each component of the filter zone will be based on standard filter design calculations to verify that filters are both internally stable and compatible for use in a layered sand filtered design. If onsite materials cannot be processed to meet the necessary specifications, Albemarle will import the required materials from an outside vendor.

Site Preparation

Most of the site preparation activities and surface disturbance will focus on the infrastructure pad, service facility sites, and adjacent utility lines located on the southern end of the site.



Archdale pit dewatering activities will also need to be completed prior to initiating tailings storage activities associated with the Proposed Project.

Proposed Project Operations

Kings Mountain

Pit

The expansion of the pit will have design parameters like batter face angles of 60 degrees, a batter height of 30 feet (9.14 meters), a berm width of 21 feet (6.4 meters), an overall wall angle of 60 degrees, and a ramp width of 93 feet (28.3 meters) for transportation of material (Figure 6: Kings Mountain Mine Site Layout). The pit will be dewatered prior to construction activities.

Albemarle obtained a NPDES permit for dewatering the existing mine pit (Permit No. NC0090212). This discharge will be temporary, approximately 18 to 24 months, or until the pit lake has been dewatered and WSB-1 is constructed. The flow will be continuous initially with an approximate flow of 2,000 gallons per minute (gpm) until the pit is dewatered. After initial dewatering, pumping will continue as needed to remove accumulated rainfall and evacuate accumulated water within the pit. The receiving water will be Kings Creek. The current water quality of the discharge water meets the limits set forth in the NPDES permit.

Rock Storage Facilities

Based on site preparation material characterization, as well as operational testing, waste rock will be classified as either non-PAG or PAG. PAG waste rock will be stored in a separate, lined facility (RSF-X [71.79 acres]) at the location of the existing historical TSF. Non-PAG waste rock will be stored in RSF-A (85.94 acres) located adjacent to and southwest of RSF-X. The location of the RSFs is depicted on Figure 6: Kings Mountain Mine Site Layout. Stormwater runoff from the RSFs will be contained and treated, if necessary. Seepage from RSF-X will be collected using an underdrain collection system.

RSF-A is anticipated to be similar in nature to the material at the multiple historical RSFs that have existed at the site for decades. RSF-A will not be lined, while RSF-X will be lined. Runoff from RSF-X will be conveyed to a PAG pond and then pumped to a constructed WTP prior to discharge into WSB-1. Runoff from RSF-A is anticipated to be of sufficient quality to allow for surface discharge after being collected in sediment ponds.

At RSF-A and RSF-X approximately 41.8 million and 47.6 million tons of rock storage will be generated, respectively. Excess rock storage will be used for TSF perimeter embankment construction or placed in RSF disposal areas (SRK 2024h).

Remaining material in RSF-A will not create long-term acid generation issues, as it will be composed of non-PAG rock. Based on predictive modeling results, the risk of groundwater degradation resulting from RSF-A is considered low.



At closure, RSF-A will begin to be graded and covered with approximately 2 feet of growth media. Larger boulders are expected to protrude from the growth media due to the nature of the rock material.

Overburden Storage Facilities

Three OSFs will be constructed to store saprolite rock that will be excavated during the creation of the RSFs and preparation of the Archdale TSF.

Run-of-Mine Pad

The ROM pad will be used to temporarily stockpile ore mined directly from the open pit. The ore will be transported by haul trucks to the ROM pad before processing. The ROM pad will be located southwest of the open pit and east of the crushing and screening circuit (Appendix B, Design Drawings) (Hatch 2023a).

North Non-Process Infrastructure Area

The NPI will consist of supporting infrastructure associated with mining and concentrating operations. The NPI will include but is not limited to, roads, offices, fueling facilities, hazardous material storage, security gates, fencing, power supplies, stormwater management, water and fire systems, a septic/sewer system, and vehicle wash areas. Two NPI areas will be located at the KMM site (north and south of I-85) to support mining and processing operations (Figure 6: Kings Mountain Mine Site Layout). Numerous types of mobile equipment will be required to perform mining activities during development and operations. Drilling, loading, hauling and other mine operations will involve equipment including but not limited to, deck drills, hammer drills, front end loaders, haul/maintenance/fuel trucks, excavators, track/wheel dozers, motor graders, pressure washers, forklifts, compressors, and backhoes.

Mineral Processing Facility

The DOE-funded concentrator facility (mineral processing facility) will be located on the south side of I-85 and will consist of a DMS circuit, the grinding circuit, desliming, magnetic separation, mica and spodumene flotation circuits, and concentrate and tails thickening and filtering circuits.

The separation of lithium-bearing spodumene ore and marketable byproducts from the host rock will be conducted at an onsite concentration plant (Figure 9: Concentrator Facilities), the Kings Mountain Mineral Processing Plant. Mined ore will be transported from the pit using haul trucks and will be placed on the ROM pad. From there, ore will be moved via conveyor to undergo primary and secondary crushing followed by sorting. Ore delivery, crushing, and preparation will occur north of I-85 near the existing lithium conversion plant. The crushed ore will be delivered via conveyor over I-85 to the enclosed mineral processing plant feed stockpile located south of I-85 using a new bridge constructed for the Proposed Project.



Figure 9: Concentrator Facilities





The mineral processing plant feed stockpile will provide a buffer between the crushing circuit (north of I-85) and the concentrator circuit (south of I-85). Plant feed material will undergo further milling, screening, and magnetic separation in the spodumene conversion plant facility. Spodumene and tailings will be separated using flotation processes. The resulting concentrate will be thickened and then filtered and dried to remove water to prepare it for shipping, and then will be delivered by conveyor back over I-85 for stockpiling and shipping via rail. The remnant tailings material will be thickened and filtered to remove water, and then moved by conveyor over I-85 prior to being loaded onto trucks for placement in the Archdale TSF.

Tailings

Tailings will be placed and compacted at the offsite Archdale TSF which will be reclaimed concurrently with native soil and vegetation due to the structural nature of the tailings material. The tailings material is anticipated to be similar in nature to the material that has existed for decades at the historical TSF with no identified impact to groundwater resources. The Archdale TSF will not be lined; however, stormwater runoff and seepage from the facility will be contained and collected, though it is anticipated to be of sufficient quality to discharge. Available geochemical characterization shows no potential to degrade groundwater or surface water.

Pit Inflows

The pit will receive stormwater runoff and direct precipitation, as well as inflows from groundwater. Based on historical observations from pit filling, groundwater seepage is anticipated to contribute 200 to 350 gpm to the pit. This water will need to be continually removed to allow mining.

Water treatment will extend approximately 4 years into the post-closure period. During this time, PAG seepage will be treated and PAG material from RSF-X will be backfilled into the pit. Once the backfill is complete and the pit refloods, treatment will no longer be required. Treatment facilities will then be dismantled and disposed of in accordance with applicable regulations.

Water Storage Basin 1

The purpose of WSB-1 will be to:

- Act as a temporary retention location before water is discharged to Kings Creek.
- Act as a final location for water quality testing before water is discharged.
- Control discharge flow to prevent disruptive surges in Kings Creek.
- Provide supply water to the processing plant for process makeup, raw water supply, and dust suppression.
- The reservoir will be designed to allow sediments to settle, reducing sediment load and turbidity downstream.



Roads

The Proposed Project will use 2.45 miles of existing roads (some of the existing roads may be modified or expanded for the Proposed Project's operations). Approximately 15.67 miles of internal roads will be constructed for pit, RSFs, OSFs, NPI, and ROM pad access throughout the KMM site. Internal haul roads will either be modified or newly constructed to transport material across the site. The haul roads will be connected to exit points and offsite roadways for material transport offsite. Haul roads may be relocated during mining operations, as the pit expands (Figure 10: Location of Onsite Roadways Left in Place).









MSHA requires design road widths to be 2.5 times the width of the mine trucks used, and all mine haul roads will require berms of one-half axle height or greater for the largest truck. Existing roads will be retrofitted/widened as necessary according to MSHA standards.

Eight new internal access roads will cross streams, impacting 899.5 linear feet of stream channels.

Roads that are not needed for closure and post-closure uses such as water management/treatment, power generation, security, and monitoring will be closed. Reclamation will be achieved by ripping compacted surfaces and regrading as needed to promote proper surface drainage, covering the area with growth media where needed, and revegetating. Where possible, the larger roads that are retained will be resized for post-closure use by regrading and ripping to a width that is appropriate for anticipated post-closure traffic.

The following roads are pending either full or partial removal to accommodate the Proposed Project:

- Castle Rock (North Carolina Department of Transportation [NCDOT])
- ParkGrace (NCDOT)
- Beta Place (NCDOT)
- Beta Circle (private)
- Goodall Drive (NCDOT and partially private)
- Miracle Drive (private)
- Holiday Inn Drive (partially NCDOT)
- Quality Lane / Industrial Drive (partially NCDOT)

Conveyors

After initial separation and transport of non-ore bearing rock and delivery of ore to the ROM pad, most material will be moved within the Proposed Project boundary by conveyors to minimize fuel use and emissions. A new bridge and enclosed conveyor will be constructed over I-85 to connect the ROM pad / crushing circuit to the concentrator and south NPI area located immediately south of I-85. After haul trucks deposit ore on the ROM pad, ore will be moved through the crushing circuit by conveyor. Once primary through tertiary screening and crushing are complete, the crushed ore will be transferred by conveyor across the new bridge to the concentrator circuit.

The enclosed conveyor system that will be constructed across the new concentrator bridge will deposit ore from the crushing circuit into the enclosed plant feed stockpile south of I-85. The plant feed stockpile will supply material to the concentrator circuit via conveyor. There will be two primary outputs from the concentrator circuit: concentrate and tailings. Concentrate will be conveyed to the north side of I-85, to either the concentrator rail loadout station or concentrator truck loadout, and stockpiled. Filtered tailings will be transported north across the I-85 bridge via a conveyor to the filtered tailings loadout area located at the north NPI.



Stormwater Outfalls

Two general drainages are on the existing mine site: South Creek and Kings Creek. After construction of the OSFs and RSFs, runoff will be managed through two separate conveyance systems, one for non-contact water and one for contact water. South Creek and Kings Creek will remain largely undisturbed in their present condition.

Contact water will be collected separately in a series of lined channels and seepage ponds, with all water stored in WSB-1, centrally located in the southern portion of the KMM site. Non-contact perimeter channels have been designed to route runoff from undisturbed areas around the Proposed Project's infrastructure into Kings Creek, maintaining clean water. Erosion protection for channels was selected based on the maximum tributary catchment throughout the life of the Proposed Project, and the expected velocities during design flood events. Most of the channels will be grass lined, while those segments with steeper gradients will be lined with riprap.

Three sediment control ponds will be situated downstream of the non-contact water channels before discharging into Kings Creek. The sediment control ponds were designed using a 25-year, 24-hour storm event, exceeding North Carolina standards. WSB-1 will provide sediment control functions for all contact and non-contact water from the Proposed Project.

Seepage and contact water runoff from the active mining areas will be routed to either the non-PAG collection sump, PAG collection sump, or the ore sorting area collection sump during operations and initial closure. As active surfaces are reclaimed, runoff contributions will be eliminated with reduced seepage flows to these sumps. Once flows have decreased, the non-PAG collection sump will be breached and allowed to discharge into the non-contact perimeter channels.

The PAG collections sump associated with RSF-X will be removed once the PAG material has been relocated to the pit backfill.

Archdale Tailings Storage Facility

The Archdale TSF will be used to store 10,000,000 tons (8,427,770 placed cubic yards) of filtered tailings produced at the KMM site within the footprint of the remnant legacy open pits, which will be progressively filled over time (Burnley 2024). The proposed Archdale TSF layout (SRK 2024c; Hatch 2023b) illustrates the locations of the primary components.

The conceptual TSF design drawings for the proposed filtered TSF and its facilities, as well as plans, sections, details, slope stability analyses, and settlement calculations were designed by a professional engineer currently registered in the state of North Carolina (SRK 2024c, 2024d). Design drawings include the following components:

- Filtered TSF;
- TSF underdrain system;
- TSF starter and phased downstream embankment expansion configurations;
- Final closed configuration;



- Seepage collection drain;
- Contact water mitigation pond;
- Haul and access roads;
- Stormwater management facilities including diversion channels and a sedimentation basin;
- Roadside ditches; and
- Culverts.

It is assumed that filtered tailings included in the filtered TSF design will be delivered to the site at a moisture content of 15 percent. The perimeter embankment design provides for full containment and internal drainage of the tailings mass.

Closure (Post-Closure)

The post-closure strategy involves implementing best management approaches to develop post-mining land uses that are agreeable to all stakeholders.

Kings Mountain Vegetation

Pursuant to North Carolina mining regulations, a mine reclamation plan is required to include plans for seeding, including the time of seeding, and the amount and type of seed, and type of fertilizer, lime, and mulch per acre. The recommendations include general seeding instructions for both permanent and temporary revegetation. A preliminary seed mix and schedule is provided in Table 9: Preliminary Seed Mix Composition and Schedule.

Table 9: Preliminary Seed Mix Composition and Schedule

Seed Mix Type	Seeding Dates	Seeding Rates
North Carolina Steep Slope Mix (ERNMX-310)	All dates	45 lbs/acre
Native Habitat Strip Mine Mix (ERNMX-111)	All dates	20 lbs/acre
Native Steep Slope with annual rye (ERNMX-181)	Feb 15–Aug 15	60 lbs/acre
Native Steep Slope with grain rye (ERNMX-181-2)	Aug 15–Feb 16	75 lbs/acre

lbs = pounds

Seed will be procured from an approved seeding contractor.

Stormwater Management

As closure covers are placed over the RSFs, contact water diversion channels will be removed to allow runoff from the reclaimed surfaces to flow into the non-contact water diversion channels. This flow will be routed through sediment ponds or in-line sediment controls, such as rock check dams to control sediment as vegetation is established. The sediment ponds will ultimately discharge to Kings Creek.



Open Pit

The open pit will be partially backfilled when the PAG material is removed from RSF-X. The open pit will recharge from groundwater inflows and precipitation, which will eventually discharge through shallow groundwater and surface water outflow into Kings Creek. The pit lake will form quickly and continue to fill until the surface water discharge point is reached, which is assumed to be at 850 feet amsl. The model predicts the pit lake will not inundate the pit backfill until 2 to 3 years after the backfill is complete and will reach the surface water discharge elevation sometime between the years 2087 and 2096. An outflow channel connecting the open pit to Kings Creek will be designed once post-mining topography has been established. Pit lake water quality predictions indicate that the shallow pit lake water chemistry will meet applicable surface water quality standards. The open pit will not be stocked with fish upon closure, and it is not currently being considered for recreational use.

Post-Closure Management

Closure management plans will be developed as mine planning progresses.

Rock Storage Facilities

During closure, RSF-X material segregated during operations will be backfilled into the open pit and will eventually be submerged as the pit lake begins to form. Remaining material in RSF-A will not create long-term acid generation issues, as it will be composed of non-PAG rock. Based on predictive modeling, the risk of groundwater degradation resulting from RSF-A is considered low.

At closure, RSF-A will be graded and covered with approximately 2 feet of growth media and revegetated. Larger boulders are expected to protrude from the growth media due to the nature of the rock material.

Overburden Storage Facilities

At closure, the three OSFs will contain excavated materials beneath the surficial growth media layer consisting of saprolite C-horizon material. The OSFs will be constructed during Proposed Project development. Their final configuration will have a slope of no greater than 3 horizontal to 1 vertical and they will be revegetated once complete to meet final stabilization requirements. Runoff from the OSFs will be conveyed to natural streams or be diverted via sedimentation basins constructed downgradient of each facility. At closure, no additional activities are anticipated unless material is borrowed from the OSFs for closure activities at other facilities. In that case, disturbed areas will be revegetated. Since the majority of the OSFs are not required during operations, they may be progressively closed during construction (SRK 2024I).

Water Treatment

Water treatment will last approximately 4 years during the post-closure period. During this time, PAG seepage will be treated and PAG material from RSF-X will be backfilled into the pit. Once the backfill is complete, treatment will no longer be required. Treatment facilities will then be dismantled and disposed of in accordance with applicable permits.



Buildings and Foundations

Associated infrastructure will be decommissioned, dismantled, and the area reclaimed.

Mineral Processing Plant

The mineral processing plant site and ancillary facilities will remain active until material processing has been completed. Subsequently, plant equipment will be cleaned, decontaminated, and removed from the KMM site. Foundations will be demolished and removed, and the area reclaimed. Remaining chemicals will be disposed of in accordance with applicable regulations.

Infrastructure

Water Supply System

Water used onsite will consist of municipal potable water for drinking and other potable water needs, and non-process water. Once operations and processing cease and water supply to the Proposed Project is no longer needed, pipes and pumps will be dismantled and removed.

<u>Roads</u>

Roads that are not needed for closure and post-closure uses such as water management/treatment, power generation, security, or monitoring will be closed. Road closure will be achieved by ripping compacted surfaces and regrading as needed to promote proper surface drainage, covering the area with growth media where needed, and revegetating. Where possible, larger roads that are retained will be resized for post-closure use by regrading and ripping to a width that is appropriate for anticipated post-closure traffic.

Industrial and Hazardous Waste

Industrial and hazardous waste will be identified in accordance with Resource Conservation and Recovery Act (RCRA) and applicable waste regulations and disposed of offsite at an approved third-party facility.

Fencing

Fencing will be removed consistent with site safety needs and transferred to an appropriate waste disposal facility once closure is complete, and appropriate exclusionary berms have been placed at the site.

<u>Ponds</u>

After the closure covers are placed on the RSFs, all sumps and collection ponds will be breached and discharged into sediment channels that lead to Kings Creek.



Yard Areas

Yards and laydown areas are generally flat stretches used to store mine materials or pad areas remaining after buildings are removed. These flat spaces will require minimal grading to blend them into the surrounding topography.

Well Abandonment

All wells will be plugged once monitoring and production wells are no longer needed in accordance with North Carolina Administrative Code 15A 02C.0113 (NCAC 15A 02C.0113), Abandonment of Wells.

Monitoring

The objective of the closure and post-closure monitoring program is to track the recovery of the site toward long-term post-closure land use goals, in accordance with overall closure objectives. The monitoring program will be designed to collect information to demonstrate that the closure criteria have been achieved, revegetation and restoration objectives have been met, and the site is stable.

The strategy will be to adopt monitoring requirements for specific environmental aspects and adapt these for closure. These activities will then be implemented throughout the closure and post-closure periods. Monitoring typically required during the closure and post-closure periods is summarized in Table 10: Monitoring Summary.

Monitoring	Summary
Surface water	Quality monitoring of surface water, including Kings Creek and South Creek drainage, to detect changes in baseline water quality conditions for a period that meets regulatory requirements.
Groundwater	Quality monitoring of both the shallow and deep aquifers. Aquifer recovery will also be monitored via water sampling to detect changes in baseline water quality conditions for a time that meets regulatory requirements.
Pit lake	Water level and water quality will be monitored in the pit lake. This may include pit lake stratification data.
Air quality	Air quality monitoring is typically limited to the period during which potentially significant dust is generated. Once these areas have been closed, the air quality network will be decreased or totally removed.
Reclamation performance monitoring	Reclamation performance monitoring consists of comparing the reclaimed areas to analogous sites where vegetation performance and soil chemical and physical properties are measured.
Biological	Biological monitoring consists of monitoring aquatic and terrestrial resources in accordance with permitting requirements.

Table 10: Monitoring Summary

Reports will be prepared to document the monitoring results during the closure and post-closure phases. These reports will provide the information required to manage ongoing closure activities. The data and reports will be used to:



- Provide recommendations for improving subsequent reclamation activities.
- Indicate where reclamation and closure activities have not been successful, requiring a potential change in design criteria.
- Provide information about when care and maintenance are required during the post-closure period.
- Indicate if relinquishment criteria have been achieved.

Progressive Reclamation

Progressive reclamation involves reclamation activities that take place during operations to accelerate closure of facilities for which closure can begin during operations, or for facilities that are no longer needed for current operations.

Progressive reclamation plans will be developed before and during operations as mine planning progresses.

Archdale Tailings Storage Facility

TSF closure will include the formation of a mounded top surface of compacted tailings graded to drain to the TSF perimeter at a minimum surface grade of 3 percent. A minimum of 2 feet of growth media will be placed in loose lifts and revegetated with an approved seed mix. BMPs will be implemented to prevent erosion until vegetation is successfully established. Stormwater berms and channels will be installed as necessary to control stormwater flows off the closed surface and will be safely routed to the perimeter stormwater management system. Riprap lining or channel erosion protection products will be employed where necessary.

Water Quality Post-Closure

During post-closure, the drains simulating the water collection system under the TSF will be deactivated and the groundwater level in the facility will be allowed to recover. Particle tracking will be used to analyze the movement of the tailings contact water during post-closure.

3. EXISTING CONDITIONS AND IMPACTS TO AFFECTED ENVIRONMENT

In the following sections, qualitative and, where applicable, quantitative information is used to describe the nature and extent of specific resources that may be affected by the Proposed Project. Potential direct and indirect impacts to those resources are also discussed within the context of Proposed Project controls.



3.1. KINGS MOUNTAIN

3.1.1. Existing Permits for Existing Conditions

The existing Kings Mountain Facility currently operates under Mining Permit Numbers 23-01 and 23-34, in accordance with the provisions of the North Carolina Mining Act of 1971. Two permit modifications for site preparation and access activities have been applied for in advance of portions of the Proposed Project located at the KMM site. Site preparation activities were separated into two modifications named the East Mine and West Mine. As previously mentioned, the existing pit is currently being dewatered per the conditions of the approved NPDES Permit NC0090212.

3.1.2. Existing Conditions

The main area north of I-85 is mostly developed/disturbed and includes Albemarle's lithium compound and metal production facility, which includes a 5,000 metric ton lithium-grade lithium hydroxide facility and the Technology Center. The northwest side of this area, along South Battleground Avenue, includes an abandoned drive-in theater and recreational vehicle campground, remnants of a textile mill, and an abandoned school building. These buildings will be demolished prior to construction of the Proposed Project. Five utility rights-of-way cross the northern and central portions of the parcel. The area south of I-85 is mostly undeveloped but has been previously disturbed by industrial activity (Figure 2: Existing and Proposed Mine Site -KMM). The Kings Mountain Gateway Trail (Gateway Trail) is located along the northern and eastern boundaries of this area, with an access point and parking area off Galilee Church Road. Once construction begins, the Gateway Trail will be relocated off the KMM and Archdale TSF sites. Additionally, three utility rights-of-way cross the parcel running northeast to southwest. Seven existing man-made ponds are onsite: the accumulated water in the existing pit, PEG 25, South Creek Reservoir, No.1 Mill Pond, WSB-1 (previously referred to as Executive Club Lake), Mud Pond 1, and Mud Pond 2. Of these ponds South Creek Reservoir, and Executive Club Lake, are jurisdictional. Executive Club Lake will no longer be jurisdictional after the impacts of the Proposed Project are permitted.

The mine site is surrounded by residential, commercial, and industrial development to the north, west, and south (Figure 2: Existing and Proposed Mine Site – KMM). The Kings Mountain Quarry, operated by Martin Marietta borders the mine site area to the northeast. Primarily undeveloped land associated with Crowders Mountain State Park is to the east. No land belonging to the state park borders the mine site.

3.2. ARCHDALE TAILINGS STORAGE FACILITY

The current condition of the Archdale TSF property is impacted by industrial operations, specifically historical mining operations. Surrounding land use includes industrial/manufacturing, commercial, residential, and other mining/drilling operations.

Based on aerial historical photographs, active mining operations began at the KMM site in the mid-1990s (Figure 5: Historical Mining Activities – TSF). Prior to mining activities, the KMM site



contained agricultural land and undeveloped woods. Active mining operations ceased around 2014, and much of the area has naturally revegetated.

3.3. RESOURCE AREAS CONSIDERED AND ASSOCIATED IMPACTS

The following sections detail existing conditions, impacts, and proposed mitigation measures for each of the affected resources. Impacts are measured by how the Proposed Project affects NEPA laws.

3.3.1. Aesthetics and Visual Resources

Existing Conditions

The area around the city of Kings Mountain, North Carolina, is characterized by open valleys, rolling hills, and taller mountains that frame the landscape. Forested areas are common and provide contrast, verticality, and texture while providing a buffer between other common lands uses (e.g., agriculture, residential, commercial). Due to the prevalence of trees and other deciduous vegetation, the landscape appearance and colors change throughout the year depending on the season. This creates variation and interest that contribute to the overall scenic value of the regional landscape. The rolling topography, forested areas, and current development (e.g., buildings and other structures) limit wider landscape views in many locations, but elevated areas (e.g., hilltops, peaks) often provide open vistas from which to view the regional landscape. Residential development is centered in Kings Mountain, but there are pockets of rural residential development throughout the region. I-85 and U.S. Route 74 are major transportation corridors, and many state and local roads also provide access throughout the region. Multiple public parks, open space areas, and other tourist destinations are near the Proposed Project.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

A visual impact assessment (VIA) was prepared to identify existing visual resource conditions and evaluate potential changes from the operation and post-closure phases of the Proposed Project (ERM 2024). Two analyses were completed to make up the VIA, a viewshed analysis and visual simulations from key observation points (KOPs) contrasting existing conditions to modeled Proposed Project conditions. The VIA used similar inventory processes, photographic simulations, and assessment techniques commonly applied to federal systems, including the Bureau of Land Management's Visual Resource Management system, the U.S. Forest Service's Scenery Management System, and the Federal Highway Administration's Visual Impact Assessment for Highway Projects, among others. The results of the analysis address public visibility, changes to the current landscape elements (e.g., form, line, color, texture), and estimate viewer sensitivity to scenic changes from the Proposed Project.

Based on the viewshed analysis, the Proposed Project will not be visible from most locations in the region. Table 11: Aesthetics and Visual provides a summary of anticipated changes at each KOP. The Proposed Project's facilities will be most visible in areas of the foreground. In



particular, the RSFs and TSF will be visible from about 18 percent and 14 percent of areas in the foreground, respectively. The RSFs have the greatest percentage of foreground areas from which they will be highly visible, but even these areas are small (under 5 percent of the total foreground area). Into the middle ground and background, the Proposed Project's facilities will generally not be visible, with less than 1 percent of the total area of each of these zones showing some level of visibility. Even the RSFs, the tallest of the Proposed Project's facilities, will only be visible from about 2 to 3 percent of middle ground and background areas.

KOP Location ¹	Visibility Rating	Changes in Visual Characteristics ²	Visible Features	Height of Features	Distance from Feature			
Kings Mountair	Kings Mountain							
KOP 8: Patriot Park	Limited visibility	 Top of RSF-A visible above existing tree line Distinct, domed form that generally blends into the existing landscape Slightly curved, weak line that follows undulating horizontal line formed by other topographic features and top of tree line No changes in colors or textures 	RSF-A	360 feet	2.05 miles			
KOP 13: Holiday Inn Drive	Visible	 Buildings are visible adjacent to the road 	Concentrator buildings	20-100 feet	0.8 mile			
KOP 14: Lake Montonia Road	Visible	 RSF is visible above existing tree line Distinct, domed form that generally blends into the existing landscape and is partially hidden by existing vegetation Little to no change in colors or textures 	RSF-A	360 feet	1.2 miles			
KOP 16: Pinnacle Peak	Visible	 RSFs and other buildings visible in the middle ground of the panoramic view of the region New, prominent (at focal point), rounded, definite masses but similar to other forms on the landscape No changes in lines or textures Colors will be similar but the dark gray of the RSFs will be more prominent and contrast with surrounding vegetated areas 	RSF-A RSF-X Concentrator buildings	360 feet 220 feet 20-100 feet	2.8 miles			

Table 11: Aesthetics and Visual



KOP Location ¹	Visibility Rating	Changes in Visual Characteristics ²	Visible Features	Height of Features	Distance from Feature
KOP 18: Dixon School Road	Visible	 RSF clearly visible above existing tree line Slightly curved, weak line that follows undulating horizontal line formed by other topographic features and top of tree line 	RSF-A	360 feet	0.6 mile
KOP 19: Casino parking lot	Moderate visibility	 RSF visible behind (during leaf-off conditions) existing screening vegetation New, large, rounded, domed form New curving/curvilinear line but similar to existing undulating lines No changes in colors or textures 	RSF-A	360 feet	0.4 mile
KOP 20: Mount Olive Baptist Church	Limited visibility	 RSF visible behind (during leaf-off conditions) existing screening vegetation New, large, rounded, domed form New sloping, curving/curvilinear line No changes in colors or textures 	RSF-A	360 feet	0.1 mile
KOP 21: Dixon School Road	Limited visibility	 Rock storage slightly visible behind (during leaf-off conditions) existing screening vegetation New, large, rounded, domed but indistinct form New, weak, broken, curving line No changes in colors or textures 	RSF-A	360 feet	0.1 mile
KOP 24: Old Drive-In Theater	Visible	 Removal of drive-in theater and associated facilities from landscape 	Project laydown areas	N/A	0.1 mile
KOP 25: Battleground Avenue	Visible	 RSF and buildings clearly visible from road 	RSF Concentrator buildings	360 feet 20-100 feet	0.6 mile
KOP 26: Gateway Trail	Visible	• Top of the mine pit is visible (the visual conditions of the pit will change over time); the RSF and other buildings are also visible, but site is low on the landscape from this perspective	RSF-A Concentrator buildings Top of mine pit	360 feet 20-100 feet	0.1 mile
KOP 27: Cardio Hill	Visible	 Mine pit is visible (internal conditions of pit change over time) with RSF, and other buildings are also visible 	RSF-A Concentrator buildings Top of mine pit	360 feet 20-100 feet	1.2 miles



KOP Location ¹	Visibility Rating	Changes in Visual Characteristics ²	Visible Features	Height of Features	Distance from Feature
Top of Proposed Catawba Casino Hotel	Visible	 As the RSFs will be built out through 2033, they will be visible to anyone at the top of the hotel After reforestation of the RSFs, the view will look more natural and in line with the existing landscape 	RSF-A RSF-X Tailings load out area	360 feet 220 feet Unknown height	Unknown
Archdale TSF					
KOP 37: Dixon Dairy Road	Limited visibility	 Limited visibility behind existing structures and tree line 	Archdale TSF	20-90 feet	0.4 mile
KOP 40: Margrace Road	Visible	 View of security entrance and 20- foot berm 	Archdale TSF	20 feet	0.1 mile
KOP 41: I-85 TP's Restaurant and Lounge	Limited visibility	 Limited view of the TSF behind tree line 	Archdale TSF	20-90 feet	0.1 mile
KOP 43: NC Welcome Center	Limited visibility	 Limited visibility behind tree line during operations After reclamation, it will be difficult to see behind the tree line 	Archdale TSF	20-90 feet	0.1 mile

Notes:

¹KOPs listed in this table are for those where the Proposed Project would be visible. The table does not include KOPs from which the Proposed Project would not be visible.

²The visual changes described consider full buildout of the Proposed Project and do not incorporate potential mitigation measures.

I-85 = Interstate 85; KOP = key observation point; NC = North Carolina; RSF = rock storage facility; Technology Center = Albemarle Global Technology Center for Research and Development; TSF = tailings storage facility

Overall, the Proposed Project will be visible from locations adjacent to or at an elevation that provides views of the Proposed Project over vegetation and other screening elements (e.g., topography, buildings). The most commonly visible Proposed Project facilities will be the RSFs. These facilities will be the tallest structures on the KMM site at full buildout, so it is reasonable to expect them to also be the most visible. The TSF and other Proposed Project structures at the KMM site (e.g., communication towers, ROM pad, mineral processing facility, support buildings, etc.) near existing roads will also be partially visible. The mine pit will have limited visibility to much of the surrounding area.

The Proposed Project will primarily be visible from roads adjacent to the main mine and TSF properties, as well as from elevated viewpoints that provide panoramic views of the region.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to aesthetics or visual resources would occur as existing conditions would remain unchanged.



Proposed Mitigation Measures

No mitigation measures are proposed at this time.

3.3.2. Air Quality (Clean Air Act)

Existing Conditions

Primary air quality standards were developed for pollutants to protect public health, including for sensitive populations such as children, the elderly, and asthmatics; and secondary standards were developed to protect the nation's welfare, including against decreased visibility and damage to animals, crops, and vegetation (Table 12: National Ambient Air Quality Standards).

Air quality modeling used the USEPA's American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) to evaluate impacts from criteria air pollutants such as nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter (PM) with a diameter of 10 micrometers or less (PM₁₀), and PM with a diameter of 2.5 micrometers or less (PM_{2.5}), as well as hazardous air pollutants (HAPs) including benzene, polycyclic aromatic hydrocarbons (PAHs), arsenic, cadmium, lead, and nickel.

The air quality modeling results indicated that the Proposed Project would lead to increases in criteria pollutants and HAPs; however, these increases were projected to remain within the National Ambient Air Quality Standards (NAAQS) and European Union (EU) Numeric Air Quality Standards. The Proposed Project will not exceed the NAAQS for any regulated pollutants, including NO₂, CO, SO₂, PM₁₀, or PM_{2.5}. The assessment of HAPs against reference exposure levels and reference concentrations showed minimal potential for acute or long-term health impacts. Additionally, the concentrations of HAPs such as arsenic, benzene, PAH, cadmium, lead, and nickel were well below the EU thresholds, confirming minimal health risks. The cancer risk was found to be negligible, evaluated through the Maximum Exposed Individual and Maximum Likelihood Estimate scenarios.

The analysis used the USEPA's Modeled Emission Rates for Precursors to assess the secondary formation of $PM_{2.5}$ and ozone (O₃). The results confirmed that the significant impact levels for both $PM_{2.5}$ and O₃ will not be exceeded. Moreover, when combined with nearby monitoring data, the projected O₃ levels remained below the NAAQS and reinforced that the Proposed Project will not contribute to air quality violations.

The comprehensive air quality assessment for the Proposed Project demonstrates that it will comply with all relevant U.S. air quality standards. The findings indicate that the Proposed Project will not cause significant deterioration of ambient air quality, and the potential health risks associated with HAP emissions will be minimal.



Pollutant		Primary/Secondary	Averaging Time	Level	Form					
Carbon monoxide (CO)		Primary	8 hours	9 ppm	Not to be exceeded more than once per year					
			1 hour 35 ppm							
Lead (Pb)		Primary and secondary	Rolling 3-month average	0.15 µg/m³ ª	Not to be exceeded					
Nitrogen dioxide (NO ₂)		Primary	1 hour	100 ppb	98th percentile of 1- hour daily maximum concentrations, averaged over 3 years					
		Primary and secondary	1 year	53 ppb⁵	Annual mean					
Ozone (O ₃)		Primary and secondary	8 hours	0.070 ppm ^c	Annual fourth- highest daily maximum 8-hour concentration, averaged over 3 years					
Particulate matter	PM _{2.5}	Primary	1 year	9.0 µg/m³	Annual mean, averaged over 3 years					
		Secondary	1 year	15.0 μg/m ³	Annual mean, averaged over 3 years					
							Primary and secondary	24 hours	35 µg/m³	98th percentile, averaged over 3 years
	PM ₁₀	Primary and secondary	24 hours	150 µg/m³	Not to be exceeded more than once per year on average over 3 years					
Sulfur dioxide (SO ₂)		Primary	1 hour	75 ppb ^d	99th percentile of 1- hour daily maximum concentrations, averaged over 3 years					
		Secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year					

Table 12: National Ambient A	Air Quality Standards
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Source: USEPA 2022

^a In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 μ g/m³ as a calendar quarter average) also remain in effect. ^b The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer

comparison to the 1-hour standard level.



^c Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards. ^d The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards (40 CFR 50.4(3)). An SIP call is a USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

 μ g/m³ = micrograms per cubic meter; PM_{2.5} = particulate matter with an aerodynamic diameter of 2.5 microns or less; PM₁₀ particulate matter with an aerodynamic diameter of 10 microns or less; ppb = parts per billion; ppm = parts per million

USEPA has concluded that the current NAAQS protect public health, including at-risk populations of older adults, children, and people with asthma with an adequate margin of safety. The airshed that contains the KMM and Archdale TSF sites in Cleveland County, North Carolina is in attainment or unclassifiable for NAAQS, meaning none of the ambient concentrations of criteria pollutants exceed the air quality standards (USEPA 2023a).

The quantity of the pollutants reasonably permitted in the air is defined based on the primary and secondary standards described above. Since 2015, all areas of North Carolina have been characterized by USEPA as meeting NAAQS (NCDEQ 2022a).¹ Albemarle has an Ambient Air Quality Monitoring Protocol (dated October 2023) that specifies conducting air quality analyses in line with NAAQS and EU Air Quality Standards (European Commission 2013).

Measurements were taken at three monitoring stations from August 1, 2023, to August 31, 2023, around the KMM site. All measurements obtained were well below NAAQS for PM_{10} and the international standard for PM_{10} .

Impacts during Site Preparation

Airborne PM has the potential to affect areas in which the Proposed Project's personnel will work, causing a potential health and safety issue. Roads will be constructed of aggregate material and the use of these roads by the Proposed Project's vehicles is anticipated to generate dust. An increase in levels of PM may potentially impact the health of site personnel and communities through which the Proposed Project's traffic will be routed and cause visual impairment and loss of wildlife and wildlife habitat as a result of long-distance transport of dust particles settling on the ground or in water.

Impacts during Construction

Construction activity will temporarily increase airborne dust particles and engine emissions. This change will be almost negligible. During construction, air emissions and dust will be generated from mobile sources (e.g., trucks, machinery) as well as ground-disruptive operations onsite. Construction activity will increase airborne dust particles and engine emissions.

Emissions from workers' vehicles and construction equipment will be temporary and transient in nature, and various BMPs, such as limiting vehicle idling, watering (if/as necessary), and use of

¹ According to data last updated in August 2022.



temporary construction entrances will be implemented to reduce potential impacts (Table 13: Facility-Wide Potential to Emit).

Air Pollutant	Potential Emissions (tons per year)
PM _{10*}	13.98
PM2.5*	9.81
СО	36.24
NOx	122.37
SO ₂	0.17
VOC	6.62
CO ₂	60,045
CH4	0.41
N ₂ O	-
CO ₂ e	60,430

Table 13: Facility-Wide Potential to Emit

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; HAP = hazardous air pollutant; N₂O = nitrous oxide; NOx = nitrogen oxide; PM_{2.5} = particulate matter of a diameter of less than 2.5 micrometers; PM₁₀ = particulate matter of a diameter of less than 10 micrometers; SO₂ = sulfur dioxide; VOC = volatile organic compounds Note: The totals in the table above represent the total potential to emit from the site (permitted and permit exempt units), actual emissions are expected to be under these totals. All regulated sources of emissions (e.g., facility boilers) are subject to specific permitted emissions levels.

Impacts during Operations

An increase in vehicle and equipment use will result in increased noise, light, and air emissions (i.e., dust, CO, NO₂, PM) with the potential to impact the natural environment (including wildlife) as well as human health (mine personnel and nearby communities). Potential sources of Proposed Project-related impacts to air quality include the crushing circuit, conveyors, exhaust emissions from vehicles, construction equipment, generators, and fugitive dust emissions from hauling activities, road traffic, and typical operation activities. These activities have the potential to generate fugitive dust resulting in short-lived episodes when PM (PM₁₀ and PM_{2.5}) concentrations are higher than air quality standards.



Table 14: Facility-Wide Potential to Emit

Air Pollutant	Potential Emissions (tons per year)
PM10⁺	63.39
PM2.5*	12.29
со	596.04
NOx	181.44
SO ₂	5.54
VOC	33.19
CO ₂	68,045
CH4	.97
N ₂ O	40.2
CO ₂ e	80,053

Note: The totals in the table above represent the total potential to emit from the site (permitted and permit exempt units), actual emissions are expected to be under these totals. All regulated sources of emissions (e.g., facility boilers) are subject to specific permitted emissions levels.

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; HAP = hazardous air pollutant; N₂O = nitrous oxide; NOx = nitrogen oxide; PM_{2.5} = particulate matter of a diameter of less than 2.5 micrometers; PM₁₀ = particulate matter of a diameter of less than 10 micrometers; SO₂ = sulfur dioxide; VOC = volatile organic compounds

Impacts during Closure and Post-Closure

No impacts are anticipated for closure or post-closure, as exposure limits will be below detection.

Air Pollutant	Potential Emissions (tons per year)
PM10*	18.60
PM2.5*	3.24
СО	3.20
NOx	7.89
SO ₂	0.01
VOC	0.65
CO ₂	4,773
CH4	0.04
N ₂ O	-
CO ₂ e	4,774

Table 15: Annual Decommissioning Emissions

CO = carbon monoxide; CO_{2e} = carbon dioxide equivalent; HAP = hazardous air pollutant; N₂O = nitrous oxide; NOx = nitrogen oxide; $PM_{2.5}$ = particulate matter of a diameter of less than 2.5 micrometers; PM_{10} = particulate matter of a diameter of less than 10 micrometers; SO_2 = sulfur dioxide; VOC = volatile organic compounds



No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to air quality would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation measures are proposed at this time.

3.3.3. Climate Change (Tackling the Climate Crisis at Home and Abroad)

Existing Conditions

An examination through historical aerial photos of neighboring construction facilities that have undergone extensive clearing and ongoing aggregate operations (such as Martin Marietta's facility) reveals no discernible correlation between the Proposed Project's activities and climate change. Martin Marrietta's nearby quarry has been actively engaged in rock excavation and aggregate transportation via trucks for over two decades. Despite this prolonged mining activity, the surrounding vegetation has shown no signs of shifting toward different climate zone vegetation. Furthermore, an assessment of rainfall patterns in this area was conducted, using the construction of Martin Marietta's mining site as a reference and benchmark for comparison.

The analysis concluded that there has been no significant increase in rainfall events in the vicinity. Consequently, based on these findings, it is improbable that the Proposed Project will contribute to or reflect climate change impacts.

Temperature

The climate in the vicinity of the Proposed Project is humid subtropical with hot summers and mild winters. The monthly temperature ranges from a minimum of approximately 53 degrees Fahrenheit (°F) in January to a maximum of approximately 104°F in August, with an average temperature of approximately 60°F. Historical data show that temperatures in the area have been increasing, with an average rise of 0.3°F per decade since 1970, or roughly 1.7°F from 1895 to 2020. Climate change is expected to further contribute to this warming trend, potentially impacting surface water conditions such as increased evaporation rates and altered streamflow patterns. Predictive climate models suggest further warming in the future, potentially resulting in more frequent and severe heatwaves and droughts.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Extended periods of heavy rain can lead to construction-related issues such as runoff, flooding, and erosion. To mitigate these impacts during severe weather events that exceed typical daily conditions, BMPs will be implemented.


Unusually long-term, dry, hot weather can cause impacts to construction due to excessive dust and reduced air quality. Air quality BMPs will be used to prevent additional impacts during major weather events outside of average daily weather conditions.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to climate change as a result of the Proposed Project would occur, as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation measures are proposed.

3.3.4. Biological Resources

Existing Conditions

Various biological surveys were conducted during each season in 2022 and 2023. During these field efforts, some common mammals, reptiles, amphibians, and birds were regularly observed. Mammals observed included white-tail deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), and raccoon (*Procyon lotor*). Additionally, black bears (*Ursus americanus*) have been observed occasionally at the site. Common reptiles observed included eastern rat snake (*Pantherophis alleghaniensis*), northern water snake (*Nerodia sipedon*), Carolina anole (*Anolis carolinensis*), five-lined skink (*Plestiodon fasciatus*), eastern fence lizard (*Sceloporus undulatus*), eastern box turtle (*Terrapene carolina*), eastern mud turtle (*Kinosternon subrubrum*), and common musk turtle (*Sternotherus odoratus*). Common amphibians included American toad (*Anaxyrus americanus*), green frog (*Lithobates catesbeianus*), northern cricket frog (*Acris crepitans*), spring peeper (*Pseudacris crucifer*), northern dusky salamander (*Desmognathus fuscus*), and spotted salamander (*Ambystoma maculatum*; egg masses only).

An aquatic habitat assessment was conducted in 2022 to determine the aquatic faunal assemblage of the ponds and streams within the KMM and Archdale TSF sites (SWCA 2022a). In ponds, bluegill (*Lepomis macrochirus*) was the most common fish species, accounting for 98.4 percent of observations. Other fish recorded species included the redbreast sunfish (*Lepomis auritus*), spotted bass (*Micropterus punctulatus*), largemouth bass (*Micropterus salmoides*), and pumpkinseed (*Lepomis gibbosus*). Other fauna in pond habitats included mud turtles (*Kinosternon subrubrum*), musk turtles (*Sternotherus odoratus*), painted turtles (*Chrysemys picta*), a yellow-bellied slider (*Trachemys scripta scripta*), a northern water snake (*Nerodia sipedon*), and bullfrog tadpoles and adults (*Lithobates catesbeianus*).

Eleven fish species were observed in Kings Creek, South Creek, and two unnamed streams. The most abundant species observed in the stream habitats was the creek chub (*Semotilus atromaculatus*), which accounted for 51 percent of observed individuals. Instream riffle/runs were dominated by creek chub, bluehead chub (*Nocomis leptocephalus*), and rosyside dace



(*Clinostomus funduloides*). Pool structures in the streams were dominated by bluegill and redbreast sunfish.

The only freshwater bivalve observed was Asian clam (*Corbicula* sp.), an introduced species of mollusk that is considered invasive. Numerous individuals of crayfish were observed and captured in the two streams. All crayfish were members of the Cambarus (*Puncticambarus*) sp. C (*acuminatus*) complex.

All fish, crustacean, and bivalve species observed had an International Union for Conservation of Nature status of Least Concern, which is a species that the International Union for Conservation of Nature has classified as not being a priority for species conservation because the species is abundant in the wild. They were not endangered, vulnerable, threatened, near threatened, or conservation dependent (IUCN 2022). Additionally, none were listed by the USFWS under the ESA, and none were state listed. The aquatic features of the Archdale TSF did not contain federally protected species.

The bird species observed included northern cardinal (*Cardinalis cardinalis*), American crow (*Corvus brachyrhynchos*), and blue jay (*Cyanocitta cristata*).

The USFWS Information for Planning and Consultation (IPaC) resource list identified tricolored bat (*Perimyotis subflavus*) as having moderate potential to occur in the KMM and Archdale TSF sites or vicinity (Table 16: USFWS Federally Listed Species with Potential to Occur within the Project Area) (USFWS 2024a, 2024b).

Common Name (Scientific Name)	Listed Status	Habitat	Potential to Occur within Project Area
Tricolored bat (<i>Perimyotis</i> <i>subflavus</i>)	Proposed endangered	During the spring, summer, and fall (i.e., non-hibernating seasons), it primarily roosts among live and dead leaf clusters of live or recently dead deciduous hardwood trees. During winter, it hibernates in caves, culverts, or abandoned water wells. Forages both in treetops and closer to ground.	High; detected during 2022 bat acoustic surveys (SWCA 2022f).
Monarch butterfly (<i>Danaus plexippus</i>)	Candidate	Prairies, meadows, grasslands, and roadsides with milkweed (<i>Asclepias</i> spp.) and flowering plants.	Low; very limited suitable habitat along utility ROWs; individuals not identified during 2022 habitat surveys (SWCA 2022c).
Dwarf-flowered heartleaf (<i>Hexastylis</i> <i>naniflora</i>)	Threatened	Acidic soils along bluffs and adjacent slopes, boggy areas next to streams and creek heads, and along slopes of nearby hillsides and ravines. Endemic to upper Piedmont of North Carolina and South Carolina.	Low; suitable habitat observed; however, this species was not identified during presence/absence surveys in 2022 (SWCA 2022d).

Table 16: USFWS Federally Listed Species with Potential to Occur within theProject Area

Source: USFWS 2024a, 2024c; ROW = right-of-way



Impacts during Site Preparation

Regarding forest-dwelling species, there is risk of direct mortality if occupied roost trees are removed while in use. Since forest-dwelling species are habitat generalists and typically roost in the foliage of living trees, identifying specific roost trees can be challenging. Site preparation, however, will not impact areas of habitat or aquatic resources.

Impacts during Construction

During construction of the facility, there may be minor, localized, and temporary adverse impacts to biological resources present at the Proposed Project site. Potential adverse impacts to wildlife species during construction include disturbance from noise and human activity and risk for direct mortality from ground disturbance. Tree removal and road construction may cause mortality and loss of habitat and foraging for some species. Wildlife and wildlife habitat may be affected by increased activity onsite during the construction phase resulting in changes in species, populations, and behavior of wildlife, as well as loss of wildlife habitat or habitat connectivity in various areas. Wildlife incidents or mortalities as a result of vehicular strikes, wildlife entering active construction areas, and attraction of wildlife to food wastes may increase with increased human presence onsite. Increases in areas of disturbance and dust levels may also negatively affect wildlife habitat on or adjacent to the site.

Impacts during Operations

Impacts to biological resources are not anticipated during operations due to avoidance of the Proposed Project site from certain species of animal.

Impacts during Closure and Post-Closure

Adverse impacts to biological resources are not anticipated after closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to biological resources would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation measures are proposed at this time.

3.3.5. Habitat Vegetation

Existing Conditions

The habitat vegetation at the KMM and Archdale TSF sites has been impacted by the effects of project activities over an extended period. Mining at Kings Mountain from the 1940s until 1994 heavily disturbed the KMM site. Much of the vegetative communities at the KMM and Archdale TSF sites are a result of ecological regeneration of historical mining areas. Outside of the mining areas and mine tailings landings, most of the KMM and Archdale TSF sites consist of deciduous forest and mixed deciduous-pine forests in various stages of forest succession.



In addition, portions of the KMM site with sizable wetlands and waterways have been or are currently influenced by beaver activity.

Six upland land use / vegetative communities have been mapped within the KMM and Archdale TSF sites:

Developed—This land use category includes areas recently and currently used for previously impacted activities associated with the chemical plant, Technology Center, former campground, movie theater, and recently acquired residential properties. Vegetation in these areas is primarily grasses and ornamentals. Some areas are barren ground.

Forested Upland Deciduous—Upland deciduous forests at the KMM and Archdale TSF sites are generally characterized by relatively widely spaced, large trees with a developed understory of smaller trees, shrubs, and some herbaceous plants. Dominant canopy tree species are American sweetgum, tulip tree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), red maple, white oak (*Quercus alba*), red oak (*Quercus rubra*), mockernut hickory (*Carya tomentosa*), and chestnut oak (*Quercus montana*). Understory species commonly observed in the deciduous forest are flowering dogwood (*Cornus florida*), black cherry (*Prunus serotina*), American holly (*Ilex opaca*), American hornbeam (*Carpinus caroliniana*), eastern red cedar (*Juniperus virginiana*), greenbrier (*Smilax* spp.), blackberry (*Rubus* spp.), and spicebush (*Lindera benzoin*).

Forested Upland Evergreen—The upland evergreen forest community is dominated by stands of loblolly pine (*Pinus taeda*). Other less common evergreen trees observed were Virginia pine (*Pinus virginiana*) and shortleaf pine (*Pinus echinata*).

Forested Upland Mix—This vegetative community is the most common forest type and includes a mixture of deciduous and evergreen trees and shrubs as mentioned above. There are both mature and successional mixed forests throughout the KMM and Archdale TSF sites.

Herbaceous Upland—The herbaceous upland communities consist of non-wetland areas dominated by non-woody vegetation. These communities are common within the existing right-of-way, in recently disturbed or cleared areas, and along edge habitats (e.g., forest edges, roadsides).

Scrub-Shrub Upland—This community type is a transition between the herbaceous and forested upland areas. It includes species found in both the herbaceous community and young saplings found in the forested uplands.

Three wetland community types have been identified and delineated at the KMM site. Wetlands were determined to be non-jurisdictional. In addition, streams and open water bodies (palustrine unconsolidated bottom [PUB]) have also been identified and delineated (Figure 11: Wetland Delineations – KMM). Wetland vegetative communities include:

Palustrine Emergent Wetland (PEM)—The PEM wetland communities consist of a prevalence of hydrophytic non-woody vegetation less than 3 feet in height, generally located in open areas without a tree canopy layer. Many of the emergent wetlands are along pond and stream edges, or in small depressional areas where woody vegetation has not developed. Emergent wetlands



are also found within mowed and maintained utility line easements. Most emergent wetlands are subject to periodic inundation rather than permanent flooding. Dominant herbaceous species included giant cane (*Arundinaria gigantea*), bushy bluestem (*Andropogon glomeratus*), lamp rush (*Juncus effusus*), cottongrass bulrush (*Scirpus cyperinus*), lesser poverty rush (*Juncus tenuis*), fowl blue grass (*Poa palustris*), shallow sedge (*Carex lurida*), and goldenrod species (*Solidago* sp.).

Palustrine Forested Wetland (PFO)—The PFO wetland communities consist of a prevalence of hydrophytic woody species 20 feet or greater in height and 3 inches or greater in diameter at breast height. Most of the forested wetlands are mature forests with large trees along stream sides or within flooded areas influenced by human and/or beaver dams. Smaller forested wetlands are generally associated with the emergence of groundwater on hillsides adjacent to streams and likely do not have year-round surface water. Several forested wetlands were also observed along the edges of lakes and ponds that may be periodically inundated after large storm events. The tree strata are dominated by red maple (*Acer rubrum*), American sycamore (*Platanus occidentalis*), water oak (*Quercus nigra*), sugarberry (*Celtis laevigata*), American elm (*Ulmus americana*), and American sweetgum (*Liquidambar styraciflua*).

Palustrine Scrub-Shrub Wetland (PSS)—The PSS wetland communities consist of a prevalence of hydrophytic woody vegetation less than 20 feet tall. Most of the scrub-shrub wetlands in the KMM and Archdale TSF sites are in linear depressional areas along the Gateway Trail or within portions of the Executive Club Lake wetland complex and are subject to periodic flooding. Most of these wetlands occur as dense thickets dominated by only a few scrub-shrub species and have a sparse herbaceous layer. The scrub-shrub strata are dominated by brookside alder (*Alnus serrulate*), American sycamore, black willow (*Salix nigra*), Chinese privet (*Ligustrum sinense*), and red maple.

Details of wetlands and streams identified and delineated on the KMM site can be found on Figures 11 and 12 (Wetland Delineations – KMM, and Surface Water Features – KMM) and Figure 13: Watershed Boundaries.



Figure 11: Wetland Delineations – KMM

















Impacts during Site Preparation

Tree removal and loss of habitat through site preparation is expected to cause damage and/or mortality to certain bat species.

Impacts during Construction, Operations, Closure and Post-Closure

Wildlife and wildlife habitat may be affected by the increase in activity onsite during the construction phase resulting in changes in species, populations, and behavior of wildlife, as well as loss of wildlife habitat or habitat connectivity in various areas. Wildlife incidents or mortalities as a result of vehicular strikes, wildlife entering active construction areas, and attraction to food wastes may increase with increased human presence onsite. Increases in disturbance areas and dust levels may also negatively affect wildlife habitat on or adjacent to the site.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to wildlife or vegetation would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation is proposed at this time.

3.3.6. Threatened and Endangered Species (Endangered Species Act of 1973)

Existing Conditions

Kings Mountain

Federally listed, threatened, and endangered species are protected under the ESA. Three species were identified on the USFWS IPaC resource list (USFWS 2024) as having the potential to occur in the KMM or vicinity (see Table 16: USFWS Federally Listed Species with Potential to Occur within the Project Area): the tricolored bat (*Perimyotis subflavus*), monarch butterfly (*Danaus plexippus*), and dwarf-flowered heartleaf (*Hexastylis naniflora*). Under the ESA, the USFWS can also propose and designate critical habitats for threatened or endangered species. No USFWS-designated critical habitats for federally listed species are within the KMM and Archdale TSF sites (Appendix C, Federally Listed Species for Kings Mountain).

Approximately 47 acres of suitable dwarf-flowered heartleaf (*Hexastylis naniflora*) habitat are possible in the KMM and Archdale TSF sites. SWCA Environmental Consultants (SWCA) conducted presence/absence surveys in these suitable habitats during the optimal survey window, and no dwarf-flowered heartleaf populations were observed in the April and May 2024 surveys or the previous May 2022 survey. Based on the results of these presence/absence surveys, the Proposed Project will have no effect on the federally listed dwarf-flowered heartleaf. If this species is subsequently identified, any occupied habitat should be avoided until after consultation with the USFWS.



According to the USFWS, surveys are valid for 2 years and will be required again starting in April 2026, if the species is still listed at that time (SWCA 2024c). If the species is removed from the federal list, the dwarf-flowered heartleaf may remain a state-listed species.

Presence/absence surveys were also conducted during the optimal survey window within potentially suitable habitat on April 8 to 10, 2024 and May 21, 2024. The 15 survey areas covered 46.74 acres of suitable habitat varying from low to high suitability. The threatened dwarf-flowered heartleaf was not identified in any of the survey areas. Several populations of the little heartleaf, a common species, were observed during the surveys. This species is noticeably larger than dwarf-flowered heartleaf and has calyx tube lengths generally longer than 1 centimeter. However, other flowers that were observed in these areas, or often adjacent to flowerless plants, had calyx tube openings larger than 8 millimeters and/or a calyx tube longer than 1 centimeter, which are not characteristics consistent with dwarf-flowered heartleaf (SWCA 2022e).

No USFWS-designated critical habitats for federally listed species are within the KMM and Archdale TSF sites (Appendix D, Federally Listed Species for the Archdale Tailings Storage Facility). The tricolored bat (*Perimyotis subflavus*), a habitat generalist, was detected during acoustic surveys conducted by SWCA in 2022 at KMM. (Figure 14: Acoustic Detectors). This bat is not currently state or federally listed, but in September 2022, the USFWS proposed to list the tricolored bat as an endangered species in response to observed population declines resulting primarily from white-nose syndrome (Federal Register 87:56381). A final decision regarding the listing status of the species is expected in 2024.



Figure 14: Acoustic Detectors





Should the tricolored bat become listed as endangered, consultation with the USFWS recommends, to keep the Not Likely to Adversely Affect (NLAA) status, that construction should commence outside pup season and winter torpor season. The tricolored bat is expected to be present at the KMM and Archdale TSF sites May 1 to July 15 (pup season) and December 15 to February 15 (winter torpor season). Conducting pre-clearing surveys and avoiding the removal of forested habitat during these timeframes will likely minimize the potential for direct mortality, and small-scale habitat modification is unlikely to result in harm to individuals.

All other bat species have a low to very low potential to occur due to a general lack of suitable habitat, as confirmed by field surveys.

Archdale Tailings Storage Facility

Federally listed, threatened, and endangered species are protected under the ESA. Five species were identified on the USFWS IPaC resource list (USFWS 2024) as having potential to occur at the Archdale TSF or vicinity (see Table 16: USFWS Federally Listed Species with Potential to Occur within the Project Area). The tricolored bat (*Perimyotis subflavus*), monarch butterfly (*Danaus plexippus*), and dwarf-flowered heartleaf (*Hexastylis naniflora*). There is moderate potential for tricolored bat to occur at the Archdale TSF site based on the forested and shrubby habitat with surrounding aquatic features. There is no suitable habitat for the monarch butterfly or the dwarf-flowered heartleaf, as most soils and vegetation at the Archdale TSF site were substantially disturbed or removed during mining activities that only recently ceased. Regenerating vegetation is currently in a dense, successional phase that does provide suitable habitat.

The tricolored bat, a habitat generalist, was detected during acoustic surveys conducted by SWCA in 2022 at the KMM site approximately 2 miles east of the Archdale TSF site. Development within the Archdale TSF site will impact forested habitat used by this species and other bats during the summer season.

Impacts during Site Preparation

Tree removal and road construction may cause mortality, loss of habitat, and loss of foraging and prey for some species. Nightshift work involving bright lights may attract insects and other prey for certain species and may cause mortality for bats.

Impacts during Construction

Protected species may be affected by the increase in activity onsite during the construction phase resulting in changes in species, populations, and behavior of wildlife, as well as loss of wildlife habitat or habitat connectivity in various areas.

Impacts during Operations

While the Proposed Project site could serve as foraging habitat for bats, the Proposed Project is unlikely to significantly alter the overall nature and quality of foraging habitat in the region. Due to the lack of natural habitat on or near the Proposed Project site, and the presence of



surrounding industrial activities, any impacts on listed threatened and/or endangered species resulting from the Proposed Project will likely be minor. Protected species are expected to avoid the area due to ongoing operational activities that cause vibrations and disrupt their adaptive habitat.

Impacts during Closure and Post-Closure

Impacts during closure and post-closure are not anticipated.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to threatened or endangered species would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

Development within the KMM and Archdale TSF sites could impact forested habitat used by the tricolored bat and other bats during the summer season. Albemarle will comply with the USFWS's seasonal tree clearing restrictions from May 1 to July 15 (pup season) and December 15 to February 15 (winter torpor season).

Other recommended management practices that may be beneficial to all bat species include minimizing forest clearing, avoiding impacts to large and intact contiguous forested blocks, and avoiding impacts to water quality by limiting stream/wetland impacts and implementing erosion and sediment controls along waterways. Additionally, revegetating with native grassland species using a pollinator mix could promote prey diversity and abundance, which will also benefit other wildlife, such as monarch butterflies.

Should the tricolored bat become listed as endangered, consultation with the USFWS is recommended to determine suitable measures, such as habitat conservation or enhancement, to address potential adverse effects. The tricolored bat is expected to be present at the KMM and Archdale TSF sites from April through October. Conducting a pre-clearing survey and avoiding the removal of forested habitat from April through October is likely to minimize the potential for direct mortality, and small-scale habitat modification is unlikely to result in harm to individuals.

3.3.7. Migratory Bird Treaty Act of 1918 and Bald and Golden Eagle Protection Act of 1940

Existing Conditions

The Migratory Bird Treaty Act (MBTA) avian species mapped through IPaC at the KMM and Archdale TSF locations are frequently seen and consistently documented during the annual breeding bird survey in this area. Current conditions show the region as a migratory bird drop zone. The breeding bird survey is a community-driven effort aimed at tracking the population dynamics of breeding birds across North America. Notable MBTA and Bird of Conservation



Concern (BCC) species observed include the Chimney Swift (*Chaetura pelagica*), Chuck-will'swidow (*Antrostomus carolinensis*), Eastern Whip-poor-will (*Antrostomus vociferus*), Grasshopper Sparrow (*Ammodramus savannarum perpallidus*), Prairie Warbler (*Setophaga discolor*), and Wood Thrush (*Hylocichla mustelina*).

According to IPaC and the Rapid Avian Information Locator, the Bald Eagle (*Haliaeetus leucocephalus*) has the potential to occur at the KMM and Archdale TSF sites. Breeding season is from September 1 to July 31. The probability of presence is highest during the first two weeks of March. The Bald Eagle is not a BCC in this area, but it warrants attention because of the Bald and Golden Eagle Protection Act, or because of potential susceptibilities in areas from certain types of development or activities.

Persons or organizations who plan or conduct activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures. Bald Eagle presence should be monitored and any impact(s) to the species requires a USFWS permit (USFWS 2024).

Impacts during Site Preparation

Site preparation includes the removal of trees and shrubs, which reduces habitat for roosting and nesting, as well as foraging opportunities for migratory bird species.

Impacts during Construction

Construction could cause loss of habitat and avoidance of the area for migratory bird species.

Impacts during Operations

Migratory bird species may experience minimal impacts, as they have the capacity to become mobile when disturbed and can relocate to alternative areas beyond the boundaries of operational sites.

Impacts during Closure and Post-Closure

No impacts are expected during closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to migratory bird species would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation is proposed at this time.



3.3.8. Cultural Resources National Historic Preservation Act (Section 106) and the Native American Graves Protection and Repatriation Act

This section describes the existing cultural resource conditions in the vicinity of the Proposed Project site.

Existing Conditions

Kings Mountain

A Phase I archaeological survey was conducted in accordance with Section 106 of the NHPA and its implementing regulations, found at 36 CFR Part 800, and in accordance with applicable federal and state guidelines and requirements, including the North Carolina Office of State Archaeology Archaeological Investigations Standards and Guidelines (NCOSA 2017). The Phase I archaeological fieldwork was conducted between June 6 and August 22, 2022 (SWCA 2023a). Fieldwork consisted of a visual inspection, pedestrian survey, and shovel testing of the KMM site. No previously recorded archaeological sites are located within the KMM site. Geotechnical coring in floodplains however indicated potential for deeply buried archaeological sites within several locations with fine alluvial and eolian sediments below the vertical extent of shovel testing. During the survey, investigators identified 24 newly recorded sites within the KMM site. Twenty-two sites were determined to be ineligible for listing in the National Register of Historic Places (NRHP), and two were recommended for further testing. During this study, no graves were found within the Proposed Project area.

A historic architecture survey conducted in July 2023 identified and intensively surveyed 59 aboveground historic-age resources. SHPO issued full concurrence on SWCA's report (SHPO 2023, 2025) wherein the survey resulted in the following property determinations—four NRHP eligible properties and 55 ineligible. The four properties eligible for listing are Macedonia Baptist Church (CL1717)—as an individual resource, it is eligible under Criterion C for architecture and meets Criterion Consideration A (religious properties), it is also eligible as a complex or district under Criteria A for recreation and C for architecture and meets Criterion Consideration A (religious properties); Galilee United Methodist Church (CL1723)—eligible under Criterion C for architecture and meets Criterion C for architecture; and the Compact School (CL0291)—eligible under Criterion A for education and C for architecture; and the Compact School and the Macedonia Baptist Church are within the Proposed Project boundary. SHPO (2025) determined that the Proposed Project has the potential to adversely affect the historic properties and requested additional consultation.

Letters of concurrence from SHPO, dated April 12, 2023, September 27, 2023, February 27, 2024, and October 11, 2024, can be found in Appendix E (Cultural, Historical, and Archaeological Resources).



Archdale Tailings Storage Facility

Phase I archaeological survey activities were conducted in accordance with Section 106 of the NHPA and its implementing regulations, found at 36 CFR Part 800, and in accordance with applicable federal and state guidelines and requirements, including the North Carolina Office of State Archaeology Archaeological Investigation Standards and Guidelines (NCOSA 2023).

The Phase I archaeological fieldwork was conducted on September 18 and September 21, 2023. Fieldwork consisted of a visual inspection, pedestrian survey, and shovel testing of the TSF area. No previously recorded archaeological sites are found in the Archdale TSF site, and investigators did not identify any during the survey. Development of the Archdale TSF will have no adverse effect on historic properties, and no additional work is recommended for the current Archdale TSF site.

No graves/human remains were found within the Proposed Project site during this study.

Impacts during Site Preparation

Site preparation at the KMM site will include demolition of structures, mostly residential, as well as demolition of two NRHP eligible properties, the Park Grace School and Macedonia Baptist Church complex. In accordance with Section 106, an agreement will be developed to resolve the adverse impacts of demolition of the NRHP eligible properties. Parties to this agreement will include, but are not limited to, DOE, SHPO, and Albemarle.

Site preparation activities will not impact registered cultural historic resources at the Archdale TSF. State and federal protocols and BMPs will be implemented if historical resources are found during site preparation.

Impacts during Construction

Ground disturbing activities associated with construction such as site clearing, grading, excavation and filling have the potential to impact archaeological resources. However, located archaeological resources eligible for demolition are still being considered. These measures are implemented based on state and federal protocols and procedures if archaeological resources are found during construction.

Impacts during Operations

Operations are not anticipated to result in any impact to terrestrial archaeological resources; however, Albemarle has committed to EPMs to further reduce the risk of potential impacts to terrestrial archaeological resources. These measures are implemented based on state and federal protocols and procedures if archaeological resources are found during operations.

Impacts during Closure and Post-Closure

No impacts are anticipated to cultural, historical, terrestrial and archaeological resources during closure and post-closure activities.



No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to cultural resources would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

Proposed mitigation measures are to be determined. Mitigation strategies implemented to resolve adverse impacts will be clearly outlined in the resolution agreement.

3.3.9. Geology and Soils

Existing Conditions

Geology

The Kings Mountain deposit is situated in North Carolina's TSB and is located within a largescale shear zone known as the Kings Mountain Shear Zone (KMSZ). The KMSZ extends for at least 37 miles and has a width of several hundred feet. It strikes northeast and exhibits steep to moderately dipping deformation, combining both ductile and semi-brittle behavior. The general topography of the Proposed Project area has been substantially altered due to mining. The Kings Mountain deposit itself is a lithium-bearing rare-metal pegmatite intrusion along the KMSZ. At its widest point in the legacy pit area, the intrusion spans approximately 1,500 feet, narrowing to 400 to 500 feet south of the legacy pit. The geology of the open pit's footprint primarily consists of metamorphic units with beds oriented to the northeast. Within this context, spodumene pegmatite intrusions intersect schist units.





Figure 15: KMM and TSF USGS 2008 Geology Map









Soils

The U.S. Department of Agriculture Soil Survey has mapped 16 unit types and three non-soil units within the KMM site. Soils consist primarily of Udorthents, Ioamy, 0 to15 percent slopes (approximately 32 percent of the Kings Mountain tract); Madison-Bethlehem complex, 2 to 8 percent slopes (approximately 9 percent of the Kings Mountain tract); and Madison-Bethlehem complex, 8 to 15 percent slopes (approximately 8 percent of the KMM site). Most of the soils were classified as well drained. Approximately 2 percent (Chewacia Ioam, 0 to 2 percent slopes) of the KMM site soils were considered hydric.

At the Archdale TSF site, the soils were primarily mapped as Hulett gravely sandy loam, 2 to 8 percent slopes (26.2 percent of site); Madison gravelly sandy clay loam, 2 to 8 percent slopes, moderately eroded (21.1 percent of site); and Madison- Bethlehem complex, 8 to 15 percent slopes, very stony, moderately eroded (20 percent of site). All the soil types within the Archdale TSF were classified as well drained and were not listed as hydric.

Impacts during Site Preparation

The Proposed Project will require land disturbance and grading; however, the land is relatively flat, and the Proposed Project is designed to minimize land disturbance and grading. During site preparation, the minor disturbance impact to geological features will result from construction, trucks, excavation, concreting, and filling activities.

Impacts during Construction

Ground disturbance during construction and mining may impact some geological features and soils through replacement of soil types such as clay, limestone, and impervious surfaces.

Impacts during Operations

Ground disturbance during operations may impact some geological features and soils through mining of geological resources.

Impacts during Closure and Post-Closure

No additional impacts are anticipated during closure and post-closure activities.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to geology or soils would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

To mitigate potential future impacts to soils and underlying geology, the Proposed Project will implement spill prevention and emergency response procedures, as well as a facility monitoring and inspection program in accordance with MSHA standards. Specifically, the Proposed Project will include a spill prevention and response plan executed by an onsite emergency response



team. The goal of these plans will be to prevent spilled constituents from infiltrating the soil and reaching underlying geology and groundwater.

Throughout the construction phase and during mining operations, all erosion control measures mandated by local, state, and federal guidelines will be diligently implemented and followed. These measures will encompass various actions, including using water trucks to control dust, installing fences or similar barriers to prevent offsite releases and protect wetlands during construction, and revegetating stockpiles or disturbed soil areas. Additionally, at road entrances, materials such as riprap or gravel will be used to reduce or eliminate vehicle track-out onto public roadways caused by construction vehicles.

3.3.10. Greenhouse Gases

Existing Conditions

The CEQ issued interim guidance on January 9, 2023, relevant to the consideration of GHGs and the climate change effects of proposed actions under NEPA. The guidance advises federal agencies to consider "(1) the potential effects of a proposed action on climate change, including by assessing both GHG emissions and reductions from the proposed action; and (2) the effects of climate change on a proposed action and its environmental impacts" (CEQ 2023).

GHGs play a pivotal role in the Earth's atmospheric dynamics, effectively trapping heat and contributing to the phenomenon of global climate change (USEPA 2023b). The Intergovernmental Panel on Climate Change states that multiple lines of evidence point to continued climate change. These lines of evidence collectively indicate that human activities, particularly those resulting in increasing levels of GHGs, are a significant contributing factor to this change (IPCC 2021). The key GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The burning of fossil fuels, including diesel, gasoline, and natural gas, emits CO₂ and CH₄.

The USEPA has determined that current and projected concentrations of six key GHGs in the atmosphere threaten the public health and welfare of current and future generations. The primary GHGs that are expected to be emitted by the Proposed Project are CO₂, CH₄, and N₂O.

Current online resources allow for very general estimates for orders of magnitude of GHG emissions for construction projects, based on known project parameters. One of these, <u>http://buildcarbonneutral.org</u>, provides these rough estimates using basic input parameters such as building size (above and below ground), primary structural materials, ecoregion within the U.S., prior land use, and current and planned vegetation (or unvegetated) types.

North Carolina's net GHG emissions decreased by 23 percent between 2005 and 2018. By the year 2025, net GHG emissions are projected to decrease by 30 percent compared to 2005 values (NCDEQ 2022a).



Impacts during Site Preparation, Construction, and Operations

Site preparation of the Proposed Project will result in temporary minor GHG emissions from construction sources including the transportation of equipment and materials, use of vehicles and construction machinery, and curing of concrete.

Impacts during Closure and Post-Closure

No increase to GHG emissions is anticipated.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to GHGs would occur as a result of the Proposed Project, as existing conditions would remain unchanged.

Proposed Mitigation Measures

The Proposed Project is expected to show GHG emissions reductions greater than GHG emissions from facility operations. Therefore, the impact to GHG emissions from this Proposed Project is net positive, and no further mitigation measures are proposed.

3.3.11. Public Health and Safety

Albemarle is wholly committed to developing and implementing a safety program committed to the protection of workers, the public, and the environment. The Proposed Project's safety and health program will be compliant with the requirements of the Occupational Safety and Health Administration (OSHA), USEPA, and NCDEQ.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

The facility is expected to have 150 to 300 or more workers onsite during construction. The actual number of construction workers is yet to be determined. Approximately 150 to 230 workers are expected to be onsite during plant operations. Of that number, approximately 95 will be administrative daytime workers. Forty-five operations workers will be onsite during each of the three shifts (day, swing, night). It is tentatively planned for the plant to operate 24/7.

Albemarle will hire a plant safety, health, and environment manager (SHEM) to implement the requirements of the safety program. The manager will be either a certified safety professional or certified industrial hygienist.

The primary duties of the SHEM will be to implement programs regarding:

- Personal and process safety;
- Monitoring of contractors for compliance with contract safety provisions;
- Industrial hygiene;
- Environmental management;



- Safety orientation for employees and visitors;
- Local, state, and federal permitting and compliance;
- Initiating job safety analyses and process hazard analyses;
- Safety meetings and training; and
- Site safety policies.

Standard operating procedures (SOPs) for safety will be developed.

- SOPs will be prepared and followed for plant processes to provide for worker, public, and environmental health and safety.
- All SOPs will be approved by facility management and the SHEM.
- All safety SOPs will be reviewed at least annually for accuracy and applicability.
- A safety SOP for spills and accident response will be included.
- Workers will be trained on all SOPs applicable to their duties.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to health or safety would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation measures are proposed at this time.

3.3.12. Land Use

Existing Conditions

Land use in the area is made up of industrial and commercial businesses. Developed land in Kings Mountain is made up of industrial, residential, and rural land uses. The *Kings Mountain Comprehensive Plan* aims to guide future land use planning and "development and redevelopment while preserving community character." This plan is an approach to keeping a variety of the land uses between open space, rural and semi-rural, and urbanized environment available (City of Kings Mountain 2022b).

Onsite Land Use

The KMM and Archdale TSF sites occur within an existing mine site and are previously disturbed by mining activities. These activities have resulted in altered upland landscapes and man-made water features (ponds and reservoirs). Several waterways are located near the site's property boundaries. The largest proximal streams flow from south to north and west.



Offsite Land Use

Martin Marietta operates an aggregate quarry that borders the KMM site to the east. The southern parcel is bordered by I-85 to the north and York Road to the south. The Archdale TSF is located approximately 3 miles southwest of the KMM and is bounded by I-85 and U.S. 29. The Imerys Mine is adjacent to the Archdale TSF.

Impacts during Site Preparation

No impacts to land use are anticipated.

Impacts during Construction

As stated in Section 1, construction will consist of adding several buildings to the site through a phased approach. Figure 1: Project Location Map also shows a map of the KMM and Archdale TSF sites and surrounding land use. Much of the site will be converted to impervious surfaces due to the conversion of forested land to buildings, parking lots, and roadways. BMPs will be used to limit the damage to surfaces and runoff. Because agricultural land is considered previously disturbed, impacts to land use from construction of the KMM and Archdale TSF sites will be temporary and minor.

Impacts during Operations

The operation of the facility will bring additional cars and trucks onto the existing roads. Land use changes to these roads are not anticipated due to the additional traffic. Operations will not change any of the surrounding land use. The operation of the site will not add additional residential or commercial areas. Therefore, impacts to land use from operation of the KMM and Archdale TSF sites will be minor.

Impacts during Closure and Post-Closure

No impacts to land use are anticipated during closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to land use would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation measures are proposed.

3.3.13. Parks, Recreational Areas, and Fisheries

Existing Conditions

No state or federal parks are within the Proposed Project's footprint. Crowders Mountain State Park is located east of the Proposed Project, southeast of I-85 in Gaston County. It has the highest elevation in the surrounding area and has trails that traverse parks in two states, Kings



Mountain State Park and Kings Mountain Military Park both located in North and South Carolina.

Kings Mountain is in the foothills of the Blue Ridge Mountains in a region with several recreational areas and parks. Kings Mountain has a variety of parks and playgrounds for residents including the Deal Park Walking Track, Patriots Park, and the Rick Murphey Children's Park. The Moss Lake Campground, also known as the John H. Moss Lake Recreation Park, is located on the Kings Mountain Reservoir.

The City of Kings Mountain has a Tourism Development Authority Board, which helps to promote tourism and travel in Kings Mountain. The Tourism Development Authority Board meets monthly and has eight members, three of which are representatives of local hoteliers.

The Kings Mountain Gateway Trail

The Gateway Trail, established in 2009, has become a social and cultural landmark for Kings Mountain. The trail was built in coordination with the National Park Service, Cleveland County, the City of Kings Mountain, and the State of North Carolina, and was created as a public-private partnership between Cleveland County and the Gateway Trail's non-profit. The Gateway Trail has received grants from a variety of organizations including North Carolina Adopt-a-Trail, the North Carolina Parks and Recreation Trust Fund, the Carolina Thread Trail, and others (ERM 2024).

When surveyed, multiple stakeholders expressed the importance of the Gateway Trail to the community. As the current Gateway Trail path at the KMM site is routed along the top portion of the existing pit, a small portion of the overall trail will have to be rerouted due to development of the Proposed Project.

Recreational and Commercial Fisheries

There are no public, recreational, or commercial fisheries within the KMM and Archdale TSF sites or vicinity, therefore the Proposed Project will not affect these resources/uses.

Onsite Onstream Channels

Onsite stream channels are not near any recreational or commercial fisheries; therefore, the Proposed Project will not affect these resources/uses.

Impacts during Site Preparation and Construction

Temporary impacts to the Gateway Trail at the KMM site are anticipated while the trail is relocated. Albemarle is working with the Gateway Trail Board of Directors, the City of Kings Mountain, and Cleveland County to develop a plan for a new route and associated improvements to the Gateway Trail that align with the City's master plan and avoids the Proposed Project area.



Impacts during Operations, Closure, and Post-Closure

No impacts are anticipated during operations as the Gateway Trail will be relocated and reestablished.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to parks, recreational areas, or fisheries would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

Plans for construction of a new Gateway Trail route is underway. The goal of these plans is to preserve and enhance the Gateway Trail experience for all users. Albemarle is working with Gateway Trail representatives to relocate the portions of the trail that overlap the KMM site to maintain public access (ERM 2022).

3.3.14. Coastal Zone

The KMM and Archdale TSF sites are not within North Carolina's designated coastal zone; therefore, a consistency determination is not required.

3.3.15. Noise and Blasting (Noise Control Act of 1972)

Noise

Existing Conditions

The KMM and Archdale TSF sites are presently zoned as industrial. Current land uses surrounding the KMM include residential, commercial, forested areas, and other industrial mining facilities. Neighboring properties of the Archdale TSF are either undeveloped or host industrial businesses. The area surrounding the KMM site can be categorized with a noise level similar to a noisy urban residential neighborhood, which experiences estimated ambient noise levels of 67 A-weighted decibels (dBA) (ANSI 2013). Average indoor and outdoor noise levels experienced on a day-to-day basis are provided in Table 17: Indoor and Outdoor Noise Levels. The KMM's surrounding land use is made up of residential, industrial, and commercial businesses with the loudest noise-emitting source being the Senator Marshall Arthur Rauch Highway (I-85) with the potential for noise levels to reach 89.9 dBA. A smaller public road, Battleground Avenue, runs from the northwest to the southwest of the KMM site and may experience traffic-related noise levels of up to 59.9 dBA. Likewise, York Road, which runs from the northeast to the southeast of the mine, may generate noise levels of up to 59.9 dBA.



Outdoor Noise	Indoor Noise	Noise Level (dBA)	
Jet flyover (1,000 feet)	Inside a New York subway train	100	
Diesel truck (50 feet)	Food blender (3 feet)	90	
Noisy urban area (daytime)	Garbage disposal (3 feet)	80	
Gas lawn mower (100 feet)	Vacuum cleaner (10 feet)	70	
Commercial area	Normal speech (3 feet)	65	
Quiet urban area (daytime)	Dishwasher (next room)	50	
Quiet urban area (nighttime)	Large conference room background noise	45	
Quiet suburban area (nighttime)	Library	40	
Quiet rural area (nighttime)	Bedroom at night	35	

Table 17: Indoor and Outdoor Noise Levels

dBA = A-weighted decibel

SWCA conducted a preliminary noise measurement program to quantify the ambient sound environment of the KMM site. Monitoring began in the second quarter of 2022 and was conducted quarterly through the first quarter of 2023. Results obtained during the first quarter of 2023 (from March 21 to 28, 2023) are provided in Table 17: Indoor and Outdoor Noise Levels. Additional noise measurement programs will be conducted.

Impacts during Site Preparation and Construction

Noise will be generated by the Proposed Project's construction activities such as using vehicles, machinery, diesel generators, and vehicles, as well as drilling, excavating, blasting, etc. Noise and vibration will be generated as a result of construction activities, including the construction of the Proposed Project's infrastructure, due to the use of equipment. High levels of environmental noise and vibrations generated by the Proposed Project may impact human health (personnel and nearby communities) and wildlife receptors. The potential to impact noise sensitive receptors (e.g., workers, communities, sensitive wildlife) depends on the type of activity and the proximity of that activity to the receptor. Noises and vibration associated with construction activities may negatively impact wildlife distribution and abundance, especially in areas where these noises historically did not exist or were infrequent or minimal.

The Proposed Project will generate temporary noise during construction from heavy machinery, such as bulldozers, graders, excavators, 19.5-ton (net) quad-axle dump trucks, and cement trucks, as well as smaller tools such as jackhammers and nail guns. Noise and sound levels will be typical of new construction activities and will be intermittent and temporary.

The construction of the Proposed Project is scheduled to take place 6 days per week and 10 hours each day during daytime hours. The anticipated noise during the day is expected to blend in with the current ambient sounds. Considering the commercial nature of the area and the fact that most employees work indoors, the slight increase in noise should be imperceptible. There may be some additional noise outside of regular business hours, but this will be sporadic and should have minimal impact due to the receptor's distance from KMM and Archdale TSF and the



staff's indoor work environment. The closest homes are located half a mile east of the Proposed Project site and will not be impacted.

Impacts during Operations

Once operational, the facility's noise will be contained primarily within the Proposed Project's boundary, except for in two scenarios. First, noise will arise intermittently during the daytime from loading and unloading materials, with 196 truck trips per day (a 23.5-ton [net] tractor trailer with a 39-foot steel bed for waste rock and a 25-ton [net] tractor trailer with a 28-foot aluminum bed for tailings). Second, the facility will require continuous ventilation, which may necessitate noise mitigation measures like baffles to maintain noise levels within acceptable limits, as per OSHA's recommendation of 85 dBA—a standard adopted by many localities.

With construction noise limited to daytime hours and the Proposed Project's location next to an existing manufacturing site with no nearby residences, the noise impact during both construction and operations is expected to be minor.

Impacts during Closure and Post-Closure

No impacts to noise are anticipated for closure and post-closure

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to noise would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

The following measures will be implemented to manage potential environmental impacts associated with the generation of noise. Noise from equipment, machinery and vehicles will be minimized to the greatest extent possible. The City of Kings Mountain's noise standards are identified in Table 17: Indoor and Outdoor Noise Levels and provide the maximum noise levels at different frequencies for various use districts.

Blasting

Blasting will fragment the ore and non-ore bearing rock directly within the open pit. The shot muck (fragmented material) will be classified as ore, non-ore bearing rock, overburden, or aggregate source material by a grade control geologist, and then it will be loaded into haul trucks. The fragmented material will be transported to the proper destination, as described in previous sections. The progressive blasting, loading, and hauling of the fragmented materials from the pit will create benches in the pit.

All blasting will be done with ammonium nitrate / fuel oil, emulsion, bulk, or packaged products. Two to five blasts will typically occur each week. Blasting will only occur during daylight hours, and meteorological conditions will be monitored for unfavorable conditions. Shots will be initiated with non-el (shock-tube), electric, or electronic blasting caps.



Ground vibration from blasting is expressed in terms of peak particle velocity (PPV), given in units of inches per second. In addition to PPV, the frequency of ground vibrations is also important in terms of its ability to damage structures, and regulatory limits are therefore dependent on frequency. PPV levels increase with charge mass and reduce over distance as logarithmic decay.

A network of nine monitoring stations has been installed around the site to monitor and confirm that vibrations, noise, and overpressure produced by the blasts are below the thresholds established by state regulations. All explosives will be handled by an experienced and licensed blasting contractor. Explosive management practices will comply with all MSHA and NCDEQ rules and regulations. NCDEQ blasting requirements are identified in the two current North Carolina Kings Mountain mining permits.

• If ground vibration or air blast limits are exceeded, the operator will immediately report the event to NCDEQ with causes and corrective actions. The use of explosives at the specific blast site that produced the excessive reading will cease until corrective actions are approved.

Impacts during Site Preparation

Kings Mountain

Blasting impacts are not anticipated during site preparation.

The following blasting scenario evaluates exceedance limits:

• The high risk (51 pound/charge delay) scenario would not produce ground vibration or overpressure exceedances at any blast/receptor combination.

Archdale Tailings Storage Facility

No blasting is anticipated for the Archdale TSF.

Impacts during Construction and Operations

Modeling will be used at 61 potential blast locations spread throughout the mine pit area prior to each stage of blasting in order to ensure that no regulatory thresholds are exceeded. The regulatory limit established by North Carolina mining regulations is 129 linear decibels.

Historic Structures

No impacts to historic structures are anticipated from blasting. Noise and blasting may but are not likely to impact threatened or endangered species, especially bat species, or habitat long term. The frequency/time structure of the noise will play a role in deterring bats from being present. The charge delay and warning-creating vibrations are expected to cause the bats to flee from their habitat (Allen et al. 2021).

Impacts during Closure and Post-Closure

No impacts are anticipated from blasting during closure and post-closure.



Proposed Mitigation Measures

Certain precautions can be implemented to prevent physical hazards to persons or neighboring properties from flyrock, excessive air blasts, or ground vibrations associated with blasting (SESHAT Consultants Pty Ltd. 2023).

Accordingly, Albemarle has committed to the following mitigation strategies:

- Each blast will be pre-planned and designed to minimize impacts. Albemarle will use appropriate models to predict overpressure and ground vibration for each blast event and compare the results to regulatory thresholds. If the model predicts an exceedance of either overpressure and/or ground vibration limits, the blast will be modified (generally by reducing the charge size) so that regulatory standards are not exceeded.
- Blasting will be restricted to the daylight hours of non-holiday weekdays. No blasting will occur on weekends, at night, or during holidays. Albemarle will also monitor and evaluate weather conditions to identify unacceptable atmospheric conditions and will avoid blasting when these occur.
- Monitors will be installed to measure the blast overpressure and ground vibration to document compliance with regulatory standards. Results will be compared to the modeled/predicted values to calibrate the model to improve accuracy, as appropriate.
- A series of pre-development test blasts are planned to provide initial calibration results for the model. When mine development begins, the early stages of the program will use conservatively small charges until the attenuation characteristics of the surrounding environment are better understood. The screening modeling is based on assumed and typical conditions.

3.3.16. Socioeconomics and Environmental Justice (Executive Order 12898)

Existing Conditions

The population of Kings Mountain is approximately 11,246 (USCB 2022b). The KMM site is located in Census Tract (CT) 9505 Block Group (BG) 3, and the TSF in CT 9506.03 BG 2 with respective populations of 1,203 and 2,050 (USCB 2022b). Additionally, the cities of Gastonia and Shelby are located within commuting distances (roughly a 17- and 30-minute drive from Kings Mountain, respectively) and may serve as locations where non-local employees might choose to live after hire. Approximately 53 percent of Kings Mountain residents work outside of Cleveland County (USCB 2019). Albemarle is committed to hiring locally where possible.

Cleveland County's economy is dependent on a diverse set of industries including manufacturing, mining, automotive machining, textiles, and data centers (EDPNC 2022). The largest industries in Kings Mountain are manufacturing (24 percent), educational services, health care and social assistance (18 percent), and retail trade (11 percent) (USCB 2022a). The unemployment rate in Kings Mountain is 8.1 percent and 7.1 percent in Cleveland County, which is higher than both the state (5.3 percent) and national (5.1 percent) averages (USCB



2021b). The median household income of Kings Mountain is \$42,336 and 13.7 percent of families live below the poverty line (USCB 2021b).

In 2021, approximately 13.3 percent of households in North Carolina were in poverty (USCB 2022c). In Kings Mountain, 21.1 percent of households were below the poverty level,² a higher proportion than those below the poverty level statewide in North Carolina (USCB 2022c). Most individuals in Kings Mountain identify as White alone (61.7 percent), followed by those who identify as Black or African American (20.6 percent), and those who identify as Hispanic or Latino (10 percent) (USCB 2022a). Out of the 19 identified census block groups (CBGs) in the study area, 14 of the CBGs have either meaningfully greater low-income or minority populations present, based on NCDEQ guidelines. Of the 14 CBGs, four CBGs have both low-income and minority populations present, six CBGs in the Proposed Project area have only meaningfully greater minority populations. This suggests that there are potential communities with EJ concerns in the study area.

Most residents in Cleveland County have either an associate or a bachelor's degree as their highest level of education (combined 55 percent), which is higher than Gaston County (combined 29 percent) and the U.S. overall (combined 34 percent) (My Future NC 2021). The high schools and community colleges in Kings Mountain and Cleveland County have vocational programs designed to give students hard skills in areas including manufacturing trades (North Carolina School Report Cards 2021; ERM 2022). Two four-year colleges, Gardner-Webb and the University of North Carolina-Charlotte are also located near Kings Mountain.

Kings Mountain has been growing as the Charlotte Metro area continues to expand further west toward Cleveland County. The City has proposed plans for new subdivisions that are currently undergoing an approval process, and the city council established a housing committee to evaluate the housing inventory to address the growing demand (City of Kings Mountain 2022a). Housing prices in Kings Mountain have increased year over year. The median sold price of a home in Kings Mountain in May 2024 was \$254,000, up 17 percent compared to May 2023 (Redfin 2024).

The housing market and public infrastructure of Kings Mountain is not likely to be overburdened by an influx of new workers to the area, as the city of Kings Mountain is a rapidly developing suburb of the greater Charlotte Metro area with existing infrastructure to support the growing population including new housing developments in creation and planning, and numerous schools including four elementary schools, one intermediate school, one middle school, and one high school.

Several healthcare facilities are located within Kings Mountain, such as Atrium Health, which provides a wide range of services including emergency services. However, the health infrastructure is currently operating at capacity, and many residents must travel outside Kings Mountain, typically to Shelby, for basic services such as primary care, pre- and post-natal care,

² Poverty level as defined by the NCDEQ and American Community Survey (NCDEQ 2022c).



and pediatric care (ERM 2022, Atrium Health 2022). Social infrastructure (fire, police, utilities) is adequate for the population of Kings Mountain.

Public Engagement

From 2022 to present, Albemarle has made specific efforts to engage with potential EJ communities to share information and solicit feedback about the Proposed Project. Albemarle has performed targeted outreach and engaged with members of potential EJ communities, hosting town hall meetings and smaller community meetings in potential EJ areas at varied times and locations. During these events, Albemarle solicited feedback from the local communities and responded to questions and will incorporate this feedback where practical and reasonable during planning and operation of the Proposed Project.

Impacts during Site Preparation, Construction, and Operations

The study area has significantly more CBGs with potential EJ communities than not, and the Proposed Project could disproportionately affect potential EJ communities. Impacts from construction, operations, and closure, however, are not anticipated to be significantly adverse; and in the case of socioeconomics, may be beneficial. Proposed Project impacts during construction, operations, and closure, will not be acutely felt by communities within the study area.

The Proposed Project is not expected to have significant, adverse effects on environmental and social resources (air quality, noise, water resources, land use, traffic and transportation, health and safety, cultural heritage, or aesthetics and visual resources). The Proposed Project will, however, result in positive impacts through the creation of approximately 1000 new jobs during construction and 400 jobs during operations. The Proposed Project will create additional economic opportunity through the procurement of goods and services during construction and operations. Further, Albemarle is committed to supporting community development through workforce upskilling and supporting community programs in Kings Mountain and education programs in Cleveland County.

Impacts during Closure and Post-Closure

Impacts to socioeconomics and EJ during closure and post-closure may occur once the facilities have been shut down and related jobs are no longer available.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to socioeconomics or EJ would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

To manage potential adverse impacts associated with the Proposed Project, Albemarle developed the selected mitigations in Table 18: Selected Mitigation Measures Pertaining to Environmental Justice Concerns.



Table 18: Selected Mitigation Measures Pertaining to Environmental JusticeConcerns

Impact	Mitigation				
Emissions	Avoiding the idling of vehicles and machinery when not in use.				
	Diesel used in site vehicles and equipment shall be low-sulfur diesel fuel where possible.				
	Use of tarps, water, and other mitigation measures (such as avoiding soil stripping during excessively dry or saturated conditions) to minimize dust and particulate matter deposition.				

3.3.17. Traffic and Transportation

Existing Conditions

Site traffic is expected to be generated from employee shift changes, deliveries, maintenance, and visitors to the mine as well as from truck shipments to the offsite Archdale TSF, located approximately 3 miles southwest of the KMM site between U.S. 29 / Highway 216 and I-85. A traffic impact analysis (TIA) was conducted to determine the potential traffic impacts of this development and to identify transportation improvements that may be required to mitigate impacts to the roadway network. The TIA also aimed to identify and recommend the most feasible route for the transport of tailings between the KMM and Archdale TSF as part of daily operations.

- Tailings from the processing plant will circulate between the KMM and the Archdale TSF. Necessary embankment material for the TSF (reflected as "Tailings Embankment" in the trip generation) will also circulate between the KMM and the TSF.
- Concentrate shipments from the KMM will be transported offsite via rail and as such are not proposed to be studied in this TIA/EA.

The highest expected truck count will be six per hour running 16 hours per day, 7 days per week. High truck counts will occur for construction months 3 thru 11. Truck counts for building the embankment will be three per hour (16 hours per day, 7 days per week) during construction months 12 thru 31.

Impacts during Site Preparation and Construction

No traffic detours or road closures are proposed at any point during construction. Construction traffic is anticipated to be distributed over time as follows: construction workers with shift arrivals and dismissals occurring during two off-peak time periods. A portion of the KMM site will be used as a temporary parking location for construction-related vehicles and the private vehicles of construction personnel. In addition, construction trailers and material storage will occur on the portion of the temporary parking lot on the KMM site.



The Proposed Project will also rely primarily on the same portion of the KMM site for equipment "laydown" areas as well as supply deliveries and staging. Given the robust nature of the current road infrastructure, the availability of temporary parking on the KMM site, and the shift changes occurring at non-peak hours, the impacts to traffic due to construction of the Proposed Project will be temporary and minor.

Impacts during Operations

Site traffic is expected to be generated from employee shift changes, deliveries, maintenance, and visitors to the mine as well as from truck shipments to the Archdale TSF. A summary of this trip generation is provided in Table 19: Daily Trip Generation.



Proposed Trip Type	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips			Data Source
		Enter	Exit	Total	Enter	Exit	Total	
Tailings shipment (20 hours/day)	256	7	7	14	7	7	14	Other data*
Tailings embankment (20 hours/day)	234	6	6	12	6	6	12	Other data*
Mine staff	620	204	107	311	107	204	311	Other data
Mine deliveries	10	2	2	4	2	2	4	Other data*
Mine visitors and maintenance	26	10	2	12	0	10	10	Other data*
Archdale staff	24	6	6	12	6	6	12	Other data*
Archdale deliveries	4	1	1	2	1	1	2	Other data*
Archdale visitors and staff	2	1	1	2	0	0	0	Other data*
Total	1,176	237	132	369	129	236	365	

*Employment and operational estimates provided by the client. All non-tailings related trips will be distributed per the regional distributions split accordingly based on estimates provided by the client. Tailing shipments will occur between the mine and the TSF (Archdale).



The impacts of additional traffic to/from the KMM and Archdale TSF sites are expected to be minor given the following: i) the current road infrastructure, with ample capacity to expand to the north (the direction the traffic to/from the site will originate from or head toward); ii) good sight lines along the route; iii) some traffic, both during construction and operations, occurring at off-peak hours; and iv) a relatively low volume of truck traffic to/from the KMM and Archdale TSF sites.

Impacts during Closure and Post-Closure

No impacts to traffic are anticipated during closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to traffic or transportation would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

No mitigation measures are proposed at this time.

3.3.18. Waste Management (Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act, and Pollution Prevention Act of 1990)

This section discusses RCRA wastes that may be generated at the facility. Such waste may be generated at the facility during the removal of the sewer line and buried radioactive material but is not anticipated. The waste will be stored temporarily but will not be treated or disposed of at the regulated Class 1 land fill waste facility. Industrial and hazardous waste will be identified in accordance with RCRA and applicable waste regulations and disposed of offsite at an approved third-party facility. All RCRA waste will be transferred to facilities permitted by the Department of Solid Waste Management (DSWM) or other federal or state jurisdictions. Hazardous wastes will be transferred to a duly-permitted treatment, storage, and disposal facility. All solid waste generated during the Proposed Project's construction phase will be collected, placed in appropriate receptacles, and disposed of offsite in accordance with DSWM requirements. The configuration of the proposed facility and its geographic location will prevent offsite environmental impacts from waste possession and disposal.

After concrete work, waste concrete, cement mixers, and equipment will be washed down in a designated concrete washout pit. The contractor will dispose of the solids offsite. Cement and fly-ash storage bins will be enclosed, and dust and PM will be managed according to air quality guidelines. Concrete production will occur within the batch plant to contain dust, and BMPs will minimize onsite dust effects.

Technologically Enhanced Naturally Occurring Radioactive Material (TENORM)

In February 1994, radioactive components were detected when old mining components were salvaged at the Cyprus Foote Mineral Company's Kings Mountain site. Two railcars of scrap


metal set off radiation detectors and were rejected by the nearby steel mill. The material consisted of approximately two truckloads of radioactive mining refuse created during previous mining operations and was encapsulated by a clay lining. A burial survey was performed for final approval of the permitted disposal process by the then Department of Environment, Health, and Natural Resources. A disposal plan was developed and subsequently approved to permanently bury the material onsite in the former tailings area. The plan was implemented and completed in May 2001. The then Division of Land Resources confirmed the completion of the permanent disposal activity and that the associated documentation requirements were met by Chemetall Foote Corporation. The Division of Land Resources certified attachment of the approval letter to the KMM Permit No. 23-01 and the property deed (TX-4-81, PB-4-27, Book L, Page 527) for future reference. The materials remain buried onsite at the KMM.

Radioactive material is present within the Proposed Project's footprint and has been buried in the mill tailings area since 2001. During the demolition of mining components by the previous operator, it was found that some equipment and building structures were contaminated with naturally occurring radioactivity from previous mining activities.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Kings Mountain

No RCRA, pollution, or hazardous waste impacts are expected.

Archdale Tailings Storage Facility

Archdale TSF does not have TENORM.

Proposed Mitigation Measures

No mitigation measures are proposed at this time.

Radon

Radon is a naturally occurring radioactive gas found in soils, rocks, water, and indoor and outdoor air. While the health risks of radon exposure are commonly associated with indoor air, radon in groundwater may also pose a threat to human health through ingestion or release into an indoor space.

On April 18, 2023, SWCA conducted groundwater sampling at ten groundwater wells to test for the presence of radon. Radon was detected at nine of the ten locations sampled.

Cleveland County is one of 19 counties in North Carolina known to have moderate to high susceptibility to elevated radon in water. The median level of radon in groundwater wells in the county is 3,090 picocuries per liter (Campbell et al. 2011). Geology is the primary influence on dissolved radon levels. Cleveland County is underlain by Cherryville granite, which is associated with higher-than-average radon levels due to the level of uranium within the bedrock (Waldron

et al. 2007). However, only one well, SNKM22-438, has a radon level that is higher than the median radon level for the county.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Kings Mountain and Archdale Tailings Storage Facility

Since radon occurs naturally in the environment, no impacts from the Proposed Project are anticipated.

Relocation of the Sewer Force Main Line and Sewer

A sanitary sewage conveyance pipe parallels the northwest railway spur before extending west to the city of Kings Mountain's municipal infrastructure. The pipe is approximately 5,700 linear feet and is buried at a depth of 4 feet. The current route conflicts with the development of the proposed infrastructure. Additionally, the municipality is planning to abandon the facilities which receive the sewage from this main line. As a result, decommissioning and demolition of the existing line is part of the site preparation plan.

A new line will be installed prior to decommissioning the existing line to maintain service continuity. The location of the new route is currently being determined based on the feasibility of connecting to the municipal system relative to Proposed Project activities. However, it is likely the line will follow the service road from the Kings Mountain Facility to I-85, and then west toward Kings Mountain Boulevard.

Clearing and grubbing will occur within a 15- to 20-foot corridor to allow for vehicle access. A wider corridor may be required locally where the current slope does not allow vehicle access. The relocation of the sewer force main line and sewage is expected to have negligible impacts on environmental resources.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Kings Mountain

The ground was previously impacted, and removal and replacement of the pipe will not cause adverse impacts to the environment.

Archdale Tailings Storage Facility

This relocation does not apply to Archdale TSF.

Proposed Mitigation Measures

No RCRA impacts or mitigation measures are proposed at this time.



Removal of Redundant Dominion Gas Distribution Line

Dominion Energy currently supplies the existing Kings Mountain Facility with natural gas via a buried 8-inch diameter distribution line. The natural gas line extends southward from the Kings Mountain Facility to I-85, although it is no longer in service (to be formally confirmed by Dominion Energy). The location of a portion of this line conflicts with future development of the crushing circuit and NPI areas, requiring decommissioning, purging, and demolition of the line between Kings Creek and I-85. The extent of the ground disturbance will be approximately 1,500 linear feet. Excavation is required to remove the line. The cross-section of the installation along the current route is unknown. A minimum of 2 feet of cover above the pipe, and a width of approximately 8 feet is expected. Excavation will be at a depth of 4 feet. Clearing and soil disturbance will occur within a 20-foot corridor to allow for vehicle access.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Kings Mountain

The ground was previously impacted, and removal and replacement of the pipe will not cause adverse impacts to the environment.

Archdale Tailings Storage Facility

This line removal does not apply to Archdale TSF.

Proposed Mitigation Measures

No RCRA or mitigation measures are proposed at this time.

Rerouting of Dominion Gas Line to Kings Mountain Facility

The Dominion Energy natural gas line, which serves the existing Kings Mountain Facility enters the property from the northwest and extends along the south side of the railway spur. Planned railway and other infrastructure upgrades will require the relocation of this gas line. The expected reroute length is approximately 5,500 feet of excavation, and replacement will be at a depth of 4 feet. To minimize interruption of the gas supply, a new line will be installed prior to decommissioning the existing line. The expected extent of clearing and soil disturbance will occur within a 15- to 20-foot corridor to allow for vehicle access.

Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Kings Mountain

The ground at the KMM site was previously impacted, and removal and replacement of the pipe will not cause adverse impacts to the environment.



Archdale Tailings Storage Facility

This line reroute does not apply to Archdale TSF.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to waste management would occur as existing conditions would remain unchanged.

3.3.19. Water Resources (Clean Water Act)

This section covers NEPA-related Proposed Project water facilities and activities, including wells, groundwater, wastewater, wetlands, stormwater, stream crossings, and dewatering. Proposed Project activities will impact jurisdictional wetlands and streams.

Kings Mountain

Thirty-seven distinct stream segments (22,527 linear feet total) within the KMM site (Appendix F, Wetlands) were identified. The 37 stream segments consist of 19 intermittent stream segments and 18 perennial stream segments. The ordinary highwater mark of streams within the KMM site averaged between 2 and 5 feet wide, and common substrates consist of sand, silt, and cobble. Based on the conditions observed during field investigations, the streams were classified as ephemeral, intermittent, or perennial. These forms were used during the assessment of all waterways as a standardized and replicable way of assessing the geomorphology, hydrology, and aquatic organisms present within the waterways and their potential jurisdictional status. Due to open culvert construction placed on the uplands to avoid contact with streams and allow more water flow, no jurisdictional streams are expected to be impacted.

Albemarle also identified onsite water resources for Proposed Project purposes. These are all man-made features and include the mine pit (53.22 acres), Mud Pond 1 (0.68 acres), Mud Pond 2 (1.20 acres), No. 1 Mill Pond (7.16 acres), PEG 25 (1.29 acres), Executive Club Lake (43.79 acres), South Creek, and South Creek Reservoir (8.37 acres) (Figure 13: Watershed Boundaries). Pit Lake is a mining pit that has filled with water since prior mining ceased. Mud Pond 1, Mud Pond 2, and No. 1 Mill Pond are non-jurisdictional isolated ponds on the KMM site parcel, north of I-85. South Creek is a south-flowing stream on the western portion of the KMM site, north of I-85, with the South Creek Reservoir making up the dammed portion that eventually discharges into Kings Creek. Executive Club Lake is an old tailings pond on the KMM site parcel, south of I-85, that discharges to Kings Creek. Small tributaries contribute to the flow to this lake.

Surface Waters and Groundwater

The natural drainage network in the vicinity of the Proposed Project is heavily influenced by legacy and active mining activities. The Proposed Project does not propose groundwater withdrawals, nor will construction impact groundwater, as the groundwater tables are not shallow at the KMM and Archdale TSF sites. Pit dewatering was included in the water balance



model, and it was determined there would be no adverse impacts to groundwater. Therefore, no impacts to groundwater are expected.

Diversion Channels

The diversion channel network has been designed to keep stormwater separate from wastewater.

Sediment Control Ponds

Permanent sediment basins are designed to serve areas larger than 5 acres and function for longer than 1 year; however, ponds with contributing areas of less than 5 acres are proposed. Eleven dedicated sediment basins have been designed for the site, which will capture site runoff and allow sediment to settle. WSB-1, while not designated a primary sediment control pond, will provide secondary sediment control and is therefore included for completeness.

Water Storage Basin 1

Stormwater and wastewater will be routed to the proposed WSB-1, which will be constructed above the footprint of the existing Executive Club Lake. Wastewater and other treated water streams will be pumped to WSB-1 for sediment control, mixing, and monitoring prior to release as wastewater through Outfall 003 to an unnamed tributary to Kings Creek. From the discharge point at Outfall 003, it will flow overland approximately 1,500 feet before joining Kings Creek. Since WSB-1 receives wastewater streams in addition to stormwater, the discharge at Outfall 003 will be regulated as a wastewater discharge.

WSB-1 will be constructed by restoring the historically breeched embankment to the original crest elevation of 850 feet amsl above the current discharge outlet of approximately elevation 820 feet amsl. Normal operational discharges will be managed through a series of 18-inch diameter vertical risers placed along the upstream embankment face at 5 feet vertical spacing.

Wastewater inflows to WSB-1 will be conveyed from other facilities in the Proposed Project area via the wastewater pipeline, which will discharge to the pond at the far eastern (upstream) end of the pond and will form a sediment forebay. A 5-feet-high permeable rockfill dam will serve to trap coarse sediments in the forebay. The remainder of WSB-1 will form a long, narrow lake, and with the nominal 830 feet amsl water level and a 100-year peak inflow, result in an estimated 114 hours of residence time in WSB-1. This is sufficient to trap 4-micron particle sized sediment.

Water Treatment Plant

The WTP will receive inflows of excess water from the concentrator and seepage/runoff from RSF-X routed through Collection Pond 51. The WTP will be designed for an average flow of 145 gpm and a peak flow of 327 gpm treatment capacity and be constructed adjacent to the concentrator. The WTP is designed to operate 365 days per year.



Wastewater

The objectives of the Proposed Project's water management plan are to achieve water quality and water quantity objectives, reduce potential effects on the downstream environment, and limit the infrastructure damage from storm events. Objectives will be achieved by separating clean, non-contact water from water that has come into contact with ore, waste rock, or tailings (i.e., contact water). Wastewater will originate from mine dewatering (classified as wastewater by DEMLR), and PAG contact water from RSF-X. Wastewater will be collected across the site and diverted to WSB-1 before discharging at Outfall 003.

Stormwater

Perimeter channels have been designed to route non-contact runoff from disturbed areas that have not come into contact with ore, preventing precipitation and runoff from becoming contact water. Non-contact water originating from disturbed areas is classified as stormwater and will be managed with sediment controls and monitored as per General Permit requirements before being released through a permitted outfall. Stormwater will be routed through one of the Proposed Project's sediment control ponds to manage sediment.

Outfalls

All regulated surface water from the Proposed Project site will be discharged to one of eight permanent and four temporary outfalls on Albemarle's KMM property. The four temporary outfalls will be used during the Proposed Project's construction phase only. Water will be discharged into an unnamed tributary to Kings Creek, Kings Creek, or South Creek, which eventually flows into King's Creek. Water from two RSF-A run-on catchment areas will only be exposed to undisturbed areas, therefore runoff from these two sites is not regulated.

The proposed outfall locations are shown in Table 20: Project Discharge Outfall Locations.

Outfall Number	Water Origin	Water Type	Receiving Water	Notes
003	Outlet from WSB-1 dam	Wastewater	Kings Creek	Combined outlet of all the discharges going into WSB-1, including water from the WTP, open pit, ore storage and processing area ponds, Collection Pond 61, and contributing catchments. Includes both stormwater and wastewater.
005	Pond C02	Stormwater	Kings Creek	Stormwater from south NPI area, initially from temporary sediment pond then Pond C02 once it is constructed.
010	Sediment Pond 1	Stormwater	Kings Creek	Stormwater from Sediment Pond 1, which captures water from OSF-3, pit perimeter ponds, and contributing catchments. Downstream of Technology Center, near other stormwater discharge locations. May flow into the wetland area and thence to Kings Creek.

Table 20: Project Discharge Outfall Locations

Outfall Number	Water Origin	Water Type	Receiving Water	Notes
062	Sediment Pond 62	Stormwater	South Creek	Stormwater from Sediment Pond 62, which captures runoff from OSF-1.
063	Sediment Pond 63	Stormwater	South Creek	Stormwater from Sediment Pond 63, which captures runoff from OSF-1.
064	Sediment Pond 64	Stormwater	South Creek	Stormwater from Sediment Pond 64, which captures runoff from OSF-3.
067	Haul road and railroad watershed	Stormwater	South Creek	Stormwater originating in haul road and railroad watersheds.
201*	Temporary sediment pond, then Pond M11	Stormwater	Kings Creek	Temporary (construction only) outfall. Stormwater from south NPI (north of I-85).
202*	Temporary sediment pond, then Pond M12	Stormwater	Kings Creek	Temporary (construction only) outfall. Stormwater from south NPI (north of I-85).
203*	Temporary sediment pond, then Pond C01	Stormwater	Kings Creek	Temporary (construction only) outfall. Stormwater from south NPI (south of I-85).
204*	Temporary sediment pond	Stormwater	South Creek	Temporary (construction only) outfall. Stormwater from north NPI.

* = Outfall is temporary and will be used during the Proposed Project's construction phase only.

I-85 = Interstate 85; NPI = non-process infrastructure; OSF = overburden storage facility; Technology Center = Global Technology Center for Research and Development; WSB = water storage basin; WTP = water treatment plant

Stream Crossing

A proposed, reinforced concrete pipe culvert will be placed across the stream for NPI north and other crossings. Riprap will be used, and no live concrete will be placed in the streams. The existing stream substrate will be buried/removed if deemed unsuitable for bedding material. The pipe will be buried 1 foot down if larger than 48 inches in diameter or will be buried to a depth of 20 percent of the diameter if less than 48 inches, so as not to impede aquatic passage during low flow.

Archdale Tailings Storage Facility

No streams were identified within the Archdale TSF site.

Waste Rock

Waste rock is material from the pit containing insufficient spodumene ore to send to the concentrator and will be used to build the Archdale TSF foundation, TSF embankment, and haul road cap.



The proposed RSF-A will permanently impact 1292 feet of intermittent stream and 443 feet of perennial stream. The existing substrate in these areas will be buried/removed if deemed unsuitable for bedding.

Water treatment at the TSF will not be necessary due to mixing and diluting the tailings seepage and embankment waste rock seepage contact water with non-contact stormwater that falls on the TSF perimeter (SRK 2024c, 2024e).

Impacts during Site Preparation

No jurisdictional streams will be impacted by site preparation activities.

Impacts during Construction

Impacts to streams are expected. For the construction phase, a Stormwater Pollution Prevention Plan will be prepared and implemented to effectively prevent potential pollution or contamination of stormwater runoff. Implementation of appropriate BMPs during construction (such as silt fencing and/or straw wattles) will prevent potential impacts to the streams from turbid stormwater runoff. Once construction is complete, discharge of treated water will be directed offsite. No surface water diversion or withdrawal is proposed. No riparian vegetation will be removed.

During construction, there may be an increase in suspended particulates that may lead to increased turbidity downstream. However, the increase will be minimal and temporary due to the installation and maintenance of proper sediment and erosion control measures (e.g., turbidity curtains, silt fences, and hay bales) during construction and shortly thereafter. Erosion control measures and BMPs will be installed and maintained at all times during construction and mining operations to prevent discharges of sediment and turbid waters to offsite surface waters and onsite wetlands that would not be impacted.

Proposed Project construction activities such as clearing, grading, excavation, and stockpiling, as well as activities conducted in or near waterbodies, have the potential to alter the movement (flow) of water as well as the quantity and quality normally encountered onsite. The quality and quantity of effluent streams discharged, including stormwater, process effluents, excavation ingress water, diversion pumping, and site drainage should be managed and treated to meet applicable effluent discharge requirements.

Impacts during Site Preparation

Site preparation will involve filling in the streams with clean fill as described. Proper sediment and erosion control measures will be installed prior to and during construction so that the substrate of remaining WOTUS will not be changed or affected.

Impacts during Construction

No additional impacts to WOTUS during construction are anticipated.



Impacts during Operations

The Archdale groundwater model, using the MODFLOW-USG control-volume finite-difference simulator, was used to help calculate flows and estimate seepage rates during operations. During the operations phase, water infiltrating the tailings will be removed using collection sumps beneath the tailings.

Impacts during Closure and Post-Closure

No impacts are expected from closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to surface waters would occur as a result of the Proposed Project, as existing conditions would remain unchanged.

Kings Mountain

Wetland delineations were conducted in 2023 and 2024 at the KMM site and the surrounding area. One offsite 0.3-acre wetland (Wetland A) was documented to the southeast of the KMM site, and outside the Proposed Project footprint. Black willow (*Salix nigra*) and sweetgum (*Liquidamber styraciflua*) dominated the wetland. The 2023 survey noted that the wetland could be considered jurisdictional by the U.S. Army Corps of Engineers (USACE) and the state; however, based on desktop mapping, it appears that the wetland is potentially isolated. If that is the case, the wetland will likely be considered non-jurisdictional under the Sackett vs. USEPA ruling (Sackett v. USEPA. 132 S. Ct. 1367 [2023]).

Based on the North Carolina Wetland Assessment Method and North Carolina Stream Assessment Method, most KMM wetlands and streams have been rated as having a high functional value. Nine small wetlands and isolated wetlands received a medium functional value. Only one stream in a residential area with little instream habitat and wooded buffer was rated as having a low functional value. (Figure 12: Surface Water Features – KMM).

A field investigation of the KMM site was conducted in February and March 2022, and February, June, and July 2023 (Appendix F, Wetlands). A delineation of wetlands and waterbodies was conducted to verify NWI mapping (USFWS 2015) and NHD data (USGS 2013) within the KMM site (SWCA 2024f). The requests for an approved jurisdictional determination (JD) and a preliminary JD were submitted on September 20, 2023.

Based on the delineation, 45 distinct wetlands (40.24 acres total) and 12 ponds/impoundments (85.58 acres) are on the KMM site (Figure 11: Wetland Delineations – KMM).

Additionally, 12 distinct PUB aquatic features (e.g., ponds, lakes, mining pits) totaling 85.58 acres were delineated within the KMM site area. Resources determined to be USACE non-jurisdictional are generally isolated within the KMM site and not connected to a downstream traditional navigable water (TNW) or are regulated under the NPDES permit for the Proposed Project.

Additional resources were determined to be USACE non-jurisdictional due to being isolated within the KMM site and not connected to a downstream TNW. Table 21: Impacts as a Percentage of Resources (Site and Basin) summarizes the number and acreages of jurisdictional and non-jurisdictional features. Hydrology within portions of the KMM site has been modified through historical mining land use practices. Additionally, most of the sizable wetlands and waterways have been influenced by beaver activity.

Resource	Resource Onsite	Impacted	% Onsite Resource	Resource in Basin	% Basin Resource
Wetlands	35.71	8.39	23.5	3370.11	0.25
Man-made lakes/ponds	20.88	0.14	0.67	347.98	0.04
Streams	20,580	4720	22.93	898,992	0.53

Table 21: Impacts as a Percentage of Resources (Site and Basin)

SWCA delineated 37 distinct stream segments (22,527 linear feet total) of which 19 stream segments were classified as intermittent and 18 stream segments were classified as perennial within the KMM area (Table 22: Waterways). Some of the intermittent and perennial streams segments originate as either sheet flow, ephemeral, or other connected intermittent streams before transitioning into their final classification. Non-jurisdictional features include upland swales and streams with no significant nexus.

Table 22: Waterways

Classification	Total Linear Feet within Project Area		
Jurisdictional ephemeral stream	0.00		
Jurisdictional intermittent stream	4,478 (19 segments)		
Jurisdictional perennial stream	17,603 (18 segments)		
Jurisdictional delineated waterway	0.00		
Non-jurisdictional feature	446		
Total	22,527 (37 segments)		

Source: 2023 SWCA Wetland Delineation Report

Sediment and erosion control measures will be implemented to prevent increased flows from negatively inundating onsite and nearby wetlands.

Archdale Tailings Storage Facility

The wetland delineation at the Archdale TSF identified one wetland complex (7.63 acres total) and six waterbodies (9.42 acres total). The waterbodies are all man-made ponds or mining pits filled with water (Figure 17: Wetland Delineations – TSF). Details are provided in the wetland and waterbody delineation report (Appendix F, Wetlands).









There are no jurisdictional streams at the Archdale TSF.

A field investigation of the Archdale TSF site was completed in September 2023 (SWCA 2024f). One PSS wetland complex and six PUB waterbodies were identified. The waterbodies are all man-made ponds or mining pits filled with water.

Impacts during Site Preparation

Several WOTUS are located onsite. During the wetland delineation, one wetland complex (7.63 acres total) and six waterbodies (9.42 acres total) were identified. The waterbodies are all manmade ponds or mining pits filled with water (Figure 11: Wetland Delineations – KMM). Details are provided in the wetland and waterbody delineation report (Appendix F, Wetlands).

Wetland Impact Summary

Albemarle wants to expand the existing non-jurisdictional mining pit (53.22 acres) to approximately 84.4 acres (Table 23: Impacts to 404 Jurisdictional Resources and Figure 18: WOTUS Impacts [July 2024]). The expansion will include dewatering the existing pit and transporting the water into South Creek Reservoir. The impact from the expansion will be to uplands and non-jurisdictional man-made ponds that will be dewatered and filled. During the dewatering of the existing pit, fish and other aquatic species (e.g., turtles) will be collected and relocated to other water bodies onsite. No federally protected species occur in the mine pit lake and no jurisdictional wetlands will be impacted by the expansion of the existing pit. The Proposed Project will result in impacts to 8.79 acres of wetlands, 0.14 acres of ponds (excluding inundation), and 6,226 linear feet of stream (2,013 linear feet of intermittent stream, and 4,213 linear feet of perennial stream).



Component/Area	Wetlands (acres)	Lakes/Ponds (acres)	Intermittent Stream (linear feet)	Perennial Stream (linear feet)
Impact Area 1: Northern NPI area	0.30	NA	96	1207
Impact Area 2-South Creek haul road crossing	NA	NA	NA	384
Impact Area 3-OSF-1 facility	0.50	NA	113	1485
Impact Area 4—RSF-A	0.02	NA	1296	440
Impact Area 5-Kings Creek haul road	NA	NA	0	116
Impact area 6-ROM pad	0.30	NA	NA	561
Impact Area 7-WSB-1 dam	0.26	0.14	226	NA
Impact Area 8-WSB inundation	3.69	10.93	286	NA
Impact Area 9-Concentrator facilities added for the pipe impacts	0.05	0.04	NA	NA
Impact Area 10: Pit	0.00	0.00	446	0.00
Total	5.12	11.11	2463	4193

Table 23: Impact Summary to 404 Jurisdictional Resources

BMP = best management practice; NA = not applicable; NPI = non-process infrastructures;

OSF = overburden storage facility; ROM = run-of-mine; RSF = rock storage facility WSB = water storage basin









Ten distinct impact areas are proposed (excluding roads). Impact Area 1 will contain the construction of necessary infrastructure in the north NPI area. The activity will impact 0.30 acres of PFO (WC-01), 96 linear feet of intermittent streams (SC-03), and 1,207 linear feet of perennial streams. Impact Area 2 will consist of the South Creek Road crossing with temporary impacts to 384 linear feet (SA-05) of perennial streams to allow access to RSF-A. Impact Area 3 will be the OSF-1 facility with impacts to 0.5 acres of wetland, 113 linear feet of intermittent streams, and 1485 linear feet of perennial streams which will result from construction of the RSFs to provide slope stability, access, and stormwater management systems. Impact Area 4, RSF-A, will impact approximately 0.02 acres of PFO wetlands (WA-01), 1,296 linear feet of SA-04 intermittent streams, and 440 linear feet of perennial streams (SA-04). Impact Area 5 will be the Kings Creek haul road with impacts to 116 linear feet of perennial streams for the bridge span. Impact Area 6 will be the ROM pad and will impact 0.30 acres of wetland (WB-05) and 561 linear feet of perennial streams. Impact Area 7 will be the WSB-1 dam and will impact 0.26 acres of wetland and 226 linear feet of intermittent streams (pending new design modifications). Impact Area 8 will impact 3.69 acres of wetlands and 286 linear feet of intermittent streams. Impact Area 8 is not expected to permanently impact the wetlands due to periodic influx and change in water elevation. Impact Area 9 will be the concentrator facilities added for pipe impacts with 0.05 acres of wetlands. Impact Area 10 will be the Pit and will impact 446 linear feet of intermittent streams (Figures 18: WOTUS Impacts [July 2024] and 19: Impact Areas).

The development of Proposed Project facilities and infrastructure will affect several wetlands, watercourses, and waterbodies through the removal of vegetation resulting in sedimentation and erosion, infilling of wetlands and waterbodies, or construction of diversions or culverts affecting the form and function of the waterbodies and/or watercourses. No additional wetlands other than those mentioned in Table 23: Impacts to 404 Jurisdictional Resources will be impacted during site preparation. See also Table 24: Wetlands and Palustrine Unconsolidated Bottom Features.









Table 24: Wetlands and Palustrine Unconsolidated Bottom Features

Classification	Number of Unique Features	Total Acres within Project Area
Jurisdictional wetlands	33	35.71
PFO	12	21.53
PSS	7	9,51
PEM	9	4.67
Jurisdictional PUBs	5	20.88
Non-jurisdictional wetlands	23	3.40
Non-jurisdictional PUBs	7	64.70

PEM = palustrine emergent wetlands; PFO = palustrine forested wetlands; PSS = palustrine scrub-shrub; PUB = palustrine unconsolidated bottom

Impacts during Construction

Impacts to wetlands are anticipated under the proposed action. Ten distinct impact areas are proposed as described in Section 3.3.19.4, Wetland Impact Summary. However, no jurisdictional wetlands will be impacted with the expansion of the existing pit.

Impacts during Operations

No impacts to wetlands are anticipated during operations.

Impacts during Closure and Post-Closure

No impacts to wetlands are anticipated during closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to wetlands would occur as existing conditions would remain unchanged.

Floodplains

Kings Mountain

Floodplain management requires agencies to assess the effects their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development of floodplains.

No impacts to 100-year floodplains will occur at the KMM site. According to Federal Emergency Management Agency (FEMA) Map 370304, the mining site is designated as Zone X, which means the area is outside of the 0.2 percent annual chance floodplain. Additionally, FEMA National Flood Hazard Layer maps depict approximately 21 acres of the KMM site being within Zone AE of the 100-year floodplain (areas subject to inundation by the 1 percent annual chance of flood) (FEMA 2024). These mapped floodplains are located along Kings Creek (Figure 20: Location of 100-Year Floodplain Limits – KMM).





Figure 20: Location of 100-Year Floodplain Limits – KMM



Archdale Tailings Storage Facility

FEMA National Flood Hazard mapping does not depict any areas in the Archdale TSF being within Zone AE of the 100-year floodplain (Figure 21: Location of 100-Year Floodplain Limits – TSF).









Impacts during Site Preparation, Construction, Operations, Closure, and Post-Closure

Construction waste may consist of RCRA Subtitle D non-hazardous solid waste. All solid waste generated during the construction phase will be collected, placed in appropriate receptacles, and disposed of offsite in accordance with legal requirements. As such, debris caught in fences during site preparation or construction may alter the natural flow of stormwater, potentially diverting it to a lower floodplain over time.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to floodplains as a result of the Proposed Project would occur, as existing conditions would remain unchanged.

Groundwater

Kings Mountain

The Piedmont and Blue Ridge aquifers within the KMM and Archdale TSF sites consist of bedrock overlain by unconsolidated weathered parent materials.

The area is characterized by ancient igneous and metamorphic rocks, with the major rock types being schist and gneiss (Versar 1984). The depth to groundwater varies from greater than 40 feet at the highest site elevations to less than 3 feet at the lowest site elevations (Versar 1984). Groundwater flows through the Piedmont and Blue Ridge aquifers in a southwestern direction. Water taken from the unconfined aquifer at the KMM site is generally not used for drinking water (Versar 1984).

Seeps and Springs

Seeps and springs were identified within the KMM site to understand and monitor site hydrology related to these resources (SWCA 2022d). Based on winter and fall surveys, there are seven seeps and 14 springs within the KMM site (Table 25: Seeps and Springs Inventory; Figure 22: Seepage Springs). Most springs form into intermittent streams that are tributaries to larger streams within the KMM site. Most seeps form into wetlands that contribute hydrology to larger streams or wetlands within the KMM site.

Location	Seeps	Springs
Main site—north of I-85	5	12
Main site—south of I-85	2	2
Total	7	14

Table 25: Seeps and Springs Inventory

Source: SWCA 2022d

I-85 = Interstate 85









Municipal and Private Water Supplies

<u>Wells</u>

Fifteen groundwater wells were installed across the KMM and Archdale TSF sites to enhance the ability to assess long-term changes to the deeper groundwater flow system and establish a baseline.

In 2022, two deep monitoring wells, 22 overburden monitoring wells, and four pumping wells within the overburden were installed. Well installation was completed in 2023, and quarterly samples are taken from these wells instead of at the interim monitoring points.

Results of the well surveys show there are no municipal or private water supplies within the KMM site. Approximately 260 confirmed or suspected wells were within the search area (SRK 2024i). Though most are suspected to be positive, at least 56 wells were positively identified based on previous environmental investigations (reports dating back as far as the early 1990s), well construction diagrams, and/or laboratory data since 2010. Well locations are shown on Figure 23: Existing Monitoring Well Locations – KMM and Figure 24: Existing Monitoring Well Locations – TSF. Well locations are approximate since location information is largely based on a parcel system and does not necessarily reflect exact coordinates. There are 23 confirmed and 226 suspected wells within a 2-mile radius of the KMM site.

Results of numerical groundwater modeling indicate that impacts related to a reduction in groundwater levels are expected to be minimal outside the site boundary as a result of dewatering and mining operations.





Figure 23: Existing Monitoring Well Locations – KMM





Figure 24: Existing Monitoring Well Locations – TSF



Impacts during Site Preparation

No impacts to offsite municipal and private water supplies are expected from site preparation.

Impacts during Construction

No impacts to offsite municipal and private water supplies are expected from construction.

Impacts during Operations

No impacts to offsite municipal and private water supplies are expected from operations.

Impacts during Closure and Post-Closure

No impacts to offsite municipal and private water supplies are expected from closure or postclosure. All wells will be plugged once monitoring and production wells are no longer needed in accordance with NCAC 15A 02C.0113 Abandonment of Wells.

Archdale Tailings Storage Facility

During post-closure, the drains simulating the water collection system under the TSF will be deactivated and the groundwater level in the facility will be allowed to recover. Particle tracking will be used to analyze the movement of the tailings contact water during post-closure.

In the base case, the maximum water level in the tailings was calculated to be 877 feet amsl, 65 years after the start of deposition (55.5 years after the end of operations). This corresponds to 47 feet of rise from the pit lake bottom. The highest water level elevation in the tailings from the sensitivity scenarios was 903 feet amsl, which is 73 feet above the pit lake bottom. The top of the planned TSF will be 1,004 feet amsl.

The amount of contact water moved to the downstream groundwater system was estimated at 5 gpm from the tailings and 7 gpm from the embankment for the base case, and 41 gpm from the tailings and 50 gpm from the embankment for the highest sensitivity simulations. Groundwater moving from the embankment to the groundwater system was also considered contact water for this analysis due to the likely movement of some water from the tailings to the embankment and then to the groundwater system.

Impacts during Site Preparation

Results of the numerical groundwater modeling indicated that impacts related to the reduction in groundwater levels are expected to be minimal outside the Archdale TSF site as a result of dewatering operations (Appendix F, Wetlands).

Impacts during Construction

No impacts to wells are anticipated during construction.



Impacts during Operations

Results of the numerical groundwater modeling indicate that impacts related to the reduction in groundwater levels as a result of mining operations and surface water outflow into Kings Creek (Appendix F, Wetlands) are expected to be minimal outside the Archdale TSF site boundary. An outflow channel connecting the open pit to Kings Creek will be designed once post-mining topography has been established. Pit lake water quality predictions indicate that the shallow pit lake water chemistry will meet applicable surface water quality standards. The open pit will not be stocked with fish upon closure and is not currently being considered for recreational use.

The amount of groundwater flow to the sump system is calculated to be 132 gpm due to the increased recharge to the TSF surface during operations. The drawdown cone formed while dewatering the existing pit lake is expected to remain within the facility's boundary. A 6 gpm seepage rate is estimated to be collected and managed at the toe of the TSF embankment.

Water quality of the TSF seepage water (at the base of the TSF, at the base of the TSF embankment, and under the TSF) has been analyzed and predicted by SRK (2024b). The results of the geochemical analysis modeling indicate that all parameters in the tailings seepage and waste rock embankment seepage are predicted to be below state surface water quality standards, which will allow these waters to be directly discharged to surface water.

Antimony and manganese are predicted to be elevated above the state groundwater standards in the tailing's seepage contact water. However, antimony is just slightly above the standard and within the margin of error of geochemical prediction models. Arsenic is also predicted to be elevated above groundwater standards in the waste rock embankment seepage. However, water treatment at the TSF will not be necessary due to mixing and diluting the tailings seepage and embankment waste rock seepage contact water with non-contact stormwater that falls on the TSF perimeter (SRK 2024c, 2024e).

Impacts during Closure and Post-Closure

No impacts to groundwater are anticipated during closure and post-closure.

No Action Alternative Impacts

Under the No Action Alternative, a hardrock lithium mine would not be constructed. No impacts to groundwater would occur as existing conditions would remain unchanged.

Proposed Mitigation Measures

Avoidance and minimization measures to stream crossings, surface waters, and wetlands are provided in Table 26: Example Avoidance and Minimization Measures.

Avoidance and Minimization Measure	Actions			
Mining buffers	Mining buffers of 50 feet around the entire perimeter of the KMM site will be established as required by the City of Kings Mountain.			
Stream crossings	Albemarle will utilize existing stream crossings where practicable, avoiding direct impacts to most streams (4720 feet).			
Stream buffers	Indirect impacts to streams will be avoided with a 100-foot stream buffer.			
Stormwater BMPs	Streams will be protected by stormwater BMPs. Sediment and erosion control measures will be used to prevent impacts to downstream waters.			
Spill prevention	Albemarle is developing a SWPPP and Spill Prevention, Control, and Countermeasure Plan.			
Storage	Construction equipment will be kept in upland areas.			
Surface waters	No live concrete will be allowed to contact surface waters.			
Water quality monitoring	Water quality monitoring will be conducted to monitor site discharge and runoff.			

Table 26: Example Avoidance and Minimization Measures

BMP = best management practice; KMM = Kings Mountain Mine; SWPPP = Stormwater Pollution Prevention Plan

Compliance with restrictions on discharge measures will be taken so that no more than minimal adverse effects due to the proposed discharge will occur. Table 27: Compliance with Restrictions on Discharge details these actions.

Table 27: Compliance with Restrictions on Discharge

Compliance with Restrictions on Discharge	Actions
Location	The discharge of fill material has been designed to minimize or prevent the creation of standing bodies of water and provide for normal flow of water, the extent of any plume, and the disruption of periodic water inundation patterns. The material to be discharged will be similar to the existing site substrate but mixed due to the nature of mining.
Material to be discharged	The fill material will consist of waste rock and overburden taken from the site. The fill material will be free of pollutants in toxic amounts. The rock is not expected to contain natural constituents that are toxic or could become toxic and/or bioavailable as a result of the discharge. This will maintain physiochemical conditions and reduce the potency and availability of pollutants.
Material after discharge	The fill material will be stabilized after discharge to prevent erosion and slumping by using grade controls, sediment containment fencing, cover seeding, sediment basins, and stormwater controls.
Method of dispersion	Sediment fencing, sediment basins, and dewatering structures will aid in minimizing the potential of the fill material to disperse.



Compliance with Restrictions on Discharge	Actions
Effects on plant and animal populations	Fill material will be placed in disposal sites that will contain no flow or be dewatered prior to the placement of fill, and aquatic life movement will be negligible. The activities in WOTUS are not expected to create habitat conducive to the development of undesirable predators or species which have a competitive edge ecologically over indigenous plants or animals. The KMM and Archdale TSF sites are similar to surrounding landscapes and do not represent rare landscapes or contain any unique landscape elements in general; thus, the surrounding area is representative of similar plant and animal populations on the KMM and Archdale TSF sites and the activities in WOTUS will have minimal impacts to plant and animal populations relative to their presence in the surrounding area.
Effects on human use	The proposed KMM and Archdale TSF sites are located outside of public and private water intakes. Procedures for discharging fill material will minimize the disturbance of aesthetic features of the aquatic resources onsite. The activities in WOTUS are internal to the KMM and Archdale TSF sites and are generally not visible, accessible, or considered aesthetically pleasing to humans.

KMM = Kings Mountain Mine; TSF = tailings storage facility; WOTUS = Waters of the United States

The following measures will be implemented to manage potential environmental impacts to wetlands, waterbodies, and watercourses. Wetlands not identified for removal will not be disturbed. Activities conducted adjacent to or in proximity to wetlands will include sediment and erosion control measures appropriate to the activities and areas adjacent to the wetland and suitable signage will provide area demarcation. Wetlands indirectly affected by construction activities will be restored so that their functions and features are maintained. Use of appropriately sized fish screens will be employed on any pump or intakes placed in waterbodies (wetlands) or watercourses which are identified as fish-bearing or that support amphibians.

Compensatory mitigation to wetlands will be required because impacts will not be considered minimal individually and/or cumulatively and will far exceed levels that generally require compensatory mitigation. Mitigation banks in the service area do not have the appropriate number and resource-type credits available.

The impacts will be within the service area of an approved in lieu fee program (Table 28: Mitigation Type and Location). The in lieu fee program has the appropriate number and resource-type credits available per wetland type. Table 29: Compensatory Mitigation Impact Analysis for 404 Jurisdictional Resources and Table 30: Compensatory Mitigation Impact Analysis for NCDEQ-Only Jurisdictional Resources Credit calculations are based on a 2 to1 ratio for streams and 0.5 to1 for open water. Table 31: In Lieu Fee Credit Calculation and Table 32: Summary of Credits calculate the summary of credits for direct and indirect impacts. Table 33: Summary of Proposed and Required Compensatory Mitigation divides the credit type into wetlands and streams.



Table 28: Mitigation Type and Location

Mitigation Bank Credits	
In lieu fee program credits	Yes
Permittee-responsible mitigation under a watershed approach	NA
Permittee-responsible mitigation, onsite and in-kind	NA
Permittee-responsible mitigation, offsite and/or out of kind	NA

NA = not applicable

Table 29: Compensatory Mitigation Impact Analysis for 404 JurisdictionalResources

Aquatic Resource Type	Impact (ac or lf)	Mitigation Ratio	Mitigation Credits
PFO	1.57	2:1	3.14
PSS	2.62	1.5:1	3.93
PEM	1.13	1:1	1.13
PER	4,193	2:1	8,386
INT	1,731	1:1	1,731
OW	11.11	0:1	0.00

ac = acres; INT = intermittent; If = linear feet; OW = open water; PEM = palustrine emergent; PER = perennial; PFO = palustrine forested; PSS = palustrine scrub-shrub

Table 30: Compensatory Mitigation Impact Analysis for NCDEQ-OnlyJurisdictional Resources

Aquatic Resource Type	Impact (ac or lf)	Mitigation Ratio	Mitigation Credits
PFO	1.86	2:1	3.72
PSS	5.33	1.5:1	8.00
PEM	1.60	1:1	1.60
PER	3,653	2:1	7,306
INT	2,459	1:1	2,459
OW	11.68	0:1	0

ac = acres; INT = intermittent; If = linear feet; OW = open water; NCDEQ = North Carolina Department of Environmental Quality; PEM = palustrine emergent; PER = perennial; PFO = palustrine forested; PSS = palustrine scrub-shrub



Feature	Direct Impacts	Indirect Impacts	Ratio	Additional Credits	Total Credits
Perennial streams	2612	0.00	2:1	NA	5224
Intermittent streams	2108	0.00	2:1	NA	4216
Open water	0.14	0.00	0.5:1	NA	0.01
Wetlands	8.39	0.00	2:1	NA	16.78
Total	4728.53	0.00	-	NA	9456.79

Table 31: In Lieu Fee Credit Calculation

NA = not applicable

Table 32: Summary of Credits

Feature	Direct Impacts	Additional Indirect Impacts	Required Credits	Additional Credits	Total Credits
Perennial streams	2523	0.00	2:1	NA	5046
Intermittent streams	2359	0.00	2:1	NA	4718
Open water	0.00	0.00	0.5:1	NA	0.00
Wetlands	7.27	0.00	2:1	NA	40.4
Total	4902.20	0.00	-	NA	9804.40

NA = not applicable

Table 33: Summary of Proposed and Required Compensatory Mitigation

Credit Type	Required Credits
Wetland credits	8.2
Stream credits	10,117

4. CUMULATIVE IMPACTS

Cumulative impacts are potential effects on the environment from the incremental impact of the Proposed Project when added to other past, present, and reasonably foreseeable future actions undertaken by other agencies (federal or nonfederal) or persons (40 CFR Part 1508.1 ((g)).

The cumulative impacts review assessed the past, present, and anticipated future projects related to the Proposed Project's location. The primary projects analyzed for cumulative impacts included the Catawba Village commercial and residential development and the Dixon Ridge Development. As part of the conceptual plan for Catawba Village, the City of King's Mountain has outlined development plans for approximately 211.88 acres. Plans for this private development include the construction of a casino (sometimes referred to as the Catawba Two



Kings Casino), residential spaces, and various amenities. The Dixon Ridge Development is a mixed-use industrial, research, and residential development across I-85 from the future Catawba Village. Other projects in the immediate vicinity include primarily residential neighborhood developments that are not likely to have cumulative impacts with the Proposed Project.

Table 34: Cumulative Impacts details the direct, indirect, and cumulative impacts for the Proposed Project.

Resource	Direct Impacts	Indirect Impacts	Cumulative Impacts	Explanation
Aesthetics and visual resources	Minor	Minor	Minor	The location of the facility is intended for industrial development. Section 3.3.1 describes the potential for minor direct and indirect impacts from the Proposed Project as a result of its design and location with respect to residential properties. Additional projects in the region would augment existing industrial and roadway infrastructure and could, therefore, have an incremental impact on visual resources.
Air quality and climate change	Minor	Minor	Minor	The Proposed Project's construction phase will result in air emissions, primarily from fugitive dust associated with earthmoving and exhaust from fuel combustion. However, emissions resulting from construction will be temporary and minimized by BMPs. In operations, the Proposed Project will support the proliferation of EVs, thereby reducing emissions from fuel combustion. Although the construction phase will have temporary impacts on air quality, the long-term effects of increased EV implementation would outweigh impacts from construction and result in a net benefit. The cumulative impacts on air quality associated with operation of the Proposed Project and the other projects in the region would be subject to regulatory oversite through the CAA.
Biological resources	Minor	Minor	Minor	Due to the current disturbed industrial land use adjacent to the Proposed Project site and the proposed facility's lack of natural habitat and low potential for wildlife use, cumulative impacts on general biological resources (wildlife and vegetation) are minor. No critical habitat is found on the Proposed
				Project site and there is a lack of natural habitat on or adjacent to the Proposed Project site and surrounding industrial areas.

Table 34: Cumulative Impacts



Resource	Direct Impacts	Indirect Impacts	Cumulative Impacts	Explanation
Cultural resources	Negligible	Negligible	Negligible	Impacts to cultural resources from the proposed action are not expected. Therefore, impacts from the proposed action, when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased impacts on cultural resources within the Proposed Project boundary.
Geology and soils	Negligible	Negligible	Negligible	The Proposed Project, in conjunction with the other possible identified projects on the Proposed Project site, would be designed to minimize soil disturbance and grading.
Greenhouse gases	Negligible	Negligible	Negligible	In the context of GHG emissions, the Proposed Project will have a net positive, long-term impact on the global climate and GHG emissions. This impact arises from the Proposed Project's contributions to decarbonizing U.S. transportation, which significantly outweigh the GHG emissions generated by the Proposed Project itself. Over the first 10 years of operation, batteries produced using material from the Proposed Project site are expected to eliminate between 4,493,770 to 4,600,000 metric tons of CO ₂ emissions. Reducing CO ₂ emissions overall would lead to lower GHG concentrations and mitigate climate change impacts, including changes in temperature, precipitation patterns, extreme weather events, and rising sea levels.
Public health and safety	Negligible	Negligible	Negligible	Impacts to health and safety from the proposed action are not anticipated as all guidelines and compliance actions will be implemented.
				the proposed action, when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased impacts on health and safety within the Proposed Project boundary or surrounding area beyond what has already been experienced.
Land use	Negligible	Negligible	Negligible	The Proposed Project, in conjunction with the other possible identified projects on the Proposed Project site, would be designed to minimize land disturbance and grading.



Resource	Direct Impacts	Indirect Impacts	Cumulative Impacts	Explanation
Noise	Moderate	Minor	Minor	The impacts from noise during construction will be intermittent and temporary. Once the Proposed Project is operational, noise impacts are expected to be minor due to the initial disturbance during site preparation and construction. This disturbance may cause wildlife to avoid the area in most cases. Consequently, it is concluded that the proposed action, when combined with other past, present, and reasonably foreseeable future actions, would not introduce new or increased noise impacts within the Proposed Project boundary or the surrounding area beyond what has already been experienced.
Socioeconomics and EJ	Negligible	Negligible	Negligible	The proposed action will have a positive environmental impact on socioeconomics and EJ. Therefore, it is concluded that impacts from the proposed action, when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased negative impacts on socioeconomics and EJ within the Proposed Project boundary or surrounding area beyond what has already been experienced, and would have a positive impact on both socioeconomics and EJ.
Traffic and transportation	Minor	Minor	Minor	The increase in traffic during construction and operation of the Proposed Project is expected to be minor. There are no current plans for future additions, expansions, or other activities related to or connected with this proposal which will cumulatively increase traffic further. Albemarle does not own contiguous parcels, and no parking spaces will be eliminated by the Proposed Project. Moreover, no temporary road closures or detours will be required during either the construction or operation of the Proposed Project, and there will be no impacts to public transit. The Proposed Project will employ local workers who are already contributing to traffic in the area. They will be accessing the KMM and Archdale TSF sites in shifts which will further minimize impacts to traffic. Therefore, while there will be an incremental increase in overall traffic, no adverse cumulative effects on the region's overall transportation network are anticipated as a result of the Proposed Project.

Resource	Direct Impacts	Indirect Impacts	Cumulative Impacts	Explanation
Waste management	Negligible	Negligible	Negligible	RCRA waste will not be generated at the facility. If RCRA waste occurs at the property in the future, the waste would be stored temporarily but would not be treated or disposed at the proposed facility. All RCRA waste would be transferred to facilities permitted under local, federal, or state jurisdictions.
Water resources	Minor	Negligible	Negligible	No reasonably foreseeable development has been identified in the vicinity of the proposed KMM and Archdale TSF sites. Development consistent with existing zoning will not result in cumulative adverse impacts to wetlands and floodplains, surface water, or groundwater.

BMP = best management practice; CAA = Clean Air Act; CO₂ = carbon dioxide; EJ = environmental justice; EV = electric vehicle; GHG = greenhouse gas; KMM = Kings Mountain Mine; RCRA = Resource Conservation and Recovery Act; TSF = tailings storage facility; U.S. = United States

5. GENERAL PUBLIC INTEREST REVIEW

5.1. PUBLIC INTEREST FACTORS

All public interest factors have been reviewed and those relevant to the Proposed Project have been considered and discussed below and in Table 35: Public Interest Factors and Effects.

Factor	None	Detrimental	Neutral (mitigated)	Negligible	Beneficial	Not Applicable
Conservation			Х			
Economics					Х	
Aesthetics			Х			
General environmental concerns			Х			
Wetlands				Х		
Historic properties				Х		
Fish and wildlife values				Х		
Flood hazards				х		
Floodplain values				х		
Land use			Х			
Navigation ^a						х

Table 35: Public Interest Factors and Effects



Factor	None	Detrimental	Neutral (mitigated)	Negligible	Beneficial	Not Applicable
Shoreline erosion and accretion ^b						Х
Recreation			Х			
Water supply and conservation			Х			
Water quality			Х			
Energy needs					х	
Safety			Х			
Food and fiber production						Х
Mineral needs					х	
Consideration of property ownership			Х			
Needs and welfare of the people					Х	

^a The Proposed Project area does not contain navigable waters, and the Proposed Project is not expected to affect navigation indirectly or directly.

^b The Proposed Project area does not contain shoreline.

6. PUBLIC AND PRIVATE NEED

The Proposed Project serves the private need of Albemarle to create a profitable business in the domestic lithium market. The Proposed Project also serves the public need for a domestic source of lithium to insulate domestic prices in the global market.

6.1. RESOURCE USE UNRESOLVED CONFLICTS

6.1.1. Kings Mountain

No unresolved conflicts pertaining to resource use have been identified.

6.1.2. Archdale Tailings Storage Facility

No unresolved conflicts pertaining to resource use have been identified.

6.1.3. Site Preparation

No unresolved conflicts pertaining to resource use have been identified.

7. PUBLIC NOTICE RESULTS

A public notice was sent on November 26,2024


Several public outreach efforts such as; community town hall, non-government organization, and other non-profit meetings have been conducted and continue weekly to monthly. See Appendix G, Public Comments and Responses for all public outreach events.

8. FINDINGS

Based on the information presented in this EA (DOE/EA-2265), DOE finds that providing costshared funding to the Proposed Project does not constitute a major federal action that will significantly affect the quality of the physical, biological, or human environment within the meaning of NEPA (Table 36: Applicable NEPA Laws). Therefore, the preparation of an Environmental Impact Statement is not required, and DOE will issue a FONSI.

Executive Order	Effect	No Effect	Likely to Affect	May Affect but Not Likely
Advancing Racial Equity and Support for Underserved Communities through the Federal Government (EO 13985)		х		
Bald and Golden Eagle Protection Act				Х
Clean Air Act				Х
Clean Water Act		Х		
Comprehensive Environmental Response, Compensation, and Liability Act		х		
Endangered Species Act				Х
Establishing a Federal Flood Risk Management Standard and a Process for further Soliciting and Considering Stakeholder Input (EO 13690)		Х		
Executive Order on America's Supply Chains (EO 14017)		х		
Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations (EO 12898)		Х		
Floodplain Management (EO 11988)		Х		
Migratory Bird Treaty Act				Х
Pollution Prevention Act of 1990		Х		
Protection of Wetlands (EO 11990)		Х		
Resource Conservation and Recovery Act				

Table 36: Applicable NEPA Laws



Executive Order	Effect	No Effect	Likely to Affect	May Affect but Not Likely
Revitalizing Our Nation's Commitment to Environmental Justice for All (EO 14097)		х		
Tackling the Climate Crisis at Home and Abroad (EO 14008)		Х		
The Noise Control Act of 1972				Х
National Historic Preservation Act		Х		
The Native American Graves Protection and Repatriation Act		х		

EO = Executive Order

8.1. LIST OF PREPARERS AND REVIEWERS

The preparers and reviewers of this EA are identified in Table 37: List of Preparers and Reviewers.

Contributors and Reviewers	Position	Email	Organization
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Table 37: List of Preparers and Reviewers

AFMC = Air Force Materiel Command; DAF = Department of the Air Force; DOE = U.S. Department of Energy; EA = Environmental Assessment; ERM = ERM NC, Inc.; NEPA = National Environmental Policy Act; NETL = National Energy Technology Laboratory; TBD = to be determined; USACE = U.S. Army Corps of Engineers; USEPA = U.S. Environmental Protection Agency; USFWS = U.S. Fish and Wildlife Service

8.2. LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED

DOE coordinated with various applicable agencies, Tribal nations, and stakeholders throughout the preparation of this EA and/or while preparing the supporting technical studies. These agencies were also notified of the availability of the draft EA through consultation letters and/or direct notification of the availability of the draft EA.



8.2.1. State Agencies

• NCDEQ

8.2.2. Local Agencies

• City of King Mountain

8.2.3. Native American Tribes

- Catawba
- Cherokee
- Eastern Bans of Cherokee Indians
- Muscogee (Creek) Nation
- Keetowah Band of Cherokee



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APPENDIX A DEPARTMENT OF THE AIR FORCE COOPERATING AGENCY LETTER



APPENDIX B DESIGN DRAWINGS



APPENDIX B-1 COMMUNICATIONS TOWERS LOCATIONS



APPENDIX B-2 MINING AND CONCENTRATOR FACILITY



APPENDIX C FEDERALLY LISTED SPECIES FOR KINGS MOUNTAIN



APPENDIX C-1 U.S. FISH AND WILDLIFE SERVICE IPAC RESOURCE LIST – KINGS MOUNTAIN



APPENDIX C-2 BIOLOGICAL RESOURCES SUMMARY REPORT FOR THE KINGS MOUNTAIN LITHIUM MINE, CLEVELAND COUNTY, NORTH CAROLINA



APPENDIX C-3 DWARF-FLOWERED HEARTLEAF REPORT FOR THE KINGS MOUNTAIN LITHIUM MINE, CLEVELAND COUNTY, NORTH CAROLINA



APPENDIX C-4 BAT SURVEY REPORT FOR THE KINGS MOUNTAIN LITHIUM MINE, CLEVELAND COUNTY, NORTH CAROLINA



APPENDIX D FEDERALLY LISTED SPECIES FOR THE ARCHDALE TAILINGS STORAGE FACILITY



APPENDIX D-1 FEDERALLY LISTED AND STATE-LISTED SPECIES REPORT FOR THE ALBEMARLE KINGS MOUNTAIN ARCHDALE TRACT, CLEVELAND COUNTY, NORTH CAROLINA



APPENDIX D-2 U.S. FISH AND WILDLIFE SERVICE IPAC RESOURCE LIST – ARCHDALE



APPENDIX E CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES



APPENDIX E-1 2023 STATE HISTORIC PRESERVATION OFFICE HISTORIC STRUCTURE SURVEY REPORT, KINGS MOUNTAIN MINING PROJECT, CLEVELAND COUNTY, ER 22-1248



APPENDIX E-2 PHASE I ARCHAEOLOGICAL SURVEY FOR THE PROPOSED KINGS MOUNTAIN MINING PROJECT, ARCHDALE TRACT, CLEVELAND COUNTY, NORTH CAROLINA



APPENDIX E-3 2024 STATE HISTORIC PRESERVATION OFFICE KINGS MOUNTAIN MINING PROJECT, KINGS MOUNTAIN, CLEVELAND COUNTY, ER 22-1248



APPENDIX E-4 2024 STATE HISTORIC PRESERVATION OFFICE KINGS MOUNTAIN MINING PROJECT, CLEVELAND COUNTY, ER 22-1248, DEPARTMENT OF ENERGY CONSULTATION



APPENDIX E-5 2024 STATE HISTORIC PRESERVATION OFFICE HISTORIC STRUCTURE SURVEY REPORT, KINGS MOUNTAIN MINING PROJECT, CLEVELAND COUNTY, ER 22-1248, FINAL CONCURRENCE



APPENDIX E-6 CULTURAL, HISTORICAL, AND ARCHAEOLOGICAL RESOURCES



APPENDIX E-7 2024 STATE HISTORIC PRESERVATION OFFICE KINGS MOUNTAIN MINING PROJECT, SWCA PROJECT NO. 70316, CLEVELAND COUNTY, ER 22-1248



APPENDIX E-8 NATIONAL REGISTER OF HISTORIC PLACES LISTED OR ELIGIBLE SITES



APPENDIX F WETLANDS



APPENDIX F-1 WETLAND DELINEATIONS AT MINE SITE


APPENDIX F-2 WETLAND DELINEATIONS AT TSF



APPENDIX F-3 WETLAND DELINEATIONS AT MINE SITE OVERVIEW



APPENDIX F-4 NATIONAL WETLANDS INVENTORY: KINGS MOUNTAIN



APPENDIX G PUBLIC COMMENTS AND RESPONSES