Instructions and Summary

Award Number: 2678
Award Recipient: Albemarle U.S. Inc

Date of Submission: 7/1/2022
Form submitted by: Albemarle U.S. Inc

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Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your EERE contact! **Do not modify this template or any cells or formulas!**

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. w th total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored ce ls contain instructions, headers, or summary calculations and should not be modified. Only blank white ce ls should be populated.
3. Enter detailed support for the project costs identified for each Category line item within each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type FAR Part 31 for For-Prof t entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than five budget periods, consult your EERE contact before adding additional budget period rows or columns.
8. ALL budget period cost categories are rounded to the nearest do lar.

BURDEN DISCLOSURE STATEMENT

Pub ic reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary

		Federal	Cost Share			Total Costs	Cost Share %	Proposed Budget Period Dates
	Budget Period 1	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			$375 525 233	60.15%	[redacted]

Section B - Budget Categories

CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Costs	% of Project	Comments (as needed)
a. Personnel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
b. Fringe Benefits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
c. Travel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
e. Supplies	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
f. Contractual								
Sub recipient	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Vendor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
FFRDC	$0	$0	$0	$0	$0	$0	0.00%	
Total Contractual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
g. Construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
h. Other Direct Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Direct Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
i. Indirect Charges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Total Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$375 525 233	100.00%	[redacted]

Additional Explanation (as needed) Figure 1. Earned Value Management Plan

[redacted]

(b) (4)

ALL REDACTIONS ARE PURSUANT TO (B) (4)

Detailed Budget Justification

a. Personnel

INSTRUCTIONS PLEASE READ!!!

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and vendors must be included under f. Contractual.
2. All personnel should be identified by position title and not employee name. Enter the amount of time (e.g., hours or % of time) and the base pay rate and the total direct personnel compensation will automatically calculate. Rate basis (e.g., actual salary, labor distribution report, state civil service rates, etc.) must also be identified.
3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e.g. fee or profit).
4. If a position and hours are attributed to multiple employees (e.g. Technicians working 1000 hours) the number of employees or that position title must be identified.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 3	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 4	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 5			
1	Sr. Engineer (EXAMPLE!!)	2000	$85.00	$170,000	200	$50.00	$10,000	200	$50.00	$10,000	200	$50.00	$10,000	200	$50.00	$10,000	2.00	$190,000	Actual Salary
2	Technicians (2)	0.00	$20.00	$80,000	0	$0.00	$0	0	$0.00	$0	0	$0.00	$0	0	$0.00	$0	0.00	$80,000	Actual Salary
1.1-4.3	Principal Investigator	[redacted]																	
1.1-4.3	Development manager																		
1.1-4.3	Project engineer																		
1.1-4.3	Environmental, health & safety manager																		
1.1-4.3	Project procurement manager																		
1.1-4.3	Supplier diversity coordinator																		
1.1-4.3	VP culture																		
1.1-4.3	Community affairs manager																		
1.1-4.3	Community affairs coordinator																		
1.1-4.3	Human resources business partner																		
1.1-4.3	Project Director																		
1.1-4.3	Project Manager																		
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
	Total Personnel Costs	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]	$7,987,222	

Additional Explanation (as needed):

b. Fringe Benefits

INSTRUCTIONS - PLEASE READ!!!

1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
EXAMPLE!!! Sr. Engineer	$170 000	20%	$34 000	$10 000	20%	$2 000	$10 000	20%	$2 000	$10 000	20%	$2 000	$10 000	20%	$2 000	$38 000
Total Personnel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	$3,194,889
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
Total	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	$3,194,889

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

X A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.*

There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification (Form EERE 335.1).

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at https://www.energy.gov/eere/funding/downloads/sample-indirect-rate-proposal-and-profit-compliance-audit, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate.

c. Travel

INSTRUCTIONS - PLEASE READ!!!

1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.
2. All listed travel must be necessary for performance of the Statement of Project Objectives.
3. Only travel that is directly associated with this award should be included as a direct travel cost to the award.
4. Federal travel regulations are contained within the applicable cost principles for all entity types.
5. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.
6. Columns E, F, G, H, I, J, and K are per trip.
7. The number of days is inclusive of day of departure and day of return.
8. Recipients should enter City and State (or City and Country for International travel) in the Depart from and Destination fields.
9. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
	Domestic Travel	Budget Period 1									
1	EXAMPLE!!! Visit to PV manufacturer			2	2	$250	$500	$100	$160	$4,040	Current GSA rates
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	International Travel										
										$0	
	Budget Period 1 Total									$13,916	
	Domestic Travel	Budget Period 2									
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	International Travel										
										$0	
	Budget Period 2 Total									$24,820	
	Domestic Travel	Budget Period 3									
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 3 Total									$14,800	
	Domestic Travel	Budget Period 4									
E	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 4 Total									$4,780	
	Domestic Travel	Budget Period 5									
	Not used									$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 5 Total									$0	
	PROJECT TOTAL									$58,316	

Additional Explanation (as needed):

d. Equipment

INSTRUCTIONS - PLEASE READ!!!
1. Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.
2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.
3. During award negotiations, provide a vendor quote for all equipment items over $50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.
4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
					Budget Period 1	
3,4,5	EXAMPLE!!! Thermal shock chamber	2	$70,000	$140,000	Vendor Quote - Attached	Reliability testing of PV modules- Task 4.3
	None			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 1 Total			$0		
					Budget Period 2	
2.2	[redacted]	[redacted]	$[redacted]625,062	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
				$0		
				$0		
				$0		
				$0		
	Budget Period 2 Total			$7,936,442		
					Budget Period 3	
3.2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 3 Total			$80,357,441		
					Budget Period 4	
	None			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 4 Total			$0		
					Budget Period 5	
	Not Used			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 5 Total			$0		
	PROJECT TOTAL			$88,293,883		

Additional Explanation (as needed):

e. Supplies

INSTRUCTIONS - PLEASE READ

1. Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Please refer to the applicable Federal regulations in 2 CFR 200 for specific supplies definitions and treatment.

2. List all proposed supplies below, providing a basis of costs (e g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

3. Multiple supply items valued at $5,000 or less used to assemble an equipment item with a value greater than $5,000 with a useful life of more than one year should be included on the equipment tab. If supply items and costs are ambiguous in nature, contact your DOE representative for proper categorization.

4. Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

5 Each budget period is rounded to the nearest dollar

SOPO Task #	General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
	Budget Period 1					
4,6	**EXAMPLE** Wireless DAS components	10	$360 00	$3,600	Catalog price	For Alpha prototype - Task 2.4
	None			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 1 Total			**$0**		
	Budget Period 2					
	None			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 2 Total			$0		
	Budget Period 3					
	None			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 3 Total			$0		
	Budget Period 4					
	None			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 4 Total			$0		
	Budget Period 5					
	Not Used			$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 5 Total			$0		
	PROJECT TOTAL			**$0**		

Additional Explanation (as needed):

f. Contractual

INSTRUCTIONS - PLEASE READ!!!

1. The en ity completing this form must provide all costs related to sub-recipients, vendors, and FFRDC partners in the applicable boxes below.

2. Sub-recipients (partners, sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) $250,000 or (2) 25% of total award costs. These sub-recipient forms may be completed by either the sub-recipients hemselves or by the preparer of this form. The budget totals on he sub-recipient's forms must match the sub-recipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whe her the objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

3. Vendors (including contractors): List all vendors and contractors supplying commercial supplies or services used to support the project. For each Vendor cost with total project costs of $250,000 or more, a Vendor quote must be provided. A vendor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competi ive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this information directly to DOE, however project costs must also be provided below.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Sub-Recipient Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
2,4	EXAMPLE!!! XYZ Corp.	Partner to develop optimal lens for Gen 2 product. Cost estimate based on personnel hours.	$48,000	$32,000	$16,000	$8,000	$4,000	$108,000
[redacted]			[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		Sub-total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$7,999,213

SOPO Task #	Vendor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
6	EXAMPLE!!! ABC Corp.	Vendor for developing robotics to perform lens inspection. Estimate provided by vendor.	$0	$32,900	$86,500	$0	$0	$119,400
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
								$0
		Sub-total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$82,388,961

SOPO Task #	FFRDC Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
	None							$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

	Total Contractual		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$90,388,174

Additional Explanation (as needed): No FFRDC used in this project

g. Construction

PLEASE READ

1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient should be entered under f. Contractual.
2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.
3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities Example Only - Build wind turbine platform

SOPO Task #	General Description	Cost	Basis of Cost	Justification of need
			Budget Period 1	
3	EXAMPLE ONLY!!! Three days of excavation for platform site	$28,000	Engineering estimate	Site must be prepared for construction of platform.
	None			
	Budget Period 1 Total	$0		
			Budget Period 2	
	None			
	Budget Period 2 Total	$0		
			Budget Period 3	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 3 Total	[redacted]		
			Budget Period 4	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 5			
	Not used			
	Budget Period 5 Total	$0		
	PROJECT TOTAL	$97,643,761		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ!!!
1. Other direct costs are direct cost items required for the project which do not fit clearly into o her categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).
2. Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.
3. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
			Budget Period 1	
5	**EXAMPLE!!!** Grad student tuition - tasks 1-3	$16,000	Established UCD costs	Support of graduate students working on project
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 2	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 3	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 3 Total	$1,707,000		
			Budget Period 4	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 5	
	Not Used			
	Budget Period 5 Total	$0		
	PROJECT TOTAL	**$7,690,000**		

Addi ional Explanation (as needed):

i. Indirect Costs

INSTRUCTIONS - PLEASE READ!!!

1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.
2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.
3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total	Explanation of BASE
Provide ONLY Applicable Rates							
Overhead Rate	0 00%	0 00%	0 00%	0 00%	0.00%		Factor on Assumed Labor Component in the Above Construction Calculation
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		Factor on Assumed Labor Component in the Above Construction Calculation
[redacted]							Not used
[redacted]							Material Freight / Logistics / General Construction Support
Indirect Costs (As Applicable)							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$80,268,987.08	

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.

_X_ There is not a current, federally approved rate agreement negotiated and available*.

*When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided by your DOE contact, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Additionally, any non-Federal entity that has never received a negotiated indirect cost rate, except for those non-Federal entities described in Appendix VII to Part 200—States and Local Government and Indian Tribe Indirect Cost Proposals, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely.As described in §200.403 Factors affecting allowability of costs, costs must be consistently charged as either indirect or direct costs, but may not be double charged or inconsistently charged as both. If chosen, this methodology once elected must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which the non-Federal entity may apply to do at any time.

You must provide an explanation (below or in a separate attachment) and show how your indirect cost rate was applied to this budget in order to come up with the indirect costs shown.

Additional Explanation (as needed): *IMPORTANT: Please use this box (or an attachment) to further explain how your total indirect costs were calculated. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total).

Cost Share

PLEASE READ

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.

2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.

3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share Item section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. Vendors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.

5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

6. NOTE A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**

7. NOTE A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**

8. Each budget period is rounded to the nearest dollar.

Recipient Provided Cost Share	Organization/Source	Type (Cash or In Kind)	Cost Share Item	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$225,866,921
f. Subrecipient (3rd Party) Provided Cost Share	**Organization/Source**	**Type (Cash or In Kind)**	**Cost Share Item** For simple cost share contributions from a partner provide the detail below; for complex contributions provide a separate budget justification (if required) or a supplementary detailed explanation	**Budget Period 1**	**Budget Period 2**	**Budget Period 3**	**Budget Period 4**	**Budget Period 5**	**Total**
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]			[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$225,866,921
			Cost Share Percentage per Budget Period	**73.2%**	**58.2%**	**59.0%**	**59.3%**	**0.0%**	

Total Project Cost: $375,525,233 **Cost Share Percent of Award: 60.1%**

Additional Explanation (as needed):

Applicant Name: Albemarle U.S. Inc Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		$375,525,233

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
a. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$375,525,232
7. Program Income						$0

Previous Edition Usable

SF-424A (Rev. 4-92)
Prescribed by OMB Circular A-102

[redacted]

Applicant Name: Albemarle U.S. Inc Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. [redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		$375,525,233

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
h. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
i. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
j. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
k. **Totals** (sum of 6i-6j)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$375,525,232
7. Program Income						$0

Current and Pending Support

Albemarle U.S. Inc

The following list includes the sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses.

Title of Activity	Sponsor of Activity/Source of Funding	Award or other Identifying Number	The Total Cost or Value of the Award or Activity	The Award Period (Start Date – End Date)	The person-months of effort per year being dedicated to the award or activity
"Thin-film lithium metal manufacture by room-temperature electrodeposition"	DOE	DE-EE0009094	$2.5M	May '20-Aug '23	14
"Single Crystal Ni-rich Cathodes"	DOE	DE-LC-000L080	$1.0M	Jan '21-Dec '23	12
"Advanced Brine Processing to Enable U.S. Lithium Independence"	DOE	DE-LC-000L080	$1.5M	Jan '21 – Dec '23	6
"Next-Generation Lithium Metal Anode Cells for Electric Aviation"	DOE (ARPA-E)	DE-AR0001450	$369K	Dec '21-Dec '24	2

*As required, a description of the above "other award[s] or activit[ies]" has been appended to this Current and Pending Support.

Signature: [redacted]

Date: 6-23-2022

I, Job Rijssenbeek, Vice President of Lithium R&D for all of Albemarle U.S. Inc, certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3730 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Current and Pending Support

Albemarle U.S. Inc

The following list includes the sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses.

Title of Activity	Sponsor of Activity/Source of Funding	Award or other Identifying Number	The Total Cost or Value of the Award or Activity	The Award Period (Start Date – End Date)	The person-months of effort per year being dedicated to the award or activity
Any	DOE	None	$0		

*As required, a description of the above "other award[s] or activit[ies]" has been appended to this Current and Pending Support.

Signature: [redacted]

Date: 6-30-2022

I, Alexander Thompson, Project Director (Vice President of Lithium Resources), certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3730 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Current and Pending Support

Albemarle U.S. Inc

The following list includes the sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses.

Title of Activity	Sponsor of Activity/Source of Funding	Award or other Identifying Number	The Total Cost or Value of the Award or Activity	The Award Period (Start Date – End Date)	The person-months of effort per year being dedicated to the award or activity
Any	DOE	None	$0		

*As required, a description of the above "other award[s] or activit[ies]" has been appended to this Current and Pending Support.

[redacted]

Signature: _____

Date: 6-30-2022

I, Henry Walqui, PhD, Principal Investigator (Group Metallurgist), certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3730 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Current and Pending Support

Cleveland Community College

The following list includes the sponsored activities, awards, and appointments, whether paid or unpaid; provided as a gift with terms or conditions or provided as a gift without terms or conditions; full-time, part-time, or voluntary; faculty, visiting, adjunct, or honorary; cash or in-kind; foreign or domestic; governmental or private-sector; directly supporting the individual's research or indirectly supporting the individual by supporting students, research staff, space, equipment, or other research expenses.

Title of Activity	Sponsor of Activity/Source of Funding	Award or other Identifying Number	The Total Cost or Value of the Award or Activity	The Award Period (Start Date – End Date)	The person-months of effort per year being dedicated to the award or activity
All	DOE	None	$0		

*As required, a description of the above "other award[s] or activit[ies]" has been appended to this Current and Pending Support.

Signature [redacted]

Date: 6-29-2022

I, Amy Dulin, Dean of Workforce Development, certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3730 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Aaron Noble **Current and Pending**
Support Mining and Minerals Engineering, Virginia Tech

Current Support:

Title: Demonstration of Scaled-Production of Rare Earth Oxides and Critical Materials from Coal-Based Sources using Innovative, Low Cost Process Technologies and Circuits
Sponsor: DOE-NETL/ University of Kentucky **Grant Number:** DE-FE0031827
Role: Site Principal Investigator **Effort:** 1.39 months per year
Award Amount: $901,672 **Period of Performance:** 10/1/2019–12/31/2022

Title: Collecting mine dust particles with liquid-coated vibrating meshes, Phase 2
Sponsor: The Alpha Foundation **Grant Number:** AFC518SP-89
Role: Principal Investigator **Effort:** 0.24 months per year
Award Amount: $905,198 **Period of Performance:** 10/1/2019 – 3/31/2023

Title: Development and testing of an integrated AMD and rare earth/critical mineral plant
Sponsor: DOE-NETL/West Virginia University **Grant Number:** **DE-FE0031834**
Role: Site Principal Investigator **Effort:** 1.09 months per year
Award Amount: $687,500 **Period of Performance**: 1/1/2020 – 6/30/2022

Title: Pilot-Scale Testing of the Hydrophobic-Hydrophilic Separation (HHS) Process to Produce Value-Added Products from Waste Coals
Sponsor: DOE-NETL **Grant Number:** DE-FE0031711
Role: Co-Investigator **Effort:** 0.09 months per year
Award Amount: $1,025,380 **Period of Performance:** 6/1/2020 – 12/31/2022

Title: Low-concentration precious metal recovery from complex streams using gas-assisted microflow solvent extraction
Sponsor: REMADE Institute **Grant Number:** 19-01-RR-03
Role: Co-Investigator **Effort:** 0.25 months per year
Award Amount: $150,000 **Period of Performance:** 5/12/2021 – 8/31/2022

Title: Development of A Novel Extraction Process for the Rare Earth Elements from Conventional and Non-Conventional Resources
Sponsor: Grimstone Mining LLC **Grant Number:** N/A
Role: Co-Investigator **Effort:** 0.5 months per year
Award Amount: $485,377 **Period of Performance:** 6/1/2021 – 5/31/2023

Title: Physical, Chemical, and Mineralogical Characterizations of MSWI Ash Product and Recommendations for Downstream Processing
Sponsor: APRA-e **Grant Number:** DE-AR0001397
Role: Co-Investigator **Effort:** 0.75 months per year
Award Amount: $500,000 **Period of Performance:** 4/19/2021 – 4/18/2023

Title: Mid-APPalachian Carbon Ore, Rare Earth and Critical Minerals (MAPP-CORE) Initiative
Sponsor: DOE-NETL/West Virginia University **Grant Number:** DE-FE0032054
Role: Site Principal Investigator **Effort:** 0.72 months per year
Award Amount: $170,000 **Period of Performance:** 10/1/2021 – 9/30/2023

Title: Coal-Waste-Enhanced Filaments for Additive Manufacturing of High-Temperature Plastics and Ceramic Composites
Sponsor: DOE/Semplastics EHC LLC **Grant Number:** DE-FE0032145
Role: Site Principal Investigator **Effort:** 1.6 months per year
Award Amount: $124,163 **Period of Performance:** 2/1/2022 – 7/31/2023

Title: Multi-Sourced Collaboration for the Production & Refining of Rare and Critical Elements
Sponsor: DOE-NETL/University of Kentucky **Grant Number:** DE-FE0032119
Role: Site Principal Investigator **Effort:** 0.20 months per year
Award Amount: $18,000 **Period of Performance:** 12/1/2021 – 2/28/2023

Title: Extraction, Separation, and Production of High Purity Rare Earth Elements and Critical Minerals from Coal-Based and Related Resources
Sponsor: DOE-NETL/University of Utah **Grant Number:** DE-FE32122
Role: Co-Investigator **Effort:** 0.46 months per year
Award Amount: $50,000 **Period of Performance:** 1/16/2022 – 10/16/2022

Title: Advanced processing of rare earth elements and critical minerals from acid mine drainage feedstocks
Sponsor: DOE-NETL/West Virginia University **Grant Number:** DE-FE0032120
Role: Site Principal Investigator **Effort:** 0.63 months per year
Award Amount: $24,850 **Period of Performance:** 1/14/2022 – 10/13/2022

Title: Molded Graphite Products Synthesized from Waste-Coal
Sponsor: DOE-NETL/Touchstone Research Laboratory **Grant Number:** under negotiation
Role: Co-Investigator **Effort:** 1.0 months per year
Award Amount: $400,0000 **Period of Performance:** 6/1/2022 – 5/31/2024

Pending Support:

Title: Fundamental Studies on the Recovery of Rare Earth Elements from Coal and Coal Byproducts
Sponsor: DOE-NETL **Grant Number:** N/A
Role: Co-Investigator **Effort:** 1.8 months per year
Award Amount: $1,942,243 **Period of Performance:** 18 months

Title: Recovery of high grade, low moisture REE/CM feedstock from small-scale, remote AMD treatment facilities
Sponsor: OSMRE/West Virginia University **Grant Number:** N/A
Role: Site Principal Investigator **Effort:** 0.09 months per year
Award Amount: $16,500 **Period of Performance:** two years

Planned Submissions:

Title: Integrated Metallurgical Processing and Accelerated Carbonation Technologies (IMPACT)
Sponsor: Arpa-e/University of Virginia **Grant Number:** N/A
Role: Site Principal Investigator **Effort:** 1.0 months per year
Award Amount: $414,000 **Period of Performance:** three years

Title: Kings Mountain Lithium Materials Processing Plant
Sponsor: DOE/Albemarle Corporation **Grant Number:** N/A
Role: Site Principal Investigator **Effort:** 1.0 months per year
Award Amount: $1,500,000 **Period of Performance:** four years

Title: Remediation of Valorisation of Mining-Influenced Waters
Sponsor: Rio Tinto/West Virginia University **Grant Number:** N/A
Role: Site Principal Investigator **Effort:** 1.0 months per year
Award Amount: $400,000 **Period of Performance:** two years

I, Aaron Noble, Associate Professor, certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3730 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Signature: [redacted] **Date:** 6/24/2022

Wencai Zhang
Mining and Minerals Engineering, Virginia Tech

Current and Pending Support

Current Support:

Title: Demonstration of Scaled-Production of Rare Earth Oxides and Critical Materials from Coal-Based Sources using Innovative, Low Cost Process Technologies and Circuits

Sponsor: DOE-NETL/ University of Kentucky

Grant Number: DE-FE0031827

Role: Co-Principal Investigator

Effort: 1.50 months per year

Award Amount: $1,125,000

Period of Performance: 10/1/2019–12/31/2022

Title: Low-Concentration Precious Metal Recovery from Complex Streams Using Gas-Assisted Microflow Solvent Extraction

Sponsor: REMADE

Grant Number: 19-01-RR-03

Role: Principal Investigator

Effort: 0.06 month per year

Award Amount: $150,000

Period of Performance: 05/12/2021–08/31/2022

Title: Multi-Sourced Collaboration for the Production & Refining of Rare and Critical Elements

Sponsor: DOE-NETL/ University of Kentucky

Grant Number: DE-FE0032119

Role: Co-Principal Investigator

Effort: 0.39 month per year

Award Amount: $18,000

Period of Performance: 12/01/2021 – 8/31/2022

Title: Mid-APPalachian Carbon Ore, Rare Earth and Critical Minerals (MAPP-CORE) Initiative

Sponsor: DOE-NETL/ West Virginia University

Grant Number: DE-FE0032054

Role: Co-Principal Investigator **Effort:** 0.24 month per year

Award Amount: $170,000 **Period of Performance:** 10/01/2021 – 9/30/2023

Title: Physical, Chemical, and Mineralogical Characterizations of MSWI Ash Product and Recommendations for Downstream Processing

Sponsor: DOE/ARPA-E **Grant Number:** DE-AR0001397

Role: Principal Investigator **Effort:** 1.00 month per year

Award Amount: $500,000 **Period of Performance:** 04/19/2021–04/18/2023

Title: Rare Earth Element Separation Using Gas-Assisted Micro-Flow Extraction with Task-Specific Ionic Liquids

Sponsor: DOE/Phinix, LLC **Grant Number:** DE-EE0009435

Role: Principal Investigator **Effort:** 0.75 month per year

Award Amount: $300,000 **Period of Performance:** 05/01/2021–07/31/2024

Title: Recovery of ZnO from End-of-Life Tires for Enhanced and Effective Waste Material Utilization

Sponsor: Center for Tire Research **Grant Number:** N/A

Role: Co-Principal Investigator **Effort:** 0.00 month per year

Award Amount: $210,000 **Period of Performance:** 09/2021–08/2024

Title: An Integrated Approach to Maximizing the Value of Coal with Low Carbon Footprint: Developing Advanced Battery Materials and Recovering Critical Elements

Sponsor: Vibrant Virginia **Grant Number:** N/A

Role: Co-Principal Investigator **Effort:** 0.20 month per year

Award Amount: $50,000 **Period of Performance:** 11/01/2021 – 10/31/2022

Title: Preliminary investigation on critical elements recovery from the acid mine drainages of Austin Elements, Inc.

Sponsor: Austin Elements Inc. **Grant Number:** N/A

Role: Principal Investigator **Effort:** 0.50 month per year

Award Amount: $24,000 **Period of Performance:** 11/01/2021 – 6/30/2022

Title: Evolve Central Appalachia

Sponsor: DOE/NETL **Grant Number:** DE-FE0032055

Role: Co-Principal Investigator **Effort:** 0.50 month per year

Award Amount: $1,499,999 **Period of Performance:** 10/01/2021 – 9/30/2023

Pending Support:

Title: Statistically Rigorous Deep Dive Nationwide Characterization of Municipal Solid Waste and Selection of Technologies Enabling Production of Conversion-Ready Feedstocks

Sponsor: DOE/Cascadia Consulting Group **Grant Number:** N/A

Role: Principal Investigator **Effort:** 0.95 month per year

Award Amount: $700,000 **Period of Performance:** 08/01/2022 – 10/31/2025

I, Wencai Zhang, Ph.D., Assistant Professor, certify to the best of my knowledge and belief that the information contained in this Current and Pending Support Disclosure Statement is true, complete and accurate. I understand that any false, fictitious, or fraudulent information, misrepresentations, half-truths, or omissions of any material fact, may subject me to criminal, civil or administrative penalties for fraud, false statements, false claims or otherwise. (18 U.S.C. §§ 1001 and 287, and 31 U.S.C. 3729-3730 and 3801-3812). I further understand and agree that (1) the statements and representations made herein are material to DOE's funding decision, and (2) I have a responsibility to update the disclosures during the period of performance of the award should circumstances change which impact the responses provided above.

Signature: [redacted] Date: 06/24/2022

Effective 10/04/2021 **NSF CURRENT AND PENDING SUPPORT** **OMB-3145-0058**

*PI/co-PI/Senior Personnel Name: Robert Mensah-Biney

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. This includes, for example, Federal, State, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[2]

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Bipartisan Infrastructure Law Baterry Materials Processing and Battery Manufacturing Funding Opportunity

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Department of Energy

*Primary Place of Performance : MRL, 180 Coxe Avenue, Asheville, NC 28801

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 1,500,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2023	5.06	4. 2026	5.06
2. 2024	5.06	5.	
3. 2025	5.06		

*Overall Objectives : MRL will provide training, expertise, knowledge and services for bench-scale and pilot-plant processes for the recovery of lithium from hard rock spodume.

*Statement of Potential Overlap : No potential overlap.

Projects/Proposals

2. *Project/Proposal Title : Ceylon Graphite Project

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: South Star Battery Metals Corp.

*Primary Place of Performance : MRL, 180 Coxe Avenue, Asheville, NC 28801

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 22,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2022	4.04	4.	
2.		5.	
3.			

*Overall Objectives : The objective is to produce about 15 kg of high-grade (>94% Fixed Carbon) graphite concentrate for South Battery Metals Corp.'s marketing evaluation.

*Statement of Potential Overlap : No potential overlap

Effective 10/04/2021 **NSF CURRENT AND PENDING SUPPORT** **OMB-3145-0058**

*PI/co-PI/Senior Personnel Name: Luis Miguel Chia

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. This includes, for example, Federal, State, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[2]

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1.*Project/Proposal Title : Bipartisan Infrastructure Law Baterry Materials Processing and Battery Manufacturing Funding Opportunity

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: Department of Energy

*Primary Place of Performance : MRL, 180 Coxe Avenue, Asheville, NC 28801

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 1,500,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2023	5.06	4. 2026	5.06
2. 2024	5.06	5.	
3. 2025	5.06		

*Overall Objectives : MRL will provide training, expertise, knowledge and services for bench-scale and pilot-plant processes for the recovery of lithium from hard rock spodume.

*Statement of Potential Overlap : No potential overlap.

Projects/Proposals

2. *Project/Proposal Title : Ceylon Graphite Project

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support: South Star Battery Metals Corp.

*Primary Place of Performance : MRL, 180 Coxe Avenue, Asheville, NC 28801

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 22,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

	*Year (YYYY)	*Person Months (##.##)		Year (YYYY)	Person Months (##.##)
1.	2022	4.04	4.		
2.			5.		
3.					

*Overall Objectives : The objective is to produce about 15 kg of high-grade (>94% Fixed Carbon) graphite concentrate for South Battery Metals Corp.'s marketing evaluation.

*Statement of Potential Overlap : No potential overlap

Department of Energy (DOE) Data Management Plan

ALL REDACTIONS PURSUANT TO (B)(4)

A. Data types and sources

The plant design and engineering data generated and used through the course of the proposed project consists primarily of metallurgical test data, mineral processing pilot plant data, and commercial scale mineral processing plant engineering data, specifications, and drawings, all of which is considered company proprietary data not for publication. Limited sets of company proprietary data developed throughout design will be released for community engagement. Data such as community economic benefits, traffic impact, water/air/noise impacts, and general plot plans will likely be disclosed. Production volumes, customer base, profitability, and proprietary process design specifications will not go out for public consumption. A significant component of the project will be high-quality data that can serve as a supplement to publications and other available work.

The aforementioned data and associated reports, as detailed in the technical and environmental volume documents, will be in PDF format.

Any source data used as inputs to the project will be properly referenced in resulting publications and data submissions, and if publicly available online, may be linked to as part of one or more data submissions, but will not be actively managed by this Project. This project may use proprietary source data subject to license agreements that forbid its public release. Any derivative data products resulting from this work will be made publicly available at the time of publication and will include references to the source data, but due to license restrictions, some source data may not be made available.

B. Content and format

Data and associated reports will be available in PDF format on the DOE website. The project will leverage existing data standards established by DOE's Office of Science and Technical Information (OSTI), and the General Services Administration's (GSA's) Project Open Data.

Albemarle standard software is MS Word for reports, MS Excel for data, MS PowerPoint for presentations, JPEG files for graphics, and AutoCad for drawings. During the lifecycle of the project, data will be stored in the most useful format for the project team, which may occasionally include proprietary formats. Data stored in proprietary formats will be exported to more commonly accessible formats prior to public dissemination, to ensure maximum utility and availability of data resulting from this project.

Albemarle uses a community engagement software package called Borealis to track stakeholder engagement, including an on-line grievances portal. This is in addition to an Integrity Helpline powered 24/7 by Convercent. Concerns can be submitted online (www.IntegrityHelpline.Albemarle.com), by phone (1-800-461-9330), or by text. The helpline provides you with a unique pin number, allowing you to follow up on your concern by receiving and sending messages in a secure environment.

C. Sharing and preservation

We expect to use several repositories for data.

Publicly accessible data derived from the project will be hosted at albemarlekingsmountain.com. Once data are published, they will be curated by the team, assigned a unique identifier, and will remain unchanged, available to the public at a fixed Internet location. All data made available will also be accessible through partner sites with, including but not limited to the DOE Data Explorer, OSTI's Data Cite catalog, and Data.gov. The project team will work to ensure that project data submissions are packaged in useful, logical bundles and contain sufficient, accurate metadata to reach the widest audience possible.

Albemarle will provide free, unrestricted access to the public to web-based platforms that will keep the public updated on project activities. These include a project Facebook page (Albemarle Kings Mountain | Facebook) and Facebook Group (What's Up Kings Mountain! | Facebook) as promotion and engagement channels and a dedicated website (Home - Albemarle and Kings Mountain (albemarlekingsmountain.com). Frequent updates to the project website will take place.

To supplement the social media and website, Albemarle will publish monthly or quarterly newsletters and utilize home mailers for maximum outreach in the community of Kings Mountain.

Finally, Albemarle will maintain a storefront in the community of Kings Mountain for face-to-face conversations and regular, in-person, community updates. This information center will be supplemented with site viewing platforms and project tour opportunities.

D. Protection

Albemarle's data management plan is described in the Information Management Policy, document 05-090-0002. This policy defines the information that is most important to the company, and how it should be treated through the document and record lifecycle. This includes information regarding data creation and classification, use and sharing, storage and security, and retention.

The controls applicable to the different information classifications identified in the Information Management Policy are detailed in the Information Classification Procedure, document 04-090-PRO-0001.

The Information Security Policy, document ID 04-200-0001, provides definitive information on the prescribed measured used to establish and enforce the information security program at Albemarle.

Furthermore, Personally Identifiable Information will be protected under Albemarle's Employee Personal Data Protection Policy, document ID 04-200-00021.

The project data manager at each contributing institution will work closely with the project team to ensure that publicly available project data do not contain any PII, proprietary interests, or other inappropriate content. The project data team leader will communicate the data management plan and provide training and guidance on data flow and practices. As an additional line of defense, all project data will be curated and reviewed a second time to ensure data quality and relevance.

E. Rationale

The collecting and sharing of data are essential to advancing lithium materials processing, we intend to follow the FAIR Guiding Principles for scientific data management and stewardship, when possible. Generally, whenever possible, data from this project will be made available to the public. The data management and provenance strategy adopted by this project is essential for building trust in the scientific community and ensuring that any data cited in derivative works continue to be discoverable, supporting the validity of those works.

I. GENERAL

The Environmental Volume provides, in detail, all information as outlined in the following sections.

II. CONTENT

A. ENVIRONMENTAL INFORMATION DESCRIBING THE PROJECT AND THE PROJECT SITE(S).

1. Summary

Albemarle U.S. Inc (Albemarle) plans to construct an advanced, commercial scale processing facility to produce lithium concentrate in Kings Mountain, NC (the Project), alongside the reopening of the former Kings Mountain lithium mine site. The new facility would allow Albemarle to process 8,000 tons per day (2.7 million tons per annum) of spodumene ore through a plant designed to produce 1,150-1,200 tons per day (~350,000 tons per annum) of 5.5-6.0% Li_2O spodumene concentrate. Such a plant would feed a 50 kTa lithium refinery to support manufacturing of the cells assembled into the average 70 kWh lithium battery used in the United States to power electric vehicles (EVs). This would serve as a cornerstone for a U.S. lithium battery supply chain supporting over 750,000 EVs produced in the U.S. by Albemarle's U.S. automotive manufacturers customers, such as Rivian and Tesla.

In addition to the processing facilities, Albemarle intends to introduce the latest in tailings filtration technology to reduce the footprint of the required storage facilities relating to processed spodumene ore. Albemarle has also begun the process of evaluating tailings material remaining on-site from previous processing operations to determine what market applications this by-product material could support.

Considered an integral part of the Project, establishing an environmentally sound, and safe and beneficial relationship with the Kings Mountain community will be a priority focus. Additional outreach and partnerships will extend the economic benefits throughout the mid-Atlantic region as well. At the local level, various community engagements have already begun and will continue throughout the project duration and into the operational phase. Albemarle has begun quarterly community forums, a community working group, and a storefront in the town of Kings Mountain. The goal of these activities is to incorporate community input into the evaluation and design of the project. Focal areas include environmental, transportation, infrastructure and plant design/planning. Feedback from the community will be incorporated into the project goal of providing a carbon neutral operation and an increase in energy resilience for the Kings Mountain community.

Albemarle expects this project may create more than 200 construction jobs and more than 200 full-time highly-skilled jobs. To invest in America's workforce, Albemarle will partner with Cleveland Community College (CCC) to provide a STEM training / retraining program for minerals plant operators. Plant operations will be staffed with a workforce trained through this tailored program developed by CCC, with outreach to local disadvantaged communities, including African-American, Hispanic, and Native American representatives.

Albemarle is currently undertaking a prefeasibility study to fully evaluate the Project's potential environmental and social impacts. The study will include comprehensive evaluation of baseline conditions at the Project site, including thorough environmental monitoring programs to characterize existing air, water, soil, noise, biological, and visual resources. These site characterization programs are described in detail below.

At this time, no new, significant degradation of environmental resources are expected because the project development is being prioritized, where possible, to brownfield areas that have been previously disturbed by historical mining and lithium processing operations. However, Albemarle understand the need to make a final determination of the potential impacts and will do so via the prefeasibility and feasibility assessments underway.

2. Proposed Project and Its Alternatives

a. Proposed Project

The proposed Project is summarized above and described in detail in the Technical Volume within this application. The proposed, and "preferred alternative", will be evaluated in detail throughout Albemarle's study phase processes.

[redacted] At this time, there are no significant off-site facility requirements expected, but these will be further identified as studies progress.

b. Alternatives to Proposed Project

Alternatives to the proposed Project (including a no-action alternative) are being assessed in the prefeasibility and feasibility studies underway.

3. Existing Environment

General Environmental Setting

The Project area is located within the Piedmont physiographic province which extends between the Blue Ridge Mountains to the west and the Coastal Plain to the east. The Fall Line, located east of the Project area, is a boundary between the Coastal Plain region and the Piedmont region. Initially, the Piedmont was a gently sloping plain until uplift raised the region to its present elevation. Bedrock consists of metamorphic rocks including biotite gneiss, schist, slate, quartzite, phyllite, and amphibolite, which has been physically and chemically weathered forming a reddish soil at the surface, which is underlain by soft, decayed rock.

The Piedmont area is characterized by rolling to hilly uplands with well-defined drainage networks consisting of well-established streams and creeks along with erosional channels which have incised the Piedmont plateau. Erosion and gullying have left narrow to fairly broad upland ridgetops and steep slopes adjacent to the major streams. Soils are formed from weathered bedrock (i.e., residuum) and a majority are classified as Udorthents with a typical soil horizon profile of a C horizon to 80 inches below surface (91 to 127 cm) with a texture of sandy clay loam.

a. Land Use

General Land Use

The Project is on private land owned by Albemarle and is located on the USGS Kings Mountain, North Carolina, 7.5-minute quadrangle (**Appendix B, Figure B-1**). Currently, the developed land use within the Project area consists of Albemarle's lithium processing facility, including a 5000 MT lithium hydroxide plant, Albemarle's Global Technical Center, and an inactive lithium mine. These developed areas are surrounded by undeveloped lands consisting primarily of forest, utility rights-of-way (ROWs), and minor wetland habitats (**Appendix B, Figure B-2**).

Protected lands were evaluated within the Project area and a 3-mile buffer surrounding the Project area. The protected areas database and NCNHP project review shows there are no federally managed lands, such as wildlife refuges or national forest within 3-miles of the Project area (**Appendix B, Figure B-3**).

There are no state-managed natural areas or conservation areas within the Project area. Approximately 0.5 mile south and 0.15 mile east of the eastern most Project area boundary is Crowders Mountain State Park managed by the North Carolina Division of Parks and Recreation. There is a Dedicated Nature Preserve within the park, which are natural areas identified by the NCNHP as having a lasting conservation commitment. Crowders Mountain State Park, including the nature preserve, totals approximately 5,208 acres. The activities at the Project will not impact the Park or the Nature Preserve.

One public-private owned greenway trail, the Kings Mountain Gateway Trail, currently runs through most of the Project area. The trail is managed by Cleveland County, the City of Kings Mountain, and Kings Mountain Gateway Trails, Inc. All portions of the trail combined total approximately 6.4 miles in length. Most of the trail is under easement from Albemarle, Martin Marietta, and the Ware Family. The trail was opened in 2009. Albemarle is currently working directly with the Gateway Trail Board of Directors to identify relocation opportunities, if the Project is approved and becomes operational.

A City of Kings Mountain Open Space, associated with a city lake, abuts the southeastern-most Project area boundary. The open space is approximately 83.43 acres and consists of a lake surrounded by forest. The lake within the open space is fed by two large stream and/or wetland systems on the eastern-most Albemarle property. These stream/wetland systems are unnamed tributaries to Kings Creek. The activities at the Project will not impact these features.

There are seven additional City of Kings Mountain-managed open spaces within 3 miles of the Project area. One of these areas is another open space for a city lake located south-southwest of the Project area. The remaining open space areas are mostly small, forested tracts of land north the Project area ranging from 0.97 acres to 8.73 acres. Additionally, there is one Cleveland County open space approximately 3 miles northwest of the Project area totaling 105 acres. The open space areas are designated as USGS GAP Status 3: "An area having permanent protection from conversion of natural land cover for the majority of the area, but subject to extractive uses of either a broad, low-intensity type (e.g., logging, Off Highway Vehicle recreation) or localized intense type (e.g., mining). It also confers protection to federally listed endangered and threatened species throughout the area" (USGS 2022). The activities at the Project will not impact this space.

The Kings Mountain site, being a historical brownfield mine site, is predominantly in a disturbed state. According to the Cleveland County, North Carolina GIS Department, the site is zoned as heavy industrial. The proposed Project plans to use land that has been previously disturbed by mining activities. However, some rezoning will be required as part of this project to allow for the expansion of land holdings for the storage and disposal of processing plant wastes (tailings, waste rock products). The processing plant will be fully located on previously disturbed land, and will not require any rezoning activities.

There is a chance for indirect and cumulative impacts. With a growing demand for lithium products, with lithium supplies still available at the Kings Mountain mine (and probably at some nearby prospects), and with a lithium hydroxide processing plant to be established, this area would be more attractive for lithium mining, lithium battery manufacturers, and battery component manufacturers. Therefore, the proposed Project could indirectly promote cumulative development of these particular industries in the Carolinas. If lithium mining resumes at, or near Kings Mountain, given the potential for future local development (commercial, industrial, residential) in the Kings Mountain area, this Project could promote local cumulative

impacts of industrial, commercial and residential growth, thus affecting land use in Cleveland County.

The prefeasibility and feasibility assessments that are underway for the Project will include detailed assessments of project alternatives that minimize the impacts to the environment, including land use and rezoning requirements. The processing plant alternative assessments prioritize locating the facilities on historical mine waste facilities (overburden and waste rock product). Alternatives for new tailings and waste rock product placement will prioritize previously disturbed areas, [redacted] and the progressive backfill of any new mining pits requirement for the Kings Mountain site. However, some amount of new land disturbance will be required to allow deposition of new tailings materials.

Local Transportation Infrastructure

The Project area is divided by Interstate-85 (I-85), with the main parcel on the west side of the highway and two smaller parcels on the east side of the highway. The main parcel is bordered by South Battleground Avenue (Highway 216), Parkgrace Road, and Tin Mine Road to the west; Quarry Road to the north; and I-85 to the south and east. The area is accessible by Holiday Inn Drive, which runs parallel to I-85. Five utility ROWs cross the northern and central portions of the Project area running northeast-southwest totaling approximately 66.5 acres of the Project area.

The parcel directly east of I-85 is mostly undeveloped. The parcel is accessed from Galilee Church Road. There are no buildings within this parcel. The Kings Mountain Gateway Trail goes around the northern and eastern boundaries with an access point and parking area off Galilee Church Road. Additionally, three utility ROWs cross the parcel running northeast/southwest.

The eastern-most parcel, east of York Road, is referred to as the Wellman property. This land is undeveloped with only a few unpaved roads for access.

The Project area is surrounded by residential, commercial, and industrial development to the north, west, and south. The Martin Marietta mine borders the Project area to the north. To the east is primarily undeveloped land associated with Crowders Mountain State Park.

b. Atmospheric Conditions/Air Quality

Local Climate

The Project site is in a humid subtropical climate region, characterized by cool winters and hot, humid summers. Biodiversity is marked by dense forest greenery, occasional hills, and the nearby Appalachian Mountain range to the west. Partial cloud cover is most common throughout the year, with occasional sunny days more common in the summer, and overcast days more common in the winter. Diurnal convective thundershowers are frequent in the summer due to intense surface heating and a saturated atmosphere, bringing periods of brief, heavy rain. Less

frequently, tropical storms also affect the area when they move in from nearby bodies of warm, tropical water such as the Atlantic gulf stream. In the winter and spring, rainfall is mostly associated with large storm systems formed by cold fronts from the westerly trade winds. On occasion, these fronts can be intense enough to produce squall lines with strong straight-line winds and tornadoes, usually coming from inland. Rainfall amounts are slightly higher in the summer, but average precipitation doesn't vary much by season. Winter temperatures are cool enough that overnight temperatures can reach freezing and occasional snowfall is possible, but daytime temperatures are usually in the 50's and most precipitation is in the form of rain. Summer daytime temperatures are warm, averaging in the 80's with a window for hot temperatures reaching 90 degrees in the late afternoon hours, and with high relative humidity values, the heat index can be very high during peak heating hours. Due to hot summertime temperatures and an abundance of vegetation, evapotranspiration is high, leading to greater rates of water transfer from the ground to the atmosphere than vice versa, whereas condensation rates become higher than evaporation rates when temperatures are cooler in the winter. Climate data was gathered from the National Oceanic and Atmospheric Administration and the Iowa Environmental Mesonet, both collected from the Gastonia Municipal Airport Weather Station in North Carolina. Based on this data, the average annual maximum temperature is 72.8°F and the average annual minimum temperature is 50.7°F. Average total precipitation is 43.95 inches per year (NOAA 2021). Prevailing winds are primarily from the north-northeast and occasionally from the southwest with average annual wind speeds of 4mph (IEM 2022).

Existing Environment

The Project Site is located in an industrial area south of the town of Kings Mountain. The active site is bordered by I-85 directly to the southeast, and Highway 216 and a railroad to the northwest. The adjacent areas to the south and north are predominantly open space with active rock quarry activities. Active quarry operations are conducted by Martin Marietta (not associated with Albemarle).

Ambient air quality and air pollution emissions are regulated under federal and state laws and regulations. In North Carolina, the North Carolina Department of Environmental Quality (NCDEQ) has primary responsibility for managing air quality through state regulations. NCDEQ has also been delegated authority by the EPA to implement federal programs of the Clean Air Act (CAA).

The CAA requires EPA to set NAAQS for air pollutants considered harmful to public health and the environment. The EPA has set NAAQS for six criteria pollutants, including carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), sulfur dioxide (SO_2), and particulate matter (PM). Primary standards are established to protect public health, and secondary standards are established to protect public welfare. These standards define the maximum level of air pollution allowed in the ambient air. The CAA and subsequent amendments allow states to promulgate additional air quality standards that are the same or more stringent than the NAAQS.

Two additional pollutants of concern, nitrogen oxides (NOx) and volatile organic compounds (VOCs), contribute to the formation of ozone in the atmosphere, which is a regulated criteria pollutant with a NAAQS. The applicable NAAQS and North Carolina AAQS for criteria pollutants are provided in **Table 1**.

Table 1: National Ambient Air Quality Standards

Pollutant	Averaging Period	Primary NAAQS	Secondary NAAQS
NO_2	1-hour	0.100 ppm	---
	Annual	0.053 ppm	0.053 ppm
SO_2	1-hour	0.075 ppm	---
	3-hour	---	0.50 ppm
	24-hour	---	---
	Annual	---	---
PM_{10}	24-hour	150 µg/m	150 µg/m
$PM_{2.5}$	24-hour	35 µg/m	35 µg/m
	Annual	12 µg/m	15 µg/m
CO	1-hour	35 ppm	---
	8-hour	9 ppm	---
Pb	3-month	0.15 µg/m	0.15 µg/m
O_3	8-hour	0.070 ppm	0.070 ppm

The Albemarle Kings Mountain Project is in Cleveland County, which is designated by the U.S. Environmental Protection Agency (EPA) as being in attainment or unclassified with respect to the National Ambient Air Quality Standards (NAAQS) for PM10, PM2.5, SO2, nitrogen dioxide (NO2), ozone (O3), and CO. Currently there are no redesignations for criteria pollutants proposed by the NCDEQ.

There are eight Federal mandatory Class I areas within North Carolina and surrounding states for which the NCDEQ requires a PSD review to determine potential impact; however, none of these areas are within 62 miles (100 kilometers) of the proposed Project site. Therefore, a PSD increment and AQRV analysis for Class I area would not be required. All other areas within North Carolina's border are designated as Class II. Sensitive receptors within one mile of the Kings Mountain facility include a school and several churches.

Active Albemarle Operations

Currently, the Kings Mountain site produces lithium salts and lithium metal products. The Kings Mountain facility operates under a Synthetic Minor Permit issued by the NCDEQ DAQ: Permit No. 2894R36. The Kings Mountain facility held a Title V permit in the past because potential emissions of hexane (a Hazardous Air Pollutant) exceeded 10 tons per year. However, use of

hexane has diminished significantly, and the site accepted a federally enforceable emissions limit of < 10 ton/yr of hexane and 25 tpy of combined HAP to establish synthetic minor status. The site otherwise uses very little organic compounds in manufacturing. The site uses a 33.6 MMBTU/hr natural gas-fired boiler to provide process heat and steam.

Criteria air pollutants from the existing facility are well below major source emissions rates. The Kings Mountain facility currently and historically has been in full compliance with its air quality operating permits and has had no reported violations. The current site permit for the plant is valid through April 30, 2025.

Adjacent Quarry Operations (Martin Marietta Operations – No association with Albemarle)
Martin Marietta Materials, Inc. – Kings Mountain Mine/Quarry owns and operates an aggregate mining and processing plant located adjacent to the Albemarle Kings Mountain facility. Martin Marietta operates the Kings Mountain Mine/Quarry under a Small Permit Class (Facility ID 2300210) issued by the North Carolina Department of Environmental Quality (DEQ), Division of Air Quality. The Kings Mountain Mine/Quarry is mainly a source of particulate emissions. The mine consists of crushing and screening (permitted sources), as well as fugitive emissions. The mine does not provide DEQ with an emission inventory that includes fugitive emissions. The mine has only an opacity limitation and has no particulate emission limitations within the Permit. The mine is required to control emissions by limiting opacity. Controls are mainly accomplished by wetting the material with water.

c. Hydrologic Conditions/Water Quality

General Site Description - Hydrologic
The Project Site is located within the Kings Creek (HUC 0305010509) and Buffalo Creek (HUC 0305010508) watersheds of the Broad River Basin. The Broad River is located approximately 15 miles southwest/west of the Project area. According to USGS topographic maps, the headwaters of Kings Creek originate approximately 0.75-mile northeast of the Project area.

Topography within the Project area is diverse, with the elevation ranging from approximately 755 to 1,073 feet above mean sea level (**Appendix B, Figure B-4**). A review of the FEMA National Flood Hazard Layer showed that approximately 21 acres of the Project area are located within Zone A (areas subject to inundation by the 1% annual chance flood) of the 100-year floodplain (FEMA 2022).

Historic USGS topographic mapping indicates most of the Project area was mapped as undeveloped with networks of intermittent and perennial streams before a quarry and mine were built before the 1970s and altered the hydrology of the area, notably Kings Creek.

Desktop Site Characterization Work

A review of Google Earth current and historic aerial imagery dating back to 1985 (Google Earth 2022) indicates that the site hydrology has not had significant changes since 1985. However, site observations and imagery indicate that portions of the Project area with sizable wetlands and waterways have been or are currently influenced by beaver activity. Outside of the mining areas and mine tailing landings, most of the Project Area consists of deciduous forest and mixed deciduous-pine forests in various stages of forest succession.

Albemarle has reviewed USGS National Hydrography Dataset (NHD) mapping to determine the potential presence of streams and waterbodies within the Project Area (Appendix B). NHD desktop data suggest the presence of 15,947 linear feet of perennial stream, 18,206 linear feet of intermittent stream, 5,672 linear feet of artificial stream paths, and 1,430 linear feet of connector features within the Project Area. There are 27 acres of lake/pond features mapped within the Project Area. A connector feature is a known, but nonspecific, invisible connection between two nonadjacent stream segments. Artificial stream paths are surrogate paths for general flow direction in frequently changing aquatic systems.

NHD features are generally located in the low-elevation portions of the Project area, and largely correspond to NWI depicted features discussed above. Intermittent streams and waterbodies may hold water or have flowing water year-round, depending on groundwater input and recent rainfall amounts, whereas perennial waters hold, or have flowing water, year-round during a typical year. Perennial streams have a well-defined channel that contains water year-round during a year of normal rainfall with the aquatic bed located below the water table for most of the year. Groundwater is the primary source of water for a perennial stream, but it also carries stormwater runoff. NHD data may misclassify intermittent waters, and field surveys typically reveal that many are ephemeral, meaning that water is only present during or directly after a precipitation event.

Wetland Delineation

Albemarle has recently (March 2022) completed a field investigation to delineate wetlands and waterbodies within the Project Area. The investigation identified 60 wetlands (59.52 acres total), 80 waterways (67,940 linear feet total), and 12 waterbodies (ponds, lakes, mining pits). Wetlands, waterways and waterbodies are regulated in North Carolina by the USACE, which authorizes projects in compliance with Section 404 of the CWA; the EPA, which enforces Section 404; and NCDEQ, which issues Section 401 Water Quality Certifications for all Section 404 Permits. The potential Project impacts to wetlands are currently being defined via the prefeasibility and feasibility studies.

Several beaver dams and two beaver lodges were located during the field reconnaissance surveys in the western and central portions of the Project area. Kings Creek and numerous of its tributaries in the Project area have been dammed up and showed signs of ongoing beaver activity during the reconnaissance. These activities have contributed to an increase of wetland areas

along Kings Creek and some of its tributaries compared to what is historically known to exist in these areas. The potential Project impacts to existing beaver dams and lodges are currently being defined via the prefeasibility and feasibility studies.

d. Geologic/Soil Conditions

Soils consist primarily of Udorthents, loamy, 0 to 15 percent slopes (27% of Project area); Uwharrie silt loam, 2 to 8 percent slopes (14% of Project area); Uwharrie-Tatum complex, 8 to 15 percent slopes (8.5% of Project area); and Tatum-Montonia complex, 15 to 30 percent slopes (6.3% of Project area) (NRCS 2022). A Soil Map is included in **Appendix B, Figure B-6**.

Eighteen mapped soil types are present within the Project area according to the NRCS (2022), see **Table 2.** Most soils within the Project area (approximately 94.51%) are classified as well drained and as not meeting hydric soil criteria. Hydric soils are those that formed under conditions of flooding, saturation, or ponding for a long enough period during the growing season, developing anaerobic conditions (Federal Register 1994). These soils are saturated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation and have distinctive color patterns within the upper layers. Presence of hydric soils is one of the three parameters required to make an area); and Tatum-Montonia complex, 15 to 30 percent slopes (6.3% of Project area) (NRCS 2022).

Table 2: Soil Types Within the Project Area

Soil Name (Map Unit)	Hydric	Drainage Class	Frequency of Flooding/Ponding	Depth to Water Table (inches)	Acreage within Project Area
Cecil sandy clay loam, 2 to 8 percent slopes, moderately eroded (CaB2)	No	Well drained	None	>80	16.2
Chewacla loam, 0 to 2 percent slopes, frequently flooded (ChA)	Yes	Somewhat poorly drained	Frequent	10	76.7
Dam (DAM)	N/A	N/A	None	>80	31.1
Dorian sandy loam, 2 to 8 percent slopes, rarely flooded (DoB)	Yes	Moderately well drained	Rare	24	0.3
Grover gravelly sandy loam, 15 to 30 percent slopes, rocky (GrD)	No	Well drained	None	>80	40.4
Hulett gravelly sandy loam, 2 to 8 percent slopes (HhB)	No	Well drained	None	>80	3.5
Hulett gravelly sandy loam, 8 to 15 percent slopes, stony (HtC)	No	Well drained	None	>80	5.5
Madison-Bethlehem complex, 2 to 8 percent slopes, stony, moderately eroded (MbB2)	No	Well drained	None	>80	45.6
Madison-Bethlehem complex, 8 to 15 percent slopes, very stony, moderately eroded (McC2)	No	Well drained	None	>80	55.2
Madison-Bethlehem-Urban land complex, 2 to 8 percent slopes (MnB)	No	Well drained	None	>80	20.1
Montonia very channery silt loam, 25 to 60 percent slopes, very stony (MoE)	No	Well drained	None	>80	15.0
Pits, quarry (Pw)	N/A	N/A	None	>80	84.1
Tatum-Montonia complex, 2 to 8 percent slopes (TaB)	No	Well drained	None	>80	16.9
Tatum-Montonia complex, 8 to 15 percent slopes (TaC)	No	Well drained	None	>80	49.2
Tatum-Montonia complex, 15 to 30 percent slopes (TaD)	No	Well drained	None	>80	89.1
Udorthents, loamy, 0 to 15 percent slopes (UdC)	No	Well drained	None	>80	380.6
Uwharrie silt loam, 2 to 8 percent slopes (UtB)	No	Well drained	None	>80	196.5
Uwharrie silty clay loam, 2 to 8 percent slopes, moderately eroded (UuB2)	No	Well drained	None	>80	28.0
Uwharrie-Tatum complex, 8 to 15 percent slopes (UvC)	No	Well drained	None	>80	120.3
Uwharrie-Tatum complex, 8 to 15 percent slopes, moderately eroded (UwC2)	No	Well drained	None	>80	38.3
Water (W)	N/A	N/A	None	>80	91.4
				Total	**1,404.0 acres**

e. Vegetation and Wildlife Resources

Vegetative Resources

Field observations, Google Earth (2022) imagery, and NLCD (USGS 2019) mapping show this landscape has been significantly altered in the northern and central portion of the Project area due to historic mining. Land cover maps (USGS 2019) indicate the Project area consists primarily of deciduous forest, mixed forest, and evergreen forest with smaller portions of pasture/herbaceous, medium to high intensity development, open water, and other additional minor land use types, see **Table 3**.

A field reconnaissance conducted in February, March, and May of 2022 confirmed most land-cover types of the Project area are consistent with those depicted on the NLCD. The land cover observed within the Project area during the field reconnaissance survey includes three major types: deciduous and mixed forests, development, and historic mining areas. Many of the forests are secondary forests that have not been logged in the past 25 years. Some forests in the western and central portions were logged between 2006 and 2008, and some forests in the eastern portion were logged between 1994 and 1999 according to Google Earth historical imagery (Google Earth 2022). The developed areas are described in Section 3.6, Land Use.

Table 3: Land Cover Types Within the Project Area

Cover Type	Acres	Percent (%)
Deciduous Forest	556.02	39.61
Mixed Forest	245.88	17.52
Evergreen Forest	196.95	14.03
Pasture/Hay	144.75	10.31
Developed, Low Intensity	62.34	4.44
Open Water	57.21	4.08
Developed, Open Space	49.37	3.52
Developed, Medium Intensity	41.03	2.92
Herbaceous	19.82	1.41
Developed, High Intensity	10.79	0.77
Shrub/Scrub	9.08	0.65
Woody Wetlands	7.56	0.54
Emergent Herbaceous Wetlands	2.00	0.14
Barren Land	0.86	0.06
Total	**1,403.67**	**100.00**

Forested Uplands
The forested upland communities consist of non-wetland areas dominated by woody species 20 feet or greater in height and 3 inches or greater in diameter at breast height. Dominant trees include American sweetgum, loblolly pine (*Pinus taeda*), tulip tree (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), red maple, white oak (*Quercus alba*), red oaks (*Quercus* spp.), mockernut hickory (*Carya tomentosa*), and chestnut oak (*Quercus montana*). Understory species commonly observed in the forested areas are flowering dogwood (*Cornus florida*), greenbrier (*Smilax* spp.), blackberries (*Rubus* spp.), spicebush (*Lindera benzoin*), and various successional hardwoods (oaks, hickories, sweetgum, maples).

This is the dominant habitat present in the Project area. Approximately 999 acres of forested uplands (i.e., deciduous, mixed, evergreen forest) are present in the Project area (see **Table 3**). Some areas appear to have been historically logged, but there is no evidence of recent logging.

Herbaceous Uplands
The herbaceous upland and edge communities consist of non-wetland areas dominated by non-woody vegetation. Dominant herbaceous species include broom-sedge (*Andropogon virginicus*), wild garlic/onion (*Allium* spp.), Kentucky blue grass (*Poa pratensis*), goldenrod (*Solidago* spp.), clovers (*Trifolium* spp.), hemp dogbane (*Apocynum cannabinum*), Japanese honeysuckle (*Lonicera japonica*), American burnweed (*Erechtites hieraciifolia*), wild strawberry (*Fragaria virginiana*), and southern crab grass (*Digitaria ciliaris*).

Palustrine Emergent Wetlands
The emergent wetland communities consist of a prevalence of hydrophytic non-woody vegetation less than 3 feet in height. Dominant herbaceous species include 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.).

Paulustrine Shrub-Scrub Wetland
The shrub-scrub wetland communities consist of a prevalence of hydrophytic woody vegetation less than 20 feet tall. The shrub-scrub strata are dominated by brookside alder (*Alnus serrulate*), American sycamore, black willow (*Salix nigra*), Chinese privet (*Ligustrum sinense*), and red maple.

Aquatic Resources
The Project area is located within the Kings Creek (HUC 0305010509) and Buffalo Creek (HUC0305010508) watersheds of the Broad River Basin (North Carolina Department of Environmental Quality [NCDEQ] 2022). The Broad River is located approximately 15 miles southwest/west of the Project area. Kings Creek, a tributary of the Broad River, runs through the Project area. According to the USGS Kings Mountain 7.5-minute quadrangle maps, the headwaters of Kings Creek originate approximately 0.75-mile northeast of the Project area.

A review of the FEMA National Flood Hazard Layer showed that approximately 21 acres of the Project area along Kings Creek are located within Zone A (areas subject to inundation by the 1% annual chance flood) of the 100-year floodplain (FEMA 2022).

Wetlands

Albemarle reviewed the USFWS NWI mapping data to determine the potential presence of wetland features and USGS NHD mapping to determine the potential presence of streams and waterbodies. Albemarle conducted a field investigation to delineate wetlands and waterbodies within the Project area in February and March 2022. The investigation identified 60 wetlands (59.52 acres total), 80 waterways (67,940 linear feet total), and 12 waterbodies (ponds, lakes). The potential Project impacts to wetlands are currently being defined via the prefeasibility and feasibility studies.

Aquatic Species

There are no federally listed aquatic species in the area; state-listed aquatic species are discussed in Section 3.11.3.

Aquatic surveys are planned for summer 2022 to capture or observe the fish, crustacean, bivalve, and amphibian communities of the lakes and streams within the Project Area. These surveys will help Albemarle to understand the aquatic faunal assemblage and to inform decisions to minimize ecological impacts of development. Additionally, demonstrating that health of aquatic ecosystems is valued by the company will play an important role in maintaining positive public relations with local stakeholders.

Federal Threatened and Endangered Species

Two federally listed threatened species were identified in the IPaC resource list (northern long-eared bat [*Myotis septentrionalis*], and dwarf-flowered heartleaf [*Hexastylis naniflora*]), see **Table 4**. The monarch butterfly (*Danaus plexippus*) is a candidate for listing. There are no known occurrences of these species within the Project area. There are no USFWS-designated critical habitats for federally listed species within the Project area.

Table 4: Federally Listed Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Listed Status	Habitat	Potential to Occur within Project Area
Northern long-eared bat	Myotis septentrionalis	Threatened, with 4(d) rule; proposed endangered, final ruling expected November 2022;	Summer roosting in trees with loose bark over 3 inches in diameter, winters in caves, forages in forest understory	Low; on edge of range
Monarch butterfly	Hexastylis naniflora	Candidate	Prairies, meadows, grasslands, and roadsides with milkweed and flowering plants	Moderate; limited suitable habitat along utility ROWs

Dwarf-flowered heartleaf	Hexastylis naniflora	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 and South Carolina.	Moderate; suitable habitat observed

Based on data reviewed and field reconnaissance to evaluate habitat, the potential for occurrence of the northern long-eared bat within the Project area is low. Northern long-eared bats are not likely to hibernate in the Project area because of the lack of suitable habitat (i.e., no caves or mines). Potential roosting habitat (i.e., forested uplands and wetlands) and roost trees are present throughout the forested uplands and wetlands (see Table 2). However, the Project area is on the extreme southeastern edge of this species' habitat making it unlikely that the species is present.

Albemarle will perform acoustic bat surveys in summer 2022, followed by mist netting surveys if northern long-eared bat occurrence cannot be ruled out by acoustic results. Mist net surveys require a permit and coordination with USFWS.

The federally threatened dwarf-flowered heartleaf is generally found in acidic soils along bluffs and adjacent slopes, in boggy areas next to streams and creek heads, and along the slopes of nearby hillsides and ravines (USFWS 2017). This plant is usually associated with mountain laurel (*Kalmia latifolia*) or American pawpaw (*Asimina triloba*) (Krings et al. 2021).

Potentially suitable habitat for the dwarf-flowered heartleaf was observed within the Project area during field reconnaissance activities. These areas largely consisted of forested slopes adjacent to stream sides, often including areas with mountain laurel and north facing slopes underlain by floodplain, sandy loam, or fine sandy loam soils. SWCA returned to these areas in May 2022 to conduct presence/absence surveys during the flowering period (March 1–May 31). After visiting an area with a known population along a nearby greenway, two SWCA biologists walked meandering transects throughout potential habitat within the Project area. This method was approved by the USFWS. The survey concluded that dwarf-flowered heartleaf was not present in the Project areas.

The monarch butterfly is a candidate for listing across most of the United States and is known to occur within North Carolina during migration from its overwintering habitat in Mexico. The species is not yet listed or proposed for listing and there are generally no ESA requirements for candidate species. The USFWS will decide if the monarch butterfly should be listed under the ESA in 2024.

Monarch breeding habitat comprises agricultural fields, pastureland, prairie remnants, urban and suburban residential areas, gardens, trees, and roadsides, but is highly dependent on the presence of milkweed. Based on data review and an initial field reconnaissance, the potential for this species to occur within the Project area is moderate. No milkweed was observed during the February–March wetland field surveys. Potential habitat that would provide nectar plants

were noted along maintained utility ROWs. Surveys will continue in Spring and Summer 2022 to qualify and quantify habitat. Any observations of the species or its host plant will be recorded.

State Listed Species

For state listed species, soil data, vegetation data, and known species ranges were reviewed to determine potential to occur within the Project area for the 17 state-listed species within Cleveland County (**Table 5**). According to data provided by NCNHP (2022a, b), no state-listed threatened, endangered, or special concern plant or animal species have been identified within the Project area. Five listed species have been observed within 1 mile of the Project area (Appendix C). Four of these species' observations occurred within Crowder Mountain State Park. The other species, oldfield deermouse (*Peromyscus polionotus*), was recorded in 1977.

Table 5: State Listed Species with Potential to Occur Within the Project Area

Common Name	Scientific Name	State Listing Status	Habitat	Potential to Occur
Birds				
Bald eagle	*Haliaeetus leucocephalus*	Threatened	Mature forests near large bodies of water (nesting); rivers, lakes, and sounds (foraging)	**Low**, lack of suitable habitat
Loggerhead shrike	*Lanius ludovicianus*	Special Concern	Fields and pastures (breeding)	**Low**, lack of suitable habitat
Barn owl	*Tyto alba*	Special Concern	Extensive open country, nesting in old buildings, silos, large tree cavities (breeding)	**Low**, lack of suitable habitat
Crustacean				
Broad river spiny crayfish	*Cambarus spicatus*	Special Concern	Streams in Broad River drainage	**Very low**, lack of suitable habitat (prefers large river habitats)
Fish				
Yellowfin shiner	*Notropis lutipinnis*	Special Concern	The Little Tennessee River system of North Carolina	**Very low**, Project area is outside of the Little Tennessee River system
Gastropod				
Dwarf threetooth*	*Triodopsis fulciden*	Special Concern	Southwestern Piedmont (endemic to North Carolina)	**Low**, extremely rare and scarcity of data on preferred habitat
Mammal				

Common Name	Scientific Name	State Listing Status	Habitat	Potential to Occur
Oldfield deermouse*	*Peromyscus polionotus*	Special Concern	Sandy, fallow fields and beaches near South Carolina line	**Low**, recorded within 1 mile of the Project in 1977 according to NCNHP
Reptile				
Timber rattlesnake	*Crotalus horridus*	Special Concern	Often on wooded rocky hillsides or in mature hardwood forests with many downed logs and a layer of leaves and humus.	**Moderate**, recorded within 1 mile of Project in 2019 according to NCNHP
Carolina pigmy rattlesnake*	*Sistrurus miliarius miliarius*	Special Concern	Pine flatwoods, pine/oak sandhills, other pine/oak forests in southeastern Coastal Plain, Sandhills, and a few portions of the southern Piedmont.	**Low**, recorded within 1 mile in 1990 according to NCNHP
Plants				
American bittersweet	*Celastrus scandens*	Endangered	Vine found in cove forests and rich woods. Flowers May to June; distinguishable fruits in fall	**Low**, has not been recorded within 1 mile of Project area according to NCNHP
Smooth sunflower*	*Helianthus laevigatus*	Special Concern - Vulnerable	Mesic to dry, open woodlands, openings and edges of woodlands, overgrown fields, roadsides, powerline clearings. Flowering and fruiting late July-September.	**Moderate**, potential habitat within right-of-ways and open woods
Dwarf-flowered Heartleaf	*Hexastylis naniflora*	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 and South Carolina.	**Moderate**, potential habitat observed
Dwarf juniper	*Juniperus communis var. depressa*	Threatened	high elevation granitic domes, low elevation rocky summits; Bluish berry-like fruit; no flower Recorded within 1-mile at Crowder Mountain State Park in 2018 and 2003 according to NCNHP	**Very low**, lack of suitable habitat.
Rough Blazing-star*	*Liatris aspera*	Special Concern - Vulnerable	Dry soil of hardwood glades with an open understory, openings in rocky woodlands; powerlines and roadsides through these habitats. Flowering and fruiting August - early October.	**Low**, prefers basic soils with high pH (Project area contains acidic soils)

Common Name	Scientific Name	State Listing Status	Habitat	Potential to Occur
Spotted phacelia	*Phacelia maculata*	Endangered	Granite flatrocks and creek bottomlands. Very rare in NC; only two known occurrences along a river in Cleveland County. Flowers in April in NC	**Low**, has not been recorded within 1 mile of Project area according to NCNHP
Dwarf chinquapin oak*	*Quercus prinoides*	Endangered	Most records are from dry acidic slopes with openings or other early succession vegetation, often with rocky areas	**Moderate**, potentially suitable habitat present in Project area
Bear oak	*Quercus ilicifolia*	Endangered	Shrub in dry, rocky soil; found in only a few isolated locations on monadnock mountains in the Piedmont of NC, the southern limit of its range Recorded within 1 mile at Crowder Mountain State Park in 2003 according to NCNHP Distinguished from other oaks primarily by leaves.	**Very low**, lack of suitable habitat. Not known in Cleveland County.
Pursh's wild-petunia	*Ruellia purshiana*	Special Concern – Vulnerable	Glades and barrens, woodland borders, open woods Flowers May-June.	**Low**, has not been recorded within 1 mile of Project area according to NCNHP Considered very rare in the southwestern Piedmont

f. Socioeconomic Conditions

The socio-economic conditions in the Project area, Kings Mountain region, and Cleveland County have not been fully assessed at this time. However, Albemarle will conduct socio-economic baseline data collection efforts in summer 2022 and will use this data to complete both a screening level and full socio-economic impact assessment as part of the prefeasibility and feasibility studies underway for the project.

g. Historic/Cultural Resources

The Area of Potential Effect (APE) for archaeological resources is defined as the construction impact area. The APE for this Project will include the areas disturbed by the construction and operation of the lithium processing plant, as well as areas required to store tailings and waste rock byproducts. It is unlikely that archaeological resources are present within the APE because the area has been previously disturbed by decades of mining. However, Albemarle is currently executing a detailed site investigation program to fully characterize any potential cultural resources still existing on the property.

To date, Albemarle has completed a desktop screening analysis to better inform upcoming cultural resource investigations planned for the site. A review of historical maps shows the project area having undergone significant changes throughout the historic past.

A summary of key findings is presented as follows:

- The earliest map reviewed depicting the Project area is from the early twentieth century.
- The 1906 Kings Mountain, North Carolina, USGS quadrangle depicts the project area as having multiple buildings scattered along non-established roadways, and a cluster around one established roadway (Raven Circle).
- The 1971 Kings Mountain, North Carolina, USGS quadrangle depicts the Project area as having gone through significant changes between 1906 and 1971. Many of the buildings and the non-established roadways found throughout the project area on the 1906 map are no longer depicted on the 1971 map. Areas north of Interstate 85 within the Project area on the 1971 map shows significant disturbances related to mining and waste pond creation. In addition to Interstate 85 being newly depicted in areas adjacent to the Project area, several buildings are also newly depicted on the 1971 map near where mining disturbances occurred within the Project area. Additionally, the cluster of buildings along Raven Circle within the Project area is still depicted on the 1971 map.
- North Carolina Department of Transportation aerial imagery from 1968 (M-698) shows the landscape of the Project area as a mix of forested areas and areas of heavy ground disturbances associated with mining and waste pond creation. The 1968 imagery also continues to show the cluster of buildings along Raven Circle. Google Earth aerial imagery from 1985 shows an increase in disturbances (e.g., logging, grading) in areas near mining activities.
- A research request for due diligence filed with the Office of State Archaeology on February 18, 2022, identified seven archaeological sites in and within 1 mile (1.6 km) of the project area, and eight previous archaeological investigations within the same search area (see **Appendix B, Figure B-7**). Two of these previous archaeological investigations (00-7689 and 10-0167) are within portions of the Project area. However, there are no previously recorded archaeological sites within, or directly adjacent to, the Project area.

h. Visual Resources

The Project site is located in the upper piedmont of North Carolina, adjacent to Crowders Mountain State Park and Interstate 85 to the south and the town of Kings Mountain to the north. The area has a history of rich mineral resources and Crowder Mountain State Park was created to preserve the mountain and rock outcroppings and resulted in an intricate system of trails for hiking enthusiasts. The vegetation of the area is predominately a hardwood climax forest with occurrences of pine and shrubby growth that is typically associated with successional forest in this area.

The Pinnacle, one of the highpoints within Crowder Mountain State Park, is located approximately 2 miles southeast of the main Albemarle site and .65 miles from the nearest Albemarle property boundary bordered by Pinnacle Road (a NCDOT designated scenic roadway). While the existing Albemarle facility (and any new facilities) would be seen from the trail summit, the facility is not seen from the hike to the summit or the majority of the trail along the ridgeline due the topography and dense vegetation. Similarly, there are no views of the existing facility from Pinnacle Road.

The adjacent Martin Marrietta mine/quarry (not associated with Albemarle) to the east of the property site is still operational and visible from points along the eastern portions of the surrounding trails. The Gateway Trail trailhead is located north of the Albemarle property boundary, however the trail itself is located within the property boundary with the trail system following the northern and western property boundary and eventually crossing I-85 via pedestrian bridge. After winding through undeveloped areas of the Albemarle property south of I-85, the trail ultimately connects to the Galilee Church Road Trailhead, located along the southern boundary of the Albemarle property. The existing site, as seen from the trail and off-site viewing locations such as adjacent residences and travel route viewers, appears semi-naturalistic with dense stands of hardwood and evergreens with views of the water-filler quarry from certain vantage points.

i. Health and Safety Factors

The health and safety baseline conditions within in the Project area have not been assessed at this time. However, in June 2022, Albemarle will commence with detailed environmental baseline data collection programs across the properties. This baseline monitoring will include air, water, and noise monitoring programs that will be used to support health and safety related assessments during the prefeasibility and feasibility studies for the Project. The monitoring of these components will continue throughout the engineering studies, permitting, construction and eventual operation phases of the Project.

B. ENVIRONMENTAL IMPACTS OF THE WORK TO BE PERFORMED.

Current Status: Albemarle has recently started (April 2022) a detailed prefeasibility assessment that will involve detailed engineering and environmental evaluations of the Project. The alternatives that will be evaluated regarding potential environmental impacts will include, but <u>will not be limited to</u>:

- Process plant locations (prioritizing locations already disturbed by previous mining activities, locations that have the least environmental and social impact, etc.),
- Process plant technologies to mitigate environmental impacts (dust mitigation, water recycling, water treatment, avoidance of diesel/gas backup power systems, etc.),

- Tailings storage facility locations (prioritizing areas already disturbed by historical mining, minimizing impacts to water courses and wetlands, avoiding potential cultural resources, minimizing impacts to potential critical habitat for federal and/or state listed species, minimizing impacts to visual resources, etc.),

- Tailings storage facility designs (evaluation of innovative processing technology such as filtered dry-stack tailings, best practice engineering controls such as environmental liner systems, storm water control systems, seepage recovery systems, etc.),

The prefeasibility assessment will also include the collection of significant environmental baseline data in order to develop a full understanding of existing environmental and social conditions. A list of environmental baseline data collection programs scheduled for 2022 include the following:

- Cultural Resource Surveys
- Threatened & Endangered Species Surveys
- Comprehensive Biological Survey
- Comprehensive Public Well Survey
- Surface & Groundwater Monitoring Program
- Water Quality Monitoring Program
- Aquatic Survey
- Air Monitoring Program
- Noise Monitoring Program
- Geotechnical Characterization
- Tailings Geochemical Characterization
- Visual Resource Surveys
- Traffic Surveys
- Socio-Economic Baseline Data Collection

The prefeasibility assessments will be followed by a more detailed feasibility assessment, which will utilize environmental site data collected during the prefeasibility study. The feasibility assessment will use this data to develop detailed predictive models used to assess potential environmental/social impacts and mitigation opportunities regarding environmental resources including air, water, soil, visual, biological (vegetative/wildlife), cultural, etc. The models and studies planned for early 2023 include:

- Surface Water Models
- Groundwater Models
- Water Quality Studies
- Air Quality Models
- Noise Assessment Studies
- Visual Resource Studies
- Mitigation Studies (Wetlands, etc.)
- Traffic Impact Studies
- Socio-Economic Impact Assessments
- Human Rights and Environmental Justice Risk Assessments

1. Land Use

Potential impacts to land will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to land.

However, potential impacts to land are expected to include clearing and grubbing required to facilitate the construction of the processing plant and for the deposition of tailings and waste rock products that will be generated during lithium processing operations. Albemarle plans to locate the processing plant facility on land that has already been impacted from historical mining activities (our current technology center and office complex is built on historical waste rock). Albemarle will also prioritize deposition of waste materials to previously disturbed brownfield areas and will evaluate alternatives to reuse previous tailings and waste storage sites located across the property. Some new disturbance will be required to facilitate storage requirements for the full life of the processing facility. The details of the waste storage requirements and environmental mitigation opportunities will be evaluated in detail during the prefeasibility and feasibility assessments.

It is not expected that any toxic and/or hazardous substances will be generated from this processing facility, however all potential waste streams will be evaluated as part of the prefeasibility and feasibility studies. Generally, tailings and waste rock materials will generally be of a non-toxic form and will be disposed of in properly engineered rock storage piles using best control technologies to mitigate any potential short or long-term impacts to environment and/or land. Albemarle will also investigate opportunities to repurpose any tailings and waste rock streams in order to minimize the volume of waste materials requiring on site storage. This will help mitigate impacts to current environmental and/or land resources.

2. Atmospheric Conditions/Air Quality

Potential impacts to air quality will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to air quality.

A comprehensive baseline environmental characterization program is planned for Summer 2022. This program will provide environmental data for the existing air quality conditions at the Project site. This data will be used to assess potential impacts to the existing air quality resources in the area. The baseline environmental monitoring program for air will include the following:

- Installation of on-site met tower; baseline meteorological monitoring for at least 12 months
- Installation of on-site PM monitors; baseline air quality monitoring for PM10/PM2.5 for at least 12 months
- Development of full emissions inventory for project, including fugitives
- Development of dispersion model to demonstrate NAAQS compliance and visibility/deposition

Like most other processing operations, the Kings Mountain Project will be required to control potential nuisances and emissions, through "Best Practices", as applied in the industry. It is important to identify early on the potential sources for those nuisances and to design mitigating methods to limit their impact on the community, workplace hygiene, and the environment.

Ultimately, the feasibility level assessments will refine the potential air emissions, and associated impacts. However, air emissions from this Project are expected to be limited and can be mitigated using best practice and best available technology. Some preventative measures and treatments of effluent are recommended to avoid emissions (discussed below).

The main air emissions expected from the Project are as follows:

- Dust
- Combustion gases
- Degradation products from reagents

The following paragraphs will describe the potential emissions and alternatives that will be evaluated to prevent or limit impacts.

Dust

Hauling Facilities

Typically, haulage trucks moving on roads, stockpile areas and dumping into feed bins are contributing to the largest potential dust emissions around the processing facility. The dust suppression associated with loading/hauling of the ore and waste is typically addressed through dust suppression by water truck, additives in the road (polymers, tackifiers, etc.), or other fleet management practices. These alternatives will be evaluated as part of the feasibility studies.

Loading and Crushing Facilities

The front end of the processing facility will include a series of operations that generally tend to create volatile dust. These include storage bins, feeders, crushers, dry screens, transportation (conveyors), chutes, etc. Because those operations are carried out on a dry process basis (no requirements for water addition to help the process), ultra-fines tend to volatilize. The loading facilities, including grizzly, and stockpile bins are typically equipped with spray nozzles which use misting water to control dust. These types of systems have been successfully used throughout industry.

Dust collecting baghouses and other potential technologies will be evaluated for the loading and crushing facilities, which will prevent dust emissions at some critical points of the dry plant. These include areas including the jaw crusher, secondary and tertiary screening, and apron

feeders. For hard rock mines, such as Kings Mountain's, there is a tendency for dust to be generated at transfer points in these key areas.

Crushed Ore Storage

Stockpiles and open ore storages at the feed end of the concentrator are potential dust sources. To counter that effect, spray nozzles are typically installed at the loading of the stockpile feed conveyor, just after the chutes, as well as around its discharge onto the pile. This method has been used extensively in the industry, however additional engineering evaluations will be required to assess suitability and potential alternative technologies and/or practices.

Waste Disposal

Rejects from the various process streams are expected to be at moisture contents between 8 and 12% when discharged to tailings storage facilities. This level of moisture content is sufficient for preventing dust emissions immediately after being produced. However, over time tailings materials will dry and may have potential to create wind-blown dust. A number of alternatives will be assessed to mitigate this long-term dust potential and may include, but is not limited to, water trucks, polymer/tackifiers, co-deposition of course and finer tailings, progressive reclamation, etc.

Combustion Gases & Degradation Products from Reagents

At this point, it is not expected that the Project will require significant amounts of fuel combustion and will therefore not be a significant source of CO2 or NOXs. Albemarle will be evaluating all opportunities to minimize diesel and/or gas-powered infrastructure.

Processing the ore from Kings Mountain will involve the use of certain reagents for flotation and products dewatering. A preliminary list of reagents and consumables that are expected to be used include the following:

- Armac T (Mica collector diluted using ethanol)
- Caustic Soda (pH regulator)
- Sodium Carbonate (EH/pH adjustor)
- Sodium Silicate (Dispersant)
- MIBC (Frothing agent)
- F100 (Dispersant)
- FA-2 (Spodumene collector)
- Ferro-Silicium
- Flocculant

It is expected that some of those reagents may result in slight odoriferous emissions, over time, due to their degradation. However, those should be very limited and contained within the immediate plant area.

3. Hydrologic Conditions/Water Quality

Potential impacts to water will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to water quality.

A comprehensive hydrogeological investigation program is planned for the site. This will include a drilling campaign (Summer 2022) to install a number of groundwater monitoring wells across the property. These groundwater monitoring wells will be used to establish baseline environmental conditions including the monitoring of groundwater levels (piezometric conditions) as well as water quality analysis.

The baseline environmental monitoring program for water resources will include the following:

- Desktop analysis, followed by full pedestrian wetland/water delineation surveys
  - Documentation of OHWM for streams, and field indicators for wetlands (vegetation, frequency/duration of inundation, soil pits)
- Installation of new groundwater monitoring wells including:
  - 18 Shallow Monitoring Wells (~150 ft); 4-inch Diameter
  - 3 Deep Monitoring Wells (~400 ft); 6-inch diameter
  - 3 Hydraulic Pump Test Wells (~150 ft); 8-inch Diameter
- Monitoring of shallow and deep groundwater levels at 23 locations, including 5 multi-level Vibrating Wire Piezometers
- Monitoring water levels in 7 surface water bodies
- Implementing continuous flow monitoring in 2022 in Kings Creek
- Quarterly sampling of pit lake (multiple locations, multiple depths)
- Quarterly sampling of groundwater (13 locations); new expansive groundwater monitoring network to be installed in 2022
- Quarterly sampling of surface water (9 locations)
- Full sampling suite includes metals, inorganics, and radiochemistry for comparison to North Carolina and IRMA standards
- 72-hr pumping tests at 7 groundwater wells
- 21 Short-term 4-hr pumping tests in shallow and deep monitoring wells

Data collected from this program will be used to develop a comprehensive groundwater model to assess how water flows across the property. Geochemical models will also be constructed to evaluate potential fate-transport risks associated with tailings materials produced by the processing plant. These models will be used identify potential environmental risks and the corresponding alternatives for best control technology and management practices.

It is not expected at this time that significant impacts to hydrologic or water quality conditions would occur as part of this project. However, prefeasibility and feasibility level engineering will need to be completed before a complete water balance and water supply strategy is evaluated.

At this time, it is anticipated that municipal water supply sources will be sufficient to feed the low water demand required by the processing plant. It is not expected that groundwater resources will be required to provide feed water to the processing facilities – however this will need to be assessed if municipal sources cannot meet the demand.

At this time, it is not expected that the deposition of tailings materials will result in significant impacts to water quality in the region. Detailed geochemical testing of the ore body and tailings materials will be completed in order to provide a thorough understanding on potential long-term chemical leaching of tailings. Engineering controls, such as liner systems and seepage collection infrastructure, will also be evaluated to provide environmental controls aligning with best available control technologies for the industry.

4. Geologic/Soil Conditions

Potential impacts to geologic and soil resources will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to soil resources.

Soil field surveys are planned for summer 2022 to collect data on soil resources within the Project Area and to verify soil resource characterization established by the NRCS. Albemarle will characterize soil resources using NRCS methodology to verify delineated soil map units. In conjunction with soil survey verification, soil scientists will evaluate surface soils for use as reclamation media and provide topsoil stripping and salvaging recommendations. Samples of potentially salvageable soils will be collected for laboratory analysis of agronomic properties relevant to reclamation planning. The baseline environmental monitoring program for soil resources will include the following:

- Desktop Assessment
  - NRCS soil map units (SMU) and ecological site descriptions
- Field Survey Methods
  - Completed by an Order II Soil Survey, NC Licensed Soil Scientist/CPSS
  - 30-50 soil sample locations,
    - Soil descriptions by horizon: color, structure, texture, redoximorphic features, coarse fragments, restrictive features.
    - Soil analysis by horizon: pH; EC; SAR; ESP; CEC; organic matter/carbon; macronutrients (N-P-K); plant available zinc, iron, manganese, copper; particle size

Establishment of the proposed Project would occur predominantly on previously disturbed land; therefore, negligible adverse impacts would occur to geology or soils. Areas of new disturbance would be limited to new tailings storage facilities. Typically, native soil in these areas would be stripped prior to any placement of waste materials. It is expected that any soil removed will be salvaged and stockpiled for later use during reclamation activities.

5. Vegetation and Wildlife Resources

Potential impacts to vegetation and wildlife will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to biological resources.

A comprehensive baseline environmental characterization program is planned for Summer 2022. This program will provide environmental data for the existing biological resources at the Project site. This data will be used to assess potential impacts to the vegetative and wildlife resources in the area. The baseline environmental monitoring program will include the following:

- Conducting desktop and field habitat assessments for state and federally listed species, including Monarch Butterfly (candidate for listing)
- Conducting presence/absence surveys for Dwarf-flowered Heartleaf (threatened plant)
  - Conducting acoustic surveys for Northern Long-eared Bat (threatened) and other bat species. Mist-net surveys will be conducted if needed based on acoustic results.
- Conducting aquatic surveys in ponds and streams to inventory fish, crustacean, bivalve, and amphibian communities
- Performing migratory bird nest surveys,

6. Socioeconomic Conditions

Potential impacts to socio-economic will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of positive and negative impacts of the project.

A comprehensive social baseline program is planned for Summer and Fall 2022. This program will provide existing social and economic data for the Kings Mountain region. This data will be used to assess potential impacts (positive and negative) to the surrounding communities. The baseline monitoring program will include the following:

- [redacted]

- [redacted]
- [redacted]
- Traffic Assessments
  - Baseline traffic monitoring at selected intersections. Monitoring includes AM/PM variability. Two monitoring periods planned to evaluate seasonal variability
  - Development of traffic inventory for the Project: construction, operations, equipment deliveries, material deliveries, product export, employee traffic
  - Traffic Impact Analysis modeling for key intersections and road segments to determine changes in Level of Service, identify improvements/mitigations.
- Noise Assessments
  - Identification of sensitive receptors, including nearest residents, special areas like historic districts, and wildlife areas

- Ambient noise monitoring with permanent instrumentation installed on met tower, for at least 12 months
- Focused short-duration noise monitoring (1 week) in the vicinity on sensitive receptors. Two separate monitoring events planned in 2022 to evaluate seasonality (summer; fall/winter)

7. Historic/Cultural Resources

Potential impacts to historic and cultural resources will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to potential archeological resources in the area of the Project.

A comprehensive cultural resource survey is planned for Summer 2022. This program will provide a comprehensive inventory of any potential historical or cultural artifacts within the Project areas. The cultural resource survey program will include the following:

- In areas of 15 percent slope or less, with undisturbed soil profiles, use of shovel test pits (STPs):
  - Determines the presence or absence of archaeological deposits.
  - STPs will be conducted at 30-meter intervals, minimum of 30 centimeters (cm) in diameter, and excavated by natural strata at least 10 cm into archaeologically sterile sediments or hydric soil or to a depth of one meter.
  - Excavated soils will be screened using standard 0.25-inch (6.35 mm) or finer hardware mesh.
  - Soil and artifact data will be documented for each STP (i.e., soil stratigraphy using USDA soil descriptions, Munsell color codes, depth, and the presence or absence of artifacts), and profile maps will be created for representative STPs.
  - Albemarle will record the locations of any identified archaeological resources using a handheld GPS unit capable of sub-meter accuracy. All STPs, will be documented by photography and profile drawings.
- Conduct a historic architecture reconnaissance survey focused on the buildings and/or structures within 0.5 mile of the project area.
  - Complete documentation and the photographic documentation of any resource 50 years or older
  - For previously recorded resources, update the OSA records to reflect the current condition of the resource
- Assess the effect of the project on resources eligible for or listed on the National Register of Historic Places within 0.5 mile of the project area

At this time, it is not anticipated that any significant cultural resources will be found in the area of the Project due to the fact that it has been significantly disturbed by previous mining activities, the installation of a major highway, and significant residential development. However, if cultural resources are found, every effort will be made to avoid disturbance. If avoidance is not possible, a cultural resource mitigation strategy will be developed per the requirements of state and federal regulatory requirements.

8. Visual Resources

Potential impacts to visual resources will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies aimed at minimizing the impacts to visual resources in the area of the Project.

A visual resource survey is planned for Summer 2022. The visual resource survey program will include the following:

- Conducting viewshed analysis to determine visibility of proposed project from surrounding areas
- Identifying a series of 25 key observation points (KOPs) from which baseline photos are taken and the visual character of the area is established
- Taking seasonal photos (March and July) to capture changing visibility in the landscape
- Developing photo-realistic simulations from KOPs to support analysis and public outreach
- Developing high-end visual renderings (fly-throughs, augmented reality, etc.) to aid public understanding of the Project

9. Health and Safety Factors

Potential impacts to Health and Safety will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies to reduce risks associated with public and employee health and safety.

10. Solid and Hazardous Wastes

Potential impacts to the environment from wastes (tailings) will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies to reduce risks associated with chemical leaching, erosion, windblown materials, etc.

A comprehensive geochemical testing program is planned for Summer 2022. This program will provide a comprehensive analysis of potential environmental impacts related to waste (tailings)

generation and deposition in the Project area. The geochemical program will include the following:

- Geochemical characterization of tailings wastes
  - Collection and testing of core samples gathered from exploration activities completed in 2018 and 2019
  - Generation and testing of simulated tailings samples produced by pilot testing apparatus
  - Laboratory testing methodologies will include programs recommended by
    - Global Acid Rock Drainage Guide (GARD Guide)
    - EPA LEAF Testing Methods
    - Industry Best Practice
      - MWMP, SPLP, TCLP Testing, etc.

11. Impacts on Regional or Local Plans

Potential impacts to the regional and local development plans will be evaluated in detail as the prefeasibility and feasibility assessments progress throughout 2022 and 2023. These assessments will include the evaluation of potential mitigation strategies to reduce project risks and maximize the benefits to surrounding communities.

C. POTENTIAL LIABILITY TO DOE OF EXISTING CONDITIONS AT THE SITE(S).

There are no outstanding liability concerns related to this Project. The areas previously disturbed by mining were reclaimed and closed in the mid-1980s. There are no significant or outstanding actions with the federal, state, or local regulatory agencies with regard to historical environmental contamination or pending reclamation requirements. The existing lithium processing facility is in compliance with all federal, state, and county permit requirements.

D. ABILITY TO MEET COMPLIANCE REQUIREMENTS AT THE SITE(S).

A detailed matrix of regulatory agencies and permitting requirements for the Project is provided in **Appendix C**. The permitting requirements will be continuously reviewed as the prefeasibility and feasibility assessments progress and the Project engineering moves toward final design configurations. A brief summary of key federal, state, and local permitting requirements is provided as follows:

Key State Permitting

The primary state permit that will govern the Project is an approved Notice of Intent (NOI) to Commence Large Mining Operations from the North Carolina Department of Environmental Quality, Division of Energy, Mineral, and Land Resources (DEMLR). Other key permits required for the Project, that will be required to accompany the State mining permit NOIs, include water quality, stormwater, National Pollutant Discharge Elimination System (NPDES), construction, dam safety, 401 certification and buffer stipulations, and hazardous waste permits.

Consultation with the North Carolina State Historic Preservation Office (NC SHPO) will be required for compliance with the National Historic Preservation Act (NHPA) Section 106 and state historic preservation laws.

In addition, coordination with the North Carolina Natural Heritage Program (NCNHP) and South Carolina Department of Natural Resources (rare, threatened, and endangered species inventory) regarding impacts to wildlife is recommended to meet the requirements of other Federal/State permits for the project. Coordination with the North Carolina Division of Parks and Recreation due to the project's proximity to Crowders Mountain State Park (east and southeast of the project) and the South Carolina Division of Parks, Recreation, and Tourism due to the proximity of Kings Mountain National Military Park east and northeast of TSF options is also recommended. Permitting requirements for the various state agencies are detailed in the permit matrix.

Key Local Permitting

The Project is located in the city of Kings Mountain, Cleveland County, North Carolina. Consultation with the City of Kings Mountain and Cleveland County will be required to determine the need for potential permits or land use approvals within these jurisdictions. Cleveland County Government Zoning will require a conditional use permit that allows the use of property in a non-conforming way.

[redacted]

Key Federal Permitting

Federal permitting with the U.S. Army Corps of Engineers (USACE) will be required for any potential impacts to wetlands or other waters of the U.S. under Section 404 of the Clean Water Act (CWA), and for crossing navigable waters under Section 10 of the Rivers and Harbors Act.

Consultation with the U.S. Fish and Wildlife Service (USFWS) and biological resources surveys are required to support compliance with Section 7 of the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA), and the Bald and Golden Eagle Protection Act (BGEPA).
National Historic Preservation Act (NHPA) Section 106 compliance is also triggered by a federal nexus.

Compliance Strategy

The permitting matrix provided in **Appendix C** forms the fundamental list of regulations that will apply to the project. These requirements will be evaluated throughout the prefeasibility and feasibility assessment to ensure the design alternatives of the processing plant and tailings storage facilities are such that they meet or exceed regulatory requirements.

The best available control technologies that will be considered during these design alternative assessments have been discussed throughout this document. Generally, the best available control technologies that will be considered during engineering evaluations will include, but are not limited to:

Air Quality

- Water trucks to minimize dust on access and haulage routes.
- Polymers/tackifiers used on key roadways and tailings facilities to reduce dust.
- Progressive reclamation on tailings stockpiles to reduce dust.
- Spray systems and bag houses (or other potential technologies) will be used in the processing plant to mitigate dust.
- Electric back-up power systems will be evaluated to eliminate use of conventional diesel/gas powered generator systems.

Visual Resources

- Opportunities to minimize impacts to visual resource in the area will be evaluated and may include, progressive reclamation, geomorphic land forming, pit back fill, low impact architecture and paint color selection, etc.

Water Quality

- Low water consumption alternatives will be evaluated for the processing plant.
- Water recycling opportunities will be evaluated to reduce dependence on potential municipal or groundwater resources.
- Liner systems will be evaluated to prevent potential environmental contamination and seepage from tailings storage facilities.
- Filtered, dry-stack tailings technologies will be evaluated to reduce geotechnical risks of tailings and recover water for reuse in processing plant.

Soils

- Soils potentially disturbed by operations will be salvaged and stockpiled for use in reclamation.
- Potential pit backfill scenarios will be assessed to evaluate opportunities to place processing wastes back in the open mine pit excavation. This will potential minimize the overall acreage of new disturbance required for the

processing plant and tailings storage facility.

- Potential repurposing of tailings waste products to minimize the overall acreage of new disturbance.

E. EXPERIENCE AND APPROACH TO THE IDENTIFICATION AND RESOLUTION OF ENVIRONMENTAL ISSUES.

Key Environmental Team

The key Albemarle environmental team that will be leading the environmental baseline data collection effort, environmental and social impacts assessments, and permitting process are as follows:

[redacted], Manager Environment & Permitting

[redacted] is an environmental engineer with 18 years of experience working in the mining industry. He has extensive international experience leading mine development, design and permitting projects across numerous resource commodities. [redacted] has a wide range of technical expertise in the environmental sciences including surface and groundwater hydrology, water treatment, habitat design, climate change, geochemistry and geotechnical.

He started his career in western Canada working on mine development projects within the oil sands and coal markets. His work in Canada included numerous environmental impacts and mine design assessments to support mine plan approvals and regulatory permitting. [redacted] spent several years living overseas working on copper and gold mining projects across Australia, Papua New Guinea, Fiji, and the Philippines. These projects included the assessment and design of best practice mine plans with a major focus on environmental impact assessments and sustainable development. For the last 8 years, [redacted] has led a technical team responsible for designing, permitting and executing mine reclamation projects across the United States and Canada. He is now focused on completing environmental and sustainability evaluations for a number of international lithium development projects.

Albemarle's Global Experience

Albemarle is the leading producer of lithium materials globally, with extraction and refining operations located in the US, Chile, Australia, and refining capacity in China. We own and operate some of the largest lithium assets in the world and have a number of world-class resources in our portfolio, producing battery grade lithium carbonate and lithium hydroxide, as well as specialty lithium chemicals and derivatives for a wide range of markets. Our Silver Peak,

NV lithium operation is the only domestic source of feedstock and has been in operation since the 1960s. The Silver Peak facility produces lithium carbonate from brine and also supplies feedstock for our lithium hydroxide refinery operations located in North Carolina.

Our Talison and MARBL joint ventures in Australia are two of the largest operating hard rock lithium mines globally. Talison has successfully operated the Greenbushes mine for decades and provides Albemarle with the operational insights and experience required to successfully restart our Kings Mountain North Carolina hard rock operation.

Albemarle has significant experience in identifying, developing, and operating world class lithium assets in a responsible and sustainable manner.

Albemarle's Existing Environmental Policy in Practice

Although not available at this time, detailed and comprehensive environmental policies will be developed as part of the feasibility and detailed design studies for the Project. These policies will align with not only the state and federal expectations but also the corporate expectations of Albemarle and the expectations of the Initiative for Responsible Mining Assurance (IRMA). IRMA is one of the most comprehensive certification programs that apply to the mineral extraction and processing industry and focus on environmental stewardship and social excellence. Information on IRMA can be found at https://responsiblemining.net.

Although Project specific environmental policies are not developed at this time, **Appendix D** provides selected examples of policies used at the active lithium processing plant located on the Kings Mountain site.

APPENDIX A

Conceptual Site Layout

[redacted]

APPENDIX B

Project Location Maps

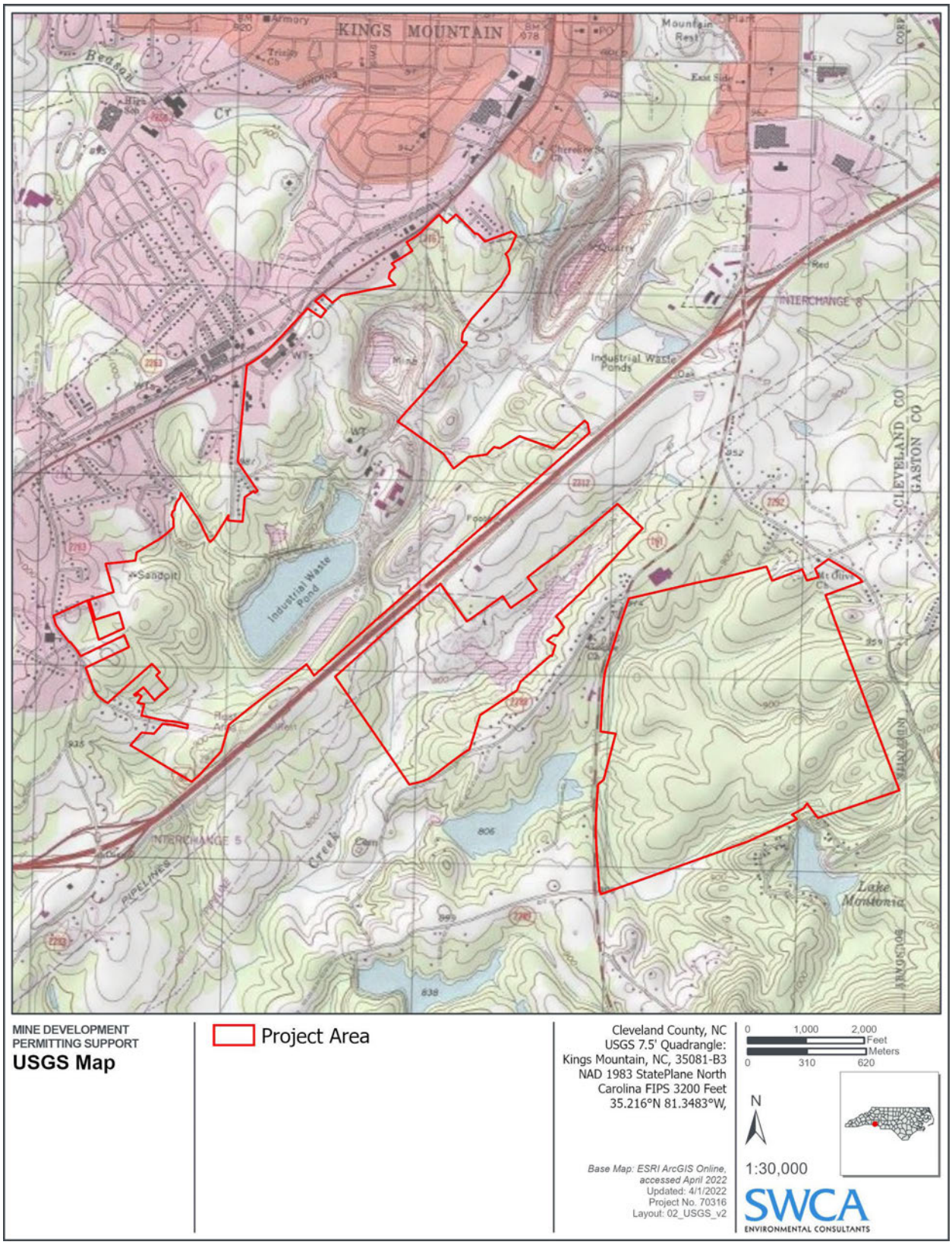


Figure B-1: Project Location

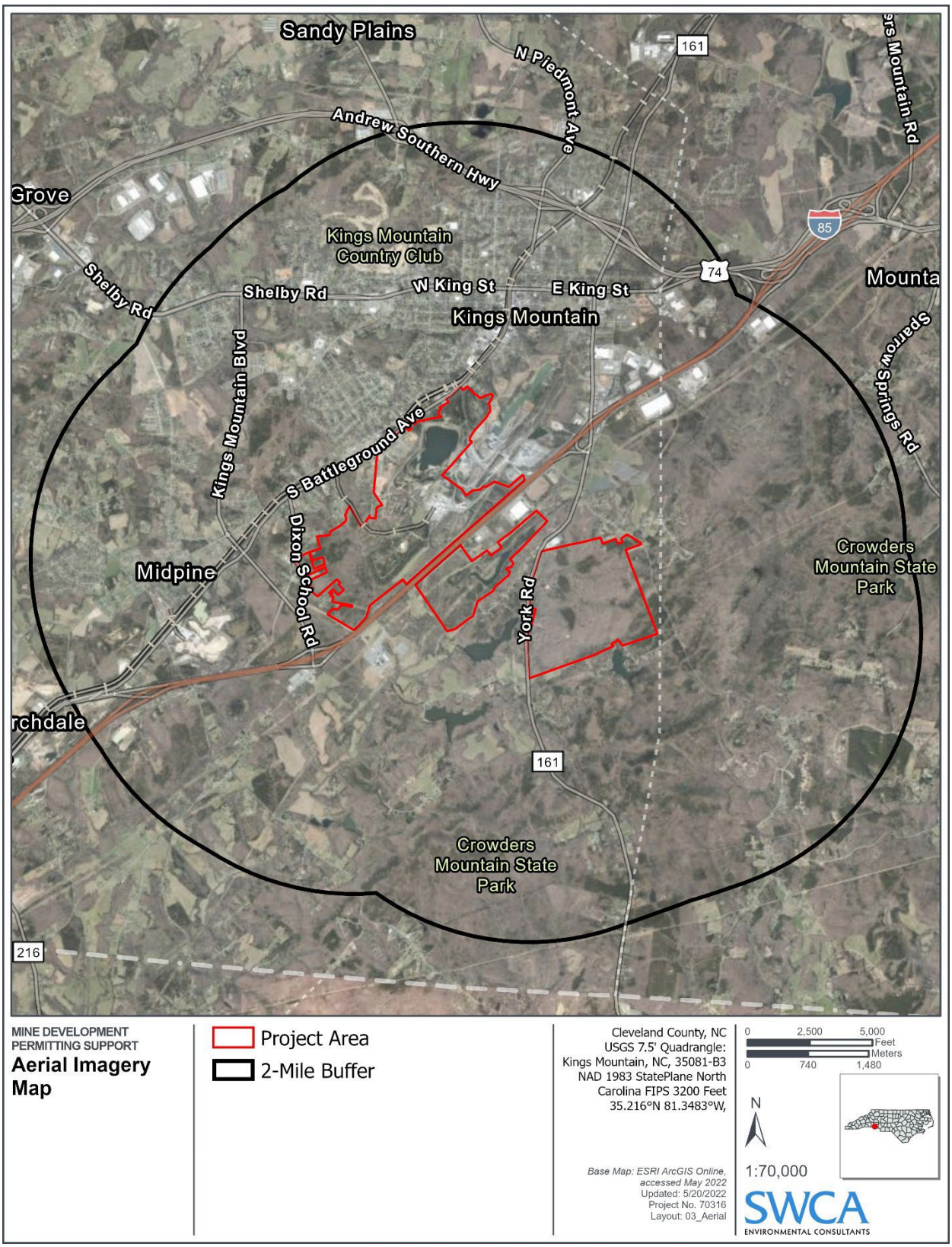


Figure B-2: Aerial Imagery of the Project Area

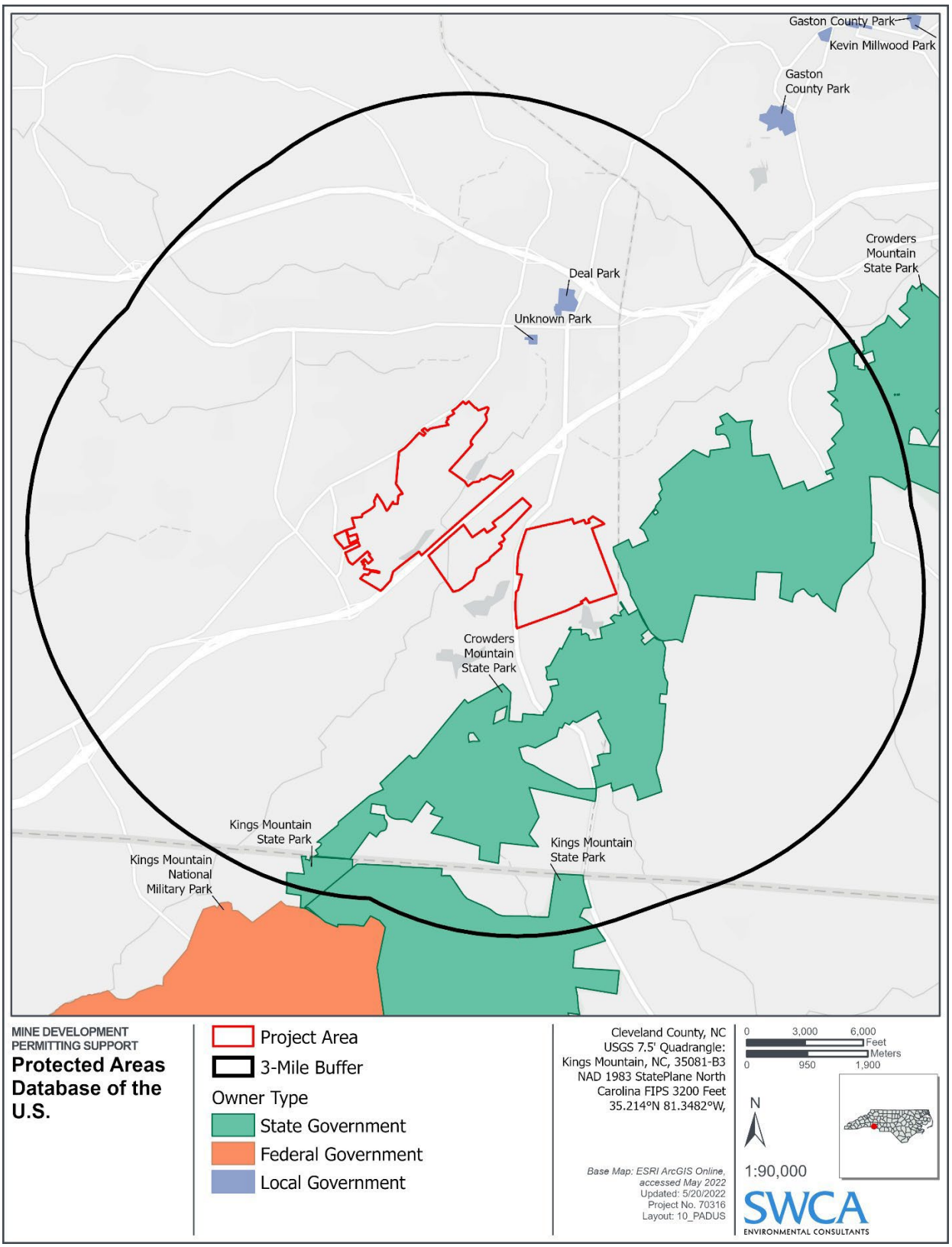


Figure B-3: Parks near the Project Area (3-miles)

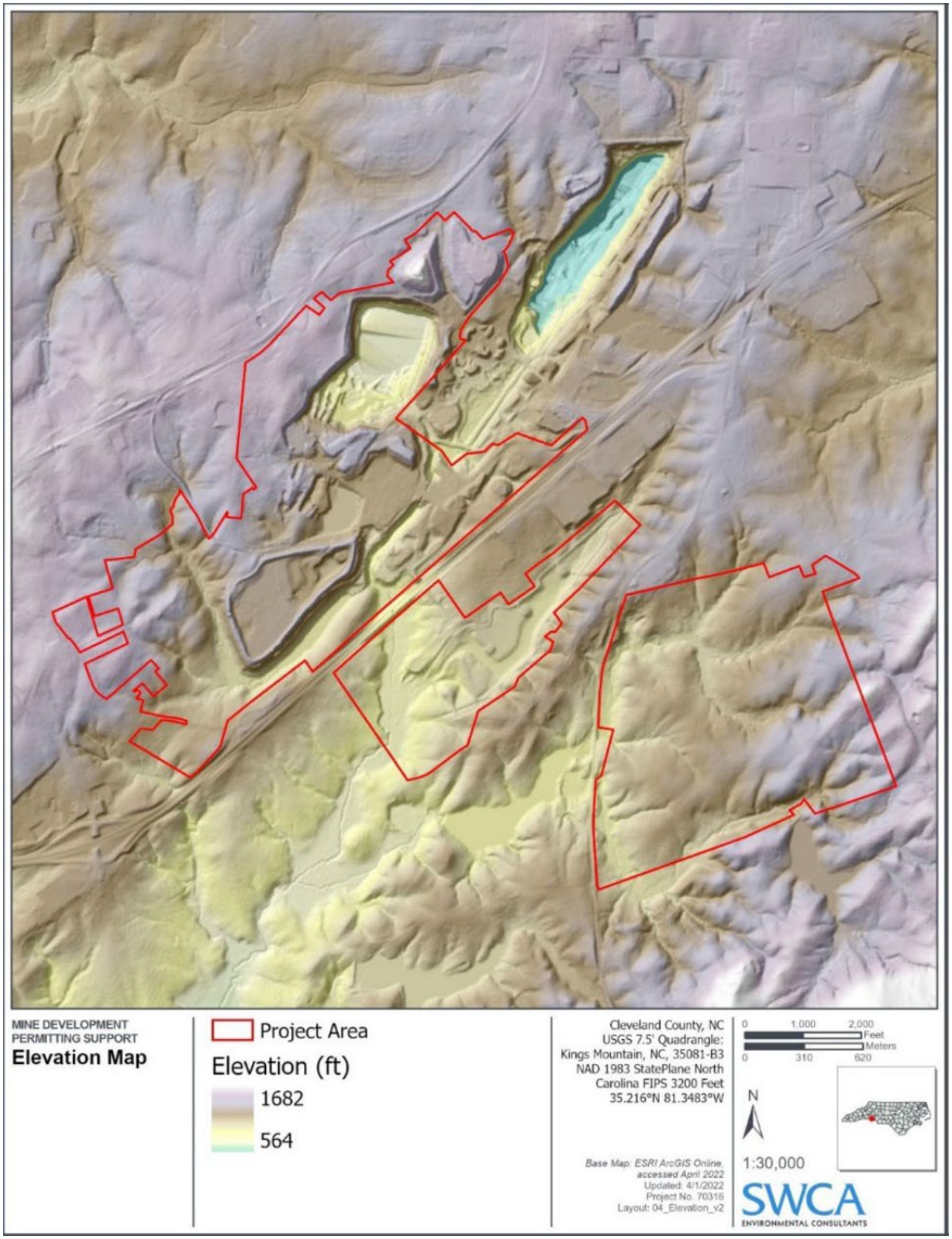
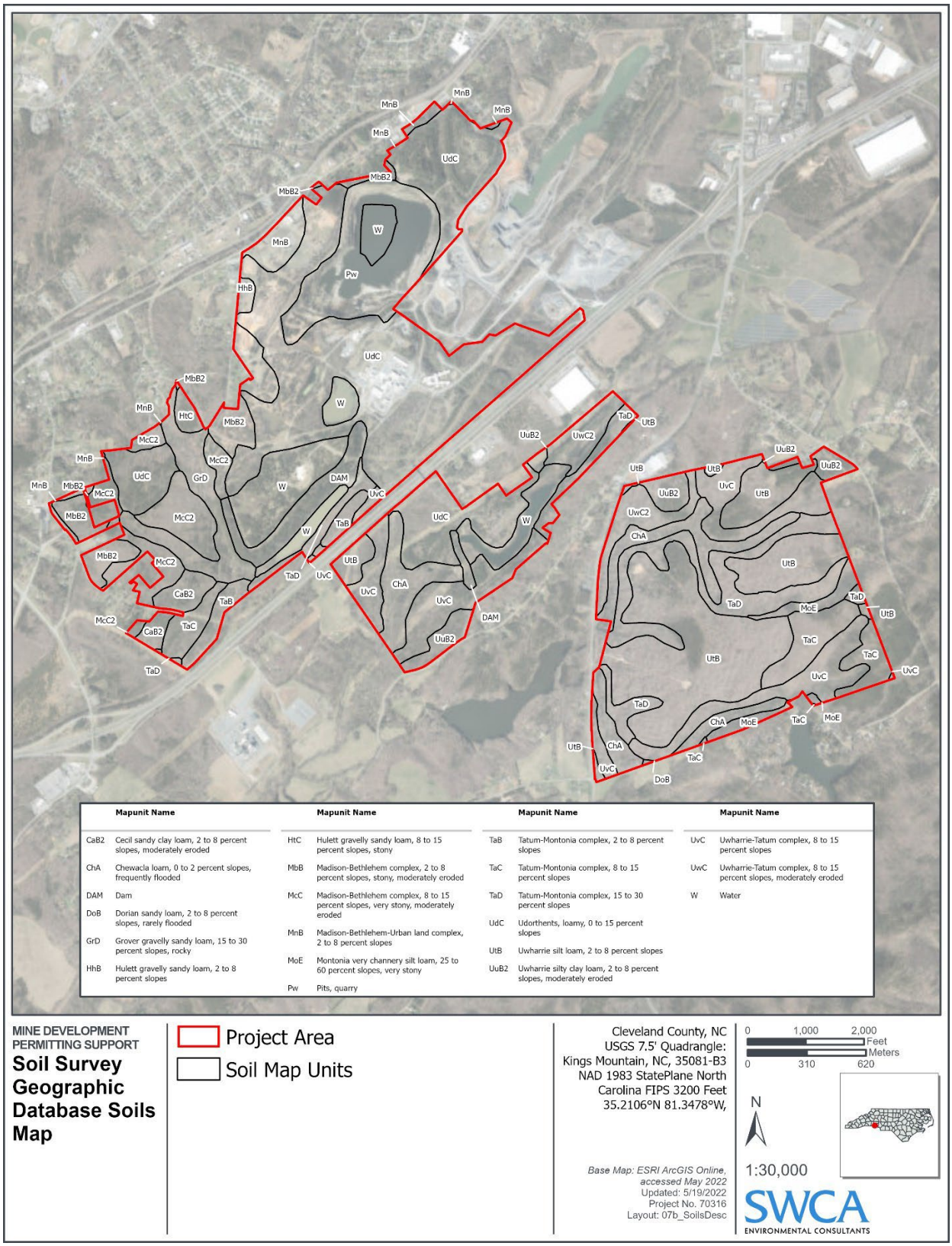


Figure B-4: Elevations within the Project Area



	Mapunit Name		Mapunit Name		Mapunit Name		Mapunit Name
CaB2	Cecil sandy clay loam, 2 to 8 percent slopes, moderately eroded	HtC	Hulett gravelly sandy loam, 8 to 15 percent slopes, stony	TaB	Tatum-Montonia complex, 2 to 8 percent slopes	UvC	Uwharrie-Tatum complex, 8 to 15 percent slopes
ChA	Chewacla loam, 0 to 2 percent slopes, frequently flooded	MbB	Madison-Bethlehem complex, 2 to 8 percent slopes, stony, moderately eroded	TaC	Tatum-Montonia complex, 8 to 15 percent slopes	UwC	Uwharrie-Tatum complex, 8 to 15 percent slopes, moderately eroded
DAM	Dam	McC	Madison-Bethlehem complex, 8 to 15 percent slopes, very stony, moderately eroded	TaD	Tatum-Montonia complex, 15 to 30 percent slopes	W	Water
DoB	Dorian sandy loam, 2 to 8 percent slopes, rarely flooded	MnB	Madison-Bethlehem-Urban land complex, 2 to 8 percent slopes	UdC	Udorthents, loamy, 0 to 15 percent slopes		
GrD	Grover gravelly sandy loam, 15 to 30 percent slopes, rocky	MoE	Montonia very channery silt loam, 25 to 60 percent slopes, very stony	UtB	Uwharrie silt loam, 2 to 8 percent slopes		
HhB	Hulett gravelly sandy loam, 2 to 8 percent slopes	Pw	Pits, quarry	UuB2	Uwharrie silty clay loam, 2 to 8 percent slopes, moderately eroded		

Figure B-5: Soil Map Units within the Project Area

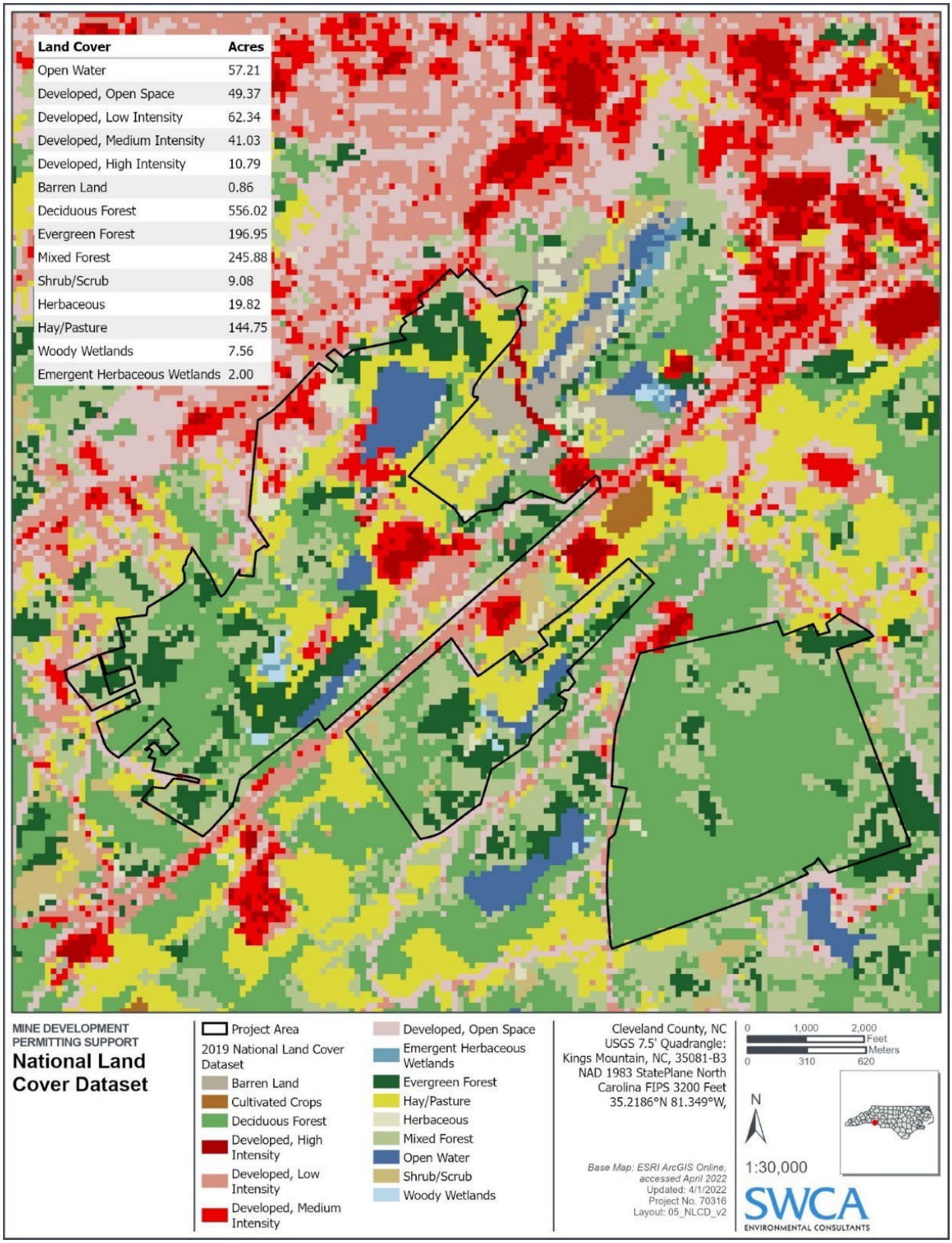


Figure B-6: National Land Cover Dataset Cover Types within the Project Area

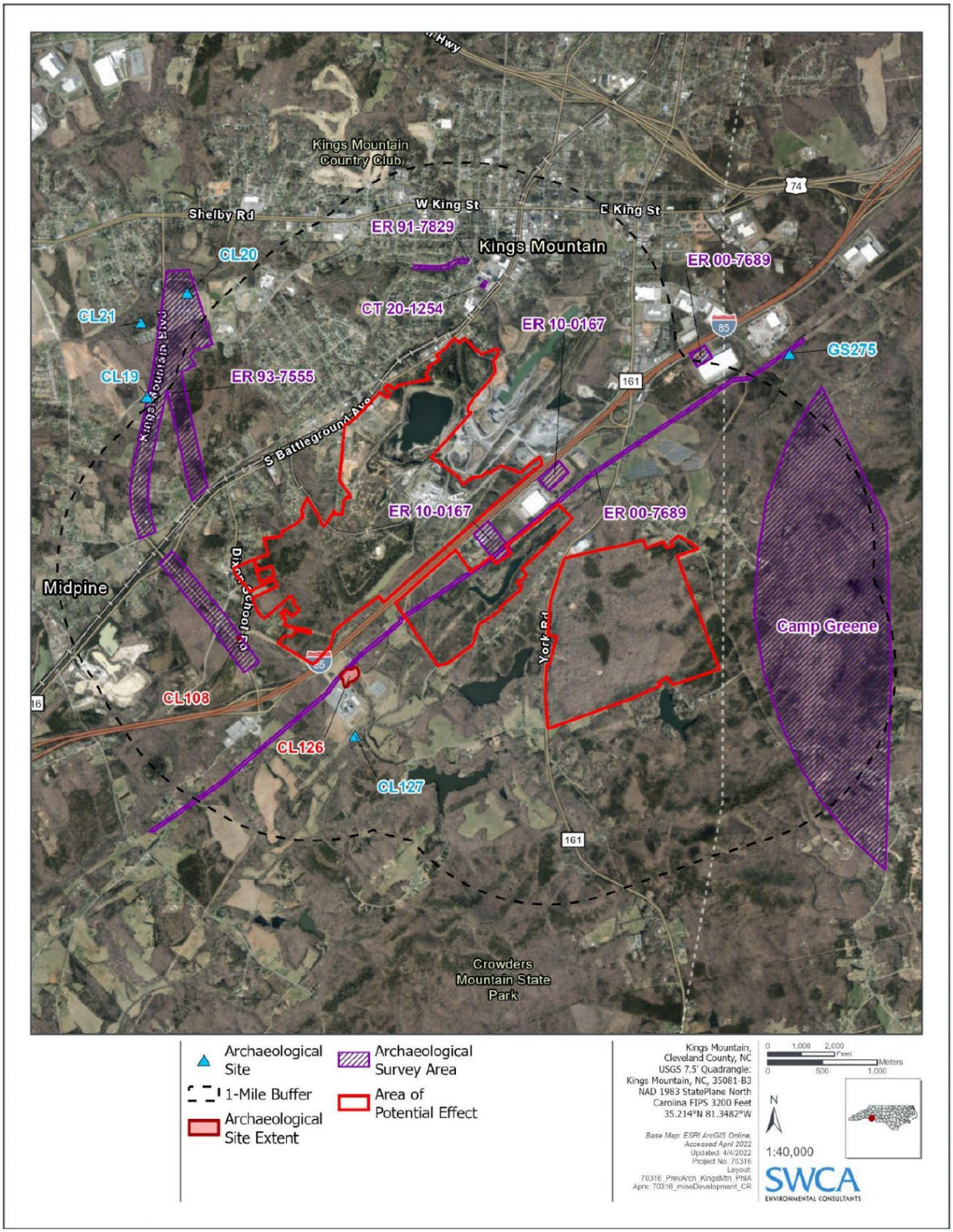


Figure B-7: Previously Identified Archaeological Sites and Investigations

APPENDIX C

Permitting Matrix and Regulatory Strategy

Appendix C: Permitting Matrix and Regulatory Strategy

Agency	Regulation/ Permit	Overview	*Typical Process Steps/ Typical Durations	Processing Time	Predecessors/Required as part of the permit
STATE AGENCY					
North Carolina, Department of Environmental Quality (DEQ), Division of Energy, Mineral, and Land Resources (DEMLR)	G.S. 74-46 thru G.S. 74-68 Land Mining Permit	Required to mine in the State of North Carolina. Notice of intent to commence large mining operations (exceeds more than 1 acre). Renewals and modifications take place regularly after issuance. As current mine permit expires in February 3, this assumes a new permit application submission will be needed to the NC DEQ.	Submit Application Agency Review within 60 days Public Hearing 30 days Permit approved with 30 days of public hearing and the filing of any supplemental information.	[redacted]	[redacted]
North Carolina, Department of Environmental Quality (DEQ), Division of Air Quality	G.S. 143-215.108 G.S. 150B-21 Air Permit	Required for any operation that establishes or operates any air containment source. Build, erects, uses or operates any equipment which may result in emission of air contaminants or is I kely to cause air pollution.	Submit Application Agency Review within 90 days (Synthetic Minor) and up to 900 days under Title V permit. If additional information is requested add another 10 days whichever is longer Permit approved	[redacted]	[redacted]
NPDES DISCHARGE PERMITS		The following three permits describe different components of the North Carolina NPDES program, which covers both non-point and point-source discharges to surface waters. The mine expansion will have four specific types of discharges that must be permitted in some manner: 1) Stormwater discharge during construction 2) Stormwater discharge from the mine site during operations 3) Discharge of dewatering water 4) Discharge of other treated water The applicability of each permitting program to the component of mine discharge is noted, as well as uncertainties to be explored with NCDEQ.			

Agency	Regulation/ Permit	Overview	*Typical Process Steps/ Typical Durations	Processing Time	Predecessors/Required as part of the permit
North Carolina, Department of Environmental Quality, Division of Energy, Mineral and Land Resources (DEMLR), Stormwater Permitting Program	Section 402 of the Clean Water Act; 40 CFR Parts 122-125; and Part 133; 15A NCAC 2H .0100, 15A NCAC 02H .1000 National Pollutant Discharge Elimination System (NPDES), Stormwater Construction General Stormwater Permit	[THIS PERMIT IS POTENTIALLY APPLICABLE TO THE STORMWATER DISCHARGE DURING MINE CONSTRUCTION] Construction activities that disturb more than one acre of land are required to get an approved Erosion and Sedimentation Control Plan (E&SC) and coverage under the Construction General Stormwater Permit (NCG01).	Submittal of approved E&SC plan The electronic Notice of Intent is submitted to receive a Certificate of Coverage under the NCG01 Permit Within 3 business days, the DEMLR will issue the Certificate of Coverage (COC) After completion of the project, must submit an electronic Notice of Termination form to end coverage under the NCG01 Permit	[redacted]	[redacted]
North Carolina, Department of Environmental Quality, Division of Energy, Mineral and Land Resources (DEMLR), NPDES Permitting Program	Section 402 of the Clean Water Act; 40 CFR Parts 122-125; Parts 130-131; and Part 133; 15A NCAC 2H .0100 NPDES Wastewater Treatment/Disposal Permit	[THIS PERMIT IS POTENTIALLY APPLICABLE TO DISCHAGE OF WASTEWATER DURING MINE OPERATION OR DISCHARGE OF DEWATERING WATER] Any wastewater treatment system that has a direct discharge point to the surface waters of the state.	Submit a complete application Agency review 60 days Approved coverage under general permits	[redacted]	[redacted]
North Carolina, Department of Environmental Quality, Division of Energy, Mineral and Land Resources (DEMLR), Stormwater Permitting Program	Section 402 of the Clean Water Act; 40 CFR Parts 122-125; Parts 130-131; and Part 133; 15A NCAC 2H .0100, 15A NCAC 02H .1000	[THIS PERMIT IS POTENTIALLY APPLICABLE TO DISCHARGE OF STORMWATER FROM THE MINE SITE DURING OPERATIONS] Direct discharges of stormwater associated with certain uncovered industrial activities to surface waters of the state that are not deemed permitted under a General Stormwater Permit (NCG01).	Submit complete application Agency review 30-60 days Public comments period 30 days Approved coverage under general permits	[redacted]	Stormwater Pollution Prevention Plan (SWPPP) Erosion and Sedimentation Control Plan (E&SC) Generally any mining permit meeting the requirement of Erosion and Sediment Control will meet state stormwater standards.
North Carolina, Department of Environmental Quality, Division of Water Resources, 401 and Buffer Permitting Branch	G.S 143, Article 21, Part 1 and Section 401, Clean Water Act G.S. 143-215.3 (a)(1); 143-215.3 ©; 143B (1)(u)	Any activity that will fill, dredge, or drain wetlands or surface waters in the state. Coordinated with the U.S Army Corps or Engineers (USACE) requirements. Most 401 Certifications are triggered by the Section 404 Permits issued by the USACE.	Submit complete application Agency review 60 days Approved permit	[redacted]	The application needs to be filed prior to project initiation with the Division of Water Quality. The application for the USACE Section 404 Permit is considered as an application for the water quality certification. Project Description Nature of discharge Maps
North Carolina, Department of Environmental Quality, Division of Energy, Mineral, and Land Resources (DEMLR), Dam Safety Program	G.S 143-215.23 thru G.S 143-215.37	The construction, modification, repair, removal of a dam and Emergency Action Plan (EAP).		[redacted]	Complete application including preliminary Engineering Plans and specification, must be filed at least 60 days prior to the proposed construction date. A North Carolina registered engineer must prepare the plans, inspect the construction and certify that the dam was constructed according to the approved plans before permission to impound may be granted. On-site inspections may be made during construction as well as periodic inspections after completion. Engineering plans prepared by a North Carolina registered professional engineer must be submitted and approved. Applies to any dam 25 feet high or higher and impounding 50 acre-feet or more; or to any dam classified as High Hazard. Permit activity must be initiated within one year of issuance.
North Carolina, Department of Environmental Quality, Division of Waste Management, Hazardous Waste Section	G.S 130 A-294	The storing, treating or disposing of hazardous waste. The storing of hazardous waste by a large quantity generator for more than 90 days.	Submit complete application Agency review 9 months - 2 years Approved permit		Part A form is a US Environmental Protection Agency form and Part B -RCRA Subtitle C Site identification form and Hazardous Waste Permit Information form Must include a narrative explaining how the facility complies with the rules.
North Carolina State Historic Preservation Office (SHPO)	Section 106 National Historic Preservation Act (NHPA) G.S. 121-12(a)	Identifies any historic properties within the project area and if there would be affects to historic properties. This process would be initiated by the lead agency who manages the land, or is the lead federal agency (likely USACE) which the	Submit with 404 permit application	[redacted]	Project Review Checklist Borrow pit/waste Area Form Cultural Survey Report

Agency	Regulation/ Permit	Overview	*Typical Process Steps/ Typical Durations	Processing Time	Predecessors/Required as part of the permit
		plant would be on, or which the access roads may cross. State/local agencies would l kely be involved as cooperating agencies, or would need information from SHPO for their permit approvals as well			
State Environmental Review Clearinghouse (SCH) Department of Administration North Carolina Department of Environmental Quality (DEQ) OR State Environmental Policy Act (SEPA) lead agency	G.S. 113A, 1 through 113A-13 1 NCAC 25, 15A NCAC 1C	**This environmental review process would only be required if the project were to use public lands greater than 10 acres.** All state agencies are required to review and report the environmental effects of all activities that meet three criteria: (1) an action by a state agency, (2) expenditure of public monies or **private use of public land**, and (3) a potential for detrimental environmental effects. An Environmental Assessment (EA) or an Environmental Impact Study (EIS) may be required.	Submit Environmental package SCH review 30-45 days (this starts from the date a notice of the document is published) Any further action needed will be addressed 30 days Issues approval	[redacted]	SEPA is not an actual permit, but an environmental impact assessment process. The purpose of SEPA is to require state agencies to evaluate the potential negative environmental impacts of a proposed project.
North Carolina Natural Heritage Program (NCNHP)	State sensitive species Information	The natural heritage inventory helps project planners and landowners make decisions that have the most benefit for society and the economy, while having the least ecological damage. Used to evaluate ecological impacts of development projects	N/A	[redacted]	Project Area, including all potential areas of disturbance
North Carolina Department of Transportation (NCDOT)	Oversize/Overweight Permit	Generally a permit is required if: - weigh exceeds legal weight by NC law, - total width is over 8'6" - overall height is greater than 13'6" - a single vehicle is over 40' or vehicle combination is over 60' in length, or (Exception: truck tractor/53-foot semi-trailer combination with no overall length limitation is allowed on all roads). You can obtain Single Trip Permits or an Annual Permit if multiple trips would be required.	Prepare and submit application	[redacted]	
North Carolina Division of Parks and Recreation	Coordination	The lead Federal Agency (USACE) may coordinate with Parks and Recreation because of the close proximity of Crowders Mountain State Park (east and southeast of project site)	N/A	[redacted]	Applicable State or Federal agency would request coordination/cooperation from Division of Parks and Recreation, no specific requirements.
North Carolina Department of Transportation (NCDOT)	Modifications to bridge over I-85	Albemarle may need to modify the bridge over I-85, which connects two parcels of Albemarle property.	Because the bridge does not connect to a local, state or federal road, NCDOT has limited jurisdiction and their biggest concern is not interfering with traffic on I-85. Meet with NCDOT to discuss project at a high level (1 day) Submit copy of plans to NCDOT (30 days to review) NCDOT approves, approves with modifications, or denies petition to modify bridge	[redacted]	
LOCAL AGENCY					
Cleveland County Government Zoning	Conditional Use Permit	Conditional Use Permit is a zoning exception that allows to use the property in a non-conforming way.	Pre-application meeting is encouraged 1 daySubmit complete application Agency review time 10 daysPermit approval 30 days	[redacted]	Application and Site Plan:Owner informationBoundary Survey MapList adjoining property ownersProposed use of the landProposed number of structures and locationsList existing easements, reservation and right-of-wayFloodplain areas as shown on FEMA Flood Hazards Boundary mapsProposed phasing of the entire projectThe Board of Adjustments may request additional information such as:Existing and proposed topographyStormwater drainageExisting and proposed water linesTraffic Impact study Environmental Impact Statement
FEDERAL AGENCY					

Agency	Regulation/ Permit	Overview	*Typical Process Steps/ Typical Durations	Processing Time	Predecessors/Required as part of the permit
U.S. Army Corps of Engineers (USACE), Wilmington District Regulatory Division review applications for Section 404 Permits.	Clean Water Act (CWA) Section 404	Any activity which would discharge dredged or fill materials into waters of the United States, including special aquatic sites such as wetlands.	Assuming worst case based on 2018 delineation. Impacts to 11.55 acres of potentially jurisdictional wetlands, and 14,045 linear feet of jurisdictional waters. Would require Environmental Impact Study (EIS). Submit Aquatic Resources Delineation report to USACE USACE review/approve Jurisdictional Determination - 90 days Submit Pre-application information materials to USACE (may be needed up to 2 weeks prior to pre-application meeting) Pre-application meeting with USACE (and other state/federal agencies that would be involved in EIS) Submit CWA 404 Individual Permit (IP) application - 1 week after pre-application meeting USACE accepts application as complete - up to 30 days USACE determination for EIS - 15-30 days USACE publishes Notice of Intent (NOI) in Federal Register - This starts the timeline on the NEPA process Scoping Period - 30-90 days USACE prepares Draft EIS (DEIS) - 1 year USACE publish Notice of Availability for DEIS in Federal Register Draft EIS public comment period 45 - 120 days USACE prepares Final EIS (FEIS) and Draft Record of Decision (ROD) - 8 months to 1 year Release of FEIS and Draft ROD - 30 day public comment period Final ROD and Issuance of the 404 Permit - 60 - 90 days	[redacted]	If a permit is required, a formal application must be submitted. Baseline biological and cultural surveys [redacted]
U.S. Army Corps of Engineers (USACE), Wilmington District Regulatory Division review applications for Section 404 Permits.	Please See Information in Row above	Please See Information in Row above	**This case assumes minimal wetlands or other WoUS impacts and could be review/permitted through an Environmental Assessment (EA). Also assumes early coordination and cooperation with USACE in developing project designs/alternatives.** Submit Aquatic Resources Delineation to USACE USACE provides Approved Jurisdictional Determination (45-90 days) Prepare/Submit CWA Section 404 Permit Application USACE determines application is complete (15 days) USACE determines an EA will be prepared for the project (30 days) USACE Issues Public Notice for 30-day Comment Period on Proposed Project Applicant prepares EA and goes through review process with USACE parallel with some of above tasks and Section 106	[redacted]	Please See Information in Row above

Agency	Regulation/ Permit	Overview	*Typical Process Steps/ Typical Durations	Processing Time	Predecessors/Required as part of the permit
			[SHPO] and Section 7 [USFWS] (2-3 months) FINAL Environmental Assessment/FONSI (2-3 months)		
U.S. Environmental Protection Agency (EPA) Region 4	40 CFR Part 112 Spill Prevention, Control and Countermeasure (SPCC)	A Facility that has an aggregate aboveground oil storage capacity greater than 1,320 U.S. gallons or a completely buried storage capacity greater than 42,000 U.S gallons and there is a reasonable expectation of an oil discharge into or upon navigable water of the U.S. or adjoining shorelines.	Not required to be submitted unless requested from EPA.	[redacted]	Prepare and implement an SPCC Plan that describes oil handling operations, spill prevention practices, discharges or drainage controls and the personnel, equipment and resources at the facility that are used to prevent oil spills from reaching navigable water or adjoining shorelines. Operating Procedures Control measures Countermeasures to contain, cleanup, and mitigate the effects of an oil spill. Plan must be certified by a Professional Engineer.
U.S. Fish and Wildlife Service (USFWS) - Asheville Ecological Services Field Office	Endangered Species Act (ESA) Section 7 ConsultationMigratory Bird Treaty Act (MBTA) & Bald and Golden Eagle Protection Act	There are currently 4 species listed in Cleveland County that are either Threatened (T) or Candidate (C) (Northern Long-eared Bat [T], Bog Turtle Similar Appearance Threatened [SAT=threatened due to similarity of appearance], Dwarf-flowered heartleaf [T], monarch butterfly [C])Birds that either occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention (Bald eagle, Eastern whip-poor-will, Kentucky warbler, Prairie warbler, Prothonotary warbler, Red-headed woodpecker, and Wood thrush)	If Formal Consultation and a Biological Assessment (BA) is required:Prepare Draft BA and submit through lead federal agency (USACE)Start of Formal Consultation - USFWS will review Draft BA and coordinate with USACE - 90 daysIf Biological Opinion is required (I kely affect determinations) - 45 days	[redacted]	Surveys will I kely be required to determine presence/absence of ESA-listed species or suitable habitat. Preparation of a BA

*Typical Process Steps and Durations can vary based on complexity of the project as well as the individual State and Federal Regulators.

Additional Agencies Reviewed No Requirements Identified	Comment
North Carolina Utilities Commission	N/A, unless Albemarle is planning to install their own power facilities
BLM minerals	N/A, No BLM oversight for this site.
Office of Surface Mining Reclamation and Enforcement	N/A, Regulates coal mines
DEQ Division of Marine Fisheries	N/A, No marine fisheries nearby

APPENDIX D

Albemarle Environmental Policy - Examples

Albemarle U.S. Inc - Equity Plan

Albemarle U.S. Inc (Albemarle) is pleased to submit the following Equity Plan, as outlined in Funding Opportunity Announcement Number DE-FOA-0002678. As a diverse and inclusive company providing more than 2500 well-paying permanent & contractor jobs within the United States, Albemarle is dedicated to the objectives of job growth and quality and the advancement of equity, environmental, and energy justice priorities.

This Equity Plan provides an overview of Albemarle's dedication to equity generally and details our approach to this proposed project specifically as it pertains to 1) Community Engagement, 2) Quality Jobs, 3) Diversity, Equity, Inclusion, and Accessibility, and 4) the goals of the Justice40 Initiative.

ALBEMARLE AWARDS

- *2020 AMERICA'S MOST RESPONSIBLE COMPANIES, NEWSWEEK*
- *2021 CEO ACTION FOR DIVERSITY & INCLUSION PLEDGE*
- *2022 AMERICA'S BEST MID-SIZE EMPLOYERS, FORBES*
- *2022 GENDER-EQUALITY INDEX, BLOOMBERG*

At Albemarle, we greatly value our people, workplace, and communities. It is important for us to build an inclusive, equitable and diverse workplace focused on employee safety, well-being, mutual respect, and professional development. Successfully achieving this goal requires support from individuals at all levels as we foster a workplace that values and recognizes the contributions of our employees and promotes a sense of belonging.

Diversity, equity, and inclusion are essential to our ability to effectively carry out our mission. These fundamental tenets are critical to our company culture and decision-making practices. Across the organization we continuously work to attract, hire, develop and retain high-quality, diverse talent. In doing so, we cultivate a work environment that reflects and celebrates the unique backgrounds and experiences of our employees and embraces diversity of thought, while providing meaningful opportunities to develop and succeed.

Albemarle is committed to the following actions to help promote diversity, equity, and inclusion in our workplace:

- Connecting diversity, equity and inclusion to our mission and view it as critical to ensure the well-being of our workforce and the communities where we live and work.
- Creating and implementing equitable policies, systems, and programs. Proactively address any known inequities.
- Increasing diverse representation by creating and supporting programs and policies that attract, develop, promote, and retain high performing, diverse talent.
- Performing pay equity analysis to ensure fair pay practices.
- Integrating DE&I goals in our annual operating plan and long-range plan to ensure transparency in our progress.
- Pursuing meaningful learning opportunities to improve culture competency and educate the workforce on diversity, equity, and inclusion.
- Courageously exploring and remediating biases that interfere with inclusiveness.
- Developing inclusive leadership.
- Supporting Employee Resource Groups which foster a culture of inclusivity.
- Encouraging employees to champion actions that drive diversity and equity in all workplace interactions, cementing everyday practices.

A. Community Engagement

It is critical that federal investments in the battery manufacturing and materials processing sector support sustainable community economic development and prosperity, as well as advance the goals outlined above. Albemarle is well-situated to be a part of that effort, and is dedicated to taking the following actions to ensure the proposed plan would not only meet but exceed the goals stated in the FOA.

Community Engagement

• Kings Mountain Quarterly town halls, Monthly listening sessions, downtown storefront
• Community Shared Value program, including Gateway Trail & pollinator garden projects
• Building strong relationship with the Cleveland County YMCA
• Community Working Group for the Kings Mountain Gateway Trail
• Formation of Community Advisory Committee

Albemarle is committed to equity in our communities. During the next quarter, with guidance from the Kings Mountain Community Advisory Committee, we will undertake a social benchmark study in addition to a gap assessment that will further define our future community engagement programs. The benchmark study will illustrate where our community is in terms of Albemarle, our impacts and our reputation and help guide future corporate giving opportunities. The gap assessment will help us define the missing or lacking areas in the business community so that we can work with the economic development office to get specific on the needs of Kings Mountain and help those potential businesses navigate the services and support available to them on a state and federal level.

Community efforts to date have been robust. We formed a Community Working Group around the Kings Mountain Gateway Trail last fall. Since the beginning of the year, we have held these meetings every three weeks on average in addition to a community town hall and started a series on monthly listening sessions for the community to come and meet with the Kings Mountain Project team so that we can better address concerns and complaints in a timely and satisfactory manner.

We are developing a shared value program that will involve enhancing STEM and engineering programs from kindergarten through community colleges. We desire to create our own talent pipeline to not only serve Albemarle but also create valuable opportunities for local residents to know they have growth potential and a meaningful career with the Kings Mountain/Cleveland County community.

Additionally, we are opening a downtown information center that will be equipped with appropriate technology allowing residents to apply for jobs on site while also providing project updates. These SMART goals are detailed as tasks in the SOPO document as part of Task 1.4.

Albemarle has a strong history of philanthropic contributions to the local communities in which they operate. The Albemarle Foundation, established in 2007, is a private, endowed 501(c)(3) entity (Foundation) that serves as the primary mechanism for Albemarle's philanthropic giving and volunteerism. Through our Foundation we control where our donations are directed, we leverage our donations to ensure maximum community benefits, and we provide a platform for employee volunteerism. Our mission is to strengthen our communities by enhancing the quality of life for our employees, customers, and neighbors through charitable giving, academic scholarships, and volunteerism. The Foundation uses community grants, matching grants, volunteer grants, and a scholarship program to distribute funds that make a profound impact.

In 2021, we committed $100,000 to SHARE Charlotte's SHINE™ program to help provide valuable resources, education, and collaboration opportunities to Black-led and Black-benefiting non-profit organizations. " We were thrilled to be partnering with the Albemarle Foundation again in 2021! With their gift they are recognizing the unique funding and resource challenges that Black-led, Black-benefiting non-profits face. This investment is one way they can help level the playing field and meaningfully impact the work of these organizations."– Melissa Hovey, Managing Director of SHARE Charlotte.

In 2018, Albemarle Foundation announced a $10 million education initiative in Charlotte, North Carolina. The Foundation's gift was matched by another $10 million grant from Bank of America. Funds for the initiative came from a special gift approved by Albemarle's Board of Directors and was distributed through the Foundation to selected non-profits over a five-year period.
"Thanks to Albemarle, Freedom School Partners served 882 scholars through our in-person Freedom School program and the distribution of books and enrichment kits, helping 87% of scholars gain or maintain their reading ability."– Glenda Bernhardt, Chief Executive Officer, Freedom School Partners.

"We are grateful for Albemarle's support over the past three years which provides funding for college and career advising, virtual college tours, ACT and SAT preparation, boot camps, and parent workshops to 200 underserved Black high school students. As a result of the funding, 100% of the seniors graduated from high school and 100% of them are now attending college."– John Martin, CEO and Co-Founder, Young Black Leadership Alliance.

"We remain grateful to work alongside partners like the Albemarle Foundation, who are helping us close the opportunity gap and ensure that all youth in our community can reach their full potential."– Amanda Wilkinson, Association Director of Literacy and Youth Programs – YMCA Charlotte.

B. Job Quality and Skilled Workforce

In addition to providing ample community engagement, as set forth above, is critical that federal investments the battery manufacturing and materials processing sector create good paying, quality jobs and spur the development of a skilled workforce. Albemarle is well-situated to be a part of that effort and is dedicated to taking the following actions to ensure the proposed plan would not only meet but exceed the goals stated in the FOA.

Job Quality and Skilled Workforce

- 200 full-time highly skilled jobs in mineral processing
- Dedicated mineral processing operator training program through Cleveland Community College
- Dedicated mineral processing engineering training program through NC A&T State University

To invest in America's workforce, Albemarle will partner with Cleveland Community College (CCC) in Shelby, NC to provide a STEM training / retraining program for minerals processing plant operators. This program will include courses in the fundamentals of mineral processing, flotation and surface, and mineral processing plant operation. CCC has a strong workforce development program and has committed to dismantling structural barriers to equity by investing in equity-focused policies, practices, and behaviors that work to support all students and employees.

We expect this project to create more than 200 full-time highly-skilled jobs in addition to hundreds of construction jobs. The Kings Mountain Lithium Materials Plant operations will be staffed with a workforce trained through this tailored program developed by Cleveland Community College, with outreach to local disadvantaged communities including African-American, Hispanic, and Native American representatives.

A targeted effort will be also made to recruit workers displaced from the coal mining industry in nearby Virgina and West Virginia. In addition, a targeted effort will be made to recruit workers from the Catawba Nation reservation in nearby South Carolina.

Albemarle's investment in CCC will demonstrate to the community Albemarle's dedication to creating a talent pipeline within the local Kings Mountain area. These SMART goals are detailed as tasks in the SOPO document as part of Task 2.4.

To further build back American mineral processing expertise, Albemarle will partner with North Carolina North Carolina State University's Asheville Minerals Research Laboratory (NCSU-MRL) and Virgina Polytechnic Institute and State University (VT). NCSU-MRL and VT will be contracted to complete some of the project metallurgical test work using their existing minerals processing facilities/equipment. The facilities, equipment, and professionals will **reduce focus on coal processing** and refocus on lithium minerals processing.

To reach historically underserved populations, Albemarle continues to explore working together with NC A&T, a historically black College & University (HBCU), on developing a robust summer internship/co-op program for NC A&T State University engineering students to be part of the Albemarle - NCSU-MRL – VT partnership. The NCSU-MRL and VT facilities will serve as a premier training grounds and early talent development program (LAUNCH) for NC A&T State University students as future Albemarle engineers. Albemarle is dedicated to these actions taken to support people from underrepresented groups in STEM.

[redacted]

[redacted]

Albemarle's safety programs are designed for continuous improvement of our safety performance, and thus we continually work to improve and enhance our safety programs and procedures. We benchmark ourselves against our ACC peers and have consistently ranked in the top quartile for our safety performance. In 2021, we saw year-over-year progress that includes improvements in injury rate (TRIR) for employees, from 0.26 in 2020 to 0.19 in 2021, and we were recognized by the ACC with Responsible Care Facility Safety Awards for our achievements at many of our sites. It is important to note that we treat our nested contractors the same as our employees, holding them to the same standards and incorporating them into our safety programs and initiatives. That stated, we recognize an increase in TRIR this year for nested contractors and are supporting focused site efforts on contractor safety. We will be staffing a corporate Contractor Safety position within the HSE group to drive improvement in our global contractor management program. Our goal is to attain zero incidents and to consistently rank among the top decile of our peers.

In 2021, we continued to focus on our key safety programs such as our Life Saving Rules, which are comprised of the eight most critical safety procedures that must be followed and that are designed to protect the lives of our employees and contractors. We have seen the benefits of this program through leading indicator data including safe work permit audit results. While we are pleased with the results that we have been able to achieve with our Life Saving Rules, our goal is ultimately to reduce the instances that necessitate the application of these rules in the context of high-risk activities as we work towards our goal of zero incidents.

C. DEIA

This proposal team is composed of a diverse set of people from various types of institutions, including community colleges, universities, and the private sector, each of whom are cognizant of the Biden Administration's policy on diversity, equity, and inclusion across the federal government, including government-sponsored research and development projects. One of the strengths of this proposal team is that each partnering institution has a formal or informal Diversity, Equity, and Inclusion Plan currently in operation, with opportunities to apply principles and practices from those plans in the day-to-day operating of the project. With each partner having well-established diversity, equity, and inclusion plans at the institutional level, we confidently commit to incorporating the following over-arching objectives into the day-to-day operations of our project: foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, advance equity, and encourage the inclusion of individuals from these groups in the project.

In 2021, Albemarle released our Diversity, Equity, and Inclusion (DE&I) Strategic Plan. This plan provides a blueprint for measurable actions that will help us integrate diversity, equity, and inclusion in our strategic decision-making, enhance organizational effectiveness, and meet our future challenges and needs. Through individual and collective responsibility from all employees, we can promote diversity, equity, and inclusion as a vital and prominent part of the fabric and culture of Albemarle. The plan relies on our leadership, managers, and supervisors in all business units, functions, and locations to assume direct responsibility for implementation.

Under the leadership of our Vice President of Culture, we have reviewed our hiring and HR processes with a Diversity, Equity, and Inclusion lens and added Diversity, Equity, and Inclusion performance goals to our people leaders. Managers are required to present diverse candidate slates and have diverse interview panels for open positions as part of the hiring process. These performance goals and practices help us to be more accountable in bringing diversity into our hiring practices.

We also expanded our Employee Resource Groups (ERGs) called CONNECT groups and leveraged the groups to drive various initiatives around DE&I throughout the organization. CONNECT groups promote an atmosphere of inclusion and encouragement, where every employee's voice is heard. These executive-sponsored, employee-led groups are formed to promote a better workplace through shared perspectives and goals that positively impact our employees and their experience, alignment with our core values, and the creation and strengthening of relationships across the company.

CONNECT groups focus on four areas:
1. Heritage Month Activities – cultural education and awareness, communication skills, valuing differences, breaking down barriers to inclusion, membership campaigns
2. Career Development –leadership skills, networking, mentoring, guest speakers, increased access to company leaders, and talent development resources
3. Attracting Talent – support for the company's diversity recruiting efforts, support for onboarding and retention, association partnerships, supplier diversity recommendations
4. Community Outreach – contribute to the communities where we live and work via strategic alignment with one or two preferred non-profits

In 2021, our CONNECT groups provided learning opportunities for our employees through several events such as Black History Month, International Women's Day, Pride Month, and Hispanic Heritage Month.

In 2021, our CEO, Kent Masters, became a signatory to CEO Action for Diversity and Inclusion, the largest CEO-driven business commitment to advance Diversity and Inclusion in the workplace. In June 2021, we held our first Day of Understanding. Days of Understanding encourage organizations to host candid conversations throughout the year to highlight and engage with real-time issues and events as they arise. As a signatory of CEO Action for Diversity and Inclusion, we are committed to providing unconscious bias training, sharing best practices, and engaging our Board of Directors in Diversity, Equity, and Inclusion work, all of which we initiated in 2021 and which we will continue to do going forward.

In 2021, we executed training and education programs through our Albemarle University. Campaigns to complete training modules included topics such as Diversity, Equity, and Inclusion Basics, Bias Awareness, Inclusive Leadership, and Cultural Awareness. Additional topics that are available for on-demand access include Gender Diversity, Generational Diversity, Unconscious Bias and Micro-Inequities, The Inclusive Manager Toolkit, and Inclusive Virtual Meetings. We will continue to offer training on additional subjects in 2022.

As our company expands globally, it is important that we help our employees develop capabilities to manage an international workforce. In the spirit of global, conscious inclusion, we provide an on-demand, cross-cultural inclusion learning platform, GlobeSmart, that allows our teams to take the GlobeSmart Profile and see how workstyles differ from each other and how they are similar to profiles of 100 different cultures. Culture Guides are available with in-depth information on how to bridge gaps within the context of 50 business topics.

To support gender diversity, we have entered into a partnership with Fairygodboss, a U.S.-based, online career community and forum for women wishing to connect on career matters. The platform offers our female employees access to free resources and the opportunity to connect with like-minded individuals. It also provides them with the chance to share why they love working at Albemarle and allows us to build a pipeline of qualified female talent.

With these guiding principles, we have built a Kings Mountain Minerals Processing DOE grant proposal team and brought on strong Carolina partners to further our diversity goals. [redacted]

To provide SMART milestones around Diversity, Equity, and Inclusion, Albemarle has committed to the following goals:

Diversity, Equity, Inclusion, and Accessibility

- Committed to increasing global gender diversity by 1% per year (22% female in 2021)
- Committed to increasing U.S. racial diversity by 1% per year in senior-level management roles (17% in 2021)
- Committed to improve supplier diversity (14% in 2021)

These SMART goals are detailed as tasks in the SOPO document as part of Task 3.4. In addition to SMART Diversity, Equity, and Inclusion goals of Albemarle, we are committed to working with our partners to advance pre-apprenticeship and early talent programs at Cleveland Community College and NC A&T State University.

Also, in late 2022, Albemarle will participate in the Society for Human Resource Management's (SHRM) pilot program – Alternative Credentials. This program will explore untapped talent of those job seekers who have earned nondegree credentials such as professional certifications.

One of the most significant efforts which will be undertaken by the Albemarle team is identification and increase of a diverse, local supplier base to build and supply the Kings Mountain minerals processing plant. Towards this end, Albemarle has recently hired a dedicated Supplier Diversity Coordinator, who will focus on the "standing up" and "maturation" of our new Supplier Diversity program. [redacted]

The Supplier Diversity Program is based on Albemarle's corporate social responsibility, including Sustainability and Diversity, Equity and Inclusion. At Albemarle, we believe Sustainability is a never-ending pursuit that requires time, attention and commitment to ensure a meaningful and positive impact on our world. It's also an opportunity to challenge ourselves to break barriers by setting higher standards, improving our performance, and doing the right things the right way. Additionally, Albemarle is committed to building a workplace that is diverse, equitable and inclusive to ensure that employees feel safe, supported and empowered to do their best work.

[redacted]

[redacted]

Having set these goals at the proposal-writing stage, this team is on a strong trajectory to meeting or exceeding these goals throughout the course of the project.

We also believe that fostering diversity, equity and inclusion is simply the right thing to do – for our employees, communities, customers, and business.

Our partners have similar ambitions. Cleveland Community College's (CCC) Equity, Diversity, and Inclusion (DE&I) Committee has formalized a DE&I policy and strategic plan, in support of the College mission and strategic plan, that promotes a welcoming and collaborative spirit, a culture of civility, respect, and understanding. Recently, One Step At a Time Consulting has led a series of President's Cabinet interviews and Focus Group meetings to put in place specific actions against this strategic plan.

As a part of North Carolina State University's School of Engineering, the Minerals Research Lab (NCSU-MRL) values diversity, equity, inclusion and justice. As a public university lab — a university of the people — they believe it is essential to welcome and support everyone in the community. They maintain a dedicated Office for Institutional Equity and Diversity to coordinate efforts across the University.

Virginia Polytechnic Institute and State University (VT) has a rich history of diversity embodied in an institutional and individual commitment to Ut Prosim (That I May Serve) in the spirit of community, diversity, and excellence. Their Inclusive VT program is run by their Office for Inclusion Diversity, which coordinates efforts across the University, including people and programs dedicated to serving underrepresented and underserved students, faculty, and staff, a series of Conversations on Race, and June Teenth Freedom Day celebrations.

North Carolina Agricultural and Technology State University (NC A&T), a historically black College & University (HBCU), is very interested in working with Albemarle to provide engineering scholarships, internships, and entry level engineering jobs, but the university has an in-depth process for grants and corporate partnership that can take up to three months for full approval, even if all of the federal funds were given in scholarships.

D. Justice40 Initiative Plan

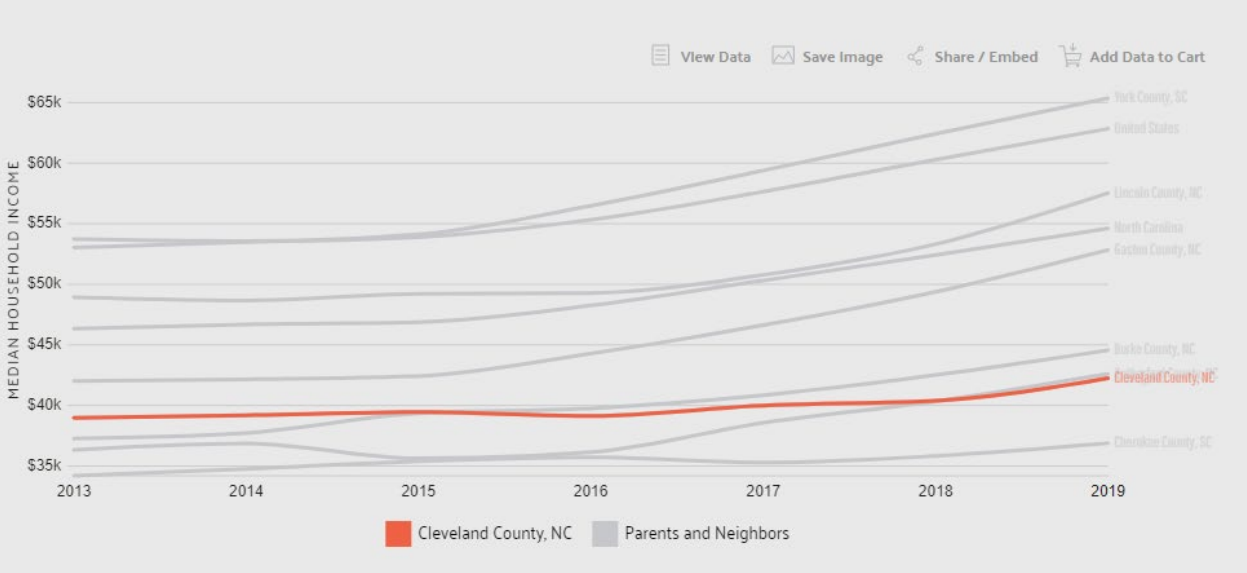
When evaluating community engagement, job creation, and Diversity, Equity, and Inclusion (DE&I) metrics, Albemarle identified a number of disadvantaged communities ("DACs") within the local, county, and regional areas, including African-American, Hispanic, and Native American communities. The resulting economic contributions from Albemarle's expenditures (direct, indirect, and induced) will benefit these communities in a significant way. These SMART goals are detailed as tasks in the SOPO document as part of Task 4.4.

Justice40 Initiative Plan

- [redacted]
- 100% renewable energy to reduce energy burden and environmental exposure
- 200 Local high-skilled jobs serving the clean energy enterprise

In 2019, Households in Cleveland County, NC, which is 29.5% minority population, had a median annual income of $42,247, which was 36% below the median annual income of $65,712 across the entire United States, and well below their neighboring counties and the State of North Carolina, see Figure 2. [redacted]

Figure 2. Cleveland County, NC Median Household Income



The Kings Mountain Lithium Materials Processing Plant economic contributions to the Cleveland Country area will be based on Albemarle's Operations and Capital Investments and the resulting economic contributions from Albemarle's expenditures (direct, indirect, and induced). Additional socio-economic benefits are expected to include environmental stewardship, innovation, technological transfers, and capacity, supply chain development and investment, and philanthropic contributions to the local community. [redacted]

The additional socio-economic benefits expected for Kings Mountain will include a strong environmental stewardship benefit. As the Kings Mountain minerals processing plant will utilize 100% renewable energy, it will not pose an additional energy burden on the community and for every 1 kilogram of CO2 emitted during the production cycle of lithium, at least 50 kilograms of CO2 are avoided in the use-phase of lithium in the battery of an EV per year.

[redacted]

CONCLUSION

This Equity Plan reflects Albemarle's dedication to the goals outlined above and the proposal team's initial plan to carry these efforts out throughout the project. As the project moves forward, the team will seek not only to meet these goals but surpass them through the identification of additional measures that would meaningfully contribute to the project's community benefit, provision of quality jobs, skilled workforce training, DEIA, and the objectives of the Justice40 Initiative Plan. Thank you for your consideration.

06/15/2022

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
1000 Independence Ave SW
Washington, DC 20585

Subject: Letter of Commitment for Albemarle Application for DE-FOA-2678, AOI-1
Control Number 2678-1587

To Whom It May Concern:

This Letter of Commitment confirms [redacted] support for the development of Albemarle's Kings Mountain minerals processing project ("the Project"), where Albemarle proposes to design and build a world class minerals processing operation to extract and process spodumene ore.

[redacted]

[redacted] understands the importance of reducing the United States' reliance on imported lithium. The Kings Mountain minerals processing project will result in the construction of facilities to create U.S. battery-grate cathode precursor manufacturing capacity that uses sustainable practices. Cathode manufacturers in the U.S. will have access to battery grade lithium produced in the U.S., resulting in greater security of supply for the U.S. EV Supply Chain.

[redacted]

We support your consideration of Albemarle's expected proposal under the above-listed funding opportunity.

[redacted]

[redacted]

[redacted]

June 10, 2022

The Honorable Jennifer M. Granholm, Secretary
United States Department of Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Letter of Commitment/Albemarle; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Commitment confirms the support and involvement [redacted] the development of new lithium sources for Albemarle and in support of Albemarle's proposed Kings Mountain minerals processing operation.

[redacted]

[redacted]

We commit to working with Albemarle on their proposed project by assisting in the development of new lithium sources, which we will test and validate throughout the course of the project.

Sincerely,

[redacted]

CEO

[redacted]

[redacted]

U.S. Department of Energy , Offices of Manufacturing and Energy Supply Chains,
and Energy Efficiency and Renewable Energy
1000 Independence Ave SW
Washington, DC 20585

Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing DE-FOA-0002678
Letter of Support for Albemarle

27 May 2022

CONFIDENTIAL BUSINESS INFORMATION

To Whom It May Concern,

This Letter of Support confirms the support of [redacted] in the development of Albemarle's Kings Mountain mine site project ("the Project"). Albemarle proposes to design and build a world class mining operation and concentrator, with the highest technology and most sustainable process, to extract and process spodumene. [redacted]

[redacted]

[redacted]

[redacted]

We remain available if you have any questions on the contents of this letter or with respect to our continuing support of the Project.

[redacted]

[redacted]

June 28, 2022

The Honorable Jennifer M. Granholm, Secretary
United States Department of Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Letter of Commitment/Albemarle U.S., Inc.; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Commitment confirms the commitment of [redacted], to develop new U.S. lithium resources for Albemarle U.S., Inc. It also confirms [redacted].

[redacted]

[redacted]

[redacted]

[redacted]

June 27, 2022

The Honorable Jennifer M. Granholm, Secretary
United States Department of Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Letter of Support/Albemarle; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Support confirms the support of [redacted] the development of new lithium sources for Albemarle and in support of Albemarle's proposed Kings Mountain minerals processing operation.

[redacted]

[redacted] is pleased to support Albemarle in its application to Area of Interest 1 under the U.S. Department of Energy (DOE) Battery Materials Processing and Recycling grant program. We understand that DOE seeks projects that will ensure a North American supply of materials to enable the domestic production of lithium batteries. This project will achieve this goal through Albemarle's domestic lithium resource and lithium materials plant, which is used to produce new battery-grade lithium materials.

[redacted]

[redacted]

June 27, 2022

The Honorable Jennifer M. Granholm, Secretary
United States Department of Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Letter of Support/Albemarle; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Support confirms the support [redacted] is interested in new lithium sources in development at Albemarle and support's Albemarle's proposed Kings Mountain minerals processing operation.

[redacted]

[redacted] is pleased to support Albemarle in its application to Area of Interest 1 under the U.S. Department of Energy (DOE) Battery Materials Processing and Recycling grant program. We understand that DOE seeks projects that will ensure a North American supply of materials to enable the domestic production of lithium batteries. This project will achieve this goal through Albemarle's domestic lithium resource and lithium materials plant, which is used to produce new battery-grade lithium materials.

[redacted]

[redacted]

June 27, 2022

The Honorable Jennifer M. Granholm, Secretary

United States Department of Energy

1000 Independence Ave SW

Washington, DC 20585

RE: Letter of Support/Albemarle; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Support confirms the support of [redacted] in the development of new lithium sources for Albemarle and in support of Albemarle's proposed Kings Mountain minerals processing operation.

[redacted]

[redacted] is pleased to support Albemarle in its application to Area of Interest 1 under the U.S. Department of Energy (DOE) Battery Materials Processing and Recycling grant program. We understand that DOE seeks projects that will ensure a North American supply of materials to enable the domestic production of lithium batteries. This project will achieve this goal through Albemarle's domestic lithium resource and lithium materials plant, which is used to produce new battery-grade lithium materials.

Sincerely,

[redacted]

[redacted]

June 29, 2022

US Department of Energy: Loan Program Office Review Team

RE: Funding Opportunity Announcement No. DE-FOA-0002678: Area of Interest 1; Full Application
Control Number: 2678-1587

To Whom it May Concern:

wishes to express support for U.S. production of Lithium Carbonate and Lithium Hydroxide when such production is undertaken responsibly.

Accordingly, supports your consideration of funding for this subject application.

Sincerely,

[1] https://www.albemarle.com/news/albemarle-recognized-by-american-chemistry-council-with-eight-responsible-care-aw

June 27, 2022

The Honorable Jennifer M. Granholm, Secretary
United States Department of Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Letter of Support/Albemarle; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Support confirms the support of in the development of new lithium sources for Albemarle and in support of Albemarle's proposed Kings Mountain minerals processing operation.

is pleased to support Albemarle in its application to Area of Interest 1 under the U.S. Department of Energy (DOE) Battery Materials Processing and Recycling grant program. We understand that DOE seeks projects that will ensure a North American supply of materials to enable the domestic production of lithium batteries. This project will achieve this goal through Albemarle's domestic lithium resource and lithium materials plant in conjunction with

Sincerely,

June 29, 2022

The Honorable Jennifer M. Granholm, Secretary
United States Department of Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Letter of Support/Albemarle; Full Application Control Number: 2678-1587

Dear Secretary Granholm,

This Letter of Support confirms the support of [redacted] in the development of new lithium sources for Albemarle and in support of Albemarle's proposed Kings Mountain minerals processing operation.

[redacted]

[redacted] is pleased to support Albemarle in its application to Area of Interest 1 under the U.S. Department of Energy (DOE) Battery Materials Processing and Recycling grant program. We understand that DOE seeks projects that will ensure a North American supply of materials to enable the domestic production of lithium batteries. We believe this project can achieve this goal through Albemarle's domestic lithium resource and lithium materials plant, which is used to produce new battery-grade lithium materials.

Sincerely,

[redacted]

[redacted]

June 22, 2022

Henry Walqui
Albemarle Corporation
ALBEMARLE, 4250 Congress Street, Suite 900, Charlotte, NC 28209
[redacted]

Proposal Title: [redacted] and EERE FOA (DE-FOA-00026780: Battery Materials Processing and Battery Manufacturing- Lithium

[redacted]

Prime Agency/FOA: US Department of Energy/DE-FOA-0002678

Period of Performance: 2023 - 2027

Dear Mr. Walqui:

This letter confirms that [redacted] intends to collaborate with your organization on the proposal referenced above. [redacted]

[redacted]

- [redacted]
- [redacted]

[redacted]

Technical questions related to the scope of work may be directed to [redacted].

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

June 30, 2022

Scott Hutchins
Leader – Resource Development
Albemarle Corporation
4250 Congress Street, Suite 900
Charlotte, NC 28209

Dear Scott,

On behalf of [redacted], it is my pleasure to express our strong support for the proposed project to develop processes and technologies for the Kings Mountain concentrator.

[redacted]

As you are aware, the demand from society for lithium is growing and will continue to grow throughout the green economy transition. [redacted] look forward to successfully completing the proposed work with you and providing a significant, positive impact on our society.

With best regards,

[redacted]

[redacted]

June 17, 2022

Scott Hutchins
Leader – Resource Development
Albemarle
4250 Congress Street, Suite 900
Charlotte, NC 28209

Dear Scott,

I am pleased to support your proposal

I am looking forward to working with you on this promising endeavor. Please do not hesitate to contact me if I can be of further assistance.

[redacted]

June 23, 2022

U.S. Department of Energy
Office of Manufacturing and Energy Supply Chains and
Office of Energy Efficiency and Renewable Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Albemarle Corporation's project response to the Bipartisan Infrastructure Law (BIL)
Battery Materials Processing and Battery Manufacturing
FOA Number: DE-FOA-0002678

To Whom It May Concern,

This Letter of Commitment confirms the support and involvement of [redacted] in the development of Albemarle Corporation's ("Albemarle") Kings Mountain Lithium Materials Processing Plant project [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

June 30, 2022

U.S. Department of Energy
Offices of Manufacturing and Energy Supply Chains, & Energy Efficiency and Renewable Energy
1000 Independence Ave SW
Washington, DC 20585

RE: Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing Funding Opportunity Announcement (DE-FOA-0002678)
Letter of Support: Albemarle Corporation Full Application Control Number: 2678-1564

To Whom It May Concern:

[redacted] I would like to express my support for the Kings Mountain lithium project currently in early development at Albemarle. [redacted]

[redacted]

[redacted]

[redacted]

[redacted]
Albemarle US Inc Project Director
[redacted]

Overview
Mining executive with extensive operational, corporate and project experience across three continents and several commodity groups with the world's largest mining and specialty chemicals organizations. Accomplished leader, with significant experience in early stage project development, strategic planning, joint ventures and mine operations. Excellent written and oral communicator grounded with practical hands on mining experience and successful leadership of culturally diverse teams.

Education
Bachelor of Engineering (Mining) (Honours)
University of New South Wales, Sydney, Australia

Professional Experience
Albemarle Corporation 2018 – Present
Vice President Lithium Resources

- Leader of internal and external cross functional team to evaluate and advance the restart of the historic Kings Mountain lithium mine and construction of downstream infrastructure (inclusive of community + government relations)

- Responsible for the development and execution of the lithium natural resources strategy and creation of an internal resources team

- Implemented enhanced mineral resource development and integrated strategic planning practices

2005-2018
Various global operational, project and corporate roles across Australia, US, Chile, Peru and Colombia with BHP, Rio Tinto and Xstrata (now Glencore).

Head of Joint Ventures
Manager Joint Ventures
Underground Production Superintendent
Underground Development Superintendent and Foreman
Mine Planning and Scheduling Engineer
Underground Shift Supervisor
Underground Operator

[redacted]
Albemarle US Inc Principal Investigator
[redacted]

Education and Training
Michigan Tech University, Chemical Engineering/Minerals Processing, Ph.D., 2005
Michigan Tech University, Mining Engineering/Minerals Processing, Ms.Sc., 2001
Universidad Nacional de San Agustin, Metallurgical Engineering, Bs.Sc., 1998

Relevant Research and Professional Experience
2021 – Present: Group Metallurgist, Albemarle Lithium Resources, Charlotte, NC.
1. Review prior Kings Mountain project metallurgical test work
2. Prepare and monitor Kings Mountain processing plant ongoing metallurgical test work
3. Oversee processing plant design studies
4. Support R&D group on the evaluation of alternative technologies for clay processing, recycling and direct lithium extraction

2017 – 2021: Director, Field Pilot Plant Programs, CiDRA Minerals Processing, Windsor, CT
5. Lead deployment of first of its kind Pilot plant for novel mineral separation technology at a Copper concentrator in Arizona
6. Lead customer engagement and metallurgical test work across multiple commodities (Cu, Au, Fe, Pb, Zn) and countries (USA, Canada, Chile, Peru, Bulgaria, Australia).
7. Provide technical feedback for the different unit operations under development and integration into a viable working system

2016 – 2017: Consultant, Self Employed, West Lafayette, IN
8. Evaluate viability of consolidating blast furnace metallic waste streams to produce a recycled feed stream and other waste streams for reuse across other industries

2013 – 2016: Technical Services Manager, Magnetation, Reynolds, IN
9. Responsible for staffing, training, and developing the processes and procedures for the Process Engineering, Quality Control, Reliability and Engineering groups.
10. Developed and delivered process and operations training to 100% of operations supervisors and control room operators.
11. Lead plant commissioning and transition to operations, including implementing plant quality management program and setting up the metallurgical laboratory.
12. Lead implementation and execution of the preventive maintenance program, including Vibration Monitoring, Thermography, Lubrication, Oil Analysis and Down Time tracking.

2005 – 2013: Multiple roles, Cleveland Cliffs, Ishpeming, Mi
13. Area Manager – Empire Plant: Lead the operations, mechanical and electrical maintenance groups (48 salary and 288 union employees) in the safe and sustainable operation and maintenance of the Empire Iron ore concentrating and pellet plant manufacturing facility in compliance with the company business plan and complying with the applicable policies and procedures

14. Area Manager – Empire Plant Operations: Manage the overall safe and efficient performance of the Empire plant operations groups (22 salary employees and 108 hourly employees) divided between an iron ore concentrating and pelletizing plant
15. Senior Section Manager Empire Concentrator Operations: Lead a multi-disciplinary team (12 salary employees and 59 hourly USW employees) in the safe and sustainable operation of the Empire Iron ore concentrating facility (17 grinding lines and associated equipment), processing 40,000 LTPD of iron ore and a $100M per year operating budget.
16. Senior Metallurgist: Accountable for the evaluation of strategic projects for the Empire and Tilden facilities aimed at integrating both facilities to realize the highest possible synergies from both sites while directing the daily activities for the Empire Plant metallurgical lab.
17. Six Sigma Black belt: Multiple continuous improvement project over a variety of areas
18. Metallurgical Engineer: Initially focused on size reduction performance, expanded to plant wide metallurgical oversight.

Awards and Honors

19. Minerals Processing Division Young Engineer Award, February 2010. Issued by the Society of Mining, Metallurgy and Exploration
20. 2002 SME Industrial Mineral Division Scholarship. February 2002. Issued by the Society of Mining, Metallurgy and Exploration

Publications

[redacted]

[redacted]
Albemarle US Inc Community Affairs Manager
[redacted]

Education and Training
University of North Carolina, Charlotte, Psychology/English, Undergraduate Degree, 2008

***Relevant* Research and Professional Experience**

2022–Present Community Affairs Manager, Albemarle Corporation, Kings Mountain, NC. Responsibilities include:

- Management of local stakeholder and community engagement strategy, developing and maintaining relationships, identifying opportunities for community investment, and coordination of communications and engagement activities including communication campaigns, community information displays, briefings and meetings

2019–2022 Senior Development Officer, Boston Red Sox, Boston, MA. Responsibilities include:

- Management of New England community outreach and charitable strategy for the Boston Red Sox, including all giving, development, external communications, and charitable special events at Fenway Park and in the local community

2015–2019 Director, Best Buddies International, Boston, MA. Responsibilities include:

- Management of strategic development, charitable revenue efforts, and brand management for all national Best Buddies events, including all community and corporate charitable partners, cause marketing, and NFL relations

2014–2015 Director, American Heart Association, Boston, MA. Responsibilities include:

- Management of charitable community efforts and revenue development as personal corporate liaison to Fortune 500 executive leadership, including all local community relations and special events

2013–2014 National Operations Manager, Albert Schweitzer Fellowship, Harvard Medical School, Boston, MA. Responsibilities include:

- Responsible for national organization operations across 13 US sites, including fund development, communications, community relations, and special events

2012–2013 NC Development Manager, Alzheimer's Association, Charlotte, NC. Responsibilities include:

- Community liaison for North Carolina for the national Walk to End Alzheimer's series of events, including speaking engagements, charitable development, and local programmatic advancement

2009–2012 Donation Manager, Habitat for Humanity, Charlotte, NC. Responsibilities include:

- Responsible for the solicitation of in-kind gifts and materials for Habitat for Humanity and the ReStore programs from community efforts to local corporate charitable partnerships

2008–2009 Volunteer Coordinator, AmeriCorps, Habitat for Humanity, Charlotte, NC. Responsibilities include:

- Daily management of community and corporate volunteers for Habitat for Humanity construction projects, blitz builds, and homeowner engagement

[redacted]
Albemarle US Inc Community Affairs Coordinator
[redacted]

Education and Training
Gaston College
Associate in Arts
Associate in Applied Science-Office Administration
Associate in Applied Science-Medical Office Technology
Western Carolina University
Paralegal Certificate, Cenage Education
Saylor Academy
Management Leadership
Leadership and Teams
Employers Resources Association (ERA)
Leadership – Principles of Management I

Professional Experience
June 2022-Present Community Affairs Adviser, Albemarle Corporation, Kings Mountain, NC
Responsibilities include:
● Assist with the creation, design, and management of the development of the Kings Mountain Information Center
● Support a developed stakeholder and community engagement strategy
● Support efforts to create STEM/Engineering programs developed by ALB for primary and secondary education
● Monitor trends in the local community to identify emerging issues and escalate where appropriate
● Provide support on any stakeholder or public community issues
● Oversee and plan logistics around all community events
● Attend employee engagement events and HR functions
2017–2022 Executive Assistant/Office Manager, Albemarle Corporation, Kings Mountain, NC
Responsibilities include:
● Organize and coordinate the Site Director's daily calendar – scheduling all appointments, coordinating logistics for speaking engagements and handling special event invitations on behalf of the Site Director
● Conserves managements time by drafting complex letters, reports, and documents
● Manage team logistics and calendars for meetings and conferences, including catering as requested
● Frequently compose and finalize correspondence, documents, presentation materials, meeting minutes, reports, and other-format documents
● Assist in the preparation of regularly scheduled reports
● Attend daily plant support meetings, and regular scheduled staff meetings
● Assist in the preparation of local townhalls & safety tailgates, collaborating with on-site leadership teams

● Provides supervision, leadership, motivation, and direction to administrative staff
● Serve as a liaison with internal staff at all levels
● Interact with external partners as well as leadership
● Supports the planning, scheduling, and organization of on-site and off-site events, manage the on-site team, coordinate schedules, and ensure follow through of all events
● Provide assistant and support to HR Partner on various projects such as new employee onboarding, Kings Mountain site calendar planning and staff communication

Office Management:
● Design, communicate and oversee the implementation of office operations, policies, and procedures
● Assist the KMT Facility Manager with managing the site facilities coordinator coordinate and supervise facility contractors/vendors and confirm work is completed per work order
● Supervise the site Facilities Coordinator to ensure overall facilities are maintained professionally and accommodations are made as needed for visitors, meetings, and conference and training rooms

2016–2017 IP Docketing Administrator, Nelson Mullins Riley & Scarborough LLP, Charlotte, NC
Responsibilities include:
● Reviewed and docketed new actions, closed completed actions, and routed to the appropriate attorneys/staff
● Entered descriptive remarks to update correspondence to/from clients and foreign counsel into the database
● Reviewed data for accuracy and updated/flagged discrepancies for attorneys
● Made sure all documentation matched most recent filings in government data
● Processed daily docket clearance reports from Intellectual Property staff, closed docket reminders, and closed deadlines based on detailed review of incoming correspondence indicating completion
● Processed outgoing file transfers by closing outstanding docket actions and inactivated cases within the docketing system
● Processed incoming file transfers by immediately entering shell records and assigning docket numbers, and flagged urgencies for attorneys
● Reviewed information/docket actions from prior counsel for accuracy and docketed accordingly
● Continued audit and cleanup of existing docket data via special projects and standardization

Synergistic Activities
● Site Council Member of the KM Albemarle Foundation Team – 2021-present
● Volunteer – Junior League of Gaston County, retired

[redacted]
Albemarle US Inc Project Manager
[redacted]

Summary

Strategic, results oriented, creative thinking, bilingual professional with over thirteen years of experience in large multi-national organizations. Experienced leading diverse and inclusive teams (locally and globally) with a deep understanding of end to end business processes and procedures in Human Resources and in Major Projects (>US$450M). Successful track record of achieving personal career and organizational goals, ensuring performance standards in safety, cost, and schedule management are met.

Education

University Technical Federico Santa Maria
Commercial Engineer (B.S.) Degree
New York University
Project Management (M.S.) Degree
Human Resources Certification Institute
HR Global Professional, Human Resources

Professional Experience

Albemarle Corporation (Feb 2022 – Present)
Project Manager - Charlotte, North Carolina, United States
-Integrated planning activities across all stakeholder groups, vendor management, and project control functions; Coordinate project deliverables; support project objectives through governance and control; manage stakeholder approvals

BHP (9 years)
Deputy Project Manager – Santiago, Region Metropolitana de Santiago, Chile
-Inclusion & Diversity Sponsor, Culture Council member, enabling and developing I&D Strategy and initiatives for the Major Projects team
-Aligned with global and corporate practices
-Copper Transportation, US$196 M, replace and prepare train equipment and lines to transport concentrate from mine to port
-Lead Transportation Software Project and integration of marketing area needs, early detection of misalignment avoiding 10% of contingency utilization, and late curve avoidance of 2%
-Desalinization Plant, BOOT Contract (Build, Own, Operate, and Transfer), US$1.5 Bn. Maintained budget alignment with only 2% of contingency utilized
-Implemented safety strategy with field observations increased by 20% and hazardous incidents reduced by 15%
-Port, US$299 M, facilities construction for container handling and storage system needed to deliver copper concentrate to vessels. Project ahead of the early curve by 5% consistently throughout the project. Zero safety incidents were recorded.

Integration Area Manager – Santiago, Region Metropolitana de Santiago, Chile
-Projects for BHP Chile's Copper division, with Capex, spend of >US$1 Bn p.a.and >3.000 FTE
-Integration focused on Culture, Analysis & Improvement, Communications, and Business plan
-Inclusion & Diversity Champion, part of the BHP Projects Culture Council, leading I&D and Culture workshops Project team, matching strategy with contents, activities, and planning for more than 300 participants, plus internal communications, aligned with company global mission.
-Productivity increase by 8%, reducing people exposure and hazardous incidents reported.
-Area budget reduction of 12% delivered through the productivity improvements identified above.

Principal HR Business Partner – Santiago, Region Metropolitana de Santiago, Chile
-Producing 8% of the world's copper supply, and with a workforce of 13.000 employees and 30.000 external contractors, I was the lead business partner of the HR function, providing strategic HR advice for main functional areas, including Finance, HSE (Health, Safety, and Environment), Legal, Corporate Affairs, Compliance, Marketing, and Projects, working closely with Vice-Presidents and their leadership teams
-Lead the Flexible Work Project for the whole Copper division (Minerals Americas). Following a year and a half of focus groups, stakeholders management, legal review, safety checks, secured Minerals Americas President Championing Flex Work in the industry and country
-EPS results increased 6% for areas adopting Flex Work Policy
-Enabling the Inclusion &Diversity strategy of the Company, aligned with global and local practices
Employee Perception Survey (EPS) averaged 82%. 3-5% increase over the previous period, especially in areas related to Inclusion & Diversity.
-Part of SuccessFactors Project Implementation, training more than 500 leaders on the tool features and new ways of working.

HR Business Partner Manager – Santiago, Region Metropolitana de Santiago, Chile
-With a CAPEX spend of US$20 Bn through the period, in projects such as new Copper Concentrators, Water Desalinization Plants, Mine Truck shop, among others, led the HR Team to achieve the company's People Strategy.
-Inclusion & Diversity rate increased from 10% to 14% within 2 years.
-Talent Management process conducted for over 800 employees including development plans, training, and career mapping analysis, connecting Inclusion and Diversity initiatives and programs to development actions, with 83% of plans completed during a 4-year period and a 20% increase in female leadership representation.
-Organizational Design Project, leading the change management strategy and a team of 5 professionals supporting the transition to a new way of working and execute more than 600 people movements with about 1.800 org transactions related to the massive transformation.
-Redeployment initiative, with more than 95% of the employees (800 FTE)placed in new roles.
-0% of voluntary turnover

[redacted]
Albemarle US Inc Project Procurement Manager
[redacted]

EDUCATION:
Gardner-Webb University, Boiling Springs, NC BA – Business Administration 2017
Associated Degree – Cleveland Community College, Shelby NC 2015
Certifications:
Certificate of Completion U.S. Department of Commerce – Export/Import Compliance Training.

PROFESSIONAL EXPERIENCE
Albemarle Corporation
Global Lithium Resource Team, Project Manager II, July 2010 – Present

- 2021 - Project Manager – Global 3PL KPI Implementation
- 2020 – North America Sustaining Capital – Manage the Capital procurement for four NA plants total spend $65MM.
- 2019 – Kemerton Project, Perth Australia - ALB Best Practice, SAP Training & Procurement
- 2017 – 2018 Drilling Projects Silver Peak NV & Kings Mountain NC ~$50MM
- 2013-2016 Chile, South America - International Project
- Leader in setting up project guidelines for international project, including accounting, procurement and shipping procedures
- Export/Import – leader in compliance for procedures and tax issues
- Customs management – Import & Export - payments, problems, permits, etc.
- Purchased $95MM of equipment, RFQ's, Procure, Shipping & Invoice/Account Management
- Accounting Audit PWC, reconcile $225MM accounting reports, instructed Chilean accounting team of necessary journal entries, goods receipts, invoice payments and accruals

- 2010-2012 LiOH Plant – **DOE Project $38MM Project Administrator**
    - Responsible for purchasing, expediting & delivery of equipment
    - Procure to Pay Accounting functions
    - Helped develop smart number system for project accounting DOE Documentation
    - Annual negotiated saving over $500K
    - Work with new vendors to set up Master Service Agreements, as well as Non-Disclosure Agreements
    - Manage Project Budgets, against actual spending
    - Manage any A/P problems
    - Recommend and encourage best practice procedures.

M&T Plumbing
Accounting Manager - Plumbing Contractor for National Builder August 2008 – January 2010

- Payroll/Benefits/Insurance
- Accounts Payables/Accounts Receivables
- Managed an extensive Department of Labor Audit
- Tax Preparation & Reports

Buckeye Fire Equipment
Buyer – Purchasing Department April 2005 – August 2008

1. Purchase all MRO items
2. Expedite Open Purchase Orders
3. Helped implement new Purchasing System
4. Helped manage ISO Paperwork
5. Inventory Control – Set and maintain Min/Max level standards

Anvil Knitwear
Administrative Assistant, VP of Manufacturing July 1987 – May 2002

1. Team Leader in the implementation of yarn inventory control system
2. Purchased and scheduled Dyes & Chemicals as needed
3. Scheduled ~1MM pounds of yarn per week (2 plants)
4. Other Duties over the years: Payroll, production planning

COMMUNITY INVOLVEMENT:
2020 ALB Wellness Committee, 2020 Women Connect Leadership Program, 2019 ALB Health & Wellness Leader, 2018 ALB Relay for Life Team Captain.

[redacted]
Albemarle US Inc Project Engineer, Integration
[redacted]

Education and Training
University of Chile, Electrical Engineering, Bachelor of Engineering, 2010
Risk Management Institute of Australasia, Certified Practicing Risk Manager, 2019
Institute of Risk Management, Enterprise Risk Management, International Certificate, 2021

***Relevant* Research and Professional Experience**

Jun 22–Present Resources Study Lead, Albemarle Corporation, Charlotte, NC. Responsibilities include:

- Coordination and delivery of the phase requirements that enable the project objectives: including governance and project controls.

Feb 20–May 22 Principal Risk Advisor, BHP, Santiago, Chile. Responsibilities include:

- Support to the asset or functional leadership team in the application of BHP's enterprise risk management framework.
- Foster the identification, prioritization and treatment of risks throughout planning cycles in order to manage the company's risk exposure, inline with objectives and strategic goals.
- Enable the delivery of initiatives or projects as per its approved Key Value Drivers and main commitments/objectives.
- Involvement in assurance and oversight activities such as independent peer reviews, execution phase reviews, post investment reviews and audits.

Jan 17–Jan 20 Principal Risk Business Partner, BHP, Santiago, Chile. Responsibilities include:

- Facilitate the application of the risk management methodology in the Minerals Americas' Vice-presidency of Projects, by liaising with assets and functions to achieve a good interrelation within the corporate planning cycle and the project governance framework.
- Foster the delivery of initiatives (e.g. Spence Growth Option or Escondida Water Supply Extension), as per Key Value Drivers and main commitments/objectives.

Oct 16–Dec 16 Construction & Commissioning Supervisor (Escondida Water Recovery), BHP, Antofagasta, Chile. Responsibilities include:

- Supervision of construction and commissioning progress to guarantee adherence to scope and defined pilot budget & plan.
- Monitoring of key activities by contractors to optimize the use of resources.
- Assurance of compliance with regulations, design criteria and relevant standards to secure a safe functionality and achieve testing plan goals.

Jun 15–Sep 16 Construction Supervisor (Escondida Water Supply), BHP, Antofagasta, Chile. Responsibilities include:

- Construction progress oversight to guarantee the adherence to the agreed scope and approved Key Performance Indicators, for example health & safety indexes, cost, schedule and operational specs.
- Monitoring of performance indicators, along with the identification of improvement opportunities to optimize the use of resources.
- Assurance reviews to secure compliance with regulations, design criteria and quality plans, in order to achieve an appropriate & safe functionality for start-up activities and operation.

Jan 14–May15 Commissioning Supervisor (Escondida Oxide Leach Area Project), BHP, Antofagasta, Chile. Responsibilities include:

- Follow-up of construction progress, with focus on key facilities/systems related to start-up commencement, ensuring compliance with programs and defined quality plans.
- Guarantee that all test plans defined by the main contractor (EPCM) complied with all start-up BHP requirements.
- Progress management and supervision of pre-operation and commissioning activities, as well as fostering the transition of new facilities to the operation.

Mar 11–Dec 13 Project Development & Delivery Engineer, BHP, Antofagasta & Santiago, Chile. Responsibilities include:

- Electrical Engineer in the New Facilities for Mine Maintenance project: Study related to the future maintenance facilities for Escondida's mobile mining equipment fleet.
- Electrical Construction Engineer in the Laguna Seca De-bottlenecking project (US$M ~300): Project that increased the nominal throughput of Escondida's Laguna Seca concentrator from 120,000 to 150,000 tons per day.
- Electrical Project Engineer within the Functional Engineering area: Providing support on technical and governance matters to a portfolio of nine projects under study phases, with a total estimated investment amount of over US$M 11,000. Make sure these bullets show how you are qualified to work on this proposal based on your experiences

[redacted]
Albemarle US Inc Environmental, Health & Safety Manager
[redacted]

Education and Training
Duke University, Master of Environmental Management, 2023
Dalhousie University, Environmental Engineering, 2005

***Relevant* Research and Professional Experience**
August 2021–Present Manager Environment and Approvals, Albemarle, Charlotte, NC

- Developed corporate ESG standards to ensure current and future mine development projects are operated in a sustainable manner. New policy includes standards for mine waste and tailings management, acid rock drainage mitigation, water stewardship, cultural heritage, endangered species, reclamation, and climate change.
- Completed a benchmarking analysis of best sustainability practices within the mining industry. Assessment included mine design components (acid rock drainage, tailings, etc.) and community engagement processes.
- Leading implementation of IRMA Certification (Initiative for Responsible Mining Assurance) for new development projects.

February 2013–October 2020 Manager Studies, BHP, Tucson, Arizona

- Directed technical study work and site investigation campaigns for a large program of mine reclamation projects in Arizona, USA.
- Led a highly efficient internal team of water resource engineers, hydrogeologists and water treatment specialists focused on responsible mine reclamation planning.
- Directed a multidisciplinary and global team of external consultants, universities and research agencies consisting of engineers, soil scientists, meteorologists, hydrologists, geologists, geochemists, etc. Focus on best practice technical assessments on mine and mineral processing reclamation.
- Supported a global due diligence audit on tailings risks. Participated in audits on operational governance and management systems to assess improvement areas.
- Conceived and established a decade-long research program with the University of Arizona to investigate post-closure soil erosion performance for the advancement of landform evolution modeling science and to improve predictive risk assessments regarding catchment scale impacts on downstream ecosystems.
- Managed an extensive campaign of water treatment pilot studies across the United States to test proven and emerging technologies for several mine wastewater streams with a range of challenging mine water chemistries.
- Completed a comprehensive operational data gap analysis to identify gaps in information and/or instrumentation required to support technical studies. Results were used to identify and design a more robust monitoring network installed across 5 mine properties. New monitoring components included groundwater wells, surface water gauging stations, significant flow meter and totalizer instrumentation, remote tipping bucket rain gauges, crest stage gauging, customized pan evaporation infrastructure, pit lake depth sensors and long-term erosion monitoring stations.

- Organized various cultural resource, jurisdictional delineation and threatened & endangered species surveys to support state and federal regulatory submittals including requirements to align with the Clean Water Act, National Historic Preservation Act, Endangered Species Act and Special Status Species.
- Directed a thorough dam safety review process for 15 legacy tailings facilities using the CDA dam safety guidelines. Water management assessments included hydraulic analysis and spillway assessments, dam breach and flood inundation modeling, and erosion scour evaluations.

October 2011–February 2013 Sr. Envir Eng, Klohn Crippen-Berger, Brisbane, Queensland

- Completed numerous surface water and erosion modeling assessments to support key decision making for projects ranging from greenfield mine development, operations and mine closure. Technical assessments included development of hydrological models (HEC-HMS, HEC-RAS), erosion studies (SEDCAD) and water balances (GoldSim).
- Developed erosion control guidelines used for mine permitting approval at a greenfield mine development in the Philippines.

November 2005–July 2011 Environmental Engineer, Stantec, Calgary, Alberta

- Completed numerous mine design studies to support greenfield development and mine expansion projects (6) within Canada.
- Led design and construction work for a fish habitat conservation project ($85M CAD). A 49-hectare habitat compensation lake was designed and built to provide an overwintering habitat for key fish species selected by local Aboriginal tribes.

September 2003–September 2004 Environmental Engineer, K+S, Halifax, Nova Scotia

- Responsible for leading a research project that included the re-vegetation of a tailings facility. The study was used to determine the best soil profile and long-term planting prescriptions using numerous test plots with varying soil profiles and seed mixtures.

Publications

[redacted]

Synergistic Activities

- Technical Review Committee: Initiative for Responsible Mining Assurance, 2022
- Technical Advisory Committee: Sustainable Mining Conference (GECAMIN), Santiago, 2021
- Technical Advisory Committee: Mine Closure Conference (ACG), Ulaanbaatar, 2021

[redacted]
Albemarle US Inc Development Manager
[redacted]

Summary
A mining professional focused on productivity and value creation alongside customers, I have experience in operations and technical roles in various commodities (copper, iron ore, and coal) throughout the United States and Australia. Areas of experience include business improvement, mine design, mine planning, budgeting, cost reporting, mine supervision, and fleet management systems. I have a broad range of technical and practical knowledge gained through regional, global, and site-based roles with hands on field experience.

Education
Virginia Polytechnic Institute and State University
Bachelor of Science (B.S.), Mining and Mineral Engineering · (2008 - 2010)
Virginia Polytechnic Institute and State University
Bachelor of Science (B.S.), Geochemistry · (2003 - 2008)

Experience
Albemarle Corporation (Oct 2021 – Present)
Leader – Resource Development (Lithium) - Charlotte, North Carolina, United States
-Lead and develop the global strategy around our hard rock mine sites and lithium extraction operations, including future growth options to increase the lithium resource base.

Komatsu Mining (4 years)
Senior Engineer Global Mining Solutions - Milwaukee, Wisconsin, United States
-Advise and assist regional distributors and Komatsu Technology (Modular/Mineware) teams with CI projects and technology roadmaps, ensuring products are aligned to voice of customer needs and presented with a One Komatsu mindset
-Act as the mining advisor for productivity and operations-based projects Global CI Program Lead (Tier 1 customer)
-Shovel Performance and RHM/CBM Project Lead (N.A. Customer)
-Organized Komatsu annual Global Continuous Improvement Conference (2019)

Manager - Embedded Resource Programs - Brisbane, Queensland, Australia
-Manage teams of mining engineers and maintenance reliability professionals embedded into customer organizations across Australia (RTIO, BMA, BHP)
-Work collaboratively with Embedded Resource customers to drive value adding step changes in productivity, reliability, safety, and technology development across the Komatsu suite of products (Komatsu, P&H, Mineware, Modular and Autonomous Haulage Systems)
-Grow the Embedded Resources program into new customer areas and business units
Provide direct input to New Product Development within the Mining Technology division

Principal Advisor - Operations Productivity - Brisbane, Australia
-Working as an Embedded Resource inside Rio Tinto Coal Australia's Productivity Division, my primary focus was on identifying, evaluating, and executing productivity and reliability improvement programs across the Komatsu line of surface equipment at RTCA Queensland and New South Wales mine sites.
-Payload optimization project, increasing target payload by 16%
-Komatsu 960E disposable tray - specification, design, and field testing
-Mine Planning - update ramp designs on waste dumps to increase volume (+6%) and reduce associated cycle time (-10%)
-Dispatch fleet management system configuration and optimization support
-Increased utilization and reduction of operational delays on 4100 XPC rope shovels
-Coal recovery projects, including acquisition of small mining fleet and in pit resource opportunities
-Operator coaching and behavioral based productivity initiatives
-During the three-year tenure with RTCA, the Embedded Resource team delivered over $50 M AU in productivity and reliability gains across the three main surface mines (MTW, HVO, and Hail Creek). The program ended with the divestment of RTCA assets by Rio Tinto in 2018.

Joy Global Inc. (2 years)
Operations Productivity Advisor - Brisbane, Queensland, Australia
-Productivity increases among 4100 rope shovels, up to 12%
-Increased operational efficiency through behavioral based training programs
-Reduced trucking congestion and operational delay through simplification of Dispatch assignments
-Safety enhancements (and resulting operational gains) amongst load unit fleet Standardized face setups for load units, reducing truck delays at the load unit
-Equipment configuration review and associated capex justification

Capstone Mining Corp (2 years)
Senior Mining Engineer – Miami, AZ
-Responsible for the medium term mine planning, short range guidance and input into life of mine planning, including Detailed yearly designs for short range planners
-Five-year production schedules and phase design/progression
-Provide inputs into life of mine design and scheduling (cost assumptions, stockpile strategy, infrastructure, and equipment requirement review) for Phase II expansion project
-Preparation of yearly and five-year operating budgets for mine operations
-Production/business improvement projects in the mine area, value engineering
-Evaluation of alternate mining scenarios

Interim Superintendent - Mine Technical Services – Miami, AZ
-Managed a team of engineers, geologists, surveyors, and technicians in the MTS group
-Ensured team performed work in a safe, efficient manner, aligned to overall business goals

[redacted]
Albemarle US Inc Vice President Culture
[redacted]

Summary

Global Human Resources professional with 17 years of success in strategic partnerships and expert consultation. Experience across multiple industries with transferrable skills and practical experience in global business partnership, talent management, compensation/total rewards, mergers and acquisitions, strategic workforce planning, and change management. A proven ability in developing talent and building strong relationships with key stakeholders internally and externally.

Education

University of North Carolina at Greensboro
Bachelor of Arts (B.A.), Political Science
North Carolina Agricultural and Technical State University
Master of Science (M.S.), Human Resources
Cornell University
Diversity & Inclusion Certificate

Experience

Albemarle Corporation (Nov 2020 – Present)
VP, Culture - Charlotte, North Carolina, United States
-Diversity, Equity, and Inclusion Leader
-Talent Acquisition Leader
-Employee/Labor Relations & Employee Experience Leader

Trane Technologies / Ingersol Rand (14 years)
Director, Global Diversity and Inclusion – Davidson, North Carolina, United States
Global HR Director – Davidson, North Carolina
HR Business Partner – Charlotte, North Carolina

Lincoln Financial Group (1 year)
Human Resources Manager – Greensboro/Winston-Salem, North Carolina, United States

GMAC Insurance (2 years)
Human Resources Generalist – Greensboro/Winston-Salem, North Carolina, United States

Bank of America (8 years)
HR Analyst / Personnel Advisor – Charlotte, North Carolina, United States
Credit / Collections Supervisor – Charlotte, North Carolina

[redacted]
Albemarle US Inc Supplier Diversity Coordinator
[redacted]

EDUCATION

Bachelor of Science, Health Care Administration **August 2019**
Purdue University Global

Bachelor of Arts, Business Administration **May 1986**
Florida Atlantic University, Boca Raton, Fl

PROFESSIONAL EXPERIENCE

Albemarle Corporation | Charlotte HQ, NC
2022 – Present

Diverse Supplier

- Establish and enhance Albemarle's relationships with suppliers to enable collaboration and enhancement of the proportion of diverse content within procurement activities and those of suppliers.
- Refine existing processes and practices, and establish new ones, to enable Albemarle (via Procurement) to better partner with suppliers to enhance diverse content in various supply chains.
- Facilitate continual alignment of Albemarle's supply chain Diversity and Inclusion strategy related and interconnected strategies developed and executed in HR, Corporate Relations/Community Investment, Sustainability, and any other relevant internal stakeholder groups.
- Manage procurement spend while engaging in business process improvement initiatives, to identify, develop, propose, and implement process change for greater inclusion of diverse supplier content within supply chain
- The ability to establish, interact, and effect change among various internal stakeholders, departments, and employee groups (corporate and site management, union/hourly employees, other site personnel)

Albemarle Corporation | Kings Mountain, SC
2019 – February 2022

Logistics Specialist

- Create and maintain Master Data within SAP for carrier agreements, rates, and surcharges
- Lead training initiatives and create training content for SAP freight settlement, SOPs
- Approve and processed 5000+ freight settlement documents for Road, Air, Ocean and Rail carriers
- Cross-functional liaison between corporate logistics team, accounts payable and carrier partners
- Develop and implement continuous improvement strategies to streamline payment collections and resolve billing disputes to gain efficiencies in freight settlement

- Plan, implement and oversee the work of staff members, and carriers for 3 warehouses in Tennessee, Utah, North Carolina to ensure efficiency and compliance with organizational requirements and company procedures.
- Implement changes to transportation services, policies or scheduling as needed.
- Monitor and direct all dispatching activities, including tracking, and dispatching transportation vehicles and rail movement.
- Collaborate with team members, and managers to create, modify and implement goals, procedures, policies and objectives when the opportunity presents itself.
- Responsible for 3PL transactional moves in SAP/TM
- Responsible for GI/GR/PGI/Extensions/Reversals
- Responsible for accurate completion of physical inventories for 3 warehouses
- Maintain strong partnership with OTC, 3PL warehouses, carriers, and internal staff
- Resolute all issues with warehouses and carriers of any service failures by identifying the root cause, and implement continuous

Cardinal Health | Fort Mill, SC
2018 – 2019

Production Manager

- Audit internal control systems and present findings to senior leadership
- Supervise team of 45 plant employees through subordinate supervisors
- Ensure organizational metrics are consistently met and exceeded
- Lead process improvement Kaizen projects
- Administer wage, salary and bonus programs in accordance with organizational policies

Globe Express Services | Charlotte, NC
2016 – 2018

Warehouse Operations Manager

- Performance appraisals, trained, motivated and set production goals for 26 employees
- ID inefficiencies through budget preparation and analysis and presented solutions
- Utilized Lean methodology to maximize customer value by ensuring FDA sterilization req
- Analyzed market costs to negotiate and provide competitive rates for customers

CLT Airfreight Carrier | Charlotte, NC
2014 – 2016

Business Development Manager

- Increased revenue by over 60% in 6-month period through creative account acquisition
- Capitalized on market opportunity to develop new line of profitable business through detailed industry analysis
- Negotiated and closed contract with major internet retailer
- Forecasted sales trends to determine future trends and drive current business decisions

[redacted]
Albemarle US Inc Project Human Resources Business Partner
[redacted]

Education and Training
UNC- Wilmington, Bachelor's of Arts, Business Administration w/Concentration in HR, 2013

***Relevant* Research and Professional Experience**
Sept 2021 –Present HR Business Partner, Charlotte, NC. Responsibilities include:

- Serve as Consultant to senior leadership to develop organizations and deploy talent development strategies (ie. Calibration, succession planning, talent reviews) to develop and retain critical talent in the organization.
- Collaborates with leaders to understand business needs and formulates organizational strategies to help deliver on objectives and increase effectiveness
- Trusted adviser for managers and employees to discuss employee related matters such as performance, coaching, compensation, etc.
- Partners with hiring managers and talent acquisition to identify talent for critical roles for a growing technology organization starting from organizational design to assisting with job descriptions to offer recommendations with a focus on time to fill.
- Leverages change management strategies to effectively deliver various HR initiatives established by CoE (ie. Performance management, talent strategy, employee experience, compensation) to internal customers.

March 2020 – September 2021, Global Talent Program Manager, Charlotte, NC

- Own and deploy business process for performance management cycle consisting of communication to internal stakeholders, training for HR Business partners, and driving continuous improvement efforts and tracking metrics for organization.
- Developed and deployed goal management dashboards to enhance reporting capabilities for business leaders and HR Leaders across the globe to increase adoption of goal setting aligned with the operating model, reaching goal setting percentage of 90% for organization.
- Consults with business leaders to establish meaningful developmental assignments for LAUNCH Rotational program participants, partnering with leaders to successfully identify 9 roles for permanent placement upon graduation of program
- Analyzed rotational program spend and revamped program framework with projection of $1M savings, gaining stakeholder buy-in across organization and roll out of new framework without sacrificing program experience.

- Lead and implement virtualization of global leadership development programs including LAUNCH rotational program, Elevating Women in Leadership program, assessing effectiveness of programs and modifying to continuously development talent.

HR Business Partner - Temporary Assignment, September 2019 – December 2019

- Served as HR Business Partner at Bayport manufacturing site handling employee matters, primarily responsible for managing change with roll out of new payroll practices and time management system within Workday at the site
- Consulted with managers on strategy and organizational needs to drive efficiencies and participated in Calibration sessions with business leaders to assess talent as part of performance management process.
- Conducted focus groups with employees to identify areas of opportunity to enhance culture address areas of concern at plant.

University Recruiter/Early Talent Acquisition Specialist – April 2017 – March 2020

- Constructed and implemented an accelerated development rotational program for early talent (recent graduates) from scratch to utilize top talent from university recruiting program to fill future business needs, currently at 100% retention of 18 participants.
- Steered each new cohort in action learning assignment designed to equip participants with project management skills and provide real-time situations to apply problem solving skills, with leadership report-out on recommendations.
- Leveraged relationships established with leaders across the global business units to identify and shape rotations around pertinent business needs to ensure benefit for both business and participant.
- Created and deployed action learning assignment concept to deliver experiential learning model to each cohort
- Partnered with learning & development to provide orientation with soft skills training for participants throughout life of the program as well as manage performance management, assignment rotations and final placement out of the program upon completion.
- Managed and lead university recruiting program including engineering co-ops and summer internships across all Global Business units from coordinating on-campus events to working with leadership to facilitate conversion process for interns/co-ops into full-time roles.
- Outperformed expected conversion rates with over 90% acceptance of offers over consecutive years
- Partnered strategically with managers and leaders to determine hiring targets for the upcoming years to create pipeline of diverse entry-level talent for direct hire roles.

[redacted]
NCSU-MRL Project Director
[redacted]

EDUCATION:

- PhD (Mineral Engineering), 1991.University of Minnesota, Minneapolis, MN
- MS (Mineral Engineering), 1976. Columbia University, New York. NY.
- A.C.S.M (Mining Engineering), 1972. C.Eng. University of Exeter (Camborne School of Mines), Camborne. England.

PROFESSIONAL EXPERIENCE:

September 2012 - present	Director, NC State Minerals Research Laboratory Asheville, NC Directs and manages a research laboratory at an off-campus location in Asheville with eight team members
January 2012 – August 2012	Assistant Director, NC State Minerals Research Laboratory, Asheville, NC. Directed and managed the daily activities at MRL in consultation with the Director
March 1994 – January 2012	Senior Mineral Processing Engineer, Minerals Research Laboratory, Asheville, NC. Responsible for laboratory and pilot plant research and development for the beneficiation of industrial minerals including projects on high purity quartz, glass-grade silica sand, phosphate, kaolin, mica, kyanite, spodumene, garnet and talc processing
July 1991-January 1994	Assistant Metallurgical Engineer. Member of the research group that used mineral processing and extractive metallurgical techniques for the treatment and management of hazardous solid waste including radio nuclides
September 1990 -July 1991	Research Associate at Minerals Resources Research Center, University of Minnesota, Twin Cities, Minneapolis, MN. Involved in research and development of novel processes for the recovery of gold from refractory ores including sulfides and carbonaceous ores with preg robbing properties
May 1976 – February 1979	Research Engineer, Hazen Research, Inc. Golden, CO. Duties included the design of laboratory bench-scale tests and direction of technicians for the performance of these tests

January 1981- June 1986	Project Engineer, Hazen Research Inc. Golden, CO. Duties included the design of laboratory bench-scale tests and direction of technicians for the performance of these tests.
March 1979-January 1981	Lecturer, University of Science & Technology, Kumasi, Ghana. Taught undergraduate course in mineral engineering plant design and operation

PUBLICATIONS:

[redacted]

[redacted]
NCSU-MRL Principal Investigator
[redacted]

Education and Training

- The University of Missouri, MO, USA, Metallurgical Engineering / Mineral Processing, PhD in Metallurgical Engineering, 1993
- New Mexico Institute of Mining & Technology, NM, USA, Metallurgy / Hydrometallurgy, MS in Metallurgy, 1983
- Universidad Nacional Mayor de San Marcos, Lima, Peru, Chemical Engineering, BS in Chemical Engineering, 1977
- University of North Florida, FL, USA, Certificate of completion of Project Management course, PMP, 2010

Relevant Research and Professional Experience

August 2019 – Present	Senior Mineral Processing Engineer, Minerals Research Laboratory of North Carolina State University, Asheville, NC. In charge of the Minerals processing plant of non-metallic and metallic minerals as well as the lab testwork
Nov. 2010 – Aug 2019	Senior Process Manager, South America, METSO, Lima, Peru. Managed a team of 8 people in the area of mineral processing equipment
Set 2005 – Oct 2010	Senior Project and Process Manager North America, OUTOTEC, Denver, USA. Responsible of the lab, pilot plant flotation, grinding, thickening tests and startup of the mineral processing projects of the company mainly in Mexico, USA and Canada
Feb 1994 – Jun 2005	Quality Control and Research &Development Director, SCOTT G. WILLIAMS, LLC, Conyers, GA, USA. Developed new micronutrient products, was in charge of the chemical lab and the quality control of raw minerals and finished products
Jan 1978 – Dec 1988	Chief Supervisor, MAURICIO HOCHCHILD, LLC, Tacna, Peru and Process Engineer in CENTROMIN. Performed research related to copper and silver flotation. In addition, carried out research related to zinc electrowinning, leaching of copper, etc.

Awards and Honors

- Organization of American States Scholarship to do PhD studies in Metallurgical Engineering in USA
- US Department of the Interior scholarship to study Master program in Metallurgical Eng.

PUBLICATIONS

1. [redacted]

[redacted] **Biographical Sketch**

Virginia Tech Project Director

[redacted]

Education and Training

Virginia Poly. Inst. & State University	Mining & Min. Engr.	PHD	2013
Virginia Poly. Inst. & State University	Mining & Min. Engr.	MS	2012
Virginia Poly. Inst. & State University	Mining & Min. Engr.	BS	2009

Research and Professional Experience

2017 – Present: Associate Professor, Mining and Minerals Engineering, Virginia Tech
2013 – 2017 Assistant Professor, Mining Engineering, West Virginia University
2009 – 2013 Graduate Research Assistant, Dept. of Mining and Minerals Engineering, Virginia Tech

Publications

1. [redacted]

[redacted]

Synergistic Activities

1. Executive committee member for Mineral and Metallurgical Processing Division of the Society for Mining, Metallurgy & Exploration (SME), 2020 – present.
2. Associate editor for Mining, Metallurgy and Exploration, 2018 – present. Editorial board member for the International Journal of Coal Preparation and Utilization, 2015 – present.
3. Participant and volunteer for several engineering diversity initiatives at Virginia Tech, including: Student Transition Engineering Program (STEP), Center for the Enhancement of Engineering Diversity (CEED), and Women's Preview Weekend.
4. Organized and chaired technical sessions at the SME Annual Meeting and Exhibit on Rare Earth Extraction from Coal and Coal byproducts: 2017, 2018, and 2019.

[redacted] **Biographical Sketch**

Virginia Tech Principal Investigator

[redacted]

Education and Training

University of Kentucky	Mining Engr.	PHD	2017
Central South University	Min. Process. Engr.	MS	2013
Shandong University of Sci. & Technol.	Min. Process. Engr.	BS	2011

Research and Professional Experience

2019 – Present: Assistant Professor, Mining and Minerals Engineering, Virginia Tech

2018 – 2019 Assistant Research Professor, Mining Engineering, University of Kentucky

2017 – 2018 Postdoc, Mining Engineering, University of Kentucky

2013 – 2017 Graduate Research Assistant, Dept. of Mining Engineering, University of Kentucky

Publications (10 of 52 most relevant peer-reviewed journal publications were selected**)**

[redacted]

10. [redacted]

Synergistic Activities

1. Professional honors and awards include: Minerals Best Paper Award (2022); Outstanding New Assistant Professor, Virginia Tech Engineering Dean's Award for Excellence (2022); Rong Yu Wan PhD Dissertation Award, Mineral Processing Division, Society for Mining, Metallurgy & Exploration (2018)
2. Professional Membership: Society of Mining, Metallurgy & Exploration (SME), 2015 – present; Coal Preparation Society of America (CPSA), 2015 – present
3. Editorial Boards: International Journal of Coal Preparation Utilization and Preparation (editor board, May 2020 – Present); Frontiers in Materials (reviewer editor board, January 2021 – Present; associated editor, starting from 06/2022); Minerals (Topic editor, November 2019 – Present); Frontiers in Chemistry (Topic editor, February 2020 – Present); Mining, Metallurgy & Exploration journal (Associate Editor, August 2021 – Present); Minerals and Mineral Materials (Editor board, October 2021 – present)

[redacted]
Cleveland Community College Dean of Workforce Development
[redacted]

EDUCATION

GARDNER-WEBB UNIVERSITY
Doctor of Organizational Leadership, anticipated completion August 2024
APPALACHIAN STATE UNIVERSITY
Master of Arts in Community College and University Leadership, December 2010
Internship: SACSCOC Compliance Review Committee for Cleveland CC
GARDNER-WEBB UNIVERSITY
Bachelor of Science in Business Administration, May 2007
CLEVELAND COMMUNITY COLLEGE
Associate in Applied Science in Business Administration, May 1997

PROFESSIONAL EXPERIENCE

CLEVELAND COMMUNITY COLLEGE
Dean of Workforce Development, 07/20 – present

- Oversees, organizes, and directs the activities of program areas—Manufacturing, Construction, Information Technology, Work-Based Learning and Apprenticeships
- Supervises and evaluates department chairs, program faculty, and staff for program areas
- Reviews program recommendations and implements program improvements
- Manages departmental budgets, including State, Federal, and grant funds
- Ensures program assessments are completed to the SACS-COC standard

Work-Based Learning Coordinator, 08/18 – 07/20

- Collaborated with business and industry to conduct needs assessments resulting in customized training, internships, and apprenticeships
- Coordinated, promoted, and oversaw work-based learning for curriculum and continuing education programs
- Collaborated with ApprenticeshipNC and employer partners to establish apprenticeships
- Oversaw pre-apprenticeships and apprenticeships for both curriculum and continuing education; served as success coach/advisor
- Presented College resources at Rapid Response meetings for displaced workers in collaboration with Region C Workforce Development Board and NCWorks staff
- Marketed, secured faculty and ensured setup with HR, order supplies, and coordinate summer camps

Advanced Manufacturing Academy and Work-Based Learning Coordinator, 04/17 – 08/18

- Developed the Advanced Manufacturing Academy
- Worked collaboratively with Cleveland County Schools on program and student performance
- Coordinated with program faculty on course offerings and student issues

- Taught ACA 115 Success and Study Skills
- Coordinated work-based learning for curriculum programs
- Worked with business and industry to raise awareness of apprenticeship and internship opportunities
- Maintained accurate records for Department of Labor apprenticeships

Success Coach, 9/13-04/17

- Advised, registered, and monitored students in all MCO-related programs
- Promoted work-based learning and internship opportunities
- Scheduled/coordinated industry tours
- Scheduled/coordinated campus tours for CCS students
- Taught ACA 115 Success and Study Skills
- Coordinated bi-monthly Success Coach Team meetings
- Assisted students with scholarship and employment applications

TEACHING EXPERIENCE, AWARDS, and HONORS

- Instructor: ACA 115 Success and Study Skills, Spring 2016 – Fall 2017
  Delivery methods included both face-to-face and online, college success course
- Instructor: WBL 111-122 Work-Based Learning, Fall 2017 – Fall 2020
  Includes face-to-face orientation, online instruction through Blackboard, site visits, and employer/student consultations
- Cleveland Community College Outstanding Staff Member Nominee, 2006, 2015
- Leadership Cleveland County Graduate-2005, Chair 2006
- Notary Public, 2006-Present

SYNERGISTIC ACTIVITIES

- Provides direct supervision of project-related employees responsible for the development of apprenticeship and short-term work-based learning programs to support Albemarle Corporation's plan to build a commercial-scale facility to produce lithium concentrate. Albemarle's operations are located in Cleveland Community College's service area of Cleveland County, North Carolina.
- Coordinate evaluations and work plans for customized training and retraining programs for Albemarle's incumbent mineral processing plant operators.
- Lead the efforts to develop effective work-based learning programs that benefit students and employers.
- Collaborate with respective College departments and personnel to deliver thoughtful and comprehensive student support services to ensure equity and success for all students.
- Ensure Albemarle's needs are met and provide stellar service as the chosen workforce development partner.

Statement of Project Objectives
Albemarle U.S. Inc.
Lithium Materials Processing Project

A. OBJECTIVES

The objective of the project is to construct a new commercial-scale facility that uses sustainably extracted spodumene minerals from a domestic based lithium mine as a supply source for a United States of America based lithium materials processing plant. The facility will have capacity to process spodumene ore at a rate of 8,000 tons per day (2.7 million tons per year), resulting in 350,000 tons per annum of lithium concentrate for downstream battery manufacturing facilities. The infrastructure and associated jobs provided by this project will serve as the cornerstone for a USA based supply chain for lithium batteries.

B. SCOPE OF WORK

The project will be conducted per Department of Energy guidance and consistent with the Albemarle Project Process, which includes: a multi-stage process with defined decision gates and readiness assurance processes at each gate; deploys a Decision Review Group (DRG) that provides the endorsement and approval of key project decisions to ensure consistent dialogue with project team and decision makers; and requires application of specific technical and business criteria used to evaluate the Go/No Go decision, compiled in a Decision Support Package (DSP) at each gate. The DSP requires DRG members to identify focus decisions requiring attention, risks and associated mitigation, plans for the next stage, funding and schedule for the next stage, project staffing, economic summary, and results from project peer reviews. Application of this Project Process will lead to construction of the first advanced, modern-day lithium ore processing facility to come on line in the U.S. in 30 years. Work will proceed according to the following process:

Budget Period 1: Evaluate/Select – FEL1/2
Lithium materials plant feasibility study (FS), including metallurgical testwork, plant design alternatives, and plant basic engineering.
Initiate early project goals with university partners working to address workforce training and development initiatives.
Equity Deliverables – Initiate social benchmark study, community working groups, community advisory committee, and quarterly community town halls, monthly community listening sessions, and open a downtown storefront.
Go/No Go Decision – Approval of Design Option and Associated Cost and Schedule.

Budget Period 2: Define – FEL3
Lithium materials processing plant detailed process design, detailed/final civil, electrical and mechanical engineering, and long lead time equipment orders.
Equity Deliverables – Complete workforce training development plan and advance workforce recruiting efforts.
Initiate community shared value projects identified in the benchmark study and supported by community working groups.
Identify and select Tier 1 diverse suppliers.
Go/No Go Decision – Approval of Final Investment Decision.

Budget Period 3: Execute 1
Go/No Go Decision – Approval of Final Permits.
Equipment fabrication and site infrastructure / civil work.
Equity Deliverables – Continue workforce recruiting and training; [redacted]

Budget Period 4: Execute 2
Site infrastructure, facilities construction, equipment installation, commissioning, and startup.
Equity Deliverables – Continue workforce training; [redacted]

C. TASKS TO BE PERFORMED

As set forth in more detail in the Technical Volume and throughout the following Statement of Project Objectives ("SOPO"), Albemarle's proposed Kings Mountain lithium materials processing plant will use domestically sourced spodumene ore; produce a sustainably sourced lithium concentrate [redacted]; align and adhere to the highest environmental and social standards; and ultimately create a cornerstone facility to support a U.S.-based lithium battery supply chain.

The following tasks will be performed:

Commented [A1]: Commercially sensitive

Commented [A2]: Commercially sensitive

Commented [A3]: Commercially sensitive

Commented [A4]: Commercially sensitive

All Budget Periods

Overall Project Management and Planning

The recipient will perform project management activities to include project planning and control, subcontractor control, financial management, data management, management of supplies and/or equipment, risk management, and reporting as required to successfully achieve the overall objectives of the project. As set forth above and described in further detail throughout the application, the project is broadly separated into four phases as set forth in the Budget Justification and other documentation.

Task 0.0 – Project Management and Planning:
The Recipient shall develop and maintain the Project Management Plan (PMP). The content, organization, and requirements for revision of the PMP are identified in the Federal Assistance Reporting Checklist and Instructions. The Recipient shall manage and implement the project in accordance with the PMP.

Task 0.1- Kick-Off Meeting:
The Recipient will participate in a project kickoff meeting with the DOE within 30 days of project initiation.

Budget Period 1: Evaluate/Select – FEL-1/2

Task 1.1 – Metallurgical Testwork Program:

[redacted]

Commented [A5]: Commercially sensitive

Task 1.2 – Trade-Off Studies:

[redacted]

Commented [A6]: Commercially sensitive

Task 1.3 – FS Engineering:

Subtask 1.3.1 – The recipient will complete equipment sizing and configuration based on the base case process design
Subtask 1.3.2 – The recipient will complete process plant layout, basic civil and infrastructure design, basic electrical, control and automation design, and material takeoffs
Subtask 1.3.3 – The recipient will complete preliminary bidding/procurement to complete a +/-15% capital cost estimate
Subtask 1.3.4 – The recipient will complete an operating cost estimate
Subtask 1.3.5 – The recipient will complete a final feasibility study report

Task 1.4 – Equity Plan Implementation:

Subtask 1.4.1 – Initiate social benchmark study
Subtask 1.4.2 – Hold community working groups; create a community advisory committee
Subtask 1.4.3 – Begin hosting quarterly town halls community and monthly listening sessions
Subtask 1.4.4 – Open downtown storefront

Milestone	Type	Description
Base Case Selected	Technical	Process design flow finalized. This will allow completion of the engineering required to refine the capital and operating cost estimate.
Feasibility Study Complete	Technical	Final Report complete with +/-15% capex and opex cost estimate.
Open Downtown Storefront	Equity	Open downtown storefront to ensure regular community feedback on the project.
Gate 2 IPR and Approval	Go/No Go	All requisite metallurgical testwork, trade-off and plant feasibility studies will be complete. This will include a signed decision support package and a signed decision readiness document detailing the selection of the best development option, an execution strategy and scope for the Define stage, and a commitment to proceed to the next budget period activities, including approval of the cost and schedule. This may also include long-lead equipment items for the concentrator plant.

Continuation: The recipient is **NOT** authorized to initiate any scope in the next budget period without the DOE Contracting Officer's prior written approval in accordance with the award terms and conditions.

Budget Period 2: Define – FEL-3

Task 2.1 – Detailed Engineering:

Subtask 2.1.1 – The recipient will complete a detailed process engineering design package
Subtask 2.1.2 – The recipient will complete a detailed civil, structural & architectural design package
Subtask 2.1.3 – The recipient will complete a detailed mechanical design package
Subtask 2.1.4 – The recipient will complete a detailed electrical/instrumentation package
Subtask 2.1.5 – The recipient will complete a detailed infrastructure engineering package

Task 2.2 – Procurement of Long Leads:

[redacted]

Commented [A7]: Commercially sensitive

Task 2.3 – Construction Bids:

Subtask 2.3.1 – The recipient will bid the civil/concrete work for the concentrator
Subtask 2.3.2 – The recipient will bid the civil/concrete work for tailings storage
Subtask 2.3.3 – The recipient will bid the civil/concrete work for the infrastructure
Subtask 2.3.4 – The recipient will bid the concentrator plant general contractor construction package (steel, buildings, pipe, E&I)
Subtask 2.3.5 – The recipient will bid the tailings plant general contractor construction package (steel, buildings, pipe, E&I)
Subtask 2.3.6 – The recipient will bid the site infrastructure general contractor construction package (steel, buildings, pipe, E&I)
Subtask 2.3.7 – The recipient will complete the definitive project cost estimate

Task 2.4 – Implementation of Equity Plan:

Subtask 2.4.1 – Complete workforce training development plan and advance workforce recruiting efforts
Subtask 2.4.2 – Initiate community shared value projects identified in the benchmark study
Subtask 2.4.3 – Identify and select Tier 1 diverse suppliers

Milestone	Type	Description
Detailed process design package complete	Technical	Detailed process engineering will be completed. This will allow issue of long lead time equipment orders.
All long lead Item Orders Placed	Technical	All long lead equipment orders will be placed. This will allow equipment fabrication to proceed to meet the plant construction schedule.
Remaining engineering design packages complete	Technical	All engineering work will be completed. This will allow construction bids for a definitive capital cost for final investment decision.
Tier 1 Diverse supplier Selection	Equity	Selection of Albemarle's Tier 1 Diverse Suppliers, after rigorous review through Albemarle's Supplier Diversity Program.
Gate 3 IPR and Approval	Go/No Go	After completion of all relevant design activities, orders for all long lead items and engineering design packages, and receipt of construction bids, Albemarle will complete a signed decision support package and a signed decision readiness document that details approval of project performance forecasts (cost, schedule, and production), and signed Final Investment Decision (FID) for the concentrator.

Continuation: The recipient is **NOT** authorized to initiate any scope in the next budget period without the DOE Contracting Officer's prior written approval in accordance with the award terms and conditions.

Budget Period 3: Execute 1

Task 3.1 – Engineering Issued for Construction:

Subtask 3.1.1 – The recipient will issue a detailed civil, structural & architectural design package for construction

Subtask 3.1.2 – The recipient will issue a detailed mechanical design package for construction

Subtask 3.1.3 – The recipient will issue a detailed electrical/instrumentation package for construction

Subtask 3.1.4 – The recipient will issue a detailed infrastructure engineering package for construction

Task 3.2 – Procurement & Fabrication of Equipment:

[redacted]

Commented [A8]: Commercially sensitive

Task 3.3 – Plant Civil Works:

Subtask 3.3.1 – The recipient will complete construction of the civil work for the concentrator
Subtask 3.3.2 – The recipient will complete construction of the civil work for tailings storage
Subtask 3.3.3 – The recipient will complete construction of the civil work for the infrastructure

Task 3.4 – Implementation of Equity Plan:

Subtask 3.4.1 – Continue workforce training and hiring initiative

[redacted]

Commented [A9]: Commercially sensitive

Milestone	Type	Description
Permits Received	Go/No Go	Albemarle must secure all federal, state and local permits for the Kings Mountain spodumene mine and concentrator plant. This is a critical decision point that will lead to additional budget period three activities described below.
Complete community shared value projects	Equity	Complete work on Gateway Trail & pollinator garden projects.
Groundbreaking	Technical	Once all permits are received, a public ground-breaking ceremony will be held.
Factory Acceptance Testing for Long Lead Equipment	Technical	All ten long lead equipment items complete and accepted for delivery to site.
Concentrator Plant Civil Works Complete	Technical	Concentrator plant civil works complete and ready for building construction.

Continuation: The recipient is **NOT** authorized to initiate any scope in the next budget period without the DOE Contracting Officer's prior written approval in accordance with the award terms and conditions.

Budget Period 4: Execute 2

Task 4.1 – Construction of Concentrator:

[redacted]

Commented [A10]: Commercially sensitive

Task 4.2 – Construction of Tailings Storage:

[redacted]

Commented [A11]: Commercially sensitive

Task 4.3 – Construction of Site Infrastructure:

[redacted]

Commented [A12]: Commercially sensitive

Task 4.4 – Implementation of Equity Plan:

[redacted]

Commented [A13]: Commercially sensitive

Milestone	Type	Description
Site Infrastructure Services Operational	Technical	Primary site services including water, air, electrical utilities operational in preparation for plant start.
Concentrator Plant Mechanical Completion	Technical	Concentrator facility completed and all equipment installed for handover to commissioning team.
[redacted]	[redacted]	[redacted]
Tailings Storage Mechanical Completion	Technical	Tailings storage facility completed and all equipment installed for handover to commissioning team.
[redacted]	[redacted]	[redacted]
First Production	Technical	Commissioning and start-up work complete for hand-over to operations team.

Commented [A14]: Commercially sensitive

Commented [A15]: Commercially sensitive

D. DELIVERABLES

In addition to the reports specified in the "Federal Assistance Reporting Checklist", the Recipient will provide the following to the DOE Project Officer (identified in Block 15 of the Assistance Agreement as the Program Manager):

- Summary of accomplishments and project work report will be prepared for inclusion in the Vehicle Technologies Office annual programmatic progress report. Report will be due by October 31 of each year.
- Budget Period 1 Deliverable: the Applicant will share results with DOE officials from the completed confirmatory metallurgical test work pursuant to Task 1.1, and share sampling results related to the domestic ore deposits.

- Budget Period 2 Deliverable: the Applicant will provide a report for DOE summarizing results of Albemarle's diverse supplier selection program for Tier 1 suppliers.

- Budget Period 3 Deliverable: the Applicant will host a ribbon cutting event to coincide with the public groundbreaking event, at which DOE officials will be welcomed and featured.

- Budget Period 4 Deliverable: Provide a tour for DOE officials upon completion of the concentrator facility, and installation of all equipment.

E. BRIEFINGS AND TECHNICAL PRESENTATIONS

- A technical presentation at the Vehicle Technologies Annual Merit Review Meeting held in Washington, DC.
- Detailed project status update briefings at Washington, DC or via communication/conferencing media approximately twice per year. Briefings will explain the plans, progress, and results of the technical effort.
- Technical paper(s) and presentations as appropriate at technical society meetings, or at technical exchange meetings.

Instructions and Summary

Award Number: 2678
Award Recipient: Albemarle U.S. Inc.

Date of Submission: 7/1/2022
Form submitted by: NC State;Minerals Research Lab (subrecipient)
(May be award recipient or sub-recipient)

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your EERE contact!
Do not modify this template or any cells or formulas!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. wi h total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item within each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit enti ies; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than five budget periods, consult your EERE contact before adding additional budget period rows or columns.
8. ALL budget period cost categories are rounded to the nearest dollar.

BURDEN DISCLOSURE STATEMENT

Public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary

	Federal	Cost Share			Total Costs	Cost Share %	Proposed Budget Period Dates
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	
Total	$1,500,000	$0			$1,500,000	0.00%	

Section B - Budget Categories

CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Costs	% of Project	Comments (as needed)
a. Personnel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
b. Fringe Benefits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
c. Travel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
d. Equipment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
e. Supplies	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
f. Contractual								
Sub-recipient	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Vendor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
FFRDC	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Total Contractual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
g. Construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
h. Other Direct Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Total Direct Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
i. Indirect Charges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Total Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$1,500,000	100.00%	

Additional Explanation (as needed):

a. Personnel

INSTRUCTIONS - PLEASE READ

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and vendors must be included under f. Contractual.
2. All personnel should be identified by position title and not employee name. Enter the amount of time (e.g., hours or % of time) and the base pay rate and the total direct personnel compensation will automatically calculate. Rate basis (e.g., actual salary, labor distribution report, state civil service rates, etc.) must also be identified.
3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e.g. fee or profit).
4. If a position and hours are attributed to multiple employees (e.g. Technician working 4000 hours) the number of employees for that position title must be identified.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 3	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 4	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 5			
1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
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				$0			$0			$0			$0			$0	0	$0	
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	$463,150	

Additional Explanation (as needed):

b. Fringe Benefits

INSTRUCTIONS - PLEASE READ

1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
Fringe-Other																
[redacted]																
[redacted]																
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[redacted]																
[redacted]																$184,553

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.*

There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification (Form EERE 335.1).

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at https //www.energy gov/eere/funding/downloads/sample-indirect-rate-proposal-and-profit-compliance-audit, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate. The total fringe benefits cost is the sum of the percentage of salary, which includes costs up to three (3) main categories, plus the appropriate portion of health insurance as determined by percentage of person effort. Of the three main categories mentioned, the first two use rates are regulated by agencies outside the University. They are (1) Life Insurance, Long Term Disability, and Retirement; and (2) FICA (Federal Insurance Contributions Act) / Medicare and OASDI (Old Age, Survivors & Disability Insurance, a.k a. Social Security). The third and smallest category: Fixed Benefit composite rate, is for a pool of expenses that cannot be directly assignable to specific employees; therefore, the rate is negotiated with our cognizant audit agency, DHHS, Division of Cost Allocation. Those costs include: Workers' Compensation, Unemployment Compensation, Severance/terminal Leave Pay, Short-term Disability and Associated Benefits and Administrative Costs. Fringe benefits are charged as a percentage of salary plus appropriate portion of health insurance. Current rates are: Faculty and Staff: 31 34% and $7,019 health insurance; Further information and details can be found at https //research.ncsu edu/sparcs/budgeting-guidelines/budgeting-fringe/. A minimum of 3% inflationary salary increase is recommended for each additional project year budgeted per UNC Board of Governors.

c. Travel

INSTRUCTIONS - PLEASE READ

1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.
2. All listed travel must be necessary for performance of the Statement of Project Objectives.
3. Only travel that is directly associated with this award should be included as a direct travel cost to the award.
4. Federal travel regulations are contained within the applicable cost principles for all entity types.
5. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.
6. Columns E, F, G, H, I, J, and K are per trip.
7. The number of days is inclusive of day of departure and day of return.
8. Recipients should enter City and State (or City and Country for International travel) in the Depart from and Destination fields.
9. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
	Domestic Travel	Budget Period 1									
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
	[redacted]									[redacted]	
	[redacted]	Budget Period 2									
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
	[redacted]									[redacted]	
	[redacted]	Budget Period 3									
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
	[redacted]									[redacted]	
	[redacted]	Budget Period 4									
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
	[redacted]									[redacted]	
	[redacted]	Budget Period 5									
										[redacted]	
										[redacted]	
	[redacted]										
	[redacted]									[redacted]	
	PROJECT TOTAL									$28,701	

Additional Explanation (as needed):

d. Equipment

INSTRUCTIONS - PLEASE READ!!!

1. Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.

2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.

3. During award negotiations, provide a vendor quote for all equipment items over $50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.

4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			[redacted]		
Budget Period 2						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]			[redacted]		
Budget Period 3						
	[redacted]					
Budget Period 4						
	[redacted]					
Budget Period 5						
	[redacted]					
	PROJECT TOTAL			**$185,000**		

Additional Explanation (as needed):

e. Supplies

INSTRUCTIONS - PLEASE READ

1. Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Please refer to the applicable Federal regulations in 2 CFR 200 for specific supplies definitions and treatment.
2. List all proposed supplies below, providing a basis of costs (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.
3. Multiple supply items valued at $5,000 or less used to assemble an equipment item with a value greater than $5,000 with a useful life of more than one year should be included on the equipment tab. If supply items and costs are ambiguous in nature, contact your DOE representative for proper categorization.
4. Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.
5. Each budget period is rounded to the nearest dollar

SOPO Task #	General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
Budget Period 1						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
	[redacted]			[redacted]		
Budget Period 2						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
	[redacted]			[redacted]		
Budget Period 3						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
	[redacted]			[redacted]		
Budget Period 4						
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
	[redacted]			[redacted]		
Budget Period 5						
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
				[redacted]		
	[redacted]			[redacted]		
	PROJECT TOTAL			$58,969		

Additional Explanation (as needed):

f. Contractual

INSTRUCTIONS - PLEASE READ!!!

1. The entity completing this form must provide all costs related to sub-recipients, vendors, and FFRDC partners in the applicable boxes below.

2. Sub-recipients (partners, sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) $250,000 or (2) 25% of total award costs. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whether the objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

3. Vendors (including contractors): List all vendors and contractors supplying commercial supplies or services used to support the project. For each Vendor cost with total project costs of $250,000 or more, a Vendor quote must be provided. A vendor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competitive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this information directly to DOE, however project costs must also be provided below.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Sub-Recipient Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

SOPO Task #	Vendor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
[redacted]		[redacted]		[redacted]	[redacted]	[redacted]		$109,200
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

SOPO Task #	FFRDC Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

	Total Contractual		$0	$0	$0	$0	$0	$0

Additional Explanation (as needed):

g. Construction

PLEASE READ!!!

1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient should be entered under f. Contractual.

2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities: Example Only!!! - Build wind turbine platform

SOPO Task #	General Description	Cost	Basis of Cost	Justification of need
Budget Period 1				
	Budget Period 1 Total	$0		
Budget Period 2				
	Budget Period 2 Total	$0		
Budget Period 3				
	Budget Period 3 Total	$0		
Budget Period 4				
	Budget Period 4 Total	$0		
Budget Period 5				
	Budget Period 5 Total	$0		
	PROJECT TOTAL	**$0**		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ!!!

1. Other direct costs are direct cost items required for the project which do not fit clearly into other categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).

2. Basis of cost are items such as vendor quotes, prior purchases of similar or l ke items, published price list, etc.

3. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
			Budget Period 1	
[redacted]				
	[redacted]	[redacted]		
			Budget Period 2	
[redacted]				
	[redacted]	[redacted]		
			Budget Period 3	
[redacted]				
	[redacted]	[redacted]		
			Budget Period 4	
[redacted]				
	[redacted]	[redacted]		
			Budget Period 5	
	[redacted]	[redacted]		
	PROJECT TOTAL	$20,557		

Additional Explanation (as needed):

i. Indirect Costs

INSTRUCTIONS - PLEASE READ

1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.

2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.

3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.

4. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total	Explanation of BASE
Provide ONLY Applicable Rates:							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			On-Campus ICR 52% Negotiated
[redacted]							
[redacted]							
[redacted]							
[redacted]							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]						[redacted]	
[redacted]						[redacted]	
[redacted]						[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$449,870	

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.

There is not a current, federally approved rate agreement negotiated and available*.

***When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided by your DOE contact, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Additionally, any non-Federal entity that has never received a negotiated indirect cost rate, except for those non-Federal entities described in Appendix VII to Part 200—States and Local Government and Indian Tribe Indirect Cost Proposals, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely.As described in §200.403 Factors affecting allowability of costs, costs must be consistently charged as either indirect or direct costs, but may not be double charged or inconsistently charged as both. If chosen, this methodology once elected must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which the non-Federal entity may apply to do at any time.**

You must provide an explanation (below or in a separate attachment) and show how your indirect cost rate was applied to this budget in order to come up with the indirect costs shown.

Additional Explanation (as needed): *IMPORTANT: Please use this box (or an attachment) to further explain how your total indirect costs were calculated. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total). Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials, supplies, services, travel and subgrants and subcontracts up to the first $25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, student tuition remission, rental costs of off-site facilities, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of $25,000. Indirect Cost Rate is 52% On-Campus Instruction/Organized Research

Cost Share

PLEASE READ

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.

2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.

3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share tem section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. Vendors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.

5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

6. NOTE A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**

7. NOTE A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**

8. Each budget period is rounded to the nearest dollar.

Recipient Provided Cost Share	Organization/Source	Type (Cash or In Kind)	Cost Share Item	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total
a. Personnel									$0
b. Fringe									$0
c. Travel									$0
d. Equipment									$0
e. Supplies									$0
f. Contractual (NOT subrecipient provided)									$0
g. Construction									$0
h. Other									$0
i. Indirect									$0
Total recipient provided cost share				$0	$0	$0	$0	$0	$0
f. Subrecipient (3rd Party) Provided Cost Share	**Organization/Source**	**Type (Cash or In Kind)**	**Cost Share Item** For simple cost share contributions from a partner provide the detail below; for complex contributions provide a separate budget justification (if required) or a supplementary detailed explanation	**Budget Period 1**	**Budget Period 2**	**Budget Period 3**	**Budget Period 4**	**Budget Period 5**	**Total**
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Total subrecipient provided cost share				**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Contractual Cost Share (Sum of Recipient and Subrecipients)				$0	$0	$0	$0	$0	$0
Grand Total Cost Share All Sources			**Totals**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
			Cost Share Percentage per Budget Period	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	

Total Project Cost: $1,500,000 **Cost Share Percent of Award: 0.0%**

Additional Explanation (as needed):

Applicant Name: Albemarle U.S. Inc. Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1.							

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a.						
h.						
i.						
j.						
k. **Totals** (sum of 6i-6j)					$0	$1,500,000
7. Program Income						$0

Applicant Name: Albemarle U.S. Inc. Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1.							

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a.						
h.						
i.						
j.						
k. **Totals** (sum of 6i-6j)						$1,500,000
7. Program Income						$0

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Instructions and Summary

Award Number: 2678
Award Recipient: Albemarle U.S. Inc.

Date of Submission: 7/1/2022
Form submitted by: Cleveland Community College (sub-recipient)
(May be award recipient or sub-recipient)

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your EERE contact!
Do not modify this template or any cells or formulas!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. with total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item wi hin each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for he costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than five budget periods, consult your EERE contact before adding additional budget period rows or columns.
8. ALL budget period cost categories are rounded to the nearest dollar.

BURDEN DISCLOSURE STATEMENT
Public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary

	Federal	Cost Share			Total Costs	Cost Share %	Proposed Budget Period Dates
Budget Period 1	[redacted]	[redacted]			[redacted]	[redacted]00%	
Budget Period 2	[redacted]	[redacted]			[redacted]	0.00%	
Budget Period 3	[redacted]	[redacted]			[redacted]	0.00%	
Budget Period 4	[redacted]	[redacted]			[redacted]	0.00%	
Budget Period 5	[redacted]	[redacted]			[redacted]	0.00%	
Total	[redacted]	[redacted]			$4,999,213	0.00%	

Section B - Budget Categories

CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Costs	% of Project	Comments (as needed)
a. Personnel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Personnel to be absorbed in budget period 4
b. Fringe Benefits	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
c. Travel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
d. Equipment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
e. Supplies	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
f. Contractual								
Sub-recipient	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Vendor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
FFRDC	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Total Contractual	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
g. Construction	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
h. Other Direct Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Total Direct Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
i. Indirect Charges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
Total Costs	$[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$4,999,213	100.00%	

Additional Explanation (as needed):

a. Personnel

INSTRUCTIONS - PLEASE READ

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and vendors must be included under f. Contractual.

2. All personnel should be identified by position title and not employee name. Enter the amount of time (e g., hours or % of time) and the base pay rate and the total direct personnel compensation will automatically calculate. Rate basis (e g., actual salary, labor distribution report, state civil service rates, etc.) must also be identified.

3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e g. fee or profit).

4. If a position and hours are attributed to multiple employees (e.g. Technician working 4000 hours) the number of employees for that position title must be identified.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 1	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 2	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 3	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 4	Time (Hrs)	Pay Rate ($/Hr)	Total Budget Period 5			
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]			[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]			[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]			[redacted]	[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]			[redacted]	[redacted]	[redacted]	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
				$0			$0			$0			$0			$0	0	$0	
	Total Personnel Costs	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]	$755,485	

Additional Explanation (as needed):

b. Fringe Benefits

INSTRUCTIONS - PLEASE READ

1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
EXAMPLE Sr. Engineer	$170,000	20%	$34,000	$10,000	20%	$2,000	$10,000	20%	$2,000	$10,000	20%	$2,000	$10,000	20%	$2,000	$38,000
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
			$0			$0			$0			$0			$0	$0
[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	$327,230

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.*

There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification (Form EERE 335.1).

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at https //www.energy.gov/eere/funding/downloads/sample-indirect-rate-proposal-and-profit-compliance-audit, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate.
State of North Carolina Fringe Benefit rate for FY2022-23 (per published information) is 24.19% Retirement, 7.65% FICA/MEDI, and $7,397 annually for health insurance premiums. Source-page 92-93 at https://www nccommunitycolleges edu/sites/default/files/basic-pages/finance-operations/0.budgetpackagetext_working_file_combined._collegeprint_v2.pdf.

c. Travel

INSTRUCTIONS - PLEASE READ

1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.
2. All listed travel must be necessary for performance of the Statement of Project Objectives.
3. Only travel that is directly associated with this award should be included as a direct travel cost to the award.
4. Federal travel regulations are contained within the applicable cost principles for all entity types.
5. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.
6. Columns E, F, G, H, I, J, and K are per trip.
7. The number of days is inclusive of day of departure and day of return.
8. Recipients should enter City and State (or City and Country for International travel) in the Depart from and Destination fields.
9. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
	Domestic Travel	Budget Period 1									
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
										[redacted]	
	[redacted]									[redacted]	
	Budget Period 2										
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
										[redacted]	
	[redacted]									[redacted]	
	Budget Period 3										
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]										
										[redacted]	
	[redacted]									[redacted]	
	Budget Period 4										
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	International Travel										
										$0	
	[redacted]									[redacted]	
	Domestic Travel	Budget Period 5									
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	[redacted]									[redacted]	
	PROJECT TOTAL									$85,317	

Additional Explanation (as needed):

d. Equipment

INSTRUCTIONS - PLEASE READ!!!

1. Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.

2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.

3. During award negotiations, provide a vendor quote for all equipment items over $50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.

4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
				Budget Period 1		
3,4,5	**EXAMPLE!!!** Thermal shock chamber	2	$70,000	$140,000	Vendor Quote - Attached	Reliability testing of PV modules- Task 4.3
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]					
	[redacted]					
	[redacted]					
	[redacted]			[redacted]		
				Budget Period 2		
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]					
	[redacted]					
	[redacted]					
	[redacted]			[redacted]		
				Budget Period 3		
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]					
	[redacted]					
	[redacted]					
	[redacted]			[redacted]		
				Budget Period 4		
	[redacted]	[redacted]	[redacted]	[redacted]		
	[redacted]					
	[redacted]					
	[redacted]					
	[redacted]			[redacted]		
				Budget Period 5		
	[redacted]			[redacted]		
	PROJECT TOTAL			**$2,400,000**		

Additional Explanation (as needed):

e. Supplies

INSTRUCTIONS - PLEASE READ

1. Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Please refer to the applicable Federal regulations in 2 CFR 200 for specific supplies definitions and treatment.

2. List all proposed supplies below, providing a basis of costs (e g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

3. Multiple supply items valued at $5,000 or less used to assemble an equipment item with a value greater than $5,000 with a useful life of more than one year should be included on the equipment tab. If supply items and costs are ambiguous in nature, contact your DOE representative for proper categorization.

4. Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

5. Each budget period is rounded to the nearest dollar

SOPO Task #	General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
				Budget Period 1		
4,6	EXAMPLE Wireless DAS components	10	$360 00	$3,600	Catalog price	For Alpha prototype - Task 2.4
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
				Budget Period 2		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
				Budget Period 3		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
				Budget Period 4		
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
				Budget Period 5		
	[redacted]					
	PROJECT TOTAL			$380,000		

Additional Explanation (as needed):

f. Contractual

INSTRUCTIONS - PLEASE READ!!!

1. The entity completing this form must provide all costs related to sub-recipients, vendors, and FFRDC partners in the applicable boxes below.

2. Sub-recipients (partners, sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) $250,000 or (2) 25% of total award costs. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whether the objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

3. Vendors (including contractors): List all vendors and contractors supplying commercial supplies or services used to support the project. For each Vendor cost with total project costs of $250,000 or more, a Vendor quote must be provided. A vendor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competitive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this information directly to DOE, however project costs must also be provided below.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Sub-Recipient Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
2,4	EXAMPLE!!! XYZ Corp.	Partner to develop optimal lens for Gen 2 product. Cost estimate based on personnel hours.	$48,000	$32,000	$16,000	$8,000	$4,000	$108,000
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

SOPO Task #	Vendor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
6	EXAMPLE!!! ABC Corp.	Vendor for developing robotics to perform lens inspection. Estimate provided by vendor.	$0	$32,900	$86,500	$0	$0	$119,400
	[redacted]	[redacted]	[redacted]					[redacted]
	[redacted]	[redacted]	[redacted]					[redacted]
	[redacted]	[redacted]	[redacted]					[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
								[redacted]
								[redacted]
		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted] 0	$184,100

SOPO Task #	FFRDC Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

	Total Contractual		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$184,100

Additional Explanation (as needed):

g. Construction

PLEASE READ!!!

1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient should be entered under f. Contractual.

2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities: Example Only!!! - Build wind turbine platform

SOPO Task #	General Description	Cost	Basis of Cost	Justification of need
	Budget Period 1			
3	EXAMPLE ONLY!!! Three days of excavation for platform site	$28,000	Engineering estimate	Site must be prepared for construction of platform.
	Budget Period 1 Total	$0		
	Budget Period 2			
	Budget Period 2 Total	$0		
	Budget Period 3			
	Budget Period 3 Total	$0		
	Budget Period 4			
	Budget Period 4 Total	$0		
	Budget Period 5			
	Budget Period 5 Total	$0		
	PROJECT TOTAL	**$0**		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ

1. Other direct costs are direct cost items required for the project which do not fit clearly into other categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).

2. Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

3. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
			Budget Period 1	
5	EXAMPLE Grad student tuition - tasks 1-3	$16,000	Established UCD costs	Support of graduate students working on project
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 2	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 3	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 4	
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]		
			Budget Period 5	
	[redacted]	[redacted]		
	PROJECT TOTAL	$176,000		

Additional Explanation (as needed):

i. Indirect Costs

INSTRUCTIONS - PLEASE READ

1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.

2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.

3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.

4. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total	Explanation of BASE
Provide ONLY Applicable Rates:							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]							
[redacted]						[redacted]	
[redacted]							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$640,581	

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

X An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.

There is not a current, federally approved rate agreement negotiated and available*.

***When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided by your DOE contact, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Additionally, any non-Federal entity that has never received a negotiated indirect cost rate, except for those non-Federal entities described in Appendix VII to Part 200—States and Local Government and Indian Tribe Indirect Cost Proposals, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely.As described in §200.403 Factors affecting allowability of costs, costs must be consistently charged as either indirect or direct costs, but may not be double charged or inconsistently charged as both. If chosen, this methodology once elected must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which the non-Federal entity may apply to do at any time.**

You must provide an explanation (below or in a separate attachment) and show how your indirect cost rate was applied to this budget in order to come up with the indirect costs shown.

Additional Explanation (as needed): *IMPORTANT: Please use this box (or an attachment) to further explain how your total indirect costs were calculated. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total).

Cost Share

PLEASE READ

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.

2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.

3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share tem section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. Vendors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.

5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

6. NOTE A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**

7. NOTE A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**

8. Each budget period is rounded to the nearest dollar.

Recipient Provided Cost Share	Organization/Source	Type (Cash or In Kind)	Cost Share Item	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total
a. Personnel									$0
b. Fringe									$0
c. Travel									$0
d. Equipment									$0
e. Supplies									$0
f. Contractual (NOT subrecipient provided)									$0
g. Construction									$0
h. Other									$0
i. Indirect									$0
Total recipient provided cost share				$0	$0	$0	$0	$0	$0
f. Subrecipient (3rd Party) Provided Cost Share	**Organization/Source**	**Type (Cash or In Kind)**	**Cost Share Item** For simple cost share contributions from a partner provide the detail below; for complex contributions provide a separate budget justification (if required) or a supplementary detailed explanation	**Budget Period 1**	**Budget Period 2**	**Budget Period 3**	**Budget Period 4**	**Budget Period 5**	**Total**
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Sub-Recipient cost share									$0
Total subrecipient provided cost share				**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Contractual Cost Share (Sum of Recipient and Subrecipients)				$0	$0	$0	$0	$0	$0
Grand Total Cost Share All Sources			**Totals**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
			Cost Share Percentage per Budget Period	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	

Total Project Cost: $4,999,213 **Cost Share Percent of Award: 0.0%**

Additional Explanation (as needed):

Applicant Name: Albemarle U.S. Inc. Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. [redacted]				[redacted]	[redacted]		[redacted]
6. Totals				$4,999,213	$0		$4,999,213

Section B - Budget Categories

[redacted]	[redacted]					[redacted]
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
h. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
i. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
j. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
k. **Totals** (sum of 6i-6j)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$4,999,213
7. Program Income						$0

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Applicant Name: Albemarle U.S. Inc. Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. [redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		$4,999,213

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
h. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
i. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
k. **Totals** (sum of 6i-6j)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$4,999,213
7. Program Income						$0

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Budget Narrative

[redacted]

[redacted]

Instructions and Summary

OMB Control Number: 1910-5162
Expiration Date: 04/30/2025

Award Number: 2678
Award Recipient: Albemarle U.S. Inc.

Date of Submission: 7/1/2022
Form submitted by: Virginia Tech (sub-recipient)
(May be award recipient or sub-recipient)

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your EERE contact!
Do not modify this template or any cells or formulas!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. with total project costs.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item wi hin each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, contractors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All o her sections are for the costs of he preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than five budget periods, consult your EERE contact before adding additional budget period rows or columns.
8. ALL budget period cost categories are rounded to the nearest dollar.

BURDEN DISCLOSURE STATEMENT
Public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary

		Federal	Cost Share			Total Costs	Cost Share %	Proposed Budget Period Dates
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]			[redacted]	[redacted]	
	[redacted]	[redacted]	[redacted]			$1,500,000	0.00%	

Section B - Budget Categories

CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Costs	% of Project	Comments (as needed)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]								
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$1,500,000	100.00%	

Additional Explanation (as needed):

a. Personnel

INSTRUCTIONS - PLEASE READ

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and contractors must be included under f. Contractual.
2. All personnel should be identified by position title and not employee name. Enter the amount of time (e.g., hours or % of time) and the base hourly rate and the total direct personnel compensation will automatically calculate. Rate basis (e.g., rate negotiated for each hour worked on the project, labor distribution report, state civil service rates, etc.) must also be identified.
3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e g. fee or profit).
4. If a position and hours are attributed to multiple employees (e.g. Technician working 4000 hours) the number of employees for that position title must be identified.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time (Hrs)	Hourly Rate ($/Hr)	Total Budget Period 1	Time (Hrs)	Hourly Rate ($/Hr)	Total Budget Period 2	Time (Hrs)	Hourly Rate ($/Hr)	Total Budget Period 3	Time (Hrs)	Hourly Rate ($/Hr)	Total Budget Period 4	Time (Hrs)	Hourly Rate ($/Hr)	Total Budget Period 5			
[redacted]																			
[redacted]																			
[redacted]																			
[redacted]																			
[redacted]																			
[redacted]																			
[redacted]																			

b. Fringe Benefits

INSTRUCTIONS - PLEASE READ!!!

1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$115,564

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

x **A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.***

There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification.

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at https://www.energy.gov/eere/funding/downloads/sample-indirect-rate-proposal-and-profit-compliance-audit, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate.

Current fringe rate agreement: https://osp.vt.edu/resources/rates/fringe-benefits.html

c. Travel

INSTRUCTIONS - PLEASE READ

1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.
2. All listed travel must be necessary for performance of the Statement of Project Objectives.
3. Only travel that is directly associated with this award should be included as a direct travel cost to the award.
4. Federal travel regulations are contained within the applicable cost principles for all entity types.
5. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.
6. Columns E, F, G, H, I, J, and K are per trip.
7. The number of days is inclusive of day of departure and day of return.
8. Recipients should enter City and State (or City and Country for International travel) in the Depart from and Destination fields.
9. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
	Domestic Travel				Budget Period 1						
1	EXAMPLE Visit to PV manufacturer			2	2	$250	$500	$100	$80	$2,520	Current GSA rates
0 0	Semi annual project management meeting	Blacksburg, VA	Charlotte, NC	2	2	$129	$0	$216	$69	$1,225	Current GSA rates
[redacted]											
	Budget Period 1 Total									[redacted]	
					Budget Period 2						
[redacted]											
	Budget Period 2 Total									[redacted]	
					Budget Period 3						
[redacted]											
	Budget Period 3 Total									[redacted]	
					Budget Period 4						
[redacted]											
	Budget Period 4 Total									[redacted]	
					Budget Period 5						
[redacted]											
	TOTAL TRAVEL									$36,252	

Additional Explanation (as needed):

Current GSA rates used for per diem and lodging costs. Flight costs based on assessment of current costs. Annual SME conference rotates between Denver and another location each year. Denver used for estimating purposes.

d. Equipment

INSTRUCTIONS - PLEASE READ!!!

1. Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.

2. List all equipment below, providing a basis of cost (e.g. contractor quotes, catalog prices, prior invoices, etc.). Briefly justify items as they apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.

3. During award negotiations, provide a contractor quote for all equipment items over $50,000 in price. If the contractor quote is not an exact price match, provide an explanation in the additional explanation section below. If a contractor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.

4. Each budget period is rounded to the nearest dollar.

SOPO Task #	Equipment Item	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
				Budget Period 1		
3,4,5	**EXAMPLE!!!** Thermal shock chamber	2	$70,000	$140,000	Contractor Quote - Attached	Reliability testing of PV modules- Task 4.3
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 1 Total			[redacted]		
				Budget Period 2		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 2 Total			$0		
				Budget Period 3		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 3 Total			$0		
				Budget Period 4		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 4 Total			$0		
				Budget Period 5		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 5 Total			$0		
	TOTAL EQUIPMENT			**$30,000**		

Additional Explanation (as needed):

e. Supplies

INSTRUCTIONS - PLEASE READ

1. Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Please refer to the applicable Federal regulations in 2 CFR 200 for specific supplies definitions and treatment.

2. List all proposed supplies below, providing a basis of costs (e g. contractor quotes, catalog prices, prior invoices, etc.). Briefly justify the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.

3. Multiple supply items valued at $5,000 or less used to assemble an equipment item with a value greater than $5,000 with a useful life of more than one year should be included on the equipment tab. If supply items and costs are ambiguous in nature, contact your DOE representative for proper categorization.

4. Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.

5. Each budget period is rounded to the nearest dollar

SOPO Task #	General Category of Supplies	Qty	Unit Cost	Total Cost	Basis of Cost	Justification of need
				Budget Period 1		
4,6	EXAMPLE Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 1 Total			[redacted]		
				Budget Period 2		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 2 Total			[redacted]		
				Budget Period 3		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 3 Total			[redacted]		
				Budget Period 4		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	Budget Period 4 Total			[redacted]		
				Budget Period 5		
	Budget Period 5 Total			[redacted]		
	TOTAL SUPPLIES			$48,000		

Additional Explanation (as needed):

f. Contractual

INSTRUCTIONS - PLEASE READ

1. The entity completing this form must provide all costs related to sub-recipients, contractors, and FFRDC partners in the applicable boxes below.

2. Sub-recipients (partners sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) $250 000 or (2) 25% of total award costs. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of this form. The budget totals on the sub-recipient's forms must match the sub-recipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whether the objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

3. Contractors (including contractors): List all contractors supplying commercial supplies or services used to support the project. For each Contractor cost with total project costs of $250,000 or more, a Contractor quote must be provided. A contractor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competitive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. contractor status.

4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this information directly to DOE, however project costs must also be provided below.

5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Sub-Recipient Name/Organization	Sub-Recipient Unique Entity Identifier (UEI)	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
2,4	EXAMPLE XYZ Corp.		Partner to develop optimal lens for Gen 2 product. Cost estimate based on personnel hours.	$48,000	$32,000	$16,000			$96,000
									$0
									$0
									$0
									$0
									$0
									$0
			Sub-total	$0	$0	$0	$0	$0	$0

SOPO Task #	Contractor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
6	EXAMPLE ABC Corp.	Contractor for developing robotics to perform lens inspection. Estimate provided by contractor.	$32,900	$86,500				$119,400
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]
								[redacted]
								[redacted]
								[redacted]
		Sub-total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$68,000

SOPO Task #	FFRDC Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

TOTAL CONTRACTUAL	[redacted]	[redacted]	[redacted]	[redacted]	$0	$68,000

Additional Explanation (as needed):

g. Construction

PLEASE READ!!!

1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a contractor or subrecipient should be entered under f. Contractual.

2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.

3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities: Example Only!!! - Build wind turbine platform

SOPO Task #	General Description	Cost	Basis of Cost	Justification of need
Budget Period 1				
3	EXAMPLE ONLY!!! Three days of excavation for platform site	$28,000	Engineering estimate	Site must be prepared for construction of platform.
	Budget Period 1 Total	$0		
Budget Period 2				
	Budget Period 2 Total	$0		
Budget Period 3				
	Budget Period 3 Total	$0		
Budget Period 4				
	Budget Period 4 Total	$0		
Budget Period 5				
	Budget Period 5 Total	$0		
	TOTAL CONSTRUCTION	**$0**		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ!!!

1. Other direct costs are direct cost items required for the project which do not fit clearly into other categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).

2. Basis of cost are items such as vendor quotes, prior purchases of similar or l ke items, published price list, etc.

3. Each budget period is rounded to the nearest dollar.

SOPO Task #	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
			Budget Period 1	
5	**EXAMPLE!!!** Grad student tuition - tasks 1-3	$16,000	Established UCD costs	Support of graduate students working on project
[redacted]	[redacted]	[redacted]		[redacted]
	Budget Period 1 Total	$34,036		
			Budget Period 2	
[redacted]	[redacted]	[redacted]		[redacted]
	Budget Period 2 Total	$35,057		
			Budget Period 3	
[redacted]	[redacted]	[redacted]		[redacted]
	Budget Period 3 Total	$36,108		
			Budget Period 4	
[redacted]	[redacted]	[redacted]		[redacted]
	Budget Period 4 Total	$37,192		
			Budget Period 5	
	Budget Period 5 Total	$0		
	TOTAL OTHER DIRECT COSTS	**$142,393**		

Additional Explanation (as needed):

i. Indirect Costs

INSTRUCTIONS - PLEASE READ

1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.

2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.

3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.

4. NOTE A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim resulting costs as a Cost Share contribution, nor can the Recipient claim "unrecovered indirect costs" as a Cost Share contribution.** Neither of these costs can be reflected as actual indirect cost rates realized by the organization, and therefore are not verifiable in the Recipient records as required by Federal Regulation (§200.306(b)(1)).

5. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total	Explanation of BASE
Provide ONLY Applicable Rates:							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		*MTDC Method*
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]							
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	
[redacted]						[redacted]	
[redacted]						[redacted]	
[redacted]						[redacted]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$497,852	

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

X An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application and will be provided electronically to the Contracting Officer for this project.
The organization does not have a current, federally approved indirect cost rate agreement and has provided an indirect rate proposal in support of the proposed costs.
This organization has elected to apply a 10% de minimis rate in accordance with 2 CFR 200.414(f).

Provide an explanation of how your indirect cost rate was applied.

*Additional Explanation (as needed): *IMPORTANT: Please use this box (or an attachment) to further explain how your total indirect costs were calculated. If the total indirect costs are a cumulative amount of more than one calculation or rate application, the explanation and calculations should identify all rates used, along with the base they were applied to (and how the base was derived), and a total for each (along with grand total).*

Current Indirect Rate Agreement: https://osp.vt.edu/content/dam/osp_vt_edu/rates/fy22-24-fa-predetermined-rate-agreement.pdf

Cost Share

PLEASE READ!!!

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.

2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Contractors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.

3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share Item section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. Contractors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.

5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

6. NOTE: A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**

7. NOTE: A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**

8. Each budget period is rounded to the nearest dollar.

Organization/Source	Type (Cash or In Kind)	Cost Share Item	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Project Cost Share
ABC Company **EXAMPLE!!!**	Cash	Project partner ABC Company will provide 20 PV modules for product development at the price of $680 per module	$13,600					**$13,600**
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		TOTAL COST SHARE	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
		Cost Share Percentage per Budget Period	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	

Total Project Cost: $1,500,000 **Cost Share Percent of Award: 0.0%**

Additional Explanation (as needed):

Applicant Name: Albemarle U.S. Inc. Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. Budget Period 1				$381,137	$0		$381,137
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		$1,500,000

Section B - Budget Categories

[redacted]	[redacted]					
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
h. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
j. Indirect Charges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
k. **Totals** (sum of 6i-6j)	[redacted]	[redacted]	[redacted]	[redacted]	$0	$1,500,000
7. Program Income						$0

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Prescribed by OMB Circular A-102

[redacted]

Applicant Name: Albemarle U.S. Inc. Award Number: 2678

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. [redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		[redacted]
[redacted]				[redacted]	[redacted]		$1,500,000

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a. [redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
h. Other	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
i. Total Direct Charges (sum of 6a-6h)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
j. Indirect Charges	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
k. **Totals** (sum of 6i-6j)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	$1,500,000
7. Program Income						$0

Previous Edition Usable

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Prescribed by OMB Circular A-102

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DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

OMB Number: 4040-0013
Expiration Date: 02/28/2025

1. * Type of Federal Action:
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

2. * Status of Federal Action:
- [x] a. bid/offer/application
- [ ] b. initial award
- [ ] c. post-award

3. * Report Type:
- [x] a. initial filing
- [ ] b. material change

4. Name and Address of Reporting Entity:

[x] Prime [ ] SubAwardee

*Name: Albemarle U.S. Inc

*Street 1: 348 Holiday Inn Dr. Street 2:

*City: Kings Mountain State: NC: North Carolina Zip: 28086

Congressional District, if known: NC 5

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency:
Department of Energy

7. * Federal Program Name/Description:
Bipartisan Infrastructure Law Battery Materials Processing and Battery Manufacturing Funding Opportunity

CFDA Number, if applicable:

8. Federal Action Number, *if known*:
DE-FOA-0002678

9. Award Amount, *if known*:
$ 150,000,000.00

10. a. Name and Address of Lobbying Registrant:

Prefix: Ms. *First Name: Barbara Middle Name: A.

*Last Name: Little Suffix:

*Street 1: 700 2nd St., NE Street 2: Suite 8200

*City: Washington State: DC: District of Columbia Zip: 20002

b. Individual Performing Services (including address if different from No. 10a)

Prefix: *First Name: Barbara Middle Name: A.

*Last Name: Little Suffix:

*Street 1: Street 2:

*City: State: Zip:

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance w[redacted]ired pursuant to 31 U.S.C. 1352. This information will be reported to the Cong[redacted]ed disclosure shall be subject to a civil penalty of not less than $10,000 [redacted]

* Signature: [redacted]

*Name: Prefix: Ms. *First Name: Barbara Middle Name: A.

*Last Name: Little Suffix:

Title: Government Affairs Telephone No.: 301-332-4823 Date: 06/07/2022

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DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

OMB Number: 4040-0013
Expiration Date: 02/28/2025

1. * Type of Federal Action:
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

2. * Status of Federal Action:
- [ ] a. bid/offer/application
- [x] b. initial award
- [ ] c. post-award

3. * Report Type:
- [x] a. initial filing
- [ ] b. material change

4. Name and Address of Reporting Entity:

[ ] Prime [x] Subawardee Tier if known: [ ]

*Name: Cleveland Community College

*Street 1: 137 South Post Road Street 2:

*City: Shelby State: NC: North Carolina Zip: 28152

Congressional District, if known: NC-10

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

*Name: Albemarle Corporation, Inc.

*Street 1: 349 Holiday Inn Drive Street 2:

*City: Kings Mountain State: NC: North Carolina Zip: 28086

Congressional District, if known: NC-10

6. * Federal Department/Agency:

Department of Energy

7. * Federal Program Name/Description:

Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing

CFDA Number, if applicable:

8. Federal Action Number, *if known:*

9. Award Amount, *if known:*

$

10. a. Name and Address of Lobbying Registrant:

Prefix: *First Name: N/A Middle Name:

*Last Name: N/A Suffix:

*Street 1: Street 2:

*City: State: Zip:

b. Individual Performing Services (including address if different from No. 10a)

Prefix: *First Name: N/A Middle Name:

*Last Name: N/A Suffix:

*Street 1: Street 2:

*City: State: Zip:

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $1[redacted]

*Signat[redacted]

*Name: *First Name: Dr. Middle Name:

Last Name: Barat Suffix:

Title: President Telephone No.: 704.669.1001 Date: 06/29/2022

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DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

OMB Number: 4040-0013
Expiration Date: 02/28/2025

1. * Type of Federal Action:
- [ ] a. contract
- [x] b. grant
- [ ] c. cooperative agreement
- [ ] d. loan
- [ ] e. loan guarantee
- [ ] f. loan insurance

2. * Status of Federal Action:
- [x] a. bid/offer/application
- [ ] b. initial award
- [ ] c. post-award

3. * Report Type:
- [x] a. initial filing
- [ ] b. material change

4. Name and Address of Reporting Entity:

[ ] Prime [x] Sub-Awardee Tier if known: [ ]

* Name: NC State University
* Street 1: Admin Services III, Suite 240 Street 2: 2601 Wolf Village Way
* City: Raleigh State: NC: North Carolina Zip: 27607
Congressional District, if known: NC-002

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

* Name: Albemarle Corporation
* Street 1: 384 Holiday Inn Rd. Street 2:
* City: Kings Mountain State: NC: North Carolina Zip: 28086
Congressional District, if known: NC-005

6. * Federal Department/Agency:
Department of Energy

7. * Federal Program Name/Description:
Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing
CFDA Number, if applicable: 81.086

8. Federal Action Number, *if known:*
DE-FOA-0002678

9. Award Amount, *if known:*
$ 1,500,000.00

10. a. Name and Address of Lobbying Registrant:

Prefix: * First Name: N/A Middle Name:
* Last Name: N/A Suffix:
* Street 1: Street 2:
* City: State: Zip:

b. Individual Performing Services (including address if different from No. 10a)

Prefix: * First Name: N/A Middle Name:
* Last Name: N/A Suffix:
* Street 1: Street 2:
* City: State: Zip:

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

* Signature: Laurinda Perez, AOR Digitally signed by Laurinda Perez, AOR Date: 2022.06.29 16:41:22 -04'00'

*Name: Prefix: Mrs. * First Name: Laurinda Middle Name:
* Last Name: Perez Suffix:

Title: Authorized Organizational Representative Telephone No.: 919-515-2444 Date: 06/29/2022

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August 2005

U.S. DEPARTMENT OF ENERGY

FINANCIAL ASSISTANCE CERTIFICATIONS AND ASSURANCES FOR USE WITH SF 424

Applicant: Virginia Polytechnic Institute and State University

Solicitation No.: **DE-FOA-0002678**

The following certifications and assurances must be completed and submitted with each application for financial assistance. The name of the person responsible for making the certifications and assurances must be typed in the signature block on the forms.

Certifications Regarding Lobbying; Debarment, Suspension and Other Responsibility Matters; and Drug Free Workplace Requirements

DOE F 1600.5, Assurance of Compliance Nondiscrimination in Federally Assisted Programs

CERTIFICATIONS REGARDING LOBBYING; DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS; AND DRUG FREE WORKPLACE REQUIREMENTS

Applicants should refer to the regulations cited below to determine the certification to which they are required to attest. Applicants should also review the instructions for certification included in the regulations before completing this form. Signature of this form provides for compliance with certification requirements under 10 CFR Part 601 "New Restrictions on Lobbying," 10 CFR Part 606 "Governmentwide Debarment and Suspension (Nonprocurement) and 10 CFR Part 607 "Governmentwide Requirements for Drug-Free Workplace (Grants)." The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Energy determines to award the covered transaction, grant, or cooperative agreement.

1. LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

2. ADDITIONAL LOBBYING REPRESENTATION

Applicant organizations which are described in section 501(c)(4) of the Internal Revenue Code of 1986 and engage in lobbying activities after December 31, 1995, are not eligible for the receipt of Federal funds constituting an award, grant, or loan.

As set forth in section 3 of the Lobbying Disclosure Act of 1995 as amended, (2 U.S.C. 1602), lobbying activities are defined broadly to include, among other thins, contacts on behalf of an organization with specified employees of the Executive Branch and Congress with regard to Federal legislative, regulatory, and program administrative matters.

Check the appropriate block:

The applicant is an organization described in section 501(c)(4) of the Internal Revenue Code of 1986? ☑ Yes ☐ No

If you checked "Yes" above, check the appropriate block:

The applicant represents that after December 31, 1995 it ☐ has ☑ has not engaged in any lobbying activities as defined in the Lobbying Disclosure Act of 1995, as amended.

3. DEBARMENT, SUSPENSION, AND OTHER RESPONSIBILITY MATTERS

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust

statutes or commission of embezzlement, theft, forgery, bribery; falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

4. DRUG-FREE WORKPLACE

This certification is required by the Drug-Free Workplace Act of 1988 (Pub.L. 100-690, Title V, Subtitle D) and is implemented through additions to the Debarment and Suspension regulations, published in the Federal Register on January 31, 1989, and May 25, 1990.

ALTERNATE I (GRANTEES OTHER THAN INDIVIDUALS)

(1) The grantee certifies that it will or will continue to provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing an ongoing drug-free awareness program to inform employees about:

(1) The dangers of drug abuse in the workplace;
(2) The grantee's policy of maintaining a drug-free workplace;
(3) Any available drug counseling, rehabilitation, and employee assistance programs; and
(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will:

(1) Abide by the terms of the statement; and
(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace not later than five calendar days after such conviction;

(e) Notifying the agency, in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted:

(1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug- free workplace through implementation of paragraphs (a),(b),(c),(d),(e), and (f).

(2) The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance: (Street address, city, county, state, zip code)

Holden Hall
445 Old Turner Street
Blacksburg, Virginia 24061

☐ Check if there are workplaces on file that are not identified here.

ALTERNATE II (GRANTEES WHO ARE INDIVIDUALS)

(1) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant.

(2) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to every grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

5. SIGNATURE

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above certifications.

Name of Applicant: Virginia Polytechnic Institute and State University

Printed Name and Title of Authorized Representative: Associate Vice President for Research and Innovation, Sponsored Programs

Trudy M Riley

Digitally signed by Trudy M Riley
Date: 2022.06.28 13:04:21 -04'00'

SIGN HERE

SIGNATURE

6/27/2022
DATE

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U.S. Department of Energy

Assurance of Compliance

Nondiscrimination in Federally Assisted Programs

OMB Control No.
1910-0400

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Virginia Polytechnic Institute and State University (Hereinafter called the "Applicant")

HEREBY AGREES to comply with Title VI of the Civil Rights Act of 1964 (Pub. L.88-352), Section 16 of the Federal Energy Administration Act of 1974 (Pub.L.93-275), Section 401 of the Energy Reorganization Act of 1974 (Pub.L.93-438), Title IX of the Education Amendments of 1972, as amended (Pub.L.92-318, Pub.L.93-568, and Pub.L.94-482), Section 504 of the Rehabilitation Act of 1973 (Pub.L.93-112), the Age Discrimination Act of 1975 (Pub.L.94-135), Title VIII of the Civil Rights Act of 1968 (Pub.L.90-284), the Department of Energy Organization Act of 1977 (Pub.L.95-91), and the Energy Conservation and Production Act of 1976, as amended (Pub.L.94-385) and Title 10, Code of Federal Regulations, Part 1040. In accordance with the above laws and regulations issued pursuant thereto, the Applicant agrees to assure that no person in the United States shall, on the ground of race, color, national origin, sex, age, or disability, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity in which the Applicant receives Federal assistance from the Department of Energy.

Applicability and Period of Obligation

In the case of any service, financial aid, covered employment, equipment, property, or structure provided, leased, or improved with Federal assistance extended to the Applicant by the Department of Energy, this assurance obligates the Applicant for the period during which Federal assistance is extended. In the case of any transfer of such service, financial aid, equipment, property, or structure, this assurance obligates the transferee for the period during which Federal assistance is extended. If any personal property is so provided, this assurance obligates the Applicant for the period during which it retains ownership or possession of the property. In all other cases, this assurance obligates the Applicant for the period during which the Federal assistance is extended to the Applicant by the Department of Energy.

Employment Practices

Where a primary objective of the Federal assistance is to provide employment or where the Applicant's employment practices affect the delivery of services in programs or activities resulting from Federal assistance extended by the Department, the Applicant agrees not to discriminate on the ground of race, color, national origin, sex, age, or disability, in its employment practices. Such employment practices may include, but are not limited to, recruitment advertising, hiring, layoff or termination, promotion, demotion, transfer, rates of pay, training and participation in upward mobility programs; or other forms of compensation and use of facilities.

Subrecipient Assurance

The Applicant shall require any individual, organization, or other entity with whom it subcontracts, subgrants, or subleases for the purpose of providing any service, financial aid, equipment, property, or structure to comply with laws cited above. To this end, the subrecipient shall be required to sign a written assurance form, however, the obligation or both recipient and subrecipient to ensure compliance is not relieved by the collection or submission of written assurance forms.

Data Collection and Access to Records

The Applicant agrees to compile and maintain information pertaining to programs or activities developed as a result of the Applicant's receipt of Federal assistance from the Department of Energy. Such information shall include, but is not limited to, the following: (1) the manner in which services are or will be provided and related data necessary for determining whether any persons are or will be denied such services on the basis of prohibited discrimination; (2) the population eligible to be served by race, color, national origin, sex, age, and disability; (3) data regarding covered employment including use or planned use of bilingual public contact employees serving beneficiaries of the program where necessary to permit effective participation by beneficiaries unable to speak or understand English; (4) the location of existing or proposed facilities connected with the program and related information adequate for determining whether the location has or will have the effect of unnecessarily denying access to any person on the basis of prohibited discrimination; (5) the present or proposed membership by race, color, national origin, sex, age, and disability, in any planning or advisory body which is an integral part of the program; and (6) any additional written data determined by the Department of Energy to be relevant to its obligation to assure compliance by recipients with laws cited in the first paragraph of this assurance.

DOE F 1600.5
(06-94)
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OMB Control No.
1910-0400

The Applicant agrees to submit requested data to the Department of Energy regarding programs and activities developed by the Applicant from the use of Federal assistance funds extended by the Department of Energy, Facilities of the Applicant (including the physical plants, building, or other structures) and all records, books, accounts, and other sources of information pertinent to the Applicant's compliance with the civil rights laws shall be made available for inspection during normal business hours on request of an officer or employee of the Department of Energy specifically authorized to make such inspections. Instructions in this regard will be provided by the Director, Office of Civil Rights, U.S. Department of Energy.

This assurance is given in consideration of and for the purpose of obtaining any and all Federal grants, loans, contracts (excluding procurement contracts), property, discounts or other Federal assistance extended after the date hereto, to the Applicants by the Department of Energy, including installment payments on account after such data of application for Federal assistance which are approved before such date. The Applicant recognizes and agrees that such Federal assistance will be extended in reliance upon the representation and agreements made in this assurance and that the United States shall have the right to seek judicial enforcement of this assurance. This assurance is binding on the Applicant, the successors, transferees, and assignees, as well as the person(s) whose signature appears below and who are authorized to sign this assurance on behalf of the Applicant.

Applicant Certification

The Applicant certifies that it has complied, or that, within 90 days of the date of the grant, it will comply with all applicable requirements of 10 C.F.R. § 1040.5 (a copy will be furnished to the Applicant upon written request to DOE).

Designated Responsible Employee

Trudy M. Riley, Associate Vice President for Research and Innovation, Sponsored Programs
Name and Title (Printed to Typed)

(540)231-5281
Telephone Number

Trudy M Riley Digitally signed by Trudy M Riley Date: 2022.06.28 13:04:47 -04'00' SIGN HERE
Signature

6/27/2022
Date

Virginia Polytechnic Institute and State University
Applicant's Name

(540)231-5281
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300 Turner Street NW, Suite 4200
Blacksburg, Virginia 24061
Address:

6/27/2022
Date

Authorized Official:
President, Chief Executive Officer
or Authorized Designee

Trudy M. Riley, Associate Vice President for Research and Innovation, Sponsored Programs
Name and Title (Printed to Typed)

(540)231-5281
Telephone Number

Trudy M Riley Digitally signed by Trudy M Riley Date: 2022.06.28 13:05:07 -04'00' SIGN HERE
Signature

6/27/2022
Date

Project Title: Kings Mountain Lithium Materials Processing Plant

Technical Volume
Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing
Funding Opportunity Announcement (FOA) Number: DE-FOA-0002678
FOA Type: Initial
CFDA: 81.086

FOA Area of Interest [1]: Commercial-scale Production Plants for Domestic Separation of Critical Cathode Battery Materials from Domestic Feedstocks

Proposer:

Technical Point of Contact:
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Email:
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Names of Team Organizations:
Albemarle U.S. Inc (ALB); Kent Masters, CEO; Karen Narwold, CAO; Eric Norris, President Lithium; Ellen Lenny-Pessagno, Global VP Government & Community Affairs

Cleveland Community College (CCC); Jason Hurst, President; Tony Fogleman, VP of Economic and Workforce Development; Amy Dulin, Dean of Workforce Development

[redacted]

Performance Period: 48 Months

Confidentiality Statement: *Pages [17-19] of this document may contain trade secrets, confidential, proprietary, or privileged information that are exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the government. The government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source. Markings are in [[ ]].*

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1. Project Overview

1.1. Background

Albemarle is the leading producer of lithium materials globally, with extraction and refining operations located in the US, Chile, Australia, and refining capacity in China. We own and operate some of the largest lithium assets in the world and have a number of world-class resources in our portfolio, producing battery grade lithium carbonate and lithium hydroxide, as well as specialty lithium chemicals and derivatives for a wide range of markets. Our Silver Peak, NV lithium operation is the only domestic source of feedstock and has been in operation since the 1960s. The Silver Peak facility produces lithium carbonate from brine and also supplies feedstock for our lithium hydroxide refinery operations located in North Carolina.

In addition to our manufacturing operations, we also house an advanced research and development facility located in Kings Mountain, NC. The technical R&D center focuses on developing and proving the next generation of battery components and chemistries to fully support the adoption of the electric vehicle (EV) industry. With a team of approximately 200 staff, the Kings Mountain center also provides advanced processing support for lithium concentrating and refining operations globally.

Our Talison and MARBL joint ventures in Australia are two of the largest operating hard rock spodumene mines globally. Talison has successfully operated the Greenbushes mine for decades and provides Albemarle with the operational insights and experience required to successfully restart our Kings Mountain Project. Through the MARBL JV, we restarted the Wodgina lithium mine and concentrator facility this year. The Wodgina concentrator facility is very similar that planned for the Kings Mountain Project. We will utilize the learnings and talent from both of these assets to ensure the Kings Mountain Project is designed to the highest standards for safety, community, and operating performance. Also of note, before suspending operations in the 1980s, Kings Mountain was a globally significant producer of lithium from the 1950s to 1980s and still contains one of the few known hard rock lithium deposits in the United States of America.

1.2. Project Goal

Albemarle plans to construct an advanced, modern-day commercial scale processing facility to produce lithium concentrate in Kings Mountain, NC alongside the reopening of the former Kings Mountain mine site. Once built, the modern processing facility will be the only functioning facility of this kind in the United States to be built in the last 30+ years.

The new facility will allow Albemarle to process 8,000 tons per day (2.7 million tons per annum) of spodumene ore resulting in 1,150-1,200 tons per day (~350,000 tons per annum) of battery chemical grade concentrate grading 5.5% – 6% Li_2O. Once operational, the Kings Mountain plant will provide enough lithium to support the manufacturing of 750,000 electric vehicles per year in the U.S. market. Upon completion, the Kings Mountain Project would serve as a cornerstone for the lithium battery supply chain for US vehicle manufacturers such as Rivian and Tesla.

ALB will deploy advanced technology at the Project that will result in decreased energy consumption, less water consumption, and less disruption of natural resources at the Kings Mountain site. As a consequence, the Project will achieve DOE's battery electrification objectives while limiting carbon dioxide emissions, natural resource consumption and disturbance.

[redacted]

[redacted]

Achieving the desired throughput and concentrate grade are considered critical success factors for the project in order to meet EV demand. Other success factors include increasing global gender diversity and racial diversity within senior-level management roles and improving supplier diversity.

1.3. DOE Impact

The lithium battery supply chain begins with lithium mining, beneficiation, and value-added processing. The Department of Energy's National Blueprint for Batteries seeks to increase domestic lithium production. [redacted]

DOE funding of the Kings Mountain beneficiation (minerals processing) plant to process the ore from this domestic resource is critical to expedite the build-out of the lithium supply chain and demonstrate U.S. government support for this cornerstone of the domestic lithium supply chain, [redacted]

1.4. Equity Plan: Quality Jobs and Community Benefits

Establishing a beneficial relationship with the Kings Mountain community is an integral part of this project and will be undertaken as a priority focus. Additional outreach and partnerships will extend the economic benefits throughout the mid-Atlantic region as well. At the local level, various community engagements have already begun and will continue throughout the project duration and into the operational phase. Quarterly community forums, a community working group, and a storefront in the town of Kings Mountain have already commenced. The goal of these activities is to incorporate community input into the evaluation and design of the project at an early stage. Focal areas include environmental, transportation, infrastructure, and plant design/planning. Feedback from the community will be incorporated into the project goal of providing a carbon neutral operation and an increase in energy resilience for the Kings Mountain community. Local organizations already engaged or planning to engage with the Albemarle team include the Gateway Trail Association, Chamber of Commerce, Rotary Club, Main Street Advisory Board, and local school district, among others.

Albemarle estimates the project could generate more than 200 construction jobs and upwards of 200 full-time highly-skilled jobs once in operation. In order to ensure the maximum employment of a local North Carolina workforce, Albemarle intends to partner with Cleveland Community College to provide a STEM training/retraining program for mineral plant operators. This tailored program will provide the plant operations team with a suitably trained staff comprised of local community members. When evaluating community engagement, job creation, and Diversity, Equity, and Inclusion (DE&I) metrics, Albemarle identified a number of disadvantaged communities ("DACs") within the local, county, and regional areas, including African-American, Hispanic, and Native American communities. The resulting economic contributions from Albemarle's expenditures (direct, indirect, and induced) will benefit these communities in a significant way. In 2019, Households in Cleveland County, NC, which is 29.5% minority population, had a median annual income of $42,247, which was 36% below the median annual income of $65,712 across the entire United States, and well below their neighboring counties and the State of North Carolina. Hiring for the lithium materials plant will target Cleveland County residents, specifically diverse community members, [redacted]

2. Technical Description, Innovation, and Impact

2.1. Relevance and Outcomes

[redacted]

The plant will process 8,000 tons per day (2.7 million tons per annum) of spodumene ore and produce 1,150-1,200 tons per day (~350,000 tons per annum) of battery chemical grade concentrate grading 5.5-6% Li_2O [redacted]

[redacted] The Albemarle facilities will serve as a cornerstone for a U.S. lithium battery supply chain supporting over 750,000 electric vehicles produced in the U.S. by Albemarle's U.S. automotive manufacturers [redacted].

In so doing, the Kings Mountain processing facility will facilitate the Department of Energy's goal to fund facilities that will expand U.S. battery-grade cathode precursor manufacturing capacity - [redacted]

2.2. Feasibility

The overall geology of the associated Kings Mountain mining project is well-understood as a result of recent exploration efforts (2018) as well as historic documentation and understanding of the previous mining operation. Lithium mineralization is primarily associated with spodumene phenocrysts within pegmatite dykes, which are locally controlled or cut by both ductile and brittle structural features. As a result, the geometry of the spodumene pegmatite bodies is locally very complex, but well understood. Albemarle completed an exploration drilling campaign in 2018 to gather further information and update resource modelling efforts, as well as provide samples for metallurgical testing programs related to process flowsheet design. Information gathered from the 2018 resource drilling campaign and historical reconciliations serve as a critical foundation for designing an efficient modern-day processing plant to process the Kings Mountain ore. Total [redacted]

Fi [redacted]

Production at the Kings Mountain site began in the 1940s for tin, and in the 1950s diverted to spodumene as the main product [redacted]) before operations ceased in the late 1980s. Records from this period provide insights into the behavior and characteristics of the ore body within the concentration process, including areas of plant design, performance, and spodumene production [redacted]

[redacted]

[redacted]

To align with updated practices and modern standards, Albemarle recently conducted further metallurgical studies and flow sheet design test work on the Kings Mountain project. The technical feasibility of the spodumene concentrator process was demonstrated in a metallurgical testwork pilot plant campaign, and engineering assessment completed during 2017-2018 as

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

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[redacted]

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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[redacted]

[redacted]

[redacted]

To support the detailed design and execution of the mineral concentration plant, Albemarle will employ project team members with experience in similar operations, including Albemarle's Australian joint ventures

Albemarle has also commenced recruitment in order to fully staff a lithium resources growth platform within the existing Lithium Technology organization to provide entry level and experienced positions to execute minerals processing evaluations and projects. To this end, we are also working on a range of workforce development initiatives with key community stakeholders in the Kings Mountain area and around the greater North Carolina region to stimulate development of a well-trained, diverse workforce. For instance, we plan to partner with North Carolina Agricultural and Technology State University (NC A&T), a historically black College & University (HBCU) to develop scholarships, internships and entry-level engineering jobs suitable for work at the Kings Mountain plant. Albemarle will also partner with Cleveland Community College (CCC) in Shelby, NC to provide a STEM training / retraining program for minerals processing plant operators. This program will include courses in the fundamentals of mineral processing, flotation and surface, and mineral processing plant operation. These efforts, in addition to workforce-focused partnerships with North Carolina State University's Asheville Minerals Research Laboratory and the Virgina Polytechnic Institute will ensure the facility has a qualified, diverse pipeline of talent to meet the community and facility's needs.

2.3. Innovation and Impacts

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted].

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3. Workplan and Market Transformation Plan

3.1. Project Objectives

To construct and commission a modern-day commercial-scale lithium ore processing facility that will supply spodumene concentrate for use in electric vehicle battery manufacturing facilities located within the United States.

Project Goals
To deliver a facility that will:

- use domestically sourced spodumene ore
- produce a sustainably sourced lithium concentrate
- generate significant economic benefits to the local and regional communities
- align and adhere to the highest environmental and social standards, and
- create the cornerstone for a US-based lithium battery supply chain

3.2 Technical Scope Summary

The project will be conducted in four budget periods, each twelve months in duration, per Department of Energy guidance and consistent with the Albemarle Project Process:

Budget Period 1 (Q1-Q4): Evaluate/Select – FEL1/2
Lithium materials plant feasibility study (FS), including metallurgical testwork, plant design alternatives, and plant basic engineering.
Initiate early project goals with university partners working to address workforce training and development initiatives.
Equity Deliverables – Initiate social benchmark study, community working groups, community advisory committee, and quarterly community town halls, monthly community listening sessions, and open a downtown storefront.
Go/No Go Decision – Approval of Design Option and Associated Cost and Schedule.

Budget Period 2 (Q5-Q8): Define – FEL3
Lithium materials processing plant detailed process design, detailed/final civil, electrical and mechanical engineering, and long lead time equipment orders.
Equity Deliverables – Complete workforce training development plan and advance workforce recruiting efforts.
Initiate community shared value projects identified in the benchmark study and supported by community working groups.
Identify and select Tier 1 diverse suppliers.
Go/No Go Decision – Approval of Final Investment Decision.

Budget Period 3 (Q9-Q12): Execute 1
Go/No Go Decision – Approval of Final Permits.
Equipment fabrication and site infrastructure / civil work.
Equity Deliverables – [redacted].
Complete community shared value projects.
[redacted]

Budget Period 4 (Q13-Q16): Execute 2
Site infrastructure, facilities construction, equipment installation, commissioning, and startup.
Equity Deliverables – [redacted]

3.3. WBS and Task Description Summary

In order to meet the project objectives, Albemarle will perform the following tasks:

Task 1.1 – Metallurgical Testwork Program:

Subtask 1.1.1 – The recipient will complete a confirmatory metallurgical testwork program [redacted]

Task 1.2 – Trade-Off Studies:

[redacted]

Task 1.3 – FS Engineering:

Subtask 1.3.1 – The recipient will complete equipment sizing and configuration based on the base case process design

Subtask 1.3.2 – The recipient will complete process plant layout, basic civil and infrastructure design, basic electrical, control and automation design, and material takeoffs

Subtask 1.3.3 – The recipient will complete preliminary bidding/procurement to complete a +/-15% capital cost estimate
Subtask 1.3.4 – The recipient will complete an operating cost estimate
Subtask 1.3.5 – The recipient will complete a final feasibility study report

Task 1.4 – Equity Plan Implementation:
Subtask 1.4.1 – Initiate social benchmark study
Subtask 1.4.2 – Hold community working groups; create a community advisory committee
Subtask 1.4.3 – Begin hosting quarterly town halls community and monthly listening sessions
Subtask 1.4.4 – Open downtown storefront

Task 2.1 – Detailed Engineering:
Subtask 2.1.1 – The recipient will complete a detailed process engineering design package
Subtask 2.1.2 – The recipient will complete a detailed civil, structural & architectural design package
Subtask 2.1.3 – The recipient will complete a detailed mechanical design package
Subtask 2.1.4 – The recipient will complete a detailed electrical/instrumentation package
Subtask 2.1.5 – The recipient will complete a detailed infrastructure engineering package

Task 2.2 – [redacted]

Task 2.3 – Construction Bids:
Subtask 2.3.1 – The recipient will bid the civil/concrete work for the concentrator
Subtask 2.3.2 – The recipient will bid the civil/concrete work for tailings storage
Subtask 2.3.3 – The recipient will bid the civil/concrete work for the infrastructure
Subtask 2.3.4 – The recipient will bid the concentrator plant general contractor construction package (steel, buildings, pipe, E&I)
Subtask 2.3.5 – The recipient will bid the tailings plant general contractor construction package (steel, buildings, pipe, E&I)
Subtask 2.3.6 – The recipient will bid the site infrastructure general contractor construction package (steel, buildings, pipe, E&I)
Subtask 2.3.7 – The recipient will complete the definitive project cost estimate

Task 2.4 – Implementation of Equity Plan:

Subtask 2.4.1 – Complete workforce training development plan and advance workforce recruiting efforts

Subtask 2.4.2 – Initiate community shared value projects identified in the benchmark study

Subtask 2.4.3 – Identify and select Tier 1 diverse suppliers

Task 3.1 – Engineering Issued for Construction:

Subtask 3.1.1 – The recipient will issue a detailed civil, structural & architectural design package for construction

Subtask 3.1.2 – The recipient will issue a detailed mechanical design package for construction

Subtask 3.1.3 – The recipient will issue a detailed electrical/instrumentation package for construction

Subtask 3.1.4 – The recipient will issue a detailed infrastructure engineering package for construction

Task 3.2 – [redacted]

Task 3.3 – Plant Civil Works:

Subtask 2.3.1 – The recipient will complete construction of the civil work for the concentrator

Subtask 2.3.2 – The recipient will complete construction of the civil work for tailings storage

Subtask 2.3.3 – The recipient will complete construction of the civil work for the infrastructure

Task 3.4 – Implementation of Equity Plan:

Subtask 3.4.1 – Continue workforce training and hiring initiative

[redacted]

Task 4.1 – [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.4. Milestone Summary

The following table 3.4.1 summarizes expected project milestones and associated time periods.

Table 3.4.1 Project Milestones

Milestone Number	Milestone Description	Milestone Verification Process	Type	Period	Due Date
M1.1	Base case selected	Review Report and presentation	Milestone	P1	Q2
M1.2	Feasibility study complete	Review Report and presentation	Milestone	P1	Q4
M1.3	Open Downtown Storefront	Visit/inspection	Milestone	P1	Q4
M1.4	Gate 2 IPR and Approval	Review signed Stage Gate Docs	Go/No-Go	P1	Q4
M2.1	Detailed process design complete	Review detailed design package	Milestone	P2	Q5
M2.2	All long lead item orders placed	Review equipment contracts & POs	Milestone	P2	Q6
M2.3	Detailed Civil, Structural, Arch, Mech, Elec, Inst design complete	Review detailed design packages	Milestone	P2	Q8
M2.4	Tier 1 Diverse supplier selection	Review suppliers	Milestone	P2	Q8
M2.5	Gate 3 IPR and Approval	Review signed Stage Gate Docs	Go/No-Go	P2	Q8
M3.1	Permits Received	Permit document	Go/No-Go	P3	Q10
M3.2	Complete community shared value projects	Inspect new projects	Milestone	P3	Q10
M3.3	Groundbreaking	Attend ceremony	Milestone	P3	Q10
M3.4	Factory Acceptance Testing for Long Lead Equipment	Completed FAT forms, inspection	Milestone	P3	Q12
M3.5	Concentrator plant civil works complete	Inspection, QA forms	Milestone	P3	Q12
M4.1	Site Infrastructure Services Operational	Inspection, QA forms	Milestone	P4	Q14
M4.2	[redacted]	Signed contract	Milestone	P4	Q14
M4.3	Concentrator Plant Mechanical Completion	Inspection, QA forms	Milestone	P4	Q15
M4.4	Tailings Storage Mechanical Completion	Inspection, QA forms	Milestone	P4	Q15
M4.5	[redacted]	Economic study	Milestone	P4	Q15
M4.6	First Production Shipment	COA/Bill of Lading	Milestone	P4	Q16

Note: Award decision expected October 2022

3.5. Go/No-Go Decision Points

Albemarle has a comprehensive project process (known internally as Albemarle Project Process or APP). The APP was created to enable a fit-for-purpose project delivery system tailored to the Albemarle business capable of handling large projects but remaining scalable for smaller projects as well. Objectives of the APP are to strengthen governance, increase project predictability, and improve the effectiveness of project teams with a clear and robust framework project participants. The APP includes a multi-stage process with defined decision gates and readiness assurance processes at each gate. Albemarle has adopted this disciplined project management methodology for projects to be planned and managed within a five-stage framework, using recommended deliverables and clearly defined decision gates to advance from one stage to the next. The five stages can be divided into two critical phases of the project lifecycle – project framing and definition (finding the right project), and project execution and delivery (doing the project right). The first three stages are all about defining the right project and the latter two are geared towards executing the right project. A simplified overview of the process can be seen in Figure 3.5.1 below. At each decision gate, the project team has four options: proceed, hold, recycle (or iterate), and cancel.

In the case of the Kings Mountain project, each stage aligns to a 12-month budget period for a total of four periods (see sections below for additional information and SOPO submission document).

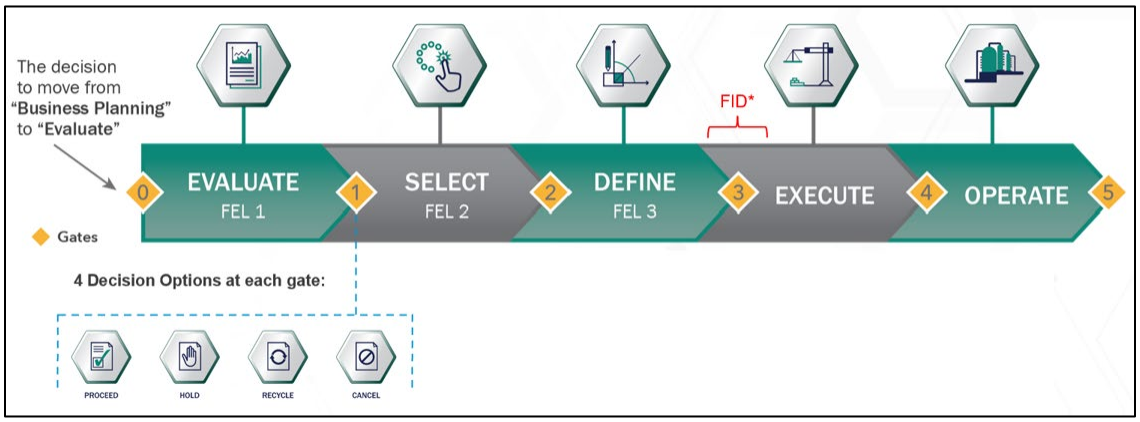

Figure 3.5.1 Overview of Albemarle Project Process Stages and Decision Gates

Gates 1 – 3 require a project readiness review before proceeding to the next stage, and Gate 3 is the earliest point at which a Final Investment Decision can be made. Three steps occur at the end of every stage to ensure consistency amongst the projects regarding Go/No Go decision points: Peer Review, Decision Review, and Final Stage Approval. A summary of these key steps are included in Figure 3.5.2.

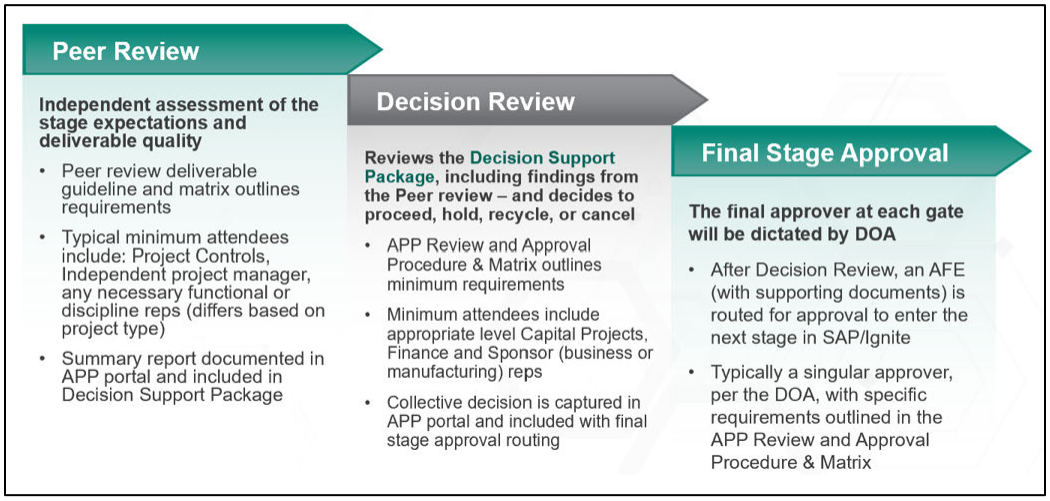

Figure 3.5.2 Key Steps for Go/No Go Decision points at each APP stage

The APP also employs a Decision Review Group (DRG) for each project to provide the endorsement and approval of key project decisions, including the stage gates, but also other course charting decisions. Members of the DRG typically include functional and business leaders whose endorsement and approval are required for commitment. By constructing the DRG in this manner, the APP ensures consistent dialogue amongst the project team and decision makers throughout the project (see Figure 3.5.3 as reference).

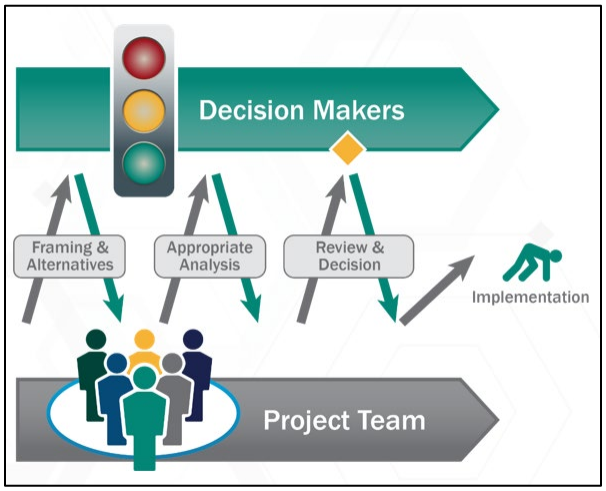

Figure 3.5.3 Decision Dialogue Process

For each respective stage gate, specific technical and business criteria are used to evaluate the Go/No Go decision and compiled in a Decision Support Package (DSP). The DSP contains key information for the DRG and Fig 3.5.4 outlines major decision areas. Information contained in each DSP also includes business/commercial issues, technical issues, Focus Decisions requiring attention, risks and associated mitigation, plans for the next stage, funding and schedule for the next stage, project staffing, economic summary, and results from project peer reviews.

EXPENSE → CAPITAL →

BUSINESS PLANNING FEL 0	0 EVALUATE FEL 1	1 SELECT FEL 2	2 DEFINE FEL 3	3 EXECUTE	4 OPERATE 5
Objectives	• Establish likely commerciality of the opportunity • Identify development options	• Evaluate a robust range of development options with a robust evaluation model • Select option with highest value	• Fully define selected option • Develop definitive execution plan, cost estimate, schedule and forecast for Sanction	• Complete design, procurement, fabrication, construction, and pre-commissioning activities • Commence production	• Monitor operating performance vs. Sanction case • Evaluate and optimize performance
Major Decisions	• What options will be considered in Select • How those options will be evaluated • Proceed to Select	• Choose the best development option • Align on the execution strategy and scope to be accomplished in Define • Proceed to Define	• Agree on the project performance forecast (cost, schedule, and production) and execution strategy • Order Long Leads • Proceed to Execute	• Production start-up • Handover to Operations	• Project review and closure
Level of Effort (Typical)	0.5% - 1% TIC	1% - 2% TIC	2% - 5% TIC	90%+ TIC *40% - 55% ENG & Procurement* *35% - 45% Construction*	1% - 2% TIC
Estimate & Schedule Quality	Class 5 (-20% to +100%) Level 1 – Milestone	Class 4 (-15% to +50%) Level 2 – activities & interfaces	Class 3 (-10% to +30%) <$50M Class 2 (-5% to +15%) >$50M Level 3 – resource-loaded	Class 2 (-5% to +15%) Level 4 – all deliverables fully integrated	
Level of Engineering	Preliminary, Conceptual Engineering is completed with various options.	Engineering studies are completed to evaluate and select preferred option.	Basic Engineering is completed (IFD) and the scope is frozen.	Detailed Engineering is completed and Issued for Construction (IFC).	Complete as-built documentation & publish final project job data books.
Project Management	Preliminary Project Execution, HSSE, Quality, Controls, Procurement, Risk Management, and Communication plans are developed.	Project Plans are updated for preferred option with more detail. Preliminary commissioning and startup plans are developed.	All Project plans are finalized with sufficient detail to take the project through Execute and Operate stages. PEER Review conducted.	Project Plans are strictly adhered to throughout project execution. Project controls are in place to manage and control deviation.	Project is completed per the scope and closed out.

VISIT THE APP PORTAL TO ACCESS ADDITIONAL INFORMATION, TOOLS & TEMPLATES

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Figure 3.5.4 Albemarle APP Matrix of major decisions, estimates, and other key criteria

Specifically, for the Kings Mountain project, the two major stage gate decision points must contain:

Gate 2 IPR and Approval (Budget Period 1) – must include a signed decision support package and a signed decision readiness document which detail the selection of the best development option, an execution strategy and scope for the Define stage, and a commitment to proceed to Define, including approval of the cost and schedule for Define, which may also include long-lead items for the concentrator.

Gate 3 IPR and Approval (Budget Period 2) – must include a signed decision support package and a signed decision readiness document with detailed approval of project performance forecasts (cost, schedule, and production) and execution strategy, orders for long lead equipment, and signed Final Investment Decision (FID) for the concentrator.

Budget Period 3 Mine Operating Permit – must include a valid mining permit for the Kings Mountain spodumene mine and concentrator plant. Go/No Go decision point revolves around the Mine Permit application. Only with a successful award of all federal, state, and local permits will the project be allowed to proceed. An awarding of federal permits is seen as the critical juncture, and further work into Budget Period 3 will be reliant on the outcomes of these permit applications.

3.6. End of Project Goal

Once completed, the Kings Mountain project will be a critical enabler for US-based processing of lithium raw materials into downstream battery manufacturing facilities. Albemarle's end goals for the Kings Mountain project are as follows:

- Construct and commission an advanced, modern-day lithium ore processing facility – the only functioning facility of this kind in the United States to be built in the last 30+ years
- Install capacity to process spodumene ore at a rate of 8,000 tons per day (2.7 million tons per year), resulting in 350,000 tons per annum of lithium concentrate for downstream battery manufacturing facilities
- To produce chemical grade spodumene concentrate with chemical characteristics of 5.5 – 6% Li_2O, ≤ 1% Fe_2O_3, and moisture content ≤ 8%

3.7.1 Project Schedule

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

3.8. Buy American Requirements for Infrastructure Projects

The Kings Mountain Project will not involve the construction, alteration, and/or repair of public infrastructure in the United States as defined by this funding opportunity announcement, applicable statutes, or guidance. Furthermore, the Kings Mountain Project will not be publicly-owned nor serve a public function. Rather, the Project will be privately owned and utilized for private use. As a consequence, the Kings Mountain project does not constitute applicable infrastructure work for purposes of the Funding Opportunity Announcement.

[redacted]

Requirements to support the project include power, rail, water, and transport enhancements (roadways, entrances, etc.), which all associated with construction of this private use facility at Kings Mountain.

While the Kings Mountain Project does not constitute public infrastructure for purposes of Buy American preferences, Albemarle plans to procure as much U.S. manufactured processing equipment as feasible, and utilize American fabricators and contractors whenever possible. To that end, Albemarle [redacted] to identify potential vendors for the major equipment to determine if any items were to require a waiver - even though the project does not constitute infrastructure for purposes as defined under the funding announcement and relevant statute, guidance and regulations, as the domestic fabrication of specialized mineral processing equipment has experienced declining capacity. [redacted]

3.9. Project Management

3.9.1. Organization and Approach to Managing the Work

The Albemarle Project Organizational Strategy guidelines will be followed regarding project organization and approach to managing the work. The organizational strategy is influenced by three key factors (1) the essential role of Albemarle as Owner; (2) Albemarle's organizational capability; and (3) contracting and procurement strategy. As Owner, Albemarle's obligations include (1) Leadership; (2) Engineering and Technical Definition; (3) Interface Management; and (4) Performance Management.

All key project positions will be filled by competent Albemarle staff. To improve the effectiveness of the project organization, the Albemarle Project Process formalizes a set of key project roles and assigns them responsibility for development of project deliverables according to their discipline and level of expertise. The roles for the Kings Mountain Lithium Materials processing plant project are defined in the next section.

3.9.2. Roles of Project Team Members

The following below Table 3.9.2.1 summarizes twelve key Albemarle roles and responsibilities in relation to the Kings Mountain Project.

Table 3.9.2.1 Project Team Member Roles and Responsibilities

Role	Key Responsibility
Project Director	Oversee evaluation, design, and execution of the project – safety, community, technical, environmental, and regulatory accountability
Principal Investigator (Group Metallurgist)	Oversees the design and evaluation of the spodumene concentrator, processing flow sheet, metallurgical testwork, and specifications of plant equipment
Community Affairs Manager	Lead engagement with local community members, elected officials, and partnership organizations
Community Affairs Coordinator	Responsible for organizing and capturing community feedback sessions, concerns, and opportunity selection for social and economic development
Project Manager	Integrated planning activities across all stakeholder groups, vendor management, and project control functions
Project Procurement Manager	Provide site-based support with logistics, scheduling, and procurement functions
Project Engineer, Integration	Coordinate project deliverables; support project objectives through governance and control; manage stakeholder approvals
Environmental, Health & Safety Manager	Coordination of background studies and data collection supporting permit applications and regulatory review; safety program coordination
Development Manager	Develop new and innovative methods to repurpose byproducts from processing operations
VP – Culture	Develop and drive strategic direction and ensure alignment with Albemarle core values
Supplier Diversity Coordinator	Review and approve diverse supplier's qualification and certification for the project
Human Resources Business Partner	Provide ongoing support for talent development and recruitment

3.9.3 Critical Handoffs/Interdependencies among Project Team Members

Project execution generates a number of internal and external interfaces between the project team, internal project resources, and external contractors. The **Project Director** ensures the Albemarle Project Interface Management plan guidelines will be followed so that all the project team members involved in project execution understand their roles as well as the roles of all other team members. Key points of the interface plan developed for the project include (1) identification of interfaces; (2) use of a LACTI chart to assign interface roles; (3) define responsibilities for the PMT, PMC, EPC, Construction Contractor and other key interfaces; and (4) track and report interface issues and risks. Albemarle has also developed a matrix for department responsibility and accountability through the APP process (see Figure 3.9.3.1 below).

Element	Engineering	Business	Finance	Operations	Maintenance	Process (R&T)	HS & E	Procurement	Legal	Public Affairs	HR
HSE & Corporate Social Responsibility	●	●				●	●			●	
Resource Characterization	●	●				●					
Commercial & Economics	●	●	●					●	●	●	
Engineering, Technology & Construction	●	●		●	●	●	●				
Commissioning & Operational Readiness	●	●		●	●	●					
Integration & Communication	●	●	●	●	●	●	●	●	●	●	●
Project Controls	●	●	●								
Contracting & Procurement	●	●	●					●	●		
Organizational Capability & Leadership	●	●								●	●

Figure 3.9.3.1 Accountability and interdependent matrix for Kings Mountain project

3.9.4 Technical and Management Aspects of the Management Plan

The **Principal Investigator** ensures the execution of the project technical scope of work. A detailed investigation plan and scope of work has been agreed upon with each subrecipient performing technical evaluations.

The **Project Manager** ensures the Albemarle Project Controls Management Plan guidelines will be followed regarding all activities involved in directing cost estimating, cost management, schedule management, and cost & schedule risk analysis over the course of the project life cycle. The discipline of Project Controls ensures projects are planned and delivered on time and on budget through use of clear, data-driven monitoring systems. Key points of the controls plan developed for this project will include (1) an assessment of project needs based on size, complexity, and risks; (2) engagement of subject matter experts and a review of lessons learned; (3) a check that recommendations are “fit for purpose”; and (4) use of Albemarle standard budgeting and schedule tools to continuously monitor the project. This will include use of the Albemarle SAP system’s projects module which includes a complete WBS identifying all project work to be completed and organizing it in a logical framework of components according to how it will be performed and by whom.

3.9.5 Approach to Handling Project Changes & Risk Management

The Albemarle Project Process Project Change Management guidelines will be followed regarding proposed project changes. The **Project Engineer, Integration**, will ensure changes to approved scope generally have a detrimental impact that must be weighed against the benefit; therefore, the Project Change Management process includes a procedure to determine if the benefit outweighs the detriment in order to approve a change. Key points of the change management plan developed for this project will include: (1) project change management process must interface with both the Contractor's Change Management process and that of the Business Operations group; (2) critical, highly impactful changes should be addressed as soon as they are identified, no wait for the monthly change review board meeting; (3) adopt a "no-change" mindset, especially after P&IDs and HAZOPs are frozen; (4) maintain rigorous evaluation procedures, carefully monitor the cumulative impact of changes over time and avoid complacency; and (5) update the change management log regularly to keep track of all project changes.

Key project risks are expected to include Project permitting, Project procurement, and Project community affairs. The Project includes an **Environmental, Health & Safety Manager**, a **Development Manager**, a **Procurement Manager**, a **Community Affairs Manager**, and a **Community Affairs Coordinator** to help manage those risks. The Albemarle Project Risk Management guidelines will be followed regarding project risk management planning. A project risk management plan will be developed which includes: (1) risk identification; (2) risk analysis; (3) risk response planning (mitigation); and (4) risk monitoring & control. Key points of the risk management plant developed for this project will include: (1) assess project risk management needs based on project size and complexity; (2) enlist support of project manager to elevate the importance of risk management activities across the entire project team; (3) engage subject matter experts to identify project specific risks (e.g. new technology) in addition to generic project risks; and (4) ensure that risk management is carried out as an evergreen activity and does not become a "check the box" activity.

The Risk Management plan also includes procedures to ensure Albemarle recruits and retains a highly qualified and diverse workforce. This plan relies on execution of the Albemarle U.S. Inc. Equity Plan document, as summarized earlier in Section 1.4, and is supported by the **Project Human Resources Business Partner, the Supplier Diversity Coordinator, and the VP-Culture.**

3.9.6 Approach to Quality Assurance/Control

The Project Director will have a robust support staff, including a Project Manager and a Project Integration Engineer, responsible for balancing competing project constraints including project scope, quality, schedule, budget, resources, and risk. The support staff will be responsible for collection and dissemination of weekly project updates and action trackers within the Albemarle Project process. A key quality check will be the Stage Gate IPR and approval process.

3.9.7 Communication Maintenance Among Project Team Members

Communication is a critical aspect of large, complex engineering and construction projects – especially amongst the core projects team. Albemarle utilizes the latest in software technology to assist and coordinate team activities as well as circulate documents and information for review. Within the Albemarle tenant, a dedicated Teams page with subchannels for each respective work area has already been commissioned (see Figure 3.9.7.1). This site is also linked to a Sharepoint area dedicated for document storage and organization exclusively for the project. Using these tools, the project team has a secure and defined repository for files, messages, and communicating with each other.

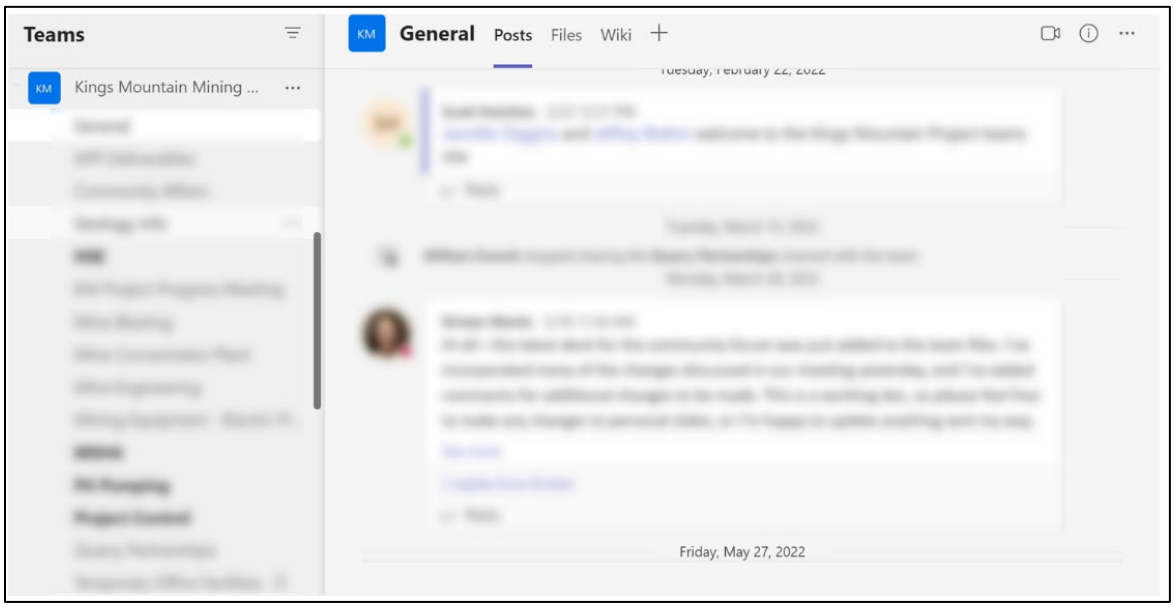

Figure 3.9.7.1 Albemarle dedicated Teams page, subchannels, and communications for the Kings Mountain Project

3.10 Market Transformation Plan

3.10.1 Target Market

[redacted] To reduce the current dependence on the Asia-centralized industrial base (see Table 3.10.1.1), Albemarle will work together with the company's existing U.S. Auto OEMs customers and future strategic U.S. Auto OEM customers to address a portion of this gap related to refined lithium.

[redacted]

3.10.2 Competition

[redacted]

3.10.3 Distribution Channels

[redacted]

[redacted]

[redacted]

3.10.4 Barriers and Commercialization

[redacted] DOE funding to support this project will help overcome the capital cost barrier and improve the US ability to level the playing field with Chinese state-supported competitors. In addition, periodic price variations of lithium materials have resulted in new lithium projects being shelved or put on hold in the recent past. DOE funding would help lower the investment risk in this market.

Permitting and financing issues are traditional obstacles that prevent forward progress in the domestic lithium production industry. However, Albemarle's process management sophistication, commitment to environmental stewardship and financial maturity puts the project in a position to overcome these traditional obstacles and achieve commercialization goals. These goals can be achieved through deployment of Albemarle's Project Risk Management guidelines and plan, which will ensure appropriate resources, subject matter expertise and management capital will be applied to reduce risk that might derail other projects.

[redacted]

3.10.5 Legal / Regulatory Requirements

Albemarle is currently entering a prefeasibility study to fully evaluate the potential environmental and social impacts (positive and negative) of the Project. These studies will include comprehensive evaluation of baseline conditions at the Project site, and thorough environmental monitoring programs to include characterization of existing air, water, soil, noise, biological, and visual resources. These site characterization programs are described in detail in the Environmental Volume included within the application. A previous **Environmental Assessment**[9] completed by the Department of Energy for a subset area of the proposed Kings Mountain Project found no significant environmental effects.

At this time, it is not expected that any significant degradation of environmental resources will occur because project development is being prioritized, where possible, to brownfield areas that have been previously disturbed by historical mining and lithium processing operations. However, final determination of the potential impacts will be required and is planned to be completed via the prefeasibility and feasibility assessments underway.

4. Technical Qualifications and Resources

Albemarle Key Project Team Personnel Qualifications

Albemarle has assembled a team of highly qualified mining and minerals resource professionals from various aspects within the industry, including leading industry organizations. Together, the team brings significant years of experience to the Kings Mountain project. Similarly, Albemarle project partners are experienced professionals with multi-decade tenure within our key partner organizations – community workforce development, minerals research, and higher education.

[redacted]

[redacted]

[redacted]

Key Sub-recipient Personnel Qualifications

[redacted]

[redacted]

[redacted]

[redacted]

Relevant Project Experience

Albemarle has substantial experience developing and commercializing large-scale lithium projects around the world, and in the United States. We will apply this experience to successfully implement the Workplan and Market Transformation Plan described herein. In relevant part, this experience includes operation and development of our Silver Peak, NV lithium operation, which as described above in Section 1.1, is the only domestic source of lithium feedstock in the United States and has been in operation since the 1960s.

Equipment and Facilities

The following facilities will be used by the project team for study and evaluation of the Kings Mountain project.

Albemarle U.S. Inc

Technical Research and Development Center in Kings Mountain, NC. This facility includes research laboratories, core storage and sample preparation areas, and office space for teams to perform modelling and design functions regarding the processing plant flowsheet.

NCSU-MRL

The Minerals Research Laboratory (MRL) facilities contain a large inventory of mineral processing research equipment, including: hydraulic separators, de-sliming and particle size separators, spiral concentrators, pilot plant flotation cells, cyclones, kiln and dryer, and numerous bench scale testing equipment.

Virginia Tech

Facilities located on the Blacksburg, VA campus include fundamental and applied process chemistry laboratories, a process development laboratory, and bench scale process equipment, such as, crushing, grinding, screening, and flotation apparatuses. A pilot plant facility is also located off campus at the Plantation Road research area.

Estimated Time Commitments

Albemarle project team members will be wholly dedicated to the project, or, if in a support role, 25% or more dedicated to the project. Subrecipients will devote time to the project at various points within the defined budget periods as specific work components are required. Graduate students sponsored by the project will devote research time outside of studies, estimated at greater than 50%.

Export of Recovered or Critical Materials

Albemarle does not expect the involvement of any foreign entities in the Kings Mountain project. Feedstock for the processing operation will be sourced from the Kings Mountain Mine and all spodumene is anticipated to be consumed domestically.

Albemarle commits to not using battery material supplies by or originating from a foreign entity of concern, as defined in 42 U.S.C. 18741 (a)(5).

Services Provided by DOE/NNSA FFRDCs

Albemarle does not expect technical services to be provided by DOE/NNSA FFRDCs.

Investigation Plan

Albemarle intends to lead and guide the overall project study and evaluation, as well as construction and commissioning of the Kings Mountain Processing facility. In support of the design work, key personnel mentioned above from associated University and Community partnerships will be required to perform work on the project. Henry Walqui of Albemarle is the lead investigator, supported by staff from MRL, as well as various other consultants and engineering companies not associated with the grant submission. Dr. Walqui will oversee each area and the specific process design and research incorporated into the project flow sheet design.

[redacted]

- [redacted]
- [redacted]
- [redacted]

[redacted]

- [redacted]

[redacted]

Albemarle, along with each subrecipient, will organize a steering committee (SteerCo) to oversee each associated work stream. This steering committee will provide direction on scientific and technical items as well as managing the integration of the research into final project design. The SteerCo will also oversee publication arrangements (if warranted) as well as intellectual property issues should they arise, and in accordance with industry/academia standard practice.

5. References

[redacted]

Reference 7. Benchmark Minerals, 2021

Reference 8. Bloomberg, March 2022

Reference 9. DOE/EA-1715, September 2010

OMB Number: 4040-0004
Expiration Date: 03/31/2012

Application for Federal Assistance SF-424

*** 1. Type of Submission:**
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

*** 2. Type of Application:**
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: Completed by Grants.gov upon submission.

4. Applicant Identifier: 1587

5a. Federal Entity Identifier: GN23KTEVJXP7

* 5b. Federal Award Identifier: 2678-1587

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Albemarle U.S. Inc

* b. Employer/Taxpayer Identification Number (EIN/TIN): [redacted]

* c. Organizational DUNS: 00-232-9456

d. Address:

* Street1: 4250 Congress Street, Suite 900

Street2:

* City: Charlotte

County/Parish:

* State: NC

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: 28209

e. Organizational Unit:

Department Name: Lithium Resources

Division Name: Lithium

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

* First Name: Alexander

Middle Name:

* Last Name: Thompson

Suffix:

Title: Project Director

Organizational Affiliation: Albemarle Corporation

* Telephone Number: [redacted]

Fax Number:

* Email: [redacted]

Application for Federal Assistance SF-424

9. Type of Applicant 1: Select Applicant Type:

Public Company, NYSE (ALB)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Department of Energy

11. Catalog of Federal Domestic Assistance Number:

CFDA Title:

*** 12. Funding Opportunity Number:**

DE-FOA-0002678

* Title:

Bipartisan Infrastructure Law Battery Materials Processing and Battery Manufacturing Funding Opportunity

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Kings Mountain Lithium Materials Processing Plant

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: 9
* b. Program/Project: 5

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 10/01/2022
* b. End Date: 10/01/2026

18. Estimated Funding ($):

* a. Federal	149,658,312
* b. Applicant	225,866,921
* c. State	0
* d. Local	0
* e. Other	0
* f. Program Income	0
* g. TOTAL	375,525,233

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

- [ ] a. This application was made available to the State under the Executive Order 12372 Process for review on _____.
- [ ] b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- [x] c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

- [ ] Yes
- [x] No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

- [x] ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix:	
* First Name:	Alexander
Middle Name:	
* Last Name:	Thompson
Suffix:	
* Title:	Project Director
* Telephone Number:	[redacted]
Fax Number:	
* Email:	[redacted]
* Signature of Authorized Representative:	Completed by Grants.gov upon submission.
* Date Signed:	Completed by Grants.gov upon submission.