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Department of Energy, National Energy Technology Laboratory (NETL)

Pursuant to:

**Office of Manufacturing and Energy Supply Chains and Office of Energy Efficiency
and Renewable Energy**

Grant Opportunity (DE-FOA-0002678)

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Date:

April 2023



Environmental Assessment

**APEX – INTEGRATED SUSTAINABLE
BATTERY ACTIVE MATERIAL AND
PRECURSOR PRODUCTION PLANT
PROJECT**

National Environmental Policy Act (NEPA) Compliance Cover Sheet

Proposed Action:

Ascend Elements proposes to construct an industrial scale facility (Project Apex) for production of sustainable, low-cost, precursor cathode materials by integrating the separation of critical cathode materials from spent lithium-ion batteries (LiBs) with the production of both precursor cathode active materials (pCAM) and metal salts, to support domestic production of cathode active materials (CAM) for U.S. electric vehicle battery production. Once operational, the facility would produce enough material to supply over 250,000 electric vehicles annually. Located within Commerce Industrial Park II in Hopkinsville, Christian County, KY, the Project Apex would consist of multiple manufacturing buildings, office space, and a warehouse, with extensive support infrastructure including a rail spur, unloading/loading stations, and holding tanks. The facility would consist of 17 buildings covering approximately 700,000 square feet. Project Apex is anticipated to generate approximately 4.7 billion dollars in total net-positive economic impact during its three-year construction period and over the first 10 years of operation while enabling sourcing of critical battery materials from within the U.S., reducing dependence on foreign suppliers. The proposed project would create approximately 420 full-time equivalent (FTE) jobs with benefits. Ascend Elements also plans to offer community benefits such as workforce training and education, affordable childcare, and affordable transportation initiatives to raise equity levels in the greater Hopkinsville community. Together, these efforts would help revitalize the workforce and economy of the greater Hopkinsville community while significantly strengthening the U.S. LiB industry.

Type of Statement: Draft Environmental Assessment

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Abstract:

Project Apex would be constructed on adjacent lots comprising 147 total acres within Commerce Industrial Park II, and would be made operational on an expedited, 36-month schedule, with site improvements and construction completed within the first 17 months. During the construction period, equipment would be specified, procured, and installed, and production lines would be tested and commissioned for commercial operation. The proposed buildings, roadways and other infrastructure would cover approximately 54 acres of Lot 4 and 56 acres of Lot 3; approximately 74 percent of the proposed project area.

The environmental analysis identified that the most notable changes to result from the proposed action would occur in the following areas: aesthetics and land use, rail and vehicular traffic, water consumption and wastewater generation, and generation of regulated wastes, with net-positive impacts to local socioeconomic conditions and greenhouse gas reduction.

Public Participation:

DOE encourages public participation in the NEPA process. This Draft Environmental Assessment (EA) is being released for public review and comment. The public is invited to provide oral, written, or e-mail comments on this Draft EA to DOE by the close of the comment period on **May 22, 2023**. Copies of the Draft EA are also being distributed to cognizant Federal and State agencies and Tribal Nations. Comments received by the close of the comment period would be considered in preparing a final Environmental Assessment for the proposed Ascend Elements action. Comments received after the end of the comment period will be addressed if possible. It is important to clearly articulate comments and include commenter's name, address, organization, with the reference "Ascend Elements Draft EA Comments". Individual names and addresses (including email) received as part of comment documents normally are considered part of the public record. Persons wishing to withhold names, addresses, or other identifying information from the public record must state this request prominently at the beginning of their submitted comments. DOE will honor this request to the extent allowed by law. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be included in the public record and open to public inspection in their entirety. The Draft EA will also be available on the National Energy Technology Laboratory (NETL) website at <https://netl.doe.gov/node/6939>.

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Acronyms and Abbreviations

AJD	approved jurisdictional determination
AOI	area of interest
BIL	Bipartisan Infrastructure Law
BMP	best management practice
CAA	Clean Air Act
CAM	cathode active material
CE	Categorical Exclusion
CEJST	Climate and Economic Justice Screening Tool
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
DAC	disadvantaged communities
DOE	United States Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
EV	electric vehicle
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FOA	Funding Opportunity Announcement
FONSI	Finding of No Significant Impact
FTE	full-time equivalent
FY	fiscal year
GHG	greenhouse gas
gpd	gallons per day
HEV	hybrid-electric vehicle
HWEA	Hopkinsville Water Environment Authority
KPDES	Kentucky Pollutant Discharge Elimination System
kV	kilovolt
kWh/yr	kilowatt hours per year

KY SHPO	Kentucky Historic Preservation Officer
LiB	lithium-ion batteries
MESC	Manufacturing and Energy Supply Chains (DOE)
mgd	million gallons per day
mtpy	metric tons per year
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NETL	National Energy Technology Laboratory
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NO _x	nitrogen oxide
NRHP	National Register of Historic Places
O ₃	ozone
OMB	Office of Management and Budget (US)
Pb	lead
pCAM	precursor cathode active materials
PM	particulate matter
PM ₁₀	particulate matter 10 microns or less
PM _{2.5}	particulate matter 2.5 microns or less
POTW	publicly owned treatment works
ppm	parts per million
ROD	Record of Decision
SF ₆	sulfur hexafluoride
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SWPPP	Stormwater Pollution Prevention Plan
TVA	Tennessee Valley Authority
ug/kg	microgram per kilogram
ug/m ³	microgram per cubic meter
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

1. Introduction & Purpose and Need

1.1 Introduction

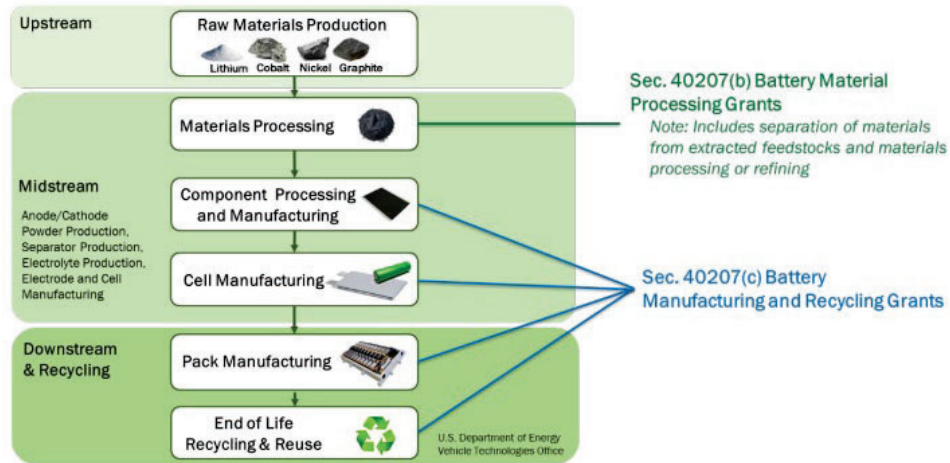
The National Energy Technology Laboratory (NETL) of the United States Department of Energy (DOE) prepared this Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) to examine potential environmental impacts associated with construction and operations of a proposed industrial scale facility (Project Apex) for production of sustainable, low-cost, precursor cathode materials to support domestic production of cathode active materials (CAM) for U.S. electric vehicle battery production. This EA provides site-specific details of the Proposed Action and addresses potential impacts of proposed construction and operations across 18 resource areas.

The Biden Administration has presented an agenda to upgrade and modernize infrastructure, address climate change, and build a clean and equitable energy economy, putting the United States on a path to achieve net-zero emissions economy-wide by no later than 2050 (Executive Order 14008, 2021). The DOE is committed to advancing frontiers of science and engineering, catalyzing clean energy jobs through research, development, demonstration, and deployment, and supporting environmental justice and inclusion of disadvantaged communities (DACs).

Batteries are a critical element of the ongoing transition to an energy economy, particularly for electric vehicle (EV) production. The U.S. Bureau of Labor Statistics (2023) notes that electric vehicles (EVs) have already increased to 4.6% of the U.S. vehicle market as of 2021, with an additional increase of up to 50% forecast by 2030. Growing demand for EVs and stationary storage alone are projected to increase the size of the lithium battery market five to ten-fold by the end of the decade. The National Blueprint for Lithium Batteries, a report developed by the Federal Consortium for Advanced Batteries, lays out five critical goals and key actions to guide federal agency collaboration to secure the nation's long-term economic competitiveness and create good-paying jobs for American workers, while supporting the Biden Administration's decarbonization goals (FCAB, 2021).

The high-capacity battery supply chain consists of five main steps including: (1) raw material production, (2) materials processing including material refinement and processing, (3) battery material /component manufacturing and cell fabrication, (4) battery pack and end use product manufacturing, and (5) battery end-of-life and recycling. Figure 1 shows how these five steps relate to the BIL investments in the battery supply chain. DOE issued a Funding Opportunity Announcement (FOA) to fund selected battery supply chain projects within these five categories.

Figure 1. High-Capacity Battery Supply Chain Steps



Source: DOE Vehicle Technologies Office, 2022

1.2 Background

The Office of Manufacturing and Energy Supply Chains, in collaboration with the Office of Energy Efficiency and Renewable Energy, has issued DE-FOA-0002678, under which FOA-awarded projects will be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act (USA 2021), also more commonly known as the Bipartisan Infrastructure Law (BIL).

DOE prepared an environmental synopsis to evaluate and compare potential environmental impacts for each proposal it deemed to be within the competitive range from proposals received in response to the FOA. The Department used the synopsis to evaluate appreciable differences in potential environmental impacts from those proposals. The synopsis included: (1) a brief description of background information for the Funding Opportunity area of interest, (2) a general description of the proposals DOE received in response to the Funding Opportunity Announcement and deemed to be within the competitive range, (3) a summary of the assessment approach DOE used in the initial environmental review to evaluate potential environmental impacts associated with the proposals, and (4) a summary of environmental impacts that focused on potential differences among the proposals. Appendix 1 contains a copy of the environmental synopsis developed for DE-FOA-0002678 proposal submissions.

DOE initially selected 21 projects under twelve topic areas of interest and provided cost-shared funding for project definition activities; all of the projects are subject to completion of project-specific NEPA reviews. DE-FOA-0002678 supports new, retrofitted, and expanded commercial-scale domestic facilities for battery materials production, materials processing, and battery recycling and manufacturing demonstrations.

The applications reviewed under this FOA were selected for negotiations in October 2022. Twelve topic areas of interest (AOIs) were included in the FOA and each AOI outlined project objectives that were specific to that AOI. The twelve AOIs were separated according to BIL

sections 40207(b)(3)(A) and 40207(c)(3)(A): AOIs 1–3 and 6–11 were directed to commercial level projects. AOIs 4, 5, and 12 were directed to demonstration level projects. DOE received 178 eligible applications in the twelve Areas of Interest.

Table 1. Areas of Interest under DE-FOA-0002678

<u>Areas of Interest</u>	<u>Title</u>
Battery Material Processing Grants pursuant to Section 40207(b)(3)(A)	
1	Commercial-scale Production Plants for Domestic Separation of Critical Cathode Battery Materials from Domestic Feedstocks
2	Commercial-scale Domestic Production of Battery-Grade Graphite from Synthetic and Natural Feedstocks
3	Commercial-scale Domestic Separation and Production of Battery-grade Precursor Materials (Open Topic)
4	Demonstrations of Domestic Separation and Production of Battery-grade Materials from Unconventional Domestic Sources
5	Demonstrations of Innovative Separation Processing of Battery Materials Open Topic
Battery Component Manufacturing and Recycling Grants pursuant to Section 40207(c)(3)(A)	
6	Commercial-scale Domestic Battery Cell Manufacturing
7	Commercial-scale Domestic Battery Cathode Manufacturing
8	Commercial-scale Domestic Battery Separator Manufacturing
9	Commercial-scale Domestic Next Generation Silicon Anode Active Materials and Electrodes
10	Commercial-scale Domestic Battery Component Manufacturing Open Topic
11	Commercial-scale Domestic Battery Recycling and End-of Life Infrastructure
12	Domestic Battery Cell and Component Manufacturing Demonstration Topic

DOE selected two projects proposed by Ascend Elements in two AOIs under DE-FOA-0002678 to support development of Ascend Elements’ Project Apex Facility (“Project Apex”, ‘Proposed Project’ or ‘Facility’). DOE proposes to provide approximately \$316 million of the \$632 million in costs for the project selected under AOI 1. DOE proposes to provide approximately \$164 million of the \$329 million in costs for the project selected under AOI 7.

DOE determined that a single Environmental Assessment would be appropriate to assess the potential impacts of both projects due to the projects being co-located at the proposed Project Apex Facility. References throughout this EA to the Proposed Project or Proposed Action, therefore, include both projects.

1.3 Purpose and Need for Department of Energy Action

The overall purpose and need for DOE action pursuant to the Office of Manufacturing and Energy Supply Chains in collaboration with the Office of Energy Efficiency and Renewable Energy program and the funding opportunity under the BIL is to accelerate the development of a resilient supply chain for high-capacity batteries by increasing investments in battery materials processing and battery manufacturing projects. BIL investments in the battery supply chain will include five main steps including: (1) raw material production, (2) materials processing including material refinement and processing, (3) battery material/component manufacturing and cell fabrication, (4) battery pack and end use product manufacturing, and (5) battery end-of-life and recycling. DOE considers Ascend Elements' proposed project and location to be one that can meet the focus of BIL sections: a) creating and retaining good-paying jobs; b) supporting inclusive and supportive workforce development efforts to strengthen America's competitive advantage; c) ensuring that the United States has a viable battery materials processing industry to supply the North American battery supply chain; d) expanding the capabilities of the United States in advanced battery manufacturing; e) enhancing national security by reducing the reliance of the United States on foreign competitors for critical materials and technologies; f) enhancing the domestic processing capacity of minerals necessary for battery materials and advanced batteries; and g) ensuring that the United States has a viable domestic manufacturing and recycling capability to support and sustain a North American battery supply chain. The Project site was selected due to its proximity to Ascend Elements' Georgia facility and its location within the emerging "Battery Belt" of EV and battery manufacturing sites in the southeastern and midwestern U.S. The site has exceptional access to transportation infrastructure, public utilities, including rail service, and its potential to have a positive economic impact on the southwestern Kentucky community.

DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements to this and the other 19 projects selected under DE-FOA-0002678. This and the other selected projects are needed to maximize benefits of the clean energy transition as the nation works to curb the climate crisis. These projects would meet the objective of recruiting, training, and retaining a skilled workforce in communities that have lost jobs due to displacement of fossil fuel-based energy jobs. This project will also meaningfully assist in the nation's economic recovery by creating manufacturing jobs in the United States in accordance with objectives of the BIL.

1.4 National Environmental Policy Act and Related Procedures

This EA is prepared in accordance with the National Environmental Policy Act (NEPA), as amended (42 U.S.C. 4321), the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and

DOE's implementing procedures for compliance with NEPA (10 CFR 1021). This statute and the implementing regulations require that DOE, as a federal agency:

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

These provisions must be addressed before a final decision is made to proceed with a proposed federal action that has the potential to cause impacts to the human environment, including providing federal funding to a project. This EA is intended to meet DOE's regulatory requirements under NEPA and provide DOE with the information needed to make an informed decision about providing financial assistance. In accordance with the above regulations, this EA allows for public input into the federal decision-making process; provides federal decision-makers with an understanding of potential environmental effects of their decisions before making these decisions; and documents the NEPA process.

1.5 Laws, Regulations, and Executive Orders

- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Protection of Wetlands (Executive Order [EO] 11990)
- Floodplain Management (EO 11988)
- Endangered Species Act (ESA)
- Migratory Bird Treaty Act (MBTA)
- Bald and Golden Eagle Protection Act (BGEPA)
- The Noise Control Act of 1972, as amended
- Tackling the Climate Crisis at Home and Abroad (EO 14008)
- Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations (EO 12898)
- Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (EO 13985)
- Executive Order on America's Supply Chains (EO 14017)
- Pollution Prevention Act of 1990
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

1.6 Agency Consultation

DOE initiated consultations with the United States Fish and Wildlife Service (USFWS) under the Endangered Species Act and with the Kentucky Heritage Council, and the

Kentucky State Historic Preservation Officer (KY SHPO) under Section 106 of the National Historic Preservation Act (NHPA). Response letters, if received, are included in Appendix 3. Prior to the EA process, Project and Project site details were shared with the U.S. Army Corps of Engineers (USACE), who issued a response letter finding no jurisdictional waters within the Proposed Project site (Appendix 2).

1.7 Consultation with Tribal Nations

DOE initiated consultations with the Cherokee Nation and the Eastern Band of Cherokee Indians, through each Tribal Nation's Tribal Historic Preservation Office. Response letters, if received, are included in Appendix 3.

2. Proposed Action and Alternatives

2.1 Department of Energy's Proposed Action

DOE proposes, through a grant with Ascend Elements, to partially fund the construction of a plant for production of lithium-ion batteries (LiBs) precursor materials such as metal salts (e.g., cobalt sulfate, nickel sulfate, etc.) and precursor cathode active materials (pCAM), as well as battery active materials such as cathode active material (CAM). Ascend Elements would construct the plant within a planned industrial park area, on land intensively farmed for 75 years in Hopkinsville, Kentucky (Figure 2). This plant would support the anticipated growth in the lithium-ion battery industry and, more specifically, the EV industry and hybrid electric vehicle (HEV) industry. If approved, DOE would provide \$480,682,200 (approximately 50% of the funding for the Proposed Project), with Ascend Elements providing \$480,696,891.

2.2 Ascend Element's Proposed Project

Ascend Elements proposes to construct an industrial scale facility (Project Apex) for the production of sustainable, low-cost precursor cathode materials by integrating the separation of critical cathode materials from spent LiBs with the production of both pCAM and metal salts, to support domestic production of CAM. The Facility would be designed to accomplish this objective using an established, proprietary Hydro-to-Cathode™ direct precursor synthesis process technology, developed in the U.S. by Ascend Elements. Once operational, the Facility would produce enough material to supply over 250,000 electric vehicles annually.

The Facility would consist of multiple manufacturing buildings, office space and a warehouse, as well as extensive support infrastructure, including a rail spur, unloading/loading stations and holding tanks. There would be a total of 17 buildings covering approximately 700,000 square feet, with a maximum building height of 60-feet tall and a maximum structure height of 98-feet tall for the stacks (Figure 3).

To initiate development of the Facility, Ascend Elements had conducted certain site grading across Lot 4 within existing fallow land, prior to the grant award and the initial meeting between Ascend and environmental staff from NETL. Additional site preparation is planned as part of the Proposed Project and would include the installation of civil works infrastructure

to provide the Facility with municipal water, sewer, electricity, storm water storage, and rail spur connectivity. Lot 4 would be developed, including the construction and fitting of 11 industrial buildings and parking lots, to facilitate the production of pCAM, while Lot 3 would include development of 6 additional buildings to focus resources on the production of CAM.

Project Apex would be constructed on Lot 3 (80 acres) and Lot 4 (67 acres) and made operational on an expedited, 36-month schedule, with initial site improvements and construction completed within the first 17 months. During the initial 36-month construction period, the Proposed Project site would continue to undergo civil works in preparation for building shell construction. In addition, during the construction period, equipment would be specified, procured, and installed, and production lines would be tested and commissioned for commercial operation. All major civil works and construction are expected to occur in months 4-17 of the schedule. Ascend Elements plans to begin certain preconstruction activities as soon as possible following further consultation with DOE. The proposed buildings, roadways, and other infrastructure would cover approximately 54 acres of Lot 4 and 56 acres of Lot 3, an area equating to approximately 74 percent of the Proposed Project area.

The Proposed Project is anticipated to generate approximately 4.7 billion dollars in total net-positive economic impact during its three-year construction period and within the first 10 years of an expected 20-year operational lifespan for the Facility. Apex 1 would enable sourcing of critical battery materials from within the U.S. and reduce the dependence on foreign material suppliers. The Proposed Project would create more than approximately 420 full-time equivalent (FTE) jobs that offer benefits such as healthcare and stock options. Ascend Elements also plans to offer community benefits such as workforce training and education, affordable childcare, and affordable transportation initiatives to raise equity levels in the greater Hopkinsville community. Together, these efforts would help revitalize the workforce and the economy of the greater Hopkinsville community for decades to come, while significantly strengthening the U.S. lithium-ion battery industry.

2.3 General Description and Location

The Proposed Project site encompasses two adjacent lots in the northwestern corner of Commerce Industrial Park II, a planned industrial development created by The Hopkinsville Industrial Foundation, in Hopkinsville, Kentucky (Figure 3). Prior to being converted to an industrial park, the 1,330-acre Commerce Industrial Park II site was used for many years for commercial agricultural crop production. As such, the land was regularly plowed, planted, and harvested using industrial mechanized farming equipment. The Project Apex site is approximately 147 acres (Lot 3 is approximately 80 acres and Lot 4 is approximately 67 acres). The Project Apex site is currently zoned I-2 Heavy Industrial District, as of December 6, 2022 (Hopkinsville City Council Ordinance 29-2022). Ascend Elements initiated development activities on Lot 4 prior any DOE grant award, which included clearing, grading, and storing materials. The existing condition of Lot 4 includes exposed dirt/lime stabilization measures for installation of the building foundations and associated construction infrastructure (e.g., trailers, roadways, etc.). The existing condition of Lot 3 includes cut corn stalks and vegetation (i.e., shrubs and trees) located along the southern property boundary.

Figure 2. Regional Location Map

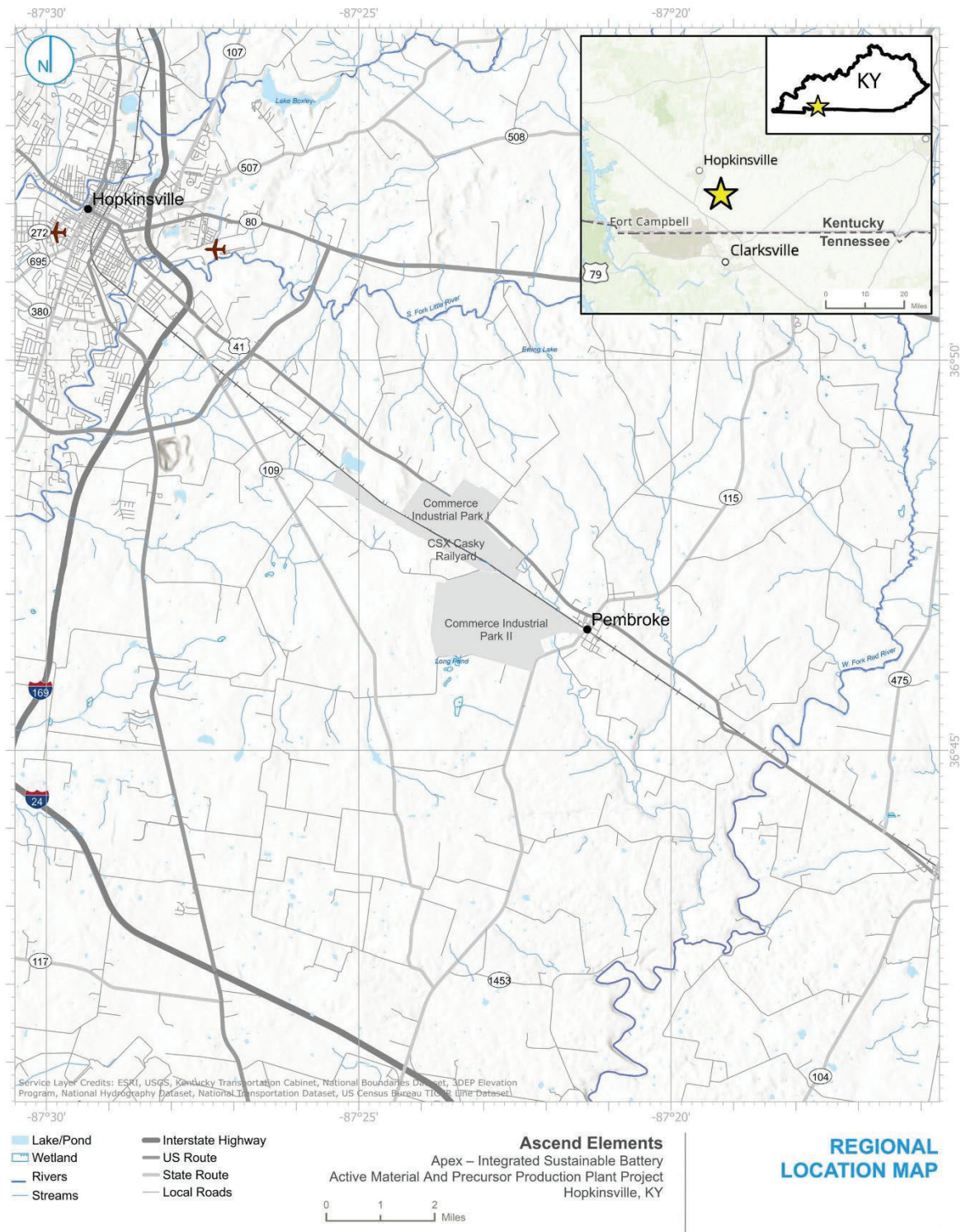
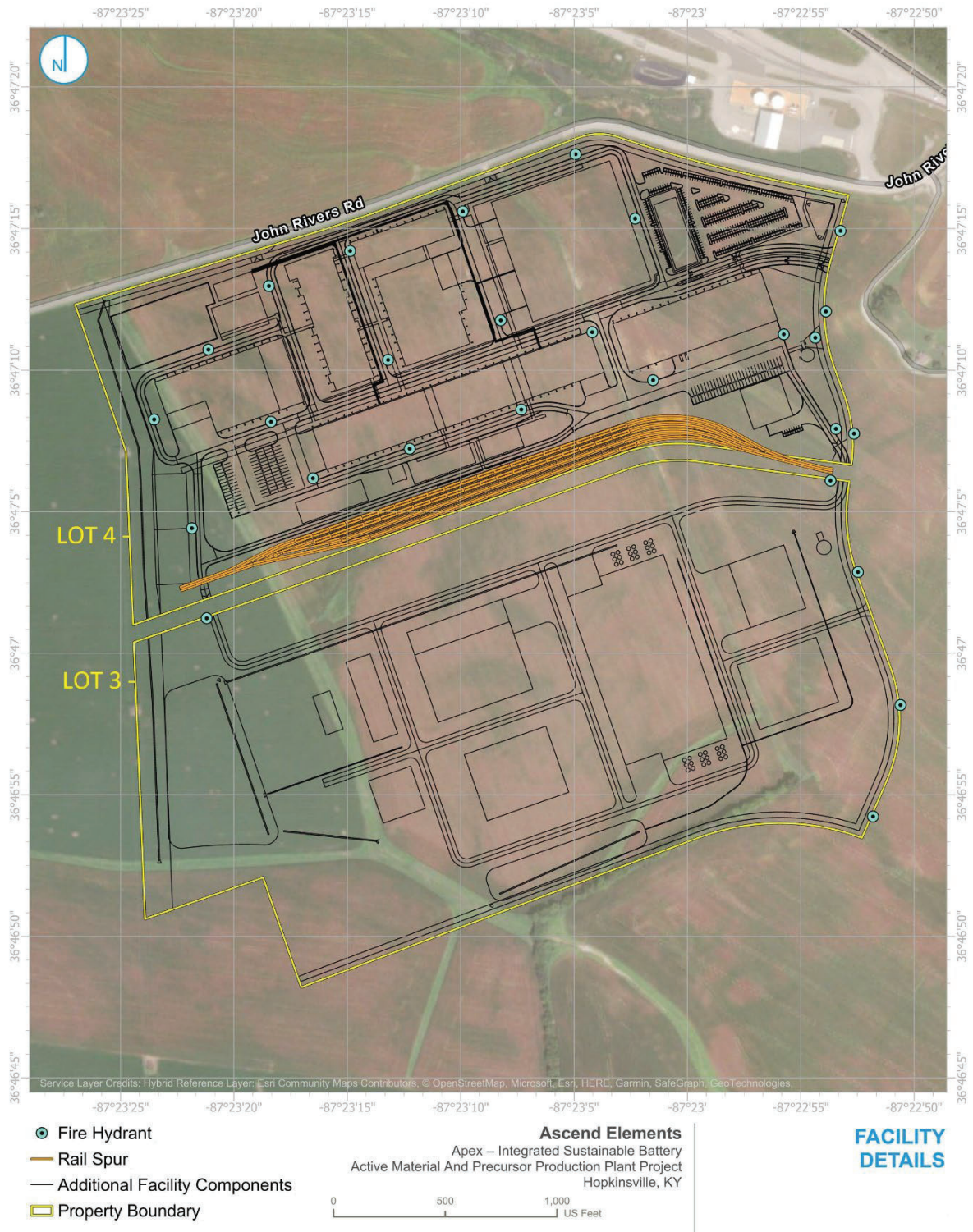


Figure 3. Proposed Project Layout Map (conceptual design)



2.4 Alternatives

DOE's alternatives to this project consist of the 178 technically acceptable applications received in response to FOA DE-FOA-0002678. Because DOE's Proposed Action is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting a project as proposed by the proponent, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and a no-action alternative for each selected project. Appendix 1 includes DOE's Environmental Synopsis that further specifies all applicants that submitted proposals to this FOA 2678. Ascend was one of 20 applicants having merit and selected for receiving Federal assistance.

2.5 No Action Alternative

Under the No Action Alternative, DOE would not provide funds to the Proposed Project. Without DOE funding, for the projects to be completed as proposed, the applicant would need to identify, obtain, and use an alternative source of funds equal to the amount of funding that the applicant would have received from DOE under the above-listed funding opportunity. As a result, these projects would be de-scoped or delayed while the applicant seeks other funding sources and may be canceled if sufficient funding is not obtained. Furthermore, acceleration of the development of industrial scale U.S. production capacity of sustainable, low-cost precursor cathode materials would be delayed or perhaps not occur. DOE's ability to achieve its objectives under the Infrastructure Investment and Jobs Act would be reduced.

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If DOE's selected projects proceed without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between the potential impacts of the projects to be implemented and the impacts of not proceeding with the projects, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

2.6 Alternatives Considered by Ascend Elements

Initially, Ascend Elements considered forty-eight (48) alternative locations as potential sites for the construction of the Apex 1 Facility. The alternatives evaluated included both greenfield and brownfield sites in Georgia, Texas, Ohio, Tennessee, Louisiana, and Maryland. None of the alternative locations were able to meet the project site requirements, including: (1) proximity to existing Ascend Elements' resources located in Covington, Georgia; (2) proximity to the larger EV and battery manufacturing industry; (3) proximity to manufacturing sites in the Southeastern U.S.; and (4) overall size and area with access to transportation infrastructure (roadways and railways) and public utilities, including power, appropriate zoning, and support from local and state entities.

2.7 Summary of Environmental Consequences

Table 2 provides a summary of the environmental, cultural, and socioeconomic impacts of the No Action Alternative and the Proposed Project:

Table 2. Summary of Environmental, Cultural, and Socioeconomic Impacts

Impact Area	No Action Alternative		Proposed Project	
	Construction	Operations	Construction	Operations
Community Services	Negligible	Negligible	Negligible	Negligible
Parks and Recreation	Negligible	Negligible	Negligible	Negligible
Socioeconomics	Negligible	Negligible	Minor (beneficial)	Minor (beneficial)
Environmental Justice	Negligible	Negligible	Minor (beneficial)	Minor (beneficial)
Aesthetics and Visual Resources	Negligible	Negligible	Negligible	Negligible
Wetlands and Floodplains	Negligible	Negligible	Negligible	Negligible
Cultural Resources	Negligible	Negligible	Negligible	Negligible
Land Use	Negligible	Negligible	Minor	Minor
Air Quality	Negligible	Negligible	Minor	Minor
Greenhouse Gases	Negligible	Negligible	Minor (beneficial)	Minor (beneficial)
Noise and Vibration	Negligible	Negligible	Minor	Minor
Geology, Soils and Topography	Negligible	Negligible	Minor	Minor
Surface Water and Groundwater	Negligible	Negligible	Minor	Minor
Vegetation and Wildlife	Negligible	Negligible	Minor	Negligible
Regulated Wastes (Solid and Hazardous Wastes)	Negligible	Negligible	Minor	Minor
Utilities and Energy Use	Negligible	Negligible	Negligible	Negligible
Transportation and Traffic	Negligible	Negligible	Minor	Minor
Public and Occupational Health and Safety	Negligible	Negligible	Minor	Minor

3. Affected Environment and Environmental Consequences

Chapter 3 provides a description of the affected environment (existing conditions) at the Proposed Project site, and a discussion of the environmental consequences of the No Action Alternative and the Proposed Project. Additionally, cumulative impacts and mitigation measures are discussed where appropriate. The methodology used to identify existing conditions and to evaluate potential impacts on the physical and human environment involved the following: review of the Environmental Questionnaires and Environmental Volumes prepared by Ascend Elements (Ascend Elements 2022a, 2022b, 2022c, and 2022d); review of documentation provided by Ascend Elements; searches of various environmental databases; and agency consultation.

3.1 Resource Areas Dismissed from Further Consideration

DOE has determined that certain resources would either not be affected or would sustain negligible impacts from the Proposed Project and were dismissed from further evaluation. These dismissed resources include community services, and parks and recreation. These resource areas are briefly discussed in this section of the EA; however, they will not be evaluated further.

Community Services: Community services pertinent to the Proposed Project include schools, police, fire, and emergency medical support, all of which are provided for in Hopkinsville. The nearest law enforcement headquarters are located within the city center, approximately 9.3 miles north of the Project site, and include the City of Hopkinsville Police Department and the Christian County Sherriff's Office. The closest Fire station in Hopkinsville is Station House Number 2, located approximately eight (8) miles to the north with a ten and a half-minute response time to the Proposed Project site according to the Hopkinsville Fire Department. The neighboring city of Pembroke also has a fire department, with the single Pembroke station only 2.2 miles south of the site.

Emergency medical services in the vicinity of the Proposed Project site include Jennie Stuart Health Hospital and the JennieCare Urgent Clinic, located approximately 9.5 miles and 8 miles north of the Proposed Project site, respectively.

Hopkinsville has four public elementary schools, one public middle school and one public high school. The region also supports numerous private elementary and high schools. The city also supports higher education opportunities at Hopkinsville Community College, Bethel College, Medical Institute of Kentucky, and Hopkinsville College of the Bible. Murray State University is the closest institution offering advanced degrees and is located in western Kentucky, approximately 58 miles west of the Proposed Project site.

Construction crews as well as permanent operational employees are anticipated to be drawn from local and regional residents and not constitute a notable permanent migration of workers and their families to the region. It is felt that the additional operational staff would not exert an undue burden on existing community services. In addition, road closures or other impacts that would restrict or impede the movement of emergency personnel or other traffic through the region are not anticipated as part of construction and operations activities associated with

the Proposed Project (see Section 3.2.11 for a discussion of transportation and traffic related impacts).

The increased burden on existing police, fire, emergency medical, and other community services during construction and operations of the Proposed Project is expected to be **negligible**.

Parks and Recreation: The City of Hopkinsville maintains approximately 15 city parks and recreation facilities, the closest of which is Tie Breaker Park, located approximately 8.5 miles north of the Proposed Project site, accessed via Highway 41 North. Pembroke City Park is located approximately 0.75 miles southeast of the Proposed Project site, on the far side of the rail tracks from the site, in the City of Pembroke. Jefferson Davis Memorial State Park is the closest state recreation facility, located approximately eight miles east of the site in Pembroke, KY, and supports daytime use. Rural recreation such as public hiking and camping are available in adjacent state forests such as Pennyrile Forest State Resort Park and Lake Malone State Park, both of which are over 30 miles from the Proposed Project site.

The Trail of Tears National Historic Trail crosses through Hopkinsville, running along U.S. Route 41, which is a four-lane divided highway at the point it is closest (approximately 0.5 miles) to the Proposed Project site. The Proposed Project site is separated from the National Historic Trail by a railyard and Commerce Industrial Park I. The Proposed Project site is approximately seven (7) miles from the Trail of Tears Commemorative Park. This commemorative park is located at one of the few documented camp sites used during the government's forced removal of members of the Cherokee Nation from their ancestral lands to present-day Oklahoma in the mid 1830's

Due to the zoning and existing land use, including commercial agricultural crop production, heavy industrial, and rail service, in proximity to the Proposed Project site, minimal impacts are anticipated. Current and anticipated parks and recreation opportunities for the citizens of Hopkinsville and Pembroke are not expected to be impacted by construction and operations of the Proposed Project, as there are no publicly designated recreation areas or parks adjacent to the site and the nearest facility is 0.75 miles away via paved highway.

The impact upon recreation and parks from the Proposed Project is anticipated to be **negligible**.

3.2 Resource Areas Considered Further

Environmental resource areas carried through for further consideration of the potential impact of Ascend Element's Proposed Project include: socioeconomics; environmental justice; aesthetics and visual resources; wetlands and floodplains; cultural resources; land use; air quality, greenhouse gases; noise and vibrations; geology, soils, and topography; surface water and groundwater; vegetation and wildlife; regulated wastes (solid and hazardous wastes); utilities and energy use; transportation and traffic; and human health and safety.

3.2.1 Socioeconomics

3.2.1.1 Affected Environment

Hopkinsville is the county seat and the largest city in Christian County, Kentucky, with a population of 31,180 residents. In recent years Christian County and Hopkinsville, through their Economic Development Council, have successfully recruited new industries into the county including a hemp processing facility (Halcyon Thruput) and a window and door production facility (Elevate Windows and Doors LLC).

Christian County is currently home to an estimated 72,748 residents, reflecting a 1.6% drop in population since the 2010 U.S. Census (US Census Bureau, 2023), with the total county labor force currently estimated at 25,113 (US Bureau of Labor Statistics, 2023). Within this total labor force, the majority are employed within private businesses (68.3%), with the public sector (Federal, state, and local government) employing 15.8%, private not-for-profit institutions employing 6.2%, and with 9.7% self-employed within incorporated and non-incorporated businesses. Christian County's estimated employment rate (40.7%) is lower than that estimated for Kentucky as a whole (55.1%).

Manufacturing is the single largest industry in terms of employment (20.5%), followed by education, health, and social services (19%), retail trade (12.1%), professional, scientific, and administrative services (11.5%), and recreation, entertainment, and food services (7.4%), with the remaining 29.5% distributed across other industry categories. While Christian County's economy has historically included a significant agricultural component, current employment within agriculture is estimated at only 3.1% (US Bureau of Labor Statistics, 2023). Management and administrative jobs are estimated to comprise the single largest class of occupation (26%), followed by production and materials transportation (20.5%), sales and office work (20%), service jobs (17.3%), construction and maintenance (10.2%), and other occupations (6%).

3.2.1.2 Environmental Consequences

3.2.1.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.1.2.2 Proposed Project

3.2.1.2.2.1 Construction

Under Ascend Element's Proposed Project, taxes would continue to be paid on the property and no adverse impacts would occur. Construction workers employed for the construction period (approximately 2,860 individuals at peak) are planned to be hired from the local

populations, and may be currently unemployed or underemployed, residing and paying taxes in Christian County or the surrounding area, with preference for contracting local companies as available for the work. Increased sales transactions for the purchase of materials and supplies would generate additional tax revenues for local and state governments, which would have a minor beneficial impact. Secondary jobs related to the increased economic activity stimulated by the Proposed Project may be created. Additional retail services and business employment may result from the Proposed Project through a multiplier effect, yielding additional sales and income tax revenues for local and state governments, also generating a minor beneficial impact.

3.2.1.2.2 Operations

The Proposed Project would create approximately 420 new, FTE, permanent jobs (John Dunham & Associates, 2022), with no current, specific plans for significantly increasing or decreasing that number throughout the planned 20-year lifespan designated for the Facility. Labor requirements are not expected to change drastically as most jobs would be in advanced manufacturing operations, which is already represented in this region. There may be some additional requirements for certain engineering disciplines that may not already be present; Ascend Elements has stated they would work with the school system and Hopkinsville Community College to help train potential employees. Ascend Elements has developed Equity Plans for Project Apex that include plans and partnerships for a robust workforce training and recruitment initiative with investments in high school and community college STEM education, faculty partnerships, and internship programs with one or more Historically Black Colleges and Universities in the region. Plans also include hiring partnerships with the Minority Economic Development Initiative of Western Kentucky, Inc., Kentucky Career Centers, and Veteran Service Organizations connected to nearby Fort Campbell. No substantial influx in population is expected, therefore the impact to housing demand and population from the Proposed Project is expected to be negligible.

3.2.1.3 Cumulative Impacts

There is currently no forecast for a population influx to Hopkinsville or Christian County from the Proposed Project or from future industrial tenancy within Commerce Industrial Park II, though future projects could theoretically result in a local population shift. Despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to socioeconomics.

3.2.1.4 Proposed Mitigation Measures

No mitigation measures would be required for socioeconomics.

3.2.2 Environmental Justice

President Biden established the Justice40 Initiative in Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*. Building on Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, the Justice40 Initiative established a goal that at least 40% of the benefits of certain Federal investments, including investments in clean energy, energy efficiency, and clean transit, flow

to disadvantaged communities. To assist agencies with identifying disadvantaged communities, the White House Council on Environmental Quality (CEQ) developed the Climate and Economic Justice Screening Tool (CEJST) (CEQ 2022), which identifies census tracts as disadvantaged based on consideration of environmental and socioeconomic burdens.

Secretary Granholm published a letter to DOE Stakeholders on July 25, 2022 to inform them that “DOE intends to implement the Justice40 Initiative throughout all its BIL efforts, wherever authorized by law, and within well-established DOE programs that fall within the climate and clean energy investment categories covered by Justice40.” (US Department of Energy, 2022). In follow up, DOE has adopted eight policy priorities that govern the Department’s implementation of the Justice40 Initiative.

1. Decrease energy burden in disadvantaged communities (DACs).
2. Decrease environmental exposure and burdens for DACs.
3. Increase parity in clean energy technology (e.g., solar, storage) access and adoption in DACs.
4. Increase access to low-cost capital in DACs.
5. Increase clean energy enterprise creation and contracting (MBE/DBE) in DACs.
6. Increase clean energy jobs, job pipeline, and job training for individuals from DACs.
7. Increase energy resiliency in DACs.
8. Increase energy democracy in DACs.

DOE concurrently published a list of the Department’s programs covered by the Justice40 Initiative because the programs include investments that can benefit disadvantaged communities (Office of Management and Budget [OMB] Memorandum 21-28 [M-21-28]). Within the Manufacturing and Energy Supply Chains Office, DOE identified the Battery Manufacturing and Recycling Grants and the Battery Material Processing Grants programs as Justice40 covered programs (Section IIAii *Clean Energy and Energy Efficiency* within OMB M-21-28).

Additionally, DOE developed a DAC Reporter to define and identify disadvantaged communities for the purposes of Department programs. The DAC Reporter identifies disadvantaged communities based on the cumulative burden the community faces from 36 burden indicators. The top 20% of communities within a state are designated as disadvantaged and interested parties can use the DAC Reporter to generate community-specific reports that include the results for each of the 36 burden indicators. Nationwide, 13,581 communities have been identified as disadvantaged by the DAC Reporter.

Ascend Elements strives to increase environmental justice efforts by advocating for and facilitating disadvantaged and marginalized communities’ involvement in environmental decision making by incorporating elements of Executive Order 14008. Ascend Elements aspires to attract and maintain a diverse workforce that reflects the western Kentucky region of Hopkinsville and Christian County. The goal is to increase awareness and access to environmental careers in the sciences and engineering in minority and underserved communities to promote diversity in the labor workforce.

3.2.2.1 Affected Environment

The Proposed Project is located within a census tract that was not designated as disadvantaged in either the DAC Reporter or the CEJST. The DAC Reporter ranked the cumulative burden faced by the census tract as being in the top 57% of communities in the Commonwealth of Kentucky, well below the 80% threshold required for a community to be designated as disadvantaged. There are, however, four census tracts within the City of Hopkinsville that are designated as disadvantaged by the DAC Reporter.

The CEJST similarly identified five adjacent census tracts as disadvantaged because they meet more than one burden threshold as well as the associated socioeconomic threshold (CEQ 2022). The burden thresholds that are currently met by one or more of the five tracts include those related to climate change, energy cost, human health conditions, housing conditions, transportation barriers, and workforce development challenges from poverty, unemployment, and low median income.

3.2.2.2 Environmental Consequences

3.2.2.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.2.2.2 Proposed Project

3.2.2.2.2.1 Construction and Operations

DOE's selection of two related projects proposed by Ascend Elements that support the development of the Proposed Project is consistent with the provisions of Executive Orders 12898 and 14008, aligns with DOE's eight policy priorities, and advances the Department's progress toward the goal established by the Justice40 Initiative that at least 40% of the benefits of certain types of Federal investment flow to disadvantaged communities.

The Proposed Project supports DOE's stated EJ policy priority to increase clean energy jobs, the job pipeline, and job training for individuals from disadvantaged communities. As discussed in Section 3.2.1.2.2 above, Ascend Elements expects to employ 2,860 individuals during the construction stage of the Proposed Project and create approximately 420 FTE jobs once operational. While the Proposed Project site is not within a disadvantaged community, Ascend Elements has committed to promoting benefits for communities in the greater Hopkinsville area from the Proposed Project, including that 40% of those benefits flow to disadvantaged communities located within the area. To facilitate that process, Ascend Elements held multiple video and in-person meetings with community leaders to gather

feedback on the needs of these communities directly from community members. Ascend Elements then used that feedback to develop Equity Plans that reflect community-based needs. The Equity Plans are built around the core benefit of high-quality, good-paying, clean energy jobs and include initiatives to reduce barriers identified by the community that could hamper disadvantaged communities from benefitting from those jobs. These initiatives include a workforce development program; affordable childcare; and affordable transportation. Ascend Elements expects to invest up to \$2,000,000 per year to support the goals of the Equity Plans, delivering meaningful benefits to local disadvantaged communities.

The Proposed Project is anticipated to provide positive short and long-term benefits to disadvantaged communities in the vicinity, and therefore have a beneficial impact on environmental justice and equity.

3.2.2.3 Cumulative Impacts

Despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to environmental justice.

3.2.2.4 Proposed Mitigation Measures

No mitigation measures would be required for environmental justice.

3.2.3 Aesthetics and Visual Resources

Impacts to identified views and vistas were determined based on an analysis of the existing quality of the landscape views, the sensitivity of the view, and the anticipated relationship of the scale and massing of the proposed buildings to the existing visual environment. Although the new construction would be visible from the immediately surrounding landscape, the scale and massing of the buildings would be consistent with other existing and planned buildings in the surrounding industrial area.

3.2.3.1 Affected Environment

The Proposed Project site is bordered on all sides by other lots within Commerce Industrial Park II, except for a small section of Lot 4 that is bordered by the CSX Casky railyard. Beyond Commerce Industrial Park II, to the North and East of the Proposed Project site is Commerce Industrial Park I, which is also zoned heavy industrial and includes properties and facilities owned or operated by Sun Chemical Corporation, Siemer Milling, Continental Mills, and T Rad North America, and, eventually, Highway 41. An above ground 161 kilovolt (kV) transmission line owned and operated by the Tennessee Valley Authority bisects Commerce Industrial Park II and runs along the western border of the Proposed Project site. The topography of the Proposed Project site and surrounding properties ranges from gentle rolling to relatively flat and therefore the site does not offer notable vistas or views.

3.2.3.2 Environmental Consequences

3.2.3.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.3.2.2 Proposed Project

3.2.3.2.2.1 Construction

Proposed Project construction would alter the visual appearance of the Proposed Project site with the presence of construction equipment (possibly to include cranes), and by the addition of Facility structures, primarily consisting of conventional industrial buildings, to the site; previously used as agricultural cropland. Building structures would be less than 60 feet in height, covering less than 60% of the area within the Proposed Project site. One structure would have an associated stack reaching up to 98 feet in height, for which a City of Hopkinsville zoning variance has been obtained (March 15, 2023). Impacts to identified views and vistas were determined based on an analysis of the existing quality of the landscape views, the sensitivity of the view, and the anticipated relationship of the scale and massing of the proposed buildings to the existing visual environment. Although the new construction would be visible from the immediately surrounding landscape, the scale and massing of the building would be consistent with other existing and planned buildings in the surrounding industrial area. The impact upon aesthetics and visual resources from the Proposed Project is anticipated to be negligible.

3.2.3.2.2.2 Operations

Exhaust gases from the proposed and permitted combustion sources will not result in visible emissions. Therefore, operations will not impact aesthetics and visual resources.

3.2.3.3 Cumulative Impacts

Located within Commerce Industrial Park II, which plans to lease to other industrial-type tenants for construction of industrial facilities, the Proposed Project's contribution to altering the visual landscape would be negligible in the context of surrounding development. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to aesthetics and visual resources.

3.2.3.4 Proposed Mitigation Measures

No mitigation measures specific to aesthetics and visual resources are planned at this time.

3.2.4 Wetlands and Floodplains

3.2.4.1 Affected Environment

The Proposed Project site includes approximately 147 acres of fallow agricultural land, and Terracon Consultants performed a wetland delineation of the Proposed Project site on August 15, 2022, to determine the potential for the presence of aquatic resources regulated under federal and state statutes. Terracon did not identify any wetlands at the Proposed Project site and mapped three upland agricultural drainages (features C3-UD, C4-UD, and C2-UD), which direct flow south into feature C1-EPH, an ephemeral drainage located entirely outside the Proposed Project site. As discussed further in Section 3.2.4.2.2.1, the Army Corps of Engineers determined that none of the drainages were “waters of the United States” under the Clean Water Act. Under this determination, no Section 404 permit or Nationwide Permit concurrence is required for the Proposed Project (LRN-2017-01081, Approved Jurisdictional Determination, Ascend Elements Site, Hopkinsville, Christian County, Kentucky, [USACE 2022]; Appendix 2).

3.2.4.2 Environmental Consequences

3.2.4.2.1 No Action Alternative

In the absence of DOE funding, and, as detailed elsewhere in this EA, Ascend Elements initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE’s financial assistance, the potential impacts would be essentially identical to those under DOE’s action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.4.2.2 Proposed Project

3.2.4.2.2.1 Construction and Operations

After considering the results of the Terracon wetland delineation, the Nashville District of the Army Corps of Engineers issued an approved jurisdictional determination (AJD) concluding the Proposed Project site “does not include navigable waters of the U.S.” and is not subject to Section 10 of the Rivers and Harbors Act of 1899. The AJD further evaluated potential water resources under the Clean Water Act and determined that there were no jurisdictional water resources on the Proposed Project site (LRN-2017-01081, Approved Jurisdictional Determination, Ascend Elements Site, Hopkinsville, Christian County, Kentucky, [USACE 2022]; Appendix 2).

A review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Numbers 21047C0367C and 21047C0370C, effective September 17, 2008, indicates the Proposed Project site lies in Zone X, above the base flood elevation (Zone AE), indicating the area is outside the 0.2% annual chance floodplain (boundary of a flood that has a 0.2-percent chance of being equaled or exceeded in any given year).

Due to the absence of regulated sensitive aquatic resources, including wetlands, waters, and floodplains within the Proposed Project site, construction and operations are anticipated to have negligible impacts.

3.2.4.3 Cumulative Impacts

Despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to wetlands and floodplains.

3.2.4.4 Proposed Mitigation Measures

No mitigation measures would be required for wetlands and floodplains.

3.2.5 Cultural Resources

3.2.5.1 Affected Environment

The Proposed Project site lies within the cultural area of two federally recognized Tribes, the Cherokee Nation and the Eastern Band of Cherokee Indians. The Trail of Tears National Historic Trail crosses through the town of Hopkinsville and runs along Hwy 41, the closest location to the Proposed Project site being approximately 0.5 miles to the east, beyond the CSX Casky Railyard. The Trail of Tears Commemorative Park is approximately seven miles away from the Proposed Project site (see Section 3.1 Parks and Recreation).

In 1979, the Kentucky Heritage Commission conducted a Commonwealth-wide Survey of Historic Sites in Kentucky and identified 13 historic sites within Christian County. None of the sites are within or adjacent to the Proposed Project site, and the nearest site listed on the National Register of Historic Places (NRHP) is approximately 7 miles away.

In 2017, the Hopkinsville Industrial Foundation commissioned Greenhouse Consultants, Inc. (GCI) to perform a Cultural Resources Reconnaissance Survey within a 705-acre section of Commerce Industrial Park II. This survey area included the Proposed Project site. As part of this commissioned study, GCI performed an analysis for records stored by the Kentucky Archaeological Survey and Kentucky Heritage Council. The analysis indicated there are no recorded historical resources listed on the NRHP within or immediately adjacent to the 705-acre study area.

GCI also performed a pedestrian survey of a 750-acre section of Commerce Industrial Park II. CGI located two prehistoric resources within the boundaries of the Proposed Project site, named P-1 and P-2, which contained almost exclusively lithic debitage. P-1 is an 83.7-acre area, of which approximately 15 acres are within Lots 3 and 4. The Survey documented one side-notched projective point fragment within area P-1, which was an active corn field at the time, but did not specify where exactly the fragment was found. P-2 is a 12.8-acre area located within the footprint of the Proposed Project, which was a soybean field at the time of the investigation. The survey found that P-2 contained less than 100 debitage but no features (See Appendix 3 for the consultation letter sent to the KY SHPO and maps of the resource areas).

Additionally, GCI documented two potential historic resources within the boundaries of the Proposed Project site during the reconnaissance survey, named H-2 and H-3. H-2 is approximately 0.1 acres and contained non-descript artifacts such as brick, concrete, and glass. H-3 is approximately 20.5 acres, less than 10 acres of which are within in the Proposed Project footprint (Lot 4) and contains remains of a farmstead complex dating from the early 1900s. The farmhouse site and associated infrastructure are separated from the Proposed Project footprint by a rural dirt road. Due to a lack of integrity, the survey concluded that H-2 and H-3 would not likely be eligible for listing on the NRHP.

3.2.5.2 Environmental Consequences

3.2.5.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.5.2.2 Proposed Project

Construction and Operations

DOE initiated consultation with the SHPO on February 14, 2023 and initiated tribal consultation with the Eastern Band of Cherokee Indians and the Cherokee Nation by phone and by formal letter in February 2023. Responses from the KY SHPO and Tribal Nations, if received, will be included in Appendix 3. To augment the body of existing information regarding cultural and archaeological resources, Ascend Elements has retained a firm led by a Secretary of the Interior (SOI) Qualified Preservation Professional to complete a Phase I archaeological survey of Lot 3 within the Proposed Project area and to complete a baseline cultural historic survey of any above-ground cultural and historic resources.

3.2.5.3 Cumulative Impacts

Despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to cultural resources.

3.2.5.4 Proposed Mitigation Measures / Inadvertent Discoveries Plan

The Proposed Project would implement a project-specific Inadvertent Discoveries Plan that details the following: construction crew member responsibilities for reporting in the event of a discovery of cultural material during construction; requirements to stop work; and directions for notification of local law enforcement officials (as required), appropriate Ascend Elements personnel, SHPOs, and the Cherokee Nation and the Eastern Band of Cherokee Indians (in

the event Tribal cultural resources or human remains are discovered during construction activities). The Inadvertent Discoveries Plan is attached in Appendix 4.

3.2.6 Land Use

3.2.6.1 Affected Environment

The Proposed Project site comprises approximately 147 acres of land fronting John Rivers Road, immediately southwest of the CSX railyard. The property is within the City of Hopkinsville and is zoned as I-2 Heavy Industrial by the City. Prior to being converted into two lots within the 1,330-acre Commerce Industrial Park II, the Proposed Project site was used for many years for commercial agricultural crop production. As such, the land was regularly plowed, planted, and harvested using industrial mechanized farming equipment. The Proposed Project site is bordered on all sides by other lots within Commerce Industrial Park II, except for a small section of Lot 4 that is bordered by the CSX Casky railyard. Beyond Commerce Industrial Park II, to the North and East of the Proposed Project site is Commerce Industrial Park I, which is also zoned heavy industrial and includes properties and facilities owned or operated by Sun Chemical Corporation, Siemer Milling, Continental Mills, and T Rad North America, and, eventually, Highway 41. An above ground 161 kV transmission line owned and operated by the Tennessee Valley Authority bisects Commerce Industrial Park II and runs along the western border of the Proposed Project site. Properties in the vicinity of the Proposed Project site are a mix of industrial and commercial uses, and transportation corridors (highway and rail).

3.2.6.2 Environmental Consequences

3.2.6.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.6.2.2 Proposed Project

3.2.6.2.2.1 Construction and Operations

Construction of the Proposed Project within Commerce Industrial Park II would be consistent with current zoning as cited above which considers the site suitable for heavy industrial uses. Hopkinsville Zoning Ordinance Section 158.069 indicates maximum building site coverage in a heavy industrial district shall be 60% of the total area and no structure shall exceed 60 feet in height. In addition, minimum setbacks for yards include 40 feet for front yards and 10 feet for rear and side yards. The planned maximum structure height is up to 98 feet. Although the use of the property is consistent with City of Hopkinsville zoning, approval for a variance

from the building height requirements is necessary. Ascend Elements received the variance approval from the City of Hopkinsville on March 15, 2023, with no associated comments. Therefore, a minor impact to land use and zoning would occur.

3.2.6.3 Cumulative Impacts

Beyond the Proposed Project, the Commonwealth of Kentucky and City of Hopkinsville are seeking additional industrial tenants for Commerce Industrial Park II. Construction and operations of the Proposed Project, along with past, present, and future development in the area would continue a land use change trend from agricultural to industrial. The Proposed Project would thus add incrementally to cumulative land use impacts, as deliberately outlined in approved land use plans and local zoning priorities set by the City of Hopkinsville and Christian County.

3.2.6.4 Proposed Mitigation Measures

No mitigation measures would be required for land use.

3.2.7 Air Quality

The Proposed Project would be subject to the applicable requirements of the Clean Air Act (CAA). The Kentucky Department of Environmental Protection enforces the requirements of the CAA through its state implementation plan. As the Proposed Project would be subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP; 40 CFR 63 Subpart VVVVVV), the Facility is subject to Title V of the CAA. The Commonwealth of Kentucky issued Ascend Elements a Title V Synthetic Minor Operating Permit for the Proposed Project on January 31, 2023 (Permit Number V-22-034; Appendix 2).

The CAA requires the United States Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA has established NAAQS for six (6) principal pollutants, which are called “criteria pollutants”: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), particulate matter (PM), sulfur dioxide (SO₂), and lead (Pb) (Table 3).

Table 3. EPA National Ambient Air Quality Standards

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
Nitrogen Dioxide (NO ₂)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb ⁽²⁾	Annual Mean
Ozone (O ₃)		primary and secondary	8 hours	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	PM _{2.5}	primary	1 year	12.0 µg/m ³	Annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m ³	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24 hours	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO ₂)		primary	1 hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

Notes:

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O₃ standards.

(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a State Implementation Plan (SIP) call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

3.2.7.1 Affected Environment

Hopkinsville, Christian County, Kentucky is currently designated as an area that is “in attainment, unclassifiable, or not designated” for CO, particulate matter less than 10 microns (PM₁₀), PM less than 2.5 microns (PM_{2.5}), NO₂, SO₂, and O₃ NAAQS. The surrounding area is primarily agricultural, with transportation and light industry to the northeast (see Section 3.2.6 *Land Use* and Section 3.2.12 *Vegetation and Wildlife*). The nearest population (sensitive receptor) is rural (farm) residences, the closest of which is roughly 0.25 miles southwest of the Proposed Project site. The nearest residential neighborhood to the Proposed Project site is part of the City of Pembroke, located approximately 0.75 miles east of the Proposed Project’s southern boundary and across the CSX railroad right-of-way and Highway 41. Pembroke City Park lies adjacent to and south of the residential neighborhood, also 0.75 miles from the Proposed Project site. Other sensitive receptors (e.g., schools, hospitals) are not located in proximity to the Proposed Project site (see Section 3.1 Community Services).

3.2.7.2 Environmental Consequences

3.2.7.2.1 No Action Alternative

It is Ascend Elements’ intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE’s financial assistance, the potential impacts would be essentially identical to those under DOE’s action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.7.2.2 Proposed Project

3.2.7.2.2.1 *Construction*

Construction of the Proposed Project is expected to be conducted over 110 acres of the total property area of 147 acres. Minor, temporary, intermittent air emissions are anticipated during project construction which could potentially have a short-term, minor adverse impact on air quality. Air emissions of CO, NO_x, SO₂, PM₁₀, PM_{2.5} and VOC associated with operation of construction equipment and vehicles are anticipated during site grading and levelling, Facility construction, installation of Facility equipment, and delivery of construction materials and supplies both by road and by rail. As such, in addition to tailpipe emissions, surface soil disturbances during excavation and grading could result in generation of fugitive dust. Fugitive dust could potentially affect both public health and the environment. The severity of its effects on health depends on the size and composition of the particulate matter. Typical effects are persistent coughs, respiratory distress, eye irritation, asthma etc. Ascend Elements’ construction contractor would implement best management practices to minimize generation of dust during construction activities. Because the Proposed Project includes components that continue to be in the design phase, it is not possible to accurately estimate air emissions that may result from Proposed Project construction, though construction emissions would be temporary in nature.

3.2.7.2.2.2 *Operations*

The Proposed Project's operational impacts to air quality are expected to be minor, direct, and long term, and would be subject to the Title V Operating Permit (Permit Number V-22-034) issued January 31, 2023 by the Commonwealth of Kentucky Department of Environmental Protection. In general, Ascend Elements plans to use five Shawnee D or equivalent superior boilers with low NOx burners, one cooling tower (Marley NC8414XAS8 or equivalent), and a backup generator (Cummins 1,300kW) maintained on site for emergency power generation for the Proposed Project. Activities deemed 'significant' for air quality regulatory purposes include wet-processing, and raw material and product handling during metal extraction, p-CAM 1, and p-CAM 2 processes. Other operations/processes have been classified as 'insignificant'.

3.2.7.3 Cumulative Impacts

As the Proposed Project would be located within Commercial Industrial Park II, which plans to lease to other facilities conducting industrial activities, any increase in air emissions resulting from operations of the Proposed Project, mitigated as described in Section 3.2.7.4 below, would be minor and consistent with activities defined under current zoning regulations for the City of Hopkinsville. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would combine with the Proposed Project to generate cumulative adverse air quality impacts.

3.2.7.4 Proposed Mitigation Measures

Numerous mitigation measures and standard procedures related to air quality would be employed during construction and operation of the Proposed Project. These are consistent with the Proposed Project's Title V Permit, which incorporates all applicable requirements of the Clean Air Act, including those related to operations and specific processes, installation of source control equipment, emissions testing requirements, and monitoring and reporting protocols.

3.2.8 Greenhouse Gases

Greenhouse gases (GHGs) are of concern for climate change, and include water vapor, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), and several hydro and per-chlorofluorocarbons.

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

3.2.8.1 Affected Environment

Rising global temperatures are associated with weather and climate shifts driving environmental and human impacts across a range of spatiotemporal scales and intensities (IPCC 2013). A recent study of climate-related impacts on seven nearby counties in western Kentucky found that the three leading climate-related environmental public health hazards for those counties were extreme heat, drought, and flooding (Houghton, 2017). While Christian County is expected to experience GHG-driven climate change impacts generally consistent with Intergovernmental Panel on Climate Change (IPCC) forecasts, the type, frequency, and intensity of these impacts are not forecast for the county or the region of southwestern Kentucky specifically.

3.2.8.2 Environmental Consequences

3.2.8.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.8.2.2 Proposed Project

3.2.8.2.2.1 Construction

Construction of the Proposed Project would result in temporary GHG emissions from sources including vehicle transportation of equipment and materials, use of construction machinery, and curing of concrete. Use of electricity during construction may indirectly increase GHG emissions depending on electric generation sources/methods employed by local utilities serving the site. Current online resources allow for very general estimates for order of magnitude of GHG emissions for construction projects, based on input of known project parameters. One of these, <http://buildcarbonneutral.org>, provides these rough estimates using only basic input parameters: area of total site, area of disturbance planned within the site, region within the US, prior land use, and current vegetation type (or unvegetated). Estimates are given as net embodied carbon from construction activities, where "embodied carbon" includes emissions from raw material extraction, transportation of materials, materials wasted, building operations and maintenance, and the emissions a building continues to produce after it is no longer in use. From Project Apex inputs, including disturbance of 110 of 147 site acres, this resource estimates net emissions of 91,152 tons of embodied carbon from Project Apex construction.

3.2.8.2.2.2 *Operations*

GHG emissions from Facility operations would be minimal. Facility operations would include five natural gas-fired boilers and two natural gas-fired emergency engines. The Proposed Project plans to purchase roughly 905,000 kilowatt hours per year (kWh/yr) of electricity for Facility operations which would contribute to the Proposed Project's Scope 2 GHG emissions. The quantity of emissions that are associated with the purchased electricity will vary year to year based on electric generation sources and methods employed by local utilities serving the Proposed Project site. Maximum CO₂ emissions from purchased electricity for Proposed Project operations, presuming all electricity is generated from fossil fuel sources, would be 773,775 lbs of CO₂ per year.

GHG emission reductions will be realized through the manufacturing of pCAM and CAM components within the United States rather than importing them from another country. The pCAM and CAM would be used as precursors to the domestic manufacture of lithium-ion batteries to be used in EVs. Ascend Elements estimates that production levels at the Proposed Project site would be sufficient to produce lithium-ion batteries for 250,000 EVs annually. It is expected that these EVs would primarily replace conventional gasoline and diesel-fueled vehicles, resulting in a proportional reduction in GHG emissions (primarily carbon dioxide [CO₂]).

To estimate annual tailpipe emissions of carbon dioxide from the operation of a typical conventional passenger car or truck in the U.S., EPA assumes that vehicle is driven 11,500 miles per year with fuel economy of 22 miles per gallon of gasoline. Using those assumptions, EPA estimates that a typical passenger vehicle emits approximately 4.6 metric tons of CO₂ annually. EV operation produces no emissions. Replacing 250,000 conventionally fueled vehicles with EVs would eliminate an estimated 1,150,000 metric tons of CO₂ annually for every operational year that an EV displaced a comparable fossil fuel vehicle. Over the course of the first five years of operation, batteries produced using material generated at the Proposed Project would be expected to eliminate 17,250,000 metric tons of CO₂ emissions. This emissions reduction would be expected to far exceed any emissions anticipated from construction and operations of the Proposed Project during its operational lifetime.

3.2.8.3 *Cumulative Impacts*

In context of global GHG emissions, the Proposed Project would incur a net-positive, long-term impact to global climate and GHG emissions through its contributions to decarbonizing U.S. transportation which would markedly outweigh Proposed Project GHG emissions. As noted above, within the first five years of operation, the Proposed Project is expected to cause a reduction in carbon dioxide emissions totaling 17,250,000 metric tons. In general, the potential benefits associated with reducing CO₂ emissions would support a reduction in GHG concentrations and reduce the associated climate change impacts (e.g., increases in atmospheric temperature, changes in precipitation, increases in the frequency and intensity of extreme weather events, rising sea levels).

3.2.8.4 Proposed Mitigation Measures

Market displacement of gasoline and diesel-powered vehicles through battery production support at the Facility for U.S. EV manufacture is expected to realize GHG emissions reductions greater than GHG emissions from Facility operations. Therefore, the impact to GHG emissions from this project is net-positive, and no further mitigation measures are proposed.

3.2.9 Noise and Vibration

3.2.9.1 Affected Environment

As noted above, the Proposed Project site is bordered on all sides by other lots within Commerce Industrial Park II, except for a small section of Lot 4 that is bordered by the CSX Casky railyard. Beyond Commerce Industrial Park II, to the North and East of the Proposed Project site is Commerce Industrial Park I, which is also zoned heavy industrial and includes multiple existing industrial facilities, and, eventually, Highway 41.

Existing noise and vibration sources within the Proposed Project site vicinity include CSX railyard traffic and activity, local transportation on primary and secondary roads, and certain industrial activities, located primarily north and northeast of the Proposed Project site in Commerce Industrial Park I. Further industrial expansion is planned for Commerce Industrial Park II surrounding the Proposed Project site to the southwest, south, and east.

The nearest sensitive receptors to the Proposed Project site are rural (farm) residences, the closest of which is roughly 0.25 miles southwest of the Proposed Project boundary. The nearest residential neighborhood to the Proposed Project site is part of Pembroke, KY, located roughly 0.75 miles east of the Proposed Project site boundary and across the CSX railroad right of way and Highway 41. At its closest point to the Proposed Project site (approximately 0.5 miles), The Trail of Tears National Historic Trail runs along a section of U.S. Route 41 that is a four-lane divided highway. Other sensitive receptors (e.g., schools, parks) do not occur within close proximity (e.g., less than 0.5 miles) to the Proposed Project site (see Section 3.1).

3.2.9.2 Environmental Consequences

3.2.9.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.9.2.2 Proposed Project

3.2.9.2.2.1 Construction

Short-term but measurable adverse minor impacts to noise levels may occur during the construction phase of the Proposed Project, associated with site grading and levelling, Facility construction, installation of Facility equipment, and use of heavy machinery during construction. Typical noise levels from comparable construction sites would be expected to be within the range of 75 to 90 decibels, which is consistent with current Proposed Project plans. Hopkinsville's noise ordinance code (§ 96.04, Part F) exempts construction activities otherwise compliant with local codes and permitting from limits on maximum permissible noise levels, though these estimates would already be generally compliant with limits set in the noise ordinance code under § 96.05 for areas zoned I-2. Construction noise and vibration would primarily be limited to the immediate vicinity of the Proposed Project site and would be short-term and intermittent. The location is at a sufficient distance from the nearest sensitive receptors such that noise and vibration impacts are anticipated to remain minor, though it is possible that nearby office workers in Commerce Industrial Park I to the north may be temporarily disturbed by the construction noise, and intermittent noise may be detectable by the nearest residents. Construction is expected to last for approximately 17 months.

3.2.9.2.2.2 Operations

The Proposed Project would result in a minor, long-term increase in noise as an average increase in ambient noise within the decibel range of existing, adjacent activities. Noise from operations would be expected to be under 90 decibels within the Facility site, attenuating to under 80 db(A) 50 feet from the Facility boundary, and to approximately 67 db(A) at the nearest identified receptor located 0.25 miles southwest from the Facility boundary. Operations would generate both intermittent and continuous noise. These estimates would be compliant with Hopkinsville's noise ordinance code (§ 96.05) maximum permissible limits for areas zoned I-2. Primary noise sources during operations are anticipated from industrial activities within enclosed facility structures, from truck and employee-vehicle traffic accessing the Facility, and a possible incremental increase in rail traffic associated with material delivery and product shipment. Heating, ventilation, and air conditioning would be installed externally on facility structures, with small contributions to low-decibel ambient noise. Due to the expected hiring of approximately 420 new FTE employees at the Facility, there is expected to be a proportional increase in commuter vehicle noise on John Rivers Road.

3.2.9.3 Cumulative Impacts

As the Proposed Project would be located within Commerce Industrial Park II, which plans to lease to other industrial-type tenants with mechanical and traffic-related noises, any increase in ambient noise levels resulting from operations of the Proposed Project would be minor, with maximum decibel levels of the Proposed Project anticipated to remain below that of existing CSX rail traffic. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified

that would interact with the Proposed Project to generate cumulative adverse noise and vibration impacts.

3.2.9.4 Proposed Mitigation Measures

No mitigation measures for noise and vibration are proposed.

3.2.10 Geology, Topography and Soils

3.2.10.1 Affected Environment

The Proposed Project site and surrounding area are situated on gently rolling terrain comprised of heavily reworked alluvial and periglacial landforms. Surface elevations at the Apex Project site range from 583 to 641 feet above mean sea level (Earth Science Engineering, LLC., 2017; USGS, 2022). Site topography is considered gently rolling with slopes ranging from 2% to about 12% (Ascend Elements, 2022a). The highest point of the Proposed Project site is located in the north central portion of the site, gently sloping downward from that point to the southeast, south, and southwest (Thomas & Hutton, 2022)

The Proposed Project site is located within the Mississippian Plateau (also referred to as the Pennyroyal Plateau) in southwestern Kentucky (University of Kentucky, 2023; Kentucky Geological Survey, 2023)., The region is immediately underlain by the Ste. Genevieve Limestone of Upper Mississippian age, and the broader area is known for karstic geologic conditions (Earth Science Engineering, LLC., 2017) associated with limestone geology. Despite the regional prevalence of karst geomorphology, no sinkholes, caves, or other karstic features have been observed from the surface on the Proposed Project site (Ascend Elements, 2022a).

Earth Science Engineering, LLC (2017) drilled 12 boreholes to examine subsurface soil conditions across the site. The borings ranged from 15.3 to 28.8 feet in depth and indicated the presence of clay from approximately 10 inches below the surface to the total depth of the borehole. The U.S. Natural Resource Conservation Service's website indicates that surficial soils at the Proposed Project site consist predominantly of silt loams and clay loams (Earth Science Engineering, LLC 2017). Depth to bedrock at the Proposed Project site is estimated to be roughly 30 feet below the surface (Ascend Elements, 2022a), though borehole logs for the site did not report contact with bedrock for any boreholes taken during the survey.

The Proposed Project site was previously zoned agricultural and prior land use was for row crop cultivation. Existing topsoil characteristics are anticipated to be consistent with long term row crop cultivation. Environmental due diligence conducted at the Proposed Project site found no evidence of the use or presence of hazardous substances or petroleum products and no recognized environmental conditions or areas of impacted soil were observed (Earth Science Engineering, LLC 2017).

3.2.10.2 Environmental Consequences

3.2.10.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.10.2.2 Proposed Project

3.2.10.2.2.1 Construction and Operations

Proposed Project impacts to geology, soils, and topography are anticipated to be direct, long term, and minor. Construction would include surficial grading and soil movement and/or topsoil loss throughout the site to accommodate construction of Facility buildings, impervious surfaces, and the planned rail spur, with exposed dirt/lime stabilization measures used in preparation for construction. Facility construction would include boring to bedrock with reinforced caissons to support structure foundations. Given soil conditions and lack of evidence of karstic conditions within the Proposed Project site, construction and operations of the Proposed Project are not anticipated to cause adverse geological impacts. Based on the past use of the property and the results of previous site investigations, there is no indication that constituents of concern are present in the soil at the Proposed Project site and, therefore, no risk that planned activities during construction and operations (e.g., site grading, building construction, and facility operations) would inadvertently accelerate the migration of such constituents across the Proposed Project site. Planned project levelling and grading activities would redistribute soils to accommodate planned development of the Proposed Project site.

3.2.10.3 Cumulative Impacts

Although additional tenants are planned for Commerce Industrial Park II, which may also disturb soils during construction and operations, all such activities would be subject to similar regulatory requirements under the Kentucky Pollutant Discharge Elimination System (KPDES) program minimizing the movement of soils to stormwater. In addition, geological and topographic conditions described for the Proposed Project site are consistent with those across Commerce Industrial Park II and are not anticipated to be impacted by construction or operations of industrial facilities in the area. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to geology, topography, and soils.

3.2.10.4 Proposed Mitigation Measures

Potential for future impacts to soils and underlying geology would be mitigated throughout the life of the Proposed Project through the implementation of spill prevention and emergency response procedures, and a facility monitoring and inspection program. Ascend Elements has a permit for Stormwater Discharges Associated with Construction Activities (KPDES Permit No. KYR10Q770; Appendix 2), and following construction but prior to operation, Ascend Elements would file a Notice of Intent for authorization under the KPDES Permit for Stormwater Discharges Associated with industrial Activities. This required permit prohibits unauthorized discharges to surface water during operations and incorporates the requirements of a facility-specific Stormwater Pollution Prevention Plan (SWPPP) and erosion control measures, as well as other sitewide best management practices (BMPs)

3.2.11 Surface Water and Groundwater

3.2.11.1 Affected Environment

3.2.11.1.1 Surface Water

The Proposed Project site is located within the Red River Watershed which trends gently southeast from a high point along John Rivers Road. An ephemeral non-jurisdictional channel, identified as C1-EPH, extends approximately 1,500 feet across the southern half of the Proposed Project site, roughly north to south, and exits from the southern boundary of the Proposed Project site. Beyond the site C1-EPH drains into an unnamed tributary that then converges with Montgomery Creek 3.2 miles south/southeast (Terracon Consultants, Inc. 2022). Montgomery Creek flows into the West Fork Red River which is located approximately 7.84 river miles from the site and is the closest Traditional Navigable Water to the Proposed Project (TNW) (US Department of the Army 2022). Sources of inputs to surface water to the Proposed Project site currently include direct precipitation and runoff from John Rivers Road. Several small ponds are present south of the Proposed Project site but are not hydrologically connected with the Proposed Project site.

3.2.11.1.2 Ground Water

According to the Kentucky Division of Water, Groundwater Branch, wells, and springs provide approximately one-third of public domestic water supplies in the state. Surface streams, the major source of Kentucky's water supply, are primarily sustained during base flow by groundwater discharge from adjacent aquifers. Within the project area, ground water in a system of crevices is developed along joints and bedding planes in the limestone. Openings are not large enough to be called caves and below about 80 feet of depth, the frequency of crevices declines rapidly (Walker, 1956). According to the Hopkinsville Water Environment Authority (HWEA), drinking water for the community is sourced by Lake Barkley.

3.2.11.2 Environmental Consequences

3.2.11.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.11.2.2 Proposed Project

3.2.11.2.3 Surface Water

3.2.11.2.3.1 Construction

Construction of the Proposed Project would have minor temporary indirect impacts from runoff to surface waters. These impacts would be minimized through the implementation of a SWPPP and BMPs, required under the KPDES program. Kentucky DEP issued Ascend Elements KPDES Permit No. KYR10Q770 (January 10, 2023) for Stormwater Discharges Associated with Construction Activities, and authorization to discharge required submittal and approval of their SWPPP as well as a requirement to comply with referenced BMPs (University of Kentucky, 2009). Additionally, Ascend Elements intends to construct three stormwater retention ponds to control runoff at the Facility (Table 4). All three ponds would be designed to support a 3 hour long 100-year-storm (City of Hopkinsville Code) and a 24 hour long 50-year-storm (Proposed Project design standard). Ascend Elements would undertake all operation and maintenance (e.g., dredging) of these ponds once constructed.

Table 4. Stormwater Retention Ponds Planned for the Proposed Project

Pond	Lot	Dimensions	Depth
A	4	100' x 120' x 120' (triangle)	4'
B	3	440' x 160' x 480' x 240' (trapezoid)	9'
C	3	540' x 100' (rectangle)	6'

3.2.11.2.3.2 Operations

Operation of the Proposed Project would include the production of certain wastewater streams.

Specifically, approximately 150,000 gallons per day ([gpd]; roughly 1 billion gallons total over the full 20-year Facility lifespan) would be routed to the Hammond-Wood Wastewater Plant, a publicly owned treatment works (POTW), treated, and then discharged by the POTW to the North Fork Little River. Ascend Elements' contribution to this discharge would represent an approximate 4 percent increase from the current average daily wastewater

discharge of the POTW (3.66 million gallons per day [mgd] (HWEA, 2017). All effluent discharge from the POTW would be required to meet water quality criteria set out in the POTW's National Pollutant Discharge Elimination System permit (Kentucky Division of Water Permit Number KY0066532); therefore, negligible impacts to water quality including to the North Fork Little River would be expected.

Approximately 80,000 gpd (roughly 530 million gallons total over the full 20-year Facility lifespan) of treated wastewater would be discharged pursuant to Ascend Element's KPDES Permit # KY0113531 (January 31, 2023; Appendix 2). Permit # KY0113531 authorizes the discharge of treated non-contact cooling tower blowdown and non-process wastewater (reverse osmosis [RO] reject from raw water treatment and boiler blowdown/condensate) to an unnamed tributary to Montgomery Creek. Permit number KY0113531 includes technology-based effluent limits based on the Kentucky Division of Water's "Best Professional Judgment" determination of the "Best Conventional Pollutant Control Technology" requirements, along with water quality-based effluent limits based on the Kentucky Water Quality Standards. Monitoring requirements are consistent with the KPDES permit program requirements for establishing effluent limitations, standards and permit conditions and requirements for recording and reporting of monitoring results. In addition, the conditions of Kentucky's Antidegradation Policy have been satisfied according to the Kentucky Department of Environmental Protection, Division of Water.

Approximately 80,000 gpd (roughly 530 million gallons total over the full 20-year Facility lifespan) of process water would be lost through evaporation, primarily from cooling conducted through Facility cooling towers, with an additional small amount of evaporative loss during internal water recycling processes.

All wastewater discharges directed to the POTW would be subject to, and in compliance with, any necessary Clean Water Act permits or authorizations that may be required. All precipitation runoff within the Proposed Project boundary would be captured and directed to a holding pond under controlled release.

3.2.11.2.4 Groundwater

3.2.11.2.4.1 Construction

The potential impact of Proposed Project construction on groundwater would be negligible. No discharges to land are anticipated during construction, and stormwater discharges would comply with the requirements of the authorization to discharge issued by the Kentucky Division of Water. Finally, Ascend Elements would develop a spill prevention and response plan designed to prevent any constituents that might be spilled from infiltrating the soil and reaching groundwater.

3.2.11.2.4.2 Operation

The Facility is expected to operate 24-hours per day for 365 days per year. Operations would require 310,000 gpd (roughly 2.1 billion gallons total over the full 20-year Facility lifespan) of process water and water for employee use, where 150,000 gallons (roughly 1 billion gallons total over the full 20-year Facility lifespan) would result in wastewater going to the

Hammond-Wood Wastewater Treatment Plant, (Ascend Elements, 2022). Facility water would be supplied by the HWEA, which obtains water from Lake Barkley. The City's water treatment plant has a design capacity of 15 mgd and average production of drinking water is 6.18 mgd; therefore, the requirements of the proposed Facility would represent approximately 3.5 percent of the remaining capacity (8.8 mgd). There would be no groundwater use for the Proposed Project. Given the absence of groundwater use and low potential that discharges from the Proposed Project would reach groundwater, Proposed Project operations would have a negligible impact on groundwater resources.

3.2.11.3 Cumulative Impacts

Given the negligible impacts to surface water and groundwater and despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would combine with the Proposed Project to generate cumulative adverse impacts to surface and groundwater.

3.2.11.4 Proposed Mitigation Measures

No mitigation measures would be required for surface water or groundwater.

3.2.12 Vegetation and Wildlife

3.2.12.1 Affected Environment

Redwing Ecological Services conducted a habitat assessment for Commerce Industrial Park II to characterize on-site natural areas and to document the presence/absence of suitable habitat for listed threatened and endangered species on June 21, 2017. For listed species, preliminary desktop analysis including USFWS IPaC data identified habitat potential for the Indiana bat (*Myotis sodalis*), the northern long-eared bat (*Myotis septentrionalis*), the gray bat (*Myotis grisescences*), and mussel species.

3.2.12.1.1 Vegetation

The Proposed Project site, located within the larger Commerce Industrial Park II survey area, consists of former agricultural land most recently cropped, with a combination of corn (*Zea mays*), wheat (*Triticum* sp.), and soybeans (*Glycine max*). One fragment of arboreal habitat as a single tree line runs roughly parallel to and intersecting with the southern border of Lot 3 (Figure 3). Common species within the mixed-aged woods of Commerce Industrial Park II include black walnut (*Juglans nigra*), silver maple (*Acer saccharinum*), box elder (*Acer negundo*), sugar berry (*Celtis laevigata*), shagbark hickory (*Carya ovata*), northern red oak (*Quercus rubra*), American sycamore (*Platanus occidentalis*), pecan (*Carya illinoensis*), persimmon (*Diospyros virginiana*), and black gum (*Nyssa sylvatica*). The single tree line is expected to be comprised of one or several of these species, along with sporadic, low-shrub understory.

3.2.12.1.2 Wildlife

Within the Proposed Project site, the only potential suitable habitat identified for listed threatened and endangered species is the single tree line at the southern boundary; no suitable mussel habitat was found. The single tree line represents potential summer arboreal roosting habitat for Indiana and northern long-eared bats.

3.2.12.2 Environmental Consequences

3.2.12.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.12.2.2 Proposed Project

3.2.12.2.3 Vegetation

3.2.12.2.3.1 Construction

Impacts to vegetation from Proposed Project construction are anticipated to be minor, affecting prior agricultural cover rather than native vegetation and habitat. Under the Proposed Project, up to 147.1 acres of disturbance to agricultural land would occur from the construction of the Facility, where 110 acres would comprise facilities and impermeable surface, and 37.1 acres would remain undeveloped/landscaped. Grading and permanent removal of vegetation during construction would cause localized removal of topsoil and permanent minor adverse impacts to vegetation. Potential staging areas for construction equipment and materials would utilize existing cleared areas, minimizing adverse impacts to vegetation.

3.2.12.2.3.2 Operations

Operations of the Proposed Project are not anticipated to create any additional impacts to vegetation.

3.2.12.2.4 Wildlife

3.2.12.2.4.1 Construction

Impacts to listed endangered or threatened species or designated critical habitat from the Proposed Project are anticipated to be negligible. No listed endangered or threatened species have been observed or documented on Lot 3 or Lot 4, and neither lot encompasses any designated critical habitat for a listed species. While the desktop analysis and report generated from query of the USFWS IPaC tool (Appendix 3) identified theoretical potential for as many

as six listed species to exist within or in proximity to the Proposed Project site, a 2017 field survey of a 704-acre section of Commerce Industrial Park II determined that there was no suitable habitat for four of the six listed species on the Proposed Project site. The survey did identify the tree line that runs along the border of the property as potentially suitable summer habitat for the Northern Long-eared Bat and the Indiana Bat. The tree line is outside the building footprint of the Apex Facility, however, and is not anticipated to be directly disturbed by construction activities. The survey also identified a solitary tree along the northern border of the Proposed Project site as potential suitable summer habitat for the Northern Long-eared Bat and the Indiana Bat, but as the tree was located more than 1,000 feet from the nearest suitable swarming or winter habitat it is therefore excluded from the definition of “suitable summer habitat”. ([*Revised Conservation Strategy for Forest-Dwelling Bats In the Commonwealth of Kentucky*](#), USFWS 2016).

According to the U.S. Fish & Wildlife Service and National Marine Fisheries Service’s Endangered Species Consultation Handbook, formal consultation is not required when an action agency reaches a “no effect” finding for a proposed project, but action agencies are encouraged to seek an optional concurrence to be placed in the administrative record for the action. DOE has sought US FWS concurrence with the Department’s no effect determination for construction and operation of Project Apex. Response letters, if received, are included in Appendix 3.

3.2.12.2.4.2 Operations

Operations of the Proposed Project are not anticipated to create any impacts to wildlife.

3.2.12.3 Cumulative Impacts

Although additional tenants are planned for Commerce Industrial Park II, the type and extent of impacts to vegetation and habitat that would result are not reasonably foreseeable due to the unknown nature of any use of other lots by the theoretical tenants. To the extent any potential impacts were reasonably foreseeable, future tenants would be subject to the Endangered Species Act, including prohibitions on unauthorized "take" (as applicable) of a listed species and on the destruction or adverse modification of critical habitat contained in. Habitat conditions described for the Proposed Project site are consistent with those across Commerce Industrial Park II and are not anticipated to be impacted by construction or operations of other industrial facilities in the area. Therefore, despite plans for additional tenant development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to vegetation and wildlife.

3.2.12.4 Proposed Mitigation Measures

No mitigation measures for vegetation and wildlife are proposed at this time.

3.2.13 Regulated Waste (Solid and Hazardous Wastes)

3.2.13.1 Affected Environment

The Proposed Project site is located within a larger, planned industrial park (Commerce Industrial Park II). There were no known prior hazardous wastes or non-agricultural or residential solid waste generation at the property that comprises Commerce Industrial Park II, and there is no EPA Identification Number associated with this property. There are no Superfund sites within at least a 1-mile radius (Earth Science Engineering, 2017).

3.2.13.2 Environmental Consequences

3.2.13.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.13.2.2 Proposed Project

3.2.13.2.2.1 Construction

Construction of the Proposed Project is expected to generate negligible to minor, direct, temporary impacts from regulated waste. Solid waste and sanitary waste generated during construction activities would be limited to common construction-related waste streams. In-state or out-of-state landfills or recycling facilities would have the capability and capacity to accept these wastes, and therefore, there would be no impact associated with the disposal of these materials. In addition, the Facility would implement BMPs to minimize the quantity of non-hazardous solid waste generated, as appropriate, during construction and to ensure proper handling of materials.

3.2.13.2.2.2 Operations

Operations are expected to incur minor, direct, long-term impacts from regulated wastes. There would be certain non-hazardous waste streams generated during Facility operations including municipal solid waste as well as sodium sulfate, which is expected to be used in the Hydro-to-Cathode recovery process. There would also be approximately 12 tons per year (estimated) of oil recovered from the process water /wastewater treatment system, which may be sold, disposed of, or recycled for energy (Ascend Elements, 2022a and 2022b). Major waste stream estimates for anticipated operations are shown in Table 5.

Table 5. Major Waste Stream Estimates for Year 1 Operations

Production Area	Description	Classification	Estimated Annual Production Rate (tons/year)
Wet Shredding	Recovered electrolyte	Waste / byproduct	726
Metals Recovery	Purification sludge	Waste (hazardous)	2,848
	Waste Oil	Waste	4
Water Recovery	Recovered oil residue	Used oil	12
	Calcium fluoride - sludges	Waste	TBD
Laboratory	Onsite laboratory wastewater	Waste (hazardous)	~120 gallons/year for offsite disposal
Emissions Control	Calcium fluoride - sludges	Waste	TBD

Estimates based on 24-hour operations, 365 days per year

No underground storage tanks are included in Proposed Project design. Materials would be stored in sacks or in tank farms appropriately designed for spill containment in accordance with best management practices and any applicable regulatory requirements. Materials would be received via railcar to facilitate more controlled and consistent unloading (Ascend Elements, 2022a).

It is anticipated that the on-site laboratory may produce some amount of hazardous waste (caustic D002; Table 5). The quantity of hazardous waste generated at the Facility would determine the Facility’s generator status and which Federal and State regulations related to waste generation, management, and disposal would be applicable. The Proposed Project would have a negligible impact on the overall quantity of hazardous waste generated and the amount of waste that would require offsite treatment and disposal.

Ascend Elements intends to recycle or reuse byproducts and non-hazardous waste to the extent possible, minimizing the amount of waste that would be disposed of offsite. As a result, the Proposed Project would have a negligible impact on the overall quantity of solid waste generated and landfilled offsite.

3.2.13.3 Cumulative Impacts

Although additional tenants are planned for Commerce Industrial Park II, the type and extent of impacts from regulated wastes on other lots within the Industrial Park are not reasonably foreseeable due the unknown nature of any use of other lots by the theoretical tenants.

Further, all projects would be subject to similar regulatory requirements related to waste generation and disposal. Despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to regulated waste.

3.2.13.4 Proposed Mitigation Measures

During construction, standard BMPs and preventative measures such as maintaining fencing around construction areas, establishing designated materials containment and storage areas, and controlling the flow of construction equipment and personnel through the Proposed

Project site, would minimize the potential for a release to occur. If a release occurs, immediate action would be taken to contain, remediate, and dispose of any contaminated materials in accordance with Federal, State, and local regulations and site-specific spill plans.

For the operational phase, arrangements are not yet made for the offsite transport and treatment, or disposal, of wastes generated during operations; however, the Facility plans to reuse materials to the extent possible and would dispose of other materials offsite in accordance with applicable regulations.

3.2.14 Utilities and Energy Use

3.2.14.1 Affected Environment

The Proposed Project is located within the service area of the City of Hopkinsville municipal water system and municipal wastewater treatment system. Tennessee Valley Authority (TVA) operates a 161 kV transmission line running through the western side of the Commerce Industrial Park, and power to the Facility would be supplied by Pennyrite Electric. Commerce Industrial Park II is served by public utilities, including a 6-inch gas line, 12-inch water line, and 8-inch sewer line. The Proposed Project site currently does not have tie-ins to these services. Anticipated service providers include:

- TVA / Pennyrite Electric (power)
- Hopkinsville Electric System (telecom and internet)
- Hopkinsville Water Environment Authority (HWEA) (water)
- HWEA (wastewater)
- Atmos Energy's Mid-States Division (natural gas)

HWEA serves more than 28,000 water and wastewater customers and has become the regional source of water for Christian County (HWEA 2023). The Moss Water Treatment Plant is located on the northeast side of the City of Hopkinsville, on Metcalfe Lane and serves drinking water to Hopkinsville, Pembroke, Crofton, and the Christian County Water District. The plant processes raw water from Lake Barkley in a 27-mile pipeline to Hopkinsville. HWEA owns, operates, and maintains over 283 miles of water mains ranging in size from 2" to 16", with over 1,249 hydrants included as part of the system. One existing hydrant adjacent to the site along John Rivers Road would be decommissioned after construction is complete, with six new fire hydrants to be placed adjacent to the Proposed Project site (three along the future road east of Lots 3 and 4, and another three along the future road south of Lot 3; Figure 3). The Proposed Project would also install and maintain private fire hydrants within Lots 3 and 4 (Figure 3). Current plans include 18 new private hydrants predominantly within Lot 4, which would be supported by a 300,000-gallon fire water tower installed and maintained within the Facility supporting emergency fire suppression capability within the Facility boundary. Additional private hydrants would be added to Lot 3 once building and road design within the Facility are finalized for Lot 4. The new hydrants and water tower would be supplied and metered through HWEA.

3.2.14.2 Environmental Consequences

3.2.14.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.14.2.2 Proposed Project

3.2.14.2.2.1 Construction

Construction of the Proposed Project would have short-term, negligible adverse impacts on utilities, including electricity, water, gas, and sewer. During the construction period the Proposed Project site would rely on portable generators, water tanks, and portable bathrooms to accommodate increases in the demand for water, electricity and sewer from workers and equipment at the Proposed Project site. Once grading is completed, contractors would build electrical lines, and Pennyrile Electric would provide temporary power to the Proposed Project site for subsequent construction activities. New permanent utility connections would be constructed during the construction period, but not be relied on for services until the Facility is operational.

3.2.14.2.2.2 Operations

Proposed Project operations would have long-term minor adverse direct impacts on local utilities and energy use, as the industrial processes involved would increase the demand for electricity, water, and gas at the Proposed Project site. Demand for electricity, potable water, and wastewater services from operation of the Proposed Project would require infrastructure tie-ins to existing facilities as well as limited upgrades to existing utility infrastructure and services.

To address wastewater generated by operations, the Proposed Project would connect to the local publicly owned treatment works (POTW) via a planned Lift Station, designed to meet the needs of the entire Commerce Park II development. Anticipated wastewater discharges from Proposed Project operations would be discharged to the POTW via the Lift Station (approximately 150,000 gallons per day (gpd)), representing a four percent increase from the current average daily wastewater discharge of the POTW. Wastewater discharge through the POTW is therefore not anticipated to exceed treatment capacity and have direct adverse impacts on wastewater infrastructure (also see Section 3.2.11 *Surface Water and Groundwater*).

To meet projected electricity demands during Facility operations (905,000 kWh/yr during full operations), the Proposed Project would tie into the planned Pennyrile electric substation, located adjacent to the southwest corner of Lot 3, via a devoted Proposed Project site substation. The Pennyrile substation would be connected to Project Apex's ("Substation 1") via limited overhead lines, running above the western edge of the Proposed Project site. Electrification of the Proposed Project site is consistent with local plans to electrify the entire Commerce Park II development, including the construction of additional substations and overhead lines, and therefore would not adversely impact users Pennyrile Electric's service elsewhere in the region.

Atmos Energy's Mid-States Division would provide natural gas to the Proposed Project Area via a 5.35 mile lateral 8 inch in diameter pipeline, which would deliver natural gas from the mainline. The Proposed Project natural gas demand is estimated to be 130,000 SCFH (130 MBH) Peak / 50,000 SCFH (50 MBH) Avg.

The Proposed Project is anticipated to require approximately 310,000 gpd of potable water, which would be obtained via an extension connecting to the existing 12-inch HWEA watermain along the eastern side of John Rivers Road. Ascend Elements has arranged to procure a volume of potable water from the HWEA that represents approximately 3.5 percent of the remaining capacity of the City's water treatment plant, an increase in demand that would not have an adverse impact on availability for other users. Additionally, Ascend Elements plans to incorporate water recycling technologies into the Facility to increase water use efficiency during operations and minimize the quantity of water required from municipal sources.

3.2.14.3 Cumulative Impacts

The Proposed Project is anticipated to contribute incrementally to cumulative impacts affecting utility infrastructure and services. Consistent with Section 3.2.7.3 (Surface Water and Groundwater), the Proposed Project, in combination with anticipated future leasing at Commerce Industrial Park II to other industrial tenants, would increase demand for electricity, the production of wastewater discharged to the POTW and the demand for treated water from the HWEA; however, future tenants each would need to coordinate with the POTW and the HWEA to negotiate resource procurement and discharge.

3.2.14.4 Proposed Mitigation Measures

No mitigation measures are currently planned for utilities or energy use.

3.2.15 Transportation and Traffic

3.2.15.1 Affected Environment

The Proposed Project site is situated roughly six (6) miles northeast of U.S. Highway 41 ALT, and roughly 0.25 miles southwest of U.S. Highway 41. U.S. Highway 41 crosses Interstate Highway I-169 within the Hopkinsville city limits approximately six (6) miles northwest of the Proposed Project site. Access to I-24 can be gained by heading southwest on US-41 via for two miles then south on Kentucky Route 115 for approximately eight miles. The CSX

railroad mainline, and CSX Casky Yard Corporate offices are located adjacent to the Proposed Project Site. Nashville International Airport (BNA) is located 65 miles southeast. Site-specific process risk assessments and safety plans would be completed to identify potential transportation hazards. If any potential new hazard is identified, Ascend Elements would implement responsive policies as needed, which would be in compliance with local, state, and federal regulations, and Ascend Elements' Corporate Safety Guidance.

3.2.15.2 Environmental Consequences

3.2.15.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.15.2.2 Proposed Project

3.2.15.2.2.1 Construction

Short-term but measurable minor adverse impacts to traffic and transportation are expected during the construction phase of the Proposed Project. Construction of the Facility is anticipated to last for up to 36 months and include the development of buildings, offices, storage areas, and necessary mechanical equipment for the manufacturing process. During the construction period approximately 2,860 jobs would be generated, where construction vehicles and construction workers' vehicles would add to existing local traffic. Construction is anticipated to require approximately ten truck trips per day for deliveries and shipments. The roads most impacted would include John Rivers Road, U.S. Highways 41, and I-24; however, these roads are designed to accommodate industrial truck traffic. The rail spur would not cross any existing roads, though it would cross the new road planned along the eastern boundary of Lots 3 and 4.

3.2.15.2.2.2 Operations

The Proposed Project would generate a minor long-term increase to traffic and transportation from anticipated daily truck and personal-vehicle traffic into and out of the industrial park. Planning activities and approval for Commerce Industrial Park II did not generate criteria meeting the Kentucky Transportation Cabinet's standards to trigger a specific traffic study, and none has been performed to date. For upgrades to KY Route 115 in support of Commercial Industrial Park I & II, a categorical exclusion was granted by the Kentucky Transportation Cabinet on January 6, 2022 (Kentucky Transportation Cabinet, 2022). Facility operations are expected to require approximately 20-50 truck trips per day for deliveries and shipments (Table 6). Trucks would use the established road network to access the industrial park, and these roadways are designed for and currently accommodate industrial truck traffic.

The Facility is anticipated to employ approximately 420 FTE employees during operations, and there is expected to be a corresponding daily increase in the number of personal vehicles at the site each day (See Section 3.2.1 Socioeconomics). The number of personal vehicles accessing the Proposed Project site are expected to be distributed throughout the day, and the Facility site design would include adequate parking, loading, and maneuver space for these vehicles and trucks.

Table 6. Estimated Major Raw Materials Shipments for Year 1 of Operations

Material	Volume (ft ³ /day)	Number of shipping days/year	Loads/day	Mode of Transportation
HCL	1,154	300	0.42	rail car
NH ₄ OH (ammonia hydroxide)	32		0.08	tank truck
NaOH (sodium hydroxide)	3,247		4.20	rail car
H ₂ SO ₄ (sulfuric acid)	2,637		1.60	rail car
Sulfonated Kerosene	3		TBD	TBD
(H ₂ O ₂) Hydrogen peroxide	1,547		0.60	rail car
Calcium chloride	84		0.18	truck
Black mass	1,513		1.67	truck
Lithium carbonate	135		0.36	truck
sodium carbonate	463		0.56	truck
sodium sulfide	33		0.03	truck

Regular deliveries of certain raw materials would be shipped to the Facility using the adjacent CSX railroad mainline, increasing the volume of material transported on regional rail infrastructure (Table 6). Despite a slight increase in shipping volume and associated minor increase in impacts to transportation infrastructure, Proposed Project integration with the existing, adjacent railway system would reduce potential operational impacts to traffic related to delivery of raw materials to the Facility. The delivery of inbound production materials and distribution of the manufactured final product via rail minimizes the potential impact to local and regional traffic by reducing the number of vehicles using local roads to reach the Proposed Project site.

3.2.15.3 Cumulative Impacts

Construction and operations of the Proposed Project, combined with past, present, and future planned development within Commerce Industrial Park II would increase localized traffic volume along John Rivers Road and within the Highway 41 corridor between Pembroke and Hopkinsville, during construction. In addition, the Proposed Project would likely increase regional rail traffic through transport of additional raw materials and finished products during operations. Combined, these would add incrementally to local and regional cumulative traffic and transportation impacts.

3.2.15.4 Proposed Mitigation Measures

No mitigation measures would be required for transportation and traffic.

3.2.16 Public and Occupational Health and Safety

3.2.16.1 Affected Environment

The Proposed Project site has been agricultural cropland with no known historical releases resulting in soil or groundwater contamination, and no known current sources of emissions or effluents. No evidence of contamination has been reported from either of the 2017 surveys conducted by Redwing Ecological Services and Earth Science Engineering (see Sections 3.2.6 and 3.2.8). No other risks to public and occupational health and safety from the existing Proposed Project site have been identified.

3.2.16.2 Environmental Consequences

3.2.16.2.1 No Action Alternative

It is Ascend Elements' intent to proceed in the absence of DOE funding, and, as detailed elsewhere in this EA, the applicant initiated and self-funded certain site preparation work. DOE recognizes that this project might continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Project and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance.

3.2.16.2.2 Proposed Project

3.2.16.2.2.1 Construction and Operations

Risks to public and occupational health and safety from Proposed Project construction and operations are expected to be minor, direct and indirect, and long-term. Numerous regulatory permitting requirements and planned mitigations governing Proposed Project construction and operations address factors relevant to public and occupational health and safety. These include land use (Section 3.2.6), air quality (Section 3.2.7), greenhouse gases (Section 3.2.8), water quality (Section 3.2.11), regulated waste streams (Section 3.2.13), and transportation and traffic (Section 3.2.15). Existing corporate policies of Ascend Elements Inc., or future updates thereof, further address relevant health and safety risk factors and would be followed throughout construction and operations. These mitigation measures are summarized below under Section 3.2.14.4.

Proposed Project operations would process certain hazardous materials on a regular basis including sulfuric acid, hydrochloric acid, hydrogen peroxide, and sodium hydroxide (Table 6). To reduce safety and logistic risk, these materials would be received via railcar within the Facility area allowing for strictly controlled and consistent management. Prior to startup, Ascend Elements would prepare an Emergency Action/Crisis Management (EA/CM) Plan that would address unanticipated events (e.g., natural disaster, terrorism, accidents, spills) and

provide procedures for the protection of the site's personnel, environment, and infrastructure. Ascend Elements would build on EA/CM Plans from their other facilities with similar operations. Three storage tanks and two railcar unloading stations would be designed into the devoted rail spur for this purpose. A storage tank for spent acid would allow trucks to return to the reprocessing plant for regeneration.

Ascend Elements would require all employees to participate in the Company's established health, safety, and security training, which includes specialized training for individuals handling hazardous materials and wastes. Ascend Elements would maintain a visible emergency contact list and close coordination with local first responders (e.g., fire department and law enforcement). Apex 1 would maintain compliance with local, state, and federal regulatory requirements including the Emergency Planning and Community Right-to-Know Act (EPCRA), Tier II reporting, and RCRA.

3.2.16.2.2 Accidents and Intentional Destructive Acts

Prior to the start of operations, Ascend Elements would initiate security procedures to protect the site's personnel, environment, and infrastructure from reasonably foreseeable accidental and intentional destructive acts, which may be possible but are considered very unlikely to occur. Procedures would focus on both prevention and emergency response, and would be predicated on environmental, health, and safety protocols established in their other manufacturing and research and development facilities. Procedures and protocols would also include those discussed in Sections 3.2.7, 3.2.13, 3.2.14, and 3.2.15, as part of operations and regulatory compliance. The Proposed Project site would be surrounded by a perimeter security fence and monitored by dedicated 24-hour security staff and trained Facility first responders. In addition, the Facility would have closed-circuit cameras in each building with focus on critical ingress and egress routes. Security badges would regulate access to Facility buildings. Facility management would work in full and immediate cooperation with emergency responders and managers from outside the Facility as appropriate.

3.2.16.3 Cumulative Impacts

Although additional industrial tenants are planned for Commerce Industrial Park II, which may also contribute to public and occupational health and safety risk, all future tenants would be subject to similar regulatory requirements as described in the resource sections listed above. Conditions described and planned for the Proposed Project are consistent with those across Commerce Industrial Park II and are not anticipated to be impacted by construction or operations of other industrial facilities in the area. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse public and occupational health and safety impacts.

3.2.16.4 Proposed Mitigation Measures

Risk mitigation for handling hazardous materials would be established through defined operational procedures (e.g., Hazardous Communication, personal protective equipment, chemical management) including, maintenance of equipment in compliance with federal,

state, and local occupational health and safety requirements, environmental regulations, and manufacturer recommendations. Spill detection equipment would be installed for storage tank farms. Further Proposed Project mitigations covered under Ascend Elements' corporate guidance include but are not limited to chemical handling procedures; waste management and handling procedures; and specific health and safety policies including proper training, equipment commissioning, regular maintenance, and engineering controls.

Site-specific process risk assessments would be completed to identify potential hazards by type (i.e., material handling or worker safety program) not present at an existing Ascend Elements Facility. If new hazards are identified additional policies would be implemented to directly address potential hazards, and in compliance with local, state, and federal regulations.

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Appendix 1

Environmental Synopsis:
Bipartisan Infrastructure Law Battery (BIL)
Materials Processing and Battery Manufacturing
DE-FOA-0002678

ENVIRONMENTAL SYNOPSIS
Bipartisan Infrastructure Law Battery (BIL) Materials
Processing and Battery Manufacturing
DE-FOA-0002678

April 2023

National Energy Technology Laboratory
U.S. Department of Energy
Pittsburgh, PA
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INTRODUCTION

The United States Department of Energy (DOE or the Department) prepared this Environmental Synopsis pursuant to the Department's responsibilities under Section 216 of the DOE's National Environmental Policy Act (NEPA) Implementing Procedures set forth in 10 CFR Part 1021. This synopsis summarizes the consideration given to environmental factors and records that the relevant environmental consequences of reasonable alternatives were evaluated in the process of selecting awardees seeking financial assistance under The Office of Manufacturing and Energy Supply Chains and the Office of Energy Efficiency and Renewable Energy, which jointly issued the Funding Opportunity Announcement (FOA) DE-FOA-0002678 Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing. Projects awarded under FOA-0002678 to be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act¹, also more commonly known as the BIL. The BIL is a once-in-a-generation investment in infrastructure, which will grow a more sustainable, resilient, and equitable economy through enhancing U.S. competitiveness in the world, creating good jobs, and ensuring stronger access to these economic benefits for disadvantaged communities (DACs). The BIL appropriates more than \$62 billion to the DOE² to deliver a more equitable clean energy future for the American people by investing in American manufacturing and workers; expanding access to energy efficiency and clean energy for families, communities, and businesses; delivering reliable, clean, and affordable power to more Americans; and building the technologies of tomorrow through clean energy demonstrations.

The BIL will invest more than \$7 billion in the batteries supply chain over the five-year period encompassing fiscal years (FYs) 2022 through 2026. This includes sustainable sourcing of critical minerals from secondary and unconventional sources, reducing the need for new extraction and mining; sustainable processing of critical minerals; and end-of-life battery collection and recycling. The activities to be funded under this FOA support BIL Sections 40207 (b) & (c) and the broader government-wide approach to upgrading and modernizing infrastructure, including by strengthening critical domestic manufacturing and supply chains to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis and advance environmental justice. These BIL Sections are focused on:

- Creating and retaining good-paying jobs, where workers are properly classified as employees, free from discrimination and harassment, with a free and fair choice to join, form, or assist a union;
- Supporting inclusive and supportive workforce development efforts to strengthen America's competitive advantage based on innovation, efficiency, and a skilled and diverse workforce up and down the supply chain;

1. Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021).

2. U.S. Department of Energy. November 2021. "DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver For American Workers, Families and Usher in the Clean Energy Future." <https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0>

- Ensuring that the U.S. has a viable battery materials processing industry to supply the North American battery supply chain;
- Expanding the capabilities of the U.S. in advanced battery manufacturing;
- Enhancing national security by reducing the reliance of the U.S. on foreign competitors for critical materials and technologies;
- Enhancing the domestic processing capacity of minerals necessary for battery materials and advanced batteries; and
- Ensuring that the U.S. has a viable domestic manufacturing and recycling capability to support and sustain a North American battery supply chain.

The DOE initially selected 21 projects under twelve topic areas of interest (AOIs) and provided cost-shared funding for project definition activities; all of the projects are subject to the completion of project-specific NEPA reviews. FOA-0002678 supports new, retrofitted, and expanded commercial-scale domestic facilities to produce battery materials, processing, and battery recycling and manufacturing demonstrations. As required by section 216, this synopsis does not contain business sensitive, confidential, trade secret or other information that statues or regulations would prohibit the DOE from disclosing. It also does not contain data or other information that may reveal the identity of the offerors.

BACKGROUND

The projects that will result from this FOA are cost-shared collaborations between the government and industry to increase investment in battery materials processing and battery manufacturing projects. In contrast to other federally funded activities, these projects are not federal projects; instead, they are private projects seeking federal financial assistance. Under the FOA, industry proposes projects that meet their needs and those of their customers while furthering the national goals and objectives of DOE. The successful development of battery materials processing and battery manufacturing projects is a key objective of the nation's effort to help mitigate the effects of climate change, gain energy independence, and bolster the domestic supply chain.

Awardees under this FOA would receive assistance using funds appropriated by the Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021) also known as the Bipartisan Infrastructure Law (BIL). The activities to be funded under this FOA support BIL Sections 40207(b) & (c) and the broader government-wide approach to upgrading and modernizing infrastructure, including by strengthening critical domestic manufacturing and supply chains to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis and advance environmental justice.

The applications reviewed under this FOA were selected for negotiations in October 2023. Twelve topic areas of interest (AOIs) were included in the FOA and each AOI outlined project objectives that were specific to that AOI. The twelve AOIs were separated according to the BIL sections 40207(b)(3)(A) and 40207(c)(3)(A):

<u>Areas of Interest</u>	<u>Title</u>
Battery Material Processing Grants pursuant to Section 40207(b)(3)(A)	
1	Commercial-scale Production Plants for Domestic Separation of Critical Cathode Battery Materials from Domestic Feedstocks
2	Commercial-scale Domestic Production of Battery-Grade Graphite from Synthetic and Natural Feedstocks
3	Commercial-scale Domestic Separation and Production of Battery-grade Precursor Materials (Open Topic)
4	Demonstrations of Domestic Separation and Production of Battery-grade Materials from Unconventional Domestic Sources
5	Demonstrations of Innovative Separation Processing of Battery Materials Open Topic
Battery Component Manufacturing and Recycling Grants pursuant to Section 40207(c)(3)(A)	
6	Commercial-scale Domestic Battery Cell Manufacturing
7	Commercial-scale Domestic Battery Cathode Manufacturing
8	Commercial-scale Domestic Battery Separator Manufacturing
9	Commercial-scale Domestic Next Generation Silicon Anode Active Materials and Electrodes
10	Commercial-scale Domestic Battery Component Manufacturing Open Topic
11	Commercial-scale Domestic Battery Recycling and End-of Life Infrastructure
12	Domestic Battery Cell and Component Manufacturing Demonstration Topic

AOIs 1–3 and 6–11 were directed to commercial level projects. AOIs 4, 5, and 12 were directed to demonstration level projects. Each level had different evaluation criteria and each application was evaluated against the criteria as outlined below:

A. Technical Review Criteria AOIs 1–3, 6–11 (commercial)

- Criterion 1: Technical Merit, Project Management, and Impact (30%)
- Criterion 2: Commercialization and Market Acceptance (30%)
- Criterion 3: Cost Share (10%)
- Criterion 4: Qualifications and Resources (10%)
- Criterion 5: Equity Plan: Quality Jobs & Community Benefits (20%)

B. Technical Review Criteria AOIs 4, 5, and 12 (demonstration)

- Criterion 1: Technical Merit, Project Management, and Impact (40%)
- Criterion 2: Commercialization and Market Acceptance (20%)
- Criterion 3: Cost Share (10%)
- Criterion 4: Qualifications and Resources (10%)
- Criterion 5: Equity Plan: Quality Jobs & Community Benefits (20%)

These criteria represented the total evaluation scoring. However, the selection official also considered program policy factors, in making final selections.

As a federal agency, DOE must comply with NEPA (42 U.S.C. §§ 4321 *et seq.*) by considering potential environmental issues associated with its actions prior to deciding

whether to undertake these actions. The environmental review of applications received in response to FOA-0002678 was conducted pursuant to Council on Environmental Quality Regulations (40 Code of Federal Regulations (CFR) Parts 1500–1508) and DOE’s NEPA Implementing Procedures (10 CFR Part 1021), which provide directions specific to NEPA in the context of procurement and financial assistance actions.

PURPOSE AND NEED

The overall purpose and need for DOE action pursuant to the Office of Manufacturing and Energy Supply Chains in collaboration with the Office of Energy Efficiency and Renewable Energy program and the funding opportunity under the BIL is to accelerate the development of a resilient supply chain for high-capacity batteries by increasing investments in battery materials processing and battery manufacturing projects. The BIL investments in the battery supply chain will include five main steps including: (1) raw material production, (2) materials processing including material refinement and processing, (3) battery material /component manufacturing and cell fabrication, (4) battery pack and end use product manufacturing, and (5) battery end-of-life and recycling. Projects selected are needed to meet the focus of the BIL sections: a) creating and retaining good-paying jobs; b) supporting inclusive and supportive workforce development efforts to strengthen America’s competitive advantage; c) ensuring that the United States has a viable battery materials processing industry to supply the North American battery supply chain; d) expanding the capabilities of the United States in advanced battery manufacturing; e) enhancing national security by reducing the reliance of the United States on foreign competitors for critical materials and technologies; f) enhancing the domestic processing capacity of minerals necessary for battery materials and advanced batteries; and g) ensuring that the United States has a viable domestic manufacturing and recycling capability to support and sustain a North American battery supply chain.

DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements to this project and the other 19 projects selected under this FOA. This project and the other selected projects are needed to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis. These projects would meet the objective.

ALTERNATIVES

The DOE received 178 eligible applications in twelve AOIs. AOIs 1 through 5 are under Battery Material Processing Grants pursuant to Section 40207(b)(3)(A); AOIs 6 through 12 are under Battery Component Manufacturing and Recycling Grants pursuant to Section 40207(c)(3)(A).

Detailed requirements for each AOI are listed in the FOA. Applications were accepted, reviewed, and initial selections were made; all of the projects are subject to the completion of

project specific NEPA reviews. AOIs and number of applications received are listed in the table below:

AOI	AOI Title	Number of applications received	Number of initial Selections
1	Commercial-scale Production Plants for Domestic Separation of Critical Cathode Battery Materials from Domestic Feedstocks	14	4
2	Commercial-scale Domestic Production of Battery-Grade Graphite from Synthetic and Natural Feedstocks	16	3
3	Commercial-scale Domestic Separation and Production of Battery-grade Precursor Materials (Open Topic)	18	2
4	Demonstrations of Domestic Separation and Production of Battery-grade Materials from Unconventional Domestic Sources	13	1
5	Demonstrations of Innovative Separation Processing of Battery Materials Open Topic	9	1
6	Commercial-scale Domestic Battery Cell Manufacturing	26	0
7	Commercial-scale Domestic Battery Cathode Manufacturing	10	2
8	Commercial-scale Domestic Battery Separator Manufacturing	6	2
9	Commercial-scale Domestic Next Generation Silicon Anode Active Materials and Electrodes	7	2
10	Commercial-scale Domestic Battery Component Manufacturing Open Topic	20	1
11	Commercial-scale Domestic Battery Recycling and End-of Life Infrastructure	7	1
12	Domestic Battery Cell and Component Manufacturing Demonstration Topic	32	2

ENVIRONMENTAL REVIEW

DOE assembled environmental review teams to assess all applications that met the mandatory requirements. The review teams considered 20 resource areas that could potentially be impacted by the technologies and sites proposed for each project that was selected for negotiations. These resource areas consisted of:

- Aesthetics
- Floodplains
- Soils

- Air Quality
- Biological Resources
- Climate
- Community Services
- Cultural Resources
- Environmental Justice
- Geology
- Ground Water
- Human Health and Safety
- Land Use
- Noise
- Socioeconomics
- Surface Water
- Transportation and Traffic
- Utilities
- Wastes and Materials
- Wetlands

The review teams were composed of environmental professionals having expertise in the resource areas considered by the DOE and with experience evaluating the impacts of industrial facilities and energy-related projects. The review teams considered the information provided as part of each application, which included narrative text, worksheets, and the environmental information volumes for the sites proposed by the applicant. Reviewers conducted preliminary analyses to identify the potential range of impacts that would be associated with each application. In addition, reviewers identified both direct and indirect potential impacts to the resource areas mentioned above, as well as short-term impacts that might occur during construction and start-up, and long-term impacts that might occur over the expected operational life of the proposed project and beyond. The reviewers also considered any mitigation measures proposed by the applicant, and any reasonably available mitigation measures that may not have been proposed.

Reviewers assessed the potential for environmental issues and impacts using the following characterizations:

- **Beneficial** – Expected to have a net beneficial effect on the resource in comparison to baseline conditions.
- **None (negligible)** – Immeasurable or negligible in consequence (not expected to change baseline conditions).
- **Low** – Measurable or noticeable but of minimal consequence (barely discernable change in baseline conditions).
- **Moderate** – Adverse and considerable in consequence but moderate and not expected to reach a level of significance (discernable, but not drastic, alteration of baseline conditions).
- **High** – Adverse and potentially significant in severity (anticipated substantial changes or effects on baseline conditions that might not be mitigable).

For cases in which an application failed to provide sufficient information to support a determination among the above characterizations, the reviewers assigned one of the following characterizations:

- **Limited Concern** – The potential for substantial adverse impacts would be negligible to low based on background information about the resource area with respect to the geographic location of the project.
- **Elevated Concern** – The potential for substantial adverse impacts would be moderate to high based on background information about the resource area with respect to the geographic location of the project.

Applications in Response to the FOA

Based on the technologies and sites proposed, the applications for the FOA were preliminarily evaluated and reviewed by the NEPA compliance team. There were several applications that were deemed to not have sufficient information for assessment, and also site selections for some projects have not been finalized. Therefore, the summary in the below section is based on the information that was available. The following impacts by resource area were considered in the selection of candidates for award:

Aesthetics – Low to moderate impact would be expected as construction would primarily be conducted on existing industrial sites. Five projects were assessed to have a visual resource impact. Visual viewpoint changes are expected to occur at the sites as a result of project implementation and construction of the facilities. One project has overhead transmission lines.

Air Quality – Moderate impact would be expected as many facilities would have air controls and permitting in place, and new facilities will be putting controls in place as required by any obtained air permits. Fifteen projects had impacts, with several pollutants listed including: greenhouse gases (GHGs), particulate matter (PM), hazardous air pollutants (HAPs), volatile organic compounds (VOCs), nitrogen oxides (NO_x), cadmium, nickel, lead, and combustion products. One project mentioned that BACT (best available control technology) would be installed, and one project mentioned MACT (maximum achievable control technology) to be installed (an iron-pellet gas purification and polishing system). One project stated that a Synthetic Minor Construction and Operations Air Permit would be required. Other impacts may be expected from transportation-related emissions or fugitive dust from construction activities.

Biological Resources – Low to moderate impact would be expected for three projects, with one project being located on the eastern edge of Great Salt Lake, and two projects being sited on greenfield sites. An additional three projects mention sites that were previously used for agriculture or grazing lands. The project located on one of the greenfield sites mentions that the site is pastureland, strands of forest, and wetlands/streams. The other greenfield site is located on farmland. Projects will be assessed for agricultural or natural habitat concerns, if any are identified.

Climate – Beneficial impacts would occur for all projects as batteries are critical to decarbonizing the economy through grid storage, resilience for powering homes and

businesses, and electrification of the transportation sector, as noted in the FOA. GHG emissions from the projects would be minimal compared to these decarbonization efforts.

Community Services – Low impacts would be expected for the projects, though no impacts were specified in the review. Generally, projects anticipating a larger temporary workforce during construction would be expected to place a higher demand on community services – particularly in smaller, more rural communities where currently existing community services are more limited.

Cultural Resources – Moderate impacts would be expected for five projects, with several being sited next to railways or on greenfield sites. One project noted that Tribal Nations, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers consultations will all be needed. It is expected that Section 106 regulations will be followed on all projects. Bureau of Land Management (BLM) and Department of Defense (DOD) cooperating agencies will be needed for one other project. One project is in proximity to an airport, and another project is located near a major railyard. BLM permitting is expected for two projects.

Environmental Justice (EJ) – The EJ impacts should be beneficial for the projects. Through the Administration’s Justice40 Initiative, 40 percent of the overall benefits of this FOA should flow to DACs, as listed in the Justice40 guidance document and the FOA³. EJ impacts were expected for four of the projects, yet EJ benefits will be considered for all projects under the Justice40 initiative. Under Justice40 the benefits include (but are not limited to) measurable direct or indirect investments or positive project outcomes that achieve or contribute to the following in DACs: (1) a decrease in energy burden; (2) a decrease in environmental exposure and burdens; (3) an increase in access to low-cost capital; (4) an increase in job creation, the clean energy job pipeline, and job training for individuals; (5) increases in clean energy enterprise creation and contracting (e.g., minority-owned or diverse business enterprises); (6) increases in energy democracy, including community ownership; (7) increased parity in clean energy technology access and adoption; and (8) an increase in energy resilience. Environmental and human health of the DACs will be considered under Executive Order 12898 — Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, as required for projects.

Floodplains – Floodplains impact for the projects are low. There are four projects with Floodplains concerns, with one of the projects below the 500 Year Flood Plain (0.2-percent-annual-chance).

Geology – Geology impacts would be low to moderate for the projects. The possibility of extraction of economic minerals for battery manufacturer should be considered for relevant projects. One project has backfilled coal mine pits and spoil piles. One project is located on an old mine site. If geology is undisturbed, no additional impacts would be expected.

Ground Water – Ground Water impacts for the projects would be low. One project has a groundwater concern. Ground water impact from metals/chemicals or wastes could be of

³ The Justice40 initiative, created by E.O. 14008, establishes a goal that 40percent of the overall benefits of certain federal investments flow to (DACs). The Justice40 Interim Guidance provides a broad definition of DACs (Page 2): <https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf>. The DOE, Office of Management and Budget (OMB), and/or the Federal Council for Environmental Quality (CEQ) may issue additional and subsequent guidance regarding the designation of DACs and recognized benefits under the Justice40 Initiative.

note for the projects, though containment measures would be in place as required for permitting. It is unknown if projects own any groundwater supply wells. Stormwater runoff will be managed in accordance with all relevant requirements, if required by projects.

Human Health and Safety – Impacts will be moderate. Five projects cited a concern. One project has a sensitive receptor (daycare) 2,500 feet from the corner of the lot. One project is upgrading its fire safety equipment, and fire safety and coordination with local fire departments is likely to be considered for all projects. Low to moderate impacts may also be considered during both construction and operations of the facilities. The level of risk is generally related to the size and complexity of the planned construction. Of note would be any concerns for handling of chemicals and metals, including minimizing exposure and prevention of spills. Safe operating practices will be implemented for all projects, and compliance with federal, state, and local regulations and standards as well.

Land Use – Low to moderate impacts would be expected for all projects due to construction within existing facilities or on a compatible nearby site. Two sites are greenfield sites, but many are already existing industrial sites. Three sites have not yet been selected. BLM permits are needed for two projects (three sites), with one BLM site also consulting with the DOD. One project is consulting with Tribal Nations, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers. Clearance of land, stormwater runoff best management practices, utility line installations, and rail lines will be considered as needed.

Noise – Noise impacts would be low to moderate. One project specifically cited noise impact. During the project construction phases, noise levels will increase, but would be temporary and ending after construction. All project facilities conducting manufacturing and/or recycling activities may have noise, but much will occur within closed buildings. Any projects located near neighboring buildings may have noise impacts to consider for those near the site if outdoor noise continues past construction phases.

Socioeconomics – Beneficial impacts would be expected for all projects. Seven projects cited socioeconomic and/or EJ concerns. All projects would provide some additional employment during construction and operations, with most opportunities occurring within the local area DACs. Tax revenue generation and direct and indirect spending in the local economy is expected for the projects.

Soils – Low impacts would be expected for projects requiring land disturbance, including two greenfield sites. Five projects have sites that are adjacent to agricultural activity, with one converting existing pastureland, and one possibly converting farmland. Construction activities could result in a potential for soil erosion, but appropriate mitigation would be implemented as necessary, such as run-off control, silt fences, and stormwater detention facilities.

Surface Water – Impacts would be low to moderate. Battery Manufacturing and recycling facilities would potentially have water influent and wastewater effluent requirements to minimize the impacts with municipalities treating water. One project noted an effluent line along an existing roadway with a connect to the Mississippi River levee and River. Stormwater controls could be used during construction and operation. Controls could be used on hazardous liquids, if any, to minimize impacts.

Transportation and Traffic – Moderate impacts are expected with eight projects citing impacts. Five projects noted that they are cited near railways, railway right of way, or may need to recommission/use railway. Transportation of construction workforce to the site would be temporary. Construction access roads may be considered for projects. Transportation of operations workforce would be considered. Recycling and manufacturing facilities would also require trucking or railcar transport of materials and wastes in and out of the facility.

Utilities – Moderate impacts would be expected for greenfield sited projects resulting from the need for new energy infrastructure for manufacturing and recycling. Recycling and manufacturing facilities may have need for water, electricity, steam, wastewater, industrial gases and/or natural gas, or other for the processes and facilities. Availability and capacity of utilities and anticipated infrastructure needs will be evaluated for projects.

Wastes and Materials – Impacts would be moderate to high. Sixteen projects have waste streams impact and hazardous material storage and use impacts. Three projects have a Resource Conservation and Recovery Act (RCRA) designation, and several others have hazardous chemicals. One project is a large quantity generator (LQG). The nature of the manufacturing and/or recycling for Batteries Materials and Processing Manufacturing and Recycling will require diligence in hazardous/non-hazardous waste management practices and applicable permitting. Transportation of waste to landfills to be considered, if applicable, to projects.

Wetlands – Wetlands impacts would be low to moderate. Four projects noted wetlands concerns, which could be avoided, or controls used to minimize impacts resulting from project construction. The extent and the conditions of the wetlands on each site will be addressed during construction and/or operations as required. One project noted that wetlands will be avoided. One project has wetlands and streams on site. Appropriate wetland mitigation measures will be implemented for unavoidable impacts.

CONCLUSION

The alternatives available to DOE from applications received in response to the FOA provided reasonable alternatives for accomplishing the Department's purpose and need to satisfy the responsibility imposed on the Department to carry out a program to bolster the nation's battery material production and battery production.

An environmental review was part of the evaluation process of these applications. DOE prepared a critique containing information from this environmental review. That critique, summarized here, contained summary as well as project-specific environmental information. The critique was made available to, and considered by, the selection official before selections for financial assistance were made.

DOE determined that selecting twenty-one applications in response to the FOA would meet the Department's purpose and need. DOE selected twenty-one projects for awards of financial assistance:

- Project Recipient (City, State) project located in City, State. Construct a new, commercial-scale U.S.-based lithium materials processing plant, sited next to existing facility, that uses sustainably extracted spodumene minerals from the site's lithium mine to produce battery grade lithium hydroxide for domestic manufacturing of lithium-ion batteries for 750,000 vehicles in the U.S. market. The DOE has determined that an environmental assessment (EA) is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Construct a battery minerals processing facility to process nickel ore in concentrate (nickel/iron and copper) from economically viable sources in support of a new domestic cathode supply chain. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Plan, design, and construct a cathode active materials (CAM) plant including a manufacturing building and the processing equipment necessary to convert precursor materials into CAM, the highest value component in a lithium-ion battery. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Design a sustainable lithium hydroxide facility to produce 30,000 metric tons per year of lithium hydroxide for the domestic battery and electric vehicle (EV) market, doubling the lithium hydroxide production capacity currently available in the U.S. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Design, construct and commission a graphite anode powder plant over a five-year period. Testing of a pilot manufacturing plant will occur site I in City, State, and graphitization at site II City, State, during the first 3 years of the project. Approximately 35,000 tons per annum of new synthetic graphite anode material capacity for lithium-ion batteries will be used in electric vehicles and critical energy storage applications. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Expand the production capacity of the integrated milling, purification, coating, and surface treatment operation producing on-specification active anode material (AAM), using natural graphite from an overseas graphite operation. Construction of a new 11,250 metric tons per annum (tpa) AAM facility is underway to serve as the only vertically integrated and large-scale natural graphite AAM producer outside China and the first large-scale natural graphite AAM producer in the U.S. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Building its first mass production site in the U.S., which will produce 10,000 metric tons per year of battery grade synthetic graphite. The project will build a new plant near City to produce 30,000 metric tons per year of graphite targeted at the EV industry. The DOE has

determined that an EA is the appropriate level of environmental review for the proposed project;

- Project Recipient (City, State) project located in City, State. Will build a new battery-grade polyvinylidene fluoride (PVDF) facility in City, State, to supply the needs of the North American EV and stationary energy storage market. Potential to provide enough PVDF to supply more than 5 million EV batteries per year at full capacity. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to build the first U.S. manufacturing plant for lithium hexafluorophosphate (LiPF₆) on the grounds of the company's existing fluorochemical production site and produce up to 10,000 metric tonnes (MT) of LiPF₆ per year, which is sufficient to support domestic production of more than a million full EVs. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to build and operate a commercial-scale facility to implement its novel process for manufacturing battery cathode grade lithium hydroxide (LiOH) (5,000 MT (metric tonnes) LiOH/year, with capacity for 30,000 MT LiOH/year) commercial processing plant from unconventional Nevada-based lithium-bearing sedimentary resources (10,000 acres). The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to demonstrate production of lithium at commercially relevant scales using a proprietary technology (using ion-exchange beads) for lithium extraction from domestic brine resources at commercially relevant scales. The project would include 4 pilot units in State and State. Each site would require 5–7 acres for demonstrations lasting 10 months to 3 years before demobilization. Additional work would be manufacturing ceramic beads at 2 existing facilities, one of which will require modification and equipment to support the new production. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to establish industrial scale U.S. production capacity of sustainable, low-cost precursor cathode materials by integrating the separation of critical cathode materials from spent lithium-ion batteries (LIBs) with the production of both precursor cathode active materials (pCAM) and metal salts to support domestic production of cathode active material (CAM). CAM can then be used in new LIBs for EVs and energy storage systems (ESS). It will produce enough material to supply over 250,000 EVs annually. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to build a plant to produce high quality lithium iron phosphate (LFP) cathode powder for the global lithium battery industry using primarily a domestic supply chain. Using its own

process technology and by acquiring licenses for certain other commercially proven processes, the plant will have two production lines built in dual phases, with each line capable of producing 15,000 tonnes per year of LFP powder. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project

- Project Recipient (City, State) project located in City, State. Proposes to build a separator facility capable of supplying 19 gigawatt-hour (GWh) of electrovoltaic batteries, including their existing 2 GWh battery plant. The project would construct new buildings, tanks, and associated equipment. The area is a greenfield site that was previously used for agriculture and is currently being developed as an industrial park. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. The proposed project would construct new separator plants with capacity of 1-1.8 billion m² per year, enough material for ~1.4 million EVs. The separator plants would include the installation of high-capacity battery separator lines. Finalized site selection is still underway. The DOE has not determined the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Build-out of a 600,000-square-foot factory that will produce breakthrough lithium-ion anode materials. The project is expected to begin production of Recipient's proprietary silicon anode material in 2025, with full production of 20 GWh equivalent of material at the project's conclusion in 2026. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to design and construct two 2,000 tonnes/year silicon-carbon anode material factories, also known as "modules." The proposed project plans to construct these modules as part of an expansion of a previously planned project. The proposed project will involve design and construction of two modules. The proposed project will also involve the construction of support facilities for all modules. These two modules and support facilities will be constructed on a planned, but undeveloped portion of the proposed project site. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to set up an advanced prelithiation and lithium anode manufacturing facility to accelerate the transition to next-generation lithium-ion (Li-ion) batteries and enable the development of a robust U.S. battery component supply chain. The proposed facility will support industrial-scale production of advanced lithiated anodes for multiple battery cell makers and automobile manufacturers. Finalized site selection is still underway. The DOE has not determined the appropriate level of environmental review for the proposed project;

- Project Recipient (City, State) project located in City, State. Proposes to expand and upgrade recipient's existing lithium-ion recycling facility. Collect, disassemble, shred, and upgrade the critical minerals present from tens-of-thousands of tons of lithium-ion batteries for reuse in new lithium-ion batteries. The project requires the physical modification of existing buildings, new construction, and ground-disturbing activities on a portion of the project site. The DOE has determined that an EA is the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to demonstrate the manufacturing of silicon nanowire anode technology at the component and cell level on multi-megawatt-hour-scale manufacturing lines that are comparable to those used in multi-GWh factories. Plans are to construct a new facility of about 120,000 square feet. Finalized site selection is still underway. The DOE has not determined the appropriate level of environmental review for the proposed project;
- Project Recipient (City, State) project located in City, State. Proposes to demonstrate the ability to domestically produce multiple battery chemistries namely NMC811 and LFP in a plant with the capacity of 3,000 tpa ready for production in 2025 scaling to 10,000 tpa in 2026. The demonstration plant will produce NMC811 generating zero waste and 70 percent less GHGs by using only 10 percent of the water and 30 percent of the energy versus traditional battery material production methods. The proposed new facility will be approximately 120,000 square feet in a zoned industrial park. Finalized site selection is still underway. The DOE has not determined the appropriate level of environmental review for the proposed project.

Appendix 2

Permits and Approvals



DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
REGULATORY DIVISION
3701 BELL ROAD
NASHVILLE, TENNESSEE 37214

December 23, 2022

SUBJECT: LRN-2017-01081, Approved Jurisdictional Determination, Ascend Elements Site, Hopkinsville, Christian County, Kentucky

Mr. David Steiner
Ascend Elements
133 Flanders Road
Westborough, MA 01581
E-copy: DSteiner@AscendElements.com

Dear Mr. Steiner:

This letter is in regard to your report entitled "Waters of the US and State Assessment" for the Ascend Elements site, dated September 22, 2022, which documented potential waters of the United States on a review area of approximately 229 acres. This project has been assigned File No. LRN-2020-01081, please refer to this number in any future correspondence.

The U.S. Army Corps of Engineers (USACE) has regulatory responsibilities pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). Under Section 10, the USACE regulates any work in, or affecting, navigable waters of the U.S. It appears the review area does not include navigable waters of the U.S. and would not be subject to the provisions of Section 10. Under Section 404, the USACE regulates the discharge of dredged and/or fill material into waters of the U.S., including wetlands.

Enclosed is an approved jurisdictional determination for aquatic resources identified as C1-EPH that was determined not jurisdictional. The rationale for this determination is provided in the attached Approved Jurisdictional Determination form. This approved jurisdictional determination expires five years from the date of this letter, unless new information warrants revision of the determination before the expiration date, or the District Engineer identifies specific geographic areas with rapidly changing environmental conditions that merit re-verification on a more frequent basis. This approved jurisdictional determination is only valid for the review area as shown on the enclosed map labeled "LRN-2017-01081, Enclosure 3"

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of

the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

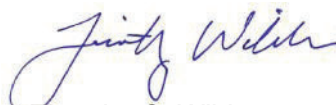
If you object to this decision, you may request an administrative appeal under USACE regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeals Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this decision you must submit a completed RFA form to the Great Lakes and Ohio River Division, Division Office at the following address:

Regulatory Appeal Review Officer
ATTN: Ms. Katie McCafferty
Army Engineer Division
550 Main Street, Room 10-780
Cincinnati, OH 45202-3222
TEL (513) 684-2699

In order for an RFA to be accepted by the USACE, the USACE must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date listed on the RFA form. **It is not necessary to submit an RFA form to the Division Office if you do not object to the decision in this letter.**

We appreciate your awareness of the USACE regulatory program. If you have any questions, you may contact myself or Jennifer Watson at (615) 587-4716 or by e-mail at Jennifer.A.Watson2@usace.army.mil.

Sincerely,



Timothy C. Wilder
Chief, West Branch
Regulatory Division

Enclosures

Enclosure 1 – AJD Form
Enclosure 2 – Appeal Form
Enclosure 3 – Aquatic Features Map

Electronic Copies Furnished:

Terracon, Caitlan Howard

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): 23 DECEMBER 2022

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Nashville, LRN-2017-01081, Ascend Elements Property

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: Kentucky County/parish/borough: Christian City: Hopkinsville
Center coordinates of site (lat/long in degree decimal format): Lat. 36.786837° N, Long. -87.383324° W.
Universal Transverse Mercator: 16
Name of nearest waterbody: Montgomery Creek
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: West Fork Red River
Name of watershed or Hydrologic Unit Code (HUC): 05130206 Red River
Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

Office (Desk) Determination. Date: 13 DECEMBER 2022
Field Determination. Date(s): 13 DECEMBER 2022

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

Waters subject to the ebb and flow of the tide.

Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

a. Indicate presence of waters of U.S. in review area (check all that apply):

- TNWs, including territorial seas
- Wetlands adjacent to TNWs
- Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
- Non-RPWs that flow directly or indirectly into TNWs
- Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
- Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
- Impoundments of jurisdictional waters
- Isolated (interstate or intrastate) waters, including isolated wetlands

b. Identify (estimate) size of waters of the U.S. in the review area:

Non-wetland waters: linear feet: width (ft) and/or acres.
Wetlands: acres.

Limits (boundaries) of jurisdiction based on: Established by OHWM.

Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: **We determined that C1-EPH, a non-RPW, did not have a significant nexus to a TNW. The available data does not demonstrate that C1-EPH has more than a speculative effect on the Red River. See Section B and Section C for additional details.**

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW: .

Summarize rationale supporting determination: .

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent": .

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: 74,880 acres

Drainage area: 192 acres

Average annual rainfall: 51.14 inches

Average annual snowfall: 7 inches

(ii) Physical Characteristics:

(a) Relationship with TNW:

Tributary flows directly into TNW.

Tributary flows through 2 tributaries before entering TNW.

- Project waters are 5-10 river miles from TNW.
- Project waters are 1-2 river miles from RPW.
 - Project waters are 5-10 aerial (straight) miles from TNW.
 - Project waters are 1 (or less) aerial (straight) miles from RPW.
- Project waters cross or serve as state boundaries. Explain: N/A.

Identify flow route to TNW⁵: C1-EPH flows into an intermittent UT to Montgomery Creek, then flows into Montgomery Creek, which flows into West Fork of Red River.

Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

Tributary stream order, if known: C1-EPH flows into an intermittent UT to Montgomery Creek, then flows into Montgomery Creek, which flows into West Fork of Red River.

(b) General Tributary Characteristics (check all that apply):

Tributary is: Natural
 Artificial (man-made). Explain: .
 Manipulated (man-altered). Explain: Tributary is located in an agricultural setting and has been altered over the decades.

Tributary properties with respect to top of bank (estimate):

Average width: 5 feet
 Average depth: 5 feet
 Average side slopes: **Vertical (1:1 or less).**

Primary tributary substrate composition (check all that apply):

<input checked="" type="checkbox"/> Silts	Sands	Concrete
<input type="checkbox"/> Cobbles	Gravel	Muck
<input type="checkbox"/> Bedrock	Vegetation. Type/% cover: 50% mix i.e., privet, poison ivy, virginia creeper	
Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: highly eroding. Channelizing the stormwater runoff from the surrounding fields.

Presence of run/riffle/pool complexes. Explain: None.

Tributary geometry: **Relatively straight**

Tributary gradient (approximate average slope): 2-4 %

(c) Flow:

Tributary provides for: **Ephemeral flow**

Estimate average number of flow events in review area/year: **20 (or greater)**

Describe flow regime: Ephemeral.

Other information on duration and volume: This feature is flows only in response to a rainfall event.

Surface flow is: **Discrete and confined.** Characteristics: Water is confined the channel during flow events.

Subsurface flow: **No.** Explain findings: No indication of groundwater connection found onsite.

Dye (or other) test performed: .

Tributary has (check all that apply):

<input checked="" type="checkbox"/> Bed and banks	
<input checked="" type="checkbox"/> OHWM ⁶ (check all indicators that apply):	
<input type="checkbox"/> clear, natural line impressed on the bank	the presence of litter and debris
<input type="checkbox"/> changes in the character of soil	destruction of terrestrial vegetation
<input type="checkbox"/> shelving	the presence of wrack line
<input type="checkbox"/> vegetation matted down, bent, or absent	sediment sorting
<input checked="" type="checkbox"/> leaf litter disturbed or washed away	scour
<input type="checkbox"/> sediment deposition	multiple observed or predicted flow events
<input type="checkbox"/> water staining	abrupt change in plant community
<input type="checkbox"/> other (list):	
<input type="checkbox"/> Discontinuous OHWM. ⁷ Explain: .	

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

<input type="checkbox"/> High Tide Line indicated by:	Mean High Water Mark indicated by:
<input type="checkbox"/> oil or scum line along shore objects	survey to available datum;
<input type="checkbox"/> fine shell or debris deposits (foreshore)	physical markings;
<input type="checkbox"/> physical markings/characteristics	vegetation lines/changes in vegetation types.
<input type="checkbox"/> tidal gauges	
<input type="checkbox"/> other (list):	

(iii) **Chemical Characteristics:**

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).

Explain: The channel has been straightened through decades of agricultural use, flows only during precipitation events.

Identify specific pollutants, if known: See above.

natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
 Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

- Wetland size: acres
- Wetland type. Explain:
- Wetland quality. Explain:
- Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:

Flow is: **Pick List**. Explain:

Surface flow is: **Pick List**

Characteristics:

Subsurface flow: **Pick List**. Explain findings:

- Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

- Directly abutting
- Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

- Project wetlands are **Pick List** river miles from TNW.
- Project waters are **Pick List** aerial (straight) miles from TNW.
- Flow is from: **Pick List**.
- Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

- Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
- Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

- All wetland(s) being considered in the cumulative analysis: **Pick List**
- Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres) Directly abuts? (Y/N) Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:2.

Proximity: The AJD review area covers the entirety of the RR. The RR is 1,505 linear feet long and has an approximate drainage area of 192 acres, making up 0.25% of the 74,880 acres of the West Fork Red River Watershed where the C1-EPH watershed drains into the Red River (USGS Stream Stats) at the point where any contribution from this RR might enter the Red River (confluence). The RR is 7.84 river miles from the West Fork Red River. The flow path is described in section B(1)(ii).

Flow Characteristics: Precipitation in this county averages 51.14 inches annually. The RR only flows in response to rain events and the duration of that flow is contained within the first 48 hours following the rain event. We infer that any contribution of water or material by the RR to the West Fork Red River is negligible based on the relative size of its watershed compared to that of the West Fork Red River.

Quality: The RR assessed on site exhibited impairment due to row-cropping. The RR does not have any wetlands associated with it.

Relevant Reach Function: The primary functions of the RR are the collection and distribution of stormwater, sediment, organic matter, and nutrients to downstream systems, which occur only during or immediately after precipitation events that produce runoff. The volume of water conveyed by the RR and the amount of substances entrained within this water are negligible in proportion to that delivered to the downstream TNW. The habitat of the RR does not support organisms dependent on an aquatic environment, and therefore does not support aquatic organisms inhabiting the TNW. The ephemeral habitat of the RR and its distance to the TNW (approximately 7.58 river miles), precludes its use by aquatic life present in the TNW for foraging, breeding, or refugia

Determination: We have concluded from our analysis that any effect of this RR's functions on the chemical, biological, or physical integrity of the downstream TNW is negligible, and we therefore cannot assert that the RR, "C1-EPH", has more than a speculative or insubstantial effect on the chemical, physical, and biological integrity of the West Fork Red River. We conclude that a significant nexus does not exist between "C1-EPH" and the Red River.

2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: .

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:

TNWs: linear feet width (ft), Or, acres.

Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: .

Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters: .

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters: .

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

- Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

Demonstrate that impoundment was created from “waters of the U.S.,” or

Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

which are or could be used by interstate or foreign travelers for recreational or other purposes.

from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

which are or could be used for industrial purposes by industries in interstate commerce.

Interstate isolated waters. Explain: .

Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters: .

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

Prior to the Jan 2001 Supreme Court decision in “*SWANCC*,” the review area would have been regulated based solely on the “Migratory Bird Rule” (MBR).

Waters do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction. Explain: **Available data does not demonstrate that the RR "C1-EPH" has more than an insubstantial or speculative effect on the chemical, physical, or biological integrity of TNWs downstream. See section C for more details.**

Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

Lakes/ponds: acres.

Other non-wetland waters: acres. List type of aquatic resource: .

Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the “Significant Nexus” standard, where such a finding is required for jurisdiction (check all that apply):

Non-wetland waters (i.e., rivers, streams): **1,505** linear feet, width (ft).

Lakes/ponds: acres.

Other non-wetland waters: acres. List type of aquatic resource: .

Wetlands: acres.

SECTION IV: DATA SOURCES.

To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: See Consultant's Report Submittal on 22 SEPTEMBER 2022, by Terracon, "Waters of the US Assessment" filed as LRN-2017-01081_20220922_AJD.

Data sheets prepared/submitted by or on behalf of the applicant/consultant.

Office concurs with data sheets/delineation report.

Office does not concur with data sheets/delineation report.

Data sheets prepared by the Corps:

Corps navigable waters' study:

U.S. Geological Survey Hydrologic Atlas: See Consultant's Report Submittal on 22 SEPTEMBER 2022, by Terracon, "Waters of the US Assessment" filed as LRN-2017-01081_20220922_AJD

USGS NHD data.

USGS 8 and 12 digit HUC maps.

U.S. Geological Survey map(s). Cite scale & quad name: 7.5 Minute Index: Hopkinsville.

USDA Natural Resources Conservation Service Soil Survey. Citation: See Consultant's Report Submittal on 22 SEPTEMBER 2022, by Terracon, "Waters of the US Assessment" filed as LRN-2017-01081_20220922_AJD

National wetlands inventory map(s). Cite name: See Consultant's Report Submittal on 22 SEPTEMBER 2022, by Terracon, "Waters of the US Assessment" filed as LRN-2017-01081_20220922_AJD

State/Local wetland inventory map(s):

FEMA/FIRM maps:

100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)

Photographs: Aerial (Name & Date): See Consultant's Report Submittal on 22 SEPTEMBER 2022, by Terracon, "Waters of the US Assessment" filed as LRN-2017-01081_20220922_AJD and photos taken by USACE on 13 DECEMBER 2022 in File LRN-2017-01081.

or Other (Name & Date):

Previous determination(s). File no. and date of response letter:

Applicable/supporting case law:

Applicable/supporting scientific literature:

Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: See file labeled "LRN-2017-01081_KY_CHRISTIAN COUNTY" for more details.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Ascend Elements, Inc, C/O David Steiner	File Number: LRN-2017-01081	Date: 12/23/2022
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at

http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
Jennifer Watson
Nashville District, U.S. Army Corps of Engineers
Regulatory Branch
3701 Bell Road
Nashville, Tennessee 37214
615-587-4716; Jennifer.A.Watson2@usace.army.mil

If you only have questions regarding the appeal process you may also contact:
Regulatory Appeals Review Officer
ATTN: Katherine McCafferty
Army Engineer Division
550 Main Street, Room 10-780
Cincinnati, Ohio 45202-3222
Phone: (513) 684-2699
Katherine.A.McCafferty2@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Date:

Telephone number:

Signature of appellant or agent.



Legend	
	Ephemeral Channel
	Site Boundary
	Upland Drainage
	Area of Standing Water

LRN-2017-01081
Enclosure 3



Project Manager: CNH Drawn by: CNH Checked by: DEW Approved by: DEW	Project No. 18227254 Scale: Not to Scale File Name: EX6 Date: SEPT. 2022		PRELIMINARY WATER RESOURCES MAP Ascend Elements John Rivers Road Hopkinsville, Kentucky	Exhibit 6
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Andy Beshear

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

Rebecca Goodman

300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Anthony R. Hatton

January 31, 2023

Mr. Daniel Russell, Chief Operating Officer
ASCEND ELEMENTS, INC.
133 Flanders Road
Westborough, MA 01581

Re: Proposed Title V / Synthetic Minor, Construction / Operating Permit for a Precursor
batter materials from recovered Lithium ion battery black mass facility

Permittee Name: Ascend Elements, Inc.
Source ID: 21-047-00163
Agency Interest: 174716
Activity: APE20220003
Permit: V-22-034

Dear Mr. Russell:

Ascend Elements, Inc. applied for their initial Title V permit for the construction and operation of a Precursor battery materials from recovered Lithium ion battery black mass facility at Hopkinsville, Kentucky. Public notice of the draft permit issued by the Division for Air Quality was published on December 27, 2022. Comments were received during the 30-day public comment period, and the Division's responses to them are in the 'Response to Comments' section.

Included with this cover letter is the signed proposed permit for this facility. The proposed permit is the final determination of the Cabinet, and carries with it the authority to construct any newly permitted emission units. The United States Environmental Protection Agency (U.S. EPA) has 45 days to comment on the proposed permit. You will be notified if any changes are made to the proposed permit based on U.S. EPA comments. If no comments are received the Division will issue the final permit.

If you have any questions regarding this matter, you may contact Mr. Zachary Bittner at 502-782-6555.

Ascend Elements, Inc. - Page 2 of 2
V-22-034



Sincerely,

X

Stephanie Burberry
Program
Coordinator Permit
Support Section
Permit Review
Branch Division
for Air Quality

SB/ZB
Enclosure

1. Commonwealth of
Kentucky

Energy and Environment Cabinet Department for Environmental
Protection Division for Air Quality
300 Sower Boulevard, 2nd Floor Frankfort, Kentucky 40601
(502) 564-3999

Proposed

2. AIR QUALITY
PERMIT
3. Issued under 401 KAR
52:020

Permittee Name: Ascend Elements, Inc.
Mailing Address: 133 Flanders Road, Westborough, MA 01581

Source Name: Ascend Elements, Inc.
Mailing Address: 6505 John Rivers Road,, Hopkinsville, KY 42266
Source Location: 6505 John Rivers Road

Permit ID: V-22-034
Agency Interest #: 174716
Activity ID: APE20220003
Review Type: Title V / Synthetic Minor, Construction / Operating
Source ID: 21-047-00163

Regional Office: Paducah Regional Office
130 Eagle Nest Drive Paducah, KY 42003
(270) 898-8468
County: Christian

Application Complete Date: December 1, 2022
Issuance Date: January 30, 2023
Expiration Date: January 30, 2028

X

Rick Shewekah

4. For Michael J. Kennedy, P.E.
Director
Division for Air Quality

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Permit	Permit Type	Activity#	Complete Date	Issuance Date	Summary of Action
V-22-034	Initial Title V/ Synthetic Minor	APE20220003	12/5/2022	1/30/2023	Initial Construction Permit

SECTION A - PERMIT

Pursuant to a duly submitted application the Kentucky Energy and Environment Cabinet (Cabinet) hereby authorizes the operation of the equipment described herein in accordance with the terms and conditions of this permit. This permit was issued under the provisions of Kentucky Revised Statutes (KRS) Chapter 224 and regulations promulgated pursuant thereto.

The permittee shall not construct, reconstruct, or modify any affected facilities without first submitting a complete application and receiving a permit for the planned activity from the permitting authority, except as provided in this permit or in 401 KAR 52:020, Title V Permits.

Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses, or approvals required by the Cabinet or any other federal, state, or local agency.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

5. Emission Unit 01 (B01)	Natural gas fired Watertube Package
Boiler #1 Emission Unit 02 (B02)	Natural gas fired Watertube Package
Boiler #2 Emission Unit 03 (B03)	Natural gas fired Watertube Package
Boiler #3 Emission Unit 03 (B04)	Natural gas fired Watertube Package
Boiler #4 Emission Unit 03 (B05)	Natural gas fired Watertube Package
Boiler #5	

Description:

Model: Superior Boiler- Shawnee D or equivalent with low NOx burner

Construction Date: B01 and B02: October 2023 Proposed

B03: March 2024 Proposed;

B04: October 2024 Proposed; and B05: September 2025

Proposed

Heat Input Capacity: 80 MMBtu/hr each (0.078 MMscf/hr each), 65,000 lb of steam/hr Primary

Fuel: Natural Gas

Stack IDs, SB01, SB02, SB03, SB04, SB05

APPLICABLE REGULATIONS:

401 KAR 59:015, New Indirect Heat Exchangers.

401 KAR 60:005, Section 2.(2)(d), 40 C.F.R. 60.40c through 60.48c (Subpart Dc), Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

Precluded Regulations:

401 KAR 51:017, Prevention of significant deterioration of air quality for PM/PM₁₀/PM_{2.5} emissions.

1. Operating Limitations:

For each indirect heat exchanger, during a startup or shutdown period, the permittee shall comply with the following work practice standards [401 KAR 59:015, Section 7(1)]:

- a. The permittee shall comply with 401 KAR 50:055, Section 2(5) [401 KAR 59:015, Section 7(1)(a)];
- b. The frequency and duration of startup periods or shutdown periods shall be minimized by the affected facility [401 KAR 59:015, Section 7(1)(b)];
- c. All reasonable steps shall be taken by the permittee to minimize the impact of emissions on ambient air quality from the affected facility during startup periods and shutdown periods [401 KAR 59:015, Section 7(1)(c)];
- d. The actions, including duration of the startup periods, of the permittee of each emission unit during startup periods and shutdown periods, shall be documented by signed, contemporaneous logs or other relevant evidence [401 KAR 59:015, Section 7(1)(d)]; and
- e. Startups and shutdowns shall be conducted according to either [401 KAR 59:015, Section 7(1)(e)]
 - (1) The manufacturer's recommended procedures [401 KAR 59:015, Section 7(1)(e)1.]; or
 - (2) The recommended procedures for a unit of similar design, for which manufacturer's recommended procedures are available, as approved by the Cabinet based on

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

documentation provided by the permittee of the emission units [401 KAR 59:015, Section 7(1)(e)2.].

6. Compliance Demonstration Method:

Compliance shall be demonstrated according to **5. Specific Recordkeeping Requirements (b)**.

2. Emission Limitations:

- a. The permittee shall not cause emissions of particulate emissions in excess of 0.1 lb/MMBtu from each boiler [401 KAR 59:015, Section 4(1)(a)].

7. Compliance Demonstration Method:

These units are assumed to be in compliance with the allowable PM standards while combusting natural gas.

- b. The opacity of visible emissions shall not exceed 20%, except: [401 KAR 59:015, Section 4(2)]
 - (1) A maximum of forty (40) percent opacity shall be allowed for a maximum of six (6) consecutive minutes in any sixty (60) consecutive minutes during fire box cleaning or soot blowing; and [401 KAR 59:015, Section 4(2)(b)]
 - (2) For emissions from an affected facility caused by building a new fire, emissions during the period required to bring the boiler up to operating conditions shall be allowed, if the method used is recommended by the manufacturer and the time does not exceed the manufacturer's recommendations. [401 KAR 59:015, Section 4(2)(c)]

8. Compliance Demonstration Method:

Compliance shall be demonstrated according to **4. Specific Monitoring Requirements (b)**

9. and 5. Specific Recordkeeping Requirements (c).

- c. The permittee shall not cause emissions of gases that contain sulfur dioxide in excess of 0.8 lb/MMBtu from each boiler [401 KAR 59:015, Section 5(1)(a)].

10. Compliance Demonstration Method:

These units are assumed to be in compliance with the allowable SO₂ standards while combusting natural gas.

- d. NO_x and CO emissions shall not exceed 30 ppmv at 3% O₂ and 50 ppmv at 3% O₂ respectively from each boiler.

11. Compliance Demonstration Method:

- (1) Initial compliance shall be demonstrated by records of manufacturer specification showing NO_x and CO emissions.
 - (2) See **3. Testing requirements** for continuous compliance.
- e. See **Section D – Source Emission Limitation and Testing Requirements**.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

3. Testing Requirements:

- a. Pursuant to 401 KAR 52:020, Section 10, within sixty (60) days after achieving the maximum production rate at which each of the affected facilities will be operated but not later than 180 days after initial start-up of such facilities and every 5 years thereafter, the permittee shall conduct a performance test to determine the NO_x and CO emission factors in terms of ppmv at 3% O₂, lb/MMBtu and lb/MMscf. See **Section G.4.**
- b. Performance testing shall be conducted using the following U.S. EPA Reference Test Methods: [401 KAR 50:045, Section 1]
 - (1) U.S. EPA Reference Method 10 for CO;
 - (2) U.S. EPA Reference Method 7 for NO_x; or
 - (3) Other methods, as approved by the Division.
- c. Testing shall be conducted at such times as may be required by the Cabinet in accordance with 401 KAR 50:045, Section 1 and 401 KAR 59:005, Section 2(2).

4. Specific Monitoring Requirements:

- a. The permittee shall monitor the amount of natural gas consumption on a monthly basis at each emissions unit [401 KAR 52:020, Section 10 and 40 CFR 60.48c(g)(2)].
- b. Compliance with the opacity standard shall be determined by the permittee performing a qualitative visual observation of the opacity of emissions at each stack no less than monthly and maintaining a log of the observations. If visible emissions from the stack are observed (not including condensed water in the plume), the permittee shall determine the opacity using Reference Method 9. In lieu of determining the opacity using U.S. EPA Method 9, the permittee shall immediately perform a corrective action which results in no visible emissions (not including condensed water in the plume).

5. Specific Recordkeeping Requirements:

- a. The permittee shall maintain records of natural gas consumption at each emission unit, in MMscf, on a monthly basis [401 KAR 52:020, Section 10 and 40 CFR 60.48c(g)(2)].
- b. The permittee shall keep records of the manufacturer's recommended procedures for startup and shutdown, any instance in which the recommended procedures were not followed, and any corrective actions taken [401 KAR 52:020, Section 10].
- c. The permittee shall maintain a log of the qualitative visual observations made, including the date, time, initials of observer, whether any emissions were observed (yes/no), and any U.S. EPA Reference Method 9 readings taken. [401 KAR 52:020, Section 10]
- d. Pursuant to 40 CFR 60.48c(i)(1), all records required under 40 CFR 60.48c shall be maintained by the permittee of the affected facility for a period of two years following the date of such record.

6. Specific Reporting Requirements:

12. See **Section F – Monitoring, Recordkeeping, and Reporting Requirements.**

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Emission Unit: GEN01 and GEN02 Natural Gas Emergency Generators

Description:

Model: Cummins QSK60G C1300N6 1300kW (1953 bhp) (Certified) or equivalent

Construction Date: July 2023 Proposed

Fuel Input: 13.51 MMBtu/hr (0.0132 MMscf/hr) each

Primary Fuel: Natural Gas

Stack IDs: SGEN01, SGEN02

APPLICABLE REGULATIONS:

401 KAR 60:005, Section 2(2)(eeee) 40 C.F.R. 60.4230 to 60.4248, Tables 1 to 4 (Subpart JJJJ), Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

401 KAR 63:002, Section 2(4)(eeee) 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

Precluded Regulations:

401 KAR 51:017, Prevention of significant deterioration of air quality for PM/PM₁₀/PM_{2.5} emissions.

13. Operating Limitations:

- a. Pursuant to 40 CFR 63.6590(c), an affected source that meets any of the criteria in 40 CFR 63.6590(c)(1) through (7) must meet the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. No further requirements apply for such engines under 40 CFR 63, Subpart ZZZZ.
- b. Pursuant to 40 CFR 60.4243(d), the permittee must operate the emergency stationary internal combustion engines (ICE) according to the following requirements. In order for the engine to be considered an emergency stationary ICE, any operation other than emergency operation, maintenance and testing and operation in non-emergency situations for 50 hours per year as described in 40 CFR 60.4243(d)(1) through(3), is prohibited. If you do not operate the engine according to the requirements in 40 CFR 60.4243(d)(1) through(3), the engine will not be considered an emergency engine and must meet all requirements for non-emergency engines.

(1) There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) The permittee may operate your emergency stationary ICE for the purpose specified in 40 CFR 60.4243(d)(2)(i) for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by 40 CFR 60.4243(d)(3) counts as part of the 100 hours per calendar year allowed in 40 CFR 60.4243(d)(2).

- (i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The permittee may petition the Administrator for approval of additional hours to be used for maintenance checks

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

and readiness testing, but a petition is not required if the permittee maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(3) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing provided in 40 CFR 60.4243(d)(2). Except as provided in 40 CFR 60.4243(d)(3)(i), the 50 hours per year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

- A. The engine is dispatched by the local balancing authority or local transmission and distribution system operator;
- B. The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.
- C. The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.
- D. The power is provided only to the facility itself or to support the local transmission and distribution system.
- E. The permittee identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the permittee.

c. Pursuant to 40 CFR 60.4243(e), the permittee may operate their engines using propane for a maximum of 100 hours per year as an alternative fuel solely during emergency operations, but must keep records of such use. If propane is used for more than 100 hours per year in an engine that is not certified to the emission standards when using propane, the permittee is required to conduct a performance test to demonstrate compliance with the emission standards of 40 CFR 60.4233.

14. Emission Limitations:

- a. Pursuant to 40 CFR 60.4233(e), the permittee must comply with the emission standards in 40 CFR 60, Subpart JJJJ, Table 1 for their stationary spark ignition engines (SI) ICE as follows:
 - (1) Emissions of NO_x shall not exceed 2.0 g/hp-hr or 160 ppmvd at 15% O₂.
 - (2) Emissions of CO shall not exceed 4.0 g/hp-hr or 540 ppmvd at 15% O₂.
 - (3) Emissions of VOC shall not exceed 1.0 g/hp-hr or 86 ppmvd at 15% O₂.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

- b. Pursuant to 40 CFR 60.4234, for each engine, the permittee of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in 40 CFR 60.4233 over the entire life of the engine.

Compliance Demonstration Method:

- (1) Pursuant to 40 CFR 60.4243(b)(1), the permittee must demonstrate compliance by purchasing an engine certified according to procedures specified in 40 CFR 60, Subpart JJJJ, for the same model year and demonstrating compliance according to 40 CFR 60.4243(a) as follows:
 - i. Pursuant to 40 CFR 60.4243(a)(1), if the permittee operates and maintains the certified stationary SI internal combustion engine and control device according to the manufacturer's emission-related written instructions, the permittee must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. The permittee must also meet the requirements as specified in 40 CFR 1068, Subparts A through D, as they apply. If the permittee adjusts engine settings according to and consistent with the manufacturer's instructions, the permittee's stationary SI internal combustion engine will not be considered out of compliance.
 - ii. Pursuant to 40 CFR 60.4243(a)(2), if the permittee does not operate and maintain the certified stationary SI internal combustion engine and control device according to the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine, and the permittee must demonstrate compliance according to 40 CFR 60.4243(a)(2)(i) through (iii), as appropriate.
- c. See **Section D – Source Emission Limitation and Testing Requirements.**

15. Testing Requirements:

Pursuant to 401 KAR 50:045, Section 1, testing shall be conducted at such times as may be requested by the Cabinet.

16. Specific Monitoring Requirements:

Pursuant to 40 CFR 60.4237(b), if the emergency stationary SI internal combustion engines does not meet the standards applicable to non-emergency engines, the permittee must install a non-resettable hour meter.

17. Specific Recordkeeping Requirements:

- a. Pursuant to 40 CFR 60.4245(a), for each unit, the permittee of all stationary SI ICE must keep records of the information in 40 CFR 60.4245(a)(1) through (4) as follows:
 - (1) All notifications submitted to comply with this subpart and all documentation supporting any notification.
 - (2) Maintenance conducted on the engine.
 - (3) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 1048, 1054, and 1060, as applicable.
 - (4) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to 40 CFR 60.4243(a)(2), documentation that the engine meets the emission standards.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

- b. Pursuant to 40 CFR 60.4245(b), for all stationary SI emergency ICE that do not meet the standards applicable to non-emergency engines, the permittee must keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The permittee must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation.

18. Specific Reporting Requirements:

- a. Pursuant to 40 CFR 60.4245(e), if the permittee of an emergency stationary SI ICE with a maximum engine power more than 100 hp that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in 40 CFR 60.4243(d)(3)(i), the permittee must submit an annual report according to the requirements in 40 CFR 60.4245(e)(1) through (3) as follows:
 - (1) The report must contain the following information:
 - (i) Company name and address where the engine is located.
 - (ii) Date of the report and beginning and ending dates of the reporting period.
 - (iii) Engine site rating and model year.
 - (iv) Latitude and longitude of the engine in decimal degrees reported to the fifth decimal place.
 - (v) Hours spent for operation for the purposes specified in 40 CFR 60.4243(d)(3)(i), including the date, start time, and end time for engine operation for the purposes specified in 40 CFR 60.4243(d)(3)(i). The report must also identify the entity that dispatched the engine and the situation that necessitated the dispatch of the engine.
 - (2) The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year.
 - (3) The annual report must be submitted electronically using the subpart specific reporting form in the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form specific to 40 CFR 60, Subpart JJJJ is not available in CEDRI at the time that the report is due, the written report must be submitted to the Administrator at the appropriate address listed in 40 CFR 60.4.
- b. See **Section F – Monitoring, Recordkeeping, and Reporting Requirements.**

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Emission Unit: CT01 COOLING TOWER

Description: Marley NC8414XAS8 or similar

Water recirculation rate: 29,166 gallons/min; Total Dissolved solids concentration: 1,500 ppm (wt)

Equipped with mist eliminator with 0.0005% Drift Loss

Date of Construction: July 2023 Proposed Process

weight rate: 10.95 tons/hr

APPLICABLE REGULATIONS:

401 KAR 59:010, New process operations.

PRECLUDED REGULATIONS:

401 KAR 51:017, Prevention of significant deterioration of air quality for PM/PM₁₀/PM_{2.5} emissions.

401 KAR 63:002, Section 2(4)(j), 40 C.F.R. 63.400 to 63.407, Table 1 (Subpart Q), National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers.

STATE-ORIGIN REQUIREMENTS:

401 KAR 63:020 Potentially hazardous matter or toxic substances.

1. Operating Limitations:

- a. Pursuant to 401 KAR 52:020, Section 10 and to preclude 40 CFR 63, Subpart Q, the permittee shall comply with **Section D.3**.
- b. The permittee shall keep records on file of the manufacturer's specification showing drift loss for the mist eliminator.

2. Emission Limitations:

- a. Pursuant to 401 KAR 59:010, Section 3(1)(a), no person shall cause, suffer, allow, or permit any continuous emission into the open air from a control device or stack associated with any affected facility which is equal to or greater than twenty (20) percent opacity.
- b. Pursuant to 401 KAR 59:010, Section 3(2), for emissions from a control device or stack no person shall cause, suffer, allow or permit the emission into the open air of particulate matter from any affected facility which is in excess of the quantity specified in Appendix A to 401 KAR 59:010 and summarized below:
 - (1) For process weight rates of 0.50 ton/hour or less: $E = 2.34$
 - (2) For process weight rates > 0.5 ton/hr up to 30 tons/hr: $E = 3.59 \times P^{0.62}$

Where: E = rate of particulate emissions in lb/hr, and
 P = process weight rate in tons/hr.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Compliance Demonstration Method:

The permittee is assumed to be in compliance with **2. Emission Limitations (a) and (b)** based on the information provided in the application. See **4. Specific Monitoring Requirement (b)**.

c. See **Section D – Source Emission Limitation and Testing Requirements.**

3. Testing Requirements:

Pursuant to 401 KAR 50:045, Section 1, testing shall be conducted at such times as may be requested by the Cabinet.

4. Specific Monitoring Requirements:

- a. Pursuant to 401 KAR 52:020, Section 10, the permittee shall monitor the hours of operation of each cooling tower on a weekly basis.
- b. Pursuant to 401 KAR 52:020, Section 10, the permittee shall monitor the total dissolved solids concentration or conductivity in the cooling water of the cooling tower on a weekly basis.

5. Specific Recordkeeping Requirements:

- a. Pursuant to 401 KAR 52:020, Section 10:
 - (1) The permittee shall maintain weekly records of the hours of operation of the cooling tower and the total dissolved solids concentration or conductivity.
 - (2) All routine and non-routine maintenance activities performed on the corresponding control device shall be recorded.
 - (3) Keep records of the manufacturer specification showing drift rate and maximum TDS on file and available for inspection.
- b. The permittee shall calculate and maintain monthly records of PM emissions based on the following equation:

60 min

$$E_{PM} = C_w \times \frac{\text{hour}}{\text{hour}} \times H_M \times \frac{8.34 \text{ pound water}}{\text{gallon}} \times \text{TDS} \times \frac{DL}{100}$$

Where:

- E_{PM} = PM emission rate from the cooling tower during the month (pounds per month) C_w = Water circulation rate in (gallons per minute)
- H_M = Hours of operation during the month (hours per month) DL = Drift loss from the mist eliminator (percent)
- TDS = Monthly average total dissolved solids in the cooling water (ppmw)

6. Specific Reporting Requirements:

19. See Section F – Monitoring, Recordkeeping, and Reporting Requirements.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Raw Material and Product handling (43 units)

20. *Raw Material And Dry Product Handling in Metal Extraction Process*

ME-E3A Black Mass Handling and Dust Recovery Unit 1; Stack ID: ME-S3
ME-E3B Black Mass Handling and Dust Recovery Unit 2; Stack ID: ME-S3
ME-E4A Sodium Carbonate Handling and Dust Recovery Unit 1; Stack ID: ME-S4
ME-E4B Sodium Carbonate Handling and Dust Recovery Unit 2; Stack ID: ME-S4
ME-E5A Calcium Chloride Handling and Dust Recovery Unit 1; Stack ID: ME-S5
ME-E5B Calcium Chloride Handling and Dust Recovery Unit 2; Stack ID: ME-S5
ME-E5C Calcium Chloride Handling and Dust Recovery Unit 3; Stack ID: ME-S5
ME-E5D Calcium Chloride Handling and Dust Recovery Unit 4; Stack ID: ME-S5
ME-E5E Calcium Chloride Handling and Dust Recovery Unit 5; Stack ID: ME-S5
ME-E5F Calcium Chloride Handling and Dust Recovery Unit 6; Stack ID: ME-S5
ME-E10 Cobalt Sulfate Handling and Dust Recovery Unit 1; Stack ID: ME-S10
ME-E11 Manganese Sulfate Handling and Dust Recovery Unit 1; Stack ID: ME-S11
ME-E13A Sodium Carbonate Handling and Dust Recovery Unit 1; Stack ID: ME-S13
ME-E13B Sodium Carbonate Handling and Dust Recovery Unit 2; Stack ID: ME-S13
ME-E15 Lithium Carbonate Packaging and Dust Recovery Unit 1; Stack ID: ME-S15

21. *Raw Material And Dry Product Handling in p-CAM 1 Process*

PC1-E3A Black Mass Handling and Dust Recovery Unit 1; Stack ID: PC1-S3
PC1-E3B Black Mass Handling and Dust Recovery Unit 2; Stack ID: PC1-S3
PC1-E6A Pre-cursor Belt Conveyor and Dust Recovery Unit 1; Stack ID: PC1-S6
PC1-E6B Pre-cursor Belt Conveyor and Dust Recovery Unit 2; Stack ID: PC1-S6
PC1-E8A Pre-cursor Blending, Sieving, and Dust Recovery Unit 1; Stack ID: PC1-S8
PC1-E8B Pre-cursor Blending, Sieving, and Dust Recovery Unit 2; Stack ID: PC1-S8
PC1-E8C Pre-cursor Blending, Sieving, and Dust Recovery Unit 3; Stack ID: PC1-S8
PC1-E8D Pre-cursor Blending, Sieving, and Dust Recovery Unit 4; Stack ID: PC1-S8
PC1-E9A Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 1;
Stack ID: PC1-S8
PC1-E9B Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 2;
Stack ID: PC1-S8
PC1-E9C Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 3;
Stack ID: PC1-S8
PC1-E9D Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 4;
Stack ID: PC1-S8
PC1-E12 Lithium Carbonate Packaging and Dust Recovery Unit 1; Stack ID: PC1-S12

22. *Raw Material And Dry Product Handling in p-CAM 2 Process*

PC2-E3A Black Mass Handling and Dust Recovery Unit 1; Stack ID: PC2-S3
PC2-E3B Black Mass Handling and Dust Recovery Unit 2; Stack ID: PC2-S3
PC2-E6A Pre-cursor Belt Conveyor and Dust Recovery Unit 1; Stack ID: PC2-S6
PC2-E6B Pre-cursor Belt Conveyor and Dust Recovery Unit 2; Stack ID: PC2-S6
PC2-E8A Pre-cursor Blending, Sieving, and Dust Recovery Unit 1; Stack ID: PC2-S8

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

PC2-E8B Pre-cursor Blending, Sieving, and Dust Recovery Unit 2; Stack ID: PC2-S8

PC2-E8C Pre-cursor Blending, Sieving, and Dust Recovery Unit 3; Stack ID: PC2-S8

PC2-E8D Pre-cursor Blending, Sieving, and Dust Recovery Unit 4; Stack ID: PC2-S8

PC2-E9A Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 1;
Stack ID: PC2-S8

PC2-E9B Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 2;
Stack ID: PC2-S8

PC2-E9C Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 3;
Stack ID: PC2-S8

PC2-E9D Pre-cursor Pneumatic Conveying, Packaging, and Dust Recovery Unit 4;
Stack ID: PC2-S8

PC2-E12 Lithium Carbonate Packaging and Dust Recovery Unit 1; Stack ID: PC2-S12

Emission Unit	Manufacturer system (emission unit with recovery device)	Proposed Construction Date	Max. Process weight rate Tons/hr	Allowable PM Limit lb/hr	Vendor guarantee lb/hr
ME-E3A	VAC-U-MAX (or similar)	March 2023	1.15	3.91	0.01
ME-E3B		Jan. 2025	1.15	3.91	0.01
ME-E4A		March 2023	0.22	2.34	0.002
ME-E4B		Jan. 2025	0.22	2.34	0.002
ME-E5A		March 2023	0.02	2.34	0.001
ME-E5B		March 2023	0.02	2.34	0.001
ME-E5C		March 2023	0.02	2.34	0.001
ME-E5D		Jan. 2025	0.02	2.34	0.001
ME-E5E		Jan. 2025	0.02	2.34	0.001
ME-E5F		Jan. 2025	0.02	2.34	0.001
ME-E10		Donaldson Torit (or similar)	March 2023	0.75	3.0
ME-E11	Carrier Vibrating Equipment (or similar)	March 2023	0.43	2.34	0.29
ME-E13A	VAC-U-MAX (or similar)	March 2023	0.23	2.34	0.002
ME-E13B		Jan. 2025	0.23	2.34	0.002
ME-E15	Donaldson Torit (or similar)	March 2023	0.42	2.34	0.09

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Emission Unit	Manufacturer system (emission unit with recovery device)	Proposed Construction Date	Max. Process weight rate Tons/hr	Allowable PM Limit lb/hr	Vendor guarantee lb/hr
PC1-E3A	VAC-U-MAX (or similar)	April 2023	1.22	4.06	0.01
PC1-E3B		June 2023	1.22	4.06	0.01
PC1-E6A	Tru-Track and /or Donaldson Torit (or similar)	April 2023	0.93	3.43	0.03
PC1-E6B		June 2023	0.93	3.43	0.03
PC1-E8A		April 2023	0.42	2.34	0.01
PC1-E8B		June 2023	0.42	2.34	0.01
PC1-E8C		June 2023	0.42	2.34	0.01
PC1-E8D		June 2023	0.42	2.34	0.01
PC1-E9A		Schenck Process (or similar)	April 2023	0.42	2.34
PC1-E9B	June 2023		0.42	2.34	0.001
PC1-E9C	June 2023		0.42	2.34	0.001
PC1-E9D	June 2023		0.42	2.34	0.001
PC1-E12	Donaldson Torit (or similar)	April 2023	0.44	2.34	0.02

Emission Unit	Manufacturer system (emission unit with recovery device)	Proposed Construction Date	Max. Process weight rate Tons/hr	Allowable PM Limit lb/hr	Vendor guarantee lb/hr	
PC2-E3A	VAC-U-MAX (or similar)	March 2025	1.22	4.06	0.01	
PC2-E3B			1.22	4.06	0.01	
PC2-E6A	Tru-Track and /or Donaldson Torit (or similar)		0.93	3.43	0.03	
PC2-E6B			0.93	3.43	0.03	
PC2-E8A			0.42	2.34	0.01	
PC2-E8B			0.42	2.34	0.01	
PC2-E8C			0.42	2.34	0.01	
PC2-E8D			0.42	2.34	0.01	
PC2-E9A			Schenck Process (or similar)	0.42	2.34	0.001
PC2-E9B	0.42			2.34	0.001	
PC2-E9C	0.42			2.34	0.001	
PC2-E9D	0.42			2.34	0.001	
PC2-E12	Donaldson Torit (or similar)			0.44	2.34	0.02

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

APPLICABLE REGULATIONS:

401 KAR 59:010, New process operations.

401 KAR 63:002, Section 2(4)(ttttt) 40 C.F.R. 63.11494 to 63.11503, Tables 1 to 9 (Subpart VVVVVV), National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources.

STATE-ORIGIN REQUIREMENTS:

401 KAR 63:020 Potentially hazardous matter or toxic substances.

PRECLUDED REGULATIONS:

401 KAR 51:017, Prevention of significant deterioration of air quality for PM/PM₁₀/PM_{2.5} emissions.

1. Operating Limitations:

- a. To preclude applicability of 401 KAR 51:017 for PM/PM₁₀/PM_{2.5},
 - (1) Each emission unit shall not operate unless the associated dust recovery unit is in operation in accordance with the manufacturer's recommendations.
 - (2) All metal containing chemical solids recovered at each integral dust recovery unit, shall be used, or reused or sold for use or reuse.

- b. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

In order to satisfy the definition of recovery device in 40 CFR 63.111 and as referenced in 40 CFR 63.11502, and the definition of uncontrolled emissions as referenced in 40 CFR 63.11502, all metal containing chemical solids recovered at each integral dust recovery unit, shall be used, or reused or sold for use or reuse.

- c. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

Pursuant to 40 CFR 63.11494(b), a chemical manufacturing process unit (CMPU) includes all process vessels, equipment, and activities necessary to operate a chemical manufacturing process that produces a material or a family of materials described by North American Industry Classification System (NAICS) code 325. A CMPU consists of one or more unit operations and any associated recovery devices. A CMPU also includes each storage tank, transfer operation, surge control vessel, and bottoms receiver associated with the production of such NAICS code 325 materials. See also definition of chemical manufacturing process in 40 CFR 63.11502.

- d. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

Pursuant to 40 CFR 63.11494(h), the permittee must achieve compliance with the provisions in 40 CFR 63, Subpart VVVVVV upon startup of the permittee's affected source.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

- e. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

Pursuant to 40 CFR 63.11495(a)(1), each process vessel must be equipped with a cover or lid that must be closed at all times when it is in organic HAP service or metal HAP service, except for manual operations that require access, such as material addition and removal, inspection, sampling and cleaning. This requirement does not apply to process vessels containing only metal HAP that are in a liquid solution or other form that will not result in particulate emissions of metal HAP (e.g., metal HAP that is in ingot, paste, slurry, or moist pellet form or other form).

Compliance Demonstration Methods:

Refer to **4. Specific Monitoring Requirements** and **5. Specific Recordkeeping Requirements**.

- f. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

Pursuant to 40 CFR 63.11495(a)(3), you must conduct inspections of process vessels and equipment for each CMPU in organic HAP service or metal HAP service, as specified in 40 CFR 63.11495(a)(3)(i) through (v) and listed below, to demonstrate compliance with 40 CFR 63.11495(a)(1) and to determine that the process vessels and equipment are sound and free of leaks. Alternatively, except when the subject CMPU contains metal HAP as particulate, inspections may be conducted while the subject process vessels and equipment are in VOC service, provided that leaks can be detected when in VOC service.

- (1) Inspections must be conducted at least quarterly.
- (2) For these inspections, detection methods incorporating sight, sound, or smell are acceptable. Indications of a leak identified using such methods constitute a leak unless you demonstrate that the indications of a leak are due to a condition other than loss of HAP. If indications of a leak are determined not to be HAP in one quarterly monitoring period, you must still perform the inspection and demonstration in the next quarterly monitoring period.
- (3) As an alternative to conducting inspections, as specified in 40 CFR 63.11495 (a)(3)(ii), you may use Method 21 of 40 CFR part 60, appendix A-7, with a leak definition of 500 ppmv to detect leaks. You may also use Method 21 with a leak definition of 500 ppmv to determine if indications of a leak identified during an inspection conducted in accordance with 40 CFR 63.11495(a)(3)(ii) are due to a condition other than loss of HAP. The procedures in 40 CFR 63.11495(a)(3)(iii) may not be used as an alternative to the inspection required by 40 CFR 63.11495(a)(3)(ii) for process vessels that contain metal HAP as particulate.
- (4) Inspections must be conducted while the subject CMPU is operating.
- (5) No inspection is required in a calendar quarter during which the subject CMPU does not operate for the entire calendar quarter and is not in organic HAP service or metal HAP service. If the CMPU operates at all during a calendar quarter, an inspection is required.

- g. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

You must repair any leak within 15 calendar days after detection of the leak, or document the reason for any delay of repair. For the purposes of 40 CFR 63.11495(a)(4), a leak will be considered “repaired” if a condition specified in 40 CFR 63.11495(a)(4)(i), (ii) or (iii) and listed below, is met.

- (1) The visual, audible, olfactory, or other indications of a leak to the atmosphere have been eliminated, or
- (2) No bubbles are observed at potential leak sites during a leak check using soap solution, or
- (3) The system will hold a test pressure.

h. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

Pursuant to 40 CFR 63.11495(a)(5), you must keep records of the dates and results of each inspection event, the dates of equipment repairs, and, if applicable, the reasons for any delay in repair.

i. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

Startup, shutdown and malfunction. Pursuant to 40 CFR 63.11495(c), startup, shutdown, and malfunction (SSM) provisions in subparts that are referenced in 40 CFR 63.11495(a), do not apply.

j. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

General duty. Pursuant to 40 CFR 63.11495(d), at all times, you must operate and maintain any affected CPMU, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator, which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the CPMU.

2. Emission Limitations:

a. For all emissions units:

Pursuant to 401 KAR 59:010, Section 3(1)(a), no person shall cause, suffer, allow, or permit any continuous emission into the open air from a control device or stack associated with any affected facility which is equal to or greater than twenty (20) percent opacity.

23. Compliance Demonstration Method:

See **4. Specific Monitoring Requirement (a)** for compliance with opacity limitation.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

b. For all emissions units:

Pursuant to 401 KAR 59:010, Section 3(2), for emissions from a control device or stack no person shall cause, suffer, allow or permit the emission into the open air of particulate matter from any affected facility which is in excess of the quantity specified in Appendix A to 401 KAR 59:010 and summarized below:

- (1) For process weight rates of 0.50 ton/hour or less: $E = 2.34$
(2) For process weight rates > 0.5 ton/hr up to 30 tons/hr: $E = 3.59 \times P^{0.62}$

Where: E = rate of particulate emissions in lb/hr, and

P = process weight rate in tons/hr.

24. Compliance Demonstration Method:

See **3. Testing Requirements (a)** for compliance with the numerical particulate matter standard.

c. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

Emissions from metal HAP process vents. You must comply with the requirements in 40 CFR 63.11496 (f)(1) and (f)(2) for metal HAP emissions from each CMPU using Table 1 metal HAP as listed below:

- (1) You must determine the sum of metal HAP emissions from all metal HAP process vents within a CMPU subject to this subpart, except you are not required to determine the annual emissions if you control the metal HAP process vents within a CMPU in accordance with Table 4 to this subpart or if you determine your total metal HAP usage in the process unit is less than 400 lb/yr. To determine the mass emission rate you may use process knowledge, engineering assessment, or test data. You must keep records of the emissions calculations.
- (2) If your current estimate is that total uncontrolled metal HAP emissions from a CMPU subject to this subpart are less than 400 lb/yr, then you must keep records of either the number of batches operated per month (batch vents) or the process operating hours (continuous vents). Also, you must reevaluate your total emissions before you make any process or operational change that affects emissions of metal HAP. If projected emissions increase to 400 lb/yr or more, then you must be in compliance with one of the options for metal HAP process vents in Table 4 to the subpart 40 CFR 63, Subpart VVVVVV upon initiating operation under the new operating conditions. You must keep records of all recalculated emissions determinations.
- (3) ***Startup, shutdown, and malfunction (SSM).*** References to SSM provisions in subparts that are referenced in 40 CFR 63.11496(a) through (h) or Tables 2 through 5 to this subpart do not apply.

- d. Pursuant to 401 KAR 63:020, Section 3, persons responsible for a source from which hazardous matter or toxic substances may be emitted shall provide the utmost care and consideration, in the handling of these materials, to the potentially harmful effects of the emissions resulting from such activities. No owner or operator shall allow any affected facility to emit potentially hazardous matter or toxic substances in such quantities or duration as to be harmful to the health and welfare of humans, animals and plants.

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Evaluation of such facilities as to adequacy of controls and/or procedures and emission potential will be made on an individual basis by the cabinet.

25. Compliance Demonstration Method:

Based upon the emission rates of toxics and hazardous air pollutants determined by the Cabinet using information provided in the application and supplemental information submitted by the source, the Cabinet determines the affected facility to be in compliance with 401 KAR 63:020, while adhering to the limits in **Section D. 4.** and **5.**

e. See **Section D – Source Emission Limitation and Testing Requirements.**

3. Testing Requirements:

- a. Pursuant to 401 KAR 52:020, Section 10, all initial performance testing listed below shall be conducted using U.S. EPA Reference Test Method 5 to determine particulate matter emissions, after the integral recovery dust recovery unit.
- b. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Black Mass Handling and Dust Recovery Unit in the Metal Extraction Process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units ME-E3A and ME-E3B. The results from the tested Black Mass Handling and Dust Recovery Unit are assumed representative of the other Black Mass Handling and Dust Recovery Unit in Metal Extraction Process. The permittee shall determine the tons of black mass processed as an hourly average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- c. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Sodium Carbonate Handling and Dust Recovery Unit in the Metal Extraction Process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units ME-E4A and ME-E4B. The results from the tested Sodium Carbonate Handling and Dust Recovery Unit are assumed representative of the other Sodium Carbonate Handling and Dust Recovery Unit in Metal Extraction Process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- d. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Calcium Chloride Handling and Dust Recovery Unit in the Metal Extraction Process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units ME-E5A, ME-E5B, ME-E5C, ME-E5D, ME-E5E and ME-E5F. The results from the tested Calcium Chloride Handling and Dust Recovery Unit are assumed representative of the other Calcium Chloride Handling and Dust Recovery Units in Metal Extraction Process. The

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permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.

- e. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the Cobalt Sulfate Handling and Dust Recovery Unit (ME-E10), Manganese Sulfate Handling and Dust Recovery Unit (ME-E11) and Lithium Carbonate Packaging and Dust Recovery Unit (ME-E15) in the Metal Extraction Process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with each Emission Unit in Metal Extraction Process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- f. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Sodium Carbonate Handling and Dust Recovery Unit in the Metal Extraction Process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units ME-E13A and ME-E13B. The results from the tested Sodium Carbonate Handling and Dust Recovery Unit are assumed representative of the other Sodium Carbonate Handling and Dust Recovery Unit in Metal Extraction Process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed
- g. If the facility opts to operate the Black Mass Handling and Dust Recovery Unit in the p-CAM process more than 110% of the rate at which the Black Mass Handling and Dust Recovery Unit in the Metal Extraction process was tested, then within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Black Mass Handling and Dust Recovery Unit in the p-CAM process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units PC1-E3A, PC1-E3B, PC2-E3A and PC2-E3B. The results from the tested Black Mass Handling and Dust Recovery Unit are assumed representative of the other Black Mass Handling and Dust Recovery Units in the p-CAM process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- h. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Pre-cursor Belt Conveyor and Dust Recovery Unit in the p-CAM process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units PC1-E6A, PC1-E6B, PC2-E6A and PC2-E6B. The results from the tested Pre-cursor Belt Conveyor and Dust Recovery Unit are assumed representative of the other Pre-cursor Belt Conveyor and Dust Recovery Units

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in the p-CAM process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.

- i. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Pre-cursor Blending, Sieving and Dust Recovery Unit in the p-CAM process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units PC1-E8A, PC1-E8B, PC1-E8C and PC1-E8D; PC2-E8A, PC2-E8B, PC2-E8C and PC2-E8D. The results from the tested Pre-cursor Blending, Sieving and Dust Recovery Unit are assumed representative of the other Pre-cursor Blending, Sieving and Dust Recovery Units in the p-CAM process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- j. Within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Pre-cursor Pneumatic Conveying, Packaging and Dust Recovery Unit in the p-CAM process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units PC1-E9A, PC1-E9B, PC1-E9C and PC1-E9D; PC2-E9A, PC2-E9B, PC2-E9C and PC2-E9D. The results from the tested Pre-cursor Pneumatic Conveying, Packaging and Dust Recovery Unit are assumed representative of the other Pre-cursor Pneumatic Conveying, Packaging and Dust Recovery Units in the p-CAM process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- k. If the facility opts to operate the Lithium Carbonate Packaging and Dust Recovery in p-CAM process more than 110% of the rate at which the Lithium Carbonate Packaging and Dust Recovery in the Metal Extraction process was tested, then within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the Lithium Carbonate Packaging and Dust Recovery Unit 1 in the p-CAM process, the permittee shall conduct performance testing to verify and establish the particulate matter (PM/PM₁₀/PM_{2.5}) emission factor (lb/hr) associated with Emission Units PC1-E12 and PC2-E12. The results from the tested Lithium Carbonate Packaging and Dust Recovery Unit 1 are assumed representative of the other Lithium Carbonate Packaging and Dust Recovery Unit 1 in the p-CAM process. The permittee shall determine the tons of black mass processed/hour as an average over the test period. The emission factor shall also be reported in terms of lb/ton of black mass processed.
- l. Testing shall be conducted at such times as may be requested by the Cabinet. [401 KAR 50:045, Section 1]

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4. Specific Monitoring Requirements:

- a. Compliance with the opacity standard shall be determined by the permittee performing a qualitative visual observation of the opacity of emissions at each stack no less than weekly and maintaining a log of the observations. If visible emissions from the stack are observed (not including condensed water in the plume), the permittee shall determine the opacity using Reference Method 9. In lieu of determining the opacity using U.S. EPA Method 9, the permittee shall immediately perform a corrective action which results in no visible emissions (not including condensed water in the plume).
- b. The permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a monitoring device (differential pressure gauges or manometers) to determine the pressure drop across the mechanical dust recovery unit once a day during the operation of the unit. A permanent label displaying the operating range established for each dust recovery unit shall be posted next to the selected instrument, displayed on the operator screen or documented in an electronic interface/data historian.
- c. The permittee shall perform semiannual inspections and maintenance in accordance with manufacturer's specifications to ensure proper performance of each dust recovery unit. This includes inspection of structural and filter integrity, airflow source and pressure drop measuring system. The permittee shall record the results of these inspections.
- d. The permittee shall monitor of the amount of black mass introduced into ME-E1, PC1-E1 and PC2-E1, on a monthly basis.

5. Specific Recordkeeping Requirements:

- a. The permittee shall maintain a log of the visual observations noting date, time, initials of observers, and records of corrective actions taken as a result of visible emissions and records of any Reference Method 9 readings performed.
- b. The permittee shall maintain records of calibration of the monitoring device and a log of the pressure drop readings across each dust recovery unit, including the date, and dates of filter replacements.
- c. The permittee shall maintain records of all maintenance conducted per manufacturer specifications and any repairs made, to ensure proper performance of each dust recovery unit.

- d. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

Pursuant to 40 CFR 63.11501(c), the permittee must maintain files of all information required by 40 CFR 63, Subpart VVVVVV for at least 5 years following the date of each occurrence according to the requirements in 40 CFR 63.10(b)(1). If the permittee is subject, the permittee must comply with the recordkeeping and reporting requirements of 40 CFR 63.10(b)(2)(iii) and (vi) through (xiv), and the applicable requirements specified in 40 CFR 63.11501(c)(1) through (8) as applicable.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

- (1) For each CMPU subject to 40 CFR 63, Subpart VVVVVV, the permittee must keep the records specified in 40 CFR 63.11501(c)(1)(i) through (viii) as applicable:
 - (i) Records of management practice inspections, repairs, and reasons for any delay of repair, as specified in 40 CFR 63.11495(a)(5).
 - (ii) Records of small heat exchange system inspections, demonstrations of indications of leaks that do not constitute leaks, repairs, and reasons for any delay in repair as specified in 40 CFR 63.11495(b)
 - (iii) If batch process vent emissions are less than 10,000 lb/yr for a CMPU, records of batch process vent emission calculations, as specified in 40 CFR 63.11496(a)(1), the number of batches operated each month, as specified in 40 CFR 63.11496(a)(3), and any updated emissions calculations, as specified in 40 CFR 63.11496(a)(3). Alternatively, keep records of the worst-case processes or organic HAP usage, as specified in 40 CFR 63.11496(a)(2) and (4), respectively.
 - (iv) Records of all TRE calculations for continuous process vents as specified in 40 CFR 63.11496(b)(2).
 - (v) Records of metal HAP emission calculations as specified in 40 CFR 63.11496(f)(1) and (2). If total uncontrolled metal HAP process vent emissions from a CMPU subject to this subpart are estimated to be less than 400 lb/yr, also keep records of either the number of batches per month or operating hours, as specified in 40 CFR 63.11496(f)(2).
 - (vi) Records identifying wastewater streams and the type of treatment they receive, as specified in Table 6 to this subpart.
 - (vii) Records of the date, time, and duration of each malfunction of operation of process equipment, control devices, recovery devices, or continuous monitoring systems used to comply with 40 CFR 63, Subpart VVVVVV that causes a failure to meet a standard. The record must include a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over the standard, and a description of the method used to estimate the emissions.
 - (viii) Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.11495(d), including corrective actions to restore malfunctioning process and air pollution.
- e. The permittee shall keep records of the amount of black mass processed introduced into ME-E1, PC1-E1 and PC2-E1 on a monthly basis.

6. Specific Reporting Requirements:

a. Refer to **Section F, Monitoring, Recordkeeping, and Reporting Requirements.**

b. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)**

Pursuant to 40 CFR 63.11501(a), the permittee must meet the requirements of the General Provisions in 40 CFR 63, Subpart A, as shown in Table 9 to 40 CFR 63, Subpart VVVVVV. The General Provisions in other parts do not apply except when a requirement in an overlapping standard, which the permittee determines is at least as stringent as 40 CFR 63, Subpart VVVVVV and with which the permittee has opted to comply, requires compliance with general provisions in another part.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

c. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

Pursuant to 40 CFR 63.11501(b), the permittee's Notification of compliance status (NOCS) required by 40 CFR 63.9(h) must include the following additional information as applicable:

- (1) This certification of compliance, signed by a responsible official:
 - (i) "This facility complies with the management practices in 40 CFR 63.11495."
 - (ii) "This facility complies with the requirements in 40 CFR 63.11496 for HAP emissions from process vents."
 - (iii) "This facility complies with the requirements in 40 CFR 63.11496 and 40 CFR 63.11497 for surge control vessels, bottoms receivers, and storage tanks."
 - (iv) "This facility complies with the requirements in 40 CFR 63.11498 to treat wastewater streams."
 - (v) "This facility complies with the requirements in 40 CFR 63.11499 for heat exchange systems."

d. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

Pursuant to 40 CFR 63, Subpart 63.11501(d), the permittee must submit semiannual compliance reports that contain the information specified in 40 CFR 63.11501(d)(1) through (7), as applicable. Reports are required only for semiannual periods during which the permittee experienced any of the events described in 40 CFR 63.11501(d)(1) through (8).

- (1) The permittee must clearly identify any deviation from the requirements of 40 CFR 63, Subpart VVVVVV.
- (2) The permittee must include the information specified in 40 CFR 63.104(f)(2) each time the permittee invokes the delay of repair provisions for a heat exchange system with a cooling water flow rate equal to or greater than 8,000 gal/min.
- (3) The permittee must provide the following information for each delay of leak repair beyond 15 days for any process equipment, storage tank, surge control vessel, bottoms receiver, and each delay of leak repair beyond 45 days for any heat exchange system with a cooling water flow rate less than 8,000 gal/min: information on the date the leak was identified, the reason for the delay in repair, and the date the leak was repaired.
- (4) The permittee must report each process change that affects a compliance determination and submit a new certification of compliance with the applicable requirements in accordance with the procedures specified in 40 CFR 63.11501(b).
- (5) If the permittee complies with the alternative standard, as specified in Table 2 to 40 CFR 63, Subpart VVVVVV or Table 3 to 40 CFR 63, Subpart VVVVVV, the permittee must report the information required in 40 CFR 63.1258(b)(5).
- (6) The permittee must report any changes in the overlapping provisions with which the permittee complies.
- (7) The permittee must report any transfer of liquids that are reactive or resinous materials, as defined in 40 CFR 63.11502(b), and not included in the NOCS.
- (8) If a malfunction occurred during the reporting period, the report must include the number of instances of malfunctions that caused emissions in excess of a standard. For each malfunction that caused emissions in excess of a standard, the report must include

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a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over the standard, and a description of the method used to estimate the emissions. The report must also include a description of actions the permittee took during a malfunction of an affected source to minimize emissions in accordance with 40 CFR 63.11495(d), including actions taken to correct a malfunction.

e. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E3A, ME-E3B, PC1-E3A, PC1-E3B, PC1-E6A, PC1-E6B, PC2-E3A, PC2-E3B, PC2-E6A, PC2-E6B)

Pursuant to 40 CFR 63.11501(e), in response to an action to enforce the standards set forth in 40 CFR 63.11495 through 40 CFR 63.11499, the permittee may assert an affirmative defense to a claim for civil penalties for violations of such standards that are caused by malfunction, as defined at 40 CFR 63.2. Appropriate penalties may be assessed if the permittee fails to meet their burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

- (1) To establish the affirmative defense in any action to enforce such a standard, the permittee must timely meet the notification requirements in 40 CFR 63.11501(e)(2), and must prove by a preponderance of evidence that:
 - (i) The violation:
 - (A) Was caused by a sudden, infrequent, and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner; and
 - (B) Could not have been prevented through careful planning, proper design, or better operation and maintenance practices; and
 - (C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and
 - (D) Was not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and
 - (ii) Repairs were made as expeditiously as possible when a violation occurred. Offshift and overtime labor were used, to the extent practicable to make these repairs; and
 - (iii) The frequency, amount, and duration of the violation (including any bypass) were minimized to the maximum extent practicable; and
 - (iv) If the violation resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and
 - (v) All possible steps were taken to minimize the impact of the violation on ambient air quality, the environment and human health; and
 - (vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and
 - (vii) All of the actions in response to the violation were documented by properly signed, contemporaneous operating logs; and
 - (viii) At all times, the affected CPMU was operated in a manner consistent with good practices for minimizing emissions; and
 - (ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the violation resulting from the malfunction event at issue. The analysis must also

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

specify, using best monitoring methods and engineering judgment, the amount of any emissions that were the result of the malfunction.

- (2) If the permittee seeks to assert an affirmative defense, the permittee must submit a written report to the Administrator, with all necessary supporting documentation, that the permittee has met the requirements set forth in 40 CFR 63.11501(e)(1). This affirmative defense report must be included in the first periodic compliance report, deviation report, or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance report, deviation report, or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance report, deviation report, or excess emissions.

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26. Wet processing operations in Metals Extraction, in p-CAM 1 and in p-CAM2 processes

27. *Wet processing operations in Metals Extraction*

Proposed Construction Date: Jan. 2025 for ME-E9B and ME-E16B; March 2023 for other units.

ME-E1 Leaching Process Tanks - Leaching reactors, wash tanks, and purification tanks

Add-on Controls: wet spray tower scrubber ME-C1A, demister ME- C1B, with replaceable canister

Activated Carbon Adsorber ME- C1C or Activated Carbon Adsorber ME- C1D; Stack ID: ME-S1

Vendor guaranteed control efficiency for HCl and HF: 96%;

Engineering judgement control efficiency for H₂SO₄: 98% Vendor

guaranteed control efficiency for VOC: 70% Vendor guaranteed

control efficiency for PM/PM₁₀: 90%

ME-E2 Leaching Filtration - Filter presses associated with leaching; vents inside the building ME-

E6 Extraction - Extraction process vessels vented to one of two condensers which then vent

to one of the activated carbon solvent adsorbers (regenerating) ME-C6A/ ME-C6B/ME-

C6C; Stack ID: ME-S6

Add-on Controls: Metals Extraction Solvent Activated Carbon Adsorber ME-C6A; Metals Extraction

Solvent Activated Carbon Adsorber ME-C6B; Metals Extraction Solvent Activated Carbon Adsorber

ME-C6C

Vendor guaranteed control efficiency for VOC: 70%

ME-E7 Extraction Filtration - Filter presses associated with extraction and purification tanks; vents inside the building

ME-E8 Sodium Sulfide Preparation, Hydrochloric Acid Dilution, Impurity Removal Tanks, and Process Water Treatment - Sodium Sulfide Preparation, Hydrochloric Acid Dilution, Impurity Removal Tanks, and Process Water Treatment

Add-on Controls: Extraction Scrubber ME-C8A; Extraction Demister ME-C8B; with replaceable

canister Extraction Activated Carbon Adsorber ME-C8C; Extraction Activated Carbon Adsorber

ME-C8D; Stack ID ME-S8

Vendor guaranteed control efficiency for HCl, HF and H₂SO₄: 90% Vendor

guaranteed control efficiency for VOC: 70%

Vendor guaranteed control efficiency for PM/PM₁₀: 90%

ME-E9A Nickel Sulfate Handling and Dust Recovery Unit 1,

Add-on Controls: Packed bed scrubber ME-C9A; Stack ID: ME-S9A Vendor

guaranteed control efficiency for PM//PM₁₀: 95%

ME-E9B Nickel Sulfate Handling and Dust Recovery Unit 2,

Add-on Controls: Packed bed scrubber ME-C9B; Stack ID: ME-S9B Vendor

guaranteed control efficiency for PM//PM₁₀: 95%

ME-E12 Lithium Precipitation; Stack ID: ME-S12; no controls

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ME-E14 Lithium Carbonate Dryer and Dust Recovery Unit; Stack ID: ME-S14;

ME-E16A Sodium Sulfate Electric Dryer; Add-on Controls: Cyclone ME-C16A and spray tower wet dust scrubber ME-C16B; Stack ID: ME-S16A;
Cyclone control efficiency: 80% and Scrubber control efficiency: 97.5% Vendor guaranteed control efficiency for PM/PM₁₀: 99.5% (combined)

ME-E16B Sodium Sulfate Electric Dryer; Add-on Controls: Cyclone ME-C16C and spray tower wet dust scrubber ME-C16D; Stack ID: ME-S16B
Cyclone control efficiency: 80% and Scrubber control efficiency: 97.5% Vendor guaranteed control efficiency for PM/PM₁₀: 99.5% (combined)

28. *Wet processing operations in p-CAM1*

Proposed Construction Date: April - June 2023

PC1-E1 Leaching Process Tanks Leaching reactors, wash tanks, and purification tank;
Add-on Controls: Wet spray tower scrubber PC1-C1A, demister PC1-C1B, with replaceable canister Activated Carbon Adsorber PC1-C1C or Activated Carbon Adsorber PC1-C1D; Stack ID: PC1-S1
Vendor guaranteed control efficiency for HCl and HF: 96%;
Engineering judgement control efficiency for H₂SO₄: 98% Vendor guaranteed control efficiency for VOC: 70% Vendor guaranteed control efficiency for PM/PM₁₀: 90%

PC1-E2 Leaching Filtration - Filter presses associated with leaching; vents inside the building PC1-

E4 Metals Adjustment - Vessels for preparation of cobalt sulfate, manganese sulfate, and/or nickel sulfate solution; Add-on Control: Packed bed scrubber PC1-C4;
Stack ID: PC1-S4; Vendor guaranteed control efficiency for PM/PM₁₀: 98%

PC1-E5A Pre-cursor Synthesis and Ammonia Recovery - Reactors and process vessels used to synthesize pre-cursor and recover ammonia; ammonia is stripped, condensed and returned to the process, while the vent from vessels and condenser are controlled by Add-on packed bed wet scrubber PC1-C5A and Demister PC1-C5B; vendor guarantee control efficiency of 90%; Stack ID: PC1-S5A;
Vendor guaranteed control efficiency for ammonia: 90%

PC1-E5B Pre-cursor Synthesis and Ammonia Recovery - Reactors and process vessels used to synthesize pre-cursor and recover ammonia; vents to Add-on packed bed wet scrubber PC1-C5C and Demister PC1-C5D; vendor guarantee control efficiency of 90%; Stack ID: PC1-S5B;
Vendor guaranteed control efficiency for ammonia: 90%

PC1-E7A Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC1-S6;

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

PC1-E7B Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC1-S6;

PC1-E7C Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC1-S6;

PC1-E7D Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC1-S6;

PC1-E10 Lithium Precipitation; Stack ID: PC1-S10;

PC1-E11 Lithium Carbonate Dryer and Dust Recovery Unit; Stack ID: PC1-S11;

PC1-E13A Sodium Sulfate Dryer; Add-on Controls: Cyclone PC1-C13A and spray tower wet dust scrubber PC1-C13B; Stack ID: PC1-S13A;

Cyclone control efficiency: 80% and Scrubber control efficiency: 97.5% Vendor guaranteed control efficiency for PM/PM₁₀: 99.5% (combined)

PC1-E13B Sodium Sulfate Dryer; Controls: Add-on Cyclone PC1-C13C and spray tower wet dust scrubber PC1-C13D; Stack ID: PC1-S13B.

Cyclone control efficiency: 80% and Scrubber control efficiency: 97.5% Vendor guaranteed control efficiency for PM/PM₁₀: 99.5% (combined)

29. *Wet processing operations in p-CAM2*

Proposed Construction Date: March 2025

PC2-E1 Leaching Process Tanks Leaching reactors, wash tanks, and purification tanks;

Add-on Controls: wet spray tower scrubber PC2-C1A, demister PC2-C1B, with replaceable canister Activated Carbon Adsorber PC2-C1C or Activated Carbon Adsorber PC2-C1D; Stack ID: PC2-S1

Vendor guaranteed control efficiency for HCl and HF: 96%;

Engineering judgement control efficiency for H₂SO₄: 98% Vendor

guaranteed control efficiency for VOC: 70% Vendor guaranteed

control efficiency for PM/PM₁₀: 90%

PC2-E2 Leaching Filtration - Filter presses associated with leaching; vents inside the building PC2-

E4 Metals Adjustment - Vessels for preparation of cobalt sulfate, manganese sulfate, and/or

nickel sulfate solution; Add-on Control: Packed bed scrubber PC2-C4; Stack ID: PC2-

S4

Vendor guaranteed control efficiency for PM/PM₁₀: 98%

PC2-E5A Pre-cursor Synthesis and Ammonia Recovery - Reactors and process vessels used to synthesize pre-cursor and recover ammonia vents to Add-on controls of packed bed wet scrubber PC2-C5A and Demister PC2-C5B; Stack ID: PC2-S5A

Vendor guaranteed control efficiency for ammonia: 90%

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PC2-E5B Pre-cursor Synthesis and Ammonia Recovery - Reactors and process vessels used to synthesize pre-cursor and recover ammonia; vents to Add-on control of packed bed wet scrubber PC2-C5C and Demister PC1-C5D; Stack ID: PC2-S5B

Vendor guaranteed control efficiency for ammonia: 90%

PC2-E7A Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC2-S6;

PC2-E7B Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC2-S6;

PC2-E7C Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC2-S6;

PC2-E7D Pre-cursor Electric Dryer and Dust Recovery; Stack ID: PC2-S6;

PC2-E10 Lithium Precipitation; Stack ID: PC2-S10;

PC2-E11 Lithium Carbonate Dryer and Dust Recovery Unit; Stack ID: PC2-S11;

PC2-E13A Sodium Sulfate Dryer; Add-on Controls: Cyclone PC2-C13A and spray tower wet dust scrubber PC2-C13B; Stack ID: PC2-S13A;

Cyclone control efficiency: 80% and Scrubber control efficiency: 97.5% Vendor guaranteed control efficiency for PM/PM₁₀: 99.5% (combined)

PC2-E13B Sodium Sulfate Dryer; Add-on Controls: Cyclone PC2-C13C and spray tower wet dust scrubber PC2-C13D; Stack ID: PC2-S13B.

Cyclone control efficiency: 80% and Scrubber control efficiency: 97.5% Vendor guaranteed control efficiency for PM/PM₁₀: 99.5% (combined)

APPLICABLE REGULATIONS:

401 KAR 53:010, Ambient Air Quality Standards for HF and H₂S emissions. 401

KAR59:010, New process operations.

401 KAR 59:105, New process gas stream.

401 KAR 63:002, Section 2(4)(tttt) 40 C.F.R. 63.11494 to 63.11503, Tables 1 to 9 (Subpart VVVVVV), National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources.

STATE-ORIGIN REQUIREMENTS:

401 KAR 63:020 Potentially hazardous matter or toxic substances.

30. PRECLUDED REGULATIONS:

401 KAR 51:017, Prevention of significant deterioration of air quality for PM/PM₁₀/PM_{2.5} emissions

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

1. Operating Limitations:

a. To preclude applicability of 401 KAR 51:017 for PM/PM₁₀/PM_{2.5},

- (1) Material shall not be added to the emission unit ME-E1, PC1-E1 and PC2-E1 unless the associated wet spray tower scrubber and demister are in operation in accordance with the manufacturer's recommendations.
- (2) Emission units PC1-E4 and PC2-E4 shall not operate unless the associated packed bed dust scrubber is in operation in accordance with the manufacturer's recommendations.
- (3) Emission units PC1-E7A, PC1-E7B, PC1-E7C and PC1-E7D in p-CAM 1 process and PC2-E7A, PC2-E7B, PC2-E7C and PC2-E7D in p-CAM 2 process shall not operate unless the associated dust recovery system is in operation in accordance with the manufacturer's recommendations.
- (4) Emission units ME-E14, PC1-E11 and PC2-E11 shall not operate unless the associated dust recovery system is in operation in accordance with the manufacturer's recommendations.
- (5) Emission units ME-E16A, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A and PC2-E13B shall not operate unless the associated cyclone and spray tower wet dust scrubber are in operation in accordance with the manufacturer's recommendations.
- (6) Emission units ME-E9A and ME-E9B shall not operate unless the associated dust recovery system is in operation in accordance with the manufacturer's recommendations.
- (7) All metal containing chemical solids recovered at each integral recovery dust collector, shall be used, or reused or sold for use or reuse.
- (8) All scrubber effluent from scrubbers associated with emission units ME-E9A and ME-E9B shall be returned to the Nickel Crystallization process.

b. **For units subject to 40 CFR 63, Subpart VVVVVV (PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

In order to satisfy the definition of recovery device in 40 CFR 63.111 and as referenced in 40 CFR 63.11502, and the definition of uncontrolled emissions as referenced in 40 CFR 63.11502, all metal containing chemical solids recovered at each integral recovery dust recovery unit, shall be used, or reused or sold for use or reuse.

c. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11494(b), a chemical manufacturing process unit (CMPU) includes all process vessels, equipment, and activities necessary to operate a chemical manufacturing process that produces a material or a family of materials described by North American Industry Classification System (NAICS) code 325. A CMPU consists of one or more unit operations and any associated recovery devices. A CMPU also includes each storage tank, transfer operation, surge control vessel, and bottoms receiver associated with the production of such NAICS code 325 materials. See also definition of chemical manufacturing process in 40 CFR 63.11502.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

- d. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11494(h), the permittee must achieve compliance with the provisions in 40 CFR 63, Subpart VVVVVV upon startup of the permittee's affected source.

- e. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11495(a)(1), each process vessel must be equipped with a cover or lid that must be closed at all times when it is in organic HAP service or metal HAP service, except for manual operations that require access, such as material addition and removal, inspection, sampling and cleaning. This requirement does not apply to process vessels containing only metal HAP that are in a liquid solution or other form that will not result in particulate emissions of metal HAP (e.g., metal HAP that is in ingot, paste, slurry, or moist pellet form or other form).

Compliance Demonstration Methods:

Refer to **4. Specific Monitoring Requirements** and **5. Specific Recordkeeping Requirements**.

- f. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11495(a)(3), the permittee must conduct inspections of process vessels and equipment for each CMPU in organic HAP service or metal HAP service, as specified in 40 CFR 63.11495(a)(3)(i) through (v) and listed below, to demonstrate compliance with 40 CFR 63.11495(a)(1) and to determine that the process vessels and equipment are sound and free of leaks. Alternatively, except when the subject CMPU contains metal HAP as particulate, inspections may be conducted while the subject process vessels and equipment are in VOC service, provided that leaks can be detected when in VOC service.

- (1) Inspections must be conducted at least quarterly.
- (2) For these inspections, detection methods incorporating sight, sound, or smell are acceptable. Indications of a leak identified using such methods constitute a leak unless you demonstrate that the indications of a leak are due to a condition other than loss of HAP. If indications of a leak are determined not to be HAP in one quarterly monitoring period, you must still perform the inspection and demonstration in the next quarterly monitoring period.
- (3) As an alternative to conducting inspections, as specified in 63.11495(a)(3)(ii), you may use Method 21 of 40 CFR part 60, appendix A-7, with a leak definition of 500 ppmv to detect leaks. You may also use Method 21 with a leak definition of 500 ppmv to

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

determine if indications of a leak identified during an inspection conducted in accordance with 63.11495(a)(3)(ii) are due to a condition other than loss of HAP. The procedures in 63.11495(a)(3)(iii) may not be used as an alternative to the inspection required by 63.11495(a)(3)(ii) for process vessels that contain metal HAP as particulate.

- (4) Inspections must be conducted while the subject CMPU is operating.
- (5) No inspection is required in a calendar quarter during which the subject CMPU does not operate for the entire calendar quarter and is not in organic HAP service or metal HAP service. If the CMPU operates at all during a calendar quarter, an inspection is required.

- g. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

You must repair any leak within 15 calendar days after detection of the leak, or document the reason for any delay of repair. For the purposes of 40 CFR 63.11495(a)(4), a leak will be considered “repaired” if a condition specified in 40 CFR 63.11495(a)(4)(i), (ii) or (iii) and listed below, is met.

- (1) The visual, audible, olfactory, or other indications of a leak to the atmosphere have been eliminated, or
- (2) No bubbles are observed at potential leak sites during a leak check using soap solution, or
- (3) The system will hold a test pressure.

- h. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11495(a)(5), you must keep records of the dates and results of each inspection event, the dates of equipment repairs, and, if applicable, the reasons for any delay in repair.

- i. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Startup, shutdown and malfunction. Pursuant to 40 CFR 63.11495(c), startup, shutdown, and malfunction (SSM) provisions in subparts that are referenced in 40 CFR 63.11495(a), do not apply.

- j. For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

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General duty. Pursuant to 40 CFR 63.11495(d), at all times, you must operate and maintain any affected CMPU, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator, which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the CMPU.

k. For Emissions Units ME-E1, ME-E8, PC1-E1, PC1-E5A, PC1-E5B, PC2-E1, PC2-E5A, PC2-E5B:

Pursuant to 401 KAR 52:020, Section 10, for the wet spray tower scrubber with demister, associated with each emission unit the permittee shall:

- (1) Maintain the daily average scrubber inlet liquid or recirculating liquid flow rate, as appropriate, above the minimum operating limit as established during the most recent performance test approved by the Division;
- (2) Maintain the daily average scrubber effluent pH above the minimum operating limit as established during the most recent performance test approved by the Division for ME-E1, ME-E8, PC1-E1 and PC2-E1;
- (3) Maintain the daily average scrubber effluent pH below the maximum operating limit as established during the most recent performance test approved by the Division for PC1-E5A, PC1-E5B, PC2-E5A and PC2-E5B;
- (4) Maintain the daily average scrubber differential pressure below the maximum operating limit as established during the most recent performance test approved by the Division.

l. For Emissions Units ME-E9A, ME-E9B, PC1-E4, PC2-E4:

Pursuant to 401 KAR 52:020, Section 10, for the packed bed scrubber, associated with each emission unit the permittee shall:

- (1) Maintain the daily average scrubber inlet liquid or recirculating liquid flow rate, as appropriate, above the minimum operating limit as established during the most recent performance test approved by the Division; and
- (2) Maintain the daily average scrubber differential pressure below the maximum operating limit as established during the most recent performance test approved by the Division.

m. For Emission Units ME-E16A, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B:

Pursuant to 401 KAR 52:020, Section 10, for cyclone and spray tower wet dust scrubber used as control device, associated with each emission unit the permittee shall:

- (1) Maintain the daily average gas inlet velocity or pressure drop across the cyclone, above the minimum operating limit as established during the most recent performance test approved by the Division; and
- (2) Maintain the daily average scrubbant flow rate above the minimum operating limit as established during the most recent performance test approved by the Division.

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(3) Maintain the daily average scrubber differential pressure below the maximum operating limit as established during the most recent performance test approved by the Division.

n. **For Emissions Units ME-E1, ME-E6, ME-E8, ME-E9A, ME-E9B, PC1-E1, PC1-E4, PC1-E5A, PC1-E5B, PC2-E1, PC2-E4, PC2-E5A, PC2-E5B:**

Pursuant to 401 KAR 52:020, Section 10, the permittee shall operate the wet scrubber with demister (if any) and activated carbon adsorber control devices according to manufacturer specification at all times when emission unit is in operation.

o. **For Emissions Units ME-E1, ME-E6, ME-E8, PC1-E1, PC2-E1:**

Pursuant to 401 KAR 52:020, Section 10, the permittee shall alternate the carbon bed adsorber once the concentration of VOC exiting the active carbon bed is 10 ppmv or the value provided by the manufacturer for breakthrough, whichever is greater, based on weekly adsorber outlet VOC monitoring.

p. **For Emissions Units ME-E6, PC1-E5A, PC1-E5B, PC2-E5A, PC2-E5B:**

(1) Pursuant to 401 KAR 52:020, Section 10, all condensate recovered at the emissions units shall be returned to the process for reuse.

(2) Pursuant to 401 KAR 52:020, Section 10, the permittee shall maintain the vent stream temperature at the exit of each condenser and other parameters (if any) according to manufacturer specifications to achieve optimum cooling and recovery.

2. Emission Limitations:

a. **For Emissions Units ME-E1, ME-E9A, ME-E9B, ME-E14, ME-E16A and ME-E16B, PC1-E1, PC1-E4, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC1-E11, PC1-E13A, PC1-E13B, PC2-E1, PC2-E4, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D, PC2-E11, PC2-E13A, PC2-E13B:**

Pursuant to 401 KAR 59:010, Section 3(1)(a), no person shall cause, suffer, allow, or permit any continuous emission into the open air from a control device or stack associated with any affected facility which is equal to or greater than twenty (20) percent opacity.

31.Compliance Demonstration Method:

See 4. Specific Monitoring Requirement (a) for compliance with opacity limitation.

b. **For Emissions Units ME-E1, ME-E9A, ME-E9B, ME-E14, ME-E16A and ME-E16B, PC1-E1, PC1-E4, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC1-E11, PC1-E13A, PC1-E13B, PC2-E1, PC2-E4, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D, PC2-E11, PC2-E13A, PC2-E13B:**

Pursuant to 401 KAR 59:010, Section 3(2), for emissions from a control device or stack no person shall cause, suffer, allow or permit the emission into the open air of particulate matter from any affected facility which is in excess of the quantity specified in Appendix A to 401 KAR 59:010 and summarized below:

(1) For process weight rates of 0.50 ton/hour or less:

$$E = 2.34$$

(2) For process weight rates > 0.5 ton/hr up to 30 tons/hr:

$$E = 3.59 \times P^{0.62}$$

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Where: E = rate of particulate emissions in lb/hr, and
 P = process weight rate in tons/hr.

32. Compliance Demonstration Method:

See 3. Testing requirement for compliance with numerical limitation for particulate matter.

- c. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Emissions from metal HAP process vents. You must comply with the requirements in 40 CFR 63.11496 (f)(1) and (f)(2) for metal HAP emissions from each CMPU using Table 1 metal HAP as listed below:

- (1) You must determine the sum of metal HAP emissions from all metal HAP process vents within a CMPU subject to this subpart, except you are not required to determine the annual emissions if you control the metal HAP process vents within a CMPU in accordance with Table 4 to this subpart or if you determine your total metal HAP usage in the process unit is less than 400 lb/yr. To determine the mass emission rate you may use process knowledge, engineering assessment, or test data. You must keep records of the emissions calculations.
 - (2) If your current estimate is that total uncontrolled metal HAP emissions from a CMPU subject to this subpart are less than 400 lb/yr, then you must keep records of either the number of batches operated per month (batch vents) or the process operating hours (continuous vents). Also, you must reevaluate your total emissions before you make any process or operational change that affects emissions of metal HAP. If projected emissions increase to 400 lb/yr or more, then you must be in compliance with one of the options for metal HAP process vents in Table 4 to the subpart 40 CFR 63, Subpart VVVVVV upon initiating operation under the new operating conditions. You must keep records of all recalculated emissions determinations.
 - (3) **Startup, shutdown, and malfunction (SSM).** References to SSM provisions in subparts that are referenced in 40 CFR 63.11496(a) through (h) or Tables 2 through 5 to this subpart do not apply.
- d. Pursuant to 401 KAR 63:020, Section 3, persons responsible for a source from which hazardous matter or toxic substances may be emitted shall provide the utmost care and consideration, in the handling of these materials, to the potentially harmful effects of the emissions resulting from such activities. No owner or operator shall allow any affected facility to emit potentially hazardous matter or toxic substances in such quantities or duration as to be harmful to the health and welfare of humans, animals and plants. Evaluation of such facilities as to adequacy of controls and/or procedures and emission potential will be made on an individual basis by the cabinet.

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33. Compliance Demonstration Method:

- a. Based upon the emission rates of toxics and hazardous air pollutants determined by the Cabinet using information provided in the application and supplemental information submitted by the source, the Cabinet determines the affected facility to be in compliance with 401 KAR 63:020, while adhering to the source-wide limits for H₂SO₄ and Nickel compound (nickel soluble salts) emissions. See **Section D. 4.** and **5.**
- b. See **1. Operations Limitation (k)** and **2. Emission Limitation (e).**

e. For Emission Unit ME-E8:

Pursuant to 401 KAR 59:105, Section 3, emissions of hydrogen sulfide in a process gas stream shall not exceed 10 grains per 100 dry standard cubic feet (dscf) (165 parts per million by volume) at zero percent oxygen except that sources whose combined process gas stream emission rate totals less than two tons per day of hydrogen sulfide shall either reduce emissions by 85 percent or control such emissions such that hydrogen sulfide in the gas stream emitted into the ambient air does not exceed ten grains per 100 dscf at zero percent oxygen.

34. Compliance Demonstration Method:

See **3. Testing Requirement.**

- f. Pursuant to 401 KAR 53:005, Section 1(3), the permittee shall not violate, or interfere with the attainment or maintenance of, ambient air quality standards as specified in 401 KAR 53:010.

35. Compliance Demonstration Method:

The results of source-wide HF and H₂S air dispersion modeling conducted by the Division demonstrates that site-wide potential to emit emission rates of HF and H₂S are in compliance with the primary and secondary standards for gaseous fluorides (expressed as HF) and the secondary standard for H₂S in Appendix A of 401 KAR 53:010. If the source alters process rates, material formulations, or any other factor that would result in an increase of HF or H₂S emissions, the source shall submit the appropriate application forms pursuant to 401 KAR 52:020, Section 3(1)(a), along with modeling or other evaluation to show the facility will remain in compliance with 401 KAR 53:010.

- g. See **Section D – Source Emission Limitation and Testing Requirements.**

3. Testing Requirements:

- a. **For Emission units ME-E1, ME-E8, PC1-E1, PC1-E5A, PC1-E5B, PC2-E1, PC2-E5A, PC2-E5B:**
 - (1) Pursuant to 401 KAR 52:020, Section 10, the permittee shall conduct initial performance testing on the wet spray tower scrubber with demister control device and the plate column/ packed bed scrubber with demister and determine the emission rates in lb/hr of H₂SO₄, HCl and HF, Particulate matter (PM/PM₁₀/PM_{2.5}) and ammonia as applicable, and in terms of lb/ton of black mass processed.

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- (2) The performance test shall be conducted within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit ME-E1.
- (3) The performance test shall be conducted within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit ME-E8.
- (4) The performance test shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the unit PC1-E1. The results from this testing are assumed to be representative of the emissions from unit PC2-E1.
- (5) The performance test shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated but not later than 180 days after initial start-up of the first Pre-cursor Synthesis and Ammonia Recovery unit (PC1-E5A, PC1-E5B, PC2-E5A, PC2-E5B) in the p-CAM process. The results from this testing are assumed to be representative of the emissions from the other unit Pre-cursor Synthesis and Ammonia Recovery units in p-CAM process. The permittee shall note the temperature of the vent stream at the exit of the condenser and other parameters (if any) specified by the manufacturer for optimum operation of the condenser.
- (6) The permittee shall also establish operating limits according to the following:
 - (i) The permittee shall establish the minimum value as the operating limit for scrubber inlet liquid or recirculating liquid flow rate, as appropriate. The minimum value shall be based on the scrubber inlet liquid or recirculating liquid flow rate, as appropriate, values measured during the performance test.
 - (ii) For ME-E1, ME-E8, PC1-E1 and PC2-E1, the permittee shall establish the minimum value as the operating limit for scrubber effluent pH. The minimum value shall be based on the scrubber effluent pH values measured during the performance test.
 - (iii) For PC1-E5A, PC1-E5B, PC2-E5A, PC2-E5B, the permittee shall establish the maximum value as the operating limit for scrubber effluent pH. The maximum value shall be based on the scrubber effluent pH values measured during the performance test.
 - (iv) The permittee shall establish the maximum value as the operating limit for scrubber differential pressure. The maximum value shall be based on the scrubber differential pressure values measured during the performance test.
- (7) The permittee shall also determine the control efficiency for particulate matter (PM/PM₁₀/PM_{2.5}) at ME-E1, ME-E8, PC1-E1, PC2-E1.
- (8) The permittee shall determine the control efficiency for ammonia emissions at PC1-E5A, PC1-E5B, PC2-E5A, PC2-E5B.
- (9) The permittee shall determine the control efficiency for H₂SO₄, HCl and HF emissions at ME-E1, ME-E8, PC1-E1 and PC2-E1.
- (10) Performance testing shall be conducted using the following U.S. EPA Reference Test Methods: [401 KAR 50:045, Section 1]
 - (i) U.S. EPA Reference Method 8 for Sulfuric acid mist;
 - (ii) U.S. EPA Reference Method 26 for HCl and HF;
 - (iii) U.S. EPA Reference Method 5 for PM/PM₁₀/PM_{2.5}
 - (iv) South Coast Air Quality Management District Method 207.1 for ammonia emissions and

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(v) Other methods, as approved by the Division.

b. For Emission units PC1-E4, PC2-E4:

(1) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit PC1-E4, the permittee shall conduct initial performance testing on the packed bed scrubber and determine the emission rates in lb/hr of particulate matter (PM/PM₁₀/PM_{2.5}), and in terms of lb/ton of black mass processed. The results from this testing are assumed to be representative of the emissions from unit PC2-E4. Testing shall be conducted using

U.S. EPA Reference Test Method 5.

(2) The permittee shall also determine the control efficiency for particulate matter (PM/PM₁₀/PM_{2.5}) at PC1-E4 and PC2-E4.

(3) The permittee shall also establish operating limits according to the following:

(i) The permittee shall establish the minimum value as the operating limit for scrubber inlet liquid or recirculating liquid flow rate, as appropriate. The minimum value shall be based on the scrubber inlet liquid or recirculating liquid flow rate, as appropriate, values measured during the performance test and.

(ii) The permittee shall establish the maximum value as the operating limit for scrubber differential pressure. The maximum value shall be based on the scrubber differential pressure values measured during the performance test.

c. For Emission Units ME-E6 :

Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit ME-E6, the permittee shall conduct performance testing on the carbon adsorber used as control device to determine the inlet and outlet VOC concentration, using Method 25A, Appendix A of 40 CFR 60. Testing shall occur at the maximum airflow rate. The results shall be reported in terms of lbs of VOC per ton of black mass processed. During the test, the permittee shall note the temperature of the vent stream at the exit of the condenser and other parameters (if any) specified by the manufacturer for optimum operation of the condenser.

d. For Emission Units ME-E16A, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B:

(1) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the first unit ME-E16A or ME-E16B, the permittee shall conduct initial performance testing on the cyclone and wet scrubber system and determine the emission rates in lb/hr of particulate matter (PM/PM₁₀/PM_{2.5}); where PM₁₀ and PM_{2.5} include filterable + condensable. The results shall also be expressed in terms of lb/ton of black mass processed. Testing shall be conducted using U.S. EPA Reference Test Method 5 and Method 202.

(2) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the first unit PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B, the permittee shall conduct initial performance testing on the cyclone and wet scrubber system and determine the emission rates in lb/hr of particulate matter PM/PM₁₀/PM_{2.5} (filterable + condensable), and in terms of

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lb/ton of black mass processed. Testing shall be conducted using U.S. EPA Reference Test Method 5 and Method 202.

- (3) The permittee shall also establish operating limits according to the following:
 - (i) The permittee shall establish the minimum value as the operating limit for gas inlet velocity or pressure drop across the cyclone. The minimum value shall be based on the gas inlet velocity or pressure drop across the cyclone, values measured during the performance test.
 - (ii) The permittee shall establish the minimum value as the operating limit for scrubbant flow rate. The minimum value shall be based on the scrubbant flow rate values measured during the performance test.
 - (iii) The permittee shall establish the maximum value as the operating limit for scrubber differential pressure. The maximum value shall be based on the scrubber differential pressure values measured during the performance test.
 - (4) The permittee shall also determine the combined control efficiency for particulate matter (PM/PM₁₀/PM_{2.5}); where PM₁₀ and PM_{2.5} include filterable + condensable, at the tested emission unit.
 - (5) Repeat testing shall be conducted every five years thereafter.
- e. **For Emission Units ME-E14, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC1-E11, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D, PC2-E11:**
- (1) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit ME-E14, the permittee shall conduct initial performance testing to determine the emission rates in lb/hr of particulate matter particulate matter (PM/PM₁₀/PM_{2.5}); where PM₁₀ and PM_{2.5} include filterable + condensable. The results shall also be expressed in terms of lb/ton of black mass processed. Testing shall be conducted using U.S. EPA Reference Test Method 5 and Method 202.
 - (2) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit PC1-E11, the permittee shall conduct initial performance testing to determine the emission rates in lb/hr of particulate matter particulate matter (PM/PM₁₀/PM_{2.5}); where PM₁₀ and PM_{2.5} include filterable + condensable. The results shall also be expressed in terms of lb/ton of black mass processed. The results from this testing are assumed to be representative of the emissions from units PC2-E11. Testing shall be conducted using U.S. EPA Reference Test Method 5 and Method 202.
 - (3) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the first Pre-cursor Electric Dryer and Dust Recovery unit in p-CAM process, the permittee shall conduct initial performance testing to determine the emission rates in lb/hr of particulate matter particulate matter (PM/PM₁₀ /PM_{2.5}); where PM₁₀ and PM_{2.5} include filterable + condensable. The results shall also be expressed in terms of lb/ton of black mass processed. The results from this testing are assumed to be representative of the emissions from other Pre-cursor Electric Dryer and Dust Recovery units in p-CAM processes. Testing shall be conducted using U.S. EPA Reference Test Method 5 and Method 202.

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f. For Emission Unit ME-E8:

Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit ME-E8, reference Method 11 shall be used to test for Hydrogen Sulfide. The sample shall be drawn from a point near the centroid of the gas line. The minimum sampling time shall be ten (10) minutes and the minimum sample volume shall be 0.01 dscm (0.35 dscf) for each sample. The arithmetic average of two (2) samples shall constitute one (1) run. Samples shall be taken at approximately one (1) hour intervals.

g. For Emission units ME-E9A, ME-E9B:

(1) Pursuant to 401 KAR 52:020, Section 10, within 60 days after achieving the maximum production but no later than 180 days after initial startup of the unit ME-E9A, the permittee shall conduct initial performance testing on the packed bed scrubber and determine the emission rates in lb/hr of particulate matter (PM/PM₁₀/PM_{2.5}), and in terms of lb/ton of black mass processed. The results from this testing are assumed to be representative of the emissions from unit ME-E9B. Testing shall be conducted using U.S. EPA Reference Test Method 5. The permittee shall note the pressure drop across the dust recovery system during the test.

(2) The permittee shall also determine the control efficiency for particulate matter (PM/PM₁₀/PM_{2.5}) at ME-E9A and ME-E9B.

(3) The permittee shall also establish operating limits according to the following:

(i) The permittee shall establish the minimum value as the operating limit for scrubber inlet liquid or recirculating liquid flow rate, as appropriate. The minimum value shall be based on the scrubber inlet liquid or recirculating liquid flow rate, as appropriate, values measured during the performance test and.

(ii) The permittee shall establish the maximum value as the operating limit for scrubber differential pressure. The maximum value shall be based on the scrubber differential pressure values measured during the performance test.

h. Testing shall be conducted at such times as may be requested by the Cabinet. [401 KAR 50:045, Section 1]

4. Specific Monitoring Requirements:

a. Compliance with the opacity standard in 401 KAR 59:010, shall be determined by the permittee performing a qualitative visual observation of the opacity of emissions at each stack no less than weekly and maintaining a log of the observations. If visible emissions from the stack are observed (not including condensed water in the plume), the permittee shall determine the opacity using Reference Method 9. In lieu of determining the opacity using U.S. EPA Method 9, the permittee shall immediately perform a corrective action which results in no visible emissions (not including condensed water in the plume).

b. The permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a monitoring device (differential pressure gauges or manometers) to determine the pressure drop across the mechanical dust recovery unit once a day during the operation of the unit. A permanent label displaying the operating range established for each collector shall be posted next to the selected instrument.

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- c. Perform semiannual inspections and maintenance to ensure proper performance of each dust recovery unit. This includes inspection of structural and filter integrity. The permittee shall record the results of these inspections.
- d. The permittee shall monitor the amount of black mass introduced into ME-E1, PC1-E1 and PC2-E1, on a monthly basis.
- e. **For Emission units ME-E1, ME-E8, ME-E9A, ME-E9B, PC1-E1, PC1-E4, PC1-E5A, PC1-E5B, PC2-E1, PC2-E4, PC2-E5A, PC2-E5B:**

The permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device to measure the differential pressure across the scrubber with demister control device. A permanent label displaying the operating range established for the control device shall be posted next to the selected instrument.

- f. **For Emission units ME-E1, ME-E8, ME-E9A, ME-E9B, PC1-E1, PC1-E4, PC1-E5A, PC1-E5B, PC2-E1, PC2-E4, PC2-E5A, PC2-E5B:**

The permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device to measure the scrubber inlet liquid or recirculating liquid flow rate through the wet scrubber with demister control device. A permanent label displaying the operating range established for the control device shall be posted next to the selected instrument.

- g. **For Emission units ME-E1, ME-E8, PC1-E1, PC1-E5A, PC1-E5B, PC2-E1, PC2-E5A, PC2-E5B:**

The permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device to measure the scrubber effluent pH exiting the wet scrubber with demister control device. A permanent label displaying the operating range established for the control device shall be posted next to the selected instrument.

- h. **For Emission Units ME-E16, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B:**

- (1) For the cyclone associated with each emission unit, the permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device (differential pressure flowmeter, anemometer, rotameter or other type of device that measures gas velocity or flow rate) to determine the gas inlet velocity, during the operation of the unit. A permanent label displaying the operating range established for the cyclone shall be posted next to the selected instrument; Or
- (2) For the cyclone associated with each emission unit, the permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device (differential pressure gauges or manometers) to determine the pressure drop across the cyclone. A permanent label displaying the operating range established for the cyclone shall be posted next to the selected instrument.

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i. For Emission Units ME-E16, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B:

For the scrubber associated with each emission unit, the permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device (differential pressure gauges or manometers) to determine the pressure drop across the scrubber. A permanent label displaying the operating range established for the spray tower wet dust scrubber shall be posted next to the selected instrument.

j. For Emission Units ME-E16, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B:

For the scrubber associated with each emission unit, the permittee shall install, calibrate, maintain and operate according to manufacturer's specifications a continuous monitoring device (liquid flow meter or other device for liquid flow) to determine the scrubbant flow rate. A permanent label displaying the operating range established for the scrubber shall be posted next to the selected instrument.

k. Pursuant to 401 KAR 52:020, Section 10, for each operating parameter that is required to be monitored under 1. Operating Limitations, (k), (l), and (m), the permittee shall install, operate, and maintain each continuous monitoring system (CMS) according to the following requirements:

- (1) The permittee shall operate each CMS and collect data at all times the process is operating.
- (2) The permittee shall collect data from at least four equally spaced periods each hour.
- (3) For at least 75 percent of the operating hours in a 24-hour period, the permittee shall have valid data for at least 4 equally spaced periods each hour.
- (4) For each hour that the permittee has valid data from at least four equally spaced periods, the permittee shall calculate the hourly average value using all valid data or, where data are collected from an automated CMS, using at least one measured value per minute if measured more frequently than once per minute.
- (5) The permittee shall calculate the daily average using all of the hourly averages calculated according to Condition (4). above for the 24-hour period.
- (6) The permittee shall record the results for each inspection, calibration, and validation check recommended by the manufacturer.

l. For Emission Units ME-E1, ME-E6, ME-E8, PC1-E1, PC2-E1:

- (1) The permittee shall monitor, for each carbon adsorber, concentration of VOC at the outlet of the carbon adsorber on a weekly basis.
- (2) The permittee shall calibrate, maintain, and operate instruments and devices used to monitor the adsorbers' VOC exhaust concentration, using procedures that take into account the manufacturer's recommendations.
- (3) Where a regenerative carbon adsorber is used as a control device at ME-E6, the permittee shall follow manufacturer specification for regeneration, including monitoring of any parameters as specified by the manufacturer.

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m. For all emission units with an add-on control device:

Perform semiannual inspections and maintenance to ensure proper performance of each control device. This includes inspection of structural and filter integrity. The permittee shall record the results of these inspections.

5. Specific Recordkeeping Requirements:

- a. The permittee shall maintain a log of the visual observations noting date, time, initials of observers, and records of corrective actions taken as a result of visible emissions and records of any Reference Method 9 readings performed.
- b. The permittee shall maintain records of calibration of the monitoring device and a log of the pressure drop readings across the dust recovery unit, including the date, and dates of filter replacements.
- c. The permittee shall maintain records of all maintenance conducted per manufacturer specifications and any repairs made to ensure proper performance of each control device.
- d. The permittee shall perform semiannual inspections and maintenance in accordance with manufacturer's specifications to ensure proper performance of each dust recovery unit. This includes inspection of structural and filter integrity, airflow source and pressure drop measuring system. The permittee shall keep record of the results of these inspections.
- e. The permittee shall keep records of the amount of black mass introduced into ME-E1, PC1-E1 and PC2-E1, on a monthly basis.
- f. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11501(c), the permittee must maintain files of all information required by 40 CFR 63, Subpart VVVVVV for at least 5 years following the date of each occurrence according to the requirements in 40 CFR 63.10(b)(1). If the permittee is subject, the permittee must comply with the recordkeeping and reporting requirements of 40 CFR 63.10(b)(2)(iii) and (vi) through (xiv), and the applicable requirements specified in 40 CFR 63.11501(c)(1) through (8) as applicable.

- (1) For each CMPU subject to 40 CFR 63, Subpart VVVVVV, the permittee must keep the records specified in 40 CFR 63.11501(c)(1)(i) through (viii) as applicable:
 - (i) Records of management practice inspections, repairs, and reasons for any delay of repair, as specified in 40 CFR 63.11495(a)(5).
 - (ii) Records of small heat exchange system inspections, demonstrations of indications of leaks that do not constitute leaks, repairs, and reasons for any delay in repair as specified in 40 CFR 63.11495(b)
 - (iii) If batch process vent emissions are less than 10,000 lb/yr for a CMPU, records of batch process vent emission calculations, as specified in 40 CFR 63.11496(a)(1), the number of batches operated each month, as specified in 40 CFR 63.11496(a)(3), and any updated emissions calculations, as specified in 40 CFR

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63.11496(a)(3). Alternatively, keep records of the worst-case processes or organic HAP usage, as specified in 40 CFR 63.11496(a)(2) and (4), respectively.

- (iv) Records of all TRE calculations for continuous process vents as specified in 40 CFR 63.11496(b)(2).
- (v) Records of metal HAP emission calculations as specified in 40 CFR 63.11496(f)(1) and (2). If total uncontrolled metal HAP process vent emissions from a CMPU subject to this subpart are estimated to be less than 400 lb/yr, also keep records of either the number of batches per month or operating hours, as specified in 40 CFR 63.11496(f)(2).
- (vi) Records identifying wastewater streams and the type of treatment they receive, as specified in Table 6 to this subpart.
- (vii) Records of the date, time, and duration of each malfunction of operation of process equipment, control devices, recovery devices, or continuous monitoring systems used to comply with 40 CFR 63, Subpart VVVVVV that causes a failure to meet a standard. The record must include a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over the standard, and a description of the method used to estimate the emissions.
- (viii) Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR 63.11495(d), including corrective actions to restore malfunctioning process and air pollution.

g. For Emission units ME-E1, ME-E8, ME-E9A, ME-E9B, PC1-E1, PC1-E4, PC1-E5A, PC1-E5B, PC2-E1, PC2-E4, PC2-E5A, PC2-E5B:

The permittee shall maintain a log of the daily average of the following:

- (1) Scrubber inlet liquid or recirculating liquid flow rate, as appropriate;
- (2) Scrubber effluent pH (if applicable);
- (3) Scrubber differential pressure;
- (4) If the daily average falls outside the value identified in the performance test, the facility shall assume zero control efficiency (for that day) in calculating monthly and 12-month rolling totals as required in **Section D – Source Emission Limitation and Testing Requirements**.

h. For Emission Units ME-E1, ME-E6 and ME-E8, PC1-E1, PC2-E1:

Where the permittee uses a carbon adsorber as a control device for VOC emissions, the following information shall be maintained:

- (1) The concentration level or reading indicated by an organic monitoring device at the outlet of the carbon adsorber measured on a weekly basis;
- (2) The dates and times when the carbon adsorber is switched and the weight of the carbon canister being replaced;
- (3) Manufacturer specifications regarding monitoring of the VOC outlet concentration; and
- (4) The permittee shall keep records on file the manufacturer specifications for regeneration of the carbon adsorber at ME-E6 and record of any parameters specified by the manufacturer for regeneration cycle.

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- i. **For Emission Units ME-E16A, ME-E16B, PC1-E13A, PC1-E13B, PC2-E13A, PC2-E13B:**

Where the permittee uses a cyclone and spray tower wet dust scrubber as a control device, a log of the daily average of the following shall be maintained:

- (1) Gas inlet velocity or Pressure drop across the cyclone;
- (2) Pressure drop across the spray tower wet dust scrubber;
- (3) Flow rate of the scrubbant fluid;
- (4) If the daily average gas inlet velocity/ pressure drop across the cyclone or the pressure drop across the spray tower wet scrubber or the flow rate of the scrubbant fluid falls outside the value identified in the performance test, the facility shall assume zero control efficiency in calculating monthly and 12-month rolling totals as required in **Section D – Source Emission Limitation and Testing Requirements.**

6. Specific Reporting Requirements:

- a. Refer to **Section F, Monitoring, Recordkeeping, and Reporting Requirements.**

- b. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11501(a), the permittee must meet the requirements of the General Provisions in 40 CFR 63, Subpart A, as shown in Table 9 to 40 CFR 63, Subpart VVVVVV. The General Provisions in other parts do not apply except when a requirement in an overlapping standard, which the permittee determines is at least as stringent as 40 CFR 63, Subpart VVVVVV and with which the permittee has opted to comply, requires compliance with general provisions in another part.

- c. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11501(b), the permittee's Notification of compliance status (NOCS) required by 40 CFR 63.9(h) must include the following additional information as applicable:

- (1) This certification of compliance, signed by a responsible official:
 - (i) "This facility complies with the management practices in 40 CFR 63.11495."
 - (ii) "This facility complies with the requirements in 40 CFR 63.11496 for HAP emissions from process vents."
 - (iii) "This facility complies with the requirements in 40 CFR 63.11496 and 40 CFR 63.11497 for surge control vessels, bottoms receivers, and storage tanks."
 - (iv) "This facility complies with the requirements in 40 CFR 63.11498 to treat wastewater streams."
 - (v) "This facility complies with the requirements in 40 CFR 63.11499 for heat exchange systems."

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- d. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63, Subpart 63.11501(d), the permittee must submit semiannual compliance reports that contain the information specified in 40 CFR 63.11501(d)(1) through (7), as applicable. Reports are required only for semiannual periods during which the permittee experienced any of the events described in 40 CFR 63.11501(d)(1) through (8).

- (1) The permittee must clearly identify any deviation from the requirements of 40 CFR 63, Subpart VVVVVV.
- (2) The permittee must include the information specified in 40 CFR 63.104(f)(2) each time the permittee invokes the delay of repair provisions for a heat exchange system with a cooling water flow rate equal to or greater than 8,000 gal/min.
- (3) The permittee must provide the following information for each delay of leak repair beyond 15 days for any process equipment, storage tank, surge control vessel, bottoms receiver, and each delay of leak repair beyond 45 days for any heat exchange system with a cooling water flow rate less than 8,000 gal/min: information on the date the leak was identified, the reason for the delay in repair, and the date the leak was repaired.
- (4) The permittee must report each process change that affects a compliance determination and submit a new certification of compliance with the applicable requirements in accordance with the procedures specified in 40 CFR 63.11501(b).
- (5) If the permittee complies with the alternative standard, as specified in Table 2 to 40 CFR 63, Subpart VVVVVV or Table 3 to 40 CFR 63, Subpart VVVVVV, the permittee must report the information required in 40 CFR 63.1258(b)(5).
- (6) The permittee must report any changes in the overlapping provisions with which the permittee complies.
- (7) The permittee must report any transfer of liquids that are reactive or resinous materials, as defined in 40 CFR 63.11502(b), and not included in the NOCS.
- (8) If a malfunction occurred during the reporting period, the report must include the number of instances of malfunctions that caused emissions in excess of a standard. For each malfunction that caused emissions in excess of a standard, the report must include a list of the affected sources or equipment, an estimate of the volume of each regulated pollutant emitted over the standard, and a description of the method used to estimate the emissions. The report must also include a description of actions the permittee took during a malfunction of an affected source to minimize emissions in accordance with 40 CFR 63.11495(d), including actions taken to correct a malfunction.

- e. **For units subject to 40 CFR 63, Subpart VVVVVV (ME-E1, ME-E2, ME-E6, ME-E7, ME-E8, PC1-E1, PC1-E2, PC1-E4, PC1-E5A, PC1-E5B, PC1-E7A, PC1-E7B, PC1-E7C, PC1-E7D, PC2-E1, PC2-E2, PC2-E4, PC2-E5A, PC2-E5B, PC2-E7A, PC2-E7B, PC2-E7C, PC2-E7D):**

Pursuant to 40 CFR 63.11501(e), in response to an action to enforce the standards set forth in 40 CFR 63.11495 through 40 CFR 63.11499, the permittee may assert an affirmative defense to a claim for civil penalties for violations of such standards that are caused by malfunction, as defined at 40 CFR 63.2. Appropriate penalties may be assessed if the

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

permittee fails to meet their burden of proving all of the requirements in the affirmative defense. The affirmative defense shall not be available for claims for injunctive relief.

- (1) To establish the affirmative defense in any action to enforce such a standard, the permittee must timely meet the notification requirements in 40 CFR 63.11501(e)(2), and must prove by a preponderance of evidence that:
 - (i) The violation:
 - (A) Was caused by a sudden, infrequent, and unavoidable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner; and
 - (B) Could not have been prevented through careful planning, proper design, or better operation and maintenance practices; and
 - (C) Did not stem from any activity or event that could have been foreseen and avoided, or planned for; and
 - (D) Was not part of a recurring pattern indicative of inadequate design, operation, or maintenance; and
 - (ii) Repairs were made as expeditiously as possible when a violation occurred. Offshift and overtime labor were used, to the extent practicable to make these repairs; and
 - (iii) The frequency, amount, and duration of the violation (including any bypass) were minimized to the maximum extent practicable; and
 - (iv) If the violation resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage; and
 - (v) All possible steps were taken to minimize the impact of the violation on ambient air quality, the environment and human health; and
 - (vi) All emissions monitoring and control systems were kept in operation if at all possible, consistent with safety and good air pollution control practices; and
 - (vii) All of the actions in response to the violation were documented by properly signed, contemporaneous operating logs; and
 - (viii) At all times, the affected CMPU was operated in a manner consistent with good practices for minimizing emissions; and
 - (ix) A written root cause analysis has been prepared, the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the violation resulting from the malfunction event at issue. The analysis must also specify, using best monitoring methods and engineering judgment, the amount of any emissions that were the result of the malfunction.
- (2) If the permittee seeks to assert an affirmative defense, the permittee must submit a written report to the Administrator, with all necessary supporting documentation, that the permittee has met the requirements set forth in 40 CFR 63.11501(e)(1). This affirmative defense report must be included in the first periodic compliance report, deviation report, or excess emission report otherwise required after the initial occurrence of the violation of the relevant standard (which may be the end of any applicable averaging period). If such compliance report, deviation report, or excess emission report is due less than 45 days after the initial occurrence of the violation, the affirmative defense report may be included in the second compliance report, deviation report, or excess emissions.

SECTION B - EMISSION POINTS, EMISSION UNITS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

- f. For each deviation from an emissions limitation (including an operating limit) or work practice standard occurring at an affected source where the permittee is using a continuous monitoring system, you must include the information specified below.
- (1) The date and time that each malfunction started and stopped.
 - (2) The date and time that each continuous monitoring system was inoperative, except for zero (low-level) and high-level checks.
 - (3) The date, time, and duration that each continuous monitoring system was out-of-control, including the information as specified in 40 CFR 63.8(c)(8).
 - (4) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period.
 - (5) A summary of the total duration of the deviations during the reporting period and the total duration as a percent of the total source operating time during that reporting period.
 - (6) A breakdown of the total duration of the deviations during the reporting period into those that are due to startup, shutdown, control equipment problems, process problems, other known causes, and unknown causes.
 - (7) A summary of the total duration of continuous monitoring system downtime during the reporting period and the total duration of continuous monitoring system downtime as a percent of the total source operating time during the reporting period.
 - (8) A brief description of the process units.
 - (9) A brief description of the continuous monitoring system.
 - (10) The date of the latest continuous monitoring system certification or audit.
 - (11) A description of any changes in continuous monitoring systems, processes, or controls since the last reporting period.

SECTION C – INSIGNIFICANT

The following listed activities have been determined to be insignificant activities for this source pursuant to 401 KAR 52:020, Section 6. Although these activities are designated as insignificant the permittee must comply with the applicable regulation. Process and emission control equipment at each insignificant activity subject to an opacity standard shall be inspected monthly and a qualitative visible emissions evaluation made. Results of the inspection, evaluation, and any corrective action shall be recorded in a log.

<u>Description</u>	<u>Generally Applicable Regulation</u>
IA-1 Solvent Oil Storage Tank. 10,000 gallons T07008A	None
IA-2 21% Ammonium Hydroxide Tank, V=10,000 gallons T07007A	401 KAR 63:020
IA-3 6 % Ammonium Hydroxide Day Tank, 15,000 gallons T22005* ¹	401 KAR 63:020
IA-4 6 % Ammonium Hydroxide Day Tank 15,000 gallons* ²	401 KAR 63:020
IA-5 6 % Ammonium Hydroxide Day Tank V ≈15,000 gallons* ³	401 KAR 63:020
IA-6 6 % Ammonium Hydroxide Day Tank V ≈15,000 gallons* ⁴	401 KAR 63:020
IA-7 93 % Sulfuric Acid Tank V= 53,536 gallons T07002A	401 KAR 63:020
IA-8 93 % Sulfuric Acid Tank V= 53,536 gallons T07002B	401 KAR 63:020
IA-9 93 % Sulfuric Acid Tank V= 53,536 gallons T07002C	401 KAR 63:020
IA-10 6N Sulfuric Acid Day Tank V≈326 gallons	401 KAR 63:020
IA-11 6N Sulfuric Acid Day Tank V≈326 gallons	401 KAR 63:020
IA-12 3N Sulfuric Acid Day Tank V=326 gallons T12046A	401 KAR 63:020
IA-13 3N Sulfuric Acid Day Tank V=326 gallons T12046B	401 KAR 63:020
IA-14 1.2N Sulfuric Acid Day Tank V=326 gallons T12061A	401 KAR 63:020
IA-15 1.2N Sulfuric Acid Day Tank V=326 gallons T12061B	401 KAR 63:020
IA-16 1N Sulfuric Acid Day Tank V≈326 gallons	401 KAR 63:020
IA-17 1N Sulfuric Acid Day Tank V≈326 gallons	401 KAR 63:020
IA-18 1N Sulfuric Acid Day Tank V=1,320 gallons T24017	401 KAR 63:020
IA-19 1N Sulfuric Acid Day Tank V=1,320 gallons TBD	401 KAR 63:020
IA-20 0.2N Sulfuric Acid Day Tank V=326 gallons T12058	401 KAR 63:020
IA-21 31 % Hydrochloric Acid Tank V=46,619 gallons T07003A	401 KAR 63:020
IA-22 6N Hydrochloric Acid Day Tank V=326 gallons T12037A* ⁵	401 KAR 63:020
IA-23 6N Hydrochloric Acid Day Tank V=326 gallons T12037B* ⁵	401 KAR 63:020
IA-24 3N Hydrochloric Acid Day Tank V=326 gallons T12070* ⁵	401 KAR 63:020
IA-25 1.2N Hydrochloric Acid Day Tank V=326 gallons T12067* ⁵	401 KAR 63:020
IA-26 Sodium Sulfide Solution Day Tank V=1,344 gallons T12098* ⁵	401 KAR 63:020
IA-27 Cobalt Sulfate Solution Storage Tank V=12,099 gallons T14001A	None
IA-28 Cobalt Sulfate Solution Storage Tank V=12,099 gallons T14001B	None
IA-29 Manganese Sulfate Solution Storage Tank V=12,099 gallons T14003A	None IA-
IA-30 Manganese Sulfate Solution Storage Tank V=12,099 gallons T14003B	None IA-31
Nickel Sulfate Solution Storage Tank V=12,099 gallons T14005A	None
IA-32 Nickel Sulfate Solution Storage Tank V=12,099 gallons T14005B	None
IA-33 Nickel Sulfate Raffinate Tank V=22,986 gallons T13001A	None
IA-34 Nickel Sulfate Raffinate Tank V=22,986 gallons T13001B	None
IA-35 Nickel Sulfate Raffinate Tank V=22,986 gallons T13001C	None

36. SECTION C – INSIGNIFICANT ACTIVITIES (CONTINUED)

IA-36 Nickel Sulfate Raffinate Tank V=22,986 gallons T13001D	None
IA-37 Nickel Sulfate Raffinate Tank V=22,986 gallons T13001E	None
IA-38 Nickel Sulfate Raffinate Tank V=22,986 gallons T13001F	None
IA-39 Wastewater Treatment Plant	None

*¹ Emissions are vented through the scrubber at PC1-E5A

*² Emissions are vented through the scrubber at PC1-E5B

*³ Emissions are vented through the scrubber at PC2-E5A

*⁴ Emissions are vented through the scrubber at PC2-E5B

*⁵ Emissions are vented through the scrubber at ME-E8

**37. SECTION D - SOURCE
EMISSION LIMITATIONS AND TESTING
REQUIREMENTS (CONTINUED)**

1. As required by Section 1b of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26; compliance with annual emissions and processing limitations contained in this permit, shall be based on emissions and processing rates for any twelve (12) consecutive months.
2. PM, PM₁₀, PM_{2.5}, H₂SO₄, HCl, HF, ammonia, H₂S emissions, measured by applicable reference methods, or an equivalent or alternative method specified in 40 C.F.R. Chapter I, or by a test method specified in the state implementation plan shall not exceed the respective limitations specified herein.
3. To preclude classification as a major source of Hazardous Air Pollutants (HAP), the permittee shall limit source-wide emissions, including insignificant activities, of an individual HAP to less than 9.0 tons per year on a 12-month rolling total basis and total HAPs to less than 22.5 tons per year on a 12-month rolling total basis.

38. Compliance Demonstration:

Compliance shall be demonstrated by calculating the monthly and 12-month rolling total of each individual HAP emissions and total HAPs from all emissions sources and maintaining records of the monthly and 12-month rolling total of the individual HAP and total HAPs. Monthly HAP emissions shall be calculated using the most recent emission factors approved by the Division.

12-month rolling total emissions for individual HAPs and total HAPs for each semiannual period will be reported in accordance with **Section F – Monitoring, Recordkeeping, and Reporting Requirements**, item 5.

4. Pursuant to 401 KAR 63:020, Nickel compound (nickel soluble salts) emissions from emissions units ME-E9A and ME-E9B, shall not exceed 0.265 tons/year.

39. Compliance Demonstration

The permittee shall calculate and keep records of the monthly and 12-monthly rolling total of Nickel compound emissions from Emission Unit ME-E9A/ME-E9B using the tested emission factor for PM including speciation for soluble Nickel compound (if any) and control efficiency.

5. Pursuant to 401 KAR 63:020, source wide Sulfuric acid emissions shall not exceed 23.1 tons/year.

40. Compliance Demonstration

The permittee shall calculate and keep records of the monthly and 12-monthly rolling total of actual source wide sulfuric acid emitted from units in Section B and Section C. For units in Section B, the actual emissions of sulfuric acid shall be based on tons of black mass processed per month, accepted emission factor and control efficiency (if any). For units with testing requirement to verify the emission factor and control efficiency, the permittee shall use the most recent tested values approved by the Division. For units in Section C (insignificant activities), the permittee may opt to use worst-case monthly potential emission rates submitted in the application, instead of calculating actual emissions.

**41. SECTION D - SOURCE
EMISSION LIMITATIONS AND TESTING
REQUIREMENTS (CONTINUED)**

6. To preclude applicability of 401 KAR 51:017, the permittee shall limit source-wide emissions, including insignificant activities, of PM/PM₁₀/PM_{2.5} to less than 90 tons per year on a 12-month rolling total basis.

42. Compliance Demonstration:

- (1) Compliance shall be demonstrated by calculating the monthly and 12-month rolling total PM/PM₁₀/PM_{2.5} emissions from all emissions sources and maintaining records of the monthly and 12-month rolling total PM/PM₁₀/PM_{2.5} emissions from these sources.
- (2) Monthly PM/PM₁₀/PM_{2.5} emissions shall be calculated using the most recent emission factors and control efficiencies (for add-on control device) approved by the Division.
- (3) For units with testing requirement to verify the emission factor and control efficiency, the permittee shall use the most recent tested values approved by the Division.
- (4) PM_{2.5} includes sulfuric acid mist where applicable.
- (5) The permittee shall certify that all material collected at the integral dust recovery device is used or reused or sold for use or reuse.

43. SECTION E - SOURCE CONTROL EQUIPMENT REQUIREMENTS

Pursuant to 401 KAR 50:055, Section 2(5), at all times, including periods of startup, shutdown and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Division which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

SECTION F - MONITORING, RECORDKEEPING, AND 44. REQUIREMENTS

1. Pursuant to Section 1b-IV-1 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26, when continuing compliance is demonstrated by periodic testing or instrumental monitoring, the permittee shall compile records of required monitoring information that include:
 - a. Date, place as defined in this permit, and time of sampling or measurements;
 - b. Analyses performance dates;
 - c. Company or entity that performed analyses;
 - d. Analytical techniques or methods used;
 - e. Analyses results; and
 - f. Operating conditions during time of sampling or measurement.
2. Records of all required monitoring data and support information, including calibrations, maintenance records, and original strip chart recordings, and copies of all reports required by the Division for Air Quality, shall be retained by the permittee for a period of five (5) years and shall be made available for inspection upon request by any duly authorized representative of the Division for Air Quality [Sections 1b-IV-2 and 1a-8 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
3. In accordance with the requirements of 401 KAR 52:020, Section 3(1)h, the permittee shall allow authorized representatives of the Cabinet to perform the following during reasonable times:
 - a. Enter upon the premises to inspect any facility, equipment (including air pollution control equipment), practice, or operation;
 - b. To access and copy any records required by the permit;
 - c. Sample or monitor, at reasonable times, substances or parameters to assure compliance with the permit or any applicable requirements.

Reasonable times are defined as during all hours of operation, during normal office hours; or during an emergency.

4. No person shall obstruct, hamper, or interfere with any Cabinet employee or authorized representative while in the process of carrying out official duties. Refusal of entry or access may constitute grounds for permit revocation and assessment of civil penalties.
5. Summary reports of any monitoring required by this permit shall be submitted to the Regional Office listed on the front of this permit at least every six (6) months during the life of this permit, unless otherwise stated in this permit. For emission units that were still under construction or which had not commenced operation at the end of the 6-month period covered by the report and are subject to monitoring requirements in this permit, the report shall indicate that no monitoring was performed during the previous six months because the emission unit was not in operation [Sections 1b-V-1 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].

SECTION F - MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS (CONTINUED)

6. The semi-annual reports are due by January 30th and July 30th of each year. All reports shall be certified by a responsible official pursuant to 401 KAR 52:020, Section 23. If continuous emission and opacity monitors are required by regulation or this permit, data shall be reported in accordance with the requirements of 401 KAR 59:005, General Provisions, Section 3(3). All deviations from permit requirements shall be clearly identified in the reports.
7. In accordance with the provisions of 401 KAR 50:055, Section 1, the owner or operator shall notify the Regional Office listed on the front of this permit concerning startups, shutdowns, or malfunctions as follows:
 - a. When emissions during any planned shutdowns and ensuing startups will exceed the standards, notification shall be made no later than three (3) days before the planned shutdown, or immediately following the decision to shut down, if the shutdown is due to events which could not have been foreseen three (3) days before the shutdown.
 - b. When emissions due to malfunctions, unplanned shutdowns and ensuing startups are or may be in excess of the standards, notification shall be made as promptly as possible by telephone (or other electronic media) and shall be submitted in writing upon request.
8. The permittee shall promptly report deviations from permit requirements, including those attributable to upset conditions as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken shall be submitted to the Regional Office listed on the front of this permit. Where the underlying applicable requirement contains a definition of prompt or otherwise specifies a time frame for reporting deviations, that definition or time frame shall govern. Where the underlying applicable requirement does not identify a specific time frame for reporting deviations, prompt reporting, as required by Sections 1b-V, 3 and 4 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26, shall be defined as follows:
 - a. For emissions of a hazardous air pollutant or a toxic air pollutant (as identified in an applicable regulation) that continue for more than an hour in excess of permit requirements, the report must be made within 24 hours of the occurrence.
 - b. For emissions of any regulated air pollutant, excluding those listed in F.8.a., that continue for more than two hours in excess of permit requirements, the report must be made within 48 hours.
 - c. All deviations from permit requirements, including those previously reported, shall be included in the semiannual report required by F.6.
9. Pursuant to 401 KAR 52:020, Title V permits, Section 21, the permittee shall annually certify compliance with the terms and conditions contained in this permit, by completing and returning a Compliance Certification Form (DEP 7007CC) (or an alternative approved by the regional office) to the Regional Office listed on the front of this permit and the U.S. EPA in accordance with the following requirements:
 - a. Identification of the term or condition;
 - b. Compliance status of each term or condition of the permit;
 - c. Whether compliance was continuous or intermittent;
 - d. The method used for determining the compliance status for the source, currently and over the reporting period.

SECTION F - MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS (CONTINUED)

- e. For an emissions unit that was still under construction or which has not commenced operation at the end of the 12-month period covered by the annual compliance certification, the permittee shall indicate that the unit is under construction and that compliance with any applicable requirements will be demonstrated within the timeframes specified in the permit.
- f. The certification shall be submitted by January 30th of each year. Annual compliance certifications shall be sent to the following addresses:

Division for Air Quality
Paducah Regional Office
130 Eagle Nest Drive
Paducah, KY 42003
Atlanta, GA 30303-8960

U.S. EPA Region 4
Air Enforcement Branch
Atlanta Federal Center
61 Forsyth St. SW

- 10. In accordance with 401 KAR 52:020, Section 22, the permittee shall provide the Division with all information necessary to determine its subject emissions within 30 days of the date the Kentucky Emissions Inventory System (KYEIS) emissions survey is mailed to the permittee.

SECTION G – GENERAL

1. General Compliance Requirements

- a. The permittee shall comply with all conditions of this permit. Noncompliance shall be a violation of 401 KAR 52:020, Section 3(1)(b), and a violation of Federal Statute 42 USC 7401 through 7671q (the Clean Air Act). Noncompliance with this permit is grounds for enforcement action including but not limited to termination, revocation and reissuance, revision or denial of a permit [Section 1a-3 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- b. The filing of a request by the permittee for any permit revision, revocation, reissuance, or termination, or of a notification of a planned change or anticipated noncompliance, shall not stay any permit condition [Section 1a-6 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- c. This permit may be revised, revoked, reopened and reissued, or terminated for cause in accordance with 401 KAR 52:020, Section 19. The permit will be reopened for cause and revised accordingly under the following circumstances:
 - (1) If additional applicable requirements become applicable to the source and the remaining permit term is three (3) years or longer. In this case, the reopening shall be completed no later than eighteen (18) months after promulgation of the applicable requirement. A reopening shall not be required if compliance with the applicable requirement is not required until after the date on which the permit is due to expire, unless this permit or any of its terms and conditions have been extended pursuant to 401 KAR 52:020, Section 12;
 - (2) The Cabinet or the United States Environmental Protection Agency (U. S. EPA) determines that the permit must be revised or revoked to assure compliance with the applicable requirements;
 - (3) The Cabinet or the U. S. EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit;
 - (4) New requirements become applicable to a source subject to the Acid Rain Program.

Proceedings to reopen and reissue a permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of the permit for which cause to reopen exists. Reopenings shall be made as expeditiously as practicable. Reopenings shall not be initiated before a notice of intent to reopen is provided to the source by the Division, at least thirty (30) days in advance of the date the permit is to be reopened, except that the Division may provide a shorter time period in the case of an emergency.

- d. The permittee shall furnish information upon request of the Cabinet to determine if cause exists for modifying, revoking and reissuing, or terminating the permit; or to determine compliance with the conditions of this permit [Sections 1a- 7 and 8 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- e. Emission units described in this permit shall demonstrate compliance with applicable requirements if requested by the Division [401 KAR 52:020, Section 3(1)(c)].

SECTION G - GENERAL PROVISIONS

- f. The permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the permit application, shall promptly submit such supplementary facts or corrected information to the permitting authority [401 KAR 52:020, Section 7(1)].
- g. Any condition or portion of this permit which becomes suspended or is ruled invalid as a result of any legal or other action shall not invalidate any other portion or condition of this permit [Section 1a-14 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- h. The permittee shall not use as a defense in an enforcement action the contention that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance [Section 1a-4 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- i. All emission limitations and standards contained in this permit shall be enforceable as a practical matter. All emission limitations and standards contained in this permit are enforceable by the U.S. EPA and citizens except for those specifically identified in this permit as state-origin requirements. [Section 1a-15 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- j. This permit shall be subject to suspension if the permittee fails to pay all emissions fees within 90 days after the date of notice as specified in 401 KAR 50:038, Section 3(6) [Section 1a-10 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- k. Nothing in this permit shall alter or affect the liability of the permittee for any violation of applicable requirements prior to or at the time of permit issuance [401 KAR 52:020, Section 11(3) b].
- l. This permit does not convey property rights or exclusive privileges [Section 1a-9 of the *Cabinet Provisions and Procedures for Issuing Title V Permits* incorporated by reference in 401 KAR 52:020, Section 26].
- m. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses, or approvals required by the Cabinet or any other federal, state, or local agency.
- n. Nothing in this permit shall alter or affect the authority of U.S. EPA to obtain information pursuant to Federal Statute 42 USC 7414, Inspections, monitoring, and entry [401 KAR 52:020, Section 11(3) d.].
- o. Nothing in this permit shall alter or affect the authority of U.S. EPA to impose emergency orders pursuant to Federal Statute 42 USC 7603, Emergency orders [401 KAR 52:020, Section 11(3) a.].

SECTION G - GENERAL PROVISIONS

- p. This permit consolidates the authority of any previously issued PSD, NSR, or Synthetic Minor source preconstruction permit terms and conditions for various emission units and incorporates all requirements of those existing permits into one single permit for this source.
- q. Pursuant to 401 KAR 52:020, Section 11, a permit shield shall not protect the owner or operator from enforcement actions for violating an applicable requirement prior to or at the time of permit issuance. Compliance with the conditions of this permit shall be considered compliance with:
 - (1) Applicable requirements that are included and specifically identified in this permit; and
 - (2) Non-applicable requirements expressly identified in this permit.

2. Permit Expiration and Reapplication Requirements

- a. This permit shall remain in effect for a fixed term of five (5) years following the original date of issue. Permit expiration shall terminate the source's right to operate unless a timely and complete renewal application has been submitted to the Division at least six (6) months prior to the expiration date of the permit. Upon a timely and complete submittal, the authorization to operate within the terms and conditions of this permit, including any permit shield, shall remain in effect beyond the expiration date, until the renewal permit is issued or denied by the Division [401 KAR 52:020, Section 12].
- b. The authority to operate granted shall cease to apply if the source fails to submit additional information requested by the Division after the completeness determination has been made on any application, by whatever deadline the Division sets [401 KAR 52:020, Section 8(2)].

3. Permit Revisions

- a. A minor permit revision procedure may be used for permit revisions involving the use of economic incentive, marketable permit, emission trading, and other similar approaches, to the extent that these minor permit revision procedures are explicitly provided for in the State Implementation Plan (SIP) or in applicable requirements and meet the relevant requirements of 401 KAR 52:020, Section 14(2).
- b. This permit is not transferable by the permittee. Future owners and operators shall obtain a new permit from the Division for Air Quality. The new permit may be processed as an administrative amendment if no other change in this permit is necessary, and provided that a written agreement containing a specific date for transfer of permit responsibility coverage and liability between the current and new permittee has been submitted to the permitting authority within ten (10) days following the transfer.

SECTION G - GENERAL PROVISIONS

4. Construction, Start-Up, and Initial Compliance Demonstration Requirements

Pursuant to a duly submitted application the Kentucky Division for Air Quality hereby authorizes the construction of the equipment described herein, all emission units at the source in accordance with the terms and conditions of this permit V-22-034.

- a. Construction of any process and/or air pollution control equipment authorized by this permit shall be conducted and completed only in compliance with the conditions of this permit.
- b. Within thirty (30) days following commencement of construction and within fifteen (15) days following start-up and attainment of the maximum production rate specified in the permit application, or within fifteen (15) days following the issuance date of this permit, whichever is later, the permittee shall furnish to the Regional Office listed on the front of this permit in writing, notification of the following:
 - (1) The date when construction commenced.
 - (2) The date of start-up of the affected facilities listed in this permit.
 - (3) The date when the maximum production rate specified in the permit application was achieved.
- c. Pursuant to 401 KAR 52:020, Section 3(2), unless construction is commenced within eighteen (18) months after the permit is issued, or begins but is discontinued for a period of eighteen (18) months or is not completed within a reasonable timeframe then the construction and operating authority granted by this permit for those affected facilities for which construction was not completed shall immediately become invalid. Upon written request, the Cabinet may extend these time periods if the source shows good cause.
- d. Pursuant to 401 KAR 50:055, Section 2(1)(a), an owner or operator of any affected facility subject to any standard within the administrative regulations of the Division for Air Quality shall demonstrate compliance with the applicable standard(s) within sixty (60) days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial start-up of such facility. Pursuant to 401 KAR 52:020, Section 3(3)(c), sources that have not demonstrated compliance within the timeframes prescribed in 401 KAR 50:055, Section 2(1)(a), shall operate the affected facility only for purposes of demonstrating compliance unless authorized under an approved compliance plan or an order of the cabinet.
- f. This permit shall allow time for the initial start-up, operation, and compliance demonstration of the affected facilities listed herein. However, within sixty (60) days after achieving the maximum production rate at which the affected facilities will be operated but not later than 180 days after initial start-up of such facilities, the permittee shall conduct a performance demonstration on the affected facilities in accordance with 401 KAR 50:055, General compliance requirements. Testing must also be conducted in accordance with General Provisions G.5 of this permit.
- g. Terms and conditions in this permit established pursuant to the construction authority of 401 KAR 51:017 or 401 KAR 51:052 shall not expire.

SECTION G - GENERAL PROVISIONS

5. Testing Requirements

- a. Pursuant to 401 KAR 50:045, Section 2, a source required to conduct a performance test shall submit a completed Compliance Test Protocol form, DEP form 6028, or a test protocol a source has developed for submission to other regulatory agencies, in a format approved by the cabinet, to the Division's Frankfort Central Office a minimum of sixty (60) days prior to the scheduled test date. Pursuant to 401 KAR 50:045, Section 7, the Division shall be notified of the actual test date at least thirty (30) days prior to the test.
- b. Pursuant to 401 KAR 50:045, Section 5, in order to demonstrate that a source is capable of complying with a standard at all times, any required performance test shall be conducted under normal conditions that are representative of the source's operations and create the highest rate of emissions. If [When] the maximum production rate represents a source's highest emissions rate and a performance test is conducted at less than the maximum production rate, a source shall be limited to a production rate of no greater than 110 percent of the average production rate during the performance tests. If and when the facility is capable of operation at the rate specified in the application, the source may retest to demonstrate compliance at the new production rate. The Division for Air Quality may waive these requirements on a case-by-case basis if the source demonstrates to the Division's satisfaction that the source is in compliance with all applicable requirements.
- c. Results of performance test(s) required by the permit shall be submitted to the Division by the source or its representative within forty-five days or sooner if required by an applicable standard, after the completion of the fieldwork.

6. Acid Rain Program Requirements

- a. If an applicable requirement of Federal Statute 42 USC 7401 through 7671q (the Clean Air Act) is more stringent than an applicable requirement promulgated pursuant to Federal Statute 42 USC 7651 through 7651o (Title IV of the Act), both provisions shall apply, and both shall be state and federally enforceable.
- b. The permittee shall comply with all applicable requirements and conditions of the Acid Rain Permit and the Phase II permit application (including the Phase II NO_x compliance plan and averaging plan, if applicable) incorporated into the Title V permit issued for this source. The source shall also comply with all requirements of any revised or future acid rain permit(s) issued to this source.

7. Emergency Provisions

- a. Pursuant to 401 KAR 52:020, Section 24(1), an emergency shall constitute an affirmative defense to an action brought for the noncompliance with the technology-based emission limitations if the permittee demonstrates through properly signed contemporaneous operating logs or relevant evidence that:
 - (1) An emergency occurred and the permittee can identify the cause of the emergency;
 - (2) The permitted facility was at the time being properly operated;

SECTION G - GENERAL PROVISIONS

- (3) During an emergency, the permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards or other requirements in the permit; and
 - (4) Pursuant to 401 KAR 52:020, 401 KAR 50:055, and KRS 224.1-400, the permittee notified the Division as promptly as possible and submitted written notice of the emergency to the Division when emission limitations were exceeded due to an emergency. The notice shall include a description of the emergency, steps taken to mitigate emissions, and corrective actions taken.
 - (5) This requirement does not relieve the source of other local, state or federal notification requirements.
- b. Emergency conditions listed in General Condition G.7.a above are in addition to any emergency or upset provision(s) contained in an applicable requirement [401 KAR 52:020, Section 24(3)].
 - c. In an enforcement proceeding, the permittee seeking to establish the occurrence of an emergency shall have the burden of proof [401 KAR 52:020, Section 24(2)].
8. Ozone Depleting Substances
- a. The permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR 82, Subpart F, except as provided for Motor Vehicle Air Conditioners (MVACs) in Subpart B:
 - (1) Persons opening appliances for maintenance, service, repair, or disposal shall comply with the required practices contained in 40 CFR 82.156.
 - (2) Equipment used during the maintenance, service, repair, or disposal of appliances shall comply with the standards for recycling and recovery equipment contained in 40 CFR 82.158.
 - (3) Persons performing maintenance, service, repair, or disposal of appliances shall be certified by an approved technician certification program pursuant to 40 CFR 82.161.
 - (4) Persons disposing of small appliances, MVACs, and MVAC-like appliances (as defined at 40 CFR 82.152) shall comply with the recordkeeping requirements pursuant to 40 CFR 82.155.
 - (5) Persons owning commercial or industrial process refrigeration equipment shall comply with the leak repair requirements pursuant to 40 CFR 82.156 and 40 CFR 82.157.
 - (6) Owners/operators of appliances normally containing 50 or more pounds of refrigerant shall keep records of refrigerant purchased and added to such appliances pursuant to 40 CFR 82.166.
 - b. If the permittee performs service on motor (fleet) vehicle air conditioners containing ozone-depleting substances, the source shall comply with all applicable requirements as specified in 40 CFR 82, Subpart B, *Servicing of Motor Vehicle Air Conditioners*.

SECTION G - GENERAL PROVISIONS

9. Risk Management Provisions

- a. The permittee shall comply with all applicable requirements of 401 KAR Chapter 68, Chemical Accident Prevention, which incorporates by reference 40 CFR Part 68, Risk Management Plan provisions. If required, the permittee shall comply with the Risk Management Program and submit a Risk Management Plan to U.S. EPA using the RMP* eSubmit software.
- b. If requested, submit additional relevant information to the Division or the U.S. EPA.

SECTION G - GENERAL PROVISIONS

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Page:

45. SECTION H - ALTERNATE OPERATING SCENARIOS

None

46. SECTION I – COMPLIANCE SCHEDULE

None



Andy Beshear
GOVERNOR

**ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca W. Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

January 10, 2023

Dan Russell
Ascend Elements Inc
133 Flanders Rd
Westborough, MA 01581

Re: KYR10 Change to Existing Coverage Acknowledgment
KPDES No.: KYR10Q770
Apex 1
Permit Type: Construction Stormwater
AI ID: 174716
Christian County, Kentucky

Dear Dan Russell :

The discharges associated with the Notice of Intent: Change to Existing Coverage you submitted have been approved for coverage under the “Kentucky Pollutant Discharge Elimination System (KPDES) General Permit for Storm Water Discharges Associated with Construction Activities (KYR100000)” master general permit. Your coverage remains effective as of September 24th, 2022. This coverage automatically terminates two years from the effective date of your coverage unless an extension is requested prior to the termination date, until the KYR100000 master general permit expires on November 30, 2024, or the Division of Water revokes coverage, whichever comes first. During this period of coverage all discharges shall comply with the conditions of the KYR100000 master general permit. This permit and links to the eNOI (and permit coverage extension) and eNOT forms can be found on our website: <https://eec.ky.gov/Environmental-Protection/Water/PermitCert/KPDES/Documents/KYR10PermitPage.pdf>.

Any person aggrieved by the issuance of a permit final decision may demand a hearing pursuant to KRS 224.10-420(2) within thirty (30) days from the date of the issuance of this letter. Any demand for a hearing on the permit shall be filed in accordance with the procedures specified in KRS 224.10-420, 224.10-440, 224.10-470, and the regulations promulgated thereto. The request for hearing should be submitted in writing to the Energy and Environment Cabinet, Office of Administrative Hearings, 211 Sower Boulevard, Frankfort, Kentucky 40601 and the Commonwealth of Kentucky, Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, Frankfort, Kentucky 40601. For your record keeping purposes, it is recommended that these requests be sent by certified mail. The written request must conform to the appropriate statutes referenced above.

Any questions concerning the general permit and its requirements should be directed to me at 502-782-7123 or email me at Karina.Villanueva@ky.gov

Construction Site GPS Coordinates: 36.786667, -87.386944
Receiving Water: Montgomery Creek

Sincerely,

Karina Villanueva
Surface Water Permits Branch
Division of Water

cc: Chad Grass, eNOI Preparer
Randy Thomas, Madisonville Regional Office



Andy Beshear
GOVERNOR

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

300 Sower Boulevard
Frankfort, Kentucky 40601
Phone: (502) 564-2150
Fax: 502-564-4245

Rebecca Goodman
SECRETARY

Anthony R. Hatton
COMMISSIONER

January 31, 2023

Ascend Elements Inc
133 Flanders Rd
Westborough, MA 01581

Re: KPDES Final Permit Issuance
KPDES No.: KY0113531
Ascend Elements Inc
AI ID: 174716
Christian County, Kentucky

Dear Daniel Russell:

Enclosed is the Kentucky Pollutant Discharge Elimination System (KPDES) permit for the above-referenced facility. This action constitutes a final permit issuance under 401 KAR 5:075, pursuant to KRS 224.16-050.

This permit will become effective on the date indicated in the attached permit provided that no request for adjudication is granted. All provisions of the permit will be effective and enforceable in accordance with 401 KAR 5:075.

Any demand for a hearing on the permit shall be filed in accordance with the procedures specified in KRS 224.10-420, 224.10-440, 224.10-470 and any regulations promulgated thereto. Any person aggrieved by the issuance of a permit final decision may demand a hearing, pursuant to KRS 224.10-420(2), within thirty (30) days from the date of the issuance of this letter. Two (2) copies of request for hearing should be submitted in writing to the Energy and Environment Cabinet, Office of Administrative Hearings, 211 Sower Boulevard, Frankfort, Kentucky 40601 and the Commonwealth of Kentucky, Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, Frankfort, Kentucky 40601. For your record keeping purposes, it is recommended that these requests be sent by certified mail. The written request must conform to the appropriate statutes referenced above.

If you have any questions regarding the KPDES decision, please contact the Surface Water Permits Branch by phone at (502) 564-3410 or via email at SWPBSupport@ky.gov. Further information on procedures and legal matters pertaining to the hearing request may be obtained by contacting the Office of Administrative Hearings at (502) 564-7312.

Sincerely,

Jason M. Hurt, P.E.
Manager, Surface Water Permits Branch
Division of Water

Enclosure

KPDES



**KENTUCKY POLLUTANT
DISCHARGE ELIMINATION
SYSTEM**

PERMIT

**AUTHORIZATION TO DISCHARGE UNDER THE KENTUCKY POLLUTANT DISCHARGE
ELIMINATION SYSTEM**

PERMIT NO.: KY0113531

AGENCY INTEREST NO.: 174716

Pursuant to Authority in KRS 224,

Ascend Elements 133
Flanders Road
Westborough, Massachusetts 01581

is authorized to discharge from a facility located at

Ascend Elements
John Rivers Road, Commerce Park Hopkinsville,
Christian County, Kentucky

to receiving waters named

UT to Montgomery Creek

in accordance with effluent limitations, monitoring requirements and other conditions set forth in this permit.

This permit shall become effective on April 1, 2023.

This permit and the authorization to discharge shall expire at midnight, March 31, 2028.

Date Signed: January 31, 2023

Carey Johnson, Director Division of Water

A handwritten signature in black ink, appearing to read "Jason M. Hurt", written over a horizontal line.

Signed by: Jason Hurt

**DEPARTMENT FOR ENVIRONMENTAL PROTECTION
Division of Water, 300 Sower Blvd, Frankfort, Kentucky 40601**

Printed on Recycled Paper

THIS KPDES PERMIT CONSISTS OF THE FOLLOWING SECTIONS:

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SECTION 1

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1.1. Compliance Monitoring Locations (Outfalls)

The following table lists the outfalls authorized by this permit, the location and description of each, and the DOW assigned KPDES outfall number:

TABLE 1.

Outfall No.	Outfall Type	Latitude (N)	Longitude (W)	Receiving Water	Description of Outfall
001	External	36.78444°	87.38833°	UT to Montgomery Creek	Non-Contact Cooling Water RO Reject Water Boiler Blowdown/ Condensate

1.2. Effluent Limitations and Monitoring Requirements

Beginning on the effective date and lasting through the term of this permit, discharges from Outfall 001 shall comply with the following effluent limitations:

TABLE 2.

EFFLUENT LIMITATIONS										MONITORING REQUIREMENTS	
Effluent Characteristic	Units	Loadings (lbs./day)			Concentrations			Daily Maximum	Maximum	Frequency	Sample Type
		Monthly Average	Daily Maximum	Report	Minimum	Monthly Average	Daily Maximum				
Flow	MGD	Report	Report	Report	N/A	N/A	N/A	N/A	N/A	1/Month	Instantaneous
Temperature	°F	N/A	N/A	N/A	N/A	Report	89	N/A	N/A	1/Month	Grab
Total Suspended Solids	mg/l	N/A	N/A	N/A	N/A	30	60	N/A	N/A	1/Month	Grab
Oil & Grease	mg/l	N/A	N/A	N/A	N/A	10	15	N/A	N/A	1/Month	Grab
pH	SU	N/A	N/A	N/A	6.0	N/A	N/A	9.0	N/A	1/Month	Grab
Total Recoverable Mercury	mg/l	N/A	N/A	N/A	N/A	0.000051	0.0014	N/A	N/A	1/Month	Grab
Hardness (as mg/l CaCO ₃)	mg/l	N/A	N/A	N/A	N/A	Report	Report	N/A	N/A	1/Quarter	Grab
Total Recoverable Copper	mg/l	N/A	N/A	N/A	N/A	Report	Report	N/A	N/A	1/Quarter	Grab
Total Recoverable Zinc	mg/l	N/A	N/A	N/A	N/A	Report	Report	N/A	N/A	1/Quarter	Grab

1.3. Standard Effluent Requirements

The discharges to Waters of the Commonwealth shall not produce floating solids, visible foam or a visible sheen on the surface of the receiving waters.

SECTION 2
STANDARD CONDITIONS

2. STANDARD CONDITIONS

The following conditions apply to all KPDES permits.

2.1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of KRS Chapter 224 and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Any person who violates applicable statutes or who fails to perform any duty imposed, or who violates any determination, permit, administrative regulation, or order of the Cabinet promulgated pursuant thereto shall be liable for a civil penalty as provided at KRS 224.99.010.

2.2. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

2.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2.4. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

2.5. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2.6. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

2.7. Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

2.8. Duty to Provide Information

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

2.9. Inspection and Entry

The permittee shall allow the Director, or an authorized representative (including an authorized contractor acting as a representative of the Administrator), upon presentation of credentials and other documents as may be required by law, to:

- (1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- (2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- (3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- (4) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

2.10. Monitoring and Records

- (1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- (2) Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five (5) years (or longer as required by 401 KAR 5:065, Section 2(10) [40 CFR 503]), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.
- (3) Records of monitoring information shall include:
 - a) The date, exact place, and time of sampling or measurements;
 - b) The individual(s) who performed the sampling or measurements;
 - c) The date(s) analyses were performed;
 - d) The individual(s) who performed the analyses;
 - e) The analytical techniques or methods used; and
 - f) The results of such analyses.
- (4) Monitoring must be conducted according to test procedures approved under 401 KAR 5:065, Section 2(8) [40 CFR 136] unless another method is required under 401 KAR 5:065, Section 2(9) or (10) [40 CFR subchapters N or O].
- (5) KRS 224.99-010 provides that any person who knowingly violates KRS 224.70-110 or other enumerated statutes, or who knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall be guilty of a Class D felony and, upon conviction, shall be punished by a fine of not more than \$25,000, or by imprisonment for not less than one (1) year and not more than five (5) years, or by both fine and imprisonment for each separate violation.. Each day upon which a violation occurs shall constitute a separate violation.

2.11. Signatory Requirement

- (1) All applications, reports, or information submitted to the Director shall be signed and certified pursuant to 401 KAR 5:060, Section 4 [40 CFR 122.22].

(2) KRS 224.99-010 provides that any person who knowingly provides false information in any document filed or required to be maintained under KRS Chapter 224 shall be guilty of a Class D felony and upon conviction thereof, shall be punished by a fine not to exceed twenty-five thousand dollars (\$25,000), or by imprisonment, or by fine and imprisonment, for each separate violation. Each day upon which a violation occurs shall constitute a separate violation.

2.12. Reporting Requirements

2.12.1. Planned Changes

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- (1) The alteration or addition to a permitted facility may meet one (1) of the criteria for determining whether a facility is a new source in KRS 224.16-050 [40 CFR 122.29(b)]; or
- (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under KRS 224.16-050 [40 CFR 122.42(a)(1)].
- (3) The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan.

2.12.2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

2.12.3. Transfers

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under KRS 224 [CWA; see 40 CFR 122.61; in some cases, modification or revocation and reissuance is mandatory].

2.12.4. Monitoring Reports

Monitoring results shall be reported at the intervals specified elsewhere in this permit.

- (1) Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Director for reporting results of monitoring of sludge use or disposal practices.
- (2) If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 401 KAR 5:065, Section 2(8) [40 CFR 136], or another method required for an industry-specific waste stream under 401 KAR 5:065, Section 2(9) or (10) [40 CFR subchapters N or O], the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Director.
- (3) Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

2.12.5. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

2.12.6. Twenty-four-Hour Reporting

1) The permittee shall report any noncompliance which may endanger health or the environment to the DOW Regional Office. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

2) The following shall be included as information which must be reported within twenty-four (24) hours under this paragraph:

- a) Any unanticipated bypass which exceeds any effluent limitation in the permit [40 CFR 122.41 (g)].
- b) Any upset which exceeds any effluent limitation in the permit.
- c) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit to be reported within twenty-four (24) hours.

3) The Director may waive the written report on a case-by-case basis under 40 CFR 122.41 (l), if the oral report has been received within twenty-four (24) hours.

4) The permittee is assigned to the Department for Environmental Protection's Madisonville Regional Field Office.

- a. Reporting shall be as required in paragraphs 1 through 3 of this subsection except that, if a spill or release of pollutants or contaminants, bypass, upset, or other event of non-compliance occurs that may present an imminent or substantial danger to the environment or the public health or welfare, the permittee shall immediately notify the regional field office by calling the Madisonville Regional Field Office at (270) 824-7529.
- b. If a report required by this subsection is made during other than normal business hours, it shall be made through the **twenty-four (24) hour environmental emergency telephone number at (800) 928-2380**.
- c. The reporting requirements of this subsection does not relieve the permittee of reporting required under other laws, regulations, programs, or emergency response plans.

2.12.7. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under Sections 2.12.1, 2.12.4, 2.12.5 and 2.12.6, at the time monitoring reports are submitted. The reports shall contain the information listed in Section 2.12.6.

2.12.8. Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

2.13. Bypass**2.13.1. Definitions**

- (1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.
- (2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

2.13.2. Bypass Not Exceeding Limitations

The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Section 2.13.3 and 2.13.4.

2.13.3. Notice

- (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.
- (2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Section 2.12.6.

2.13.4. Prohibition of Bypass

- (1) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - a) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - c) The permittee submitted notices as required under Section 2.13.3.
- (2) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three (3) conditions listed above in Section 2.13.4

2.14. Upset**2.14.1. Definition**

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

2.14.2. Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Section 2.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2.14.3. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

- (1) An upset occurred and that the permittee can identify the cause(s) of the upset;
- (2) The permitted facility was at the time being properly operated; and
- (3) The permittee submitted notice of the upset as required in Section 2.12.6; and
- (4) The permittee complied with any remedial measures required under Section 2.4.

2.14.4. Burden of Proof

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

SECTION 3

BEST MANAGEMENT PRACTICES PLAN (BMPP) REQUIREMENTS

3. BEST MANAGEMENT PRACTICES PLAN (BMPP) REQUIREMENTS

The permittee shall develop and implement a Best Management Practices Plan (BMPP) consistent with 401 KAR 5:065, Section 2(4).

3.1. Applicability

These conditions apply to all permittees who use, manufacture, store, handle, or discharge any pollutant listed as: (1) toxic under Section 307(a)(1) of the Clean Water Act; (2) oil, as defined in Section 311(a)(1) of the Act; (3) any pollutant listed as hazardous under Section 311 of the Act; or (4) is defined as a pollutant pursuant to KRS 224.1-010(35) and who have operations which could result in (1) the release of a hazardous substance, pollutant, or contaminant, or (2) an environmental emergency, as defined in KRS 224.1-400, as amended, or any regulation promulgated pursuant thereto (hereinafter, the "BMP pollutants"). These operations include material storage areas; plant site runoff; in-plant transfer, process and material handling areas; loading and unloading operations, and sludge and waste disposal areas.

3.2. Plan

The permittee shall develop and implement a BMPP consistent with 401 KAR 5:065, Section 2(4) pursuant to KRS 224.70-110, which prevents or minimizes the potential for the release of "BMP pollutants" from ancillary activities through site runoff; spillage or leaks, sludge or waste disposal; or drainage from raw material storage.

3.3. Implementation

The permittee shall implement the BMPP upon of the commencement of regulated activity. Modifications to the plan as a result of ineffectiveness or plan changes to the facility shall be implemented as soon as possible.

3.4. General Requirements

The BMPP shall:

- (1) Be documented in narrative form, and shall include any necessary plot plans, drawings, or maps.
- (2) Establish specific objectives for the control of toxic and hazardous pollutants.
 - a. Each facility component or system shall be examined for its potential for causing a release of "BMP pollutants" due to equipment failure, improper operation, natural phenomena such as rain or snowfall, etc.
 - b. Where experience indicates a reasonable potential for equipment failure (e.g., a tank overflow or leakage), natural condition (e.g., precipitation), or other circumstances which could result in a release of "BMP pollutants", the plan should include a prediction of the direction, rate of flow, and total quantity of the pollutants which could be released from the facility as result of each condition or circumstance.
- (3) Establish specific BMPs to meet the objectives identified under paragraph (2) b of this section, addressing each component or system capable of causing a release of "BMP pollutants".
- (4) Include any special conditions established in part b of this section.
- (5) Be reviewed by engineering staff and the site manager.

3.5. Specific Requirements

The plan shall be consistent with the general guidance contained in the publication entitled "NPDES Best Management Practices Guidance Document", and shall include the following baseline BMPs as a minimum:

- (1) BMP Committee

- (2) Reporting of BMP Incidents
- (3) Risk Identification and Assessment
- (4) Employee Training
- (5) Inspections and Records
- (6) Preventive Maintenance
- (7) Good Housekeeping
- (8) Materials Compatibility
- (9) Security
- (10) Materials Inventory

3.6. SPCC Plans

The BMPP may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under Section 311 of the Clean Water Act and 40 CFR Part 112, and may incorporate any part of such plans into the BMPP by reference.

3.7. Hazardous Waste Management

The permittee shall assure the proper management of solids and hazardous waste in accordance with the regulations promulgated under the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1978 (RCRA) (40 U.S.C. 6901 et seq.) Management practices required under RCRA regulations shall be referenced in the BMP plan.

3.8. Documentation

The permittee shall maintain a copy of the BMPP at the facility and shall make the plan available upon request to EEC personnel.

3.9. BMPP Modification

The permittee shall modify the BMPP whenever there is a change in the facility or change in the operation of the facility that materially increases the potential for the release of "BMP pollutants".

3.10. Modification for Ineffectiveness

The BMPs and the BMPP shall be reviewed and appropriate modifications implemented to utilize other practicable measures if any of the following events occur:

- (1) As a result of either a fixed or episodic event-driven evaluation, the permittee determines the selected BMPs are not achieving the established performance benchmarks;
- (2) As a result of an evaluation or inspection by Cabinet personnel; or
- (3) A release of any petroleum-based product, toxic or hazardous substance.

SECTION 4

OTHER CONDITIONS

4. OTHER CONDITIONS

4.1. Schedule of Compliance

The permittee shall attain compliance with all requirements of this permit on the effective date of this permit unless otherwise stated.

4.2. Other Permits

This permit has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal, and local agencies.

4.3. Continuation of Expiring Permit

This permit shall be continued in effect and enforceable after the expiration date of the permit provided the permittee submits a timely and complete application in accordance with 401 KAR 5:060, Section 2(4).

4.4. Antidegradation

For those discharges subject to the provisions of 401 KAR 10:030 Section, 1(3)(b)5, the permittee shall install, operate, and maintain wastewater treatment facilities consistent with those identified in the SDAA submitted with the KPDES permit application.

4.5. Reopener Clause

This permit shall be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved in accordance with 401 KAR 5:050 through 5:080, if the effluent standard or limitation so issued or approved:

- (1) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
- (2) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of KRS Chapter 224 when applicable.

4.6. Cooling Water Additives, FIFRA, and Mollusk Control

The discharge of any product registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in cooling water which ultimately may be released to the waters of the Commonwealth is prohibited, except Herbicides, unless specifically identified and authorized by the KPDES permit. In the event the permittee needs to use a biocide or chemical not previously reported for mollusk control or other purpose, the permittee shall submit sufficient information, a minimum of thirty (30) days prior to the commencement of use of said biocides or chemicals to the Division of Water for review and establishment of appropriate control parameters.

4.7. Outfall Signage

This KPDES permit establishes monitoring points, effluent limitations, and other conditions to address discharges from the permitted facility. In an effort to better document and clarify these locations the permittee should place and maintain a permanent marker at each of the monitoring locations.

SECTION 5

MONITORING AND REPORTING REQUIREMENTS

5. MONITORING AND REPORTING REQUIREMENTS

5.1. KPDES Outfalls

Discharge samples and measurements shall be collected at the compliance point for each KPDES Outfall identified in this permit. Each sample shall be representative of the volume and nature of the monitored discharge.

5.2. Effluent Data for New Operations

Within two (2) years of commencing discharge, the permittee shall submit to the Division of Water actual discharge data for the pollutants required by, Section XII A of KPDES Form SC. This shall only apply to outfalls receiving influent from new operations.

5.3. Sufficiently Sensitive Analytical Methods

Analytical methods utilized to demonstrate compliance with the effluent limitations established in this permit shall be sufficiently sensitive to detect pollutant levels at or below the required effluent limit, i.e. the Method Minimum Level shall be at or below the effluent limit. In the instance where an EPA-approved method does not exist that has a Method Minimum Level at or below the established effluent limitation, the permittee shall:

- (1) Use the method specified in the permit; or
- (2) The EPA-approved method with an ML that is nearest to the established effluent limit.

It is the responsibility of the permittee to demonstrate compliance with permit parameter limitations by utilization of sufficiently sensitive analytical methods.

5.4. Certified Laboratory Requirements

All laboratory analyses and tests required to demonstrate compliance with the conditions of this permit shall be performed by a laboratory holding the appropriate general or field-only certification issued by the Cabinet pursuant to 401 KAR 5:320.

5.5. Submission of DMRs

The completed DMR for each monitoring period must be entered into the DOW approved electronic system no later than midnight on the 28th day of the month following the monitoring period for which monitoring results were obtained.

For more information regarding electronic submittal of DMRs, please visit the Division's website at: <https://eec.ky.gov/Environmental-Protection/Water/SubmitReport/Pages/NetDMR.aspx> or contact the DMR Coordinator at (502) 564-3410.

Appendix 3

Consultation with Agencies and Tribal Nations



February 22, 2023

Hon. Lee Andrews Field
Office Supervisor
Kentucky Ecological Services Field Office
U.S. Fish and Wildlife Service J
C Watts Federal Building
330 West Broadway, Room 265
Frankfort, KY 40601-8670

RE: Section 7 Consultation under the Endangered Species Act for the Apex – Integrated Sustainable Battery Active Material And Precursor Production Plant Project

Dear Supervisor Andrews,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Ascend Elements Inc. (Ascend) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law. Ascend intends to construct and operate a manufacturing facility producing lithium-ion battery materials in Hopkinsville, KY that is capable of establishing industrial scale U.S. production capacity of sustainable, low-cost precursor cathode materials by integrating the separation of critical cathode materials from spent lithium-ion batteries with the production of both precursor cathode materials and metal salts to support domestic production of cathode active materials. To achieve its purpose, the facility will consist of manufacturing buildings, office space and a warehouse, as well as support infrastructure. See, Exhibit 1 (Facility Site Plan).

The proposed site for the project is located within the Hopkinsville Commerce Industrial Park II, in Hopkinsville, Kentucky. See, Exhibit 2 (Christian County, Kentucky & Hopkinsville, Kentucky) and Exhibit 3 (Proposed Project Location). Commerce Industrial Park II is located in Christian County, Kentucky, along US Route 41. The location is 10 miles from both Interstate 24 and Interstate 169 and one hour from Nashville International Airport, and is serviced by a CSX rail line. Commerce Industrial Park II is adjacent to Hopkinsville Commerce Industrial Park I. The land that comprises the industrial park is currently zoned as heavy industrial, with a TVA (Tennessee Valley Authority) 161 kV transmission line running through the western side of the Industrial Park.

The proposed project site encompasses two adjacent lots in the northwestern corner of Commerce Industrial Park II, Lot 3 and Lot 4. Lot 3 is approximately 80 acres (southern lot shown in yellow) and Lot 4 is approximately 64 acres (northern lot shown in blue/white) as presented in Exhibit 4 (Proposed Project Site), attached. Prior to being converted to an industrial park, the proposed project site was used for many years for commercial agricultural crop production. As such, the land was regularly plowed, planted, and harvested using industrial mechanized farming equipment. The project proponent has undertaken certain self-funded site preparation activities, including land grading and levelling across the two lots.

1450 Queen Ave. SW, Albany, OR 97321

Section 7 Consultation for

The U.S. Fish & Wildlife Service's Information for Planning and Consultation website identified three listed species, the Gray Bat, the Indiana Bat, and the Northern Long-eared Bat, and one candidate species, the Monarch Butterfly, that potentially could be impacted by a project located at the proposed project site. See, Exhibit 5, attached. In 2017, the South Western Kentucky Economic Development Council commissioned a Threatened/Endangered Species Report for a much larger, 704-acre section of Commerce Industrial Park II, which included Lots 3 & 4 (Report). See, Exhibit 6. The Report, prepared by Redwing Ecological Services, identified six species as potentially occurring in Christian County, Kentucky: the three bat species listed above plus three species of mussels (the ring pink mussel (*Obovaria retusa*), the slabside pearly mussel (*Pleuonaia dolabelloides*), and the fluted kidneyshell (*Ptychobranthus subtentum*). DOE reviewed the U.S. Fish and Wildlife Service (FWS) list of federally endangered and threatened species that are known to occur in Christian County, Kentucky, and found no other threatened or endangered species that might occur on the proposed project site. It also contains no critical habitat.

Based on a review of available data and a field investigation, the Report found no listed species present at the proposed project site and no suitable habitat for the gray bat and the three species of mussels. Additionally, based on an absence of mines, wells, caves, and the like, the Report found that there were no areas that were suitable as winter hibernacula for the Indiana bat and the Northern Long-eared bat. The Report identified a few locations across the larger, 704-acre section of the Industrial Park as potentially suitable summer roosting habitat for the Indiana bat and the Northern Long-eared bat.

Within Lots 3 & 4, the Report identified a solitary tree along John Rivers Road at the northern boundary of the proposed project site (Lot 4) as a potentially suitable summer roost tree for the Indiana bat and the Northern Long-eared bat, as well as a row of trees at the southern property boundary of Lot 3 that could potentially offer suitable summer habitat for the two bat species. See, Exhibit 7 (Areas Potentially Suitable for Summer Roosting Habitat) and Exhibit 8 (Areas Potentially Suitable for Summer Roosting Habitat with Facility Site Plan Overlay). Of the two areas identified in the 2017 report, only the row of trees at the southern property boundary remains.

The Kentucky Ecological Services Field Office of the Fish & Wildlife Service has generated maps of the Commonwealth documenting known habitat of the Indiana bat and of the Northern Long-eared bat. See, Exhibit 9 (Known Indiana Bat Habitat in Kentucky), and Exhibit 10 (Known Northern Long-eared Bat Habitat in Kentucky). A review of the two maps confirms that the proposed project site does not include known habitat for either the Indiana bat or the Northern Long-eared bat.

Finally, while the Report did identify a row of existing trees along the southern border of Lot 3 as potentially suitable summer roosting habitat for the two species of bats, the trees are outside of the footprint of the proposed facility. According to the proposed project plan, trees located on Lot 3 will be preserved as they currently exist, and none will be removed.

Based on the above information, DOE determined that there would be no effect to federally threatened or endangered species and designated critical habitat. The proposed action and its interrelated and interdependent actions will not directly or indirectly affect listed species or

Section 7 Consultation for

destroy/adversely modify designated critical habitat. Key facts supporting this conclusion include that no listed species or designated critical habitat are present in Lots 3 & 4 or the larger 704-acre section of Commerce Industrial Park II, no suitable habitat for the gray bat, ring pink mussel, slabside pearly mussel, and the fluted kidneyshell exists within Lots 3 & 4 or the larger 704-acre section of Commerce Industrial Park II, and all existing trees within Lot 3 identified as potentially suitable habitat for either the Indiana bat or the Northern Long-eared bat will be preserved.

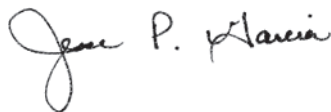
According to the U.S. Fish & Wildlife Service and National Marine Fisheries Service's *Endangered Species Consultation Handbook*, formal consultation is not required when an action agency reaches a "no effect" finding for a proposed project, but action agencies are encouraged to seek an optional concurrence to be placed in the administrative record for the action. DOE asks for your concurrence with the above conclusion and thanks you in advance for your consideration.

Based on the scope of the proposed Ascend project, DOE plans to prepare an Environmental Assessment (EA) (*DOE/EA-2205D*) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, your office will be sent an electronic and hard copy where you may provide any further comments.

Please forward the results of your review and any requests for additional information to: NEPA

Contractor: Diane M. Sanzone, PhD
Impact Assessment and Permitting Lead-Americas
Ramboll US Consulting, Inc.
Email: dsanzone@ramboll.com
Telephone: D +1 (617) 946-6102
M +1 (508) 524-4629

Sincerely,



Jesse Garcia
NEPA Compliance/Document Manager

Attachments

1. Exhibit 1 Facility Site Plan
2. Exhibit 2 Christian County, Kentucky & Hopkinsville, Kentucky
3. Exhibit 3 Proposed Project Location
4. Exhibit 4 Proposed Project Site

continued on next page

Section 7 Consultation for

5. Exhibit 5 Information for Planning and Consultation Report
6. Exhibit 6 Threatened/Endangered Species Report
7. Exhibit 7 Areas Potentially Suitable for Summer Roosting Habitat
8. Exhibit 8 Areas Potentially Suitable for Summer Roosting Habitat with Facility Site Plan Overlay
9. Exhibit 9 Known Indiana Bat Habitat in Kentucky
10. Exhibit 10 Known Northern Long-eared Bat Habitat in Kentucky

Endangered Species Act Compliance for Project Apex - Integrated Sustainable Battery Active Material and Precursor Production Plant		
EXHIBIT LIST		
Exhibit #	Document	Page #
Exhibit 1:	Facility Site Plan	001
Exhibit 2:	Christian County, Kentucky & Hopkinsville, Kentucky	002
Exhibit 3:	Proposed Project Location	003
Exhibit 4:	Proposed Project Site	004
Exhibit 5:	List of Threatened and Endangered Species	005
Exhibit 6:	Threatened/Endangered Species Report (2017 Report)	014
Exhibit 7:	Areas Potentially Suitable for Summer Roosting Habitat from 2017 Report	037
Exhibit 8:	Areas Potentially Suitable for Summer Roosting Habitat from 2017 Report with Facility Site Plan Overlay	039
Exhibit 9:	Known Indiana Bat Habitat in Kentucky	041
Exhibit 10:	Known Northern Long-eared Bat Habitat in Kentucky	043

Exhibit 1: Facility Site Plan

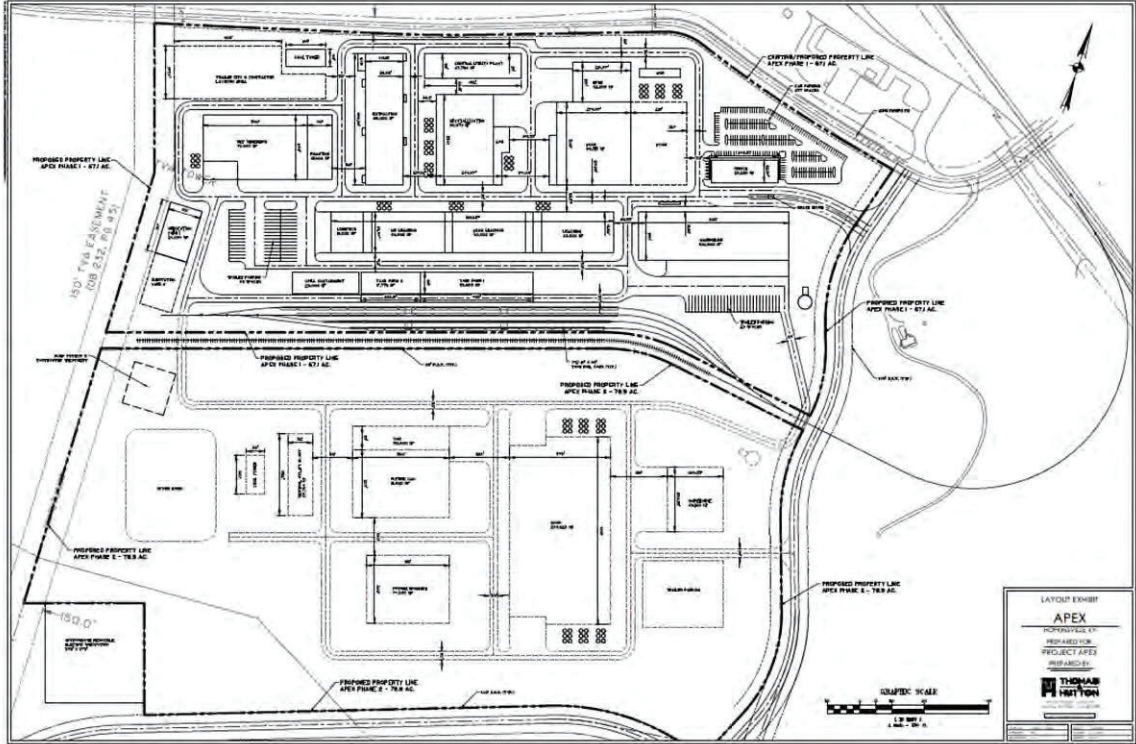


Exhibit 2: Christian County & Hopkinsville, Kentucky

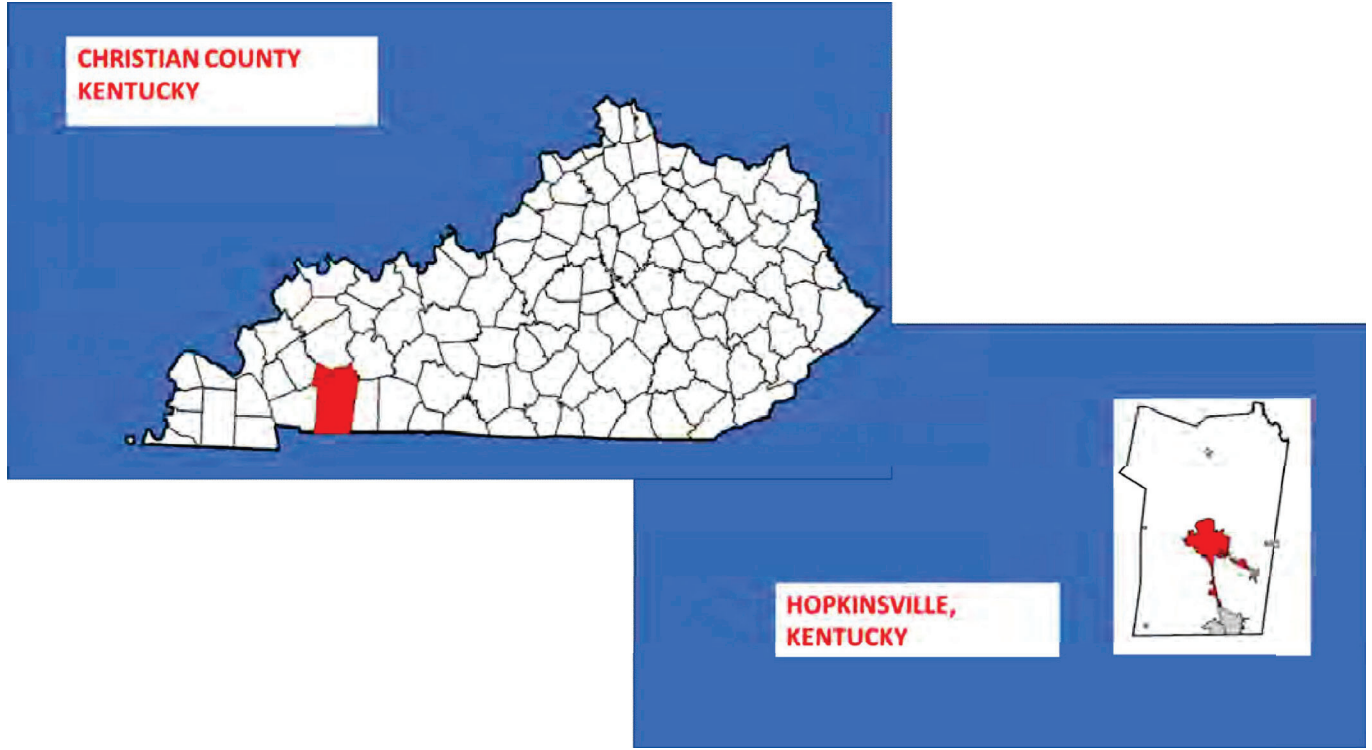
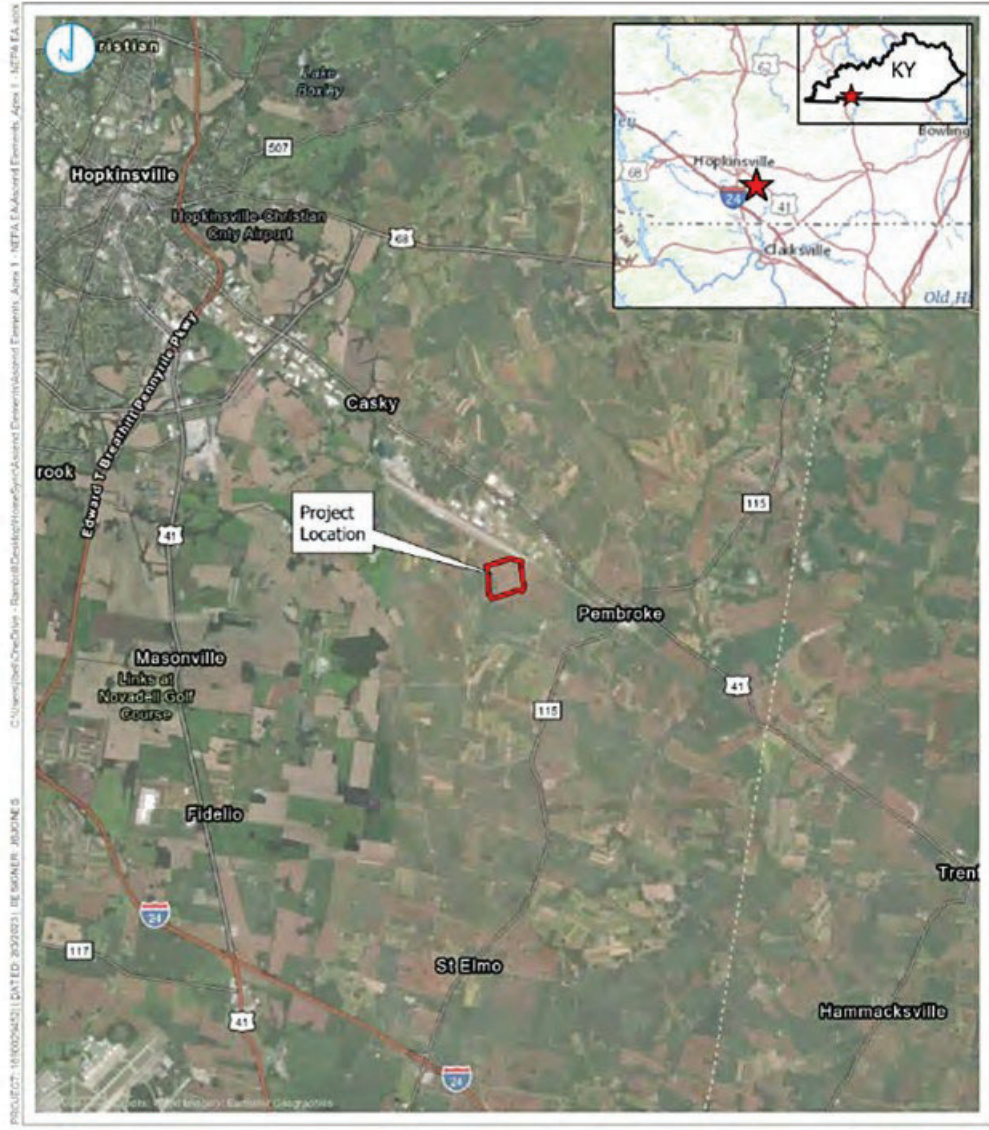


Exhibit 3: Proposed Project Location



PROJECT: 18002045 | DATED: 202303 | DESIGNER: JACQUE S
 C:\Users\jacob.Chen\OneDrive - Ramboll\Desktop\18002045\Ascend Elements\Map\Ascend Elements Area 1 - NEPA EA 403

- Project Boundary (approximate)
- ★ Project Location



**REGIONAL
LOCATION MAP**

FIGURE 01

Ascend Elements
 Apex – Integrated Sustainable Battery Active
 Material And Precursor Production Plant Project
 Hopkinsville, KY

RAMBOLL US CORPORATION
 A RAMBOLL COMPANY



Exhibit 3: Proposed Project Location

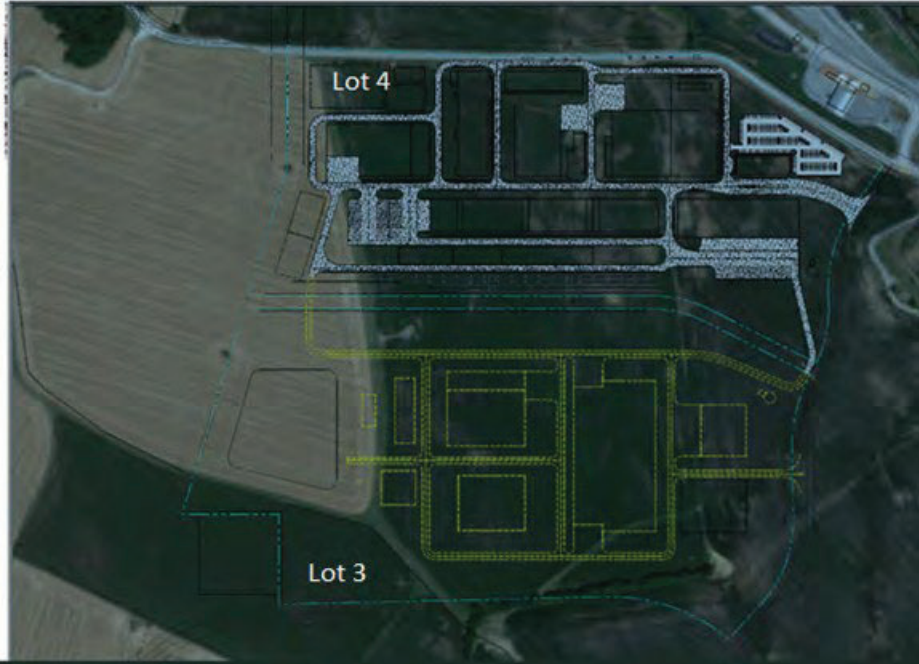


Exhibit 5: List of Threatened and Endangered Species



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Kentucky Ecological Services Field Office
J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670
Phone: (502) 695-0468 Fax: (502) 695-1024
Email Address: kentuckyes@fws.gov

In Reply Refer To:
Project Code: 2023-0049506

February 27, 2023

Project Name: APEX – INTEGRATED SUSTAINABLE BATTERY ACTIVE MATERIAL AND PRECURSOR PRODUCTION PLANT

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of

this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Kentucky Ecological Services Field Office

J C Watts Federal Building, Room 265

330 West Broadway

Frankfort, KY 40601-8670

(502) 695-0468

PROJECT SUMMARY

Project Code: 2023-0049506

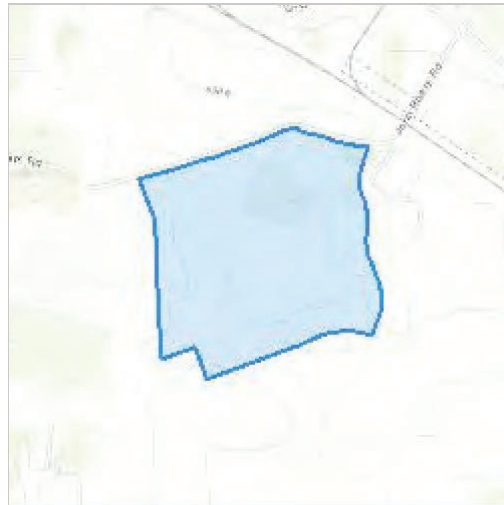
Project Name: APEX – INTEGRATED SUSTAINABLE BATTERY ACTIVE MATERIAL AND PRECURSOR PRODUCTION PLANT

Project Type: Commercial Development

Project Description: Ascend Elements proposes to construct an industrial scale facility (Project Apex) for the production of sustainable, low-cost precursor cathode materials by integrating the separation of critical cathode materials from spent LiBs with the production of both precursor cathode active materials (pCAM) and metal salts, to support domestic production of cathode active material (CAM). The proposed Project will entail development of 75% of the project area, including numerous buildings, buried and above ground infrastructure, and paved parking and access areas. Construction would occur over the course of 36 months.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@36.7842456,-87.38572852586151,14z>



Counties: Christian County, Kentucky

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
<p>Gray Bat <i>Myotis grisescens</i></p> <p>No critical habitat has been designated for this species.</p> <p>This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ The project area includes potential gray bat habitat. <p>Species profile: https://ecos.fws.gov/ecp/species/6329</p> <p>General project design guidelines: https://ipac.ecosphere.fws.gov/project/6UJCMYK37ZATFO3TXGWEDCN3WE/documents/generated/6422.pdf</p>	Endangered
<p>Indiana Bat <i>Myotis sodalis</i></p> <p>There is final critical habitat for this species. Your location does not overlap the critical habitat.</p> <p>This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ The project area includes 'potential' habitat. All activities in this location should consider possible effects to this species. <p>Species profile: https://ecos.fws.gov/ecp/species/5949</p> <p>General project design guidelines: https://ipac.ecosphere.fws.gov/project/6UJCMYK37ZATFO3TXGWEDCN3WE/documents/generated/6422.pdf</p>	Endangered
<p>Northern Long-eared Bat <i>Myotis septentrionalis</i></p> <p>No critical habitat has been designated for this species.</p> <p>Species profile: https://ecos.fws.gov/ecp/species/9045</p> <p>General project design guidelines: https://ipac.ecosphere.fws.gov/project/6UJCMYK37ZATFO3TXGWEDCN3WE/documents/generated/6422.pdf</p>	Threatened

INSECTS

NAME	STATUS
------	--------

Monarch Butterfly *Danaus plexippus*

Candidate

No critical habitat has been designated for this species.

Species profile: <https://ecos.fws.gov/ecp/species/9743>

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPAC USER CONTACT INFORMATION

Agency: Department of Energy
Name: Galen Peracca Heavrin
Address: 217 Commercial Street, Suite 500
City: Portland
State: ME
Zip: 04101
Email: gperacca@gmail.com
Phone: 2175178223

Endangered Species Act Compliance for Project Apex - Integrated Sustainable Battery Active Material and Precursor Production Plant		
EXHIBIT LIST		
Exhibit #	Document	Page #
Exhibit 1:	Facility Site Plan	001
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Exhibit 9:	Known Indiana Bat Habitat in Kentucky	041
Exhibit 10:	Known Northern Long-eared Bat Habitat in Kentucky	043

Exhibit 6: Threatened/Endangered Species Report (2017 Report)



1139 South Fourth Street • Louisville, KY 40203 • Phone 502.625.3009 • Fax 502.625.3077

August 18, 2017

Ms. Sharon S. Butts
Associate Director
South Western Kentucky Economic Development Council
2800 Fort Campbell Boulevard
Hopkinsville, Kentucky 42240

**Subject: Threatened/Endangered Species Report
 Commerce Park II
 Christian County, Kentucky
 USFWS Consultation Code: 04EK1000-2017-SLI-0517
 Redwing Project No.: 17-083**

Dear Ms. Butts:

Redwing Ecological Services, Inc. (Redwing) is pleased to submit this report to the South Western Kentucky Economic Development Council (SWK-EDC) regarding the potential presence of threatened/endangered species on the proposed Commerce Park II development site in Christian County, Kentucky. The purpose of this report is to address potential impacts to species listed by the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act that could result from the development of the project site.

The wooded areas of the site represent potential summer roosting habitat for the federally-endangered Indiana bat (*Myotis sodalis*) and the federally-threatened northern long-eared bat (*Myotis septentrionalis*). Suitable habitat for other federally-listed threatened/endangered species is not present based on:

- The absence of caves, abandoned mines, sinkholes, and other cave-like features that represent suitable winter hibernacula for the Indiana bat and the northern long-eared bat, as well as suitable winter or summer roosting habitat for the gray bat (*Myotis grisescens*).
- The isolated and low quality nature of marginal foraging habitat for the gray bat.
- The absence of rivers or large streams with substrate suitable for mussel species.

PROJECT BACKGROUND

The SWK-EDC is proposing the industrial development of the Commerce Park II project on an approximately 704-acre site located approximately 6.5 miles southeast of Hopkinsville in Christian County, Kentucky. The site is located southwest of Highway 41 (Pembroke Road), directly south of existing rail lines and Johns Rivers Road (Figures 1, 2 and 3).

STUDY METHODOLOGY

Redwing assessed the site for the presence of suitable habitat for federally-listed threatened/endangered species through a combination of in-house research and a field survey. In-house research involved review of available mapping, aerial photographs, and a data report from the USFWS Information for Planning Consortium (IPaC). Redwing biologists conducted a field assessment of the Commerce Park II development site on June 21, 2017, to characterize the on-site natural areas and to document the presence/absence of suitable habitat for the Indiana bat, northern long-eared bat, gray bat, and mussel species. Areas of suitable habitat were marked on site maps and documented with notes and photographs.

RESULTS

The results of the ecological assessment are presented below in terms of existing natural habitats and federally-listed species.

EXISTING HABITATS

The majority of the Commerce Park II site consists of active agricultural land currently cropped with a combination of corn (*Zea mays*), wheat (*Triticum* sp.), and soybeans (*Glycine max*). The corn fields are located in the western and eastern portion of the site, while the soybean and wheat fields are located in the central portion of the site.

Small areas of forest habitat occupy scattered woodlots, stream corridors and fence lines primarily along the perimeter of the site, as well as in the south-central and eastern portion of the site. Common species within the mixed-aged woods include black walnut (*Juglans nigra*), silver maple (*Acer saccharinum*), box elder (*Acer negundo*), sugar berry (*Celtis laevigata*), shagbark hickory (*Carya ovata*), northern red oak (*Quercus rubra*), American sycamore (*Platanus occidentalis*), pecan (*Carya illinoensis*), persimmon (*Diospyros virginiana*), and black gum (*Nyssa sylvatica*).

THREATENED/ENDANGERED SPECIES

The attached USFWS IPaC data report (Consultation Code 04EK1000-2017-SLI-0517) identifies three mammal and three mussel species potentially occurring on, or in the vicinity of, the project site. Species listed on the report, the presence/absence of suitable habitat for these species on the site, and potential effects on each species are summarized in the following table and discussed below.

Scientific Name	Common Name	Federal Status	Habitat Present	Species Impacted
Mammals				
<i>Myotis grisescens</i>	gray bat	E	No	No
<i>Myotis septentrionalis</i>	northern long-eared bat	T	Summer	Indirect
<i>Myotis sodalis</i>	Indiana bat	E	Summer	Indirect
Mussels				
<i>Obovaria retusa</i>	ring pink	E	No	No
<i>Pleurotaia dolabellodes</i>	slabside pearly mussel	E	No	No
<i>Ptychobranchus subtentum</i>	fluted kidneyshell	E	No	No

E = Federally Endangered; T = Federally Threatened

Indiana Bat: The federally-endangered Indiana bat requires distinct habitat types during the winter and summer months. Winter habitat is restricted to suitable underground hibernacula typically consisting of caves located in karst areas; however, these species also hibernate in cave-like locations, including abandoned mines. During the habitat assessment, a pedestrian survey of the project site was performed to identify caves, abandoned mines, sinkholes, and other underground features that could be considered suitable winter habitat.

Summer habitat for the Indiana bat consists of a variety of forested areas utilized for roosting, foraging, and commuting. These habitats include forested blocks and linear features that consist of dense or loose aggregates of trees with variable amounts of canopy closure. Suitable summer roosting habitat is defined as trees (live or dead) with a diameter at breast height (dbh) of five inches or greater that exhibit exfoliating bark, crevices, or cracks. Typical foraging habitat includes closed to semi-open forest, where bats forage along forest edges and the tree canopy. Commuting habitat is used to travel between roosting and foraging areas, and typically includes forest edges and linear features, including riparian corridors and wooded fencerows.

No caves, rock shelters, or mine portals are present; however, there were small depressions on the site that were notated as sink holes on the University of Kentucky, Kentucky Geological Map Information Services website. Based on the site visit, the small depressions in the wheat field have been filled with rip rap and marked with a pipe, and the depressions in the western portion of the site are ponds. Therefore, no winter habitat for the Indiana bat is present on the site. The mixed-aged forest on site represents suitable summer roosting habitat for the Indiana bat. The identified summer roosting habitat was marked on aerial photographs, and the location and extent of this habitat was transferred into ArcGIS to calculate habitat acreages. The project area is located within an area designated by the USFWS as Potential summer roosting/maternity habitat (Figure 3). It is located over 11 miles from the nearest designated Known swarming habitat zone. The proposed project site contains 16.77 acres of suitable Indiana bat summer roosting habitat including 15.69 acres of forested blocks and 1.08 acre of 12 individual trees (Figure 2).

Clearing of roosting habitat during the occupied period (April 1 through October 15) may be considered a potential direct impact, while clearing during the unoccupied timeframe (October 15 to March 31) would be considered an indirect impact. Potential impacts to Indiana bats from clearing of summer habitat (wooded areas) can generally be managed through the *Revised Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky* (effective June 2016) developed by the USFWS Kentucky Field Office. Under this Conservation Strategy possible direct or indirect impacts to the bat can be mitigated through payment to the Imperiled Bat Conservation Fund (IBCF).

Northern Long-Eared Bat: The federally-threatened northern long-eared bat requires distinct habitat types during the winter and summer months. Winter habitat is restricted to suitable underground hibernacula typically consisting of caves located in karst areas; however, these species also hibernate in cave-like locations, including abandoned mines. During the habitat assessment, a pedestrian survey of the project site was performed to identify caves, abandoned mines, sinkholes, and other underground features that could be considered suitable winter habitat.

Summer habitat for the northern long-eared bat consists of a variety of forests utilized for roosting, foraging, and commuting. These habitats include forested blocks and linear features that consist of dense or loose aggregates of trees with variable amounts of canopy closure. Suitable summer roosting habitat is defined as trees (live or dead) with a diameter at breast height (dbh) of three inches or greater that exhibit exfoliating bark, crevices, or cracks. Northern long-eared bats have also been found roosting in man-made structures, including barns, sheds, and houses. Typical foraging habitat includes closed to semi-open

forests, where bats forage along forest edges and the tree canopy. Commuting habitat is used to travel between roosting and foraging areas, and typically includes forest edges and linear features, including riparian corridors and wooded fencerows.

No caves, rock shelters, or mine portals are present; however, there were small depressions on the site that were notated as sink holes on the University of Kentucky, Kentucky Geological Map Information Services website. Based on the site visit, the small depressions in the wheat field have been filled with rip rap and marked with a pipe, and the depressions in the western portion of the site are ponds. Therefore, no winter habitat for the or northern long-eared bat is present on the site. The mixed-aged forest on site represents suitable summer roosting habitat for the northern long-eared bat. The identified summer roosting habitat was marked on aerial photographs, and the location and extent of this habitat was transferred into ArcGIS to calculate habitat acreages. The project area is located within an area designated by the USFWS as Potential summer roosting/maternity habitat for the species (Figure 3). It is located over 11 miles from the nearest designated Known swarming habitat zone. The proposed project site contains 16.77 acres of Potential northern long-eared bat summer roosting habitat including 15.69 acres of forested blocks and 1.08 acres of 12 individual trees (Figure 2).

Under the current USFWS 4(d) Rule, incidental take of the northern long bat is not prohibited since the project is not located within 0.25 mile of a known hibernacula or 150 feet of a known maternity roost tree (Figure 4).

Gray Bat: This federally-endangered species roosts in caves year-round, but utilizes different caves during the winter and summer. Gray bats have also been known to roost in abandoned mines and other cave-like structures, under bridges, and in culverts. No caves, abandoned mines or rock shelters, were identified at the property during the assessment. The sinkholes present within the site have been filled or are ponds surrounded by corn fields, and are therefore, not habitat for the gray bat.

Typical foraging habitat for the gray bat includes riparian areas and open water bodies, such as rivers, streams, lakes, and reservoirs. Commuting habitat for this species primarily consists of wooded corridors used to travel between roosting and foraging habitat.

Based on the lack of caves, abandoned mines, and suitable sinkholes identified on the project site, no impacts to gray bat summer or winter roosting habitat are anticipated from the project. Additionally, Best Management Practices (BMPs) will be implemented to limit impacts from sedimentation and other contaminants into downstream waters. Although the wooded portions of the site containing streams and the four ponds represent marginal gray bat foraging habitat, the lack of adjacent forested areas, isolation of on-site forested areas, and the current land use (active corn fields) make it poor quality foraging habitat that is likely not utilized by the species. Thus, the proposed project is unlikely to adversely affect this species.

Mussels: The three federally threatened/endangered mussel species potentially occurring in Christian County in the vicinity of the project are found in small to large rivers in shallow or deep water. Coarse sediments, such as sand and gravel, are preferred habitat, though some of the species tolerate muddy sediments. The on-site streams do not provide suitable habitat for these species due to their limited flow regime, degraded riffle/run habitat, and unsuitable substrate (muddy and silty bottoms). In addition, no shells were observed within the streams during the site visit.

The project is not likely to adversely affect these species based on the lack of suitable habitat for the mussel species and the utilization of an Erosion Prevention and Sediment Control plan to ensure sediment is not transferred off site.

DISCUSSION

Under Section 7 of the Endangered Species Act, projects that have federal nexus (utilize federal funds or require federal permits) are required to complete consultation with the USFWS. Thus, any future phases of development on the Commerce Park II site that require Section 404 permits from the U.S. Army Corps of Engineers for impacts to jurisdictional waters/wetlands or that receive federal funding, will likely be required to consult with the USFWS. The USFWS typically resolves proposed clearing of Indiana bat summer habitat (forests or individual trees) through payments to the IBCF. At the current time, payment rates within Potential habitat area are \$3,420/acre for clearing in the occupied period between April 1 through October 15 (excluding June and July), \$1,710/acre for clearing in the unoccupied period between October 15 and March 31, and \$6,840/acre for clearing in June and July.


CONCLUSION

Suitable habitat for federally-listed species on the project site is limited to summer roosting habitat for the Indiana and northern long-eared bats, which includes the small scattered woodlots, fencerows and riparian zones. No suitable habitat for mussel species, summer/winter roosting habitat for the gray bat, winter hibernacula habitat for the Indiana and northern long-eared bat is present on the site. Under the current USFWS 4(d) Rule, incidental take of the northern long-eared bat at this site is not prohibited. If tree clearing is proposed for specific phases of future development that also involve federal permitting or funding, consultation with the USFWS will likely be required and result in a per-acre payment to the ICBF for any clearing of suitable bat habitat.

We appreciate the opportunity to work with you on this project. If you have any questions regarding this report or the overall project, please feel free to contact Kaitlin McCulloch or Ron Thomas at (502) 625-3009.

Sincerely,


Kaitlin J. McCulloch
Staff Ecologist

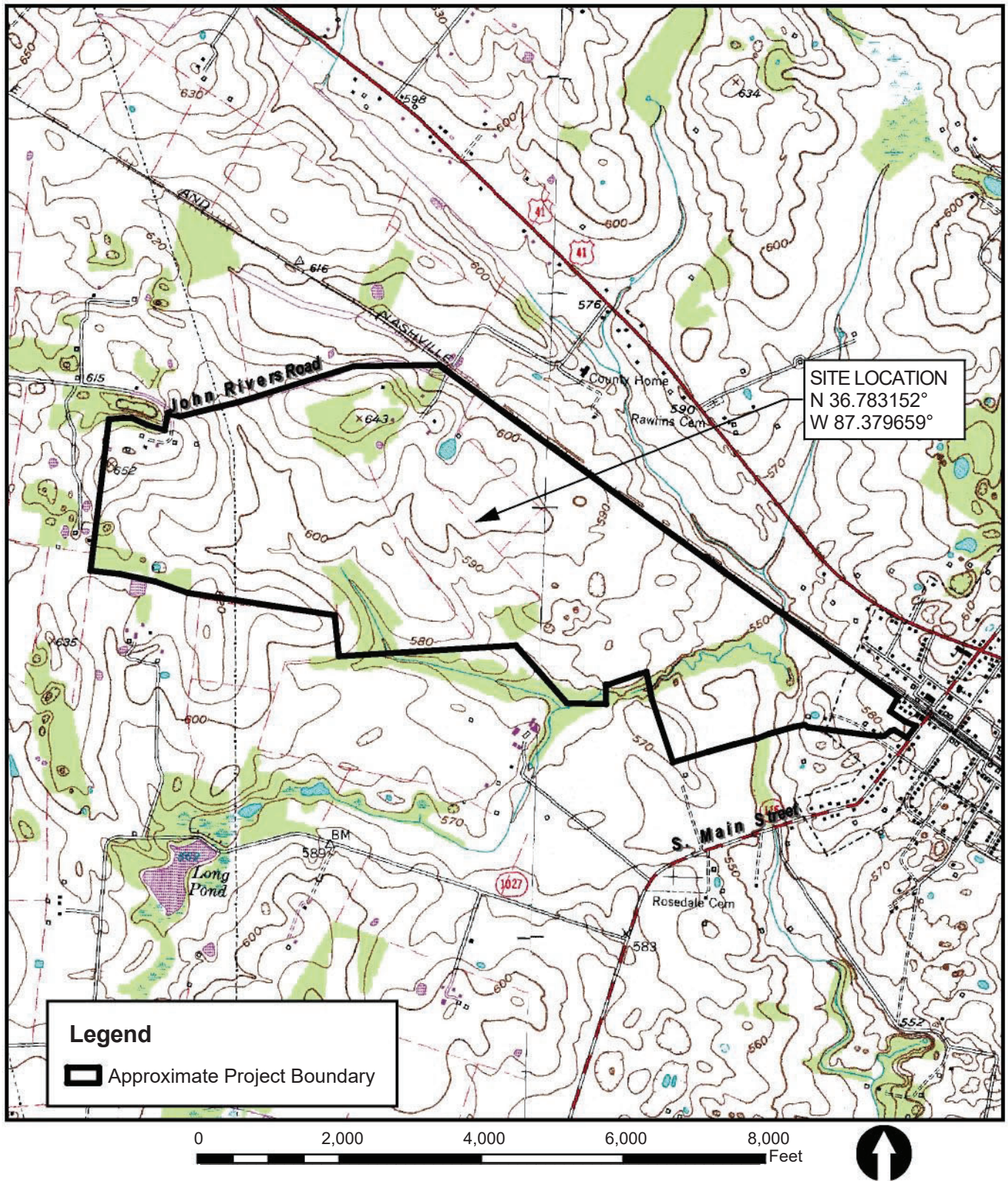

Ronald L. Thomas
Principal
Senior Ecologist

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Attachments: Figures
Photographs
USFWS IPaC Data Search Results

FIGURES

Source: USGS 7.5-minute Topographic Map - Hopkinsville and Pembroke, Kentucky Quadrangles.



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COMMERCE PARK II
CHRISTIAN COUNTY, KENTUCKY



SITE LOCATION MAP

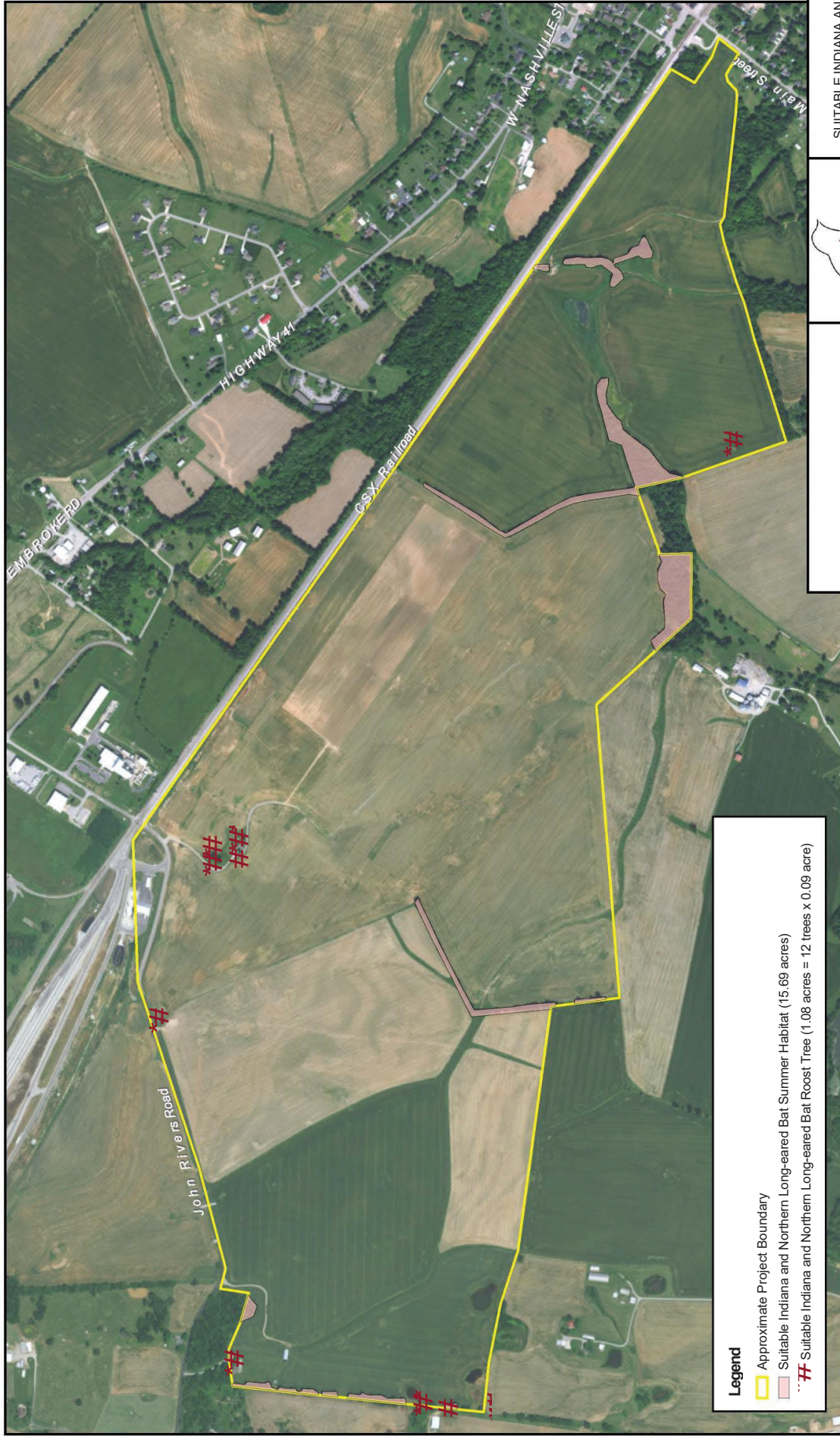
REVISED DATE: 06-23-17

DRAWN BY: KJM

FIGURE 1

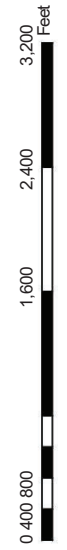
021

Source: World Imagery - Esri and the GIS User Community (2016).



Legend

- Approximate Project Boundary
- Suitable Indiana and Northern Long-eared Bat Summer Habitat (15.69 acres)
- # Suitable Indiana and Northern Long-eared Bat Roost Tree (1.08 acres = 12 trees x 0.09 acre)

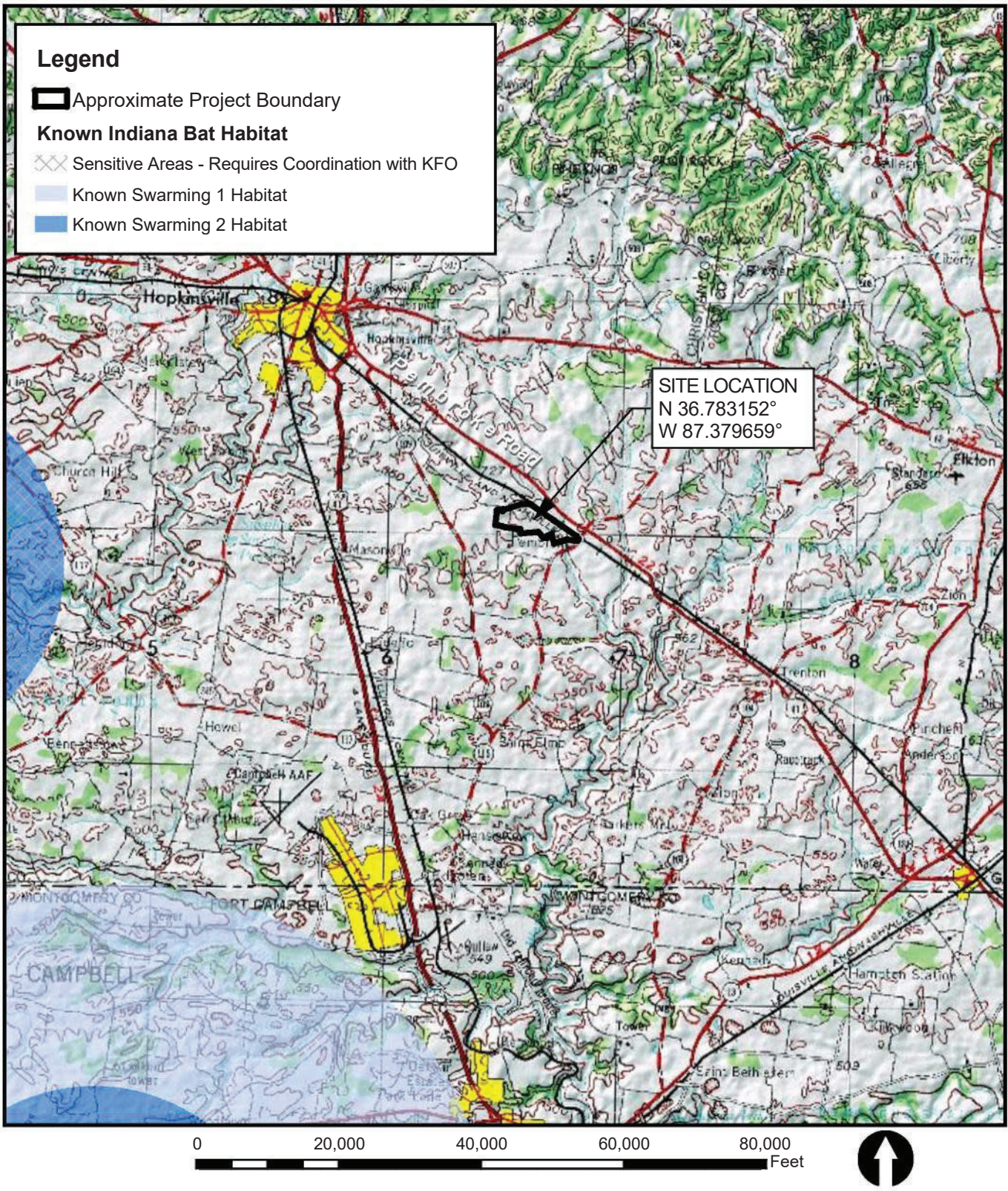


COMMERCE PARK II
CHRISTIAN COUNTY, KENTUCKY

REVISED DATE: 07-17-17 | DRAWN BY: KIMEDB

SUITABLE INDIANA AND NORTHERN LONG-EARED BAT HABITAT MAP

FIGURE 2

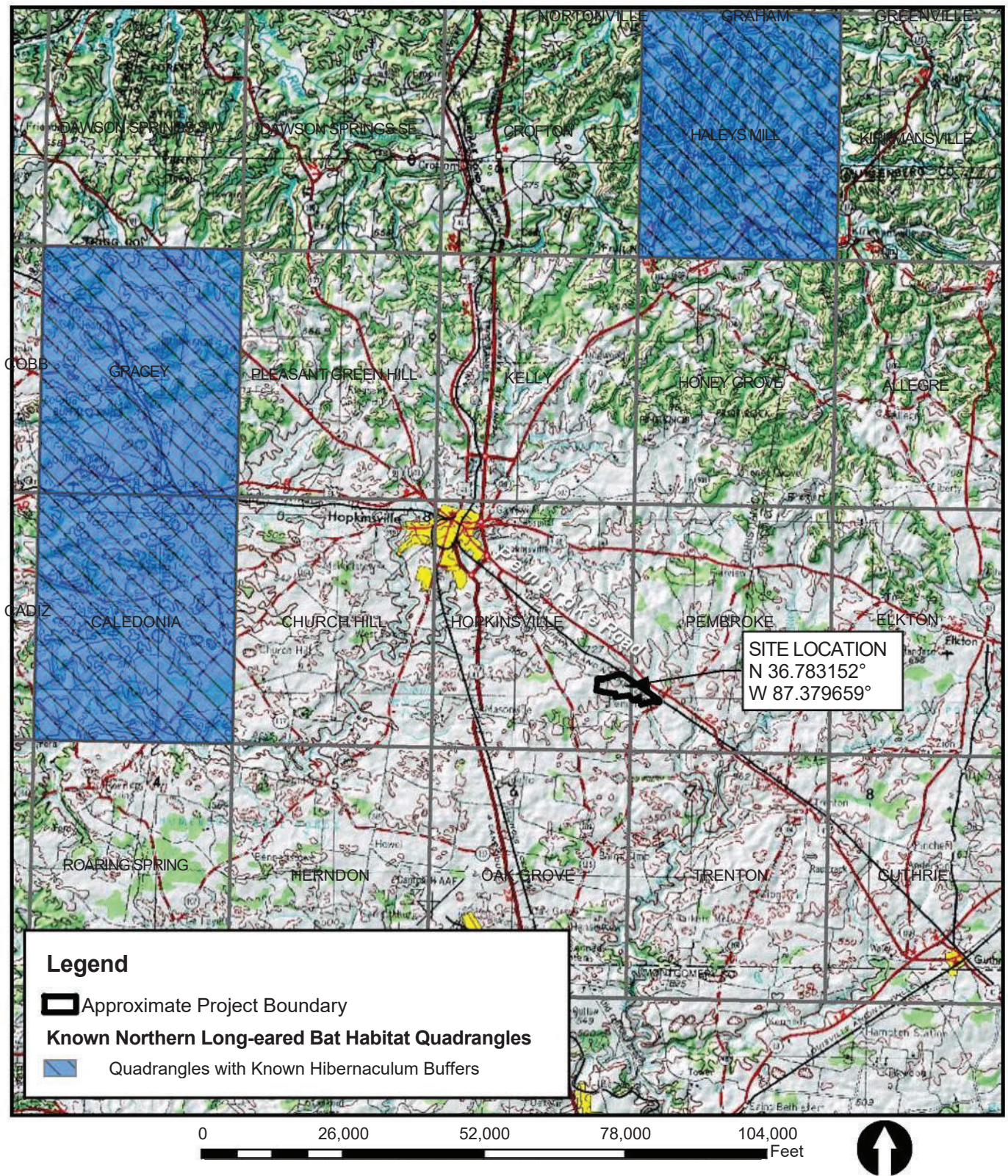


COMMERCE PARK II
CHRISTIAN COUNTY, KENTUCKY



KNOWN INDIANA AND NORTHERN
LONG-EARED BAT HABITAT

Source: USA Topo Maps, (2013) National Geographic Society, USGS 7.5-minute Topographic Map - Kentucky and Tennessee Quadrangles.



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COMMERCE PARK II
CHRISTIAN COUNTY, KENTUCKY



KNOWN NORTHERN
LONG-EARED BAT HABITAT
QUADRANGLE MAP

REVISED DATE: 06-23-17

DRAWN BY: KJM

FIGURE 4
024

PHOTOGRAPHS



Photograph 1: Mixed-aged woods in the southeastern portion of the site within the stream riparian corridor. The mixed-aged woods contain trees that provide suitable summer habitat for Indiana and northern long-eared bats (*Myotis sodalis* and *Myotis septentrionalis*). June 21, 2017.



Photograph 2: Forested corridor along an on-site perennial stream in the eastern portion of the site represents suitable Indiana and northern long-eared bat summer habitat. June 21, 2017.



Photograph 3: The on-site perennial stream, facing downstream, exhibits a silty substrate that does not represent suitable habitat for the federally-listed mussels in Christian County, Kentucky. June 21, 2017.



Photograph 4: View of one of the four ponds located on the site within active crop fields in the southwestern portion of the site. June 21, 2017.



Photograph 5: View of the harvested wheat field, with sprouting soybeans, and the forested tree line that provides suitable habitat for the Indiana and northern long-eared bat. June 21, 2017.



Photograph 6: View of the corn fields located in the eastern portion of the site. June 21, 2017.



Photograph 7: Overview of the site showing corn fields and harvested wheat fields. June 21, 2017.



Photograph 8: View of a sinkhole within the wheat/soybean field that has been filled with rip rap and marked with a white pipe. June 21, 2017.

**USFWS IPaC DATA SEARCH RESULTS
CONSULTATION CODE:
04EK1000-2017-SLI-0517**



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Kentucky Ecological Services Field Office
J C Watts Federal Building, Room 265
330 West Broadway
Frankfort, KY 40601-8670
Phone: (502) 695-0468 Fax: (502) 695-1024
<http://www.fws.gov/frankfort/>

In Reply Refer To:

June 14, 2017

Consultation Code: 04EK1000-2017-SLI-0517

Event Code: 04EK1000-2017-E-01858

Project Name: Commerce Park II - Rail Served Site

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

Your concern for the protection of endangered and threatened species is greatly appreciated. The purpose of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA) is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. The species list attached to this letter fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the ESA to provide information as to whether any proposed or listed species may be present in the area of a proposed action. This is not a concurrence letter; additional consultation with the Service may be required.

The Information in Your Species List:

The enclosed species list identifies federal trust species that may occur within the boundary that you entered into IPaC. For this list to most accurately represent the species that may potentially be affected by the proposed project, the boundary that you input into IPaC should represent the entire "action area" of the proposed project by considering all the potential "effects of the action," including potential direct, indirect, and cumulative effects, to federally-listed species or their critical habitat as defined in 50 CFR 402.02. This includes effects of any "interrelated actions" that are part of a larger action and depend on the larger action for their justification and "interdependent actions" that have no independent utility apart from the action under consideration (e.g.; utilities, access roads, etc.) and future actions that are reasonably certain to occur as a result of the proposed project (e.g.; development in response to a new road). If your project is likely to have indirect effects that extend well beyond the project footprint (e.g.;

substantial impacts to water quality), we highly recommend that you coordinate with the Service early to appropriately define your action area and ensure that you are evaluating all the species that could potentially be affected.

We must advise you that our database is a compilation of collection records made available by various individuals and resource agencies available to the Service and may not be all-inclusive. This information is seldom based on comprehensive surveys of all potential habitats and, thus, does not necessarily provide conclusive evidence that species are present or absent at a specific locality. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and associated information. To re-access your project in IPaC, go to the IPaC web site (<https://ecos.fws.gov/ipac/>), select "Need an updated species list?", and enter the consultation code on this letter.

ESA Obligations for Federal Projects:

Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

If a Federal project (a project authorized, funded, or carried out by a federal agency) may affect federally-listed species or critical habitat, the Federal agency is required to consult with the Service under section 7 of the ESA, pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). Recommended contents of a Biological Assessment are described at 50 CFR 402.12. For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat.

ESA Obligations for Non-federal Projects:

Proposed projects that do not have a federal nexus (non-federal projects) are not subject to the

obligation to consult under section 7 of the ESA. However, section 9 of the ESA prohibits certain activities that directly or indirectly affect federally-listed species. These prohibitions apply to all individuals subject to the jurisdiction of the United States. Non-federal project proponents can request technical assistance from the Service regarding recommendations on how to avoid and/or minimize impacts to listed species. The project proponent can choose to implement avoidance, minimization, and mitigation measures in a proposed project design to avoid ESA violations.

Additional Species-specific Information:

In addition to the species list, IPaC also provides general species-specific technical assistance that may be helpful when designing a project and evaluating potential impacts to species. To access this information from the IPaC site (<https://ecos.fws.gov/ipac/>), click on the text “My Projects” on the left of the black bar at the top of the screen (you will need to be logged into your account to do this). Click on the project name in the list of projects; then, click on the “Project Home” button that appears. Next, click on the “See Resources” button under the “Resources” heading. A list of species will appear on the screen. Directly above this list, on the right side, is a link that will take you to pdfs of the “Species Guidelines” available for species in your list. Alternatively, these documents and a link to the “ECOS species profile” can be accessed by clicking on an individual species in the online resource list.

Next Steps:

Requests for additional technical assistance or consultation from the Kentucky Field Office should be submitted following guidance on the following page <http://www.fws.gov/frankfort/PreDevelopment.html> and the document retrieved by clicking the “outline” link at that page. When submitting correspondence about your project to our office, please include the Consultation Tracking Number in the header of this letter. (There is no need to provide us with a copy of the IPaC-generated letter and species list.)

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Kentucky Ecological Services Field Office

J C Watts Federal Building, Room 265

330 West Broadway

Frankfort, KY 40601-8670

(502) 695-0468

Project Summary

Consultation Code: 04EK1000-2017-SLI-0517

Event Code: 04EK1000-2017-E-01858

Project Name: Commerce Park II - Rail Served Site

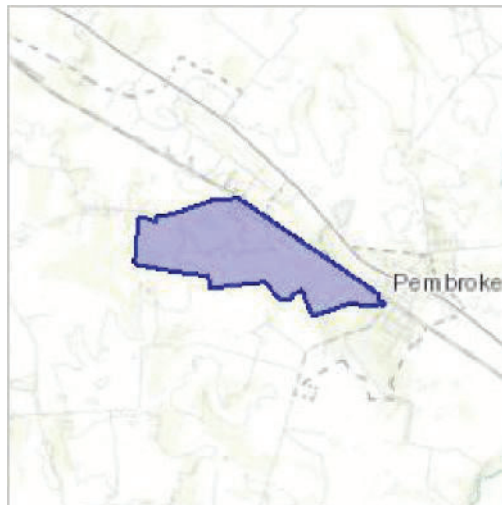
Project Type: DEVELOPMENT

Project Description: The approximately 704-acre site is located southwest of Highway 41 (Pembroke Road), directly south of existing rail lines and John Rives Road.

Project Location:

Approximate location of the project can be viewed in Google Maps:

<https://www.google.com/maps/place/36.78121780120328N87.38153618236413W>



Counties: Christian, KY

Endangered Species Act Species

There is a total of 6 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
<p>Gray Bat (<i>Myotis grisescens</i>)</p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329</p>	Endanger
<p>Indiana Bat (<i>Myotis sodalis</i>)</p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5949</p>	Endanger
<p>Northern Long-eared Bat (<i>Myotis septentrionalis</i>)</p> <p>No critical habitat has been designated for this species. This species only needs to be considered under the following conditions:</p> <ul style="list-style-type: none"> ▪ Incidental take of the northern long-eared bat at this location is excepted by the 4(d) rule and <p>Species profile: https://ecos.fws.gov/ecp/species/9045</p>	Threaten

Clams

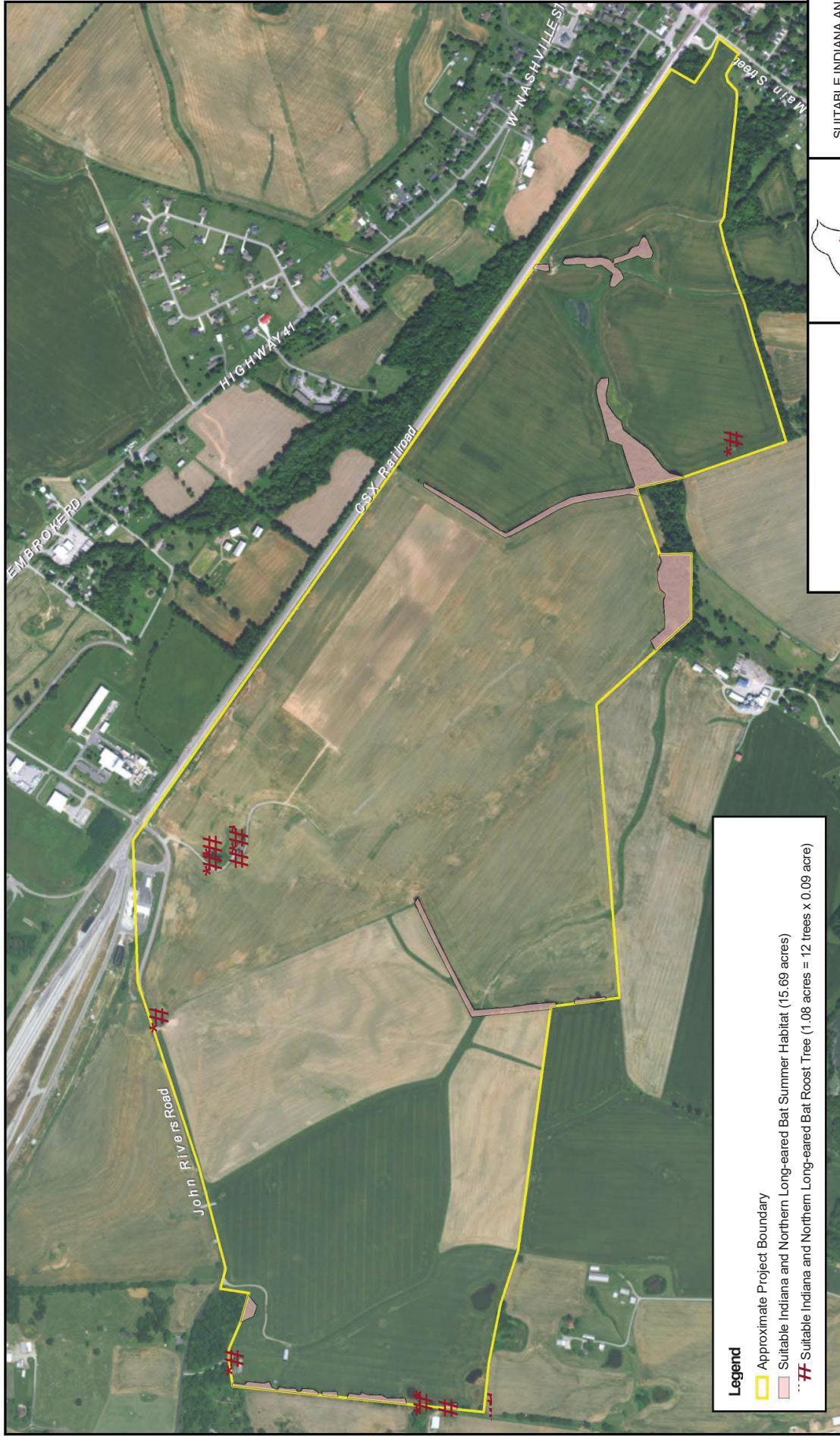
NAME	STATUS
<p>Fluted Kidneyshell (<i>Ptychobranthus subtentum</i>)</p> <p>There is a final critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1397</p>	Endanger
<p>Ring Pink (mussel) (<i>Obovaria retusa</i>)</p> <p>No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4128</p>	Endanger
<p>Slabside Pearlymussel (<i>Pleuonaia dolabelloides</i>)</p> <p>There is a final critical habitat designated for this species. Your location is outside the designated critical habitat.</p>	Endanger

Critical habitats

There are no critical habitats within your project area.

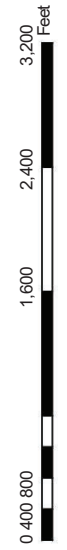
**Exhibit 7: Areas Potentially Suitable for Summer Roosting Habitat from 2017
Report**

Source: World Imagery - Esri and the GIS User Community (2016).



Legend

- Approximate Project Boundary
- Suitable Indiana and Northern Long-eared Bat Summer Habitat (15.69 acres)
- Suitable Indiana and Northern Long-eared Bat Roost Tree (1.08 acres = 12 trees x 0.09 acre)



COMMERCE PARK II
CHRISTIAN COUNTY, KENTUCKY

REVISED DATE: 07-17-17 | DRAWN BY: KIMEDB

SUITABLE INDIANA AND
NORTHERN LONG-EARED
BAT HABITAT MAP

FIGURE 2

Exhibit 8: Areas Potentially Suitable for Summer Roosting Habitat from 2017 Report with Facility Site Plan Overlay

© 2014 Aerial Imagery / Esri and the GIS User Community (2014)



- Legend**
- Approximate Project Boundary
 - Suitable Indiana and Northern Long-eared Bat Summer Hobbs (15.69 acres)
 - ▲ Suitable Indiana and Northern Long-eared Bat Roost Trees (1.08 acres + 12 trees + 0.09 acres)



COMMERCE PARK
CHRISTIAN COUNTY, KENTUCKY



SUITABLE INDIANA AND
NORTHERN LONG-EARED
BAT HABITAT MAP

FIGURE 2

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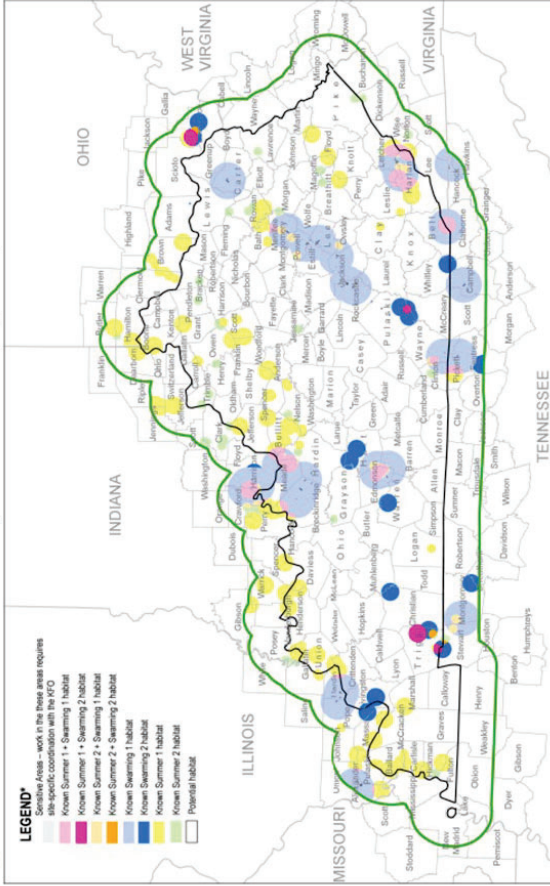
Exhibit 9: Known Indiana Bat Habitat in Kentucky

02/27/2023



U.S. Fish & Wildlife Service

Known Indiana bat habitat in Kentucky and within 20 miles (August 2019)

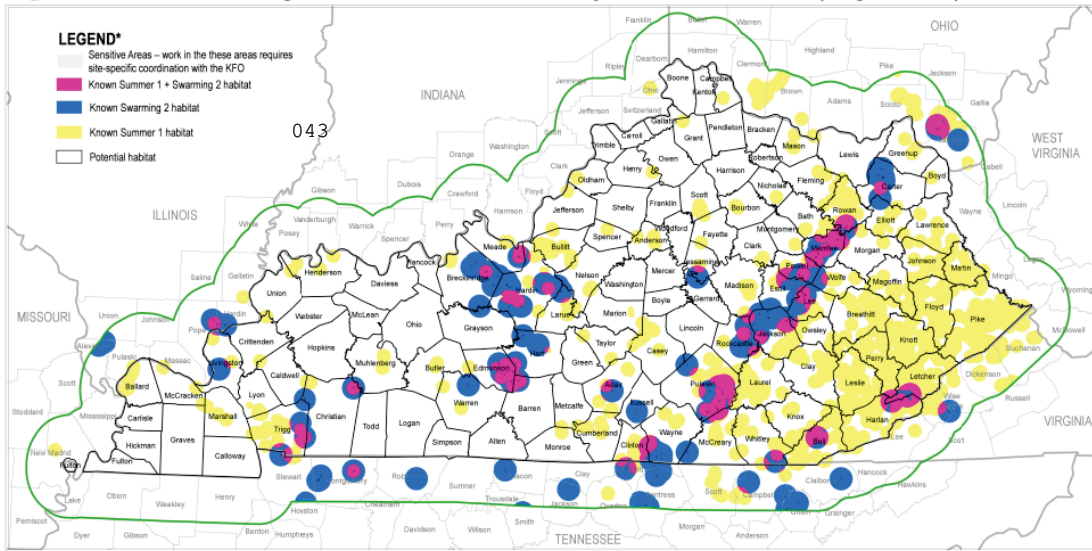


The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content. This map was produced as an appendix to the Conservation Strategy for

**Exhibit 10: Known Northern Long-eared Bat Habitat in
Kentucky**



Known northern long-eared bat habitat in Kentucky and within 20 miles (August 2019)



NOTE: This map is based on species occurrence information and is subject to change as new data become available. Please contact our office at 502/895-0468 to ensure you are working with the most current version.
 *For an explanation of terms, please see the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky.

The USFWS makes no warranty for use of this map and cannot be held liable for actions or decisions based on map content. This map was produced as an appendix to the Conservation Strategy for Forest-Dwelling Bats in the Commonwealth of Kentucky and should only be used in the context of this Strategy.



February 13, 2023

Hon. Craig Potts
Director and State Historic Preservation Officer
Kentucky Heritage Council
The Barstow House
410 High Street
Frankfort, KY 40601
craig.potts@ky.gov

SUBJECT: Consultation and Section 106 Compliance for Project Apex - Integrated Sustainable Battery Active Material and Precursor Production Plant.

Dear Mr. Potts:

I write regarding a project that the U.S. Department of Energy, National Energy Technology Laboratory (NETL) proposes to fund within the Commonwealth of Kentucky. I called your office last week and left my contact information. I have initiated Tribal Consultation with the Cherokee Nation of Oklahoma and the Eastern Band of Cherokee Indians in North Carolina. At your earliest convenience, I would like to introduce myself and discuss this project with you.

NETL proposes to provide federal funding to Ascend Elements Inc. (Ascend) for the following Project: Apex – Integrated Sustainable Battery Active Material and Precursor Production Plant. The project would involve the construction of a manufacturing facility producing lithium-ion battery materials in Hopkinsville, KY that is capable of establishing industrial scale U.S. production capacity of sustainable, low-cost precursor cathode materials by integrating the separation of critical cathode materials from spent lithium-ion batteries with the production of both precursor cathode materials and metal salts to support domestic production of cathode active materials. To achieve its purpose, the facility will consist of manufacturing buildings, office space and a warehouse, as well as support infrastructure, including a rail spur, unloading/loading stations, and holding tanks. See, Exhibit 1 (Facility Site Plan).

The proposed site for the project is located within the Hopkinsville Commerce Industrial Park II, in Hopkinsville, Kentucky. See, Exhibit 2 (Christian County, Kentucky & Hopkinsville, Kentucky) and Exhibit 3 (Proposed Project Location). Commerce Industrial Park II is located in Christian County, Kentucky, along US Route 41. The location is 10 miles from both Interstate 24 and Interstate 169 and one hour from Nashville International Airport, and is serviced by a CSX rail line. Commerce Industrial Park II is adjacent to Hopkinsville Commerce Industrial Park I. The land that comprises the industrial park is currently zoned as heavy industrial, with a TVA (Tennessee Valley Authority) 161 kV transmission line running through the western side of the Industrial Park.

The proposed project site encompasses two adjacent lots in the northwestern corner of Commerce Industrial Park II, Lot 3 and Lot 4. Lot 3 is approximately 80 acres (southern lot shown in yellow) and Lot 4 is approximately 64 acres (northern lot shown in blue/white) as presented in Exhibit 4 (Proposed Project Site), attached. Prior to being converted to an industrial park, the proposed project site was used for many years for commercial agricultural crop production. As such, the land was regularly plowed, planted, and harvested using industrial mechanized farming equipment. The project proponent has undertaken certain self-funded site preparation activities, including land grading and levelling across the two lots.

In 1979, the Kentucky Heritage Commission conducted a Commonwealth-wide Survey of Historic Sites in Kentucky. See, Exhibit 5 (Survey of Historic Sites in Kentucky). Christian County was included as part of the Pennyriple Area Development District, and 13 historic sites were identified within the County. None of the sites are within or adjacent to the proposed project site. Furthermore, the nearest site listed on the National Register of Historic Places (NRHP) is approximately 14 miles from the project site.

The Trail of Tears National Historic Trail crosses through the town of Hopkinsville, running along U.S. Route 41, which is a four-lane divided highway at the point it is closest (approximately 2/3 mile) to the Project site. The site is separated from the National Historic Trail by a by a railyard and Commerce Industrial Park I. Additionally, the site is approximately seven miles from the Trail of Tears Commemorative Park.

In 2017, the Hopkinsville Industrial Foundation, Inc. commissioned Greenhouse Consultants Incorporated to complete a Cultural Resources Reconnaissance Survey for a 705-acre section of Commerce Industrial Park II, including Lots 3 & 4 (Survey). See, Exhibit 6 (Cultural Resources Reconnaissance Survey). In the course of completing the Survey, Greenhouse consulted Kentucky Archaeological Survey and Kentucky Heritage Council records and determined there were no resources within or immediately adjacent to the 705-acre area listed on the NRHP. Survey, at p. 32. A previous cultural resource reconnaissance survey completed on a small portion of the Industrial Park had identified two preliminary archeological sites, but the area included in that survey was well outside of Lots 3 & 4, and not implicated by the proposed project.

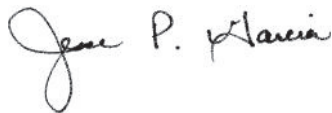
The Survey identified four areas containing historical resources that are within or partially within Lots 3 & 4. See, Exhibit 7 (Resources Identified During 2017 Field Work) and Exhibit 8 (Resources Identified During 2017 Field Work with Facility Site Plan Overlay). Two of the areas, P-1 and P-2, were characterized as prehistoric resources containing almost exclusively lithic debitage. P-1 is an 83.7 acre area, of which approximately 15 acres are within Lots 3 & 4. See, Exhibit 9 (Resource Area P-1). The Survey documented one side-notched projective point fragment from within area P-1, but did not specify where within the area the fragment was found. P-2 is a 12.8 acre area located within the footprint of the proposed project. The Survey documented less than 100 debitage and no features within area P-2. See, Exhibit 10 (Resource Area P-2). The third area, H-2, is approximately 0.1 acres in size and contained non-descript artifacts such as brick, concrete, and glass. See, Exhibit 11 (Resource Areas H-2 and H-3). Finally, the fourth area, H-3, is a 20.5 acre area, with less than 10 acres being within Lot

4. This area contains remains of a farmstead complex dating from the early 1900s. See, Exhibit 10. Due to a lack of integrity, the Survey concluded that areas H-2 and H-3 would not likely be eligible for listing on the NRHP. Survey, at 76.

Based on the scope of the proposed Ascend project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2205D) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, the Kentucky Heritage Council will be sent an electronic and hard copy where you may provide any further comments.

If you have any questions concerning the project, please contact me. I look forward to working with you.

Sincerely,



Jesse P. Garcia
NEPA Compliance/Tribal Liaison
U.S. Department of Energy
National Energy Technology Laboratory
1450 Queen Ave SW
Albany, Oregon 97321-2198
541-967-5912
Jesse.Garcia@netl.doe.gov

Attachments:

- Exhibit 1: Facility Site Plan
- Exhibit 2: Christian County, Kentucky & Hopkinsville, Kentucky
- Exhibit 3: Proposed Project Location
- Exhibit 4: Proposed Project Site
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- Exhibit 6: Cultural Resource Reconnaissance Survey, Commerce Park II, Hopkinsville, Christian County, Kentucky
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- Exhibit 9: Resource Area P-1
- Exhibit 10: Resource Area P-2
- Exhibit 11: Resource Areas H-2 and H-3

February 10, 2023

Elizabeth Toombs.
Tribal Historic Preservation Officer
Cherokee Nation
PO Box 948
Tahlequah, OK 74465

SUBJECT: Tribal Consultation and Section 106 Compliance for project Apex -
Integrated Sustainable Battery Active Material and Precursor Production
Plant.

Dear Elizabeth Toombs:

I previously spoke with you regarding a project that the U.S. Department of Energy,
National Energy Technology Laboratory (NETL) proposes to fund.

NETL proposes to provide federal funding to Ascend Elements Inc. (Ascend) for the
following Project: Apex – Integrated Sustainable Battery Active Material and Precursor
Production Plant. The project would involve the construction of a manufacturing facility
producing lithium-ion battery materials in Hopkinsville, KY that is capable of
establishing industrial scale U.S. production capacity of sustainable, low-cost precursor
cathode materials by integrating the separation of critical cathode materials from spent
lithium-ion batteries with the production of both precursor cathode materials and metal
salts to support domestic production of cathode active materials. To achieve its purpose,
the facility will consist of manufacturing buildings, office space and a warehouse, as well
as support infrastructure, including a rail spur, unloading/loading stations, and holding
tanks. See, Exhibit 1 (Facility Site Plan).

The proposed site for the project is located within the Hopkinsville Commerce
Industrial Park II, in Hopkinsville, Kentucky. See, Exhibit 2 (Christian County,
Kentucky & Hopkinsville, Kentucky) and Exhibit 3 (Proposed Project Location).
Commerce Industrial Park II is located in Christian County, Kentucky, along US Route
41. The location is 10 miles from both Interstate 24 and Interstate 169 and one hour
from Nashville International Airport, and is serviced by a CSX rail line. Commerce
Industrial Park II is adjacent to Hopkinsville Commerce Industrial Park I. The land that
comprises the industrial park is currently zoned as heavy industrial, with a TVA
(Tennessee Valley Authority) 161 kV transmission line running through the western
side of the Industrial Park.

The proposed project site encompasses two adjacent lots in the northwestern corner of
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lot shown in yellow) and Lot 4 is approximately 64 acres (northern lot shown in
blue/white) as presented in Exhibit 4 (Proposed Project Site), attached. Prior to being
converted to an industrial park, the proposed project site was used for many years for

commercial agricultural crop production. As such, the land was regularly plowed, planted, and harvested using industrial mechanized farming equipment. The project proponent has undertaken certain self-funded site preparation activities, including land grading and levelling within Lot 4.

In 1979, the Kentucky Heritage Commission conducted a Commonwealth-wide Survey of Historic Sites in Kentucky. See, Exhibit 5 (Survey of Historic Sites in Kentucky). Christian County was included as part of the Pennyryle Area Development District, and 13 historic sites were identified within the County. None of the sites are within or adjacent to the proposed project site. Furthermore, the nearest site listed on the National Register of Historic Places (NRHP) is approximately 14 miles from the project site.

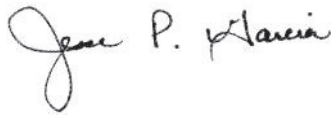
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The Survey identified four areas containing historical resources that are within or partially within Lots 3 & 4. See, Exhibit 7 (Resources Identified During 2017 Field Work) and Exhibit 8 (Resources Identified During 2017 Field Work with Facility Site Plan Overlay). Two of the areas, P-1 and P-2, were characterized as prehistoric resources containing almost exclusively lithic debitage. P-1 is an 83.7 acre area, of which approximately 15 acres are within Lots 3 & 4. See, Exhibit 9 (Resource Area P-1). The Survey documented one side-notched projective point fragment from within area P-1, but did not specify where within the area the fragment was found. P-2 is a 12.8 acre area located within the footprint of the proposed project. The Survey documented less than 100 debitage and no features within area P-2. See, Exhibit 10 (Resource Area P-2). The third area, H-2, is approximately 0.1 acres in size and contained non-descript artifacts such as brick, concrete, and glass. See, Exhibit 11 (Resource Areas H-2 and H-3). Finally, the fourth area, H-3, is a 20.5 acre area, with less than 10 acres being within Lot 4. This area contains remains of a farmstead complex dating from the early 1900s. See, Exhibit 10. Due to a lack of integrity, the Survey concluded that areas H-2 and H-3 would not likely be eligible for listing on the NRHP. Survey, at 76.

Based on the scope of the proposed Ascend project, DOE plans to prepare an Environmental Assessment (EA) (*DOE/EA-2205D*) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, the Cherokee Nation will be sent an electronic and hard copy where you may provide any further comments.

If you have any questions concerning the project, please contact me. I look forward to working with your Tribal Nation.

Sincerely,



Jesse P. Garcia
NEPA Compliance/Tribal Liaison
U.S. Department of Energy
National Energy Technology Laboratory
1450 Queen Ave SW
Albany, Oregon 97321-2198
541-967-5912
Jesse.Garcia@netl.doe.gov

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February 13, 2023

Beau Carroll
Tribal Historic Preservation Office
2877 Governors Island Road
Bryson City, NC 28713

SUBJECT: Tribal Consultation and Section 106 Compliance for project Apex -
Integrated Sustainable Battery Active Material and Precursor Production
Plant.

Dear Mr. Carroll:

I previously spoke with you regarding a project that the U.S. Department of Energy, National Energy Technology Laboratory (NETL) proposes to fund.

NETL proposes to provide federal funding to Ascend Elements Inc. (Ascend) for the following Project: Apex – Integrated Sustainable Battery Active Material and Precursor Production Plant. The project would involve the construction of a manufacturing facility producing lithium-ion battery materials in Hopkinsville, KY that is capable of establishing industrial scale U.S. production capacity of sustainable, low-cost precursor cathode materials by integrating the separation of critical cathode materials from spent lithium-ion batteries with the production of both precursor cathode materials and metal salts to support domestic production of cathode active materials. To achieve its purpose, the facility will consist of manufacturing buildings, office space and a warehouse, as well as support infrastructure, including a rail spur, unloading/loading stations, and holding tanks. See, Exhibit 1 (Facility Site Plan).

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The proposed project site encompasses two adjacent lots in the northwestern corner of Commerce Industrial Park II, Lot 3 and Lot 4. Lot 3 is approximately 80 acres (southern lot shown in yellow) and Lot 4 is approximately 64 acres (northern lot shown in blue/white) as presented in Exhibit 4 (Proposed Project Site), attached. Prior to being converted to an industrial park, the proposed project site was used for many years for commercial agricultural crop production. As such, the land was regularly plowed,

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The Trail of Tears National Historic Trail crosses through the town of Hopkinsville, running along U.S. Route 41, which is a four-lane divided highway at the point it is closest (approximately 2/3 mile) to the Project site. The site is separated from the National Historic Trail by a railyard and Commerce Industrial Park I. Additionally, the site is approximately seven miles from the Trail of Tears Commemorative Park.

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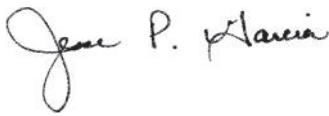
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Tribal Consultation for DOE/EA2205D

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If you have any questions concerning the project, please contact me. I look forward to working with your Tribal Nation.

Sincerely,



Jesse P. Garcia
NEPA Compliance/Tribal Liaison
U.S. Department of Energy
National Energy Technology Laboratory
1450 Queen Ave SW
Albany, Oregon 97321-2198
541-967-5912
Jesse.Garcia@netl.doe.gov

cc: Russell Townsend, Tribal Historic Preservation Office
Stephen Yerka, Tribal Historic Preservation Office

Attachments:

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February 13, 2023

Russell Townsend
Tribal Historic Preservation Office
2877 Governors Island Road
Bryson City, NC 28713

SUBJECT: Tribal Consultation and Section 106 Compliance for Project Apex -
Integrated Sustainable Battery Active Material and Precursor Production
Plant.

Dear Mr. Townsend:

I previously spoke with your colleague, Beau Carroll, regarding a project that the U.S. Department of Energy, National Energy Technology Laboratory (NETL) proposes to fund.

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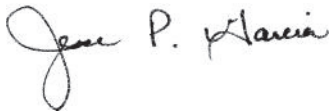
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Tribal Consultation for DOE/EA2205D

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If you have any questions concerning the project, please contact me. I look forward to working with your Tribal Nation.

Sincerely,



Jesse P. Garcia
NEPA Compliance/Tribal Liaison
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Jesse.Garcia@netl.doe.gov

cc: Beau Carroll, Tribal Historic Preservation Office
Stephen Yerka, Tribal Historic Preservation Office

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February 13, 2023

Stephen Yerka
Tribal Historic Preservation Office
2877 Governors Island Road
Bryson City, NC 28713

SUBJECT: Tribal Consultation and Section 106 Compliance for Project Apex -
Integrated Sustainable Battery Active Material and Precursor Production
Plant.

Dear Mr. Yerka:

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In 2017, the Hopkinsville Industrial Foundation, Inc. commissioned Greenhouse Consultants Incorporated to complete a Cultural Resources Reconnaissance Survey for a 705-acre section of Commerce Industrial Park II, including Lots 3 & 4 (Survey). See, Exhibit 6 (Cultural Resources Reconnaissance Survey). In the course of completing the Survey, Greenhouse consulted Kentucky Archaeological Survey and Kentucky Heritage Council records and determined there were no resources within or immediately adjacent to the 705-acre area listed on the NRHP. Survey, at p. 32. A previous cultural resource reconnaissance survey completed on a small portion of the Industrial Park had identified two preliminary archeological sites, but the area included in that survey was well outside of Lots 3 & 4, and not implicated by the proposed project.

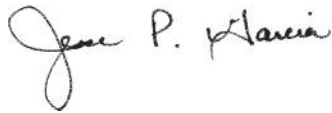
The Survey identified four areas containing historical resources that are within or partially within Lots 3 & 4. See, Exhibit 7 (Resources Identified During 2017 Field Work) and Exhibit 8 (Resources Identified During 2017 Field Work with Facility Site Plan Overlay). Two of the areas, P-1 and P-2, were characterized as prehistoric resources containing almost exclusively lithic debitage. P-1 is an 83.7 acre area, of which approximately 15 acres are within Lots 3 & 4. See, Exhibit 9 (Resource Area P-1). The Survey documented one side-notched projective point fragment from within area P-1, but did not specify where within the area the fragment was found. P-2 is a 12.8 acre area located within the footprint of the proposed project. The Survey documented less than 100 debitage and no features within area P-2. See, Exhibit 10 (Resource Area P-2). The third area, H-2, is approximately 0.1 acres in size and contained non-descript artifacts such as brick, concrete, and glass. See, Exhibit 11 (Resource Areas H-2 and H-3). Finally, the fourth area, H-3, is a 20.5 acre area, with less than 10 acres being within Lot 4. This area contains remains of a farmstead complex dating from the early 1900s. See, Exhibit 10. Due to a lack of integrity, the Survey concluded that areas H-2 and H-3 would not likely be eligible for listing on the NRHP. Survey, at 76.

Tribal Consultation for DOE/EA2205D

Based on the scope of the proposed Ascend project, DOE plans to prepare an Environmental Assessment (EA) (*DOE/EA-2205D*) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, the Eastern Band of Cherokee Indians will be sent an electronic and hard copy where you may provide any further comments.

If you have any questions concerning the project, please contact me. I look forward to working with your Tribal Nation.

Sincerely,



Jesse P. Garcia
NEPA Compliance/Tribal Liaison
U.S. Department of Energy
National Energy Technology Laboratory
1450 Queen Ave SW
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541-967-5912

Jesse.Garcia@netl.doe.gov

cc: Russell Townsend, Tribal Historic Preservation Office
Beau Carroll, Tribal Historic Preservation Office

Attachments:

- Exhibit 1: Facility Site Plan
- Exhibit 2: Christian County, Kentucky & Hopkinsville, Kentucky
- Exhibit 3: Proposed Project Location
- Exhibit 4: Proposed Project Site
- Exhibit 5: Survey of Historic Sites in Kentucky
- Exhibit 6: Cultural Resource Reconnaissance Survey, Commerce Park II, Hopkinsville, Christian County, Kentucky
- Exhibit 7: Resources Identified During 2017 Field Work
- Exhibit 8: Resources Identified During 2017 Field Work with Facility Site Plan Overlay
- Exhibit 9: Resource Area P-1
- Exhibit 10: Resource Area P-2
- Exhibit 11: Resource Areas H-2 and H-3

Tribal Consultation and Section 106 Compliance for Project Apex - Integrated Sustainable Battery Active Material and Precursor Production Plant

EXHIBIT LIST

Exhibit #	Document	Page #
Exhibit 1:	Facility Site Plan	001
Exhibit 2:	Christian County, Kentucky & Hopkinsville, Kentucky	002
Exhibit 3:	Proposed Project Location	003
Exhibit 4	Proposed Project Site	004
Exhibit 5:	Survey of Historic Sites in Kentucky	005
Exhibit 6:	Cultural Resource Reconnaissance Survey, Commerce Park II, Hopkinsville, Christian County, Kentucky	011
Exhibit 7:	Resources Identified During 2017 Field Work	097
Exhibit 8:	Resources Identified During 2017 Field Work with Facility Site Plan Overlay	098
Exhibit 9:	Resource Area P-1	099
Exhibit 10:	Resource Area P-2	100
Exhibit 11:	Resource Areas H-2 and H-3	101

Exhibit 1: Facility Site Plan

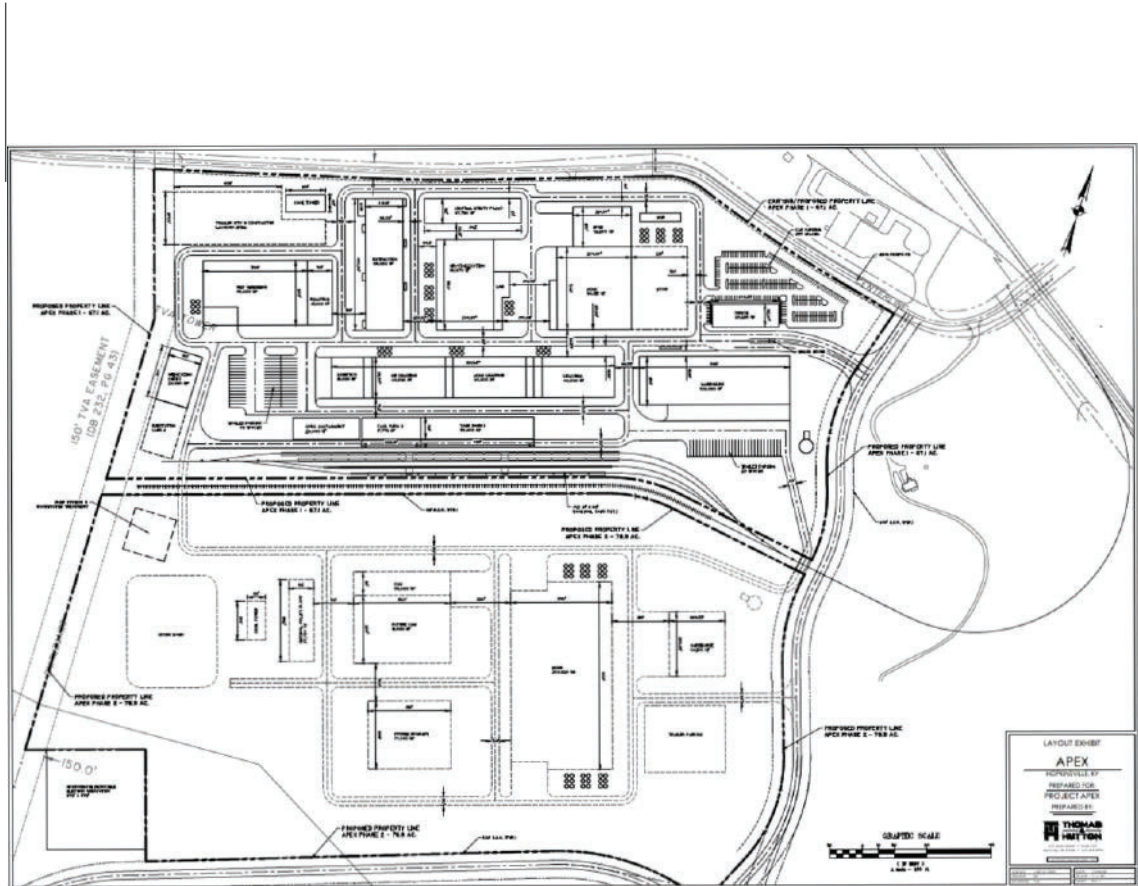


Exhibit 2: Christian County & Hopkinsville, Kentucky

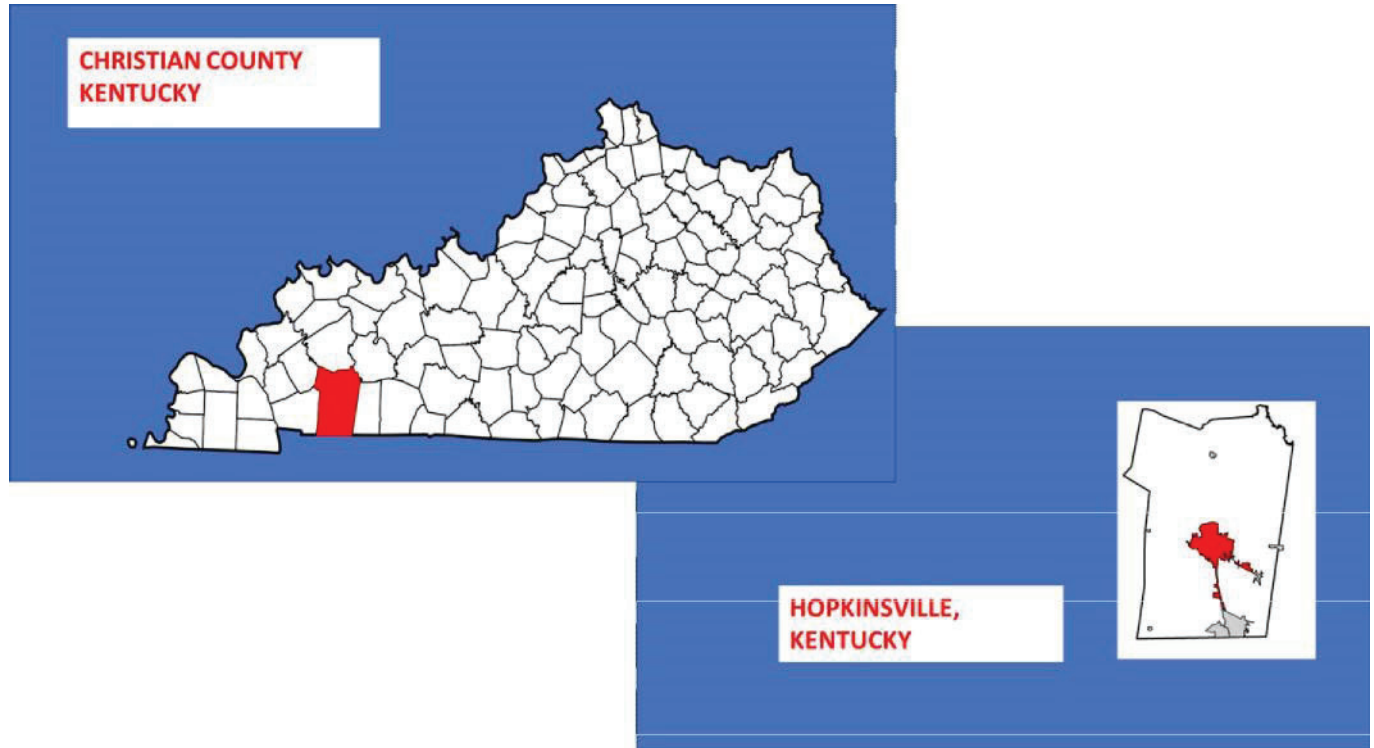


Exhibit 4: Proposed Project Site

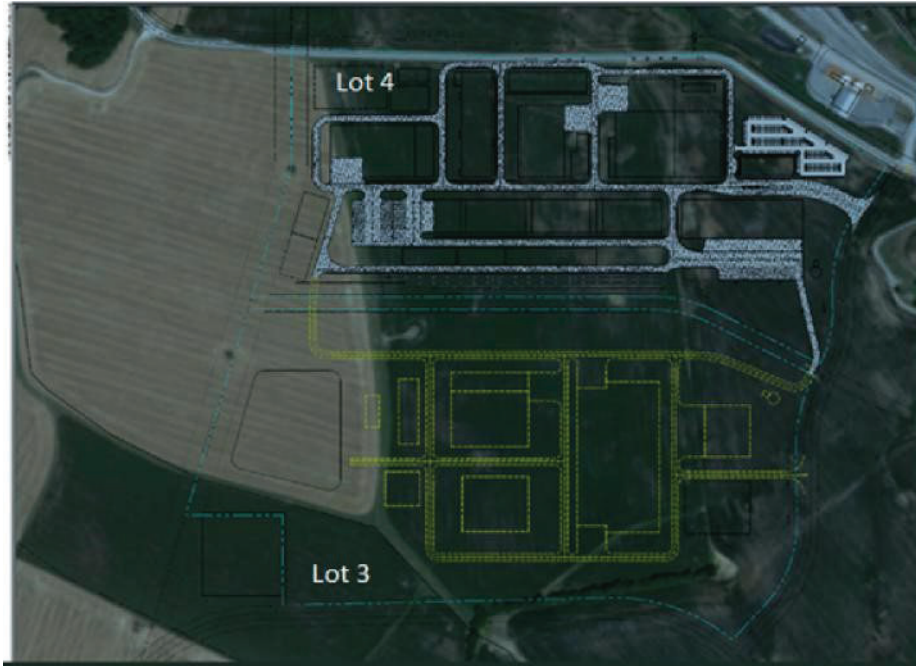


Exhibit 5: Survey of Historic Sites in Kentucky

The Library of the

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University of Illinois
at Urbana-Champaign

Survey of Historic Sites in Kentucky



Kentucky Heritage Commission

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PENNYRILE AREA DEVELOPMENT DISTRICT

The Pennyrile Area Development District is located in southwestern Kentucky and includes nine counties: Caldwell, Christian, Crittenden, Hopkins, Livingston, Lyon, Muhlenberg, Todd and Trigg. Figure 3 presents the total historic sites surveyed, by counties, in this district. A presentation of the sites follows:

Caldwell County

- "Adsmore," Hewlitt, Col. James B., House. North Jefferson, Princeton, Caldwell County. 1860. Architectural example.
- Elkhorn Tavern Site. Near Crider, Caldwell County. ca. 1810. Site of stagecoach tavern run by James L. Blue; located on Trail of Tears.
- Flournay, Henry H., House. 221 East Main, Princeton, Caldwell County. Pre-1840. Architectural example.
- Hunter, James, House. Eddyville Road, Princeton, Caldwell County. 1865. Architectural example.
- McGoodwin, Dr. Preston B., House. 115 McGoodwin Avenue, Princeton, Caldwell County. 1832. Architectural example.
- McNary, Thomas, House. 710 Locust, Princeton, Caldwell County. ca. 1840. Architectural example.
- Pettit, Thomas, House. Eddyville Road, Princeton, Caldwell County. 1828. Architectural example--farm house.
- Powell, William S., House. 501 Washington, Princeton, Caldwell County. 1860. Architectural example.
- Ratliff, Charles Sr., House. 317 South Jefferson, Princeton, Caldwell County. 1856. Architectural example.
- Urey, Francis W., House. 309 South Jefferson, Princeton, Caldwell County. 1855. Architectural example.

Christian County

- "Blue Lantern." Cadiz Road, Hopkinsville, Christian County. 1851-56. Architectural example; originally owned by Robertson T. Torian.

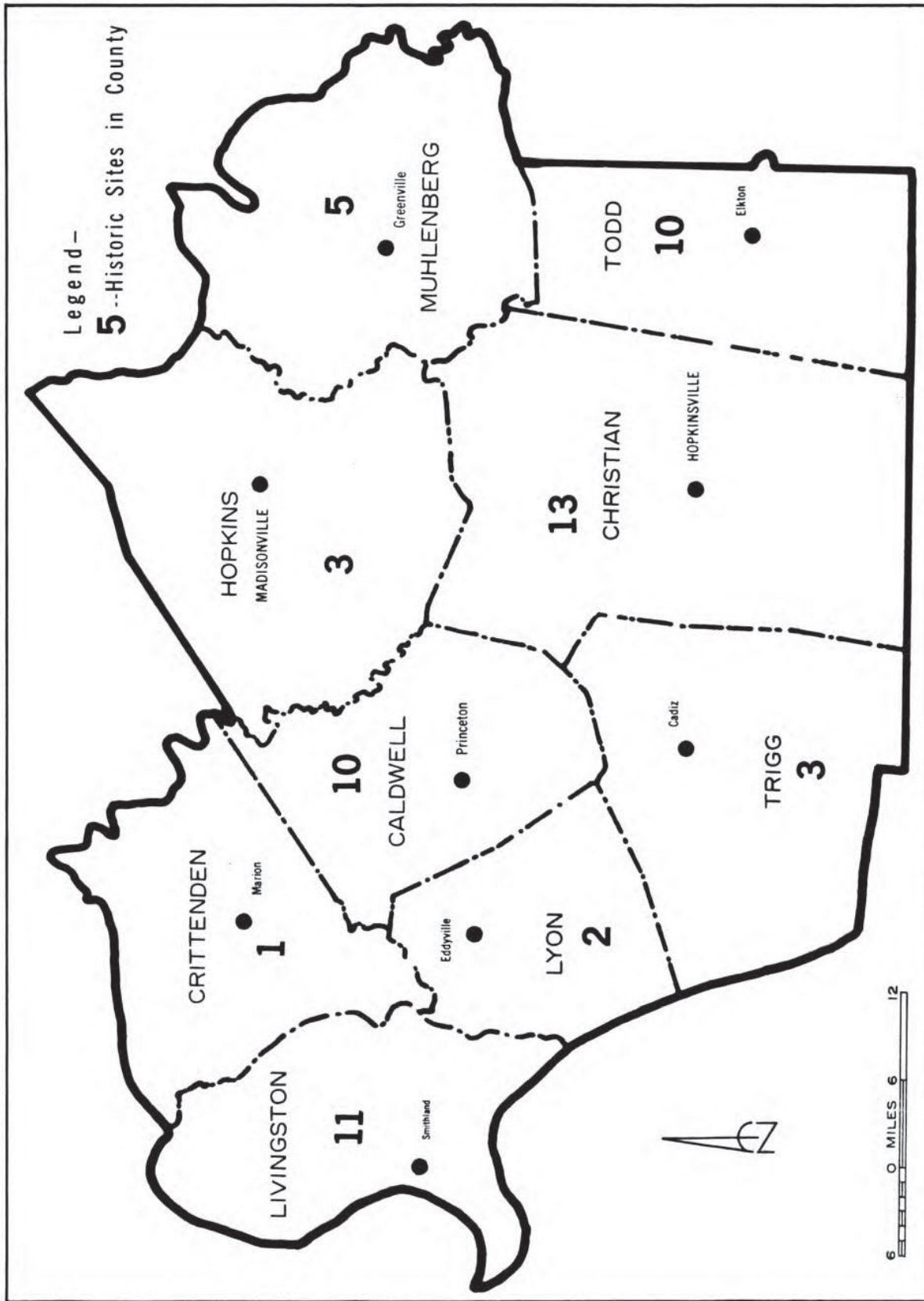


Figure 3. Historic Sites--Pennryle Area Development District

Cayce, Gordon, Gift Shop. 14th and Main Streets, Hopkinsville, Christian County. ca. 1847-48. Originally the home of Robert Dillard; served as headquarters of Gen. McCook during occupation of Hopkinsville by Federal troops during Civil War.

Christian County Courthouse. South Main Street, Hopkinsville, Christian County. 1869. Architectural example.

Church Hill Grange Hall. Southwest of Hopkinsville, Christian County. 1873-77. Only surviving grange hall in area.

Crockett-Hickman House, or "Lone Oak." East 16th Street, Hopkinsville, Christian County. 1836. Believed to be the oldest house standing in Hopkinsville, originally the home of Judge Joseph B. Crockett.

French's "Brick House." St. Elmo, near Hopkinsville, Christian County. ca. 1798. Probably the oldest house in Christian County, built by Simon French, Revolutionary War veteran.

"Genoa." Beverly, south of Hopkinsville, Christian County. 1847-49. Home of Winston James Davie, Kentucky's first Commissioner of Agriculture.

Hotel Latham Site. Virginia Street, Hopkinsville, Christian County. 1894. Site of hotel built under urging of John C. Latham, Jr.; local social and civic center until it burned in 1940.

Latham Homestead Site. 7th and Campbell Streets, Hopkinsville, Christian County. 1845. Site of the home of John C. Latham, Sr., founder and first president of the Bank of Hopkinsville.

Stevenson House Site. Herndon, Christian County. ca. 1817. Site of house where Adlai Ewing Stevenson, U.S. Vice President, was born in 1835.

Webber House. Webber Street, Hopkinsville, Christian County. ca. 1839. Originally the home of Jesse C. Wood; later residence of Dr. Augustine Webber, well-known local physician.

Western State Hospital. Russellville Road, Hopkinsville, Christian County. 1862-67. State mental hospital, originally called "Western Kentucky Lunatic Asylum."

Wood, Bartholomew, House Site. 9th and Virginia Streets, Hopkinsville, Christian County. ca. 1795. Site of the first house in Hopkinsville, built by Bartholomew Wood, who donated land for location of the county seat.

Crittenden County

James, Ollie, House. East Depot Street, Marion, Crittenden County. ca. 1870. At one time was the home of Ollie James, U.S. Senator during the administration of Woodrow Wilson.

Hopkins County

Gordon, Major Maurice K., House. 220 North Main Street, Madisonville, Hopkins County. Date unknown. U.S. Army officer, coined the name "American Legion" in France after World War I.

Hockersmith, Capt. L. D., House. 218 South Scott Street, Madisonville, Hopkins County. 1880's. Confederate officer who served with Gen. John Hunt Morgan, was captured and escaped with him from Union prison in Ohio in 1863.

Munn's Schoolhouse. Ky. 70, west of Madisonville, Hopkins County. ca. 1865. Only known one-room brick school building in area (one-room frame addition constructed ca. 1900).

Livingston County

Conant House. Conant Lane, Smithland, Livingston County. 1840's. Located on a hill overlooking Ohio and Cumberland Rivers; cannons were placed on property during Civil War.

Dollam, James L., House, Mill Street, Smithland, Livingston County. ca. 1840. First three owners of house--James L. Dollam, W. P. Fowler and Blount Hodge--were prominent early settlers of Livingston County.

**Exhibit 6: Cultural Resource Reconnaissance Survey, Commerce Park II,
Hopkinsville, Christian County, Kentucky**

**Cultural Resource Reconnaissance Survey
Commerce Park II
Hopkinsville, Christian County, Kentucky**

Prepared for:

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Hopkinsville, Kentucky 42240
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Prepared by:

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August 2017

Greenhouse CONSULTANTSincorporated

Barry D. Greenhouse, Project Principal
Dean Afendras, MA, RPA, Principal Investigator and Primary Author
Vince Versluis, MA, RPA, Research Supervisor

Abstract

Greenhouse CONSULTANTS incorporated conducted a cultural resources reconnaissance survey of the Commerce Park II development (approximately 705 acres), Christian County, Kentucky, for the Hopkinsville Industrial Foundation. The proposed project is for the construction a 1.5 million square foot building with associated access routes, parking lots, and a rail spur off an existing railroad alignment. The purpose of the survey was to determine the potential for cultural resources within the 705-acre tract and the need for a Phase I cultural resources survey. At this time, no federal nexus has been identified and this survey was completed as a due diligence effort.

One cultural resources survey has been conducted within the extreme northwest corner of the project area, yielding two preliminary archaeological sites (15CH698 and 15CH699). That project is the Phase I Archaeological Survey of the Proposed CSXT Inspection Yard, Mile Post 00H 229.72-00H 234.84, Christian County, Kentucky, Revised Version.

Sixteen prehistoric resources (P-1 through 16), eight historic resources (H-1 through 8), one historic isolated find (IF-1), and one mid-nineteenth century cemetery were documented during this reconnaissance survey. P-2 through 7, 9, 12 through 14 consisted solely of debitage found at the surface. P-1, 8, 10, 11, and 15 consisted of debitage with other artifacts including pottery, cores, bifaces, side-notched projectile point fragments, manos, metate fragments, and scrapers. The resources with only debitage tended to have fewer artifacts and be located further from the confluence of Montgomery Creek with other watercourses. The resources with other artifacts in addition to debitage tended to have higher artifact density and be nearer to the creek confluence. The prehistoric resources were delineated by surface expression, but due to variable surface visibility and potential for subsurface deposits, shovel testing should be used to determine the subsurface extent of the resources and assess them for National Register of Historic Places Eligibility (NRHP).

H-1 and 3 are the remains of early- to mid-twentieth century farmsteads. Most of the buildings for each have been razed and the resources are associated with large surface artifact scatters. H-2, 4 through 8 are surface artifact scatters which are the remains of residential and commercial buildings associated with late-nineteenth to mid-twentieth century Pembroke. No features were observed at these resources. Because of plowing, it is unlikely intact historic deposits or features would be identified through additional subsurface investigation. Furthermore, these resources would likely not be NRHP eligible due to lack of integrity.

Our reconnaissance survey revealed approximately 234 acres (33 percent) of the project area contains prehistoric and historic resources. Surface visibility was poor over large portions of the project area and many of the gaps in resources were in these areas suggesting there are additional resources and the extents of documented resources may be larger. On the basis of this reconnaissance we recommend that a Phase I survey should be conducted in advance of development in order to locate and delineate cultural resources within the project area, evaluate the National Register of Historic Places eligibility of located cultural resources, and assess the effect the proposed improvements will have on the resources. The research design and field methods should be determined in consultation with the Kentucky State Historic Preservation Office (Kentucky Heritage Council).

This report is for informational purposes only. If this project is determined to be a federal undertaking, the consulting agency may still require a Phase I cultural resources survey to comply with Section 106 of the National Historic Preservation Act.

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Introduction

This report presents the results of a cultural resources reconnaissance survey of approximately 705 acres in Christian County, Kentucky (Figure 1). The project sponsor is proposing to construct a new facility between the town of Pembroke, a CSX railroad, and John Rives Road. The proposed development will include a 1.5 million square foot building with associated access routes, parking lots, and a rail spur off an existing railroad alignment. Additional, as of yet unspecified, development may be planned within the project area. At this time, no federal nexus has been identified and this survey was completed as a due diligence effort.

The purpose of the reconnaissance survey was to determine the potential for cultural resources within the 705-acre tract and the need for a Phase I cultural resources survey. The survey consisted of pedestrian transects to identify built environment (i.e., buildings greater than 45 years of age) and archaeological resources. One cultural resources survey has been conducted within the extreme northwest corner of the project area yielding two preliminary archaeological site locations (15CH698 and 15CH699). There are currently no site forms filed with the State of Kentucky for either of the two preliminary site locations.

Fieldwork was initiated August 10, 2017. The Principle Investigator for the project was Dean Afendras, MA, RPA who also conducted the background research with Vince Versluis, MA, RPA. In addition to the Principal Investigator, project fieldwork was conducted by Mickey Sierzchula, MA, RPA, Josh Davis, BA, Mike Taylor, BA, and Staci Hesler, BA. Dean Afendras was the principal author of this report. He was assisted by Vince Versluis and other staff members.

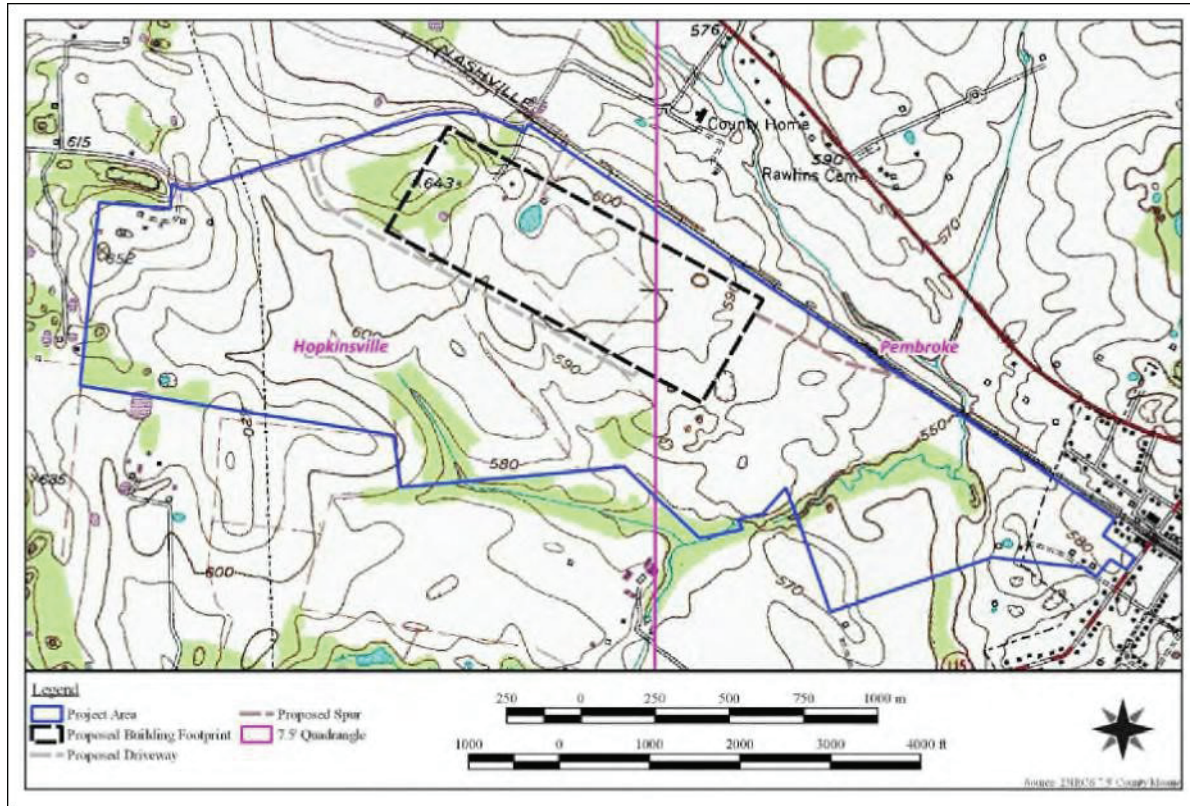
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The prehistoric resources were delineated by surface expression, but due to variable surface visibility and potential for subsurface deposits, shovel testing should be used to determine the subsurface extent of the resources and assess them for National Register of Historic Places Eligibility (NRHP).

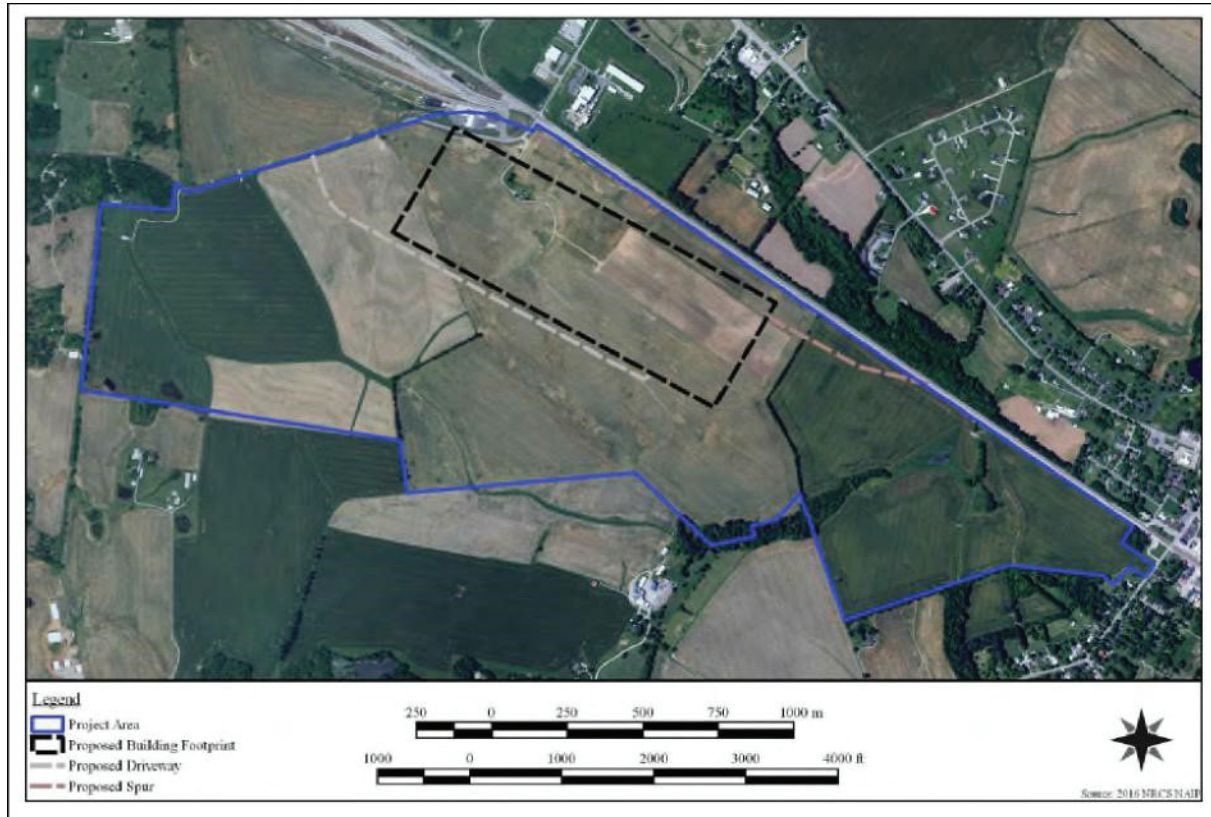
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Our survey revealed approximately 234 acres (33 percent) of the project area contains prehistoric and historic resources. Surface visibility was poor over large portions of the project area and many of the gaps in resources were in these areas suggesting there are additional resources and that the extents of documented resources may be larger. It is our recommendation that a Phase I survey should be conducted, in advance of development, in order to locate and delineate cultural resources within the project area, evaluate the National Register of Historic Places eligibility of located cultural resources, and assess the effect the proposed improvements will have on the resources. Research design and field methods should be determined in consultation with Kentucky State Historic Preservation Office.

This report is for informational purposes only. If this project is determined to be a federal undertaking, the consulting agency may still require a Phase I cultural resources survey to comply with Section 106 of the National Historic Preservation Act.



**Figure 2. Project Area
(USGS Hopkinsville and Pembroke 7.5" Quadrangle)**



**Figure 3. Aerial View of the Project Area
(2016 aerial image)**

Environmental Setting

Topography

The project area covers dissected uplands which overlooks watercourses to the northeast, southeast, and south. The terrain is rolling and sinkholes are common. Intermittent watercourses converge with the primary branch of Montgomery Creek in the eastern portion of the project area from the north, west, and southwest. The highest elevation is 650 feet above mean sea level (amsl) at the west end and the lowest is 548 feet amsl within the creek channel at the southeastern portion of the project area.

Physiography

The project area is situated in Christian County, which is located in southwestern Kentucky. Christian County covers an area of 464,130 acres or 725 square miles (Froedge 1980:1). The project area lies in the central-southern part of the county, in the Mississippi Plateau Physiographic Region (Office of State Archaeology 1982:17). The project area is situated in the Plain Section of the Pennyroyal Cultural Landscape and the Pennyroyal Section of the Green River Management Area (Pollack 1990:22-23).

The Mississippi Plateau Physiographic Region is characterized by Mississippian-age limestone's, primarily St. Genevieve, which are Lower Mississippian deposits. The terrain of the Mississippi Plateau, and the southern portion of Christian County, is characterized by a mostly level to gently sloping limestone plateau. This area is karstic, consisting of sinkholes into which most surface water drains (Froedge 1980:1).

Soils

The project area is underlain with soils belonging to the Pembroke-Crider association. The information for this soil type was gathered from the Web Soil Survey that provides soil data produced by the National Cooperative Soil Survey operated by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (2017) (Figure 4 and Table 1).

Crider silt loam, 2-6% slopes (CrB). This soil is a well-drained type that occurs on ridge summits. The typical surface soil is a 0-8 inch silt loam underlain with an 8-38 inch silt loam, 38-100 inch clay, and a 100-110 inch bedrock. The parent material for this soil is a “thin fine-silty noncalcareous loess over clayey residuum weathered from limestone.”

Dunning Soils (Du). These soils are well-drained and occur on floodplains. The typical surface soil is a 0-7 inch silty clay loam underlain with a 7-68 inch clay. The parent material for this soil is “clayey alluvium.”

Lindside silt loam (Ln). This soil is a moderately well-drained type that occurs on floodplains. The typical surface soil is a 0-8 inch silty clay loam underlain with a 8-60 inch clay. The parent material for this soil is “mixed fine-silty alluvium.”

Newark silt loam (Ne). This soil is a somewhat poorly drained type that occurs on floodplains. The typical surface soil is a 0-9 inch silt loam underlain with a 9-36 inch silt loam, and a 36-76 inch silty clay loam. The parent material for this soil is a mixed fine-silty alluvium.

Nicholson silt loam, 2-6% slopes (NbB). This soil is a moderately well drained type that occurs on ridge summits. The typical surface soil is a 0-8 inch silt loam underlain with an 8-23 inch silty clay loam, a 23-42 inch silty clay loam, and a 42-70 inch silty clay. The parent material for this soil is a “thin fine-silty noncalcareous loess over clayey residuum weathered from limestone.”

Nolin silt loam (No). This soil is a well-drained type that occurs on floodplains. The typical surface soil is a 0-9 inch silt loam underlain with a 9-63 inch silt loam. The parent material for this soil is “mixed fine-silty alluvium.”

Pembroke silt loam, 0-2% slopes (PmA). This soil is a well-drained type that occurs on ridge summits. The typical surface soil is a 0-9 inch silt loam underlain with an 9-18 inch silt loam, a 18-62 inch silty clay loam, and a 62-79 inch silty clay. The parent material for this soil is a “thin fine-silty noncalcareous loess over clayey residuum weathered from limestone.”

Pembroke silt loam, 2-6% slopes (PmB). This soil is a well-drained type that occurs on ridge summits. The typical surface soil is a 0-8 inch silt loam underlain with an 8-31 inch silt clay loam and a 31-93 inch silty clay. The parent material for this soil is a “thin fine-silty noncalcareous loess over clayey residuum weathered from limestone.”

Pembroke silt loam, 6-12% slopes (PmC). This soil is a well-drained type that occurs on ridge summits. The typical surface soil is a 0-9 inch silt loam underlain with a 9-18 inch silt loam, an 18-62 inch silty clay loam, and a 62-79 inch silty clay. The parent material for this soil is a “thin fine-silty noncalcareous loess over clayey residuum weathered from limestone.”

Vertrees silty clay loam, 6-12% slopes (VeC). This soil is a well-drained type that occurs on ridge backslopes. The typical surface soil is a 0-8 inch silty clay loam underlain with an 8-72 inch clay. The parent material for this soil is a clay residuum weathered from limestone.

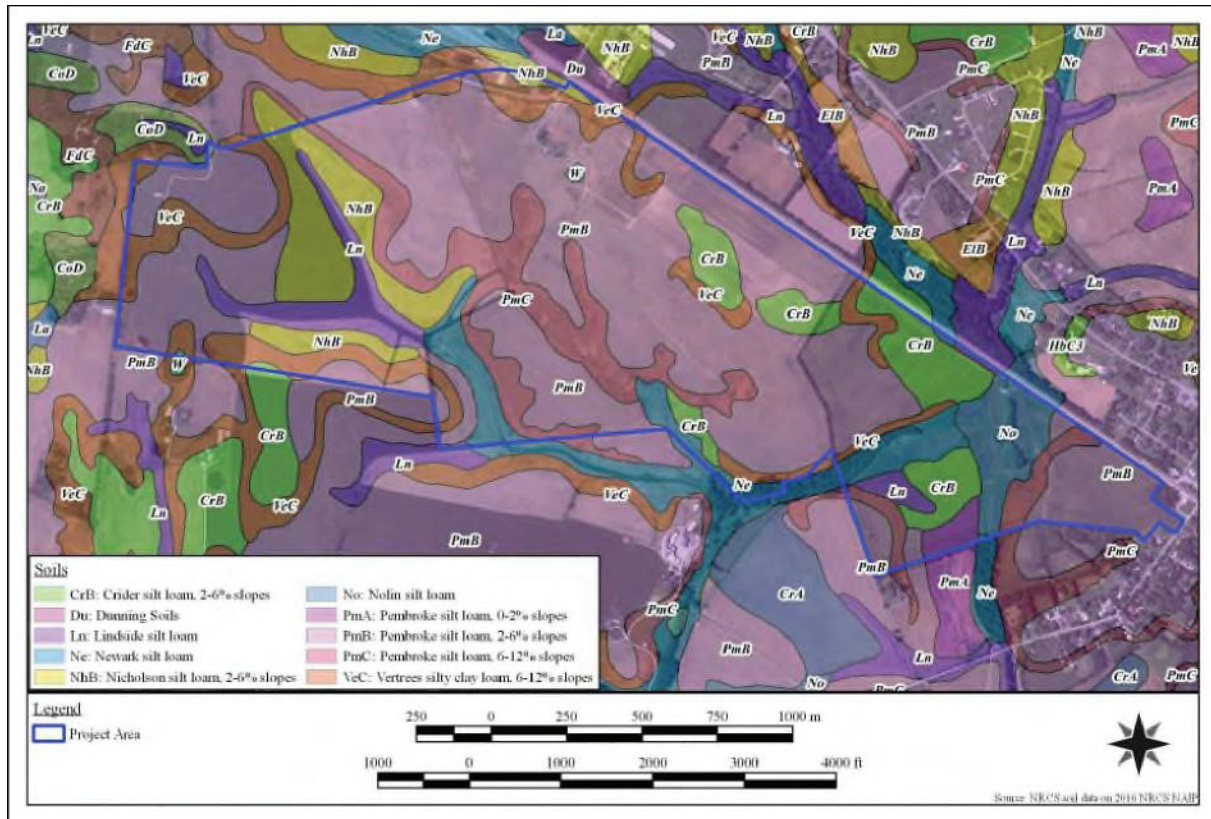


Figure 4. Project Area Soils

**Table 1. Project Area Soils
(adapted from NRCS 2017)**

#	Soils	Landform	Parent Material	Drainage Class	Restrictive Feature (inches)	Typical Profile (inches)
CrB	Crider silt loam, 2 to 6 percent slopes	Ridges	Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone	Well drained	59 to 157 to lithic bedrock	Ap - 0 to 8: silt loam Bt1 - 8 to 38: silt loam 2Bt2 - 38 to 100: clay 2R - 100 to 110: bedrock
Du	Dunning soils	Flood plains, closed depressions	Clayey alluvium	Poorly drained	More than 80	H1 - 0 to 7: silty clay loam H2 - 7 to 68: clay
Ln	Lindside silt loam	Flood plains, closed depressions	Mixed fine-silty alluvium	Moderately well drained	More than 80	H1 - 0 to 8: silt loam H2 - 8 to 60: silty clay loam
Ne	Newark silt loam	Closed depressions, flood plains	Mixed fine-silty alluvium	Somewhat poorly drained	More than 80	H1 - 0 to 9: silt loam H2 - 9 to 36: silt loam H3 - 36 to 76: silty clay loam
NhB	Nicholson silt loam, 2 to 6 percent slopes	Ridges	Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone	Moderately well drained	16 to 30 to fragipan	H1 - 0 to 8: silt loam H2 - 8 to 23: silty clay loam H3 - 23 to 42: silty clay loam H4 - 42 to 70: silty clay
No	Nolin silt loam	Flood plains, closed depressions	Mixed fine-silty alluvium	Well drained	More than 80	H1 - 0 to 9: silt loam H2 - 9 to 63: silt loam
PmA	Pembroke silt loam, 0 to 2 percent slopes	Ridges	Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone	Well drained	More than 80	Ap - 0 to 9: silt loam Bt1 - 9 to 18: silt loam 2Bt2 - 18 to 62: silty clay loam 2Bt3 - 62 to 79: silty clay
PmB	Pembroke silt loam, 2 to 6 percent slopes	Ridges	Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone	Well drained	More than 80	Ap - 0 to 9: silt loam Bt1 - 9 to 18: silt loam 2Bt2 - 18 to 62: silty clay loam 2Bt3 - 62 to 79: silty clay
PmC	Pembroke silt loam, 6 to 12 percent slopes	Ridges	Thin fine-silty noncalcareous loess over clayey residuum weathered from limestone	Well drained	More than 80	Ap - 0 to 9: silt loam Bt1 - 9 to 18: silt loam 2Bt2 - 18 to 62: silty clay loam 2Bt3 - 62 to 79: silty clay
VeC	Vertrees silty clay loam, 6 to 12 percent slopes	Ridges	Clayey residuum weathered from limestone	Well drained	More than 80	H1 - 0 to 8: silty clay loam H2 - 8 to 72: clay

Drainage

The southern part of Christian County is drained by tributaries of Cumberland River, such as Little River which flows into Cumberland River (Lake Barkley) near Cadiz, in Trigg County, Kentucky. The project area is drained by an unnamed tributary of Montgomery Creek that lies southeast of the project area. As noted above, numerous water-filled sinkholes and ponds exist in the vicinity of the study area.

Climate

The climate of Christian County is temperate with warm, humid summers and moderately cold winters. The average annual temperature is 57.2 degrees Fahrenheit, with the average winter temperature at 37 degrees Fahrenheit, and the average summer temperature of 77 degrees Fahrenheit (Froedge 1980:2). The mean annual rainfall for Christian County is 47 inches (119 cm), with the majority of rainfall occurring from April through September (Froedge 1980:3).

Flora and Fauna

The project area falls within the Western Mesophytic Forest region (Braun 1950). The Western Mesophytic Forest region is characterized by a mosaic of vegetational communities including oak-hickory, mixed mesophytic, swamp forest and prairies of barrens (Braun 1950:157-158). Oak and hickory dominate in this region but are accompanied by a wide range of other species (Pollack 1990:7). The flora in the study area would have provided food and raw materials for prehistoric people, as well as food and shelter for a variety of animal species.

Modern faunal species in Christian County include white-tail deer, squirrel, rabbit, raccoon, skunk, opossum, beaver, muskrat, otter, quail, and dove (Froedge 1980:3). Game present during the early historic period in Christian County, but now rare or absent include elk, wild turkey, wild pigeon, wolf, black bear, and bobcat (Sanders and Maynard 1979:16). The more important game during prehistoric times in what is now Kentucky included the white-tail deer, turkey, elk, bison, black bear, beaver, turtles, birds, opossum, raccoon, fish and river mussels (Tankersley 1996:35; Jefferies 1996:45,56; Railey 1996:84; Lewis 1996b:129).

Prehistoric Environment

The Pleistocene Epoch ended as the North American glaciers retreated for the last time around 10,000 years ago. Based on limited regional pollen and faunal remains, the cool and moist climate of the area supported boreal spruce forest and associated animals such as mastodon, ground sloth, giant beaver, tapir, horse, sabre tooth cats, and deer during the Late Pleistocene. As conditions warmed into the early Holocene, the boreal forest was replaced with a deciduous regime by 5000 B.P. Environmental changes coincided with the extinction of many animals, notably the megafauna, 4000 B.P. (through today) the climate began to ameliorate resulting in moderate temperatures, but also interspersed with drought cycles. These conditions supported biotic communities similar to today (Albert and Wyckoff 1984:33-35).

Cultural Setting

The following section outlines the general prehistory of the eastern United States and the cultural development in western Kentucky. The cultural background of western Kentucky has been divided into five periods of cultural development: Paleoindian, Archaic, Woodland, Mississippian, and Historic. The Archaic and Woodland periods are divided into Early, Middle, and Late temporal-cultural periods.

The Paleoindian Period

Human populations are believed to have been present in what is now Kentucky as early as about 10,000 B.C. (Lewis 1996a:17). The Paleoindian period is the earliest conclusively documented cultural development in the region. This stage of development (10,000 B.C. to 8000 B.C.) is generally characterized by mobile microbands of nomadic hunters and gatherers (Lewis 1996a:17-18). Paleoindians manufactured fluted and non-fluted, lanceolate projectile points that were used to hunt large game or megafauna (Tankersley 1996:26). Large game exploitation is seen in the archaeological record at sites throughout the United States, where fluted points have been found in direct association with bison or mammoth remains (Tankersley 1996:26).

Although emphasis may have been on hunting large game, such as mastodon and bison, Paleoindian subsistence probably included plant foods and smaller animals (Childress and Buchner 1999:16). Late in the Paleoindian period, populations began to rely more on smaller game as megafauna, including mammoth, mastodon, bison, ground sloth, horse, musk ox, stag-moose, and peccary, all of which were native to Kentucky, became extinct or migrated north with the retreat of the ice glaciers (Tankersley 1996:21, 36).

Paleoindian sites in Kentucky are found over a range of environmental settings, but they tend to be located in specific landscapes. These topographic settings include: terraces or floodplains near major stream or tributary confluences; margins of bogs, ponds and saline springs, and in areas of large amounts of high quality lithic material such as at the Adams site and Savage Cave in western Kentucky (Tankersley 1996:37).

Flaked or chipped stone knives and scrapers were common tools in the Paleoindian toolkit in the eastern United States, and “were necessary for butchering game and processing plant fibers for cordage” (Tankersley 1996:24). Other flaked-stone tools include, graters, perforators or drills, and *pièces esquillée* or wedges (Tankersley 1996:32). Diagnostic Paleoindian points found in the eastern United States include lanceolate forms such as *Clovis, Cumberland, Plainview, Agate Basin*; Late Paleoindian points include *Dalton, Beaver Lake, Quad, Greenbrier and Hardaway Side Notched* points (Justice 1987:17-42).

The Archaic Period

Climatic and cultural changes and the end of the Pleistocene characterize the Archaic period. During the Archaic period, the number and size of hunter and gathering bands grew larger and the climate became warmer and drier (Jefferies 1996:39). The archaeological record of the Archaic period is more abundant than that of the previous Paleoindian period, which probably is due to increases in population size, and/or the occurrence of longer term, intensive occupation (Jefferies 1990:151). The Archaic period is divided into three subperiods: Early (8000-6000 B.C.), Middle (6000-4000 B.C.), and Late (4000-1000 B.C.). Each division has certain assemblages and distinctive point types that serve as general temporal-cultural markers.

Archaeological evidence of low artifact density and scarce midden deposits, suggest that Early Archaic groups were highly mobile. By the Middle Archaic, there is evidence of increased sedentism as indicated by thick midden, features, and burials (Jefferies 1996:72-73). Archaic populations subsisted on hunting such animals as whitetail deer and, to a lesser extent, gathering a limited number of nutritious plant foods (Chapman 1977; Cleland 1966).

A more diversified subsistence strategy during the Middle and Late Archaic periods is seen in an increased number of groundstone, food processing tools, such as pestles and grinding slabs, and plant remains in Middle and Late Archaic assemblages (Jefferies 1990:151; 1996:73). In addition, the importance of plant foods in the Archaic diet is suggested by the substantial amounts of fire-cracked rock in Archaic sites. Fire-cracked rocks (FCR) which are the by-products of rock-boiling activity are seen to represent intensive exploitation of food resources (Childress and Buchner 1999:17).

Near the end of the Archaic period, the archaeological record indicates that populations in the region were occupying sites for longer periods, and some groups were expanding food subsistence activities to include cultivation of plants (Jefferies 1990:153). Evidence also suggests that interregional exchange became more common with Late Archaic cultures. For example, copper artifacts from north of the Ohio River and marine shell from the southern Atlantic or Gulf of Mexico have been found at shell mounds or middens (e.g., Indian Knoll and Carlston Annis) along the Green River in western Kentucky (Tankersley 1996:74-75).

Early Archaic lithic assemblages in the eastern United States include: mullers, grinding slabs, pitted cobbles, polished celts, atlatls, scrapers, and drills (Bense 1994:65; Chapman 1985:43-46). Diagnostic points of the Early Archaic include: side notched types such as *Big Sandy* and *Raddatz Side Notched and St. Albans Side Notched* points; and corner notched types like *Kirk Corner Notched*, *Decatur*, *Palmer Corner Notched*, *Charleston Corner Notched* and *Pine Tree Corner Notched* points; and stemmed types such as *Kirk Stemmed*, *LeCroy Bifurcated Stemmed* and *Kanawha Stemmed* points (Justice 1987:60-96).

Middle Archaic lithic assemblages in the eastern United States include: atlatl weights to increase velocity of the projectile point; grooved stone axes; and netsinkers used to keep fish nets under water (Bense 1994:75). Diagnostic points of the Middle Archaic include: *White Springs* and *Sykes* points, basally notched types such as *Eva I* and *Eva II* points; stemmed types such as *Stanly Stemmed*, and *Morrow Mountain I* and *Morrow Mountain II* (Justice 1987:97-110).

Late Archaic lithic assemblages in the eastern United States include stone containers made of steatite or sandstone (Steponaitis 1986; Bense 1994:86). Diagnostic points of the Late Archaic include: stemmed forms such as *Benton Stemmed*, *Elk River Stemmed*, *Ledbetter Stemmed*, *Pickwick*, *Saratoga Stemmed* and *Savannah River Stemmed* points (Justice 1987:111-158).

The Woodland Period

The Woodland cultures developed out of the Archaic period, beginning about 1000 B.C. and lasting until about A.D. 900. The Woodland period has been divided into three subperiods: Early (1000-300 B.C.), Middle (300 B.C.-A.D. 600), and Late (A.D. 600-900). This stage of cultural development is generally marked by the emergence of pottery, construction of burial mounds and other earthworks, the development of a more sedentary way of life and increased emphasis on plant cultivation (Railey 1996).

Early Woodland groups throughout many parts of eastern United States constructed earthen mounds for human burial, but perhaps the most extensive form of ceremonial/mortuary practice was that developed in the Ohio Valley region, known as the Adena complex (Griffin 1983). Centered north of the Ohio River, the impact of the Adena complex extended beyond the Ohio Valley and into parts of the southeastern United States (Bense 1994:121). The Adena complex is marked by mortuary mound centers with conical or platform mounds and human burials elaborately furnished with Adena ornaments. Late Adena mounds are larger than those earlier in the period and include projectile points; tubular pipes, gorgets, bifacial blades, hematite celts, copper bracelets, mica cutout ornaments, beads, crescents, effigy pipes; and engraved stone tablets and marine shell (Seeman 1986; Railey 1996:96-97, Figures 4.13 and 4.16).

During the later stages of the Adena complex, which extends into the Middle Woodland period, there is evidence of Hopewellian elements. Jimmy Railey (1996:100) notes that in north-central Kentucky, Hopewellian features include square-to-rectangular structure at the Riley Mound in Boone County (Webb 1943), and sand tempered, stamped ceramics at the Wright Mound in Montgomery County (Haag 1940). In western Kentucky, Adena Stemmed projectile points occur, for example, at Watkins Mound in Logan County (Dowell 1979), and Hopewellian ceramics of the Crab Orchard complex are found at the Smith Site and site 15He13 in Henderson County (Hoffman 1966; Marquardt 1971; Railey 1996:103).

The Middle Woodland period saw the emergence of another socio-religious complex in the Ohio Valley known as the Hopewell, named after the Hopewell farm in Ross County, Ohio (Waldorf and Waldorf 1987:186). Like the Adena, the Hopewell represented a system of exchange, ceremonial practices and mortuary goods, more than it represented a group of people (Muller 1986). Reid (1997:35-36) explains,

“Hopewellian societies maintained a separate identity, but shared a belief system, mortuary symbolism, and certain items of material culture (Bense 1994:122). Caldwell defined the group of cultures participating in this ceremonial complex as the “Hopewell Interaction Sphere” (Caldwell and Hall 1964). Burial mounds with associated earthworks are the dominant characteristic of sites containing evidence of Hopewellian traits (Bense 1994:122). Mounds were seen as symbols of the increased status of the interred individuals, and they often contained exotic trade goods, such as copper and marine shell.”

The Late Woodland period saw the collapse of the Hopewell Interaction Sphere and the sharp decline of such Hopewellian characteristics as earthwork construction and long-distance trade (Railey 1996:110). During this time, horticulture intensified, although archaeobotanical evidence suggests that wild plants and animals remained the focus of Late Woodland subsistence (Railey 1996:111, 1990:256). In some areas of Kentucky, Late Woodland populations occupied nucleated villages, with houses, work areas and refuse areas spaced around a central public zone (Railey 1996:111-112). In western Kentucky, some Late Woodland Cane Hills phase sites, such as the Rice site in Fulton County, have thick midden, mounds and/or possible central plazas. These features indicate the beginnings of a hierarchical settlement system which characterize later Mississippian societies (Railey 1996:113).

Early Woodland artifact assemblages include a variety of lithics and ceramics. Early Woodland ceramics in the Green River Management Area in Kentucky generally consist of conoidal-shaped, narrow and flat based vessels, usually plain but also marked on the exterior, and sometimes interior, with cordmarked, fabric-impressed, or cord-wrapped dowel-impressed decoration (Railey 1990:249). Adena ceramics are primarily Adena Plain that are tempered with sandstone or limestone (Haag 1942:341-342; Railey 1990:253).

Other Adena ceramic types include Montgomery Incised and simple stamped and check stamped decorated pieces (Haag 1941:264-265; Setzler 1930; Railey 1990:253). Diagnostic points of the Early Woodland in the eastern United States include: stemmed types such as *Turkey-tail*, *Delbi*, *Wade*, *Adena Stemmed*, and *Little Bear Creek*, and *Robbins* points; and corner notched types such as *Motley* (Justice 1987:173-201).

Middle Woodland ceramics in the Green River Management Area are characterized by cordmarked, cord-wrapped dowel-impressed, or fabric impressed exterior surfaces (Railey 1990:251). Late Middle Woodland ceramics in Kentucky consist mainly of subconoidal jars, with outflaring or direct rims and vessel surfaces have simple stamped, check stamped, rocker stamped, complicated stamped, and brushed decoration (Railey 1990:251). Diagnostic points of the Middle Woodland include: corner notched types such as *Snyders*; stemmed forms such as *Steuben Expanded Stemmed*, *Bakers Creek*, and *Lowe Flared Base* points; and triangular types such as *Copena* (Justice 1987:201-214), as well as Adena Stemmed and Robbins points in Kentucky (Railey 1996:97, Figure 4.16). Adena and Robbins points were often placed with burials in Adena mounds (Railey 1990:253).

Late Woodland artifact assemblages throughout Kentucky are generally similar to those of the Middle Woodland, but without the elaborate ceramic decoration and other elements associated with the Hopewellian Interaction Sphere. Late Woodland ceramics include cordmarked, subglobular and subconoidal jars. By the end of the Late Woodland there is greater regional variability in ceramic style (Railey 1990:256). Diagnostic points of the Late Woodland include: pentagonal types such as *Jack's Reef Pentagonal*; corner notched types such as *Jack's Reef Corner Notched* (Justice 1987:215-220); and incurvate triangular forms such as *Hamilton Incurvate* (Justice 1987:229-230).

The Mississippian Period

This Late Prehistoric cultural tradition dates approximately from A.D. 900 to A.D. 1600 and developed into one of the most complex sociopolitical systems in the southeastern United States. Mississippian societies varied in complexity, but from about A.D. 900 to European contact in the sixteenth century, these people “controlled local and regional territories along most of the large rivers of the interior Southeast” (Childress and Buchner 1999:22).

Elements of the Mississippian culture include “ceremonial centers” or palisaded mound-village complexes with plazas flanked by earthworks and platform mounds, and a subsistence economy based on hunting and gathering and on cultivation of maize, beans and squash among other plants (Lewis 1990:375; 1996:155). Mississippian societies created very elaborate art and religious systems, known as the Southeastern Ceremonial Complex, the iconography of which included various standardized designs and motifs engraved and painted on pottery, engraved and embossed in shell, and depicted in clay, stone and wood sculptures (Griffin 1967).

Other Mississippian markers include shell tempered pottery; dart sized triangular points, long-distance exchange, a hierarchical social structure and a political system described as a chiefdom (Service 1971; Griffin 1967; Lewis 1990:375). Reid writes (1997:37-38),

“An elaborate belief system and corresponding hierarchical social structure, based on kinship and structured through hereditary ranked lineages, were also characteristic of Mississippian societies (Chapman 1985; Smith 1986; Steponaitis 1986). Hereditary ranking determined individual social position, with chiefs controlling social, religious, and economic activities. Clans were also an important part of Mississippian social organization. Clan membership provided social identity, prescribed social behaviours, and determined property ownership (Chapman 1985).”

In the Pennyroyal Section of the Green River Management Area of Kentucky, early Mississippian regional developments include those of the Hadden site, a mortuary complex located on a hilltop that overlooks the Whippoorwill Valley in Todd County (Lewis 1996b:140). The Hadden site and other early Mississippian sites in southern Kentucky, consist of only a few small mounds, each of which holds one or more stone-lined mortuary cists (Allen 1977:11; Lewis 1996b:140). The Late Mississippian culture in the western portion of the Pennyroyal Section and the eastern part of the Lower Tennessee/Cumberland Section of the Purchase Management Area include Tinsley Hill phase (A.D. 1300-1450) cultures. The Tinsley Hill site is a large village consisting of Tinsley Hill and Jonathan Creek phase occupations, which are located in the Cumberland Valley near the mouth of Eddy Creek in Lyon County (Clay 1979; Lewis 1996b:145-146).

Mississippian artifact assemblages differ considerably from those of earlier periods and vary between regions within the Mississippian period depending on stylistic preferences and availability of certain raw materials (Lewis 1996b:157). In western Kentucky during the early Mississippian period (before A.D. 1300), ceramics are characterized by plain, fabric-impressed, or red-filmed globular jars, hemispherical bowls, flanged-rim bowls, hooded bottles and pans. During the later part of the Mississippian period (after A.D. 1300) in western Kentucky, ceramics include incised jars, bowls, and plates, although decorated vessels account for less than five percent of the total assemblage (Lewis 1996b:158).

Mississippian points include: triangular arrow types such as *Madison*; and elliptical forms such as the late Mississippian *Nodena* (Justice 1987:224-227, 230-232). Mississippian assemblages include: the bow and arrow; soapstone and steatite ear spools; polished celts; stone pipes; chisels; chert hoes; mortars; anvil stones; hammerstones; stone disks; awls, needles and fish hooks of bone; and gorgets, beads, and hoes made of shell (Griffin 1967; Muller 1986; Schroedl et al. 1985).

The Historic Period

By the time of Euro-American colonization of Kentucky in the late 1700s, Mississippian villages had probably long been abandoned (Lewis 1996b:159). It is unclear when the first Europeans explored what is now Kentucky, but by the late seventeenth century, Marquette and Joliet at least viewed parts of Kentucky during their trip down the Mississippi River in 1673 (McBride and McBride 1990:583).

Early settlement in the lower Ohio Valley includes Fort Massac, which was established by the French in 1711 on the banks of Ohio River in Illinois and near Paducah, Kentucky. Another early fort built along the lower Ohio River was Fort Jefferson, which was authorized for establishment in 1780 by Thomas Jefferson, then the governor of Virginia. The fort was planned to be the first permanent Euro-American settlement in extreme west Kentucky, however, following repeated attacks by the British and their Chickasaw allies, the fort was abandoned in 1781 (Carstens 1991:3-4).

By the late 1760s, “Long Hunters” from the eastern United States were also venturing into present-day Kentucky, via the Cumberland Gap, for months and years at a time (McBride and McBride 1990:587). Daniel Boone, negotiating with the Cherokee, built the Wilderness Road, which became the primary overland route through Kentucky from 1775 to 1818 (Ison et al. 1991:11). With increasing white settlement in the region, the struggle for control between the French, British and Native Americans led to the steady decline of Native populations, primarily resulting from introduced Old World diseases, such as small pox, chicken pox, influenza, measles and the common cold, to which they had not developed a resistance (Sharp 1996:181).

Christian County was established in 1797 and the town of Elizabeth was made the county seat. In 1804, the town’s name was changed to Hopkinsville (Turner 1974). The first settlers in Christian County were natives of Virginia including James Davis and John Montgomery. The following twenty years saw the steady migration of settlers into Christian County (Froedge 1980:1). The economic focus of the region was geared to large farms for cropland and pasture. The timber industry has also been important and forest has receded. Corn, soybeans, small grains, tobacco, dairy, poultry, and timber are economic drivers (Froedge 1980:1).

Archival and Previous Cultural Resource Research

The following sections present the results of the archival and background research executed prior to fieldwork.

Survey of Historic Documents

Table 2 lists the maps and aerial photographs that were examined as part of the literature review and Figures 5 and 6) show the building locations noted from those documents. The earliest detailed maps available are those produced by the Sanborn Map Company for the town of Pembroke. The Sanborn maps only show a small portion of the project area where it is along Main Street. Between 1895 – 1910 several structures are shown associated with a tobacco stemmery, cooper shop, livery, and a farmstead within or immediately adjacent to the project area. The maps were digital and so the scale was not useful for determining the exact placement of the structures within the project area.

The 1912 county soil map shows many structures along Main Street in Pembroke, however, it is difficult to determine if they are within the project area. Structures in these maps are often plotted in relation to other features rather than in their precise locations plus the maps have large scales. Two additional structures are west of the Pembroke town limits just south of the railroad tracks and two are shown in the field southeast of the new CSX facility, which is at the location of an existing farmstead.

The 1937 and 1955 county highway maps have similar issues as the 1912 soil map with precision and scale. Individual structures are not plotted east of the creek and the area is marked as within the Pembroke town limits. A structure is shown at the location of the existing farmstead at the west end of the project area in 1937 and another is shown at the existing farmstead at the north end of the project area. Although buildings come into use and go out of it through time, both of these farmsteads are on every subsequent map and aerial photograph through the present.

Structures are shown in the eastern half of the project area adjacent to Pembroke on the USGS quadrangles and aerial photographs through 1973. By 1981, only one structure remained in the field and this one was removed by 2006. By 2013, the only buildings remaining of the western complex is a barn, an outbuilding, and a pump house; the only building remaining of the northern complex is the house. The only additions have been the CSX facility built at the north end of the project area.

Table 2. Summary of Maps Examined During the Literature Review

Map Source and Date	Summary of Findings
1895, 1905, 1910 Pembroke Sanborn fire insurance maps	Shows several structures within Pembroke including those related to a tobacco stemmery, cooper shop, livery, and a farmstead
1912 Christian County soil map, USDA, Bureau of Soils	2 structures outside of Pembroke, 6 structures within Pembroke, John Rivers Road and Louisville and Nashville Railroad present and in current alignment
1937 Christian County highway map, Kentucky Department of Highways	1 structure outside Pembroke, no structures shown east of creek – within Pembroke town limits
1950/1951 (ph. Rev. 1981) USGS Pembroke, KY 7.5' quadrangle	Several structures appear associated with two farmstead complexes
1955 Christian County highway map, Kentucky State Highway Department	1 structure outside Pembroke, no structures shown east of creek – within Pembroke town limits
1951/1956 (ph. Rev. 1982) USGS Hopkinsville, KY 7.5' quadrangle	Several structures appear associated with two farmstead complexes
1949, 1969, 1973, 1981, 1993, 2006, 2008, 2011, 2013, 2015, 2016 NRCS aerial photographs	Two farmstead complexes outside of Pembroke;

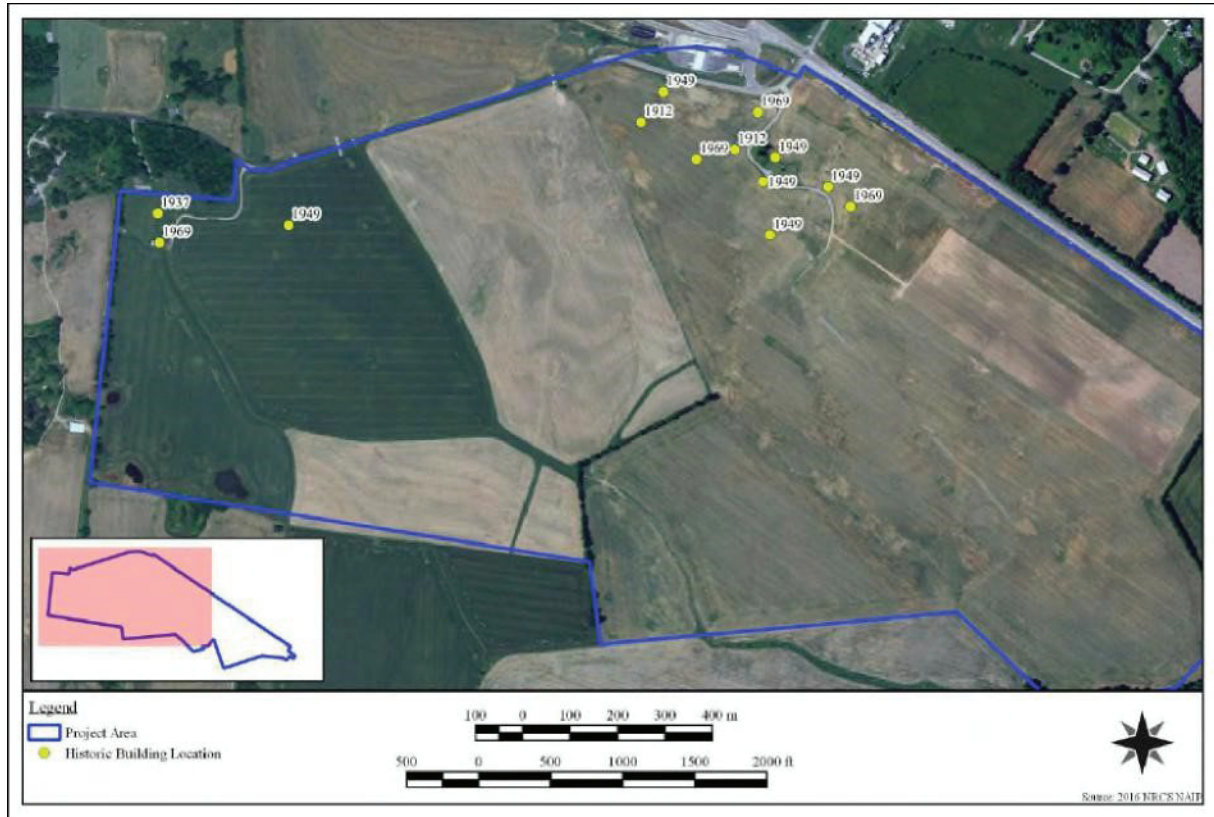


Figure 5. Building Locations Plotted from Historic Maps and Aerial Photographs, West Half (dates are earliest the structure appears)



Figure 6. Building Locations Plotted from Historic Maps and Aerial Photographs, East Half (dates are earliest the structure appears)

Previous Investigations

One cultural resources survey has been conducted within the extreme northwest corner of the project area. During the 2014 survey, Richard Stallings, Susan Andrews, and Duane Simpson documented two sites just within the project area. The sites are recorded as preliminary. There are currently no site forms filed with the State of Kentucky for either of the two preliminary site locations. That project is the Phase I Archaeological Survey of the Proposed CSXT Inspection Yard, Mile Post 00H 229.72-00H 234.84, Christian County, Kentucky, Revised Version.

Previously Recorded Cultural Resources

There are no previously NRHP listed within or immediately adjacent to the project area according to Kentucky Archaeological Survey and Kentucky Heritage Council records. Two preliminary archaeological sites, 15CH698 and 15CH699, are within the extreme northwest corner of the project area.

Research Design and Field Methods

Objectives

The purpose of the survey was to determine the potential for cultural resources within the project area and the need for a Phase I cultural resources survey. Therefore, the research design and field methods were produced by evaluating the environmental and cultural settings with archival records to identify the types of resources which may be present and where they may be found.

Research Design

Based on the results of background literature and recorded archaeological sites, prehistoric were most likely to be encountered along watercourses, on landforms overlooking watercourses, and on landforms overlooking sinkholes. The presence of lithic raw materials would increase the chance for these resources, but no such outcrops were shown in or around the project area.

Based on background research, the project area had a high potential for yielding nineteenth and twentieth century sites. Available maps did not extend further back in time than 1895 so historic occupation in this area predating 1895 is unknown. It was expected that remnants of the western and northern farmsteads, and buildings associated with Pembroke would be encountered.

Field Methods

The fieldwork consists of pedestrian survey with transects spaced 65.6 feet (20 m) apart. Areas of good surface visibility, cut banks, eroded slopes, tree tip-ups, and rodent back dirt piles are given extra attention. When encountered, all resources are delineated by visual inspection, documented with representative photographs of the setting and any artifacts or features. Any artifacts are subjected to in-field analysis and replaced. A Garmin *etrex 30* handheld receiver set to NAD 1983 is used to record all photographs and points of interest. All photographs are taken using an eight megapixel or greater digital camera. Any resources encountered are written up according to the *Specifications for Conducting Fieldwork and Preparing Cultural Resource Assessment Reports* (Kentucky Heritage Council 2006). Due to project time constraints, all resources located during fieldwork are presented in this report with temporary site numbers. Afendras Archaeology will take care of all form submissions to SHPO.

Fieldwork Results

Field Observations

The survey took place during August 2017. Weather conditions were sunny to partly cloudy, hot, humid, and dry except for the final day which had received overnight rain. The project area was easily accessible. As will be discussed below, surface visibility was a major impediment to the survey due to vegetation cover.

The terrain is rolling and divided into fields (Figure 7). The field divisions are generally oriented with landforms (i.e., ridges and drainages). All watercourses observed exhibit some degree of channelization where the centers of the drainages have been modified with shallow channels of consistent width (Figure 8). Banks along the wooded fencelines have been in place long enough to be several feet above the surrounding ground. The build-up appears to be due to a combination of windblown sediment collection and soil deflation and erosion of the surrounding fields. Most of the slopes within the project area have been artificially contoured. Despite the evidence for deflation and erosion, no exposed subsoil (e.g., well-developed Bt horizons) were observed outside of the occasional cutbank suggesting the possibility that the plow zone may not exceed the depth of more recent soil horizons (e.g., A horizon). To accommodate the CSX facility at the north end of the project area, John Rives Road was diverted and a portion of the hill was removed (Figures 9 and 10).

The vegetation was split between soybeans, corn, and woods. At approximately 425 acres, the soybean fields covered the largest amount of area (Figures 11 through 15). The plants were up to four feet high. In some areas, the soybeans were very dense with no clear rows and difficult to walk through. In other areas, there was space enough between the rows to allow easy walking. Wider rows did not always provide for better surface visibility as the ground was matted with winter wheat chaff. The chaff was not smashed into the ground suggesting the soybeans were planted soon after the wheat was harvested. Broken limestone was present in certain areas with the purpose of improving the soil. No bedrock exposures were observed within the project area and the geophysical study of the property concluded that bedrock was 13 – 50 feet below the surface (Mundell & Associates, Inc. 2017:8). Surface visibility in the soybean fields ranged from none to 80 percent. There were few small widely scattered areas of bare ground.

Approximately 280 acres of the project area were corn fields (Figures 16 through 18). The corn averaged around eight feet in height. Most of the ground within the fields was bare. Scattered areas of tall, thick grass were present at lower elevations and around drainages, and sinkholes. Broken limestone was also present in certain areas. Surface visibility averaged 90 percent.

The woods along the fences were thinly strung out. The drainage in the south was the largest wooded area (Figure 19). This is a riparian setting with fields abutting fairly steep slopes which descend to the channel. There was flowing water and the channel was up to 10 feet wide. The woods were moderately dense and the understory varied between low and high density of bushes and some briars. There was no surface visibility except for the occasional erosional cutbank and game trail.



Figure 7. Facing West Half of the Project Area



**Figure 8. Example of Channelized Drainage
between corn and soybean fields**



Figure 9. Northeast Facing CSX Facility



Figure 10. Southwest Facing CSX Facility



Figure 11. Example of Good Surface Visibility in soybean field -- note limestone at surface



Figure 12. Example of Soybean Field with thicker vegetations but clear rows



Figure 13. Example of Dense Soybean Field with no clear rows



Figure 14. Example of Sinkhole in Soybean Field

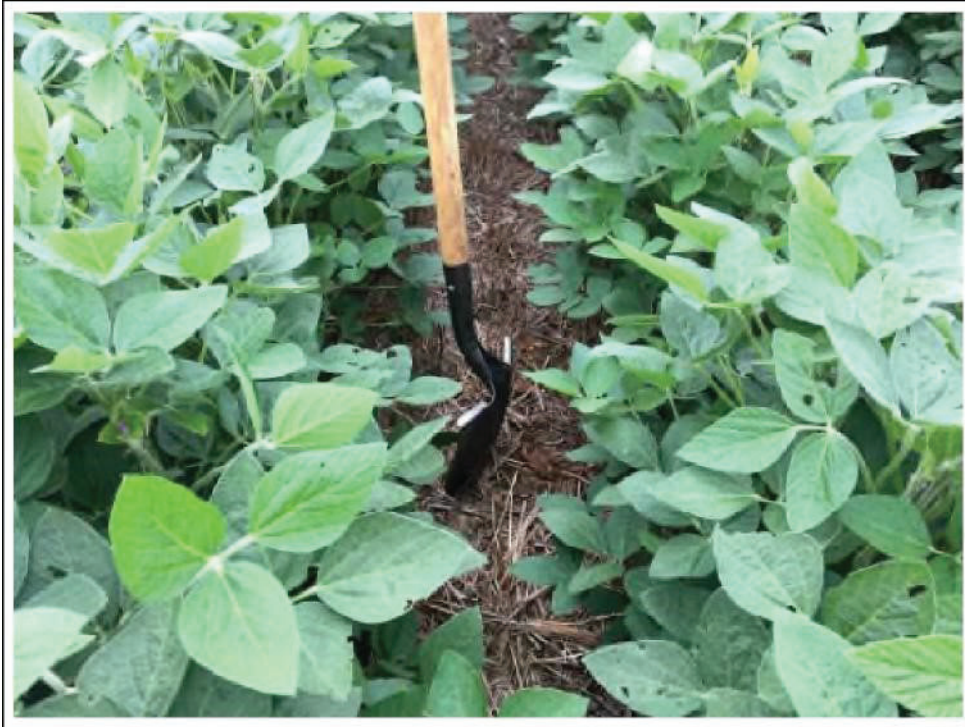


Figure 15. Example of Soybean Field with Surface Covered with wheat chaff



Figure 16. Example of Corn Field/Woods Border



Figure 17. Example of Surface Visibility within Corn Field



**Figure 18. Steep Banks Descending to Water-Filled Sinkhole
in corn field**



Figure 19. Example of Wooded Creekland Riparian Vegetation

Cultural Resources

Sixteen prehistoric resources (P-1 through 16), eight historic resources (H-1 through 8), one historic isolated find (IF-1), and one mid-nineteenth century cemetery were documented during the survey (Figures 20 and 21). Approximately 234 acres (33 percent) of the project area contains prehistoric and historic resources. Surface visibility was poor over large portions of the project area and many of the gaps in resources were in these areas suggesting there are additional resources and that the extents of documented resources may be larger.

The following are some general observations about the prehistoric and historic resources. Most of the prehistoric artifacts were lithic debitage, especially shatter, and the raw materials were similar at all locations. It is unclear whether the similarities are due to contemporaneous occupation or proximity, cultural or geographic, to certain lithic raw material sources. Because no subsoil was observed at the surface, there is the possibility for intact deposits and features (probably truncated). The depth of the plow zone and the potential for buried, both shallow and deeply, would need to be assessed through shovel testing.

The historic artifacts present at all sites were consistently stoneware, Albany, Bristol, clear glass, blue and purple glass, unmarked red brick fragments, concrete chunks, transfer, and milk glass mason jar lid fragments. Powerline/telephone insulators of clear and blue glass and ceramic were also noted. One clay marble was found at H-7. These materials date from the late nineteenth into the twentieth century which corresponds with the information on the historic resources from maps and aerial photographs. Because of plowing, it is unlikely intact historic deposits or features would be identified through additional subsurface investigation.

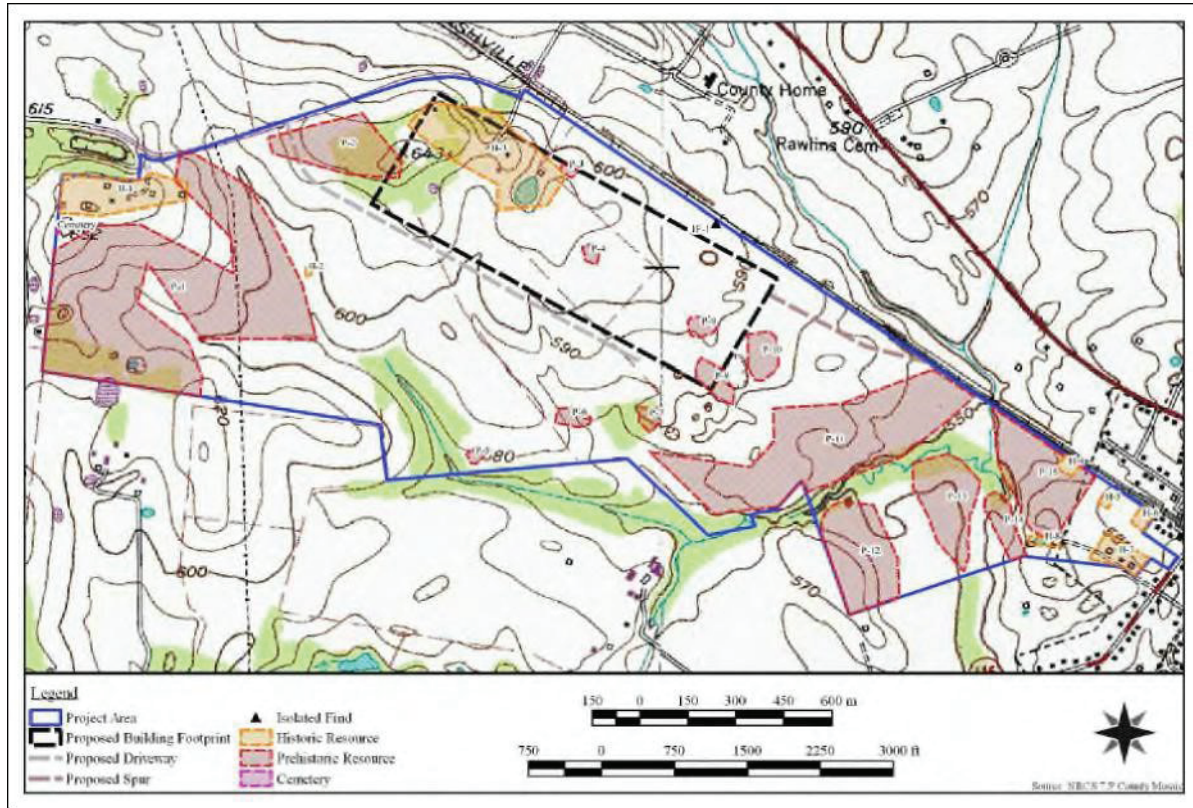


Figure 20. Resources Identified During Fieldwork with proposed developments, quadrangle

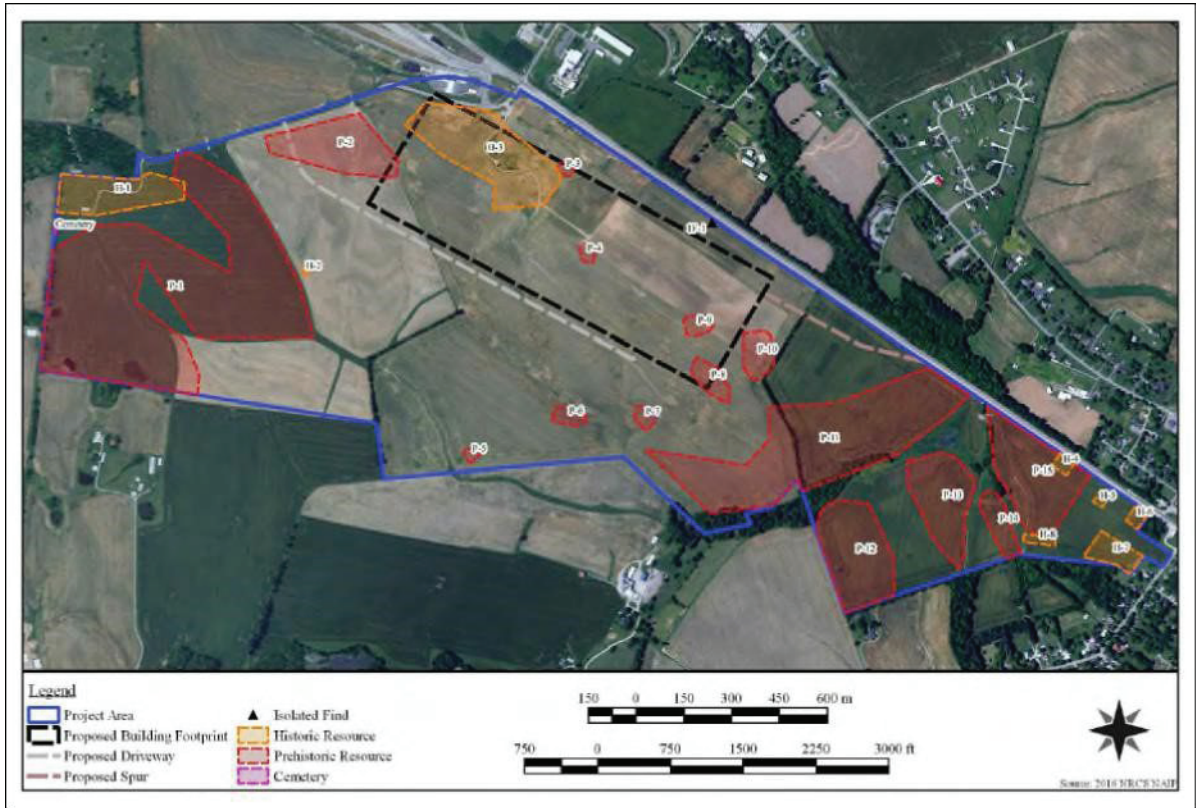


Figure 21. Resources Identified During Fieldwork with proposed developments, aerial photograph

P-1

This is a prehistoric resource consisting of hundreds of debitage and one side-notched projectile point fragment (Big Sandy) across approximately 83.7 acres at the surface of two adjoining landforms overlooking a drainage to the east (Figure 22). One landform is a southeast facing ridgetoe to the north and the other is a ridgeline and saddle to the south. One branch of the drainage borders the north side of the resource and another separates the two landforms. On the ridgetoe, the resource hugs the lower slopes, but it covers the slopes as well as the crest of the ridgeline and saddle. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. Big Sandy points date to the Early Archaic, however, as a surface find it is unclear whether P-1 is an Early Archaic occupation or representative of one of other components. features were observed. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.



**Figure 22. Side-Notched Projectile Point Fragment
from northeast facing slope off saddle**

P-2

This is a culturally unassigned prehistoric resource consisting of less than 100 debitage scattered across approximately 12.8 acres at the surface of a knoll and southwest slope towards a drainage. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond the present boundary.

P-3

This is a prehistoric resource consisting of about 10 debitage scattered across approximately 0.4 acres at the surface of a northeastern ridgeline overlooking a drainage to the northeast and a sinkhole to the west. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-4

This is a prehistoric resource consisting of about 10 debitage scattered across approximately 0.6 acres at the surface of an east facing ridge crest. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-5

This is a prehistoric resource consisting of about 10 debitage scattered across approximately 0.5 acres at the surface of a south facing ridgetoe overlooking the confluence of two drainages. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-6

This is a prehistoric resource consisting of about 10 debitage scattered across approximately 1.3 acres at the surface of a and east facing ridgetoe overlooking a drainage. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-7

This is a prehistoric resource consisting of about 10 debitage scattered across approximately one acre at the surface of southwest facing ridgetoe overlooking a drainage to the south and a sinkhole to the east. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-8

This is a prehistoric resource consisting of 20 debitage, a core, and a biface fragment scattered across approximately 2.4 acres at the surface of a southeastern slope overlooking sinkholes to the southwest and northeast. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-9

This is a prehistoric resource consisting of about 10 debitage scattered across approximately 1.2 acres at the surface of an east sloping ridgetoe overlooking a sinkhole to the southeast. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-10

This is a prehistoric resource consisting of about 20 debitage and a core scattered across approximately 3.1 acres at the surface of a southeast facing ridgetoe overlooking a sinkhole to the southwest. No features were observed. It is within a soybean field with variable surface visibility. The resource was delineated by surface expression, but due to visibility and potential for subsurface deposits, the resource may extend beyond present boundary.

P-11

This is a prehistoric resource consisting of hundreds of debitage, metate fragments, a mano, side-notched projectile point fragments, bifaces, cores, and pottery scattered across approximately 46 acres at the surface of a southeast facing slope overlooking watercourse confluences to the southeast, northeast, and southwest, and sinkholes to the northwest (Figures 23 through 25). The eastern half of P-11 is in a corn field with up to 95 percent surface visibility and the western half is in a soybean field with variable surface visibility. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. The pottery is shell tempered with no decorative elements. No features were observed. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.



**Figure 23. Sample of Artifacts from P-11
(4 shell tempered pottery in upper right,
metate fragment in center right,
projectile point fragments in lower right,
discarded adze or biface in top center,
remainder of debitage representative lithic raw materials)**



Figure 24. Biface from P-11



Figure 25. End Scraper from P-11

P-12

This is a prehistoric resource consisting of dozens of debitage scattered across approximately 15.2 acres at the surface of a north-south rise overlooking the watercourse to the northeast. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. No features were observed. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.

P-13

This is a prehistoric resource consisting of hundreds of debitage scattered across approximately 11.7 acres at the surface of a northeast point of land overlooking the confluence of a drainage with Montgomery Creek. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. No features were observed. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.

P-14

This is a prehistoric resource consisting of dozens of debitage scattered across approximately 3.4 acres at the surface of a northeast point of land overlooking the confluence of a drainage with Montgomery Creek. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. No features were observed. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.

P-15

This is a prehistoric resource consisting of dozens of debitage, cores, side-notched projectile point fragments, and bifaces scattered across approximately 16.3 acres at the surface of a northwest facing ridgetoe and terrace overlooking the confluence of a drainage with Montgomery Creek (Figure 26). The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. No features were observed. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.



Figure 26. Samples of Artifacts from P-15

H-1

This is the remains of a farmstead complex consisting of a barn (Building-1) and a pumphouse (Building-2) and an approximately 9.9-acre associated surface scatter with hundreds of domestic artifacts. The original house stood east of the barn, but was abandoned after a new one was built north of the barn after 1993. A shed was also built west of the barn after 1993. The farmstead is on an upland rise, and the highest point within the project area, overlooking the surrounding landscape. It is within a corn field with up to 95 percent surface visibility and a manicured grass lawn with less than 10 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey. Structures are first visible on historic maps in 1937 and on aerial imagery at this location in 1949. Based on good surface visibility, the surface expression was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

Building-1. This is a standing front gable barn of no distinctive architectural style (Figure 27). It rests on a concrete foundation and has been covered with sheet metal, but was probably originally wood. There is one metal door near the southeast corner. Building-1 is first visible on historic aerial imagery in 1969.

Building-2. This is a front gable pump house of no distinctive architectural style (Figures 28 and 29). Building-2 is composed of a wood superstructure which covers a semi-subterranean housing for modern pump equipment. Building-2 is first visible on historic aerial imagery in 1949.



Figure 27. Northwest Facing H-1 Barn



Figure 28. East Facing H-1 Pumphouse



Figure 29. Interior View of H-1 Pumphouse

H-2

This is a historic resource consisting of non-descript artifacts scattered across approximately 0.1 acres at the surface of a southwest facing slope overlooking the confluence of two drainages. The artifacts include unmarked red bricks, concrete chunks, and clear glass. No features were observed. No buildings are shown at this location in the past, but the 1973 aerial photograph shows there used to be converging fencelines at this location. It is within a soybean field with variable surface visibility. Although the resource was delineated solely by surface expression, it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

H-3

This is the remains of a farmstead complex consisting of a house (Building-1) and an approximately 20.5-acre associated surface scatter with hundreds of domestic artifacts. The complex has contained up to 10 buildings based on maps and aerial photographs, the earliest of which were in 1912, but all except for the house have been razed. The farmstead is on a ridge overlooking the surrounding landscape (Figure 30). It is within a soybean field with variable surface visibility. Although the resource was delineated solely by surface expression, it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

Building-1. This is a house built in the National Folk style. The house is a side gable building with a drop cross gable covered front porch and entryway. It is composed of a concrete foundation which supports a brick and vinyl exterior. The doors and windows are metal. Building-1 is first visible on historic aerial imagery in 1949.



Figure 30. Northwest Facing H-3 House

H-4

This is a historic resource consisting of dozens of late-nineteenth to early twentieth century domestic artifacts scattered across approximately 0.6 acres at the surface of a southwest facing slope overlooking the confluence of a drainage and Montgomery Creek. No features were observed. A building is shown at this location in 1912, but not after. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

H-5

This is a historic resource consisting of dozens of late-nineteenth to early twentieth century domestic artifacts scattered across approximately 0.3 acres at the surface of a northwest facing ridgetoe overlooking the confluence of a drainage and Montgomery Creek. No features were observed. A building is shown at this location in 1912, but not after. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

H-6

This is a historic resource consisting of dozens of late-nineteenth to early twentieth century domestic artifacts scattered across approximately 0.7 acres at the surface of a northwest facing ridgetoe overlooking the confluence of a drainage and Montgomery Creek. No features were observed. Buildings are shown at this location in 1912, but not after. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

H-7

This is a historic resource consisting of hundreds of late-nineteenth to early twentieth century domestic artifacts scattered across approximately three acres at the surface of a southwest slope overlooking the confluence of a drainage and Montgomery Creek. No features were observed. Buildings are shown at this location in 1895 - 1973, but not after. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

H-8

This is a historic resource consisting of dozens of nondescript domestic artifacts scattered across approximately 0.6 acres at the surface of a southwest slope overlooking the confluence of a drainage and Montgomery Creek. No features were observed. Buildings are shown at this location in 1949 - 1993, but not after. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

IF-1

This consists of a single broken clear glass powerline/telephone insulator found at the surface on a northeast facing slope overlooking the railroad. The find is at the edge of a soybean field which had 75 percent surface visibility. No additional artifacts or features were present. No buildings have been shown at this location. Based on good surface visibility, the surface find was delineated during the survey and it is unlikely additional intact deposits or features would be encountered through subsurface investigation.

Cemetery

This cemetery is not on any available maps past or present and appears to be abandoned (Figures 31 through 36). A large amount of broken stone scattered on the surface indicates possible disturbance. While it does not appear there has been any earthmoving, the stones may have been from the corn field and placed at the cemetery. It is on the west side of an upland knoll overlooking lower terrain to the west. The cemetery is bounded by a wooded fenceline on the west side and is open to the north, east, and south. There is dense vegetation, including trees, shrubs, and thick, tall grass. There is no surface visibility. The cemetery consists of one standing headstone inscribed with:

In Memory of
Mondania
Daughter of A.T.
& M.L. Reeder
Born Oct 3rd 1815
Died July 26th
1845

This stone faces west. Another headstone of similar material and fabrication was lying face down and imbedded in the ground about two feet away due to possible disturbance. Parallel with the fenceline and in line with the standing headstone are three unhewn and unadorned limestone slabs are imbedded in the ground and protruding a few inches above the surface. These may be additional graves. Aside from the headstones limestone, the only other item present was a chunk of mixed aggregate formed concrete post remnant. It is haphazardly strewn and partially imbedded in the surface. Brief internet searches did not reveal any information about Mondania and her parents although many nineteenth century Reederes are buried in Hopkinsville.



Figure 31. South Facing Vegetation at Cemetery



Figure 32. Close-up of Headstone for Mondania Reeder



**Figure 33. Standing and Fallen Headstones
with Scattered Limestone**



**Figure 34. North Facing Headstones
(fencepost remnant to left)**



**Figure 35. South Facing Headstones
(with imbedded limestone slabs)**



Figure 36. Close-up of Concrete Fencepost Remnant

Summary and Recommendations

Greenhouse CONSULTANTS incorporated conducted a cultural resources reconnaissance survey of the Commerce Park II development (approximately 705 acres), Christian County, Kentucky, for the Hopkinsville Industrial Foundation. The proposed project is for the construction of a 1.5 million square foot building with associated access routes, parking lots, and a rail spur off an existing railroad alignment. The purpose of the survey was to determine the potential for cultural resources within the 705-acre tract and the need for a Phase I cultural resources survey. At this time, no federal nexus has been identified and this survey was completed as a due diligence effort.

One cultural resources survey has been conducted within the extreme northwest corner of the project area, yielding two preliminary archaeological sites (15CH698 and 15CH699). That project is the Phase I Archaeological Survey of the Proposed CSXT Inspection Yard, Mile Post 00H 229.72-00H 234.84, Christian County, Kentucky, Revised Version.

Sixteen prehistoric resources (P-1 through 16), eight historic resources (H-1 through 8), one historic isolated find (IF-1), and one mid-nineteenth century cemetery were documented during the survey. P-2 through 7, 9, 12 through 14 consisted solely of debitage found at the surface. P-1, 8, 10, 11, and 15 consisted of debitage with other artifacts including pottery, cores, bifaces, side-notched projectile point fragments, manos, metate fragments, and scrapers. The resources with only debitage tended to have fewer artifacts and be located further from the confluence of Montgomery Creek with other watercourses. The resources with other artifacts in addition to debitage tended to have higher artifact density and be nearer to the creek confluence. The prehistoric resources were delineated by surface expression, but due to variable surface visibility and potential for subsurface deposits, shovel testing should be used to determine the subsurface extent of the resources and assess them for NRHP.

H-1 and 3 are the remains of early- to mid-twentieth century farmsteads. Most of the buildings for each have been razed and the resources are associated with large surface artifact scatters. H-2, 4 through 8 are surface artifact scatters which are the remains of residential and commercial buildings associated with late-nineteenth to mid-twentieth century Pembroke. No features were observed at these resources. Because of plowing, it is unlikely intact historic deposits or features would be identified through additional subsurface investigation. Furthermore, these resources would likely not be NRHP eligible due to lack of integrity.

Our survey revealed approximately 234 acres (33 percent) of the project area contains prehistoric and historic resources. Surface visibility was poor over large portions of the project area and many of the gaps in resources were in these areas suggesting there are additional resources and that the extents of documented resources may be larger. On the basis of this reconnaissance we recommend that a Phase I survey should be conducted to locate and delineate cultural resources within the project area, evaluate the National Register of Historic Places eligibility of located cultural resources, and assess the effect the proposed improvements will have on the resources. The research design and field methods should be determined in consultation with the Kentucky State Historic Preservation Office.

This report is for informational purposes only. If this project is determined to be a federal undertaking, the consulting agency may still require a Phase I cultural resources survey to comply with Section 106 of the National Historic Preservation Act.

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Appendix I: Facility Survey Plan



Figure 37. Conceptual Plan of the Commerce Park II Development

Exhibit 7: Resources Identified During 2017 Field Work

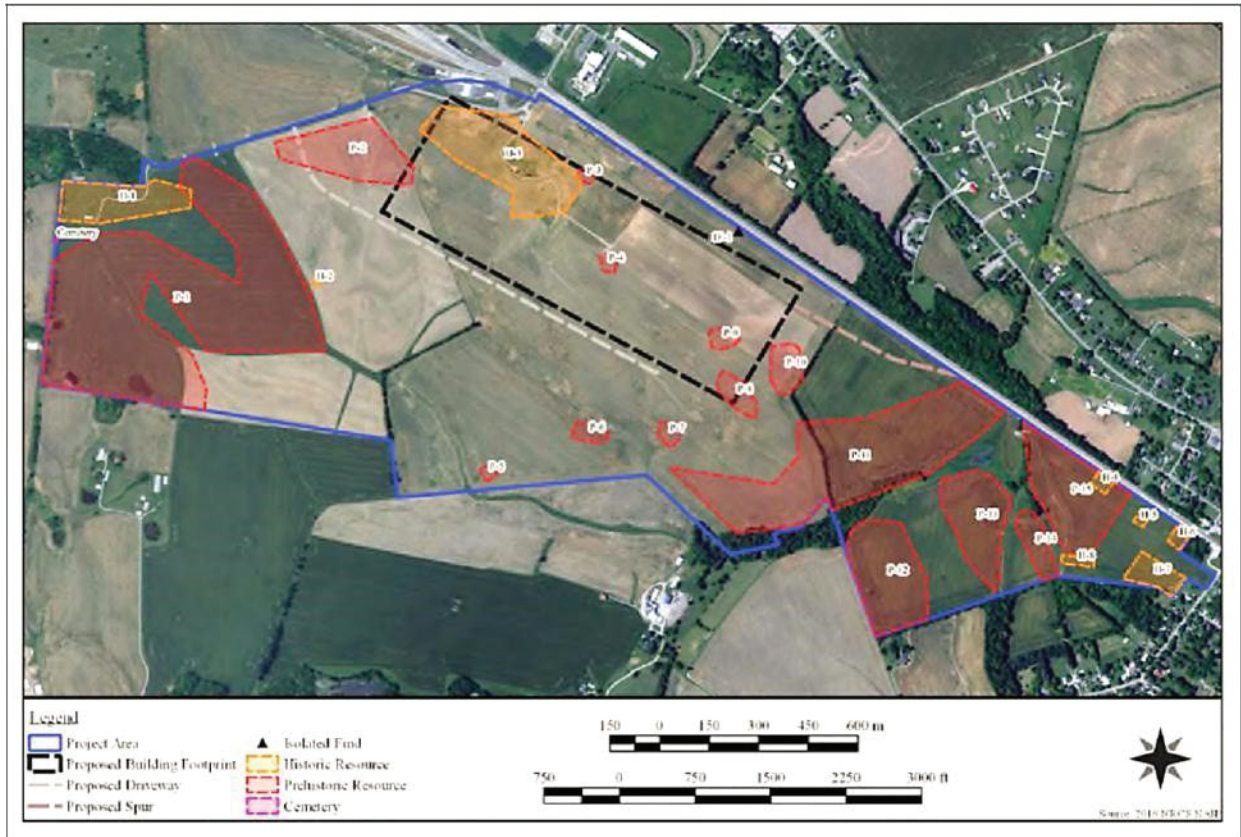


Exhibit 8: Resources Identified During 2017 Field Work with Facility Site Plan Overlay

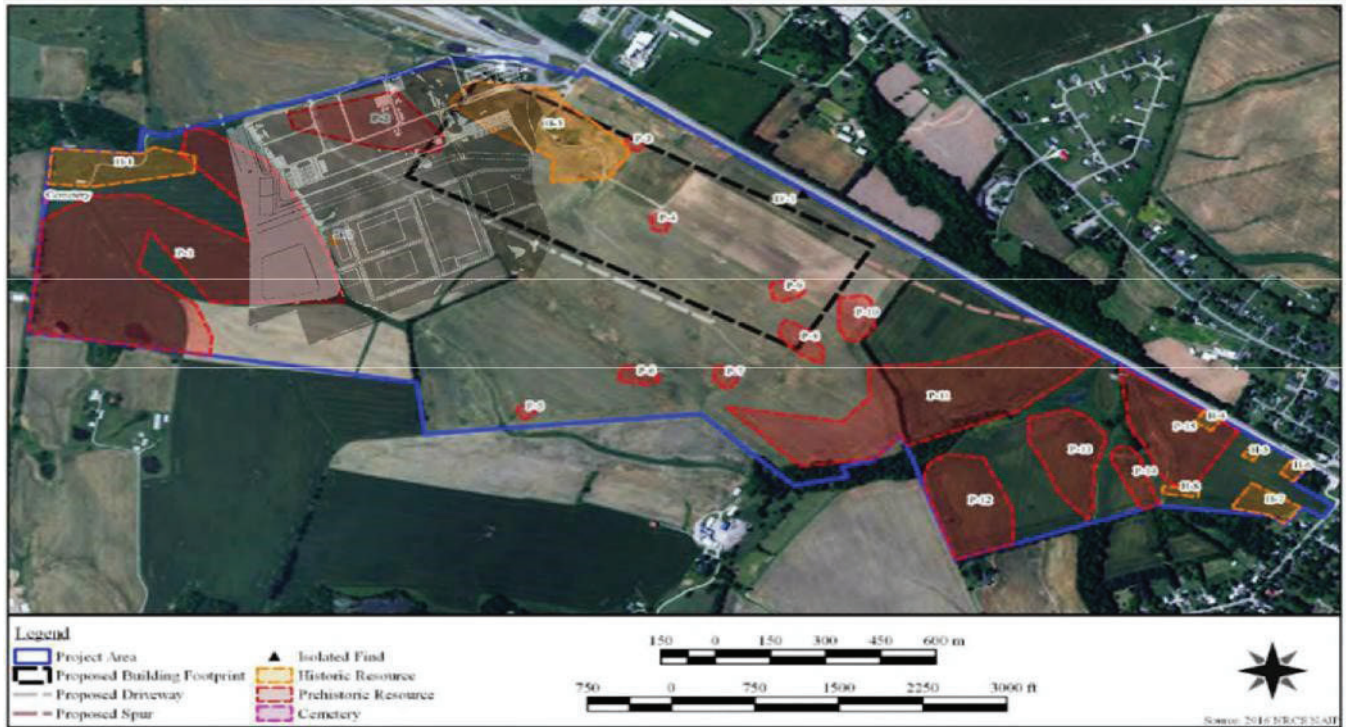


Exhibit 9: Resource Area P1



P1

This is a prehistoric resource consisting of hundreds of debitage and one sidenotched projectile point fragment (Big Sandy) across approximately 83.7 acres at the surface of two adjoining landforms overlooking a drainage to the east (Figure 22). One landform is a southeast facing ridgetoe to the north and the other is a ridgeline and saddle to the south. One branch of the drainage borders the north side of the resource and another separates the two landforms. On the ridgetoe, the resource hugs the lower slopes, but it covers the slopes as well as the crest of the ridgeline and saddle. The artifact scatter was not consistently distributed across the landscape, but was denser in some area and less dense in others. Big Sandy points date to the Early Archaic, however, as a surface find it is unclear whether P-1 is an Early Archaic occupation or representative of one of other components. features were observed. It is within a corn field with up to 95 percent surface visibility. Based on good surface visibility, the surface expression was delineated during the survey, but intact subsurface deposits and features may exist.

- Commerce Park II Reconnaissance Survey
Christian County, Kentucky at p.52.

Exhibit 10: Resource Area P2

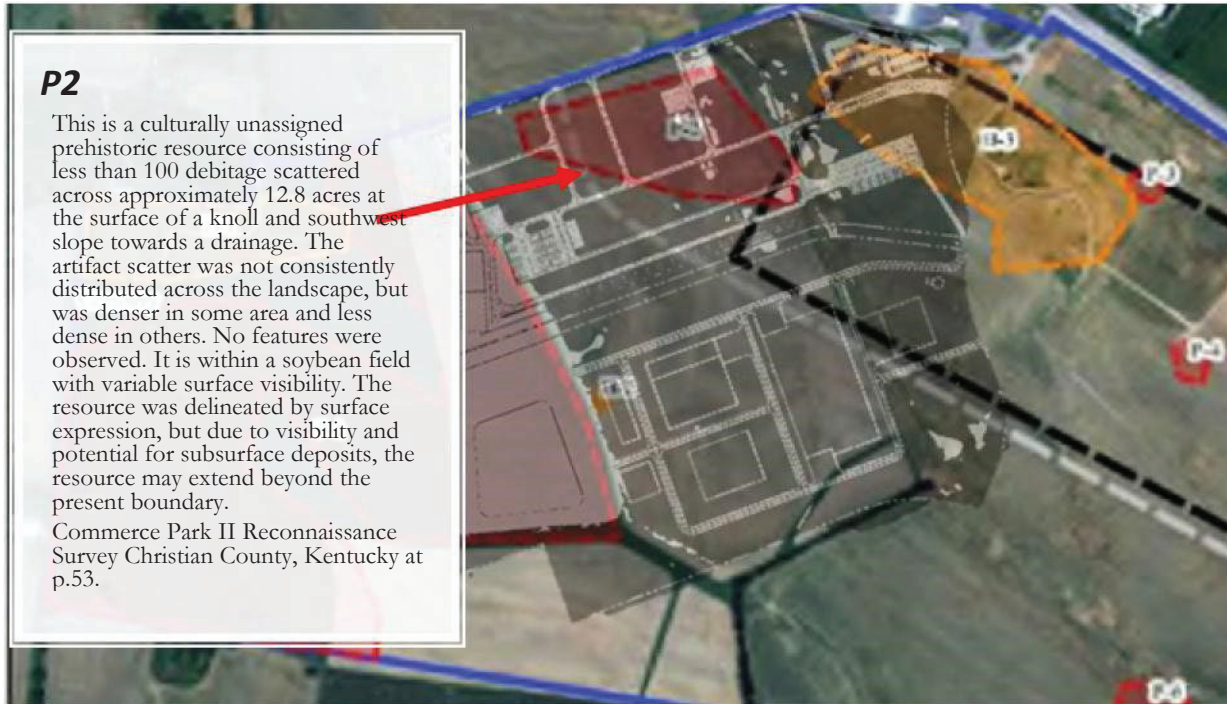
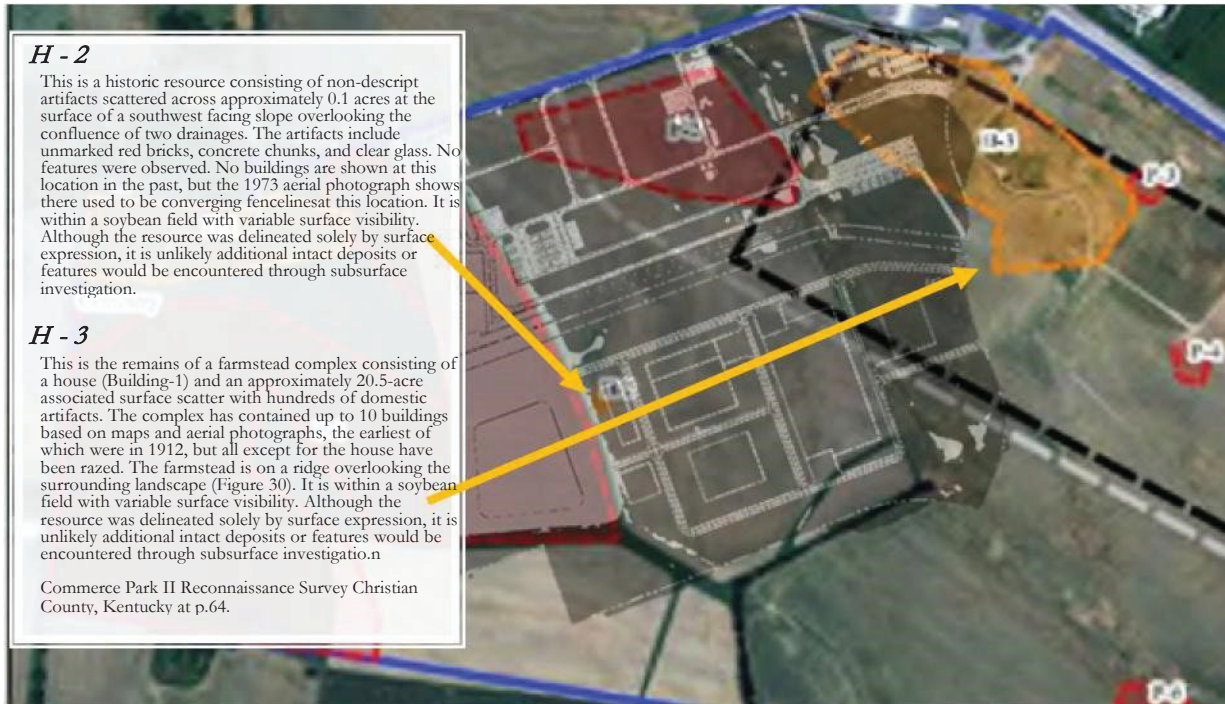


Exhibit 11: Resource Areas H2 and H3



Appendix 4

Relevant Project Plans

Inadvertent Discovery Plan for Project Apex

Ascend Elements is committed to working with the Department of Energy, the Kentucky Heritage Council, and Tribal Nations to identify and document any historic or cultural resources that exist at the Project Apex site. As a supplement to that work, Ascend Elements has adopted the following process for responding to any unanticipated discoveries of, or effects on, historic resources during implementation of the Project.

I. Procedures for Unanticipated Historic Resources or Unanticipated Adverse Effects

If historic properties are discovered or if unanticipated effects on historic properties occur, Ascend Elements will implement the following procedures:

- A. Ascend Elements will immediately pause all operations with the potential to affect the unanticipated historic resource or that has resulted in an unanticipated adverse effect on a known historic resource.
- B. On the same day the discovery is made, complete the attached "Ascend Elements Unanticipated Discovery Reporting Form."
- C. Within one business day after the date of an unanticipated discovery, Ascend Elements will inform the Department of Energy and the Kentucky Heritage Council, using the contact information contained in Section III, of the unanticipated discovery, along with any additional information relevant to the discovery.
- D. When appropriate, Ascend Elements will consult with a third party that possesses the appropriate qualifications regarding the potential eligibility of the unanticipated historic resource for listing on the National Register or the potential for the unanticipated adverse effect to impact the qualifying characteristics of a known historic resource.
- E. Within three business days after the date of an unanticipated discovery, or as soon as appropriate thereafter, and taking into account any consultation conducted under Paragraph C, Ascend Elements will inform the Department of Energy and the Kentucky Heritage Council of the potential eligibility of the unanticipated historic resource for listing on the National Register or the potential for the unanticipated adverse effect to impact the qualifying characteristics of a known historic resource, along with a determination as to whether any additional evaluation of the unanticipated historic resource or unanticipated adverse effect on a known resource is planned.
- F. In addition to the notifications described above, to the extent an unanticipated historic resource or unanticipated adverse effect on a known resource has the potential to adversely affect sites of religious or cultural significance to a Tribal Nation, Ascend Elements will also inform the Tribal Nations, using the contact information contained in Section III, when notifying the Department of Energy and the Kentucky Heritage Council under Paragraph C or Paragraph E, or as soon as possible thereafter.
- G. In response to receiving information under Paragraph C, Paragraph E, or Paragraph F, the State Historic Preservation Officer or the Tribal Historic Preservation Officer representing the State Agency or the Tribal Nation who received the information may request consultation regarding Ascend Elements' determination as to whether any additional evaluation of the unanticipated historic resource or unanticipated adverse effect on a known resource is planned.
- H. Any consultation requested under Paragraph G will be conducted within three business days after the date such consultation is requested.
- I. Upon the expiration of the period for consultation specified in Paragraph H, or, if no request for consultation is made within five business days after the date the information under Paragraph E, or Paragraph F is delivered, all work paused under Paragraph A may resume.

II. Special Procedures for the Treatment of Human Remains and Sacred Objects

The purpose of these special procedures is to establish a clear plan of response in the event of an inadvertent discovery of human remains and/or artifacts at the Project Apex site that could potentially be Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony. These procedures incorporate protective measures contained in the Native American Graves Protection and Repatriation Act (NAGPRA) (P.L. Law 101-601; U.S.C. 3001-3013; 104 STAT. 3048-3059, Section 3) and implementing regulations (43 CFR Part 10, Section 10.4), which govern such discoveries on federal or Tribal lands. The special procedures are consistent with the principle that any human remains encountered during the undertaking will be given sensitive and respectful treatment.

If human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered at any time during implementation of the Project, Ascend Elements will follow the procedures described above, as supplemented by these additional procedures.

- A. Immediately stop all work within thirty (30) meters of the area of the discovery.
 - a. The "area" is defined as any ground surrounding the discovery that is needed to ensure the protection of the human remains, funerary objects, sacred objects, or objects of cultural patrimony.
- B. If the discovery is of skeletal remains, contact the appropriate law enforcement office as soon as practicable after discovery, but no later than the same day as the date of discovery.
 - a. If skeletal material discovered cannot be reasonably identified as non-human, do not disturb the find.
 - b. Only the Sheriff/Coroner has the authority to remove the skeletal material to make a final determination as to its origin.
 - c. Under no circumstances will any unauthorized Ascend Elements personnel or contractors use potentially destructive means (trowels, probes, shovels etc.) to determine if the remains are human or remove the skeletal material.
- C. Secure the area of discovery.
 - a. Human remains must be provided with security at all times until removed.
 - i. Upon discovery, post a guard at the area of discovery until at least the time the proper authorities are notified.
 - ii. An alternative security plan can be utilized after notification if the alternative plan is developed after consultation with the proper authorities.
- D. Protect the discovery.
 - a. At a minimum, protecting the discover will include flagging off the area of discovery.
 - b. Human remains will be carefully covered and secured to protect them from any degradation, inappropriate observation, or inappropriate photography.
- E. Consult with Tribal Nations and the Kentucky State Historic Preservation Office, using the contact information contained in Section III.

III. Contact Information

Ascend Elements will use the following when completing notifications or consultations under this Plan.

- A. Cherokee Nation
 - Hon. Elizabeth Toombs
 - Tribal Historic Preservation Officer
 - PO Box 948
 - Tahlequah, OK 74465
 - (918) 453-5389
 - elizabeth-toombs@cherokee.org
 - <http://www.cherokee.org>
- B. Eastern Band of Cherokee Indians
 - Hon. Russell Townsend
 - Tribal Historic Preservation Officer
 - 2877 Governors Island Road
 - Bryson City, NC 28713
 - (828) 359-6851
 - russtown@ebci-nsn.gov
 - <https://ebci.com>
- C. Eastern Band of Cherokee Indians
 - Hon. Beau Carroll
 - Tribal Historic Preservation Office
 - 2877 Governors Island Road
 - Bryson City, NC 28713
 - (828) 359-6861
 - beaucarr@ebci-nsn.gov
- D. Eastern Band of Cherokee Indians
 - Hon. Stephen Yerka
 - Tribal Historic Preservation Office
 - 2877 Governors Island Road
 - Bryson City, NC 28713
 - (828) 359-6852
 - syerka@ebci-nsn.gov
- E. Kentucky State Historic Preservation Office
 - Hon. Craig Potts
 - Kentucky State Historic Preservation Officer
 - Kentucky Heritage Council
 - The Barstow House
 - 410 High Street
 - Frankfort, KY 40601
 - (502) 892-3601
 - craig.potts@ky.gov
 - <https://heritage.ky.gov/>
- F. Hopkinsville Police Department
 - Non-emergency Dispatch
 - 101 North Main Street
 - Hopkinsville, KY 42240
 - 270-890-1300

G. Department of Energy
Jesse Garcia
NEPA Compliance and Tribal Liaison
U.S. Department of Energy/NETL
1450 Queen Ave SW
Albany, OR 97321
541-967-5912
jesse.garcia@NETL.DOE.gov

ASCEND ELEMENTS UNANTICIPATED DISCOVERY REPORTING FORM

1. DATE OF DISCOVERY:
2. TIME OF DISCOVERY:
3. DATE AND TIME THIS REPORT IS BEING COMPLETED:
4. PERSON COMPLETING THIS REPORT:
 - a. COMPANY AFFILIATION AND POSITION OF THE REPORTER:
 - b. TELEPHONE NUMBER AT WHICH REPORTER CAN BE REACHED:
5. PERSON WHO MADE THE DISCOVERY:
 - a. COMPANY AFFILIATION AND POSITION OF THE DISCOVERER:
 - b. OFFICIAL WORK ADDRESS:
 - c. LOCAL WORK ADDRESS:
 - d. TELEPHONE NUMBER AT WHICH FINDER CAN BE REACHED:
6. CIRCUMSTANCES SURROUNDING DISCOVERY:

7. AREA OF DISCOVERY:
 - a. IS MAP SHOWING LOCATION ATTACHED: Y: _____ N: _____
8. NUMBER AND DESCRIPTION OF ITEM/S DISCOVERED

PLEASE CONTINUE ON BACK, IF NEEDED.

9. WAS ANYTHING REMOVED FROM SITE: Y: _____ N: _____
 - a. IF YES, WHERE IS IT NOW?

10. IF SKELETAL REMAINS, CONTACT INFORMATION FOR LAW ENFORCEMENT OFFICER NOTIFIED

11. SIGNATURE OF THE REPORTER AND DATE:
