

ENVIRONMENTAL ASSESSMENT

THE PLASMA LOW-COST ULTRA SUSTAINABLE CATHODE ACTIVE MATERIAL (PLUSCAM™) PROJECT

December 2023.



Prepared by:

U.S. Department of Energy
National Energy Technology
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**THE PLASMA LOW-COST ULTRA SUSTAINABLE CATHODE ACTIVE MATERIAL
(PlusCAM™) PROJECT**

FINAL ENVIRONMENTAL ASSESSMENT

Madison County, Tennessee

Prepared By:

U.S. Department of Energy
National Energy Technology Laboratory

Recipient:

6K Energy Tennessee, LLC

December 2023



NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) COMPLIANCE COVER SHEET

Proposed Action

6K Energy Tennessee, LLC (6K) proposes to construct the Plasma Low-cost Ultra Sustainable Cathode Active Material (PlusCAM) Project. The objective for 6K's PlusCAM Project would be to demonstrate the ability to domestically produce multiple battery chemistries, namely NMC811 and LFP, in a plant ready for production in 2025 using its patented 6K's UniMelt® microwave plasma processing technology. The facility would sustainably produce NMC811, generating zero hazardous waste (ammonia/sulfates) and 70% less greenhouse gases (GHGs) while using only 10% of the water and 30% of the energy that traditional battery material production methods use. Production costs for both materials would be lower than materials sourced from China. 6K's Project is needed to provide additional supply of critical materials for new lithium-ion batteries, thereby reducing overall national emissions of air pollutants and human-caused GHGs. Once operational, the facility would produce enough material to supply over 100,000 electric vehicles (EV) annually. (This quantity is an approximation only and is contingent upon EV battery specifications and customer demand. It's important to note that not all of the product(s) would be allocated to EV car batteries). DOE's action is to provide 6K with a \$50,000,000 Federal Cost Share towards a \$177,808,345 Total Project Value.

Located within the Airport Industrial Park in Jackson, Madison County, Tennessee, the Project would consist of multiple buildings including a 125-150,000 sq. ft. main building, an electrical building, utility switchyard, raw material and finished product warehousing, and 206 proposed parking spaces. The Proposed Project would include both a pilot phase and full-scale production. Once at full-scale, the Project would be expected to create approximately 150 to 230 long-term jobs throughout operation. 6K would make efforts to work with certified disadvantaged business enterprises (DBEs) and minority-owned businesses during construction and has a goal to hire 40% minority, veteran, and disabled employees during operations as part of the Justice40 Initiative. They would collaborate with vocational rehabilitation centers and/or veteran service organizations to offer training and job placement services, while promoting a diverse and inclusive workplace culture. Furthermore, 6K would offer the "6K for 6K Scholars" scholarship program for eligible students at Lane College, an HBCU (Historically Black Colleges and Universities), pursuing STEM degrees.

While electrification of vehicles and the grid is a key component of a sustainable energy strategy, the manufacturing processes for many key battery materials are not well aligned with the environmental end goals. 6K's revolutionary sustainable manufacturing process using UniMelt® Technology would strengthen domestic production of EV battery materials and enable those materials to be crafted with a focus on environmental responsibility with reduced water and energy usage and zero hazardous waste compared to traditional material manufacturing processes.

Type of Statement: Final Environmental Assessment

Lead Agency: U.S. Department of Energy; National Energy Technology Laboratory



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Abstract

Construction of the proposed facility would be scheduled to begin in **early 2024**. The proposed facility would be brought online in two (2) distinct phases: Phase 1 and Phase 2. Phase 1 would include a pilot program for production lines 1 and 2, which would have 750 tons per annum (tpa) capacity by Q3 2024. During Phase 1, processing would then ramp up to include production lines 3 and 4, for a combined 3,000 tpa capacity by Q1 2025. Phase 2 would see production line 5 brought online and additions to production lines 3 and 4, for a combined capacity of 10,000 tpa by Q1 2026.

The environmental analysis identified that the most notable changes to result from the proposed action would occur in the following areas: aesthetics and visual resources, air quality, generation of regulated wastes, geology and soils, land use, noise, and traffic and transportation, with net-positive impacts to local socioeconomic conditions and greenhouse gas reduction.

Public Participation

DOE encourages public participation in the NEPA process. The Draft Environmental Assessment (EA) was released for public review and comment. The public was invited to provide oral, written, or e-mail comments on the Draft EA to DOE by the close of the comment period on November 28, 2023. Copies of the Draft EA were also distributed to cognizant Federal and State agencies and Tribal Nations. Comments received by the close of the comment period were considered in preparing this final Environmental Assessment for the proposed 6K action. **No comments were received after the end of the comment period.** It is important to clearly articulate comments and include commenter’s name, address, organization, with the reference “6K Draft EA Comments”. Individual names and addresses (including e-mail) 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. **DOE did not receive any such request to withhold information.** 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 and Final EA is also available on the National Energy Technology Laboratory (NETL) website at <https://netl.doe.gov/node/6939>.

Changes to this Final EA from the Draft EA have been bolded, except when they are minor typographical changes and/or changes in tense.



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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
6K	6K Energy Tennessee, LLC.
AADT	Annual Average Daily Trips
ALD	Atomic layer deposition
AMSL	Above mean sea level
AOI	Areas of interest
APE	Area of Potential Effect
APZ	Accident Potential Zone
ARPA	Archaeological Resource Protection Act
BGS	Below ground surface
BIL	Bipartisan Infrastructure Law
BMPs	Best Management Practices
CAA	Clean Air Act
CAM	Cathode Active Materials
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH₄	Methane
CIH	Certified Industrial Hygienist
CO	Carbon Monoxide
CO₂	Carbon Dioxide
CSP	Certified Safety Professional
DAC	Disadvantaged communities
DBE	Disadvantaged business enterprises
DEIA	Diversity, Equity, Inclusion and Accessibility
DOE	Department of Energy
DOL	Department of Labor
DOT	Department of Transportation
DSWM	Division of Solid Waste Management
DTH	Dekatherm
EA	Environmental Assessment
EJ	Environmental justice
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EV	Electric vehicle
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Maps



FOA	Funding Opportunity Announcement
FONSI	Finding of No Significant Impact
GEN	Generation
GHGs	Greenhouse gases
gpd	Gallons per day
gpm	Gallons per minute
HAP	Hazardous Air Pollutant
HBCU	Historically Black Colleges and Universities
HFC	Hydrofluorocarbons
HVAC	Heating, Ventilation, and Air Conditioning
IDP	Inadvertent Discovery Plan
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
JSA	Job Safety Analyses
KV	Kilovolt
kWh/yr	kilowatt hours per year
LEED	Leadership in Energy and Environmental Design
LFP	Lithium Iron Phosphate
LFPR	labor force participation rate
LiNiMnCoO₂ NMC	Lithium-Nickel-Manganese-Cobalt-Oxide
LMNO	Lithium Manganese Nickel Oxide battery
LMO	Lithium-ion Manganese Oxide battery
LNO	Lithium Nickel Oxide battery
MESC	DOE's Office of Manufacturing and Energy Supply Chains
MVA	Megavolt-amperes
MW	Megawatt
N₂O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NHPA	National Historic Preservation Act
NMC	LiNiMnCoO ₂ NMC
NMSZ	New Madrid Seismic Zone
NOx	Nitrogen Oxide
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
OSHA	Occupational Safety and Health Administration



PFC	Perfluorocarbons
PlusCAM	Plasma Low-cost Ultra Sustainable Cathode Active Material
PM	Particulate matter
PPE	Personal Protection Equipment
PSD	Prevention of Significant Deterioration
psi	Pounds per square inch
R&D	Research and development
RCRA	Resource Conservation and Recovery Act
RHK	Roller hearth kiln
RPZ	Runway Protection Zone
SDS	Safety Data Sheet
SF₆	Sulfur hexafluoride
SHEM	Safety, Health and Environment Manager
SHPO	State Historic Preservation Officer
SOP	Standard Operating Procedure
SO_x	Sulfur Oxides
SPCC	Spill Prevention, Control and Countermeasure
SQG	Small quantity generator
STEM	Science, Technology, Engineering and Mathematics
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TEMA	Tennessee Emergency Management Agency
THC	Tennessee Historical Commission
THPO	Tribal Historic Preservation Officer
TMA	Trimethylaluminum
Tpa	Tons per annum
Tpy	Tons per year
TSDf	Treatment, storage, and disposal facilities
TVA	Tennessee Valley Authority
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compounds
VSQG	Very small quantity generator
WOTUS	Waters of the United States



CHAPTER 1. INTRODUCTION & PURPOSE AND NEED

1.1 Introduction

This **Final** Environmental Assessment (EA) was prepared by the United States Department of Energy (DOE) - National Energy Technology Laboratory (NETL) pursuant to the National Environmental Policy Act of 1969 (NEPA) (Title 42, Section 4321 et. Seq., United States Code) and DOE's NEPA implementing procedures (Chapter 10, Part 1021, Code of Federal Regulations (CFR)) to evaluate the potential environmental and social impacts of DOE's proposed action to provide funding to 6K, 6K's proposed project, and the No Action alternative. The purpose of this EA is to provide the information needed to assess the potential environmental and social impacts associated with construction and operations of a proposed facility which would produce cathode battery materials at the factory scale in Jackson, Madison County, Tennessee. This EA provides site-specific details of the Proposed Action and addresses potential impacts of proposed construction and operations across 14 resource areas.

1.2 Background

The Office of Manufacturing and Energy Supply Chains (MESC), 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 A 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 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.

The applications reviewed under this FOA were selected for negotiations in October 2022. Twelve topic areas of interest (AOIs; Table 1) 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): AOIs 1–3 and 6–11 were directed to commercial level projects. AOIs 4, 5, and 12 were directed to demonstration level projects.



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

Areas of Interest	Title
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 the project proposed by 6K Energy Tennessee, LLC (6K) under AOI-12 of DE-FOA-0002678 to support the development of a new battery materials manufacturing facility in Tennessee (the proposed ‘Project’ or ‘Facility’). DOE’s action is to propose \$50,000,000 of the project’s total award value of \$177,808,345 in a cost-shared arrangement.

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 6K’s proposed project and location to be one that can 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. The Project site was selected due to its location in an existing industrial zone, its access to transportation infrastructure and public utilities, and its potential to have a positive economic impact on the regional and local community.

DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements to this and the other 20 projects selected under DE-FOA-0002678. This 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. This project would meet the objective of recruiting, training, and retaining a skilled workforce in communities that have lost jobs due to the displacements of fossil energy jobs. This project would also meaningfully assist in the nation's economic recovery by creating manufacturing jobs in the United States in accordance with the objectives of the BIL.

1.4 National Environmental Policy Act and Related Procedures

This EA is prepared in accordance with the NEPA, as amended (42 U.S.C. 4321), the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 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

- Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (Executive Order [EO] 13985)
- Bald and Golden Eagle Protection Act (BGEPA)



- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Endangered Species Act (ESA)
- Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (EO 13690)
- Executive Order on America’s Supply Chains (EO 14017)
- Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations (EO 12898)
- Floodplain Management (EO 11988)
- Migratory Bird Treaty Act (MBTA)
- Pollution Prevention Act of 1990
- Protection of Wetlands (EO 11990)
- Resource Conservation and Recovery Act (RCRA)
- Revitalizing Our Nation’s Commitment to Environmental Justice for All (EO 14097)
- Tackling the Climate Crisis at Home and Abroad (EO 14008)
- The Noise Control Act of 1972, as amended.

1.6 Agency Consultation

DOE initiated consultations with the United States Fish and Wildlife Service (USFWS) and the State of Tennessee Wildlife Resources Agency under the Endangered Species Act and with the Tennessee Historical Commission at the State Historic Preservation Office (SHPO) under Section 106 of the National Historic Preservation Act (NHPA). Response letters, if received, are included in Appendix B.

1.7 Consultation with Tribal Nations

DOE initiated consultations with the Chickasaw Nation and the Coushatta Tribe of Louisiana, through each Tribal Nation’s Tribal Historic Preservation Office. Response letters, if received, are included in Appendix C.

1.8 Scope of Environmental Assessment

NEPA requires Federal agencies to take into account the potential consequences of their actions on both the natural and human environments as part of their planning and decision-making processes.

The proposed Project is categorized within the following group of actions listed in Appendix C to Subpart D of the DOE NEPA Implementing Procedures (Categories of Actions that Normally Require Environmental Assessments [EAs] but not necessarily an Environmental Impact Statement (EIS)): *C12 Siting, construction, operation, and decommissioning of energy system demonstration actions (including, but not limited to, wind resource, hydropower, geothermal, fossil fuel, biomass, and solar energy, but excluding nuclear)*. For purposes of this category, “demonstration actions” means actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.



In accordance with the NEPA, this EA will address the construction and operation planned for the Project. DOE has prepared this EA to comply with the NEPA, CEQ regulations implementing NEPA (40 CFR Parts 1500–1508), and DOE NEPA Implementing Procedures (10 CFR Part 1021).

For projects with an EA level of review, DOE has prepared an Interim Action Memorandum to approve select tasks that can be performed prior to DOE’s completion of the EA for the entire project and prior to issuance of a Finding of No Significant Impact (FONSI). DOE has determined that completing the tasks as outlined in the Interim Action Memorandum would not have an adverse environmental impact; nor would it limit the choice of reasonable alternatives for the project. Elements of the proposed Project, such as land acquisition, construction procurement, design, permitting, and select training and hiring were examined and then determined by DOE to have no significant effect on the environment or limit the range of reasonable alternatives for the project. These tasks were authorized under the Interim Action Memorandum prior to the completion of this EA, as documented in the memorandum titled, “RE: Interim Action(s) within the scope of an ongoing Environmental Assessment prior to issuance of a Finding of No Significant Impact (FONSI) for the Plasma Low-cost Ultra Sustainable Cathode Active Materials Project”. The Interim Action Memorandum for the proposed 6K Project is included as Appendix D.

The scope of the Proposed Action has been reviewed (providing federal financial assistance for construction of the facility) to identify any potentially significant issues that warrant detailed review in this EA. In its review, DOE considered the scope of the Proposed Action, the location of the facility within Airport Industrial Park, the existing industrial setting, and the current status of the permits and approvals necessary for construction of the facility (see Appendix E).

Based on DOE’s review of the scope of the Proposed Action, existing site conditions, and permit status, the scope of the issues analyzed in this EA includes:

- Aesthetics and Visual Resources
- Air quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gases
- Health and Safety
- Land Use
- Noise
- Socioeconomics and Environmental Justice
- Traffic and Transportation
- Waste Management
- Water Resources.

These resource areas were identified as potentially being affected by the Project, and each was assessed to determine the nature and extent of the impacts (see Chapter 3). This EA also examines the direct, indirect, and cumulative effects of the Project. The assessment combines desktop research and analysis of existing available information along with select field studies,



including site assessments related to wetlands; air emissions; soils and geology; visual and aesthetic resources; waste management; as well as cultural resources.

Because the Project would be located in an existing, previously disturbed, industrially zoned area, impacts on parks and recreation are not anticipated. Therefore, the 'Recreation' is not a resource area included in the scope of this EA.

At the completion of the Project, the permits listed in Appendix E would apply.



CHAPTER 2. PROPOSED ACTION & ALTERNATIVES

2.1 Department of Energy's Proposed Action

DOE proposes, through a grant awarded to 6K, to partially fund the construction of a new 125-150,000-square-foot manufacturing facility to produce multi-chemistry cathode materials for EV batteries. 6K proposes to demonstrate the ability to domestically produce multiple battery chemistries, namely Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO₂) (NMC) and Lithium Iron Phosphate (LFP), in a plant using its patented 6K's UniMelt® microwave plasma processing technology. If approved, DOE proposes to provide \$50,000,000 of the project's \$177,808,345 total costs. 6K's private cost share would be at least \$127,808,342.

2.2 6K's Proposed Action

6K is planning to design, construct and operate a 10,000 tons per annum (tpa) (10,000 metric ton) Plasma Low-cost Ultra Sustainable Cathode Active Material (PlusCAM™) facility; "Project"). Currently, 85% of the world's battery material is sourced from China. 6K's facility would expand domestic processing of battery materials to meet the incredible growth in demand for energy storage materials for portable power, grid storage, and EVs. 6K has developed a unique process to produce a range of battery material for EVs, grid storage and consumer electronics. The current process for battery material manufacturing is co-precipitation which generates large amounts of pollutants, consumes huge amounts of water, and uses energy-intensive processes that take 2-3 days for production. By contrast, 6K has developed UniMelt® technology, which produces material in as little as 2 seconds and produces less hazardous waste, and drastically reduces water usage and power usage.

The purpose of this project would be to construct a new 125-150,000-square-foot manufacturing facility to produce multi-chemistry cathode materials for EV batteries. The facility, which is the subject of federal financial support, would be located at 256 James Lawrence Road. It would be on a 50-acre parcel of the 100-acre Airport Industrial Park – Site A, located west of Smith Lane (Highway 223) and south of Brownsville Highway (Highway 70) in Jackson, Madison County, Tennessee. The subject property comprises a portion of Madison County Parcel No. 057090 02400. The approximate site latitude and longitude are 35° 35' 42.01" N and 88° 56' 20.40" W.

6K proposes to demonstrate the ability to domestically produce multiple battery chemistries, namely LiNiMnCoO₂ NMC and LFP, in a plant ready for production in 2025 using its patented 6K's UniMelt® microwave plasma processing technology. The facility would sustainably produce NMC811, generating zero hazardous waste (ammonia/sulfates) and 70% less greenhouse gases (GHGs) while using only 10% of the water and 30% of the energy that traditional battery material production methods use. Production costs for both materials would be lower than materials sourced from China. Financially supporting 6K's Project is needed to provide additional supply of critical materials for new lithium-ion batteries, thereby reducing overall national emissions of air pollutants and human-caused GHGs.

The Plasma Low-cost Ultra Sustainable Cathode Active Material (PlusCAM™) facility (the proposed "Project" or "facility") involves the construction and operation of a facility in Jackson, Madison County, Tennessee, to produce cathode battery materials at the factory scale. The proposed facility would utilize proprietary UniMelt® microwave plasma technology to deliver critical battery materials for the EV and electric grid markets. The use of a microwave plasma



provides for a controlled, uniform, highly reactive, and high temperature reaction zone that enables the synthesis of materials at rates far greater than with conventional methods, and with much greater chemistry and size flexibility. The proposed multi chemistry plant would produce both NMC811 and LFP batteries: both dominant EV batteries in commercial markets. Both battery types are needed to meet the purpose and need of the proposed project.

The proposed facility would be within a 50-acre site within an Airport Industrial Park and would include an approximately 125-150,000 sq. ft. main building (Figure 1). In addition to this building, there would also be 206 proposed parking spaces, an electrical building, utility switchyard, and raw material and finished product warehousing (Figure 2). These proposed features are included in the scope of this EA.

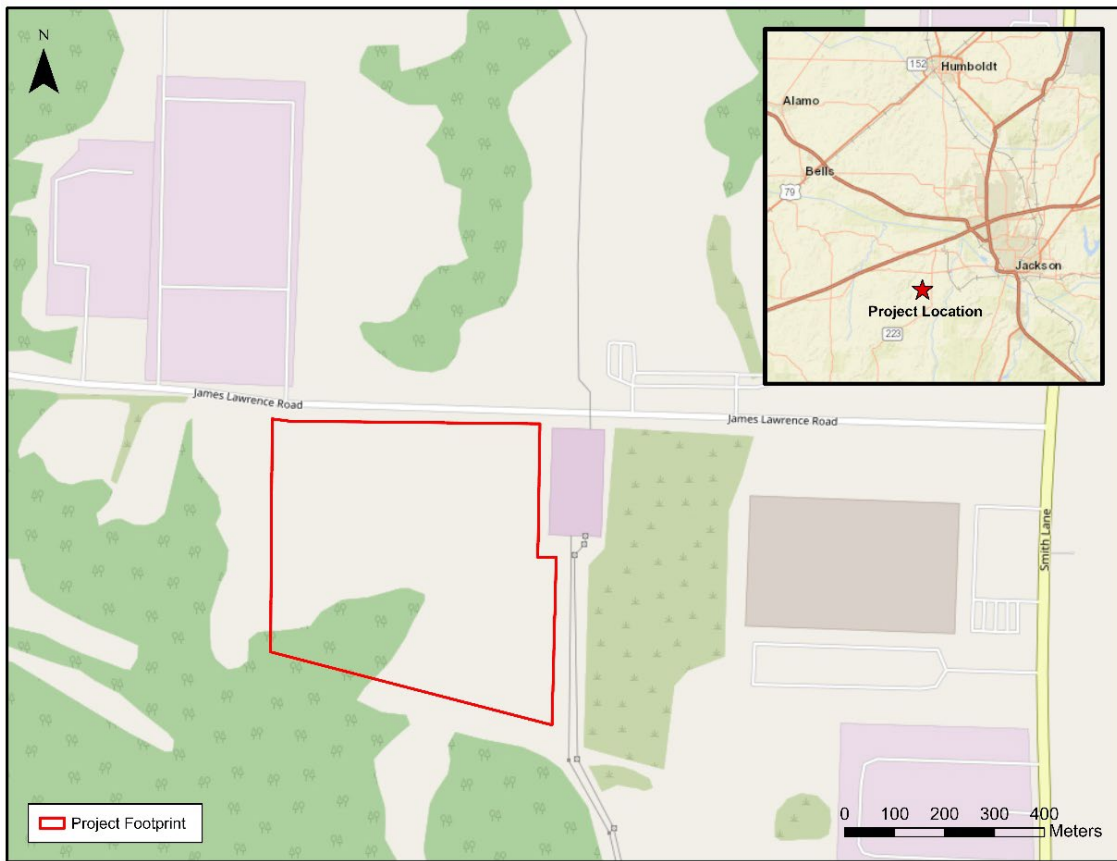


Figure 1. Proposed site layout of the proposed facility.

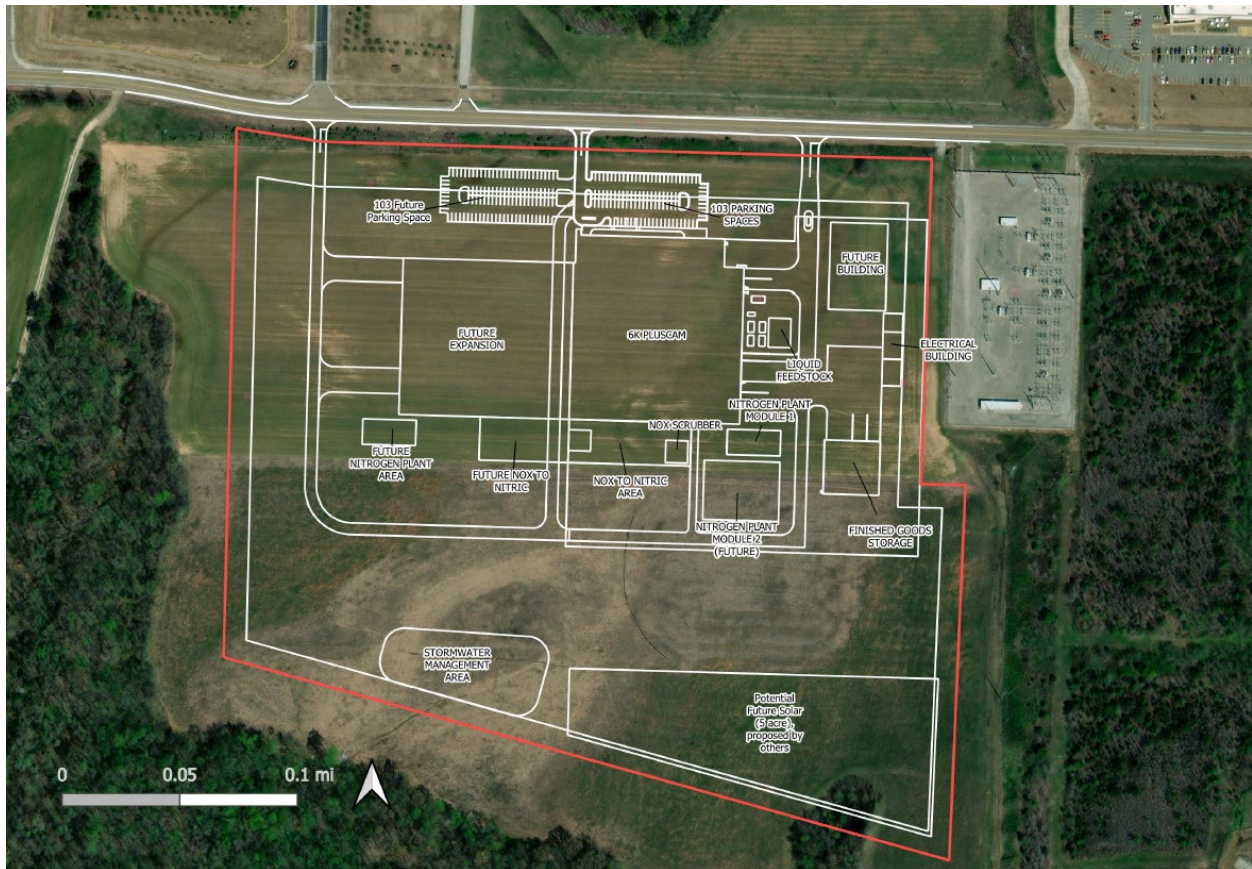


Figure 2. Proposed site layout of the proposed facility.

6K has retained space on site for: 1.) potential future expansion and associated facilities, 2.) a potential salt production partner and 3.) a potential solar facility (potentially proposed by others). Upon interview with 6K (April 11, 2023), it is highly unlikely that any future expansion efforts of the facility would take place at the Madison County, Tennessee site location. The potential future expansion and the possible salt production and solar facilities have independent utility from the proposed facility, and are not within the scope of this EA. If these plans do manifest, they would be assessed under a separate NEPA process (if required/applicable) and environmental permitting efforts.

The proposed facility would be brought online in two (2) distinct phases: Phase 1 and Phase 2 (Table 1). Phase 1 would include a pilot program for production lines 1 and 2, which would have 750 tpa capacity by Q3 2024 from six (6) Generation (Gen) 1 UniMelts® (with a nitrogen oxide (NOx) scrubber) producing both NMC and LFP. During Phase 1, processing would then ramp up to include production lines 3 and 4, for a combined 3,000 tpa capacity by Q1 2025 from 30 Gen 1 UniMelts® (with closed loop nitric acid production). Phase 2 would see production line 5 brought online and additions to production lines 3 and 4, including retrofitting with ten (10) Gen 2 UniMelts® with closed loop nitric acid production, for a combined capacity of 10,000 tpa by Q1 2026. Gen 2 UniMelt® technology is still under development, and no specifications or input/output information is currently available.



Table 2. Proposed Phased Production.

Phase	Production Line(s)	Torches	Capacity
1	Pilot lines 1 and 2	6x Gen 1 UniMelt® NMC & LFP	750 tpa
	Production lines 3 and 4	24x Gen 1 UniMelts® NMC	2,250 tpa
2	Production line 5 Addition to production lines 3 and 4	30x Gen 1 UniMelts® LFP 10x Gen 2 UniMelts® NMC	7,000 tpa

2.3 Alternatives

DOE’s alternatives to this project consist of the numerous technically acceptable applications received in response to FOA DE-FOA-0002678. Before selection, DOE made preliminary determinations about the level of review under NEPA based on potentially significant impacts it identified during review of technically acceptable applications. DOE conducted these preliminary reviews pursuant to 10 CFR 1021.216 and prepared a synopsis for projects under the FOA. These preliminary NEPA determinations and environmental reviews were provided to the selection official, who considered them during the selection process. 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.

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

2.4 No Action Alternative

Under the No Action Alternative, the DOE would not provide financial assistance funding to 6K for the purpose of implementing the Project. As a result, the project would likely not occur in the same time frame and alternative sources of funding and investment would be sought to achieve the same substantive project scope. Without the proposed Project, there would be no change or beneficial impacts incurred from current conditions related to domestic energy production.

2.5 Alternatives Considered by 6K but Dismissed

More than 80 different sites across the eastern United States were examined as potential sites for siting the facility. These alternatives were considered but ultimately dismissed as infeasible, impractical, or inconsistent with the Project’s purpose and need, and/or represented higher environmental, financial, social, or schedule costs than the preferred alternative.

Prior to DOE funding award 6K selected the site in the Madison County, Tennessee location. Before selecting this location, two alternative sites were assessed for feasibility: one in Walker County, Alabama, and one in Peach County, Georgia. All three locations were feasible locations in ‘Industrial’, or ‘General Industrial’ zoning declarations where habitat, or wetland or other waters



of the United States (WOTUS) impacts would not be required. In addition, all three could benefit from the specific Diversity, Equity, Inclusion and Accessibility (DEIA) and Justice40 Initiative actions and policies identified in the 6K Equity Plan for each phase of the Project. Because the location was selected prior to the NEPA process starting, the two other locations are not considered reasonable alternatives at this stage, because changing location would be unfeasible given the effort and work which has gone into the planning and design, initial studies and technical reports for the Madison County, Tennessee site location, using non-DOE investment funds

2.6 Proposed Action – Preferred Alternative

Under the Proposed Action Alternative, the DOE would provide financial assistance to 6K in the amount of approximately \$ 50,000,000 Federal Share towards a \$177,808,345 project cost.

The DOE's financial assistance would be used for the following activities:

1. Phase I equipment for the pilot phase, including approximately 3,000 tpa capacity from 28 UniMelts®.
2. Construction of the Phase I and Phase II facility building and warehouse facility.

While the DOE will not be funding the remainder of the facility's capacity (including an additional approximately 7,000 tpa capacity) or building appurtenances, the remainder of the proposed facility is considered in scope for this EA.

2.6.1 Project Construction

The construction of the proposed facility would sequence through successive phases starting with the establishment of sedimentation and erosion control measures, rough grading and clearing, building pad preparation and construction, building shell construction, final grading, and site stabilization and landscaping. The final phase of building construction includes the installation of the equipment to support the battery cell manufacturing process. After the building shell is constructed, the Project site would be landscaped with running trails and xeriscape¹ plants and pollinator friendly plant species to maximize natural habitat and to promote biodiversity and aesthetic views from surrounding land uses and facilities.

The project is anticipated to be constructed and brought online in stages (as discussed in section 2.1). The site was agricultural and was being used for agricultural purposes (growing cotton and cereals) until Q1 2023. The site consists of farming areas, flat to mildly undulating topography, organic material stockpiles, sparse native vegetation on the site's periphery, and wetlands beyond the southern end of the site (Appendix F). No demolition, no tree removal, and no wetland impacts would be required for the construction (or operation) of the proposed facility.

Construction of the proposed facility would be scheduled to begin in **early 2024** ready for Phase 1 to be implemented by Q3 2024. Construction activities would take place during daylight hours only, and the construction schedule would likely occur over a six day per week, ten hours per day schedule. Construction equipment would include pick-ups trucks, excavators, bulldozers, graders, and concrete mixer trucks. The project is designed to minimize land disturbance and the extent

¹ Xeriscaping is the practice of designing landscapes to reduce or eliminate the need for irrigation. This means xeriscaped landscapes need little or no water beyond what the natural climate provides.



of grading to the area necessary to complete the work. Vegetation removal would be limited to the area necessary for construction. No large trees would be cleared or grubbed from the Project site. During construction, sufficient Best Management Practices (BMPs) would be implemented to minimize erosion and the risk of sediment or construction-related contaminants from leaving the site and entering surface waters. These BMPs would be adapted as necessary over time, to ensure they are performing effectively. A Spill Prevention, Control, and Countermeasure (SPCC) Plan would also be developed and employed onsite to further protect the environment during construction. Additional proposed measures during construction would aim to direct runoff away from disturbed soils, slow runoff with BMPs and install BMPs to catch sediment before it migrates off-site. Specific construction BMPs could include: installing silt fencing, wattles and/or berms, covering stockpiles if left unworked, and replanting areas of ground disturbance post construction. Once construction is complete, the paved surfaces would not be an ongoing source of sediment and erosion.

Security during construction would include reasonable measures such as fencing, a manned guard shack while receiving trucks, and security cameras. No full or partial traffic closures or detours would be required for construction. In addition, no permanent or temporary improvements to existing highways, roads, sidewalks, or other transportation facilities are envisioned. The site is not served by rail, and a rail spur would not be added. A transloading facility is located approximately 12 miles northeast from the site and Memphis is served by multiple intermodal facilities, about 80 miles northeast from the site. The proposed facility is within an Airport Industrial Park but is not in an Accident Potential Zone (APZ) or Runway Protection Zone (RPZ).

Building materials would include conventional roofing, conventional concrete slab, some architectural stone masonry, and ventilated siding (to dissipate any potential accumulation of NO_x). Further, the roof would be fitted with Heating, Ventilation, and Air Conditioning (HVAC) to cool the building and ventilate any NO_x excursions (discussed further in section 3.3.2). Trenching for utilities would ensure adequate power, natural gas, sewer, stormwater, telephone, and cable utilities service the site. The site is currently serviced by Jackson Energy Authority, who provides:

- Electricity: 12,470 V distribution system in the industrial park, currently 15 Megavolt-amperes (MVA) capacity in the substation (with 30MVA planned and potential for expansion to 60 MVA); substation has a 161 Kilovolt (kV) ring bus; alternate feed with 11 Megawatt (MW) is available. Since this substation is part of the Jackson 161 kV transmission loop, the substation is dual-served by the Tennessee Valley Authority (TVA) transmission system and interconnected to the TVA grid at two points, providing added electric reliability. On the north side of Jackson, it interconnects with the 500 kV system with two 161 kV lines at the Oakfield Primary Substation. On the south side of Jackson, it interconnects with four 161 kV lines at the South Jackson Primary Substation.
- Natural gas: 12-inch steel main north and east site boundary; line pressure of 55 pounds per square gauge (psig) (future upgrade to 99 psig); line capacity 565 Dekatherm (DTH)/hr.
- Water service: 20-inch main on the east site boundary, 16-inch main on the north site boundary; available capacity: 7,142,000 gallons per day (gpd); maximum average water pressure of 67 psi (pounds per square inch) with design fireflow of 3,480 gallons per minute (gpm) at 40 psi.



- Sewer service: 10-inch gravity main on the north site boundary, two pump stations and force mains; served by Miller Creek Wastewater Treatment Plant, which has an available capacity of approximately 9,400,000 gpd.
- Telecom: 100% fiber optic Gigabit Ethernet network offering cable television, high speed internet, and local and long-distance phone services.

Jackson Energy Authority provided a letter of support outlining the various utility needs of the proposed Project and confirms available capacity to meet those needs (Appendix G).

Since water would be provided by the utility, there would be no surface water withdrawals and no groundwater withdrawal. The proposed facility would be designed to maximize rainwater capture. Drainage not naturally infiltrated would be directed to the stormwater pond; there would be no direct discharges to surface waters. The stormwater pond would be engineered to serve a dual purpose: stormwater control and treatment (designed for a 2-year, 24-hour storm) and to be used for feedstock for nitrate salts.

2.6.2 Project Operations

2.6.2.1 Manufacturing Process Summary

The proposed facility would domestically produce Cathode Active Materials (CAM); components of rechargeable batteries used in electric vehicles (EVs) and renewable energy storage. Traditional methods of cathode production generally involve taking the starting materials through various processes including stirring, precipitation, washing and drying, sieving, adding lithium calcination, flux and heat treatment, and washing and drying, over a period of approximately two (2) days. 6K is proposing a different process using microwave plasma processing with UniMelts®.

In the UniMelt® process, a stable and uniform plasma is formed using a gas appropriate to the product chemistry (e.g., oxygen, nitrogen, argon, hydrogen, etc.). Feedstock containing all necessary elements for the product is fed into the plasma, where any carrier liquids (if present) are quickly evaporated and causes the precursor to react and form the target compound (driven by the high heat and highly reactive ions).

For NMC production, the raw materials are first dissolved using nitric acid in a closed loop system, mixed, and then synthesized using the UniMelt® technology. This synthesis process produces NO_x as a byproduct. In a separate chemical process, the NO_x is converted back to nitric acid to be re-consumed in the production process. (Further NO_x abatement equipment would be used to reduce NO_x emissions to meet regulation standards). During LFP production, solid raw materials are formulated and blended in an aqueous high shear mixer, creating a slurry that is then wet milled for sizing and homogenization. The slurry is subsequently spray-dried to produce a solid powder, which is fed into the UniMelt®. After UniMelt® processing, the powder undergoes calcination in an RHK and may be jet milled (to ensure the correct sizing).

The plasma processing in both cases takes approximately 2-3 seconds and is followed by heat treatment for between 0 and 3 hours, for a total cathode powder production time of 3 hours or less (Figure 3). The process is incredibly accelerated from traditional methods, has a small footprint, and results in exceptionally low conversion costs. This reduces costs, waste, water usage, and energy requirements. Compared to traditional co-precipitation techniques, UniMelt®



uses approximately 10x less water, up to 2x less power and carbon dioxide (CO₂) emissions and produces no ammonia/sulfates.

A cooling water loop would ensure that air and water releases are close to ambient temperature. A chiller-based system, using accuchillers, is proposed to cool water that is then circulated around the facility, to cool the plant. Once the warmed water completes the loop, it returns to the accuchillers, where it is cooled again. There would be no direct release of high temperature water.

Final steps for NMC production include coating with an atomic layer deposition (ALD) coating (to ensure additional stability) and sieving, while final steps in the LFP process include magnetic sieving. Product is then packaged, stored, and then shipped.

Key equipment to be used in the proposed facility includes UniMelts®, mixing tanks, super sacks, roller hearth kilns (RHKs), ALD coater, jet mill, wet mill, spray dryer and NO_x processing system. Accessory processes include water treatment using reverse osmosis purification for the closed loop water cooling system, wastewater treatment (for equipment wash down), maintenance areas, dust capture, gas detection systems, O₂ delivery plant and the N₂ delivery plant.

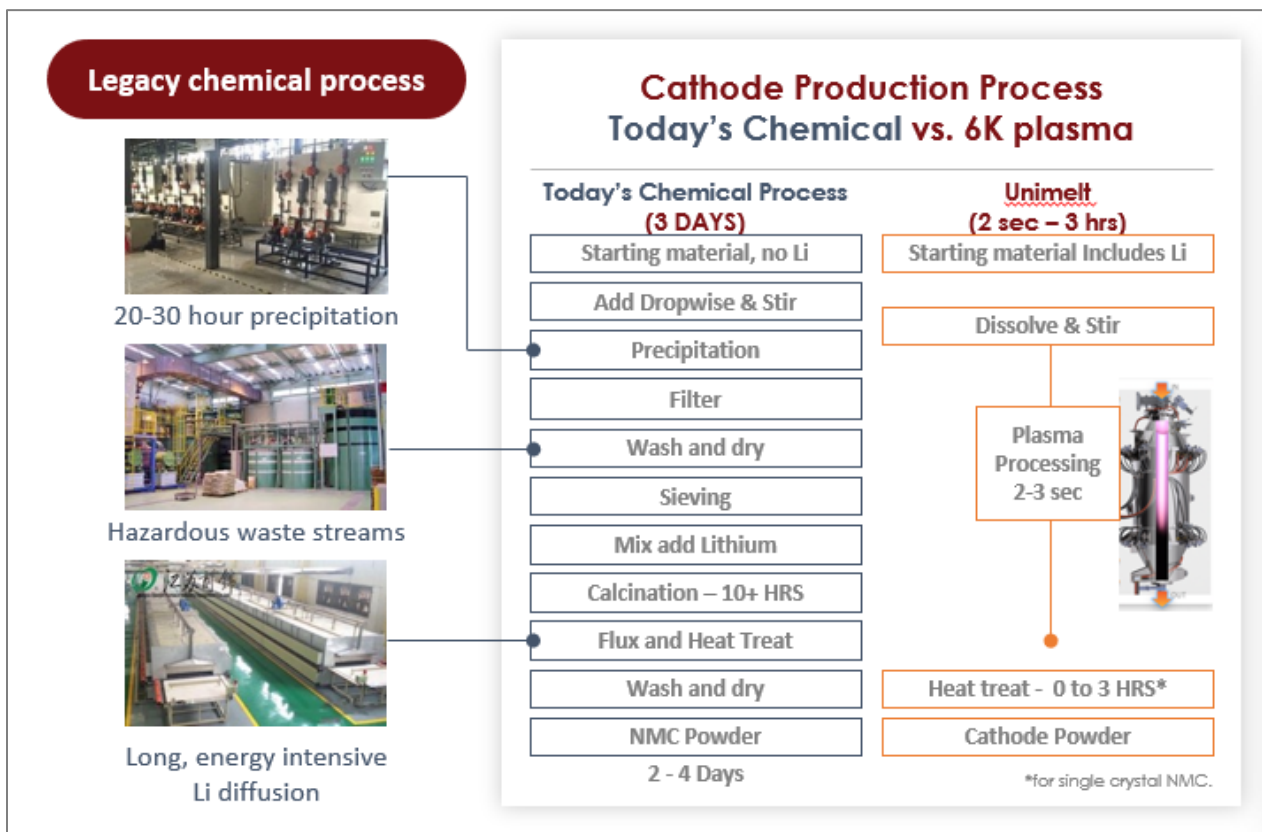


Figure 3. New Cathode Production Process (right) vs traditional processes (left).

Extensive testing and experimental work for the proposed process has occurred at 6K's Battery Center of Excellence facility in Andover, MA. The 33,000 sq. ft. research and development (R&D) has ten (10) UniMelts® and has operated since 2002. Its purpose is to validate and verify processes prior to being transferred to the scaled production plant (the proposed facility).



2.6.2.2 Operations Logistics

The proposed facility would operate 24 hours a day, seven days a week, once fully operational. Approximately 150 to 230 people would work at the proposed facility. Security at the facility would include fencing, a manned guard shack, security cameras, keycard access to the buildings, and certain locked rooms with restricted access for key personnel within the facility.

The proposed facility would have an approximate twenty (20) year life span. Elements of the processing facility and equipment would be replaced and upgraded as required during that life span. For example, the UniMelts® would be replaced approximately every 2 to 3 years. 6K anticipates that once the life span of the facility is complete, the building would be repurposed for other uses, under different permitting and compliance conditions.

The proposed facility would store RCRA wastes temporarily, but these wastes would not be treated or disposed at the proposed facility. All RCRA waste would be transferred to facilities permitted by the Division of Solid Waste Management (DSWM) in the Tennessee Department of Environment and Conservation (TDEC) or permitted by other federal or state jurisdiction.



CHAPTER 3. ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

In the following sections, a specific resource is addressed using both qualitative and, where applicable, quantitative information to describe the nature and characteristics of the resource that may be affected by the Project as well as the potential direct and indirect impacts on that resource from the Project, given Project controls.

3.2 Resource Areas Dismissed from Further Consideration

The DOE has determined that a certain resource would either not be affected or would sustain negligible impacts from the Proposed Project and was dismissed from further evaluation. The dismissed resource includes parks and recreation. This resource area is briefly discussed in this section of the EA; however, it will not be evaluated further.

Madison County lists five (5) parks, one (1) community park, and one (1) natural area (Madison County, 2023a). The City of Jackson is the home to twenty (20) public parks, eight (8) public educational and recreation facilities, and one (1) public golf course (City of Jackson, 2023). H. Leroy Pope Park (1643 Westover Road, Jackson, TN) is the closest park facility, approximately three (3) miles to the northeast of the Proposed Project site. Savannah Williamson Community Park (152 Neely Station Road Denmark, TN) is approximately 3.55 miles south southwest of the Proposed Project site, and Cypress Grove Nature Park (866 Airways Blvd, Jackson, TN) is almost four (4) miles to the northeast of the Proposed Project site.

Hatchie Wildlife refuge is over 13 miles to the southwest of the Proposed Project site. Johnston Mounds State Archaeological Area and the Pinson Mounds State Archaeological Park are 12+ miles to the southeast of the Project site. Approximately 1.8 miles to the northeast of the site, across the McKellar-Sipes Regional Airport, is the Sculley Golf Course and Driving Range.

Due to the industrial zoning and previously disturbed land use of the Proposed Project site, including for agricultural crop production, and surrounding industrial and commercial land use (including regional airport), negligible impacts to Parks and Recreation are anticipated. Current and anticipated parks and recreation opportunities for the citizens of Jackson and Madison County 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 recreation facility is more than three (3) miles away via paved road and the nearest park is over four (4) miles away by paved road.

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

3.3 Resource Areas Considered Further

Environmental resource areas carried through for further consideration of the potential impact of 6K's Proposed Project include: aesthetics and visual resources; air quality; biological resources (wildlife and vegetation, and threatened and endangered species); cultural resources; geology and soils; greenhouse gases; health and safety; land use; noise; socioeconomics and environmental justice; traffic and transportation; waste management and water resources (surface water and floodplain, and groundwater).



3.3.1 Aesthetics and Visual Resources

The Project site would be located at 256 James Lawrence Road in Jackson, Madison County, Tennessee and contains approximately 50 acres. The site is currently an undeveloped agricultural field and is in an industrial park (Airport Industrial Park – Site A). The Project site is presently zoned industrial.

Neighboring properties are either undeveloped or host industrial businesses. To the north of the site is a Toyota manufacturing facility, Kellogg's distribution center and agricultural fields. There is an unattended electrical substation bordering the Project site to the east. The southern, eastern and western adjoining properties mostly consist of undeveloped woodlands. Approximately 950 ft to the east of the site are Kirkland Home Warehouse and Pacific Manufacturing Tennessee Inc. buildings. No residences are within visual range of the Project site. The nearest residences are to the east of the Project site; approximately 0.5 miles away. These residences are screened from the Project site by woodland areas and Kirkland Home Warehouse. These wooded areas are not proposed for removal by the Project and would continue to provide visual screening during portions of the year. During the portion of the year when deciduous trees have little to no foliage, there is unlikely to be aesthetic and visual impacts given the distance to the residential properties. Aesthetic and visual impacts to surrounding industrial, commercial, and agricultural uses are minor.

Impacts during Construction

The construction of the proposed facility would sequence through successive phases starting with the establishment of sedimentation and erosion control measures, rough grading and clearing, building pad preparation and construction, building shell construction, final grading, and site stabilization and landscaping. The final phase of building construction includes the installation of the equipment to support the battery cell manufacturing process. Construction activities would take place during daylight hours only, occurring on a six day per week ten hours per day schedule. Construction equipment would include pick-up trucks, excavators, bulldozers, graders, and concrete mixer trucks, and these, as well as staging and stockpiling activities, would result in minor and temporary adverse visual impacts from construction activities on site. Construction activities would minimize land disturbance and the extent of grading to the area necessary to complete the work. Additionally, vegetation removal would be limited to the area necessary for construction. No large trees would be cleared or grubbed from the Project site. During construction, BMPs would be implemented to minimize impacts to aesthetic and visual impacts, including staging material and equipment in areas that are not prominent from the road where possible, and using clean, clear signs and public notices with directions to enhance visual interest, safety and guidance. Because construction activities of the new facility would be temporary and minimized through BMPs, as well as being distanced from existing residences, impacts on aesthetic and visual resources from the Project would be temporary and minor.

Impacts during Operation

The Project would result in permanent visual changes on the site – namely, the construction of a new building on what is currently undeveloped open land. However, the approximate 125-150,000 sq. ft. facility would have an appearance consistent with other industrial complexes in the Airport Industrial Park surrounding areas (Figure 4). After the building is constructed, the Project site



would be landscaped with running trails and xerophytic and pollinator-friendly plant species which would maximize natural habitat and promote biodiversity and aesthetic views from surrounding land uses and facilities. The xerophytic plant species would blend with the surrounding natural landscape. Operations at the new facility are being designed with the goals of achieving LEED Silver status building certification, retention of existing natural vegetation (no tree removal proposed on site), planting new biodiversity vegetation, running trails and xeriscape surrounding the facility, all of which improve the visual aspects of the Project. Because the Project Site is in a zoned industrial park, and the design of the Project is similar to that of the existing manufacturing facilities in the area, impacts on aesthetic and visual resources resulting from the Project would be minor.



Figure 4. Simulated Facility Rendering.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to aesthetics and visual resources would occur as existing conditions would remain unchanged.

3.3.2 Air Quality

Pursuant to the Clean Air Act (CAA), the Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) to control a limited number of widely occurring criteria pollutants, including carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM) with a diameter of less than 2.5 micrometers (PM_{2.5}), PM with a diameter of less than 10 micrometers (PM₁₀), and sulfur dioxide. Primary air quality standards were developed for these pollutants to protect public health, including sensitive populations such as children, the elderly, and asthmatics, and secondary standards were developed to protect the nation's welfare,



including protection against decreased visibility and damage to animals, crops, and vegetation. EPA has concluded that the current NAAQS protect public health, including at-risk populations of older adults, children, and people with asthma, with an adequate margin of safety. The airshed that contains the Project site in Jackson, Madison County, Tennessee is in attainment or unclassifiable for the NAAQS, meaning none of the ambient concentrations of criteria pollutants exceed the air quality standards (EPA 2023a).

To protect air quality, several permitting programs under the CAA regulate point-source air emissions. Under the New Source Review (NSR) permitting program, a major stationary source is one of 28 listed facility types that has the potential to emit 100 tons per year (tpy) or more of a regulated NSR pollutant or is an unlisted facility that has the potential to emit 250 tpy or more of a regulated NSR pollutant. A Prevention of Significant Deterioration (PSD) permit is required for new major sources or a major source making a major modification in areas that are in attainment for all the NAAQS. The proposed facility is not considered a new major stationary source because it is not one of the 28 listed facility types, nor does it have the potential to emit 250 tpy of a regulated NSR pollutant. The facility applied to receive a minor NSR permit to construct the emission sources located at the facility. The TDEC administers this permitting program and issues the permit to construct and operate the facility.

Emissions Analysis

Air emissions would result from construction and operation of the Project. During construction, air emissions and dust would be generated from mobile sources (*e.g.*, trucks, machinery) as well as on-site ground-disruptive operations. Construction activity would temporarily increase airborne dust particles and engine emissions. This change would be almost negligible.

Emissions from workers' vehicles and construction equipment would be temporary and transient in nature, and various BMPs, such as limiting vehicle idling, watering (*if/as* necessary), and the use of temporary construction entrances would be implemented to reduce potential impacts. All operations would remain in compliance with the requirements of Tennessee Air Pollution Control Regulation 1200-03-08-.01, Fugitive Dust, including the requirement to limit visible emissions beyond the facility property line to a maximum of 5 minutes per hour or 20 minutes per day. Fugitive dust emissions during Project construction may result in temporary adverse air quality impacts at the Project site; however, these impacts would be minor and would occur only during active construction. Because emissions during construction would not overlap with emissions during operation, and because of the controls that would be implemented during Project construction, impacts on air quality as a result of construction of the Project would be temporary and minor.

The operation of the proposed facility would result in several sources of air pollutant emissions that would result in the approximate total emissions presented in Table 3. The proposed facility is designed to make both LFP and Metal Oxide Products (NMC, LNO, LMNO, LMO; as discussed in Chapter 2). The operating production steps of each LFP and metal oxide product would result in off-gases, including H₂O, CO₂, H₂ and very little (almost undetectable) short chain hydrocarbons, Methane, Ethane, and CO, as displayed in the process flow diagrams below (Figure 5; Figure 6). Control devices to be used include: fabric filter/dust collectors on every UniMelt® and NO_x recovery to form nitric acid using compression and adsorption, and re-consumed in the production process.



Table 3. Facility-Wide Potential to Emit.

Air Pollutant	Potential Emissions (Tons per year)
Nitrogen Oxide (NO _x)	16.9
Carbon Monoxide (CO)	3.40
Volatile Organic Compounds (VOC)	1.98
PM	13.1
PM ₁₀ *	13.1
PM _{2.5} *	13.1
Sulfur Oxides (SO _x)	0.02
CO _{2e}	4,505
Total Hazardous Air Pollutant (HAP)	7.08

*PM_{2.5} = particulate matter of a diameter of less than 2.5 micrometers; PM₁₀ = particulate matter of a diameter of less than 10 micrometers The totals in the table above represent the total potential to emit from the site (permitted and permit exempt units), actual emissions are expected to be under these totals. All regulated sources of emissions (e.g., facility boilers) are subject to specific permitted emission levels.

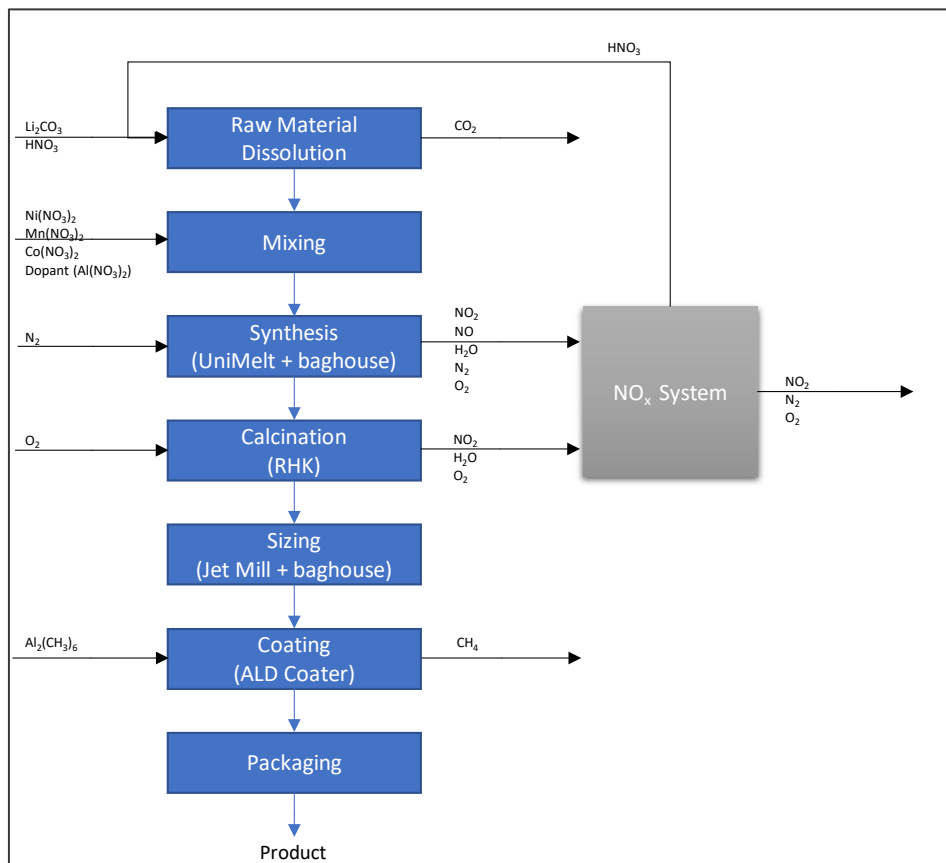


Figure 5. NMC process flow diagram with emissions during each phase

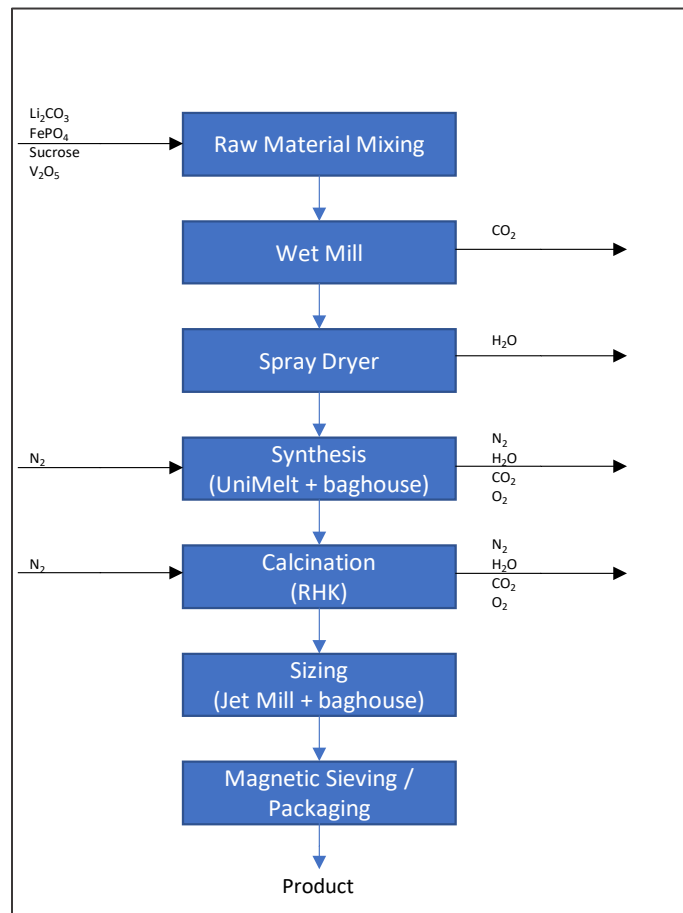


Figure 6. LFP process flow diagram with emissions during each phase.

Controls that could be implemented during the Project operation to minimize potential air quality impacts include:

- Fabric filters/dust collectors for every UniMelt®
- Re-use of NO_x to nitric acid and re-consumption in the production process
- A NO_x scrubber would be used to capture the majority of the NO_x emanating from the process. The scrubber technology is in the process of being finalized.

Because of the location of the Project site, existing air quality conditions, the amount of anticipated air emissions and the permitting of such emissions, and the controls that would be implemented during operation and meeting applicable emission standards, impacts on air quality as a result of the Project would be minor.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to air quality (including any beneficial impacts from the production of materials for EV batteries) would occur as existing conditions would remain unchanged.



3.3.3 Biological Resources

This section describes the existing biological resources, including threatened and endangered species, in the vicinity of the Project site. The area of potential effect (APE) for biological resources includes the area within and immediately adjacent to the proposed Project that would be affected by the action, either during construction or permanently. The proposed Project and analyses of its potential effects on biological resources conform with and meet the requirements of the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.).

3.3.3.1 Wildlife and Vegetation

The Project site is an undeveloped agricultural field, located in an industrial park at 256 James Lawrence Road. According to a review of historical information, the Project site has been an agricultural field since at least 1941 (TTL, 2023; Appendix H). The adjoining properties consist of James Lawrence Road, a Toyota Motor Manufacturing facility, electrical substation, solar farm, and undeveloped woodlands.

The subject property and surrounding area supports a diverse range of terrestrial, aquatic, and semi-aquatic plant and animal species. Patches of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), American sycamore (*Platanus occidentalis*) and trumpet creeper (*Campsis radicans*) trees on the property can support a range of bird species, such as woodpeckers, sparrows, thrush, and warblers. The farmland areas of the property support a mix of crops and grasses, potentially attracting mammals like rabbits (*Sylvilagus floridanus*), white-tail deer (*Odocoileus virginianus*) elk (*Cervus canadensis*), skunks (*Mephitis mephitis*), squirrels (*Sciurus carolinensis*, *Glaucomys volans*, *Glaucomys sabrinus*, *Sciurus niger*, and *Sciurus carolinensis*), and rodents (including shrews, mice, rats and moles), and less likely, large predators like black bear (*Ursus americanus*), cougars (*Puma concolor*), bobcats (*Lynx rufus*), foxes (*Urocyon cinereoargenteus* and *Vulpus vulpes*), and coyotes (*Canis latrans*).

Several watercourses are located in proximity to the property, but no wetlands or streams are located on the Project site. The largest channel flows north and west and is beyond the perimeter of the property boundary. The channel contains sporadic pools, a wet hyporheic zone, and depositional bars and benches within a continuous bed and bank. The wetland areas to the south of the property support a mix of sedge species and rush species and sporadic black willow (*Salix nigra*) shrubs, as well as aquatic invertebrates like dragonflies and mayflies. Surrounding off-site streams could provide habitat for a range of fish species, such as bluegill (*Lepomis macrochirus*), sunfish (family Centrarchidae), crappie (*Pomoxis* spp.), catfish (order Siluriformes) and bass (*Micropterus* spp.), as well as amphibians like frogs (likely species include: *Acris gryllus*, *Hyla chrysoscelis*, *H. avivoca*, *H. gratiosa*, *H. versicolor*, *Pseudacris crucifer*, *P. feriarum*, *Gastrophryne carolinensis*, *Lithobates areolatus*, *L. clamitans*, *L. palustris*, *Rana sphenoccephala*) and salamanders (over 60 native species in Tennessee and most of them could occur near the Project site). Other species that could potentially be present on the property include reptiles like snakes (*Carphophis amoenus*, *Coluber constrictor*, *Diadophis punctatus*, *Pantherophis guttatus*, *P. spiloides*, *Heterodon platirhinos*, *Lampropeltis calligaster*, *L. getula*, *L. triangulum*, *Pituophis melanoleucus*, *Storeria dekayi*, *S. occipitamaculata*, *Thamnophis* spp., *Agkistrodon piscivorus*, and *Sistrurus miliarius*), and insects like butterflies and bees, which rely on a mix of plant species for nectar and pollen.



Impacts during Construction

During construction of the facility, there would be minor, localized and temporary adverse impacts to biological resources present in the Project site. Adverse impacts to wildlife species during construction include potential disturbance from noise and human activity and risk for direct mortality from ground disturbance and vehicle/construction equipment strikes. The implementation of design elements to completely avoid impacting mature trees and wetlands and aquatic resources in the area, as well as conservation measures, such as vehicle speed limits in the construction zone and limiting construction to daylight hours, would minimize potential impacts to biological resources during construction.

Impacts during Operation

The proposed Project would produce a minimal amount of light due to the 24-hour-a-day nature of operations at the facility. These sources of light and glare would be oriented away from sensitive areas (i.e., the wetlands and streams) to minimize adverse impacts to wildlife. There would be some beneficial impacts to biological resources from the proposed planting with new biodiverse vegetation and xeriscape surrounding the facility.

Due to the current industrial land use adjacent to the Project site, the modified and monoculture nature of the existing biological resources on the majority of the site because of the agricultural land use, the proposed facility's lack of natural habitat and connection to intact natural habitats, and resultant low potential for wildlife use, impacts on general biological resources (wildlife and vegetation) as a result of the Project would be minor.

3.3.3.2 Threatened and Endangered Species

A search for critical habitat and protected species was conducted using the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool. No critical habitats were identified in the Project site. Three protected species were listed as endangered in the Project site: the Indiana bat (*Myotis sodalist*), the northern long-eared bat (*M. spetentrionalis*) and the whorled sunflower (*Helianthus verticillatus*). Two species proposed to be listed were identified: the tricolored bat (*Perimyotis subflavus*) proposed as endangered, and the alligator snapping turtle (*Macrochelys temminckii*) proposed as threatened. One candidate species, the Monarch butterfly (*Danaus plexippus*), was identified, also with no critical habitat present in the Project site.

Impacts during Construction

Construction at the 50-acre Project site would have no permanent impact on the three protected species or the proposed species because the Project site does not contain critical habitat. Because of the lack of critical habitat in the Project site, and the lack of mature tree (potential bat habitat) removal proposed, impacts to listed and proposed to be listed threatened and endangered species as a result of the construction of the facility would be temporary and minor.

Impacts during Operation

Although the area could be used as foraging habitat for the bat, the Project would not change the overall nature and quality of foraging habitat in the area. Because of the lack of natural habitat on or adjacent to the Project site and the surrounding industrial activities, impacts on listed and



proposed to be listed threatened and endangered species resulting from the Project would be minor.

Pursuant to its responsibilities under Section 7 of the Endangered Species Act, DOE concurs that the Project would have no effect on the listed threatened or endangered species or on designated critical habitat. According to the USFWS 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. However, on July 11, 2023, the DOE sought optional concurrence from the USFWS (Appendix B). The Tennessee Wildlife Resources Agency does not anticipate this Project to cause adverse impacts to species of concern (Appendix B).

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to biological resources would occur as existing conditions would remain unchanged.

3.3.4 Cultural Resources

This section describes the existing cultural resource conditions in the vicinity of the Project site. The APE for cultural resources includes the area within and immediately adjacent to the proposed Project that would be affected by the action, either during construction or permanently. Cultural resources include archaeological sites, historic structures and objects, and traditional cultural properties. Several Federal laws and regulations have been established to manage cultural resources, including the National Historic Preservation Act (NHPA) of 1966; the Archaeological and Historic Preservation Act of 1974; the American Indian Religious Freedom Act of 1978; the Archaeological Resource Protection Act of 1979; and the Native American Graves Protection and Repatriation Act of 1990. In addition, Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, charges Federal departments and agencies with regular and meaningful consultation with Native American tribal officials in the development of policies that have tribal implications. Historic properties are cultural resources that are listed in or eligible for listing in the *National Register of Historic Places* because they meet one or more criteria and retain integrity (36 CFR 60.4). Section 106 of the *National Historic Preservation Act* (16 U.S.C. 470 et seq.) and its implementing regulations at 36 CFR Part 800 requires that Federal agencies take into account the effects of their actions on historic properties. As part of the Section 106 process, agencies are required to consult with the State Historic Preservation Officer (SHPO) on their determinations and decisions. The Tennessee Historical Commission (THC) serves as the SHPO.

Existing Cultural and Historic Conditions

The following section describes the existing historic and cultural resources conditions in the area of the proposed manufacturing facility. Continuous prehistoric occupation of the region is likely to have occurred since 12,000 B.P. (TRC, 2004). Prior to statehood in 1796, Tennessee was occupied by historic tribes such as the Chickasaws and Choctaws (Alexander, 2023). The area was a primary hunting enclave for the northeastern Mississippi Chickasaw, which was then purchased in 1818 to expand settlement (TRC, 2004). As west Tennessee was settled in the late 18th century, forests in Madison County were cleared for subsistence farming, and cotton was



produced for exportation. Families first arrived in Madison County in 1819 and settled just east of Jackson. In 1822, Jackson became the county seat for Madison County (Alexander, 2023). The city became an important railroad junction with the chartering of the Mobile and Ohio Railroad in 1848 which served the transportation needs of commercial agriculture (Alexander, 2023). Madison County's economy, once largely based on agriculture, now rests on a diversified industrial and commercial base (Madison County, 2023b).

In 2004, a Phase I archaeological survey was conducted for the relocation of the South Jackson-Madison 161-kV transmission line (TRC, 2004). A portion of the 100-foot-wide survey traversed the eastern edge of the Project site. The 2004 report identified a few previously recorded archaeological sites or isolated finds within 1 mile of the Project Site; all were heavily disturbed and lacked integrity. No additional archaeological sites were documented. In addition, another archaeological survey was conducted in 2010 (TRC, 2010). Here, a preliminary records search found that no archaeological sites had been previously recorded within the project's APE. TRC conducted an archaeological survey which resulted in the identification of two isolated finds of historic period artifacts: neither were recommended as eligible for listing on the National Register of Historic Places (TRC, 2010).

No additional survey information or historical resources were identified within one (1) mile of the site after reviewing the Tennessee Historical Commission database (THC, 2023). The Project site has functioned as an undeveloped agricultural field since 1941 and appears to have been plowed and used for agriculture during that timeframe causing some subsurface disturbance.

Proposed Action Impacts

As it appears that much of the Project site has been previously disturbed, cultural resources are not likely to be present. Therefore, it is expected that construction would have no impact on cultural resources. On July 12, 2023, the Tennessee SHPO concurred that there are no National Register of Historic Places listed or eligible properties affected by this undertaking (Appendix B). On August 2, 2023, the Chickasaw Nation also reviewed the provided documentation and concurred with the DOE's finding of no adverse effect. They were unaware of any specific historic properties, including those of traditional, religious, and cultural significance, in the Project area (Appendix C). No response from the Coushatta Tribe of Louisiana has been received to date.

In the event of an inadvertent discovery of possible cultural materials during construction, standard procedure is for all work to stop immediately in the vicinity of the find. The Project would implement a project-specific Inadvertent Discovery Plan (IDP) that details the following: 6K and 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 6K personnel, SHPOs, and the Chickasaw Nation and the Coushatta Tribe of Louisiana (in the event Tribal cultural resources or human remains are discovered during construction activities). A 100-meter buffer would be placed around the discovery with work being able to proceed outside of this buffered area unless additional cultural materials were encountered. The area would be secured and protected, the unanticipated discoveries of cultural/archaeological materials would be evaluated and, if needed, mitigated in



accordance with consultation with the SHPO. The IDP is attached in Appendix I. Operational activities are not expected to have an impact on cultural resources.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to cultural resources would occur as existing conditions would remain unchanged.

3.3.5 Geology and Soils

The Project site is a sloping parcel with thirty-five feet of elevation change across the site. The elevation of the subject property is between 410 and 445 feet above mean sea level (amsl). The highest elevation is located at the eastern and central portion of the subject property, with land sloping downward to the south, west, and north (USGS, 2019).

Madison County is geologically part of the physiographic subdivision known as the Gulf Coastal, with the valley of the Mississippi River cut into it and its flood plain sediments deposited on top. This part of the state is geologically young, consisting of Cretaceous, Tertiary, and Holocene Age deposits.

Jackson, Tennessee is located on the eastern edge of a narrow band that parallels the eastern bluffs of the Mississippi River known as the “Loess Hills.” This band lies within a Section called the Mississippi Embayment. The Embayment is a bell-shaped arm of the Gulf of Mexico outlined roughly by Little Rock, Arkansas on the west; Cairo, Illinois on the north; and the Lower Tennessee River on the east (PSI, 2014).

Structurally, the Mississippi Embayment is a down-warped, partly down-faulted trough in Paleozoic rocks. The axis of the trough has migrated in past geologic time but now approximates the course of the Mississippi River. The trough has been filled with unconsolidated gravels, sands, and clays ranging in age from upper Cretaceous to Recent. In the Jackson area, the unconsolidated sediments are about 600 to 1,200 feet thick. The loess soils can be thin or absent in the Jackson area (PSI, 2014).

Madison County is proximal to the major intraplate (within a tectonic plate) seismic zone known as the New Madrid Seismic Zone (NMSZ). The NMSZ is an approximately 120-mile-long fault system that stretches across five (5) states including western Tennessee. The NMSZ is responsible for some of the largest earthquakes in the North American continent. This includes the noted three-month period between December 1811 and February 1812 that had earthquakes reaching Richter Scale magnitudes into the 7.0 through 8.6 ranges, which created Reelfoot Lake in Lake County, Tennessee. These earthquakes would have been felt in Madison County. From the time when seismic measurement instruments were installed in and around the zone in the 1970’s, more than 4,000 small earthquakes have been recorded, with the vast majority being too small to be felt. Presently, the NMSZ contains the highest level of seismicity in the central and eastern parts of the United States (Madison County, 2021).

Madison County sits in what the Federal Emergency Management Agency (FEMA) and the Tennessee Emergency Management Agency (TEMA) consider the 20-county New Madrid Impact Zone. Statistical earthquake vulnerability studies from FEMA show that, out of these 20 counties, Madison County would receive moderate to severe impacts because of its proximity to the NMSZ



(Madison County, 2021). While Madison County has zero documented earthquake events, the USGS database shows that there is a 4.65% chance of a major earthquake within 50 km of Madison County, Tennessee within the next 50 years. The USGS expects 20 to 50 occurrences of damaging earthquake shaking in Madison County over 10,000 years (USGS, 2022).

Five Unified Soil Classification System (USCS) soil map units occur at the Project site; they are summarized below in Table 4.

Table 4. Soils at the Project Site.

Soil Unit	Slope	Drainage	Percent of Project Site
Calloway silt loam (Co)	0 to 2 percent	Somewhat poorly drained	3.7%
Falaya silt loam (Fa)	None provided	Somewhat poorly drained	3.0%
Grenada silt loam (GrB)	2 to 5 percent	Moderately well drained	20.1%
Lexington silt loam (LeD)	8 to 12 percent	Well drained	13.8%
Feliciania silt loam (Fa)	0 to 1 percent	Well drained	59.4%

Source: NRCS, 2023.

On-site observations have not revealed any surface indications of slope failure or highly unstable soils on the property.

A 2023 geotechnical investigation was conducted in support of this Project, and 30 borings were advanced at the proposed Project site (ECS, 2023a). Sixteen (16) borings were advanced to 25 feet below ground surface (bgs); twelve (12) borings were advanced to 10 feet bgs; and two (2) borings were advanced to 15 ft bgs. Silty clay, sandy lean clay, silty clay with sand generally extended from ground surface to 12 to 17 feet bgs with the soil becoming clayey sand and sand from about 12 to 17 ft bgs to end of boring. In general, loess deposited soils were encountered across the site, and organic laden topsoil was encountered from the surface to 0.8 ft bgs. The soils encountered at the borings beneath the four (4) to nine (9) inches of organic soil may be divided into three (3) general strata. The upper stratum consisted of predominantly very soft to firm silt and silty clay (0.8-13.5 ft bgs); the second stratum consisted of clayey sand and sandy clay (13.5-18.5 ft bgs); and the third stratum consisted of medium dense sand. Laboratory tests from two borings indicate moisture sensitive soils.

A previous geotechnical investigation conducted in 2013 yielded similar results (PSI, 2014).

All of the proposed Project site's 50 acres, with the exception of a small portion in the southwestern corner of the property, is classified as prime farmland by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) (Data Basin, 2023) and is subject to consideration under the Farmland Protection Policy Act of 1981.



Proposed Action Impacts

The Project would require land disturbance and grading; however, the land is relatively flat, and the project is designed to minimize land disturbance and grading. No large trees or shrubs (with an extensive root system) would be cleared or grubbed from the Project site. Construction design should take into account loess deposit soils which may require undercutting and replacement as well as the presence of moisture sensitive soils. During construction, the Contractor would be required to implement sufficient BMPs to minimize erosion and the risk of sediment or construction-related contaminants from entering surface waters. Specific construction BMPs could include: installing silt fencing, wattles and/or berms and replanting areas of ground disturbance post construction. Stockpiles would be covered if they are unworked. These BMPs would be site-specific and adapted as necessary over time, to ensure they are performing effectively to reduce erosion and sedimentation. Once construction is complete, landscaped and paved surfaces would not be an ongoing source of sedimentation and erosion.

The Project would directly convert up to 40 acres and indirectly convert approximately 10 acres of prime farmland to industrial use. On May 25, 2023, Form AD-1006 and supporting documentation was sent to the NRCS in Tennessee for assessment of the proposed prime farmland conversion. In a letter dated June 1, 2023, they determined that the direct and indirect conversion of up to 50 acres of prime farmland at the Airport Industrial Site is consistent with the Project area having been designated by a state or local government entity for commercial and/or industrial land use and therefore is not subject to FPPA and no mitigation is required (Appendix J).

The proposed buildings and appurtenances would be required to meet all applicable seismic standards and requirements.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to geological and soils resources would occur as existing conditions would remain unchanged.

3.3.6 Greenhouse Gases

Greenhouse gases (GHGs) play a pivotal role in the Earth's atmospheric dynamics, effectively trapping heat and contributing to the phenomenon of global climate change (EPA 2023b). The Intergovernmental Panel on Climate Change (IPCC) states that multiple lines of evidence point to continued climate change. These lines of evidence collectively indicate that human activities, particularly those resulting in increasing levels of GHGs, are a significant contributing factor to this change (IPCC, 2021). The key GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs). The burning of fossil fuels, including diesel, gasoline, and natural gas, emits CO₂ and CH₄.

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.”



Impacts during Construction

Construction of the proposed Project would result in temporary GHG emissions from sources including the transportation of equipment and materials, use of vehicles and construction machinery, and curing of concrete. 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 basic input parameters: building size (above and below ground), primary structural materials, ecoregion within the US, prior land use, and current and planned vegetation type (or unvegetated). With this information, this tool estimates the embodied energy and subsequent carbon amounts released during construction. The measurements account for building materials, processes, and carbon released due to ecosystem degradation or sequestered through landscape installation or restoration.

Based on a 150,000 sq ft building footprint, constructed entirely above ground, comprising wood, concrete, and steel, in the eastern temperate forest ecoregion, where 170,000 sq ft of existing agricultural vegetation would be replaced with 20,000 sq ft of landscaping and the remainder being impervious surface, this tool estimates net emissions of 4,099 metric tons of embodied carbon from the construction of the proposed Project.

Impacts during Operation

During operation (once at full capacity), the Project will use approximately 25-30 MVA, operating for 24 hours a day approximately 266 days per year. Using the more conservative 30 MVA estimate (30,000kW), then approximately 191,520,000 kilowatt hours per year (kWh/yr) of electricity would be used for facility operations. The quantity of emissions that are associated with this electricity use will vary year to year based on electric generation sources and methods employed by local utilities serving the Project site.

Approximately 45% of the energy provided by Jackson Energy Authority will be generated from fossil fuels (approximately 31% from oil and natural gas and 14% from coal). This means that approximately 86,184,000 kWh/yr of electricity used for facility operations would contribute to the proposed Project's GHG emissions. The remaining 55% will be from carbon free sources (nuclear (42%) and renewable energy (13%)). Looking forward, Jackson Energy Authority anticipates reducing their reliance on fossil fuels to approximately 36% (approximately 31% from oil and natural gas and 5% from coal). Using the EPA Greenhouse Gas Equivalencies Calculator (EPA 2023c), the approximate CO₂ emissions from electricity use for Project operations, assuming 45% of the electricity is generated from fossil fuel sources, would be 37,283 metric tons (82,194,300 lbs) of CO₂ per year.

When operational, the traffic to/from the Project site would include between 150 to 230 cars per day (not including up to 6 trucks per day either bringing in raw materials or loading processed materials). The approximate CO₂ emissions from 230 gasoline-powered passenger vehicles driven for one year (assuming no electric vehicles), would be 1,034 metric tons (2,278,626 lbs) of CO₂ per year (EPA 2023c).

The operation of the proposed facility would result in several sources of GHG emissions (see the approximate total emissions presented previously in Table 3; including 4,505 tons per year of CO₂e) (4,087 metric tons per year). The proposed facility is designed to make both LFP and Metal



Oxide Products (NMC, LNO, LMNO, LMO; as discussed in Chapter 2). The operating production steps of each LFP and metal oxide product would result in off-gases, including H₂O, CO₂, H₂ and very little (almost undetectable) short chain hydrocarbons, Methane, Ethane, and CO, as displayed in the process flow diagrams (Figure 5; Figure 6). Control devices to be used include: fabric filter/dust collectors on every UniMelt® and NO_x recovery to form nitric acid using compression and adsorption, and re-consumed in the production process.

GHG emission reductions will be realized through the manufacturing of different cathode active materials within the United States rather than importing them from another country. The cathode active materials would often be used in the domestic manufacture of lithium-ion batteries to be used in EVs. 6K estimates that production levels at the proposed Project site would be sufficient to produce lithium-ion batteries for 100,000 EVs annually. (This quantity is an approximation only and is contingent upon EV battery specifications and customer demand. It's important to note that not all of the product(s) would be allocated to EV car batteries). It is expected that these EVs would primarily replace conventional gasoline and diesel-fueled vehicles, resulting in a proportional reduction in GHG emissions (primarily CO₂).

To estimate annual tailpipe emissions of CO₂ from the operation of a typical conventional passenger car or truck in the U.S., the EPA assumes that vehicle is driven 11,500 miles per year with fuel economy of 22.2 miles per gallon of gasoline (EPA 2023d). 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 100,000 conventionally fueled vehicles with EVs would eliminate an estimated 449,377 to 460,000 metric tons of CO₂ annually for every operational year that an EV displaced a comparable fossil fuel vehicle. Over the course of ten years of operation, batteries produced using material generated at the Proposed Project site would be expected to eliminate between 4,493,770 to 4,600,000 metric tons of CO₂ emissions (again, depending on the amount of product being used for EV car batteries by the customers). This emissions reduction would be expected to far exceed any emissions anticipated from construction and operations of the Proposed Project during its operational lifetime.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No GHG emissions during construction or operation would occur, and no beneficial impacts from reductions in GHGs emissions from the domestic manufacturing of EV batteries would be incurred.

3.3.7 Health and Safety

The owners and management of 6K are wholly committed to developing and implementing a safety program committed to the protection of workers, the public, and the environment. The Safety and Health Program would be compliant with the requirements of the Occupational Safety and Health Administration (OSHA), Tennessee OSHA, the EPA and TDEC.

There is negligible concern for public and environmental safety from the metals, chemical compounds, and gases stored, used, and generated at the plant. This observation is based on: 1) the foregoing Environmental Site Assessment; 2) the planned location and layout of the plant; 3) the distant proximity to residences and population centers; and 4) the engineered containment systems at the plant.



6K would hire a plant Safety, Health and Environment Manager (SHEM) to implement the requirements of the safety program. The manager would be either a Certified Safety Professional (CSP) or Certified Industrial Hygienist (CIH) and would report to the Plant Director.

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

- Personal and process safety
- Monitoring of contractors for compliance with contract safety provisions
- Industrial hygiene
- Environmental management
- Safety orientation for employees and visitors
- Local, state, federal permitting and compliance
- Initiating Job Safety Analyses (JSA) and Process Hazards Analyses
- Industrial hygiene monitoring
- Safety meetings and training
- Site safety policies.

When the SHEM is not on duty, a trained safety officer would be present on site to serve as the primary responsible party.

The facility is expected to have 150 to 300 or more workers onsite during construction. The actual number of construction workers is yet to be determined. There would be approximately 150 to 230 workers onsite during plant operations. Of that number, approximately 95 would be administrative daytime workers. Forty-five (45) operations workers would be onsite during each of the three shifts (day, swing, night). It is tentatively planned for the plant to operate 24/7.

To protect against and prevent unauthorized entry to the facility, security fencing and monitoring devices would be placed around the perimeter of the operational areas of the plant. A 24/7 guard staff would be onsite. A guardhouse would be located at the fenced entry point to the plant. The plant would be monitored during operations for factors (*e.g.*, emissions, spills, security) that could affect workers, the public, and/or environmental health.

Standard Operating Procedures (SOPs) for Safety would be developed.

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

Hazardous Chemicals Inventory

The following Tables show the hazardous chemicals that would be stored and utilized in the plant processes (Table 5; Table 6; Table 7). Quantities are best estimates at the time of writing.



Table 5: Outside Storage Tanks Planned Chemical Storage.

	Chemical	Days on Hand	Total Gallons Stored
Outside Storage Tanks	68% Nitric Acid	7	28,493
	Nickel Nitrate	2	31,604
	Cobalt Nitrate	14	18,711
	Manganese Nitrate	3	3,219
	Aluminum Nitrate	14	13,189
	Trimethylaluminum (TMA)*	0*	0*
	Potassium Nitrate	14	6,288

* There is a separate room for TMA with a maximum daily 22-Gal requirement.

Table 6: Warehouse Planned Chemical Storage.

	Chemical	Days on Hand	Quantity	Weight Assumed Per Sack (Kg)	Total Weight (Kg)
Warehouse	Lithium Carbonate	14	182	446	81,163
	Iron Phosphate	14	182	793	144,290
	Sucrose	7	7	793	5,550
	Vanadium Oxide	14	14	496	6,937

Table 7: Planned Finished Goods Storage.

	Super Sack Stored*	Total Quantity*
Finished Goods Storage	LFP	96
	LNO	64
	NMC 811	16
	NMC 955	16

* The weight of each super sack is 1000 kg.

Suppliers of these substances have not yet been fully identified. Safety Data Sheets (SDS) for hazardous and non-hazardous substances are available on request. The facility would be configured for these compounds to be safely stored, segregated, and handled. Procedures are being prepared for prompt, safe remediation of spills, and for disposal of the spilled materials in compliance with pertinent RCRA requirements. The most hazardous of these substances is TMA. It would be stored in an appropriately designed area, with a dedicated material handling system. The operators would be specifically trained for the task and would operate the system in a bundled



operating area. This is a designated space that is designed and constructed with containment measures to prevent the accidental release or spillage of this material. An impermeable bund (or containment structure) surrounds the operational area, acting as a secondary containment system. Any spillages would be managed by a well-qualified contractor, and the material disposed in accordance with all applicable RCRA regulations. Of the inventory listed above, TMA and Nitric Acid pose safety challenges. Provisions for their safe receipt, possession, and uses are discussed further below.

Workers would be trained in the receipt, storage, usage, and disposal of hazardous substances. A comprehensive Operator, Maintenance Technician and Quality Technician Training Plan would be developed. As of this writing, the training plan is in the concept stage. 6K has formed a relationship with TN College of Applied Technology, Jackson State College and Lane College locally to complement their in-house training program.

6K has no current plans for utilizing phosphoric acid. However, they consider phosphoric acid to be a possible feedstock. If the plant is unable to source its iron phosphate, it may determine that phosphoric acid would be necessary, and if so would be made internally. It would not be received or held in-stock as an effluent. The plant would include bunded secondary containment at loading docks where liquid chemicals would be unloaded and contained in all storage tank areas, which would have the containment capacity to hold more than the contents of any one tank. Incompatible chemicals would be segregated inside the plant and inside storage locations.

Safety for Trimethylaluminum (TMA)

TMA would be used to deposit thin film, low-k (non-absorbing) dielectric layer of Al_2O_3 , which is strongly refractory. TMA would be injected to the 6K UniMelt® microwave plasma process to control corrosion of the plasma product. TMA is a highly pyrophoric (flammable corrosive) liquid and vapor. It would be the most hazardous substance at the plant. It violently and spontaneously ignites when exposed to air and water. Additional hazards include corrosivity, peroxide formation, toxicity, damage to the liver, kidneys and central nervous system. TMA would be received from the vendor, stored, and used in nonaqueous liquid to prevent exposure to air and water. If TMA waste is generated, it would be sent for disposal in nonaqueous liquid.

The designs and routine use of all protective systems for the receipt, storage, handling, use, storage, and disposal of TMA would be evaluated by the SHEM or alternatively by another CIH or a CSP. Possession of TMA at the site would not be permitted prior to approval by the SHEM of the protective systems and the procedures for safe use. The SHEM would, at least annually, review TMA receipt, usage, and disposal. Safety training would be provided to all workers involved with TMA receipt, usage, and disposal. The SHEM would determine all personal protective equipment (PPE) requirements relative to protective clothing, hand protection, eye protection, and respiratory protection prior to usage of TMA at the plant. Workers would wash thoroughly and immediately after handling TMA. They would remove any contaminated clothing and wash before reuse.

Additional TMA safety provisions include:

- The amount of TMA purchased and in inventory would be limited to avoid unnecessary quantities within the facility.
- The TMA SDS must be reviewed by all people working in the area.



- At least two people would be working together when handling TMA to ensure prompt response to exposures and explosions.
- All TMA containers would be secured upright.
- All expired and waste TMA would be promptly disposed of as RCRA Subtitle C hazardous waste.
- Fully operating safety showers, eyewashes, telephone, and fire extinguishers would be kept in the work area. All workers would be informed of the locations of these items.
- TMA would be kept in a dedicated location away from incompatible chemicals, flammables, water, and oxidizers.
- All TMA containers would be labeled with the original manufacturer's label bearing the chemical name, hazard labels, and pictograms.

Safety for Nitric Acid

Nitric Acid (HNO_3) would be used in the Metal Oxide Process for dissolution of metals. Solid Lithium Carbonate (Li_2CO_3) would be dissolved to generate a Lithium Nitrate (LiNO_3) solution, which would evolve CO_2 . The CO_2 would be vented to the exterior. The dissolved Lithium Nitrate is combined with the other ingredients such as Manganese Nitrate, Cobalt Nitrate, Nickel Nitrate, and any dopants (such as Aluminum Nitrate) to form a salt solution. Once the salt solutions are prepared, they would be pumped into a series of distribution tanks in preparation for feeding to the UniMelt® Systems.

Feedstock Nitric Acid would be delivered by truck to the plant and would be off-loaded into dedicated storage tanks in banded areas of the plant. A Nitric Acid production facility would be constructed adjacent to the plant. A Nitric Acid recovery system would be integral to the process for economic, environmental, and RCRA waste minimization considerations. Final safety procedures for Nitric Acid receipt, storage, utilization, recovery, and spill control/response would be completed after the plant design is finalized.

Nitric Acid is a strong oxidizer that may cause the formation of hazardous nitrogen oxides (NO_x). Nitric Acid can be harmful if inhaled, ingested, or absorbed through the skin. It is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. It causes severe skin and eye burns and may cause blindness and permanent eye damage. Closed systems with properly engineered vapor capture and treatment regimens would be used in the plant to control hazardous vapors from Nitric Acid.

The designs and routine use of all protective systems for the receipt, storage, handling, use, storage, and disposal of Nitric Acid would be evaluated by a CIH or a CSP. Possession of Nitric Acid at the site would not be permitted prior to approval by the SHEM of the protective systems and the procedures for safe use. The SHEM would, at least annually, review Nitric Acid receipt, usage, and disposal. Safety training would be provided to all workers involved with Nitric Acid receipt, usage, and disposal. The SHEM would determine all PPE requirements relative to protective clothing, hand protection, eye protection, and respiratory protection prior to usage of Nitric Acid at the plant. Workers would be trained to avoid contact with skin, eyes, and clothing. They would be taught to wash their hands before breaks and immediately after handling the product. Eye washes and safety showers would be placed strategically in areas where Nitric Acid



is received, stored, and utilized. Workers would be notified of the locations of eye washes and safety showers and would be trained on methods for using these items.

Workers would be trained on proper responses to accidental exposure to Nitric Acid:

- If skin is exposed, affected workers would promptly remove contaminated clothing and shoes, rinse for 15 minutes in the safety shower and wash with soap.
- If eyes are exposed, affected workers would promptly remove contact lenses, and flush eyes for 15 minutes in the eye wash; continue rinsing eyes during transport to hospital.
- If Nitric Acid is inhaled, the affected worker would be promptly moved to fresh air and follow-up medical actions taken.
- The workers' supervisor and the SHEM would be notified promptly to assist in response to an employee whose skin, eyes, or respiratory system have been exposed to Nitric Acid. The workers' supervisor or the SHEM would determine whether an employee requires medical attention. Workers, management, or the SHEM would call 911 in the event of severe exposure. A Nitric Acid SDS would be shown to Emergency Medical Technicians, doctors, and medical personnel for those workers requiring medical attention.

Nitrogen Oxides (NO_x)

NO_x would be released by the Nitric Acid metal oxide process wherever nitrates decompose. NO_x is hazardous. Exposure to high levels of NO_x can damage the respiratory system and contact with the skin or eyes can cause burns. Therefore, emissions of NO_x at the plant would be controlled for the protection of workers and the environment in compliance with applicable regulations. PPE would be required when determined appropriate by the plant SHEM. Adequate workplace ventilation would also be provided.

By reason of economics, NO_x would be recovered to form Nitric Acid using compression and absorption. NO_x produced in the PlusCAM facility would be recovered from the UniMelt® machines and the initial ramp zones of RHK's for Nitric Acid production. The process capture is ideally optimized to maximize recovered Nitric Acid concentration by minimizing dilution of the NO_x stream. The gaseous discharge from the NMC UniMelt® Cyclone and Baghouse, as well as the first zone of the NMC RHK would be rich in NO_x. A NO_x scrubber would be used to capture the majority of the NO_x emanating from the process and recover it as Nitric Acid for re-use. The scrubber technology is in the process of being finalized.

The final product would not contain NO_x, so there would be no reasonable public safety concern. There would be some residual concentration of NO_x trapped in the powder bed collected from the UniMelt® and/or in the head space above the powder in the collection vessel. The concentration would be dependent on the success of the continuous isolation of the UniMelt® process gases from the product collection vessel, but even in best cases, some elevated levels should be anticipated and accounted for in the powder transport processes.



Control of Gases and Vapors

To protect workers, the public, and environment, the plant would have closed systems that utilize engineered gas and vapor capture and treatment regimens. Otherwise, system venting would be used primarily for pressure balancing. The emissions would meet applicable regulatory standards.

As a result of the measures to address health and safety—including the foregoing Environmental Site Assessment; the planned location and layout of the plant; the distant proximity to residences and population centers; the engineered containment systems at the plant, plans for preventing chemical spills and potential mishandling of hazardous materials and response plans—impacts related to health and safety from use of hazardous materials during construction and operation are anticipated to be minor.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to health and safety would occur as existing conditions would remain unchanged.

3.3.8 Land Use

Onsite Land Use

The Project site is approximately 50 acres within an industrial park comprised largely of an undeveloped agricultural field, with few trees outlining the Project boundary. The Project site has a wide range of both plant and animal species. Several waterways are located in proximity to the property boundaries of the site. The largest proximal streams flow from south to north and west. There is a small wetland beyond the south end of the Project site.

Offsite Land Use

A Toyota manufacturing facility and a Kellogg's distribution center both sit to the north of the site. To the south, east, and west, there is largely a mix of developed and undeveloped agricultural fields. The nearest residential area is approximately 0.5 miles east of the Project site.

Coastal Zone

In 1972, Congress enacted the Coastal Zone Management Act (16 USC 1451) to encourage and assist States and territories in developing management programs that preserve, protect, develop, and, where possible, restore the resources of the coastal zone (i.e., the coastal waters and the adjacent shore lands strongly influenced by one another, which may include islands, transitional and intertidal areas, salt marshes, wetlands, beaches, and Great Lakes waters). Section 3071(3)(A) of the Coastal Zone Management Act requires that applicants for Federal permits, in this case 6K, whose proposed activities could affect coastal zones certify to the licensing agency, in this case the DOE, that the proposed activity would be consistent with the State's coastal management program. However, the Project site is not within Tennessee's designated coastal zone; therefore, a consistency determination is not required.



Impacts during Construction

As stated in section 2.2.1, construction would consist of several buildings through a phased approach. Figure 1 also shows a map of the Project site and surrounding land use. The Project would either directly or indirectly convert up to 50 acres of farmland to industrial use. Much of the site would be converted to impervious surfaces due to the conversion of agricultural land to buildings, parking lots, and roadways. BMPs would be used to limit the damage to surfaces and runoff. Because agricultural land is considered previously disturbed, impacts to land use from construction of the Project site would be temporary and minor.

Impacts during Operation

The operation of the facility would bring additional cars and trucks onto the existing roads. There is not anticipated to be any land use change to these roads because of the additional traffic. Operation would not change any of the surrounding land use. The operation of the site would not add any additional residential or commercial areas. Therefore, impacts to land use from operation of the Project site would be minor.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to land use would occur as existing conditions would remain unchanged.

3.3.9 Noise

The Project site is presently zoned industrial. Neighboring properties are either undeveloped or host industrial businesses. The nearest facility is an unattended electrical substation bordering the Project site to the east and about 400 feet further in that direction is the back of a Kirkland Home warehouse that is buffered from the Project site by an area of undeveloped land. The other facilities in the area are on the north side of James Lawrence Road with Toyota Motor facility and adjoining Bodine Aluminum facility approximately one-quarter mile to the northwest of the Project site and a large Menasha Packaging distribution facility a few hundred yards to the northeast of the Project site.

Madison County has no specific noise ordinance, while the covenants for the Airport Industrial Park (Madison County, 1997), which contains the Project site, prohibit certain excessive emissions, including noise. The covenants states, "...nor shall anything be done which may be or become an annoyance or nuisance to said Industrial Park by reason of unsightliness of the excessive emission of...noise". The covered emissions are deemed excessive a) if not as the result of normal business allowed per the covenants or b) if they violate some other part of the covenants or c) the emissions violate federal, state or local law or regulation.

Impacts during Construction

The Project would generate temporary noise during construction from heavy machinery, such as bulldozers, graders, excavators, dump trucks, and cement trucks, as well as smaller tools such as jackhammers and nail guns. Noise and sound levels would be typical of new construction activities and intermittent and temporary.



Construction of the Project would be occurring on a six day a week ten hours per day schedule. The projected daytime noise from construction of the Project would be similar to the existing daytime background noise along James Lawrence Road. Given the nature of the other businesses in the area, with employees working inside during these hours, and their distances from the Project site property line, the impact of that slight increase in noise would likely not be noticeable. For the few hours before and after the normal daytime shift of other businesses in the area there would be additional noise, again it would be intermittent construction noise and the effect on surrounding business would be minimal given the distances and those staff who would be largely working inside. The nearest residences are to the east of the Project site; approximately 0.5 miles away, and would not be affected by construction noise.

Impacts during Operation

Once the facility is in operation on the Project site, noise from ongoing activities would largely be confined to the interior of the facility with two exceptions.

First, there would be the potential for noise from the on/off loading of materials to be processed as well as processed material and waste. This noise would be intermittent and would only occur during the daytime. It is estimated that with a very modest total of 32 truck trips per/week (20 raw material trucks and 12 processed material trucks) the additional intermittent noise due to truck traffic would be minimal and similar to that generated at nearby facilities.

Second, the processes at the facility would necessitate ventilation fans on the main building and those fans would essentially run continually (or anytime the facility is operating). As discussed above, the Airport Industrial Park covenants only prohibit noise not envisioned by the covenants, prohibited elsewhere in the covenants, or restricted by regulation (Madison County has no such restrictions). To ensure the level of noise generated by the fans is reasonably consistent with the levels anticipated by the covenants, there may be a need to install baffles or some other noise reduction technology to reduce noise levels outside the facility to a reasonable level. OSHA recommends a level of 85 dBA and such a level has been adopted in many jurisdictions.

Due to controls that would be implemented during construction (restricted to daytime only and intermittent) and the nature of the area surrounding the Project (i.e., adjacent to existing manufacturing facility, with no nearby residential properties), impacts from noise generated by the Project during construction and operation would be minor.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No noise impacts would occur as existing conditions would remain unchanged.

3.3.10 Socioeconomics and Environmental Justice

Socioeconomics

The Project site would be located in Jackson, Madison County, Tennessee. The population of Madison County as of July 1, 2022 was 99,245 (USCB, 2022). The site is within census tract 17, which has an estimated population of 1,473 (USCB, 2020a; 2020b). It is in Airport Industrial Park, in an undeveloped agricultural field that is industrially zoned, the site is bordered by an unattended



electrical substation and undeveloped land. Kirkland Home warehouse, Toyota Motor Manufacturing, Toyota Bodine Aluminum facility, Menasha Packaging, Ryder Distribution Center and Kellogg’s Distribution Center are all within the immediate vicinity of the Project site.

Where the county was historically mostly agricultural, the economy is now held up by a diversified industrial and commercial base (Madison County, n.d.). It is home to several colleges and universities including Lane College, Lambuth University, Union University, and Jackson State Community College.

The City of Jackson is the county seat of Madison County. Jackson-Madison County is one of the state’s leaders in industrial and distribution centers and is a regional hub for medical, retail and service jobs in West Tennessee according to the Jackson Chamber (Jackson Chamber, n.d.). Jackson’s labor draw includes Madison and the surrounding eight counties. More than 50 percent of Madison County employees commute from outside of Madison County and this number is higher in the manufacturing sector.

As of February 2023, the Jackson (Madison County) area civilian labor force was 134,136 and of that area employment was 128,775, with a regional unemployment rate of 4.0 percent (Jackson Chamber, 2023). During the same period the Jackson Metropolitan Statistical Area’s labor force was 64,252, the area employment was 61,930, with an unemployment rate of 3.6 percent (DOL, 2023a). According to the Tennessee Department of Labor and Workforce Development, in February 2023, the county labor force was 46,294 (civilian labor force 46,264), there were 3,369 unemployed and the unemployment rate was 3.6 percent (TDOL, 2023). From February 2022 to February 2023, the Madison County unemployment rate increased 0.3 percent. As of March 2023, the Jackson County labor force participation rate (LFPR), which is the percentage of people 16 or older who are working or actively looking for work, was 60.7 percent. By comparison, the unemployment rate for the State of Tennessee in March 2023 was 3.4 percent, which was a 0.1 percent increase in unemployment from March 2022 and the LFPR was 59 percent (DOL, 2023b).

Also according to the Jackson Chamber, the Jackson area has a median age of 37.7 with 88 percent of the population having a high school diploma or higher. The nearest schools are to the northwest of the Project site; Halls Elementary is approximately 2.3 miles away, and Halls High School is approximately 2.5 miles away.

The per capita annual income for 2017-2021 in Madison County was \$28,677, and the median household income for the same years \$51,526. By comparison, in the State of Tennessee, the per capita annual income for 2017-2021 was \$32,908, and the median household income was \$58,516 (USCB, 2022).

The facility is expected (not yet determined) to create 150-300 or more jobs during construction and approximately 150 to 230 long-term jobs throughout operation. Based on the increase in employment opportunities and the available labor force, the Project would result in a beneficial socioeconomic impact.

Environmental Justice

Executive Order 12898, “**Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,**” is supported by Executive Order 14008, “**Tackling the Climate Crisis at Home and Abroad,**” Executive Order 14096, “**Revitalizing Our Nation’s Commitment to Environmental Justice for All**” and supplemental and



accompanying guidance collectively direct federal agencies to **identify and** address **disproportionately high and adverse** environmental and human health conditions in minority and low-income communities. During the environmental justice (EJ) evaluation, potential high and adverse impacts from the proposed Project’s programs, policies and activities must be identified and addressed in order to prevent minority and low-income populations within the affected area from being disproportionately affected. **6K will adhere to Executive Orders 12898, 14008, 14096 and their accompanying and supplemental guidance. Plans to comply are detailed below.**

Minority individuals are those who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic origin) or Hispanic.

In accordance with EPA’s EJ guidelines, minority populations should be identified when either 1) the minority population of the affected area exceeds 50 percent or 2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

According to the U.S. Census, the minority population of the State of Tennessee for 2017-2021 was 24.7 percent and for Madison County it was 42.5 percent (USCB, 2021b). Census tract 17, the location of the Project site, had a minority population of 31.7 percent for the same time period (USCB, 2021c).

Low-income populations refer to households with incomes below the federal poverty thresholds. Madison County’s poverty rate for 2017-2021 was 19.4 percent, 3.3 percent higher than the State of Tennessee’s poverty rate of 16.1 percent for the same time period (USCB, 2021a). The poverty rate for Census Tract 17, was 13.1 percent, lower than the rates of Madison County and the State of Tennessee for the same time period.

The minority population of both Madison County and census tract 17 do not exceed 50 percent and although higher, is not meaningfully greater than the minority percentage in the general population. Also, because the Project site is in a previously disturbed area with industrial zoning, the Project would not disproportionately affect minority and low-income populations and would instead be consistent with the “One Jackson Civic Master Plan,” that includes an economic development goal of diversifying and growing the Jackson economy “to support and stimulate businesses that broaden the tax base and provide stable, quality employment opportunities” (City of Jackson, 2015).

Further promoting the Jackson plan, 6K would make efforts to work with certified disadvantaged business enterprises (DBEs) or minority-owned businesses during the construction phase. 6K also has a goal to hire forty percent minority, veteran and disabled employees during operations. Doing so would offer potential transformative benefits to these communities and would also serve to meet the goal of the Justice40 Initiative. Justice40 is a requirement of Executive Order 14008 and establishes the goal of having 40 percent of the overall benefits of certain federal investments such as (but not limited to) clean energy, energy efficiency and climate change flow to disadvantaged communities (DACs). DACs include people in geographic proximity and/or those experiencing common conditions. 6K would work to achieve this goal by actively recruiting from these communities through job fairs, job postings on audience-specific websites and outreach to relevant organizations.



Additionally, 6K would partner with organizations such as vocational rehabilitation centers or veteran service organizations that provide these groups with training and job placement services. 6K would incentivize individuals from these communities to attend training necessary to be qualified, would promote employee referral bonus programs and would continue to create and maintain a welcoming workplace culture that values diversity and prioritizes providing opportunities for employees to succeed.

Finally, 6K would offer the “6K for 6K Scholars” scholarship program, which is designed to support and empower Lane College students pursuing STEM (Science, Technology, Engineering and Mathematics) degrees, with a focus on Chemistry majors. The program would award \$6,000 per eligible student, per year, starting from the semester that they apply and qualify and continuing until graduation. Students enrolled at Lane College, an HBCU (Historically Black Colleges and Universities), with a grade point average of 2.8 or higher would be eligible. The program would select two initial awardees and one additional each school year going forward. In addition to the financial support, the program would also offer optional summer internships at 6K that would provide hands-on experience in a professional setting.

Considering the absence of disproportionately high negative environmental and human health impacts; the goal and efforts to hire at least forty percent from veteran, disabled and minority groups from the local area; the training provided; the cultivation of a positive and diverse work environment and the “6K for 6K Scholars” scholarship program offered, it can be concluded that the Project would result in positive environmental justice impacts.

In summary, the Project would not result in adverse and disproportionate Environmental Justice impacts. The Project is located in an existing industrial site. Further, from the initial stages of site selection to present, 6K has and will continue to comply with all aforementioned executive orders directing environmental justice concerns in NEPA analysis. 6K conducted meaningful engagement with the local community throughout 2023 by connecting with local schools, universities, colleges, public utilities, and businesses. These deliberate and persistent actions were taken in an effort to gain insight and also identify ways to contribute to the community as a new business in the area. The Project was designed around and centered on incorporating this community feedback, hitting J40 goals and other EJ measures with a net benefit shown.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No socioeconomic or EJ impacts would occur as existing conditions would remain unchanged.

3.3.11 Traffic and Transportation

The Project site would be located at 256 James Lawrence Road; a two-lane road approximately 1 mile in length running from Smith Lane (Hwy 223) to the east and dead ends at a turnaround west of the Project site beyond the Toyota Motors facility. The intersection at James Lawrence Road and Smith Lane is controlled by a stop sign for James Lawrence Road traffic. Lines of sight in both directions are clear and Smith Lane itself is a two-lane road with a continuous third shared turn lane that runs north and south of the intersection. Additionally, Smith Lane headed south has a dedicated turn lane for traffic turning right onto James Lawrence Road.



Heading north toward the City of Jackson, which is the major population center of the area, Smith Lane becomes a four-lane road at Technology Center Drive. Continuing north, the next intersection (approximately 1.5 miles north of the Project site) is US 70, a four-lane divided highway and one of the major access routes for traffic headed to/from the Project site. The intersection at US 70 is signal-controlled and has dedicated right and left turn lanes to/from Smith Lane. Approximately another 2 miles north, Smith Lane has on/off ramp access to Interstate 40; another possible route for traffic headed to/from the Project site. To the south of the Project site, Smith Lane maintains the center turn lane for about one-half mile before becoming a two-lane road without the center turn lane as the road continues into a largely rural area. Data from the Tennessee Department of Transportation Data Management System confirms substantially higher Annual Average Daily Trips (AADT) measured at locations on Smith Lane north of the Project site than those south of the Project site.

Impacts during Construction

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

The Project would also rely primarily on the same portion of the Project site for “laydown” areas for equipment as well as supply deliveries and staging. These areas would have direct access to the James Lawrence Road for truck deliveries. Given the robust nature of the current road infrastructure, the availability of temporary parking on the Project site, and the shift changes occurring at non-peak hours; the impacts on traffic as a result of the construction of the Project would be temporary and minor.

Impacts during Operation

Once operational, the traffic to/from the Project site would bring additional vehicles onto James Lawrence Road that would access the road after turning off Smith Lane. The Project would employ between 150 to 230 workers over three shifts, with approximately 140 employees during the peak daytime shift and 45 employees each on the other two shifts. Vehicle movement during the peak morning traffic period would increase over existing conditions as would peak late-afternoon traffic conditions. During the day shift there would also be approximately up to 6 trucks per day either bringing in raw materials or loading processed materials. There would be two accesses to the Project site from James Lawrence Road, one to the parking lot and the west side of the main building and one to the east side between the main building and the raw material storage building.

Along the approximately 1-mile length of James Lawrence Road there are four accesses to/from the Toyota Motors facilities and another three from the Menasha Packaging facility. The majority of that traffic is staff personal vehicles with some intermittent truck traffic to/from the Toyota facilities. The traffic to/from the Menasha facility is mostly personal vehicle traffic as that facility has truck loading dock access directly from Smith Lane. Because the intersection at James Lawrence Road is sign controlled and not signal controlled, there may be a need to coordinate



departure times of daytime staff with the other facilities on James Lawrence Road to ensure smooth traffic flow.

Given the following: 1) the current road infrastructure with ample capacity expanding headed north (the direction the vast majority of traffic to/from the site originate from or head toward), 2) good sight lines along the route, 3) a dedicated turn lane from south Smith Lane onto James Lawrence Road, 4) the fact that some traffic both during construction and operations would occur at off-peak hours, 5) a relatively low volume of truck traffic to/from the Project site, and 6) the fact that most of the truck traffic to/from the facility has direct access to Smith Lane, the impacts of the additional traffic to/from the Project site would be minor.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No traffic and transportation impacts would occur as existing conditions would remain unchanged.

3.3.12 Waste Management

This section discusses RCRA wastes that would be generated at the facility. The configuration of the proposed facility and its geographic location would prevent offsite environmental impact from waste possession and disposal. The wastes would be stored temporarily, but would not be treated or disposed at the proposed facility. All RCRA waste would be transferred to facilities permitted by the DSWM in the TDEC or permitted by other federal or state jurisdiction.

General wastewater would be directed to the sewer and the Miller Creek Wastewater Treatment Plant for treatment via a 10-inch gravity main situated along the north site boundary. Additionally, two pump stations and force mains will be installed. The Miller Creek Wastewater Treatment Plant has an available capacity of approximately 9,400,000 gpd. The Plant will ensure proper treatment and disposal of wastewater generated by the Project and other sources in the vicinity. No septic system is proposed.

Construction Wastes

Construction waste would consist of RCRA Subtitle D non-hazardous solid waste. All solid waste generated during the construction phase of the plant would be collected, placed in appropriate receptacles, and disposed of off-site in accordance with DSWM requirements. Some soil involved with construction may come to contain construction debris. Within reason, construction debris contained in the soil would be segregated, managed as solid waste, and disposed offsite in accordance with DSWM requirements.

Non-hazardous RCRA Subtitle D Wastes Generated During Operations

Non-hazardous RCRA Subtitle D solid waste (i.e., garbage) would be collected in office and shop receptacles placed at appropriate locations in the facility. Subsequently the solid waste would be bagged and disposed of in dumpsters awaiting collection by vendor or municipal refuse transport. From the 6K facility, the refuse transport operation would deliver the waste to the Madison County collection facility.



Hazardous RCRA Subtitle C Wastes Generated During Operations

Incidental to operation of the facility, RCRA Subtitle C characteristic hazardous wastes (*i.e.*, not listed wastes) may be generated. The facility would acquire necessary RCRA Subtitle C permit from the DSWM. It is expected that the facility would be either a very small quantity generator (VSQG) or a small quantity generator (SQG). Hazardous wastes would be transferred to duly-permitted treatment, storage, and disposal facilities (TSDF).

Certain wastes generated at the plant may be acutely hazardous as defined by Tennessee and EPA regulations. Characteristic wastes may be generated at the plant. Characteristic wastes are those that display one or more of these characteristics:

- Ignitable
- Oxidizer
- Corrosive
- Reactive
- Toxic
- Lethal.

Nitric Acid

Nitric Acid meets the RCRA Subtitle C definition for corrosivity, therefore Nitric Acid that would not be recovered by plant systems for reuse would be treated as hazardous waste. It would be sent for recycling or processing at a duly permitted facility. The used nitric acid would be conveyed for transport, recycled, or processed for disposal by a permitted waste brokerage company. Shipments would be consigned in accordance with applicable U.S. Department of Transportation (DOT) requirements. The plant would recover and recycle the majority of the Nitric Acid produced and would minimize quantities that go offsite. The vendor for offsite disposal is not yet defined.

Trimethylaluminum (TMA)

TMA waste is toxic, ignitable, corrosive, and reactive. Therefore, it would be disposed of as RCRA Subtitle C hazardous waste. TMA waste would be handled and stored in containers with nonaqueous liquid. The waste containers would be kept closed, labeled and in a designated area, away from incompatible materials including aqueous solutions until disposal. A flammable cabinet would be used when appropriate to hold the waste for disposal. Shipments would be consigned in accordance with applicable U.S. DOT requirements.

Based on the following: 1) the configuration of the facility and its geographic location would prevent offsite environmental impact from waste possession and disposal; 2) the wastes would be stored temporarily, but would not be treated or disposed at the facility; and 3) all RCRA waste would be transferred to facilities permitted by the DSWM in the TDEC or permitted by other federal or state jurisdiction impacts from waste generated at the facility should be minimal.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No waste management impacts would occur as existing conditions would remain unchanged.



3.3.13 Water Resources

This section describes the existing water resources on and in the area of the Project site. Surface water includes lakes, rivers, and streams while groundwater comprises the subsurface hydrogeologic resources of the physical environment. Wetlands and floodplains are also discussed.

3.3.13.1 Surface Water and Floodplain

The Project site falls within the South Fork Forked Deer River watershed, which is included in the larger Mississippi River watershed, and drains to the Mississippi River. The watershed covers approximately 1,840 square miles and provides surface water to western Tennessee for industrial, residential, and agriculture uses (SNOFLO, 2023). Cub Creek (TN08010205012_1250) is approximately 0.5 miles to the east of the Project site, and is impaired by physical substrate and habitat alteration and well as sedimentation (TDEC, 2022). Surface water features near the Project site include one (1) delineated wetland to the southeast of the Proposed Project site (Figure 7) (ECS, 2023b). There were no potential streams identified within the Project Study Area (Appendix K).

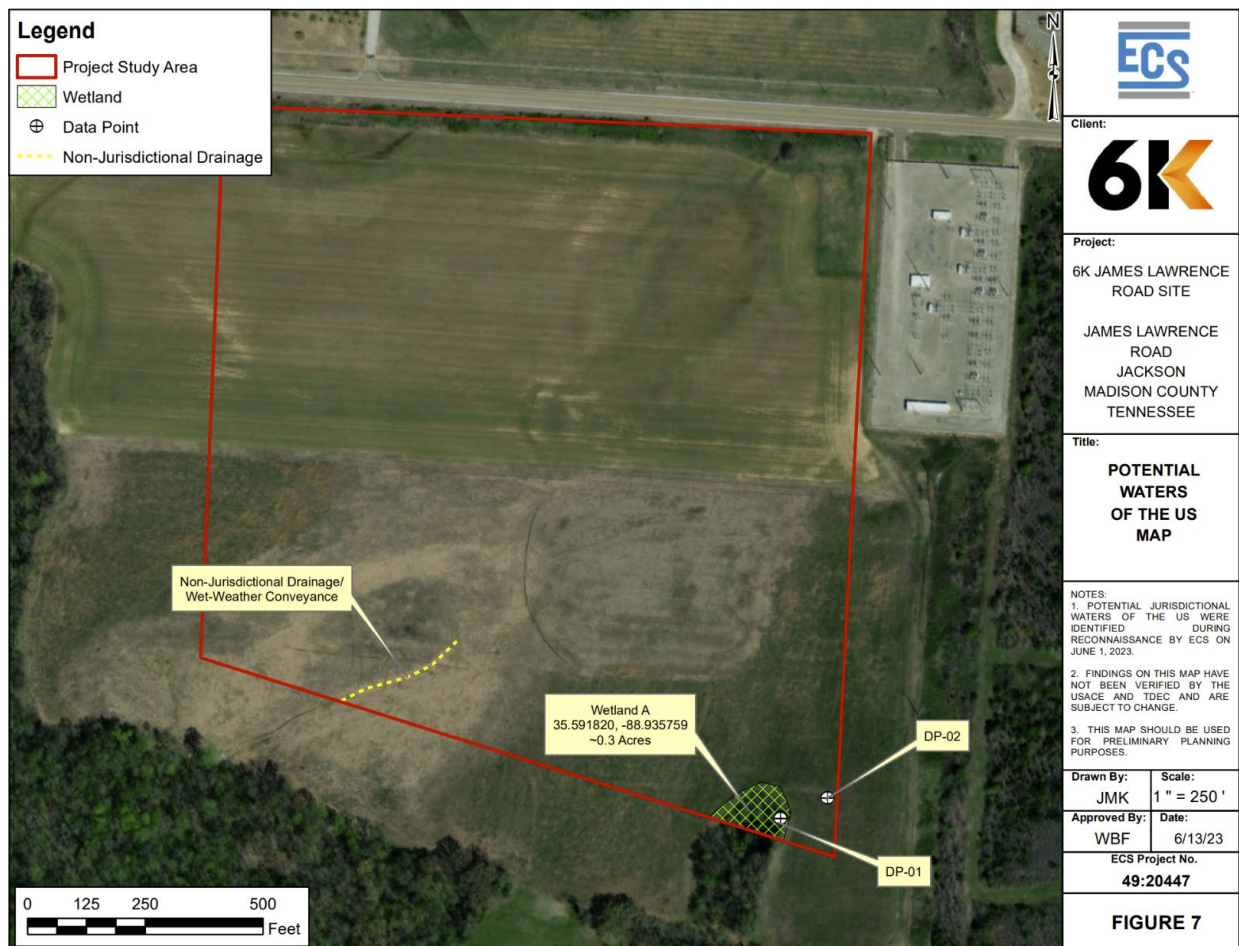


Figure 7. Delineated wetland and stream features on the Project site.



Note that the Project boundaries shown above have since changed and the wetland is not within the Proposed Project area boundaries. Source: ECS, 2023b.

DOE regulations at 10 CFR Part 1022, “*Compliance with Floodplain and Wetland Environmental Review Requirements*,” implement the requirements of Executive Order 11990, “Protection of Wetlands.” These regulations require, among other things, that the Department notify appropriate government agencies and interested parties of a proposed wetlands action; conduct a wetlands assessment to evaluate the impacts of that action to wetlands in an EA or environmental impact statement; consider alternatives that would avoid or minimize impacts to wetlands; design or modify the action to minimize potential harm to wetlands; and allow for public review and comment of the analysis.

A 2023 wetland delineation was conducted of the site and surrounding area (ESA 2023). One off-property 0.3-acre wetland (wetland A) was documented to the southeast of the Project area, and outside the Project footprint. Black willow (*Salix nigra*) and sweetgum (*Liquidamber styraciflua*) dominated the wetland. The 2023 survey noted that wetland could be considered jurisdictional by the United States Army Corps of Engineers (USACE) and the TDEC, however, based on desktop mapping, it appears that the wetland is potentially isolated. If that is the case, the wetland would likely be considered non-jurisdictional under the Sackett vs EPA ruling.

Floodplains are lowlands of relatively flat areas adjoining waters that are subject to flooding. The 100-year floodplain is designated based on different factors on the Federal Insurance Rate Maps (FIRMs) along with other flooding and storm surge information. With respect to occurrence, a 100-year flood has a one percent chance of occurring in any given year and the 500-year flood has a 0.2 percent chance in any given year. Floodplains are defined by the limit/extent of these floods. Floodplains are regulated by the FEMA with standards outlined in 44 CFR Part 60.3. Executive Order 11988, *Floodplain Management*, requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains. No floodplains occur on the site (FIRM #47113C0255E and #47113C0260E, effective 3 August 2009) (FEMA, 2023).

3.3.13.2 Groundwater

The Memphis Sand of the Claiborne Group of Tertiary age underlies approximately 7,400 square miles in western Tennessee, including the Project site. The formation primarily consists of a thick body of very fine to very coarse sand that includes subordinate lenses or beds of clay and silt at various horizons. The Memphis Sand ranges from 0 to about 900 feet in thickness, but where the original thickness is preserved, it is about 400 to 900 feet thick (Parks and Carmichael, 1990). The Memphis Sand yields water to wells in most of the area of occurrence in western Tennessee and, where saturated, makes up the Memphis aquifer. The Memphis Sand thins eastward, towards Jackson where its saturated thickness ranges from 0 to 270 feet; the Fort Pillow Sand, from 0 to 180 feet (Bailey, 1993). The City of Jackson pumps its water from 21 deep wells from the Memphis Sands aquifer (underground water bearing zone) and the deeper Fort Pillow aquifer.

The highest elevation at the Project site is located at the eastern and central portion of the subject property and slopes downward to the south, west, and north. Therefore, shallow groundwater is



expected to follow the direction of the slope south, west, or north depending on its location on the subject property (ECS, 2023a; TTL, 2023).

A 2023 geotechnical investigation was conducted, and 30 borings were advanced at the proposed Project site. Sixteen (16) borings were advanced to 25 feet bgs; twelve borings (12) were advanced to 10 feet bgs; and two (2) borings were advanced to 15 ft bgs. Water was encountered in eleven of the 30 borings at depths ranging from 5 feet bgs to 24 ft bgs (ECS, 2023a).

A geotechnical investigation was conducted at the Project site, and six (6) borings were advanced in 2013 (PSI, 2014). Observations were made to determine if groundwater was present in the borings during drilling and at completion of drilling. During drilling operations, groundwater was measured at a depth of 34 feet in one boring and 31 feet in another. Some fluctuations of the groundwater level should be anticipated with changing seasons and climatic conditions. Free water was not observed in the remaining borings at the time of drilling operations. Some saturated soils were encountered as shallow as 2 feet.

Proposed Action Impacts

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

No impacts to wetlands are anticipated under the Proposed Action. Wetland A occurs outside the construction footprint and off the subject property. No permitting through the USACE or TDEC would be required because there are no direct or indirect wetland impacts proposed. BMPs would be implemented during construction to protect these resources from turbid stormwater runoff impacts.

The Project does not propose groundwater withdrawals, nor would construction impact groundwater, as the groundwater tables are not shallow in the Project site. Therefore, no impacts to groundwater are expected.

No Action Alternative Impacts

Under the No Action Alternative, the DOE would not provide funding to 6K for the purpose of implementing the Project. No impacts to water resources would occur as existing conditions would remain unchanged.

3.3.14 Cumulative Impacts

Cumulative impacts are potential effects on the environment from the incremental impact of the Project when added to other past, present, and reasonably foreseeable future actions undertaken by other agencies (federal or nonfederal) or persons (40 CFR Part 1508.1 (g)). The existing setting, as presented for the Project location takes into account past actions, while the present and future actions that may contribute to a cumulative effect were identified through a review of active project lists and planning documents from Tennessee (TVA], TDOT, Madison County Chamber of



Commerce, City of Jackson, the West Tennessee Industrial Association, with additional information from 6K). The review identified the present and reasonably foreseeable future projects associated with the Project location:

- Possible 5-acre salt production facility, by others, in the southwest corner of the Project site
- Possible 5-acre solar farm, by others, in southeast corner of the Project site.

DOE reviewed the identified projects in the region to determine the resources that may be subject to a cumulative impact. The review focused on the resources affected by the Project and identified resources that may be affected by both the Project and other projects in the region. Based on this review, the following resources were evaluated for cumulative impacts.

- Aesthetics and Visual Resources
- Air Quality and Climate Change
- Biological Resources
- Cultural Resources
- Geology and Soils
- Health and Safety
- Land Use
- Noise
- Socioeconomics and Environmental Justice
- Traffic and Transportation
- Waste Management
- Water Resources.

3.3.14.1.1 Aesthetics and Visual Resources

The location of the facility is intended for industrial development. Section 3.3.1 describes the potential for minor direct impacts of the Project as a result of its design and location with respect to residential properties. Additional projects in the region would augment existing industrial and roadway infrastructure and thereby could have an incremental impact on visual resources. However, because of 1.) the Project location in an industrial zoned space, 2.) the design to maximize the sustainability and biodiversity of the site, and minimize aesthetic and visual resource impacts, including through the retention of existing natural vegetation (no tree removal proposed on site), planting new biodiverse vegetation, and including running trails and xeriscape surrounding the facility, and 3.) the existing surrounding infrastructure, cumulative impacts on aesthetics and visual resources would be minor.

3.3.14.1.2 Air Quality and Climate Change

The Project's construction phase would result in air emissions, primarily from fugitive dust associated with earthmoving and exhaust from fuel combustion. However, emissions resulting from construction would be temporary and minimized through the use of BMPs.

In operation, the Project would support the proliferation of EVs, thereby reducing emissions from fuel combustion. Although the construction phase would have temporary impacts on air quality,



the long-term effect of increased EV implementation would outweigh impacts from construction and result in a net benefit.

The potential exists for the operations of the Project to result in cumulative impacts on regional air quality. Madison County is in attainment or unclassifiable for all of the NAAQS; in accordance with the CAA, the state has developed a State Implementation Plan to maintain compliance with the NAAQS. Any new emissions in the airshed, including those of the identified projects in the region that are subject to CAA permitting, have to comply with CAA regulations and would be reviewed to ensure that air quality in the region maintains compliance with the NAAQS. Therefore, the cumulative impacts on air quality associated with operation of the Project and the other projects in the region would be subject to regulatory oversight through the CAA.

In addition to direct and indirect sources of atmospheric emissions, cumulative emissions associated with the proposed facility are reasonably foreseeable from offsite combustion associated with electrical generation, mobile-source and rail fuel combustion, and stationary-source emissions associated with regional suppliers, manufacturers and vendors near the facility. Although the extent of cumulative emissions cannot be accurately quantified, for each of the cumulative-source emissions categories, regulatory requirements, including the CAA and Tennessee State Statute, constrain emissions sources, based on public health considerations. Again, the Project would foster the expansion of EV adoption, effectively counterbalancing emissions produced by gasoline- and diesel-powered vehicles' exhaust and leading to a substantial reduction in nationwide greenhouse gas emissions—a significant driver of climate change. Further, compared to traditional co-precipitation techniques, UniMelt® uses up to 2x less power with a corresponding reduction in carbon dioxide (CO₂) emissions, so the proposed facility has an environmental advantage over other proposed facilities that are also proposing to expand domestic battery material supply.

3.3.14.1.3 Biological Resources

Due to the current industrial land use adjacent to the Project site, the modified and monoculture nature of the existing biological resources on the majority of the site because of the agricultural land use, the proposed facility's lack of natural habitat and connection to intact natural habitats, and resultant low potential for wildlife use, cumulative impacts on general biological resources (wildlife and vegetation) are minor.

There is no critical habitat within the Project site and there is a lack of natural habitat on or adjacent to the Project site and surrounding industrial activities.

3.3.14.1.4 Cultural Resources

As stated in section 3.3.4, impacts to cultural resources from the proposed action are not expected. Therefore, it is concluded that impacts from the proposed action, when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased impacts on cultural resources within the Project boundary or surrounding area beyond what has already been experienced.

3.3.14.1.5 Geology and Soils

The proposed Project, in conjunction with the other possible identified projects on the Project site, would be designed to minimize land disturbance and grading. The projects would convert no more



than 50 acres of prime farmland to industrial use. This impact was evaluated using the USDA Farmland Conversion Impact Rating Form (AD1006) using site assessment criteria to ascertain the regional importance of the area of converted prime farmland in the context of the broader community (through, for example, examining the distance to urban support services, size of the present farm unit compared to the average in the area, and the availability of farm support services). Because the proposed Project site has been designated by a state or local government entity for commercial and/or industrial land use, it is not subject to mitigation under the Farmland Protection Policy Act.

3.3.14.1.6 Greenhouse Gases

In context of global GHG emissions, the 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 Project GHG emissions. Within the first ten years of operation, batteries produced using material generated at the Proposed Project site would be expected to eliminate between 4,493,770 to 4,600,000 metric tons of CO₂ emissions. In general, the potential benefits associated with reducing CO₂ emissions would reduce 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).

3.3.14.1.7 Health and Safety

Section 3.3.7 details the impacts to health and safety from the proposed action. Hazardous materials, such as TMA, Nitric Acid, and Nitrogen Oxides would occur as a result of the proposed action, and measures to protect health and safety have been documented and would be required to be followed throughout construction, operation, and potentially decommissioning of the facility. Impacts to health and safety from the proposed action are not anticipated.

Therefore, it is concluded that impacts from the proposed action when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased impacts on health and safety within the project boundary or surrounding area beyond what has already been experienced.

3.3.14.1.8 Land use

As described in section 3.3.8, impacts to land use from the proposed action would be minor. An analysis was completed of other projects that may potentially impact land use either on the Project site or the surrounding area. Impacts from the proposed action when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased impacts on land use within the Project boundary or surrounding area beyond what has already been experienced.

3.3.14.1.9 Noise

As described in section 3.3.9, impacts to noise during construction would be intermittent and temporary. Impacts to noise during operation would be negligible. Therefore, it is concluded that impacts from the proposed action when combined with other past, present, and reasonably foreseeable future actions, would have no new or increased impacts on noise within the Project boundary or surrounding area beyond what has already been experienced.



3.3.14.1.10 Socioeconomic and Environmental Justice

As stated in section 3.3.10, the proposed action would have a positive environmental impact on socioeconomics and environmental justice. Therefore, it is concluded that impacts from the proposed action are combined with other past, present, and reasonably foreseeable future actions, would have no new or increased negative impacts on socioeconomics and environmental justice within the Project boundary or surrounding area beyond what has already been experienced and would have a positive impact on both socioeconomics and environmental justice.

3.3.14.1.11 Traffic and Transportation

The increase in traffic during construction and operation of the proposed Project is expected to be minor. There are no current plans for future additions, expansion, or other activity related to or connected with this proposal which would cumulatively increase traffic further. The applicants do not own contiguous parcels. Moreover, no parking spaces would be eliminated by the proposed Project, no temporary road closures or detours would be required during either the construction or operation of the proposed Project, and there would be no impacts to public transit. The proposed Project would employ workers already local and contributing to traffic in the area. They would be accessing to/from the Project site in shifts which further minimizes impacts to traffic. Therefore, while there would be an incremental increase in overall traffic, no adverse cumulative effects on the region's overall transportation network are anticipated as a result of the proposed Project.

3.3.14.1.12 Waste Management

As described in section 3.3.12, RCRA waste would be generated at the facility. The waste would be stored temporarily but would not be treated or disposed at the proposed facility. All RCRA waste would be transferred to facilities permitted by the DSWM in the TDEC or permitted by other federal or state jurisdiction. Hazardous wastes would be transferred to duly-permitted TSDF. All solid waste generated during the construction phase of the plant would be collected, placed in appropriate receptacles, and disposed of off-site in accordance with DSWM requirements. The configuration of the proposed facility and its geographic location would prevent offsite environmental impact from waste possession and disposal.

3.3.14.1.13 Water Resources

As stated in section 3.3.13, there are no mapped floodplains present within the Project site. The proposed Project, in conjunction with the other surrounding identified projects, are not currently planned to directly impact the wetlands or streams on or surrounding the Project site.

There are no known plans for surface water or groundwater withdrawals or discharges associated with the Project or other surrounding identified projects. The water supply to the site is provided by the utility (Jackson Energy Authority), which has sufficient available capacity (7,142,000 gpd). While the cumulative projects in the area would lead to an incremental increase in water use, it would remain below the utility's available and approved capacity. In addition, some applicants are considering rainwater capture systems to supplement the water supply, thereby reducing the potential impacts on water quantity. Moreover, stormwater generated by the Project and other surrounding identified projects would be directed to designated treatment systems, ensuring proper management and prevention of potential contamination.



CHAPTER 4. FINDING

Based on the information presented in this Final EA (DOE/EA-2223), DOE finds that providing cost-shared funding to 6K for the proposed PlusCAM™ project would not constitute a major federal action that would significantly affect the quality of the physical, biological, or human environment, within the meaning of NEPA. Therefore, the preparation of an Environmental Impact Statement is not required, and DOE will be issuing a FONSI.



CHAPTER 5. LIST OF AGENCIES CONTACTED

DOE coordinated with the following agencies, tribal nations, and stakeholders throughout the preparation of this EA and/or during the course of preparing the technical supporting studies. These agencies were also notified of the availability of the Draft EA through consultation letters and/or direct notification of the availability of the Draft EA.

- Chickasaw Nation
- Coushatta Tribe of Louisiana
- Department of Energy
- Jackson Energy Authority
- Tennessee Department of Environment and Conservation
- Tennessee Historical Commission
- Tennessee Valley Authority
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture, Natural Resource Conservation Service.



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APPENDICES

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Appendix J. Clearance of Farmland Protection Policy Act

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APPENDIX A. ENVIRONMENTAL SYNOPSIS

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
Morgantown, WV
Albany, OR

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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 (DAC's). 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;
- Ensuring that the U.S. has a viable battery materials processing industry to supply the North American battery 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>

- 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 (AOI's) 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 statutes 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 2022. Twelve topic areas of interest (AOI's) were included in the FOA and each AOI outlined project objectives that were specific to that AOI. The twelve AOI's 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

AOI’s 1–3 and 6–11 were directed to commercial level projects. AOI’s 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 AOI’s 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 AOI's 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 20 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 numerous eligible applications in twelve AOI’s. AOI’s 1 through 5 are under Battery Material Processing Grants pursuant to Section 40207(b)(3)(A); AOI’s 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. AOI’s and number of initial selections are listed in the table below:

AOI	AOI Title	Number of initial Selections
1	Commercial-scale Production Plants for Domestic Separation of Critical Cathode Battery Materials from Domestic Feedstocks	4
2	Commercial-scale Domestic Production of Battery-Grade Graphite from Synthetic and Natural Feedstocks	3
3	Commercial-scale Domestic Separation and Production of Battery-grade Precursor Materials (Open Topic)	2
4	Demonstrations of Domestic Separation and Production of Battery-grade Materials from Unconventional Domestic Sources	1
5	Demonstrations of Innovative Separation Processing of Battery Materials Open Topic	1
6	Commercial-scale Domestic Battery Cell Manufacturing	0
7	Commercial-scale Domestic Battery Cathode Manufacturing	2
8	Commercial-scale Domestic Battery Separator Manufacturing	2
9	Commercial-scale Domestic Next Generation Silicon Anode Active Materials and Electrodes	2
10	Commercial-scale Domestic Battery Component Manufacturing Open Topic	1
11	Commercial-scale Domestic Battery Recycling and End-of Life Infrastructure	1
12	Domestic Battery Cell and Component Manufacturing Demonstration Topic	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
- Air Quality
- Biological Resources
- Climate
- Community Services
- Cultural Resources
- Environmental Justice
- Floodplains
- Geology
- Ground Water
- Human Health and Safety
- Land Use
- Noise
- Socioeconomics
- Soils
- 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 DAC’s, 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 DAC’s: (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 DAC’s 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 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

³ The Justice40 initiative, created by E.O. 14008, establishes a goal that 40percent of the overall benefits of certain federal investments flow to (DAC’s). The Justice40 Interim Guidance provides a broad definition of DAC’s (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 DAC’s and recognized benefits under the Justice40 Initiative.

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 DAC's. 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 B. CONSULTATION WITH AGENCIES

July 11, 2023

E. Patrick McIntyre, Jr.
Executive Director/State Historical Preservation Officer
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

SUBJECT: U.S Department of Energy's Section 106 Determination for 6K, Inc's PlusCAM™
Project, Madison County, Tennessee

Dear Mr. McIntyre:

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to 6K, Inc. (6K) 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 (BIL). 6K proposes a factory-scale facility that would produce multi-chemistry cathode materials for electric vehicle (EV) batteries with the goal of meeting the demands of the growing EV market. The proposed facility will utilize proprietary UniMelt® microwave plasma technology to deliver critical battery materials for the EV and electric grid markets. The use of a microwave plasma provides for a controlled, uniform, highly reactive, and high temperature reaction zone that enables the synthesis of materials at rates far greater than with conventional methods, and with much greater chemistry and size flexibility. The proposed multi chemistry plant will produce both Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO₂) (NMC) and Lithium Iron Phosphate (LFP) batteries: both dominant EV batteries in commercial markets.

NETL proposes to provide federal funding for the Project. The proposed project area is located at 256 James Lawrence Road in Jackson, Madison County, Tennessee (See Exhibit 1, Project Location Map). The approximate site latitude and longitude are 35° 35' 42.01" N and 88° 56' 20.40" W. The proposed facility will be within a 50-acre site within an Airport Industrial Park and will include an approximately 125-150,000 sq. ft. main building. In addition to this building, there are also 206 proposed parking spaces, an electrical building, utility switchyard, a NO_x to nitric area, and raw material and finished product warehousing. The proposed project site is an undeveloped agricultural field, located in an industrial park (See Exhibit 2, Site Photos). The site is zoned industrial. According to a review of historical information, the Project site has been an agricultural field since at least 1941 (TTL, 2023). The adjoining properties consist of James Lawrence Road, a Toyota Motor Manufacturing facility, Kellogg's distribution center, electrical substation, solar farm, and undeveloped woodlands.

The construction of the proposed facility will sequence through successive phases starting with the establishment of sedimentation and erosion control measures, rough grading and clearing,

building pad preparation and construction, building shell construction, final grading, and site stabilization and landscaping. The final phase of building construction includes the installation of the equipment to support the battery cell manufacturing process. After the building shell is constructed, the Project site will be landscaped with running trails and xeriscape plants and pollinator friendly plant species to maximize natural habitat and to promote biodiversity and aesthetic views from surrounding land uses and facilities.

There were two different culture reports done for this area by TRC (Environmental Consultant) under the direction of the Tennessee Valley Authority, one in 2010 and one in 2004. I'm attaching both of these reports here for your reference. This property was previously disturbed and the subject property has been an agricultural field since as early as 1941. Most recently in April 2023, the Greater Jackson Chamber had a Phase I Environmental Site Assessment Report completed for 6K, Inc.

Based on the scope of the proposed project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2223) in accordance with requirements of the National Environmental Policy Act (NEPA) 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, you will be sent an electronic and hard copy where you may provide any further comments.

With the information provided to DOE and further review of this 50acre parcel, we have made the determination that this parcel has a low probability for the presence of significant archaeological resources. We would like a concurrence to our decision, if you so agree.

If you have any questions concerning the project, please contact me. I look forward to working with you.

Sincerely,



Harry E. Taylor, P.E.
NEPA Compliance Officer
U.S. Department of Energy - National Energy Technology Laboratory
3610 Collins Ferry Road, Building 26, Room 102, MS 107 Morgantown, WV 26505
304.-285.5091
harry.taylor@netl.doe.gov

cc: Jennifer Barnett, Cultural Resource Consultant Manager, SHPO, (jennifer.barnett@tn.gov)
Vanessa Rogers, Hamer Environmental (vanessa@hamerenvironmental.com)
Stacey Kilarski, Hamer Environmental (stacey@hamerenvironmental.com)
Deborah Sung, 6K, Inc (Deborah.Sung@6Kinc.com)
Colvin Wang, 6K, Inc (Colvin.Wang@6Kinc.com)

Taylor, Harry E.

From: TN Help <tnhelp@service-now.com>
Sent: Wednesday, July 12, 2023 3:50 PM
To: Taylor, Harry E.
Subject: [EXTERNAL] New Construction of 6K, Inc Factory-Scale Facility - Project # SHPO0003443

Follow Up Flag: Follow up
Flag Status: Flagged



TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

07-12-2023 14:43:15 CDT

Harry Taylor
US Department of Energy
harry.taylor@netl.doe.gov

RE: Department of Energy (DOE), New Construction of 6K, Inc Factory-Scale Facility , Project#: SHPO0003443, Jackson, Madison County, TN

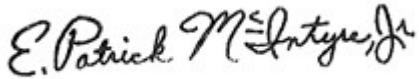
Dear Harry Taylor:

In response to your request, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

After considering the documentation submitted, we concur with your agency that there are no National Register of Historic Places listed or eligible properties affected by this undertaking. We have made this determination because either: no National Register listed or eligible Historic Properties exist within the undertaking's area of potential effects, the specific location, size, scope and/or nature of the undertaking and its area of potential effects precluded affects to Historic Properties, the undertaking will not alter any characteristics of an identified eligible or listed Historic Property that qualify the property for listing in the National Register, or it will not alter an eligible Historic Property's location, setting or use. We have no objections to your proceeding with your undertaking.

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Please provide your Project # when submitting any additional information regarding this undertaking. You may direct questions or comments to Jennifer Barnett, who drafted this response, at Jennifer.Barnett@tn.gov, +16156874780.

Sincerely,



E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

Ref:MSG9016059_miXWDoanyAfaZZvvJaTs

This message does not originate from a known Department of Energy email system.
Use caution if this message contains attachments, links or requests for information.



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF ARCHAEOLOGY
Cole Building #3, 1216 Foster Avenue
NASHVILLE, TN 37210
(615) 741-1588 FAX (615) 741-7329

February 3, 2013

Ms. Mandy White
Senior Vice President, Economic Development
Jackson Chamber
197 Auditorium Street
Jackson, Tennessee 38301

Re: Tennessee Select Sites – Airport Industrial Park, Jackson.

Dear Ms. White:

The above-referenced project was reviewed under our responsibilities set forth in Tennessee Code Annotated 11-6-108. Sites A and B was surveyed by archaeologist Dr. Larry McKee of TRC Environmental Corporation in 2010 while investigating a new TVA transmission line. While archaeological sites were recorded within the project area, they were determined to be deflated and ineligible for the National Register of Historic Places. This project, as currently proposed, should have no effect upon significant archaeological resources.

For the applicant's information, a court order from Chancery Court must be obtained prior to the removal of any human graves. **If human remains are encountered or accidentally uncovered by earthmoving activities, all activity within the immediate area must cease.** The county coroner or medical examiner, a local law enforcement agency, and the state archaeologist's office should be notified at once (Tennessee Code Annotated 11-6-107d).

If you have any further questions, please feel free to contact me at 741-1588, ext. 113.

Sincerely,

Mark Norton
State Programs Archaeologist



July 11, 2023

Daniel Elbert, Supervisor
Fish and Wildlife Service
Tennessee Ecological Services Field Office
446 Neal Street
Cookeville, TN 38501-4027
tennesseeES@fws.gov
Phone: (931) 528-6481

SUBJECT: U.S Department of Energy's Section 7 Determination under the Endangered Species Act for PlusCAM™ Project, Madison County, Tennessee

Dear Mr. Elbert:

The U.S. Department of Energy (DOE), National Energy Technology Laboratory (NETL) proposes to provide federal funding to 6K Energy Tennessee, LLC (6K) for the construction and operation of a Plasma Low-cost Ultra Sustainable Cathode Active Material (PlusCAM™) facility which will produce cathode battery materials at the factory scale 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. The project proposes a factory-scale facility that would produce multi-chemistry cathode materials for electric vehicle (EV) batteries with the goal of meeting the demands of the growing EV market. The proposed facility will utilize proprietary UniMelt® microwave plasma technology to deliver critical battery materials for the EV and electric grid markets. The use of a microwave plasma provides for a controlled, uniform, highly reactive, and high temperature reaction zone that enables the synthesis of materials at rates far greater than with conventional methods, and with much greater chemistry and size flexibility. The proposed multi chemistry plant will produce both Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO₂) (NMC) and Lithium Iron Phosphate (LFP) batteries: both dominant EV batteries in commercial markets.

The proposed project area is located at 256 James Lawrence Road in Jackson, Madison County, Tennessee (See Exhibit 1, Project Location Map). The approximate site latitude and longitude are 35° 35' 42.01" N and 88° 56' 20.40" W. The proposed facility will be within a 50-acre site within an Airport Industrial Park and will include an approximately 125-150,000 sq. ft. main building. In addition to this building, there are also 206 proposed parking spaces, an electrical building, utility switchyard, a NOx to nitric area, and raw material and finished product warehousing. The proposed project site is an undeveloped agricultural field, located in an industrial park (See Exhibit 2, Site Photos). The site is zoned industrial. According to a review of historical information, the Project site has been an agricultural field since at least 1941 (TTL, 2023). The adjoining properties consist of James Lawrence Road, a Toyota Motor Manufacturing

facility, Kellogg's distribution center, electrical substation, solar farm, and undeveloped woodlands.

The construction of the proposed facility will sequence through successive phases starting with the establishment of sedimentation and erosion control measures, rough grading and clearing, building pad preparation and construction, building shell construction, final grading, and site stabilization and landscaping. The final phase of building construction includes the installation of the equipment to support the battery cell manufacturing process. After the building shell is constructed, the Project site will be landscaped with running trails and xeriscape plants and pollinator friendly plant species to maximize natural habitat and to promote biodiversity and aesthetic views from surrounding land uses and facilities.

The subject property and surrounding areas likely support a range of terrestrial, aquatic, and semi-aquatic plant and animal species. Patches of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), American sycamore (*Platanus occidentalis*) and trumpet creeper (*Campsis radicans*) trees on the periphery of the property could support a range of bird species, such as woodpeckers, sparrows, thrush, and warblers. The farmland areas of the property support a mix of crops and grasses, potentially attracting mammals like rabbits (*Sylvilagus floridanus*), white-tail deer (*Odocoileus virginianus*) elk (*Cervus canadensis*), skunks (*Mephitis mephitis*), squirrels (*Sciurus carolinensis*, *Glaucomys volans*, *Glaucomys sabrinus*, *Sciurus niger*, and *Sciurus carolinensis*), and rodents (including shrews, mice, rats and moles), and less likely, large predators like black bear (*Ursus americanus*), cougars (*Puma concolor*), bobcats (*Lynx rufus*), foxes (*Urocyon cinereoargenteus* and *Vulpus vulpes*), and coyotes (*Canis latrans*).

Other species that could potentially be present on the property include reptiles like snakes (*Carphophis amoenus*, *Coluber constrictor*, *Diadophis punctatus*, *Pantherophis guttatus*, *P. spiloides*, *Heterodon platirhinos*, *Lampropeltis calligaster*, *L. getula*, *L. triangulum*, *Pituophis melanoleucus*, *Storeria dekayi*, *S. occipitomaculata*, *Thamnophis* spp., *Agkistrodon piscivorus*, and *Sistrurus miliarius*), and insects like butterflies and bees, which rely on a mix of plant species for nectar and pollen. There is a wetland area south of the property which supports a mix of sedge species and rush species and sporadic black willow (*Salix nigra*) shrubs, as well as aquatic invertebrates like dragonflies and mayflies.

The U.S. Fish & Wildlife Service's Information for Planning and Consultation (IPaC) website identified three listed species: the Indiana bat (*Myotis sodalists*), the northern long-eared bat (*M. spetentrionalis*) and the whorled sunflower (*Helianthus verticillatus*) that could potentially be impacted by the project. Two species proposed to be listed were identified: the tricolored bat (*Perimyotis subflavus*), proposed as endangered, and the alligator snapping turtle (*Macrochelys temminckii*), proposed as threatened. One candidate species, the Monarch butterfly (*Danaus plexippus*), was identified. No critical habitats were identified on the project site (See Exhibit 3, IPaC Report).

Habitat requirements for each listed species are not present in the project area:

- Indiana bats typically forage in semi-open to closed forested habitats with open understory, forest edges, and riparian areas. Adult males occupy similar habitats but can use a

wider range of roosts compared to females (USFWS 2023a). There is no forested habitat in the project area. The scattered sporadic trees on the periphery of the property are not adequate foraging or roosting habitat and species presence is not anticipated. In addition, no trees will be cleared or grubbed from the project site.

- During the summer and portions of the fall and spring, northern long-eared bats may be found roosting singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags, or dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines (USFWS 2023b). Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. The species has also been found, although less commonly, roosting in structures, such as barns and sheds. Northern long-eared bats use forested areas not only for roosting, but also for foraging and commuting between summer and winter habitat (USFWS 2023b). There are no forested habitats or caves in the project area. The scattered sporadic trees on the periphery of the property are not adequate foraging or roosting habitat and species presence is not anticipated. In addition, no trees will be cleared or grubbed from the project site.
- Whorled sunflower is found in moist-soiled sites where little to no overstory canopy is present. Habitat quality ranges from remnant prairie or woodland sites to degraded sites along roadsides, railroad tracks, and agricultural fields. Despite their commonly degraded condition, associated plant species in these habitats indicate a community with strong prairie affinities (USFWS 2023c). The species was not reported during ecological site visit (wetland delineation) in June 2023 or August 2013 and species presence is not anticipated. The project site was used for agricultural purposes (growing cotton and cereals) until Q1 2023, and this ploughing/tilling and associated monoculture of crops is not conducive to whorled sunflower presence.

The proposed action will minimize land disturbance and the extent of grading to the area necessary to complete the work. No impacts to nearby off-site wetlands or other water resources will occur, either directly or indirectly. For the construction phase, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared and implemented to effectively prevent potential pollution or contamination of stormwater runoff. Implementation of appropriate BMPs during construction (such as silt fencing and/or straw wattles) will prevent potential impacts to nearby water resources from turbid stormwater runoff. Once constructed, discharge of treated water will be directed off site. No surface water or groundwater diversion, withdrawal or discharge is proposed. No riparian vegetation will be removed.

Vegetation removal will be limited to the area necessary for construction and no trees will be cleared or grubbed from the project site. The implementation of design elements to avoid impacting mature trees and wetlands and aquatic resources in the area, as well as conservation measures, such as vehicle speed limits in the construction zone and limiting construction to daylight hours, will minimize potential impacts to biological resources during construction. The proposed project will produce a minimal amount of light due to the 24-hour-a-day nature of operations at the facility. However, these sources of light and glare will be oriented away from sensitive areas (i.e., the trees, wetlands and streams) to avoid adverse impacts to wildlife. The property is surrounded by existing industrial and agricultural uses with a minimal increase in human movement and activity proposed beyond existing condition. There will be some

beneficial impacts to biological resources from the proposed planting with new biodiverse vegetation and xeriscape surrounding the facility.

Due to the current industrial land use adjacent to the project site, the modified and monoculture nature of the existing biological resources on the majority of the site because of the agricultural land use, the proposed facility's lack of natural habitat and connection to intact natural habitats (and lack of proposed impacts thereto), and resultant low potential for wildlife use, impacts to general biological resources (wildlife and vegetation) as a result of the project are negligible. 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 destroy/adversely modify designated critical habitat. Key facts supporting this conclusion include that no listed species or designated critical habitat are present in project area, and no suitable habitat for these species was identified on the project site.

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 project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2223) in accordance with requirements of the National Environmental Policy Act (NEPA) 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, you 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 Agency.

Sincerely,



Harry E. Taylor, P.E.
NEPA Compliance Officer
U.S. Department of Energy - National Energy Technology Laboratory
3610 Collins Ferry Road, Building 26, Room 102, MS 107 Morgantown, WV 26505
304.-285.5091
harry.taylor@netl.doe.gov

cc: Vanessa Rogers, Hamer Environmental (vanessa@hamerenvironmental.com)

Stacey Kilarski, Hamer Environmental (stacey@hamerenvironmental.com)
Deborah Sung, 6K, Inc (Deborah.Sung@6Kinc.com)
Colvin Wang, 6K, Inc (Colvin.Wang@6Kinc.com)

Attachments:

Figure A Property Site

Figure B Existing Pictures of the Site

Figure C US Department of Interior, Fish and Wildlife, Information for Planning and Consultation (IPaC) Letter

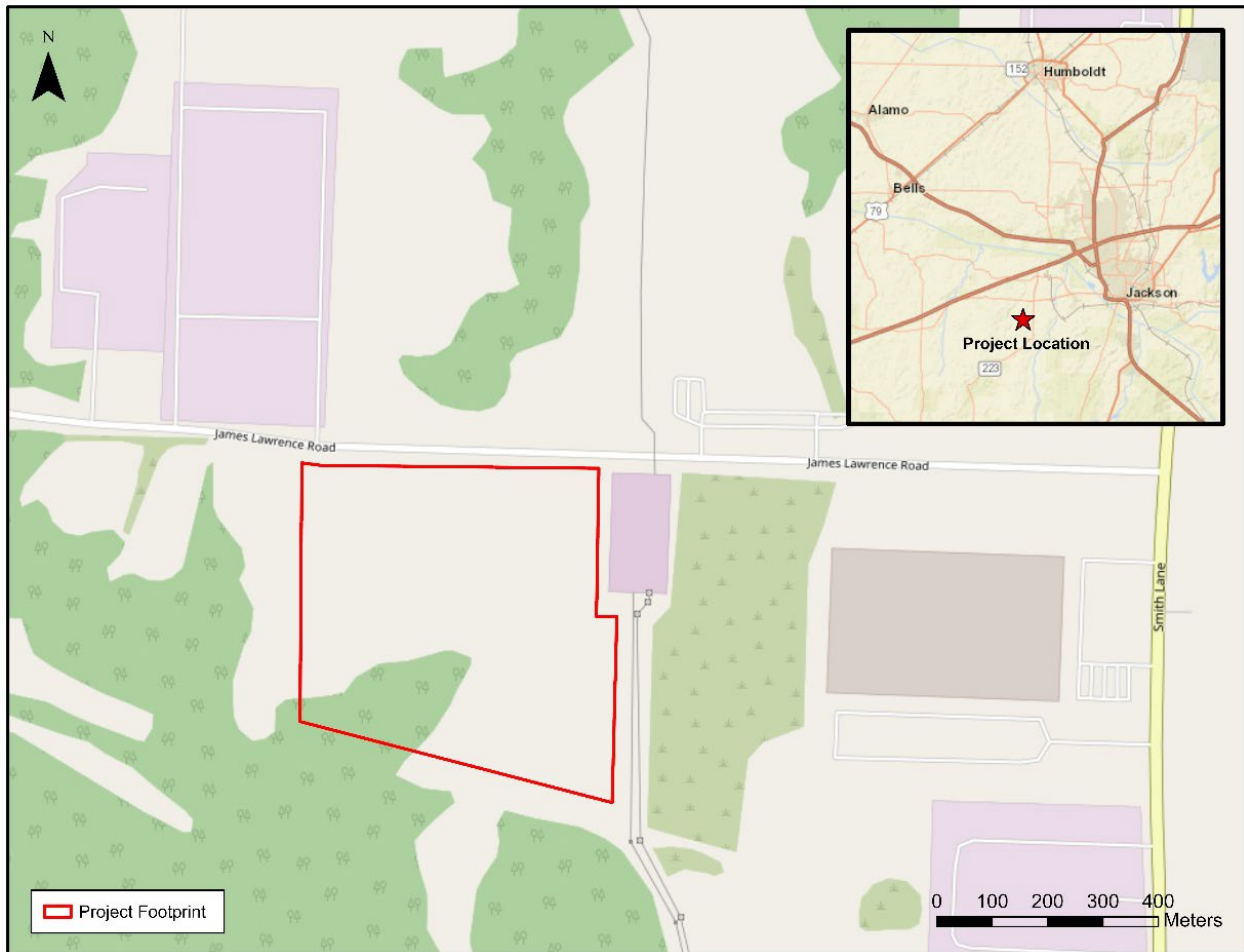


Figure A-1. Project Location Map.



Figure B.1 Existing Site View 1



Figure B.2 Existing Site View 2 from James Lawrence Road



Figure B.3 Existing Wetlands View [Project Does Not Propose Impacts]



Figure B.4 Existing Wetlands View [Project Does Not Propose Impacts]

Figure C

06/13/2023

2

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
- Migratory Birds
- Wetlands



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:

Tennessee Ecological Services Field Office

446 Neal Street

Cookeville, TN 38501-4027

(931) 528-6481

PROJECT SUMMARY

Project Code: 2023-0092852

Project Name: PlusCAM

Project Type: Commercial Development

Project Description: The proposed facility will be within a 50-acre site within an Airport Industrial Park and will include an approximately 125-150,000 sq . ft. main building. In addition to this building, there are also 206 proposed parking spaces, an electrical building, utility switchyard, and raw material and finished product warehousing.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@35.5933531,-88.93716436510007,14z>



Counties: Madison County, Tennessee

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 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.

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
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

REPTILES

NAME	STATUS
Alligator Snapping Turtle <i>Macrochelys temminckii</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Whorled Sunflower <i>Helianthus verticillatus</i>	Endangered
Population: There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3375	

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

-
1. The [Migratory Birds Treaty Act](#) of 1918.
 2. The [Bald and Golden Eagle Protection Act](#) of 1940.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\) list](#) or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Kestrel <i>Falco sparverius paulus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9587	Breeds Apr 1 to Aug 31
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31

NAME	BREEDING SEASON
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12

(0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.

- The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

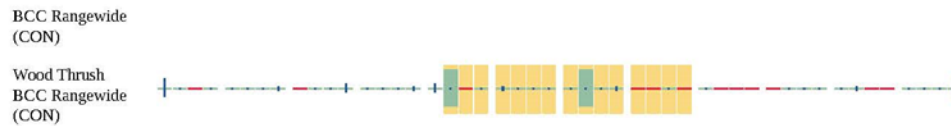
No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Additional information can be found using the following links:

- Birds of Conservation Concern <https://www.fws.gov/program/migratory-birds/species>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPAC USER CONTACT INFORMATION

Agency: Hamer Environmental
Name: Stacey Kilarski
Address: 7192 Kalaniana'ole Hwy.,
Address Line 2: Suite A143A #218
City: Honolulu
State: HI
Zip: 96825
Email: stacey@hamerenvironmental.com
Phone: 8088590339

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Department of Energy



TENNESSEE WILDLIFE RESOURCES AGENCY

ELLINGTON AGRICULTURAL CENTER
5107 EDMONDSON PIKE
NASHVILLE, TENNESSEE 37211

8/7/2023

Harry,

The Tennessee Wildlife Resources Agency has reviewed the information provided for the proposed project that will involve The U.S. Department of Energy (DOE), National Energy Technology Laboratory (NETL) providing federal funding to 6K Energy Tennessee, LLC (6K) for the construction and operation of a Plasma Low-cost Ultra Sustainable Cathode Active Material (PlusCAM™) facility which will produce cathode battery materials at the factory scale 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. The project proposes a factory-scale facility that would produce multi-chemistry cathode materials for electric vehicle (EV) batteries with the goal of meeting the demands of the growing EV market. The proposed facility will utilize proprietary UniMelt® microwave plasma technology to deliver critical battery materials for the EV and electric grid markets. The use of a microwave plasma provides for a controlled, uniform, highly reactive, and high temperature reaction zone that enables the synthesis of materials at rates far greater than with conventional methods, and with much greater chemistry and size flexibility. The proposed multi chemistry plant will produce both Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO₂) (NMC) and Lithium Iron Phosphate (LFP) batteries: both dominant EV batteries in commercial markets.

In reviewing this project as well as the species database, I considered a 4-mile radius beginning at coordinates -88.939000, 35.595003 which were provided in the information. No species of concern under the authority of the Tennessee Wildlife Resources Agency (TWRA) have been recorded within this radius of the project location.

Currently, TWRA does not anticipate this project to cause adverse impacts to species of concern. TWRA does require that Best Management Practices (BMPs) be implemented throughout the project site as well as during ALL construction activities associated with this project. TWRA also requires that all efforts be made to minimize/eliminate adverse impacts to nearby and downstream waterbodies by the introduction of silt and other debris either by direct impact, by natural precipitation runoff events or other possible construction activities from this project site.

It is recommended that the United States Fish and Wildlife Service (USFWS), in the Cookeville TN office, be made aware of this project should there be any concerns of possible adverse impacts to Federally Listed species. TWRA would agree with any comments or concerns that USFWS may have.

The State of Tennessee

AN EQUAL OPPORTUNITY, EQUAL ACCESS, AFFIRMATIVE ACTION EMPLOYER

Thank you for the opportunity to review and comment about this project. Please contact me if I can be of further assistance.

Allen Pyburn

Region 1 Aquatic Habitat Biologist/DCB Chairman

Tennessee Wildlife Resources Agency

200 Lowell Thomas Drive

Jackson, TN 38301

C: 731-298-6144

www.tnwildlife.org

gooutdoorstennessee.com





APPENDIX C. CONSULTATION WITH TRIBAL NATIONS

July 18, 2023

Kristian Poncho, Tribal Historical Preservation Officer, Coushatta Tribe of Louisiana
P.O. Box 10
1940 C.C. Bel Road
Elton, LA 70532

SUBJECT: Tribal Consultation and Section 106 Compliance for U.S Department of Energy's Section 106 Determination for 6K, Inc's PlusCAM™ Project, Madison County, Tennessee

Dear Kristian Poncho:

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to 6K, Inc. 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 (BIL). 6K proposes a factory-scale facility that would produce multi-chemistry cathode materials for electric vehicle (EV) batteries with the goal of meeting the demands of the growing EV market. The proposed facility will utilize proprietary UniMelt® microwave plasma technology to deliver critical battery materials for the EV and electric grid markets. The use of a microwave plasma provides for a controlled, uniform, highly reactive, and high temperature reaction zone that enables the synthesis of materials at rates far greater than with conventional methods, and with much greater chemistry and size flexibility. The proposed multi chemistry plant will produce both Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO₂) (NMC) and Lithium Iron Phosphate (LFP) batteries: both dominant EV batteries in commercial markets.

NETL proposes to provide federal funding for the Project. Federal Cost Share is \$50,000,000.00 for Total Project Cost and \$107,395,080.00 for a Total Award Value. The proposed project area is located at 256 James Lawrence Road in Jackson, Madison County, Tennessee (See Site Plans 1-3). The approximate site latitude and longitude are 35° 35' 42.01" N and 88° 56' 20.40" W. The proposed facility will be within a 50-acre site within an Airport Industrial Park and will include an approximately 125-150,000 sq. ft. main building. In addition to this building, there are also 206 proposed parking spaces, an electrical building, utility switchyard, a NO_x to nitric area, and raw material and finished product warehousing. The proposed project site is an undeveloped agricultural field, located in an industrial park (See Site Photos 1-4). The site is zoned industrial. According to a review of historical information, the Project site has been an agricultural field since at least 1941 (TTL, 2023). The adjoining properties consist of James Lawrence Road, a Toyota Motor Manufacturing facility, Kellogg's distribution center, electrical substation, solar farm, and undeveloped woodlands.

The construction of the proposed facility will sequence through successive phases starting with the establishment of sedimentation and erosion control measures, rough grading and clearing, building pad preparation and construction, building shell construction, final grading, and site stabilization and landscaping. The final phase of building construction includes the installation

of the equipment to support the battery cell manufacturing process. After the building shell is constructed, the Project site will be landscaped with running trails and xeriscape plants and pollinator friendly plant species to maximize natural habitat and to promote biodiversity and aesthetic views from surrounding land uses and facilities.

There were two different culture reports done for this area by TRC (Environmental Consultant) under the direction of the Tennessee Valley Authority, one in 2010 and one in 2004. I'm attaching both of these reports with this letter for your reference. This property was previously disturbed prior to the applicant's involvement. Also, this property has been an agricultural field since as early as 1941. Most recently in April 2023, the Greater Jackson Chamber had a Phase I Environmental Site Assessment Report completed for 6K, Inc.

Based on the scope of the proposed project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2223) in accordance with requirements of the National Environmental Policy Act (NEPA) 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, you will be sent an electronic and hard copy where you may provide any further comments.

With the information provided to DOE and further review of this 50-acre parcel, we have made the determination that this parcel has a low probability for the presence of significant archaeological resources. The Tennessee Historical Commission/SHPO has found No Objection with proceeding with our undertaking. We would like your concurrence to our decision if you so agreed.

If you have any questions concerning the project, please contact me. I look forward to working with you.

Sincerely,



Harry E. Taylor, P.E.
NEPA Compliance Officer
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26505
304.285.5091
harry.taylor@netl.doe.gov

cc: Vanessa Rogers, Hamer Environmental
Deborah Sung, 6K, Inc

Attachments:

Tennessee Historical Commission (SHPO) Concurrence Letter
Phase I Archeology Reports (2004 and 2010)
Topographic Project Map
Site Photographs

July 18, 2023

Kirk Perry, Historic Preservation Executive Officer, Chickasaw Nation
520 East Arlington
P.O. Box 1548
Ada, OK 74820

SUBJECT: Tribal Consultation and Section 106 Compliance for U.S Department of Energy's Section 106 Determination for 6K, Inc's PlusCAM™ Project, Madison County, Tennessee

Dear Kirk Perry:

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to 6K, Inc. 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 (BIL). 6K proposes a factory-scale facility that would produce multi-chemistry cathode materials for electric vehicle (EV) batteries with the goal of meeting the demands of the growing EV market. The proposed facility will utilize proprietary UniMelt® microwave plasma technology to deliver critical battery materials for the EV and electric grid markets. The use of a microwave plasma provides for a controlled, uniform, highly reactive, and high temperature reaction zone that enables the synthesis of materials at rates far greater than with conventional methods, and with much greater chemistry and size flexibility. The proposed multi chemistry plant will produce both Lithium-Nickel-Manganese-Cobalt-Oxide (LiNiMnCoO₂) (NMC) and Lithium Iron Phosphate (LFP) batteries: both dominant EV batteries in commercial markets.

NETL proposes to provide federal funding for the Project. Federal Cost Share is \$50,000,000.00 for Total Project Cost and \$107,395,080.00 for a Total Award Value. The proposed project area is located at 256 James Lawrence Road in Jackson, Madison County, Tennessee (See Site Plans 1 - 3). The approximate site latitude and longitude are 35° 35' 42.01" N and 88° 56' 20.40" W. The proposed facility will be within a 50-acre site within an Airport Industrial Park and will include an approximately 125-150,000 sq. ft. main building. In addition to this building, there are also 206 proposed parking spaces, an electrical building, utility switchyard, a NO_x to nitric area, and raw material and finished product warehousing. The proposed project site is an undeveloped agricultural field, located in an industrial park (See Site Photos 1 - 4). The site is zoned industrial. According to a review of historical information, the Project site has been an agricultural field since at least 1941 (TTL, 2023). The adjoining properties consist of James Lawrence Road, a Toyota Motor Manufacturing facility, Kellogg's distribution center, electrical substation, solar farm, and undeveloped woodlands.

The construction of the proposed facility will sequence through successive phases starting with the establishment of sedimentation and erosion control measures, rough grading and clearing, building pad preparation and construction, building shell construction, final grading, and site stabilization and landscaping. The final phase of building construction includes the installation

of the equipment to support the battery cell manufacturing process. After the building shell is constructed, the Project site will be landscaped with running trails and xeriscape plants and pollinator friendly plant species to maximize natural habitat and to promote biodiversity and aesthetic views from surrounding land uses and facilities.

There were two different culture reports done for this area by TRC (Environmental Consultant) under the direction of the Tennessee Valley Authority, one in 2010 and one in 2004. I'm attaching both of these reports with this letter for your reference. This property was previously disturbed prior to the applicant's involvement. Also, this property has been an agricultural field since as early as 1941. Most recently in April 2023, the Greater Jackson Chamber had a Phase I Environmental Site Assessment Report completed for 6K, Inc., that can be provided for review upon request.

Based on the scope of the proposed project, DOE plans to prepare an Environmental Assessment (EA) (DOE/EA-2223) in accordance with requirements of the National Environmental Policy Act (NEPA) 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, you will be sent an electronic where you may provide any further comments.

With the information provided to DOE and further review of this 50-acre parcel, we have made the determination that this parcel has a low probability for the presence of significant archaeological resources. The Tennessee Historical Commission/SHPO has found No Objection with proceeding with our undertaking. We would like your concurrence to our decision if you so agreed.

If you have any questions concerning the project, please contact me. I look forward to working with you.

Sincerely,



Harry E. Taylor, P.E.
NEPA Compliance Officer
U.S. Department of Energy
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26505
304.285.5091
harry.taylor@netl.doe.gov

cc: Vanessa Rodgers, Hamer Environmental
Deborah Sung, 6K, Inc.

Attachments:

Tennessee Historical Commission (SHPO) Concurrence Letter
Phase I Archeology Reports (2004 and 2010)
Topographic Project Map
Site Photographs

August 2, 2023

Mr. Harry E. Taylor
NEPA Compliance Officer
U.S. Department of Energy
3610 Collins Ferry Road
Building 26, Room 102, MS 107
Morgantown, WV 26505

Dear Mr. Taylor:

Thank you for the email notification, culture resource reports, photographs, site plans, and state historic preservation office letter regarding 6K, Inc.'s Plus CAM Project in Madison County, Tennessee. The undertaking is potentially receiving funding from the United States Department of Energy (DOE). We understand the project site is an undeveloped agricultural field located in an industrial park. The proposed project is within our area of interest and subject to our review under Section 106 of the National Historic Preservation Act.

The Chickasaw Nation has reviewed the provided documentation and concurs with the DOE's finding of no adverse effect. We are unaware of any specific historic properties, including those of traditional, religious, and cultural significance, in the project area. In the event the agency becomes aware of the need to enforce other statutes, we request to be notified under ARPA, AIRFA, NEPA, NAGPRA, NHPA, and Professional Standards.

We appreciate your efforts to preserve and protect significant historic properties. If you have any questions, please contact Ms. Karen Brunso, tribal historic preservation officer, at (580) 272-1106 or by email at hpo@chickasaw.net.

Sincerely,

A handwritten signature in black ink, appearing to read "Lisa John", with a long horizontal line extending to the right.

Lisa John, Secretary
Department of Culture & Humanities

cc: Harry.Taylor@netl.doe.gov



APPENDIX D. INTERIM ACTION MEMORANDUM

September 27, 2023

Deborah Sung
Project Manager
6K, Incorporated
25 Commerce Way
North Andover, MA 01845

RE: Interim Action(s) within the scope of an ongoing Environmental Assessment prior to issuance of a Finding of No Significant Impact (FONSI) for the Plasma Low-Cost Ultra Sustainable Cathode Active Materials Project (MS0000021)

Dear Ms. Sung,

In accordance with criteria established by the Council on Environmental Quality in its regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA)(40 CFR Parts 1500-1508), DOE’s NEPA implementing regulations (10 CFR Part 1021), which rely on those criteria, and DOE Order 451.1B, *National Environmental Policy Act Compliance Program*, our office has reviewed the Environmental Questionnaire submitted and found it acceptable to proceed with the following project tasks and subtasks from the enclosed Statement of Project Objectives (SOPO):

Task Number	Task Title	Nature of Task Activities
0.0	Project Management and Planning	Overall project management and planning
0.1	Kick-Off Meeting	Meeting
1.1.1 And 1.1.4	Procurement	Procuring materials for construction and building function (e.g. HVAC, electrical, etc.)
1.1.2	Plant design	Designing a full blueprint for the plant
1.1.3	Permitting	Obtain necessary permits
1.1.5 And 1.1.7	Planning	Planning for utilities connection and construction project planning
1.2	Equipment Deployment	R&D scale runs at 6K Battery of Excellence and ordering equipment for plant
1.3	Developing Critical Domestic Salt Supply	Development and validation of processes at R&D location and/or partner

These tasks include administrative work, paper studies, analysis, permitting, planning, ordering equipment and supplies. They are listed as tasks 0.0, 0.1, Task 1.1.1 through

1.1.5, 1.1.7, 1.2, and 1.3 (“The Recipient will initiate equipment and construction procurement, plant design, permitting, planning utilities and construction, conduct R&D scale runs, and develop Critical Domestic Salt Supply.”) The other tasks in the SOPO are not authorized under this interim action memorandum. Any tasks or portions of tasks not noted above are not considered to be interim actions, and potential environmental impacts of these activities must be evaluated with the Environmental Assessment (EA) planned for this project. No construction, groundbreaking, land disturbances, or other related activities are authorized under this interim action memorandum. Proceeding with any tasks not noted above prior to the issuance of a FONSI will put federal funding for this award at risk, and such costs may not be recognized as allowable cost share.

Although the tasks discussed in the above paragraph would take place prior to DOE’s completion of the EA for the entire project (*wherein a more thorough and extensive review will be conducted*), DOE has determined that completing these tasks would not have an adverse environmental impact; nor would it limit the choice of reasonable alternatives for the project. It is therefore acceptable for you to proceed with these tasks.

The activities detailed within this interim action will need to be further documented and included in the upcoming EA. This interim action memorandum will be included as an Appendix in the upcoming EA and become part of the official record. Please contact Harry Taylor at 304-285-5091, or Fred Pozzuto at 304-285-5219 if you have questions concerning this interim action memorandum.

Sincerely,



Harry Taylor
NEPA Compliance Officer



Fred Pozzuto
Director, NETL NEPA Division

Enclosure: MS0000021 6K, Incorporated SOPO

cc: Miranda Kreger, MESC HQ
Vanessa Rogers, Senior VP, Chief of Policy and Compliance, Hamer Environmental



APPENDIX E. LIST OF NECESSARY PERMITS

The following is a list of the environmental permits that this project would be required at minimum to consider and/or obtain.

Agency	Type of Permit	Identification N°	Date Applied	Date Approved
TDEC	Clean Air Act Permitting – Air Quality Construction Permit	Not yet available.	Not yet applied.	N/A
TDEC	Clean Air Act Permitting – Operating Permit	Not yet available.	Not yet applied.	N/A
TDEC	State Archaeological Permit	Not yet available.	Not yet applied.	N/A
TDEC	Hazardous Waste Treatment, Storage, and Disposal Permit	Not yet available.	Not yet applied.	N/A
TDEC	Notification of Hazardous Waste Activity	Not yet available.	Not yet applied.	N/A
TDEC	RCRA Site ID	Not yet available.	Not yet applied.	N/A
TDEC	NPDES General Construction Activity Permitting	Not yet available.	Not yet applied.	N/A
Madison County	Building Permits including electrical, plumbing, mechanical and fire safety permits	Not yet available.	Not yet applied.	N/A

If the relevant regulatory agencies advise that further permitting or approvals are required, 6K would implement the necessary steps to obtain those permits and approvals in compliance with federal, state, and local environmental regulations. 6K is committed to upholding environmental standards and would actively collaborate with the regulatory authorities to ensure full compliance with all permitting requirements.



APPENDIX F. EXISTING SITE CONDITION PHOTOGRAPHS



Appendix F-1. Existing site view 1.



Appendix F-2. Existing site view 2 from James Lawrence Road.



Appendix F-3. Existing wetland view 1. [Project does not propose impacts].



Appendix F-4. Existing wetland view 2. [Project does not propose impacts].



Appendix F-5. Facility near site.



APPENDIX G. JACKSON ENERGY AUTHORITY LETTER OF SUPPORT



Jackson Energy Authority

March 13, 2023

RE: Utility Letter of Support to 6K Energy Tennessee, LLC

To Whom It May Concern:

As the major utility provider for Jackson, Tennessee, Jackson Energy Authority (JEA) is pleased to partner with Team Madison County in the recruitment of 6K Energy Tennessee, LLC in the Airport Industrial Park. The following utility information is provided in support of this project. All incentives are based on the proposed load information provided to JEA as outlined below and the customer's ability to meet those projections. Required assumptions where usage information has not been provided are properly noted.

Electric Estimated Commitment Value: \$3,000,000

- Projected Load Information
 - Phase 1 3.5 MW @ 75% load factor (summer 2024)
 - Phase 2 8 MW @ 75% load factor (early 2025)
 - Phase 3 16 MW @ 75% load factor (end of 2025)
 - Phase 4 25 MW @ 75% load factor (end of 2026)
- Service Description – The site is currently served by the McKellar Substation, unit #3 (30 MVA) which is dual served by the TVA 161 kV Jackson Transmission Loop. McKellar #3 currently has approximately 15.4 MW of available capacity and a 3-phase 12.47 kV overhead service is available on James Lawrence Road. JEA would serve Phases 1 & 2 with the existing McKellar #3 unit. Phases 3 & 4 would be served by a new 30 MVA transformer to be located in McKellar Substation (McKellar #4).
- Incentive – JEA will provide overhead service from McKellar #3 to a primary meter location at an agreed upon location on the customer's property at no cost to the customer. JEA will provide up to four overhead circuits from McKellar #4 to an agreed upon metering point on the customer's property. Estimated cost of this incentive is \$3,000,000 including substation and distribution improvements for all four phases.
- Timeline – Estimated timeline to complete installation of the service for Phase 1 is 3 months and will be coordinated with the project construction schedule.

- Other Comments – Upon completion of the installation of McKellar #4, electric load will be shifted from McKellar #3 to #4. This proposal does not include any JEA infrastructure behind the primary meter. Medium voltage transformers and auxiliary equipment can be provided, if desired, under an equipment rental agreement as a part of the Customer Energy & Utility Agreement.

Natural Gas Estimated Commitment Value: \$50,000

- Projected Load Information
 - Usage for building heat/support only
 - Assumed up to 4,000 therms/month (peak)
- Service Description – A 12-inch steel main, operating at 55 psig (nominal), is currently available on James Lawrence Road. Available capacity is approximately 14,000 MCF/day. A 3-inch line is proposed to serve the project.
- Incentive – JEA will provide gas service, including service line, meter, and regulator, to within five feet of the building at no charge to the customer. Estimated cost of this incentive is \$50,000.
- Timeline – Estimated timeline to complete the installation of the new service is six months and will be coordinated with the building construction schedule.

Water Estimated Commitment Value: \$34,956

- Projected Load Information
 - 80,000 GPD (500 GPM peak flow assumed)
- Service Description – The site is served by a 16-inch main available on James Lawrence Road. The main operates at a recorded pressure of 62 psi (static) and 45 psi (residual). Current available capacity is over 2 million gallons/day. The site is capable of being served by two JEA water treatment plants – South Jackson Plant and North Jackson Plant – providing redundant water service to the area. Capacity of the South Jackson Water Treatment plant (the primary plant) is 10 million gallons/day with over 4 million gallons/day of capacity currently available. JEA will provide the service line, including 3-inch meter, to a location near the property line.
- Incentive – JEA will waive the 3-inch meter access fee of \$4,956 and the 3 inch meter connection fee of \$30,000 which includes the service line to the meter location near the property line.
- Timeline – Estimated timeline to complete the installation of the new service is three months and will be coordinated with the building construction schedule.
- Other Comments – JEA proposes a 12-inch fire sprinkler main with a connection fee of \$16,000.

Wastewater Estimated Commitment Value: \$48,554

- Projected Load Information
 - 65,000 GPD (relatively constant flow assumed)
- Service Description – The site is served by a 10-inch gravity main located on the north side of James Lawrence Road. The site is served by the Miller Drive Wastewater Treatment Plant which has an excess capacity of 3.2 million gallons per day and is located approximately four miles away. JEA will provide a 6-inch

service line to an agreed upon point at the property line. This service installation includes a 100 foot bore and a 16-inch casing under James Lawrence Road

- Incentive – JEA will provide the gravity main extension to the site and waive the Service Connection Charge (\$65), the Access Fee (\$8,489), and service lateral charge (\$40,000).
- Timeline – Estimated timeline to complete the installation of the new gravity service line is three months and will be coordinated with the building construction schedule.
- Other Comments – Any pre-treatment facility required will be the responsibility of the Customer. JEA will reserve the right to install a wastewater meter on the customer's site at JEA expense or require a sampling point on the Customer's property upon completion of a review of the effluent.

Telecommunications

- Service Description – The site is served by a 12-count fiber as a part of the JEA 100% fiber optic Gigabit Ethernet network. Available bandwidth capacity of 2 Gbps (symmetrical) is available to each customer with dark fiber available for up to 10 Gbps.
- Incentive – JEA will provide service to the customer's head-end at no charge to the customer with a signed sales agreement
- Timeline – Installation of the fiber service will be coordinated with the building construction schedule.

All proposed incentives are based on utility consumption noted. Revisions to projected utility consumptions could result in a revision to the proposed incentives. We look forward to the opportunity to work with your company in the future.

Sincerely

JACKSON ENERGY AUTHORITY



Monte Cooper
President and Chief Executive Officer



APPENDIX H. PHASE I ENVIRONMENTAL SITE ASSESSMENT



PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

**50-Acre Parcel
James Lawrence Road
Jackson, Madison County, Tennessee**

Prepared for:
6K Energy Tennessee LLC
c/o Greater Jackson Chamber
197 Auditorium Street
Jackson, Tennessee 38301

Prepared by:
TTL, Inc.
624 Grassmere Park, Suite 14
Nashville, Tennessee 37211

Project No. 23-08-01017.00

Site Visit Date: March 21, 2023
Report Date: April 3, 2023

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EXECUTIVE SUMMARY

TTL, Inc. (TTL) was retained by the Greater Jackson Chamber on behalf of 6K Energy Tennessee LLC to perform a Phase I Environmental Site Assessment (ESA) for the property located at James Lawrence Road in Jackson, Madison County, Tennessee. According to the Madison County property tax records, the subject property is identified as being a portion of Parcel No. 057090 02400 (Madison County) and contains approximately 50 acres. The subject property is currently an undeveloped agricultural field. A topographic location map, derived from a portion of the United States Geological Survey (USGS) *Westover, Tennessee (2019)* 7.5-minute topographic quadrangle is included as **Figure 1 (Appendix A)**. An aerial photograph that depicts the subject property, approximate property boundary, and surrounding properties is included as **Figure 2**.

The subject property is an irregular-shaped tract of undeveloped land. The subject property is located to the south of James Lawrence Road and consists of agricultural fields and is located in an industrial park. The subject property was observed as consisting of an undeveloped agricultural field. The highest elevation can be found in the center and southeast portion of the subject property. The steepest area is located at the southwest portion of the subject property.

According to a review of historical information, the subject property has been an agricultural field since at least 1941.

TTL retained the services of a regulatory database search company, ERIS, to conduct a search of federal, state, and tribal databases for environmentally regulated sites within an approximate 1-mile radius of the subject property. According to ERIS records, the subject property is not listed on any Federal, state, or tribal regulatory databases reviewed. TTL reviewed other listings in the vicinity of the subject property that included TSCA, HWM, and RCRA-VSQG listings, however, based on review of regulatory information it was determined that these listings do not represent significant environmental concern with respect to the subject property.

Based on a review of historic/regulatory information, observations during our site reconnaissance, and interviews as part of this assessment, TTL did not identify recognized environmental conditions (RECs) with respect to the subject property.

1.0 INTRODUCTION

TTL, Inc. (TTL) was retained by the Greater Jackson Chamber on behalf of 6K Energy Tennessee LLC to perform a Phase I Environmental Site Assessment (ESA) for the property located at James Lawrence Road in Jackson, Madison County, Tennessee. According to the Madison County property tax records, the subject property is identified as being a portion of Parcel No. 057090 02400 (Madison County) and contains approximately 50-acres. The subject property is currently an undeveloped agricultural field. A topographic location map, derived from a portion of the United States Geological Survey (USGS) *Westover, Tennessee (2019)* 7.5-minute topographic quadrangle is included as **Figure 1 (Appendix A)**. An aerial photograph that depicts the subject property, approximate property boundary, and surrounding properties is included as **Figure 2**.

TTL performed this Phase I ESA in general accordance with American Society for Testing and Materials (ASTM) specification ASTM E 1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*. The ASTM E 1527-13 Standard is intended to satisfy the U.S. Environmental Protection Agency's (EPA's) All Appropriate Inquiry (AAI) Rule as defined in Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 101(14) (312.1(c)). This report presents the findings of the Phase I ESA performed at the subject property subject to the scope of work and limitations outlined in **Section 11** of this report.

2.0 SITE AND VICINITY INFORMATION

2.1 Site Location and Description

The subject property is an irregular-shaped tract of undeveloped land. The subject property is located to the south of James Lawrence Road and consists of agricultural fields.

2.2 Site Improvements

The subject property has a gravel driveway leading into it from James Lawrence Road.

2.3 Current Property Use

The subject property is currently an agricultural field.

2.4 Current Uses of Surrounding Properties

Direction	Description
North	James Lawrence Road is located to the north of the subject property followed by a Toyota Motor Manufacturing facility and an agricultural field.
South	The southern adjoining property consists of undeveloped woodland and a solar farm.
East	The eastern adjoining property consists of an electrical substation and undeveloped woodland.
West	The western adjoining property consists of undeveloped woodland.

2.5 Site Topography, Surface Drainage, and Subsurface Conditions

PHYSICAL SETTING INFORMATION		
Physical Setting Reviewed	Comments	Source
USGS Topographic Map Review:	The subject property is a sloping parcel which demonstrates thirty-five feet of elevation change across the site. The elevation of the subject property is between 445 and 410 feet above mean sea level (amsl). Shallow groundwater is expected to flow to the south, west, and north.	USGS Topographic Map of <i>Westover, Tennessee (2019)</i>
Interpreted Groundwater Flow Direction:	The highest elevation is located at the eastern and central portion of the subject property and slopes downward to the south, west, and north. Therefore shallow groundwater is expected to follow the direction of the slope south, west, or north depending on its location on the subject property.	USGS Topographic Map of <i>Westover, Tennessee (2019)</i>
Water Bodies:	No surface water bodies were observed on or bordering the subject property.	USGS Topographic Map of <i>Westover, Tennessee (2019)</i> and Site Inspection Observations
Soil Type(s):	Calloway silt loam, 0 to 2 percent slopes, north (Co) Falaya silt loam (Fa) Feliciana silt loam, 2 to 5 percent slopes, northern phase (FcB) Grenada silt loam, 2 to 5 percent slopes (GrB) Lexington silt loam, 8 to 12 percent slopes (LeD)	ERIS Physical Setting Report
Geologic Formation(s):	Quaternary loess (Ql)	Physical Setting Report

3.0 USER PROVIDED INFORMATION

TTL reviewed (or requested) the following information pertaining to the subject property. User provided information can be found in **Appendix B**.

3.1 Title Information

TTL requested title information from the Greater Jackson Chamber to review whether there may be environmental liens or AULs recorded against the subject property. TTL was not provided with title work for the subject property.

3.2 Previous Environmental Assessment Reports

No previous environmental reports for the subject property were provided for review.

3.3 User Questionnaire

ASTM E 1527-13 includes a requirement that the User of the Phase I ESA complete a “User Questionnaire.” In order to qualify for one of the *Landowner Liability Protections (LLPs)* offered by the Small Business Liability Relief and Brownfields Revitalization Act of 2001 (the “*Brownfields Amendments*”), the *User* must provide certain information (if available) to the *environmental professional*. Failure to provide this information could result in a determination that “*all appropriate inquiry*” is not complete. The questionnaire is used to determine if the User of the Phase I ESA report has knowledge of contamination issues at the subject property, if the purchase price of the property reflects fair market value, or if the User has knowledge of environmental liens recorded against the subject property. Ms. Mandy White, the chief economic development officer of the Greater Jackson Chamber, returned a user questionnaire on March 27, 2023. In the questionnaire, Ms. White indicates that the subject property has historically been used for agriculture, and has no knowledge of any chemical spills, environmental cleanups, engineering controls, or land use restrictions on the subject property.

3.4 Reason for Performing Phase I ESA

TTL understands that the Greater Jackson Chamber requested this Phase I ESA to assess the potential for environmental concerns associated with the subject property.

4.0 REGULATORY RECORDS REVIEW

TTL engaged Environmental Data Resources, Inc. (ERIS) to conduct a search for regulatory information pertaining to the subject property and surrounding properties situated within ASTM-defined approximate minimum search distances (AMSDs) relative to the subject property. A complete copy of ERIS's findings, which includes a summary of the data sources and dates of database versions utilized, is provided in **Appendix C**.

TTL provided ERIS with the property boundary of the subject property as a reference point to conduct the research. TTL relied on the regulatory records search by ERIS, which was based on information published by State and Federal regulatory agencies and was conducted based on ASTM-established AMSDs. ERIS provided TTL with a map of locations and specific regulatory reports for those facilities that were identified within the prescribed AMSDs. This information was used to evaluate whether the subject property, adjoining facilities, or surrounding facilities within the AMSDs have environmental impacts which might adversely impact the subject property based on information presented in the regulatory database report.

ERIS incorporates "ERIS high risk historical records" information in the regulatory database report. These listings are not related to Federal, state, or tribal regulatory listings and instead contain only historical information that is presented by ERIS in the regulatory database report. Since this information is not related to regulatory databases, we will not discuss these listings in this section of the report. As appropriate, the historical information presented in the "ERIS high risk historical records" is discussed in the historical sections of this report.

Facility Name and Address	Database Listed	Distance and Relative Location	REC?	Basis for Elimination as a REC			Comments
				Regulatory Status	Distance	Hydrologic Relationship	
Toyota Bodine-Aluminum-Tennessee 301 James Lawrence Road	RCRA-VSQG, TSCA, HWM	Subject Property	No	X		X	

According to ERIS records, there are no listings associated with the subject property.

ERIS identified the Toyota Bodine-Aluminum-Tennessee (Bodine-Aluminum) facility, which adjoins the subject property to the north, is hydrologically downgradient to the subject property. The Bodine-Aluminum facility is listed as being on the RCRA-VSQG, Toxic Substances Control Act (TSCA), and Hazardous Waste Management facilities (HWM) databases. The TSCA listing states that the Bodine-Aluminum facility produces solid aluminum and dross. The RCRA-VSQG listing shows that less than 100 kilograms of hazardous waste are generated at the facility per month and that more than 1,000 kilograms of the waste product are stored on site per month. The HWM listing shows that the waste product is managed on site to some degree. Due to no listings or observations regarding improper waste, as well as the Bodine-Aluminum facility being hydrologically downgradient to the subject property, TTL does not consider the Bodine-Aluminum facility to be a recognized environmental condition (REC) in respect to the subject property.

There were no other listings in a one-mile radius of the subject property.

5.0 HISTORICAL RECORDS RESEARCH

TTL reviewed historical records and documents to gather information pertaining to the historical use and development of the subject property and its surroundings. The findings from this review of reasonably ascertainable resources are summarized in this section. Historical information reviewed as part of this assessment is included in **Appendix D**.

Historical information was obtained from ERIS and from other publicly available sources to ascertain the historical use of the subject property and adjoining properties back to at least 1940 or first development. The historical sources used include the following:

Historical Source	Date Range
Aerial Photographs	1941-2021
City Directory	1997-2022
Topographic maps	1959-2019
Property tax info	Current

Location	Historic Summary
Subject Property	The subject property has been an agricultural field since as early as 1941.
North Adjoining	The north adjoining property was an undeveloped, agricultural field prior to 1997. Between 1997 and 2004, construction had begun on the Toyota Bodine Aluminum industrial facility.
East Adjoining	The east adjoining property consisted of an undeveloped agricultural field from 1941 to 1997. Between 1997 and 2004 a Kirkland’s Home warehouse was developed. A substation was also developed along the northeastern subject property boundary. The field between the subject property and Kirkland’s Home warehouse was allowed to become overgrown with trees and was wooded at the time of the site visit. The eastern adjoining property exists in this state at the present day.
South Adjoining	The southern adjoining property has existed as a mix of agricultural land and undeveloped woodland from 1941 to 2021. Between 2021 and 2023, the southern adjoining property was developed into a solar farm.
West Adjoining	The west adjoining property has consisted of undeveloped agricultural fields and undeveloped woodland from 1941 to the present day.

6.0 SITE RECONNAISSANCE

6.1 Methodology and Limiting Conditions

A reconnaissance of the subject property and surrounding area was performed by a TTL Professional on March 21, 2023. TTL completed both a walking reconnaissance of the subject property and a vehicular reconnaissance of an AMSD of one-mile, relative to the subject property, to look for conditions on surrounding sites that may pose an environmental liability relative to the subject property. Selected photographs taken during the site visit are provided in **Appendix E**.

6.2 General Site Setting

The subject property is an undeveloped agricultural field located in an industrial park in Jackson, TN.

6.3 Building Observations

No buildings were observed on the subject property.

6.4 Property Observations

The subject property was observed as an undeveloped agricultural field. The highest elevation can be found in the center and southeast portion of the subject property. The steepest area is located at the southwest portion of the subject property. A small wooded area is present near the southeast corner of the subject property where standing water was observed.

6.5 Specific Property Considerations

In this section, TTL provides a summary of observations noted during the site reconnaissance on March 21, 2023, as they pertain to specific physical considerations relative to the subject property.

6.5.1 Underground/Aboveground Storage Tanks

Evidence of USTs and ASTs was not observed during the site reconnaissance.

6.5.2 Hazardous and Petroleum Products Storage and Drums

Small hand packages of potentially hazardous and petroleum products were not observed during the reconnaissance.

6.5.3 Septic Systems

Evidence of septic tanks was not observed during the site reconnaissance.

6.5.4 Pits, Ponds, Lagoons, and Surface Waters

Standing water was observed in the wooded area located in the southeast corner of the subject property.

6.5.5 Water Supply and Water Wells

No water wells were observed or reported on the subject property.

6.5.6 Drains and Sumps

Drains and sumps were not observed during the site reconnaissance.

6.5.7 Solid Waste Disposal

Improper solid waste disposal was not observed during the site reconnaissance.

6.5.8 Unidentified Substance Containers

No unidentified substance containers were observed on the subject property.

6.5.9 Polychlorinated Biphenyls (PCBs)

Pole-mounted transformers were observed along Railroad Avenue and North Hillcrest Drive. The transformers appeared to be in good condition with no indications of release observed.

6.5.10 Pools of Liquid

No standing water was observed on the subject property.

6.5.11 Stressed Vegetation and Stained Soils/Pavement

Stressed vegetation and stained soils were not observed during the site reconnaissance.

6.5.12 Unusual Odors

TTL did not detect unusual odors during the site reconnaissance.

7.0 INTERVIEWS

7.1 Interview with the Representative of the Subject Property

TTL received a user questionnaire from Ms. Maddie White of the Greater Jackson Chamber. This can be found in section **3.3**.

7.2 Interview with Emergency Response Personnel

Madison County Fire Department – On March 20, 2023, TTL submitted an email incident request to the Madison County Fire Department inquiring about any reported incidents relating to hazardous materials, fires, chemical usage or storage at the subject property. At this time a response has not been received.

7.3 Other Interviews

No other interviews were conducted for this assessment.

8.0 SUMMARY OF FINDINGS AND CONCLUSIONS

No environmental assessment can preclude the presence of hazardous materials on a site. The conclusions in this report are based on reasonably ascertainable historical information and conditions observed during the site reconnaissance. Future changes in environmental conditions and subject property characteristics/usage may occur with the passage of time, in which case the conclusions in this report may require re-evaluation.

This report is intended to assist the client and the client's legal counsel in evaluating and allocating the environmental risks that may be present with a real estate transaction. However, it is the responsibility of the client and the client's legal counsel to determine, based on the client's experience and risk tolerance, whether additional information is required to meet the investigative burdens placed on real estate owners by state and federal agencies. Information and statements made in this report represent opinions of the environmental professional and are not to be construed as statements of fact.

8.1 Summary of Findings

TTL, Inc. (TTL) was retained by the Greater Jackson Chamber to perform a Phase I Environmental Site Assessment (ESA) for the property located at James Lawrence Road in Jackson, Madison County, Tennessee. According to the Madison County property tax records, the subject property is identified as being a portion of Parcel No. 057090 02400 (Madison County) and contains approximately 50 acres. The subject property is currently an undeveloped agricultural field.

The subject property is an irregular-shaped tract of undeveloped land. The subject property is located to the south of James Lawrence Road and consists of agricultural fields and is located in an industrial park. The subject property was observed as consisting of an undeveloped agricultural field. The highest elevation can be found in the center and southeast portion of the subject property. The steepest area is located at the southwest portion of the subject property.

According to a review of historical information, the subject property has been an agricultural field since as early as 1941.

TTL retained the services of a regulatory database search company, ERIS, to conduct a search of federal, state, and tribal databases for environmentally regulated sites within an approximate 1-mile radius of the subject property. According to ERIS records, the subject property is not listed on any Federal, state, or tribal regulatory databases reviewed. TTL reviewed other listings in the vicinity of the

subject property that included TSCA, HWM, and RCRA-VSQG listings, however, based on review of regulatory information it was determined that these listings do not represent significant environmental concern with respect to the subject property.

8.2 Conclusions

TTL has performed this Phase I ESA of the subject property in general conformance with the scope and limitations of ASTM Practice E 1527-13. Exceptions to, or deletions from, this practice are described in Section 11.3 of this report.

Based on a review of historic/regulatory information, observations during our site reconnaissance, and interviews as part of this assessment, TTL did not identify RECs with respect to the subject property.

9.0 OPINION OF ENVIRONMENTAL PROFESSIONAL

TTL has performed this Phase I ESA of the subject property in general conformance with the scope and limitations of ASTM Practice E 1527-13.

Based on a review of historic information, regulatory information, our site reconnaissance, and interviews as part of this assessment, TTL did not identify RECs in connection with the subject property. In our opinion, further environmental assessment is not warranted at this time.

10.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

We declare that, to the best of our knowledge and belief, that David B. Carden listed below meets the definition of *Environmental Professional*, as defined in 312.10 of 40 CFR 312, and have specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. TTL has developed and performed the all-appropriate inquiries in general conformance with the standards and practices set forth in 40 CFR Part 312.

Résumés of professionals who contributed to this project are provided in **Appendix F**.



Michael Andrews
Project Geologist



David B. Carden, PG
Senior Geologist

11.0 LIMITATIONS

11.1 Purpose

This Phase I ESA discusses potential environmental concerns associated with the subject property. TTL also understands that this Phase I ESA was requested in order to provide due diligence in partial fulfillment of the requirements for securing one of the innocent landowner liability protections that are afforded under CERCLA.

The purpose of a Phase I ESA is to convey a professional opinion regarding whether past or present, on-site or off-site activities have caused or could potentially cause a release of hazardous substances or petroleum products into the soils, groundwater, or surface water of the subject property (recognized environmental conditions – as defined below). TTL’s professional opinion stated herein is based on a review of readily available site information, including historical resources, site/vicinity observations, and interviews with knowledgeable persons, as well as TTL’s experience with similar projects.

The ASTM E 1527-13 Standard defines a “recognized environmental condition” (REC) as:

“...the presence or likely presence of any hazardous substances or petroleum products in, on or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; (3) under conditions that pose a material threat of a future release to the environment... Conditions determined to be de minimis are not recognized environmental conditions.”

The ASTM E 1527-13 Standard defines a “historic recognized environmental condition” (HREC) as:

“...a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls...”

The ASTM E 1527-13 Standard has also introduced the term “controlled recognized environmental condition” (CREC) which is defined as:

“...a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products

allowed to remain in place subject to the implementation of required controls. A CREC should be listed as a REC in the conclusions section of the Phase I ESA report.”

11.2 Scope of Services

This Phase I ESA was performed in general accordance with the scope of accepted standard practices as defined by the ASTM E 1527-13 Standard and included the following tasks:

- An evaluation of the subject property’s physical setting characteristics, including a review of published topographic maps (as they are readily available) and area observations to characterize the subject property's drainage.
- A review of historical documents, maps, aerial photographs, and tax records to evaluate present and past subject property/vicinity land uses. These historical resources were obtained from sources considered both readily available and reasonably ascertainable per the ASTM standard. Reasonable attempts were made to fill any identified data gaps.
- A review of environmental lists published by state, federal, and tribal agencies to assess whether the subject property or nearby properties are listed as having present or past environmental problems, are under investigation, or are regulated by state, federal, or tribal environmental regulatory agencies. Federal and state institutional and/or engineering control registries (as they are available) were also reviewed to determine Activity or Use Limitations (AULs) for the subject property.
- A walking/driving site and vicinity reconnaissance to look for obvious indications of present or past activities, such as waste handling, solid waste disposal, hazardous materials usage, waste water treatment, discharge, or disposal, or the presence of underground/aboveground storage tanks (UST/AST), which have or could have contaminated the subject property.
- Interviews with persons knowledgeable of the property’s history, including the current property owner and emergency management personnel to inquire about known possible environmental issues at the subject property.
- Preparation of this Phase I ESA report presenting findings, conclusions, and recommendations. The report is signed by an Environmental Professional, as defined by the ASTM E 1527-13 Standard.

11.3 Project Limitations/Data Gaps

Conclusions were drawn from conditions observed during the site visit and reconnaissance of the subject property. Due to the fact that the environmental conditions of the subject property may change with the passage of time, TTL acknowledges that the information presented in this Phase I ESA report reflects only the conditions encountered or observed at the time of the site visit. We assume that information provided to us by others is given in good faith, but we cannot confirm the reports and anecdotal comments offered to us by the individuals interviewed.

TTL was unable to interview a current representative of the subject property. While this does constitute data gaps, based on review of historic and regulatory information it is our opinion that these are not significant data gaps.

11.4 Non-Scope Considerations

Pursuant to the ASTM E 1527-13 Standard, this Phase I ESA does not address non-scope considerations such as, but not limited to, asbestos-containing building materials, radon, lead-based paint, lead in drinking water, wetlands, cultural resources, endangered species, indoor air quality and mold. In addition, this Phase I ESA did not include sampling and/or analysis of soils, subsurface water or building materials. This Phase I ESA does not provide for an in-depth review of the past uses of properties surrounding the subject property and is not performed to determine their compliance with environmental regulations.

11.5 Special Terms and Conditions

The findings and opinions presented are relative to the dates of TTL's site reconnaissance and should not be relied on to represent conditions at later dates. The opinions included herein are based on information obtained during this study and TTL's experience. If additional information becomes available which might impact TTL's environmental conclusions, we request the opportunity to review the information, reassess the potential concerns, and modify our opinions, if warranted.

Although this assessment has attempted to identify the potential for environmental impacts to the subject property, potential sources of contamination may have escaped detection due to: (1) the limited scope of this assessment; (2) the inaccuracy of public records; (3) the presence of undetected or unreported environmental incidents; (4) buried waste or debris; and (5) deliberate concealment of information.

According to the ASTM E 1527-13 Standard, no Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. Therefore, with recognition to reasonable limits of time and costs, performance of this Phase I ESA is intended to reduce, but cannot eliminate, uncertainty regarding the potential for RECs in connection with the subject property. The purpose of this Phase I ESA is not to determine the actual presence, degree or extent of contamination. Such determination would require additional exploratory work, including sampling and laboratory analysis.

11.6 User Reliance

This assessment has been prepared for the sole use of 6K Energy Tennessee LLC and Greater Jackson Chamber. No other individual, party, or entity may rely on this Phase I ESA without having received expressed written permission from TTL. Upon approval by 6K Energy Tennessee LLC and Greater Jackson Chamber, reliance will be extended, at TTL's option, to other parties material to a property transaction with such reliance being conditional upon that party's acceptance of the terms, conditions and liability limitations stated in TTL's client agreement and payment of a fee. Information received by any other third parties is not for reliance unless TTL first receives a signed Secondary Client Agreement and a completed User Questionnaire Form from the third party.

12.0 REFERENCES

ASTM “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessments Process,” ASTM Designation E 1527-13, Published November 2013.

ERIS, Database Report, Inquiry Number 23032000325, dated March 20, 2023.

USGS Topographic Map of the *Westover, Tennessee Quadrangle* (2019).

For brevity, the appendices to this Report have not been included but are available on request.

TTL





APPENDIX I. INADVERTENT DISCOVERY PLAN

Inadvertent Discovery Plan

This Inadvertent Discovery Plan (IDP) is offered to assist the Department of Energy (DOE) and 6K in implementing best management practices with regard to the discovery of unexpected archaeological finds and to ensure proper communication between the State Historic Preservation Officer (SHPO) (and Tribal Historic Preservation Officer(s) (THPOs), if applicable), DOE, and project proponents in the event of inadvertent discovery.

6K is committed to working with the DOE, the Tennessee Historical Commission at the State Historic Preservation Office, and Tribal Nations to identify and document any historic or cultural resources that exist at the Project site. As a supplement to that work, 6K has adopted the following process for responding to any unanticipated discoveries of, or effects on, historic or cultural resources during implementation of the Project. This IDP establishes a standard course of action to follow in the event of the inadvertent discovery of archaeological remains during activities considered an undertaking as defined by the National Historic Preservation Act (NHPA).

Cultural resources accidentally discovered during operations shall be recorded and evaluated by a SHPO/THPO qualified archaeological consultant. If the find is determined to be potentially significant and cannot be avoided by project design, the archaeological consultant, in cooperation with DOE SHPO/THPO, and 6K, will develop a treatment plan outlining recovery of the resource, analysis, and reporting of the find.

I. Procedures for Unanticipated Historic Resources or Unanticipated Adverse Effects

In the event of an inadvertent discovery of possible historic properties or cultural materials, including human remains, 6K will implement the following procedures:

1. In the event that any project personnel discover archaeological deposits during ground-breaking activities, **stop work** in the immediate area of the find and immediately notify the 6K Project Manager, who in turn will notify DOE and the SHPO/THPO. The area will be secured and protected.

Note that construction activity must stop until discussions with the SHPO/THPO are complete. Failure to cease activities that intentionally destroy archaeological deposits prior to evaluation and determination of significance (in accordance with 36 Code of Federal Regulations [CFR] 800) may result in fines and penalties under Archaeological Resource Protection Act (ARPA) and other cultural resource protection laws and implementing regulations.

2. Within 24 hours of discovery:
 - a. The attached “6K Unanticipated Discovery of Cultural or Historic Resources During Construction Form” will be completed.
 - b. 6K will contact the DOE and the SHPO, using the contact information contained in Section III, along with any additional information relevant to the discovery.
 - c. When appropriate, 6K will initiate a third party that possesses the appropriate qualifications to assess 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 or cultural resource.

3. 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 2 above, 6K will inform the DOE and SHPO 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 or cultural 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.

If the SHPO/THPO, Archaeological Consultant, and Responsible Entity (DOE) agree that the discovered archaeological deposit is not eligible for nomination to the National Register of Historic Places (NRHP), the discussion will be summarized in a Memorandum of Record to be included as part of the site documentation. The Archaeological Consultant may then advise 6K to proceed with project activities. The Archaeological Consultant will monitor the remainder of immediate construction activities in case additional archaeological deposits are discovered.

4. 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, 6K will also inform the Tribal Nations and THPO when notifying the DOE and the SHPO in the same timeframes noted above, using the contact information contained in Section III, or as soon as possible thereafter.
5. In response to receiving such information, the SHPO or THPO representing the State Agency or the Tribal Nation (respectively) who received the information may request consultation regarding 6K's determination as to whether any additional evaluation of the unanticipated historic resource or unanticipated adverse effect on a known resource is planned.
6. Any consultation requested under Paragraph 5 will be conducted after such consultation is requested. Construction may continue at the discovery location only after the process outlined in this plan is followed and SHPO/THPO, Archaeological Consultant, and Responsible Entity (DOE) determine that compliance with state and federal laws is complete.

II. Special Procedures for the Treatment of Human Remains and Sacred Objects

The discovery of human remains should be treated initially as a crime scene (*e.g.*, a possible homicide, an Archaeological Resource Protection Act (ARPA) violation, or illegal trafficking under 18 U.S. Code Section 1170 (USC §1170)) with cultural resource professionals and the appropriate law enforcement authorities being brought in to assist in the determination of antiquity and manner of death (*i.e.*, homicide, suicide, natural, accidental, or undetermined). To the maximum extent possible, the human remains should be protected from further damage by natural elements. If



practical and if the remains are not from a clearly modern context, they should be permanently protected in place. Any human skeletal remains will at all times be treated with dignity and respect.

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 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 ARPA [(16 USC §470aa-470mm), and 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 10.6(a)), 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, 6K will follow the procedures described above, as supplemented by these additional procedures.

1. 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.
2. If the discovery is of skeletal remains, contact the appropriate law enforcement office and coroner as soon as practicable after discovery, but no later than the same day as the date of discovery. **Do not call 911.** Notify the 6K Project Manager and engage an Archaeologist, as needed. Do not engage with media.
3. 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 6K personnel or contractors use potentially destructive means (trowels, probes, shovels etc.) to determine if the remains are human or remove the skeletal material.
4. 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.
5. Protect the discovery.
 - a. At a minimum, protecting the discovery 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.
6. Consult with Tribal Nations and the Tennessee SHPO, using the contact information contained in Section III. Within 5 working days of the discovery, the Archaeological Consultant for 6K will send a written documentation of the discovery with copies of any correspondence to the SHPO/THPO and Bureau of Indian Affairs (when appropriate).

For Native American human remains that are not the subject of criminal cases, disposition shall be in accordance with the implementing regulations of NAGPRA, 43 CFR Part 10.6(a). A good faith attempt shall be made to identify the descendants of all Non-Native American human remains with disposition going to the appropriate lineal descendants. When descendants are not found and the human remains are not the subject of a criminal investigation, then disposition shall be according to applicable tribal or state law.

III. Contact Information

6K will use the following when completing notifications or consultations under this Plan.

1. Department of Energy

Harry Taylor

NEPA Compliance Officer

U.S. Department of Energy/NETL

3610 Collins Ferry Road, Building 26, Room 102, MS 107, Morgantown, WV 26505

304.285.5091

Harry.Taylor@netl.doe.gov

2. State Historic Preservation Office

Please quote: "Project#: SHPO0003443" in all communications.

Jennifer Barnett

State Archeologist

Tennessee State Historic Preservation Office

2941 Lebanon Pike, Nashville, TN 37243

615.687.4780

Jennifer.Barnett@tn.gov

E. Patrick McIntyre, Jr.

Executive Director/SHPO

Tennessee State Historic Preservation Office

2941 Lebanon Pike, Nashville, TN 37243

615.770.1096

Patrick.mcintyre@tn.gov

Casey Lee

Section 106 Review



Tennessee State Historic Preservation Office
2941 Lebanon Pike, Nashville, TN 37243
615.253.3163
casey.lee@tn.gov

3. Chickasaw Nation

Bill Andatubby
Governor
520 East Arlington, Ada, OK 74820
580.436.2603
tammy.gray@chickasaw.net

Kirk Perry
Historic Preservation
P.O. Box 1548, Ada, OK 74821
580.272.5323
hpo@chickasaw.net

4. Coushatta Tribe of Louisiana

Jonathon Cernek
Chairman
1940 C.C. Bell Road, Elton, LA 70532
337.584.1401
mbell@coushatta.org

Kristian Poncho
THPO
P.O. Box 10, Elton, LA 70532
337.275.1350
kponcho@coushatta.org

5. Law Enforcement

Jackson Police Department
Non-emergency Dispatch
234 Institute St, Jackson, TN 38301
731.425.8400

6. 6K

Chris Gilman
6K Project Manager (Sr. Director Facilities/EHS)
25 Commerce Way, North Andover, MA 01845
603.860.5584
Chris.Gilman@6Kinc.com



**UNANTICIPATED DISCOVERY OF CULTURAL OR HISTORIC RESOURCES DURING
CONSTRUCTION FORM**

Project Site: _____

Date and Time of Discovery: _____

Contact Information: Person Who Made the Discovery:

- Name / Company: _____
- Contact Number: _____
- Email: _____

Date and Time this Form being Completed: _____

Contact Information: Person Completing this Form:

- Name / Company: _____
- Contact Number: _____
- Email: _____

Type of Discovery: [Artifact / Structure / Fossil / Skeleton / Burial Site / Other] _____

Location of Discovery: [Description of the location where the discovery was made] _____

Actions Taken: [Briefly describe the actions taken upon discovery including construction halting and measures to safeguard discovery] _____

People Notified: [List the names and positions of individuals or organizations notified] _____

Number and Description of What Was Found:

- Item 1:
 - Description: _____
 - Material: [e.g., stone, metal, ceramic, bone etc.] _____
 - Quantity: _____
 - Approximate Age [If known] _____
 - Condition [e.g., intact, partially damaged, deteriorated, etc.]. _____



- Dimensions / measurements, or approx. size of the discovery]: _____
- Item 2:
 - Description: _____

 - Material: [e.g., stone, metal, ceramic, bone etc.] _____
 - Quantity: _____
 - Approximate Age [If known] / Condition: _____
 - Condition [e.g., intact, partially damaged, deteriorated, etc.]. _____
 - Dimensions / measurements, or approx. size of the discovery]: _____
- [Add more items as necessary below or append another form].

Additional Notes or Comments:

Photos Taken: Yes / No

[Please attach photo(s) to this form].

Map Attached: Yes / No

[Please attach map(s) showing the location of discovery to this form].

Signature of Person Completing this Form:

Signed: [NAME] _____

Date: _____



APPENDIX J. CLEARANCE OF FARMLAND PROTECTION POLICY ACT

May 25, 2023

Mr. Sheldon Hightower, State Conservationist
Natural Resources Conservation Service
801 Broadway, 675 US Courthouse
Nashville, TN 37203

**Subject: CLEARANCE OF FARMLAND PROTECTION POLICY ACT CONCERNS – 6K
ENERGY FACILITY AT AIRPORT INDUSTRIAL PARK**

Dear Mr. Hightower:

6K Energy (6K) is proposing to construct and operate a new 100-125,000-square-foot manufacturing facility to produce multi-chemistry cathode materials for EV batteries in a 50-acre parcel of the 100-acre Airport Industrial Park, located immediately south of James Lawrence Road in Jackson, Madison County, Tennessee. Please see attached topographic map.

6K applied for federal financial support (a loan) pursuant to DOE's Bipartisan Infrastructure Law Battery Materials Processing and Battery Manufacturing and Recycling, which was created to support new and expanded commercial-scale domestic facilities to process lithium, graphite and other battery materials, manufacture components, and demonstrate new approaches, including manufacturing components from recycled materials. The Bipartisan Infrastructure Law is designed to expand domestic manufacturing of batteries for electric vehicles (EVs) and the electrical grid and for materials and components currently imported from other countries. DOE awarded \$50M of federal funding to 6K for the project.

The subject property is an irregular-shaped tract of undeveloped land and is located in the Airport Industrial Park. The attached web soil survey indicates close to 90 percent of the area is prime farmland. Please note the percentages in the web soil survey are approximated based on the site plan and imagery, since we were not supplied with any geospatial information. The specific measurements from the web soil survey are conservative and resulted in a slight overage of the subject property acreage. We have completed the attached Farmland Conversion Impact Rating Form for your consideration in converting these 50 acres from farmland to industrial use. The subject property scored 64 on the site assessment criteria. The West Tennessee Industrial Association has designed the parcel as a Select Tennessee Certified Site, which provides prospective companies with a level of assurance that the site has undergone thorough due diligence to uncover and address potential development obstacles. The property is located within close proximity to Interstate 40 along Highway 223 for ease in transporting materials. According to the West Tennessee Industrial Association, it is located in an area planned for industrial development, as well as having all utilities at the site, an estimate for site grading, and no known environmental issues that cannot be reasonably avoided.

More than 80 different sites across the eastern United States were examined as potential sites for siting the facility. These alternatives were considered but ultimately dismissed as infeasible, impractical, or inconsistent with the project's purpose and need, and/or represented higher environmental, financial, social, or schedule costs than the preferred alternative. Prior to DOE funding approval, 6K Inc. selected

the site in the Madison County, Tennessee location. Before selecting this location, two alternative sites were assessed for feasibility: one in Walker County, Alabama, and one in Peach County, Georgia. All three locations were feasible locations in 'Industrial', or 'General Industrial' zoning declarations where habitat, or wetland or other waters of the United States (WOTUS) impacts would not be required. In addition, all three could benefit from the specific Diversity, Equity, Inclusion and Accessibility (DEIA) and Justice40 Initiative actions and policies identified in the 6K Equity Plan for each phase of the project. Because the location was selected prior to the NEPA process starting, the two other locations are not considered reasonable alternatives at this stage, because changing location would be unfeasible given the effort and work which has gone into planning and design, the initial studies and technical reports for the Madison County, Tennessee site location, using non-DOE investment funds.

We feel the conversion of the 50 acres at the Airport Industrial Site is consistent with the Farmland Protection Policy Act and look forward to your assessment. AGEISS Inc. is working with Hamer Environmental, who has been contracted by 6K to prepare environmental documentation. If you have questions or require further information, please contact me at 303-956-4171 or melissar@ageiss-inc.com.

Sincerely,

Melissa Russ
Senior Geologist

Attachments: Topographic Map
Web Soil Survey
Farmland Conversion Impact Rating Form

cc: Vanessa Rogers/Hamer (w/ attachments)

one inch



**Subject
Property**



Year: 2006
Source: USDA
Scale: 1" = 500'
Comment:

Address: Jackson Chamber, Jackson, TN
Approx Center: -88.93737863,35.59368154

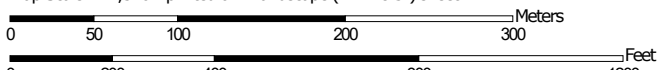
Order No: 23032000325



Soil Map—Madison County, Tennessee
(6K Proposed Project Site)



Map Scale: 1:4,510 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84




MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madison County, Tennessee

Survey Area Data: Version 17, Sep 15, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 6, 2019—Sep 11, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Co	Calloway silt loam, 0 to 2 percent slopes, north	2.2	3.7%
Fa	Falaya silt loam	1.8	3.0%
FcB	Feliciana silt loam, 2 to 5 percent slopes, northern phase	35.2	59.4%
GrB	Grenada silt loam, 2 to 5 percent slopes	11.9	20.1%
LeD	Lexington silt loam, 8 to 12 percent slopes	8.2	13.8%
Totals for Area of Interest		59.3	100.0%

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request			
Name of Project		Federal Agency Involved			
Proposed Land Use		County and State			
PART II (To be completed by NRCS)		Date Request Received By NRCS		Person Completing Form:	
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	
Major Crop(s)		Farmable Land In Govt. Jurisdiction Acres: %		Average Farm Size	
Name of Land Evaluation System Used		Name of State or Local Site Assessment System		Amount of Farmland As Defined in FPPA Acres: %	
				Date Land Evaluation Returned by NRCS	
PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly					
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site					
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide Important or Local Important Farmland					
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value					
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)					
PART VI (To be completed by Federal Agency) Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		Maximum Points	Site A	Site B	Site C
1. Area In Non-urban Use		(15)			
2. Perimeter In Non-urban Use		(10)			
3. Percent Of Site Being Farmed		(20)			
4. Protection Provided By State and Local Government		(20)			
5. Distance From Urban Built-up Area		(15)			
6. Distance To Urban Support Services		(15)			
7. Size Of Present Farm Unit Compared To Average		(10)			
8. Creation Of Non-farmable Farmland		(10)			
9. Availability Of Farm Support Services		(5)			
10. On-Farm Investments		(20)			
11. Effects Of Conversion On Farm Support Services		(10)			
12. Compatibility With Existing Agricultural Use		(10)			
TOTAL SITE ASSESSMENT POINTS		160			
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)		100			
Total Site Assessment (From Part VI above or local site assessment)		160			
TOTAL POINTS (Total of above 2 lines)		260			
Site Selected:		Date Of Selection		Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>	
Reason For Selection:					
Name of Federal agency representative completing this form:					Date:

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.



Melissa Russ, PG
Program Manager
AGEISS Inc.
PO Box 6126
Longmont, CO 80501

June 1, 2023

Dear Ms. Russ,

The Natural Resources Conservation Service (NRCS) in Tennessee has received your [Farmland Protection Policy Act](#) (FPPA) request ([AD-1006, Farmland Conversion Impact Rating](#)) regarding the 6K Energy project, located south of James Lawrence Road in Jackson, Tennessee. The intent of the FPPA is to minimize the impact Federal programs have on the unnecessary and irreversible conversion of important farmland to nonagricultural uses.

Through the review process, it has been determined this project does not meet the guidance set forth by the act and is therefore **EXEMPT** from Farmland Protection Policy Act (FPPA) review due to the following:

- No federal funding – This project is not planned and/or constructed with the assistance of federal funding and therefore is not subject to FPPA.
- Not prime farmland – This project does not have an unnecessary or irreversible impact on land designated as prime farmland and therefore is not subject to FPPA. Official land classification information can be found at <http://websoilsurvey.nrcs.usda.gov>.
- Urban development - This project area is already in or committed to urban land use or has existing footprints including right-of-ways and therefore is not subject to FPPA.
- Subsurface corridor project (minimal disturbance) – Properly planned/permitted buried utility projects will result in minimal disturbance of agricultural lands and are therefore not subject to FPPA.
- Agricultural structures - The construction of on-farm structures that are associated with farm operations are not subject to FPPA.
- Zoning - This project area has been designated by a state or local government entity for commercial and/or industrial landuse and therefore is not subject to FPPA.
- Water storage - This project area involves land used for water storage and therefore is not subject to FPPA.
- Minimal acreage threshold - This project falls below the threshold of 10 acres per linear mile which require review and therefore is not subject to FPPA.

Questions regarding your inquiry and this response can be directed to the Tennessee State Soil Scientist at (615) 277-2550 or emailed to the FPPA intake box at tnhawc@usda.gov.

Sincerely,

Natural Resources Conservation Service
801 Broadway, 675 U.S. Courthouse
Nashville, Tennessee 37203
Voice (615) 277-2531 Fax (855) 591-1284
USDA is an equal opportunity provider, employer, and lender.



APPENDIX K. WETLAND DELINEATION REPORT

WETLAND DELINEATION REPORT



6K JAMES LAWRENCE ROAD SITE

JAMES LAWRENCE ROAD
JACKSON, TENNESSEE 38301

ECS PROJECT NO. 49:20447

FOR: 6K ENERGY

JUNE 15, 2023





June 15, 2023

Ms. Deborah Sung
6K Energy
25 Commerce Way
North Andover, Massachusetts, 01845

ECS Project No. 49:20447

Reference: Waters of the U.S. Delineation Report, 6K James Lawrence Road Site, James Lawrence Road, Jackson, Madison County Tennessee

Dear Ms. Sung:

ECS Southeast, LLP (ECS) is pleased submit this report of the Waters of the U.S. (WOUS) services for the above-referenced site. ECS services were provided in general accordance with ECS Proposal No. 49:37946P authorized on June 1, 2023 and generally meets the requirements of the 1987 U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 dated November 2010. **Based on our field reconnaissance, potentially jurisdictional WOUS are present onsite.**

If there are questions regarding this report, or a need for further information, please contact the undersigned.

ECS Southeast, LLP

Justin Kelley, TN-QHP
Environmental Project Manager
jmkelley@ecslimited.com
615-885-4983

Paul M. Stephens IV, P.E., PWS
Associate Principal
pstephens@ecslimited.com
843-654-4448

1.0 INTRODUCTION

This report presents the findings of a Wetland Delineation study conducted by ECS Southeast, LLP (ECS) for 6K Energy at the 6K James Lawrence Road Site located at James Lawrence Road, Jackson, Madison County, Tennessee (35.593885, -88.937008). The site consists of a 50 acre portion of one parcel totaling approximate 101 acres. According to the Madison County Geographic Information System (GIS) website, the Parcel Identification Numbers (PIN) is 090 024.00 (50 acres). The site includes approximately 50 acres, as shown on the Site Location Map (Appendix I, Figure 1). The site currently consists of cleared and forested land. The purpose of this study was to identify and delineate jurisdictional Waters of the U.S. (WOUS) within the project study area (PSA).

Wetlands are defined by the United States Army Corps of Engineers (USACE) and the United States Environmental Protection Agency (EPA) as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions.” In order for an area to be classified as wetland, hydrophytic vegetation, hydric soils, and wetland hydrology indicators must be present described in the 1987 “Corps of Engineers Wetlands Delineation Manual” and the Appropriate Regional Supplement.

2.0 METHODOLOGY

The findings of the WOUS delineation is based on ECS’ professional judgment and application of the technical criteria presented in the 1987 USACE Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 dated November 2010.

ECS completed the following tasks to identify and delineate potentially jurisdictional WOUS boundaries onsite:

2.1 Literature Review

ECS reviewed supporting information from publicly-available databases to identify possible ecological effects the project may have on potential state- and/or federally-jurisdictional water resources. During the desktop review, ECS documented relevant, site-specific details (e.g., topographic characteristics, soil composition, recent precipitation, level of disturbance, plant community structure, etc.) and integrated the obtained information with the onsite delineation effort.

2.2 Methodology for Field Investigation

Wetland boundaries were delineated using the routine onsite determination method described in the USACE Manual and Regional Supplement, in conjunction with the Atlantic and Gulf Coastal Plain 2020 Regional Wetland Plant List and the USDA Soil Survey.

ECS performed onsite wetland delineations as described above. First, site hydrology was observed and the plant community within the data plot was characterized. The dominant plant species within each community were then identified, and it was determined whether or not hydrophytic (wetland) plants dominated the plant community. The USFWS has defined five wetland plant indicator categories including:

- Obligate wetland (OBL) – has >99% probability of occurring in wetlands
- Facultative wetland (FACW) – has 66% to 99% chance of occurring in wetlands
- Facultative (FAC) – has 33% to 66% chance of occurring in wetlands
- Facultative upland (FACU) – has 1 to 33% chance of occurring in wetlands
- Upland (UPL) – has <1% chance of occurring in wetlands
- No Indicator (NI) – no wetland indicator for the specified species, considered UPL

Plants identified as OBL, FACW, or FAC are considered wetland plants (or hydrophytes) by USACE.

In areas determined to have hydrophytic vegetation and potential wetland hydrology, an approximately 16-24 inch hand auger soil boring or shovel test pit was completed to determine if hydric soils were present. The soil boring was also inspected to determine if indicators of wetland hydrology (inundation, soil saturation, etc.) were present.

Once an area is determined to be a wetland, further testing was performed to locate the wetland/upland (non-wetland) boundary. A second soil data point was completed in the upland area to document non-wetland conditions. Wetland boundaries were marked with consecutively numbered surveyor's ribbon flags.

Data forms specified in the Regional Supplement were completed for each wetland and non-wetland soil data point location. The data forms recorded the vegetation, soils, and hydrology observations used in making the wetland determinations.

2.3 Methodology for Delineating Streams

While onsite, ECS implemented the Tennessee Department of Environment and Conservation (TDEC), Division of Water Resources (DWR) Guidance for Making Hydrologic Determinations in conjunction with federal protocols discussed in Regulatory Guidance Letter (RGL) No. 05-05 to identify, classify and delineate streams that would likely be considered jurisdictional by state and federal regulatory agencies.

The TDEC DWR Guidance for Making Hydrologic Determinations (Version 1.5) and associated HD Field Data Sheet (Version 1.5) were implemented to determine flow regime by evaluating observable geomorphological, hydrological and biological in-stream attributes. ECS completed TDEC DWR HD Field Data Sheets to document stream conditions observed at the time of review (Appendix III).

RGL No. 05-05 provides guidance on identifying physical indicators of Ordinary High Water Mark (OHWM) as defined in 33 CFR Sections 328.3(e) and 329.11(a)(1) and discusses implementation of other appropriate means that consider the characteristics of the surrounding areas to establish the lateral limits of jurisdiction over tidal and non-tidal waters. Per RGL No. 05-05, "the lateral limits of

jurisdiction over non-tidal water bodies extend to the [OHWM], in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands”.

3.0 FINDINGS

3.1 Literature Review

ECS professionals reviewed the U.S. Geological Survey (USGS) Topographic Map, U.S. Department of Agriculture Natural Resource Conservation Service (USDA-NRCS) Web Soil Survey, the Soil Data Access (SDA) Hydric Soils List, the Federal Emergency Management Agency (FEMA) Floodplain Mapping Service, U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Wetlands Mapper, and available aerial photographs to identify potentially jurisdictional Waters of the U.S. (i.e., streams, wetlands, natural ponds, lakes) and available watershed information.

3.1.1 Literature Review Summary

The following is a summary of the available desktop information that was reviewed as part of this study:

- According to the Westover (Tennessee) USGS Topographic Map Quadrangle dated 1981 (Appendix I, Figure 2), no streams, wetlands, or ponds are depicted on the PSA. The PSA ranges from approximately 420 to 440 feet above mean sea level (MSL).
- According to the USDA-NRCS Web Soil Survey (Appendix I, Figure 3), the PSA is comprised of the following soil map units: FcB - Feliciana silt loam, GrB - Grenada silt loam, LeD - Lexington silt loam, Fa - Falaya silt loam, Co - Calloway silt loam. Fa is listed on the SDA Hydric Soils List for Madison County, Tennessee.
- The US Fish and Wildlife NWI map (Appendix I, Figure 4) does not identify wetlands on the PSA. The site is located within the South Fork Forked Deer River - Cub Creek watershed and is identified as Hydrologic Unit Code (HUC) 080102050305.
- The FEMA Flood Insurance Rate Maps (FIRMs), Panel 47113C0260E, dated August 3, 2009 (Appendix I, Figure 5) indicates the PSA is located in Zone X. These areas are determined to be outside the 0.2% Annual Chance Floodplain.
- ECS reviewed the TN/USGS LiDAR Elevation Data of the site (Appendix I, Figure 6). The on-site elevations range from approximately 418 feet above MSL to approximately 436 feet above MSL.

3.2 Field Investigation Findings

ECS personnel conducted the field investigation on June 1, 2023. The last precipitation event prior to the site reconnaissance was on May 28 and approximately 0.31 inches of rain was recorded.

A potential wetland area totaling approximately 0.3 acres was identified in the southwestern corner of the PSA. These jurisdictional areas were located using a Trimble Geo7X hand-held GPS unit capable of sub-meter accuracy. ECS identified one potentially jurisdictional area summarized in the table below:

Table 1: Potential WOUS Summary Table

Feature ID	GPS Coordinates (decimal degrees)	Approximate Acreage	Approximate Square Footage	Approximate Linear Feet (if applicable)
Wetland A	35.591820, -88.935759	0.3	13068	N/A

3.2.1 Wetland Summary

The potential wetland area exhibited wetland indicators of hydrophytic vegetation, wetland hydrology, and hydric soils during the site reconnaissance. The wetland area is depicted on the Waters of the U.S. Delineation Map (Appendix I, Figure 7). Photographs of the wetland are presented in Appendix II.

3.2.2 Stream Summary

Potential streams were not identified within the boundaries of the PSA during the site reconnaissance.

4.0 REGULATORY DISCUSSION

After review of the findings in the report and at the client's request, ECS can coordinate with the USACE and the Tennessee Department of Environment and Conservation (TDEC) to conduct a jurisdictional determination and field visit, if necessary. The timeline of this process is dependent on the availability of the regulatory agency. ECS recommends receipt of the formal jurisdictional determination letter from the necessary agencies prior to conducting any land-disturbance activities.

5.0 WATERSHED CLASSIFICATION/BUFFER REQUIREMENTS

5.1 State Riparian Buffer Requirements

According to the TDEC Division of Water Resources (DWR), surface waters within the PSA are located in the South Fork Forked Deer River - Cub Creek watershed. TDEC-DWR requires a 30 or 60 foot buffer on streams, at least 30 feet on any stream, and 60 feet on exceptional Tennessee waters or waters listed as impaired due to sedimentation. Cub Creek is currently listed as impaired due to sedimentation

5.2 Local Buffer Requirements

ECS reviewed the Madison County Planning and Zoning requirements and Code of Ordinances concerning local vegetative buffer requirements for streams and other surface waters. According to the Madison County Planning Department, there are no additional riparian buffer requirements in addition to the state mandated rule.

ECS recommends consultation with a civil engineer to determine if mandatory vegetative buffers and/or regulated development (impervious surfaces) setbacks are required for the site in addition to those mentioned above.

6.0 CONCLUSIONS


One potentially jurisdictional wetland area totaling approximately 0.3 acres was identified and delineated within the study area. The locations and boundaries of the potentially jurisdictional Waters are illustrated on the attached Waters of the U.S. Delineation Map (Appendix I, Figure 7).

The findings summarized in this report represent our best professional judgment concerning the presence of potential jurisdictional aquatic resources in the PSA at the time of the study. These findings are only to be considered preliminary and are for planning purposes only, as they have not yet been verified by the regulatory agencies and are, therefore, subject to change pending their review. ECS cannot guarantee that field conditions and/or WoUS boundaries will not change over time.

Prior to conducting construction-related activities onsite, ECS recommends requesting a Jurisdictional Determination from the USACE for verification of these results to satisfy the requirements of Section 404 of The Clean Water Act (33 U.S.C. 1344). No earth-disturbing activities should be conducted within the PSA until a USACE Determination has been issued.

Appendix I: Figures

Legend

 Project Study Area



Client:

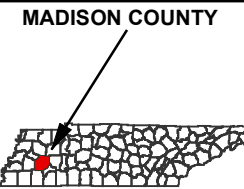
Project:

6K JAMES LAWRENCE
ROAD SITE

JAMES LAWRENCE
ROAD
JACKSON
MADISON COUNTY
TENNESSEE

Title:

**SITE
LOCATION
MAP**



Drawn By:
JMK

Scale:
1' = 1 mile

Approved By:
WBF


Date:
6/13/23

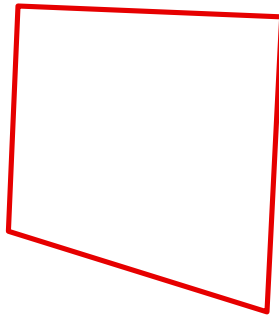
ECS Project No.
49:20447

FIGURE 1



Legend

 Project Study Area



Client:

Project:

6K JAMES LAWRENCE
ROAD SITE

JAMES LAWRENCE
ROAD
JACKSON
MADISON COUNTY
TENNESSEE

Title: **USGS
TOPOGRAPHIC MAP**

**DATED: 1981
WESTOVER, TN
7.5X7.5 MINUTE**

PROJECT STUDY AREA



Drawn By:
JMK

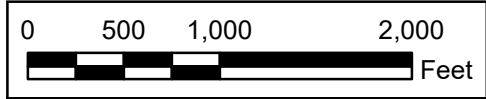
Scale:
1" = 1,000'

Approved By:
WBF


Date:
6/13/23

ECS Project No.
49:20447


FIGURE 2



Legend

 Project Study Area


Soil Map Unit

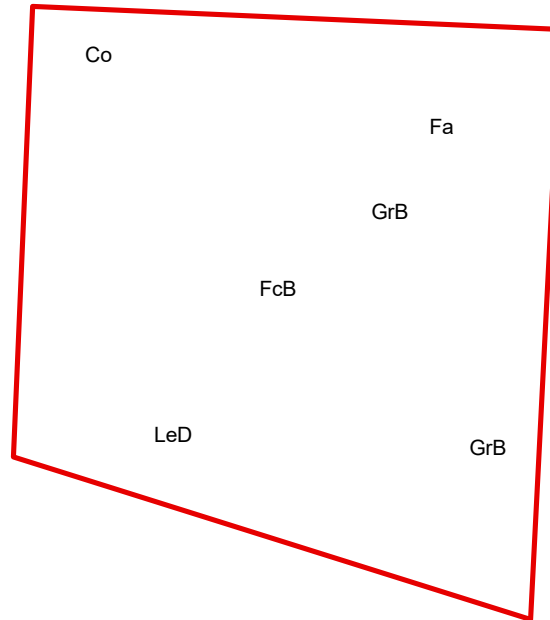
 Co: Calloway silt loam

 Fa: Falaya silt loam

 FcB: Feliciana silt loam

 GrB: Grenada silt loam

 LeD: Lexington silt loam



Client:

Project:

6K JAMES LAWRENCE
ROAD SITE

JAMES LAWRENCE
ROAD
JACKSON
MADISON COUNTY
TENNESSEE

Title: **USDA - NRCS
SOIL SURVEY MAP**

**DATED: 2020
WEB SOIL SURVEY
VERSION 8**

PROJECT STUDY AREA



Drawn By:

JMK

Scale:

1" = 500'

Approved By:

WBF

Date:

6/13/23


ECS Project No.

49:20447


FIGURE 3





Legend

 Project Study Area

Wetland Type

 Freshwater Emergent Wetland

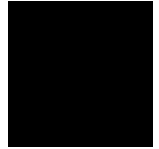
 Freshwater Forested/Shrub Wetland

 Freshwater Pond

 Lake

 Other

 Riverine




Client:

Project:
6K JAMES LAWRENCE ROAD SITE

JAMES LAWRENCE ROAD
JACKSON
MADISON COUNTY
TENNESSEE

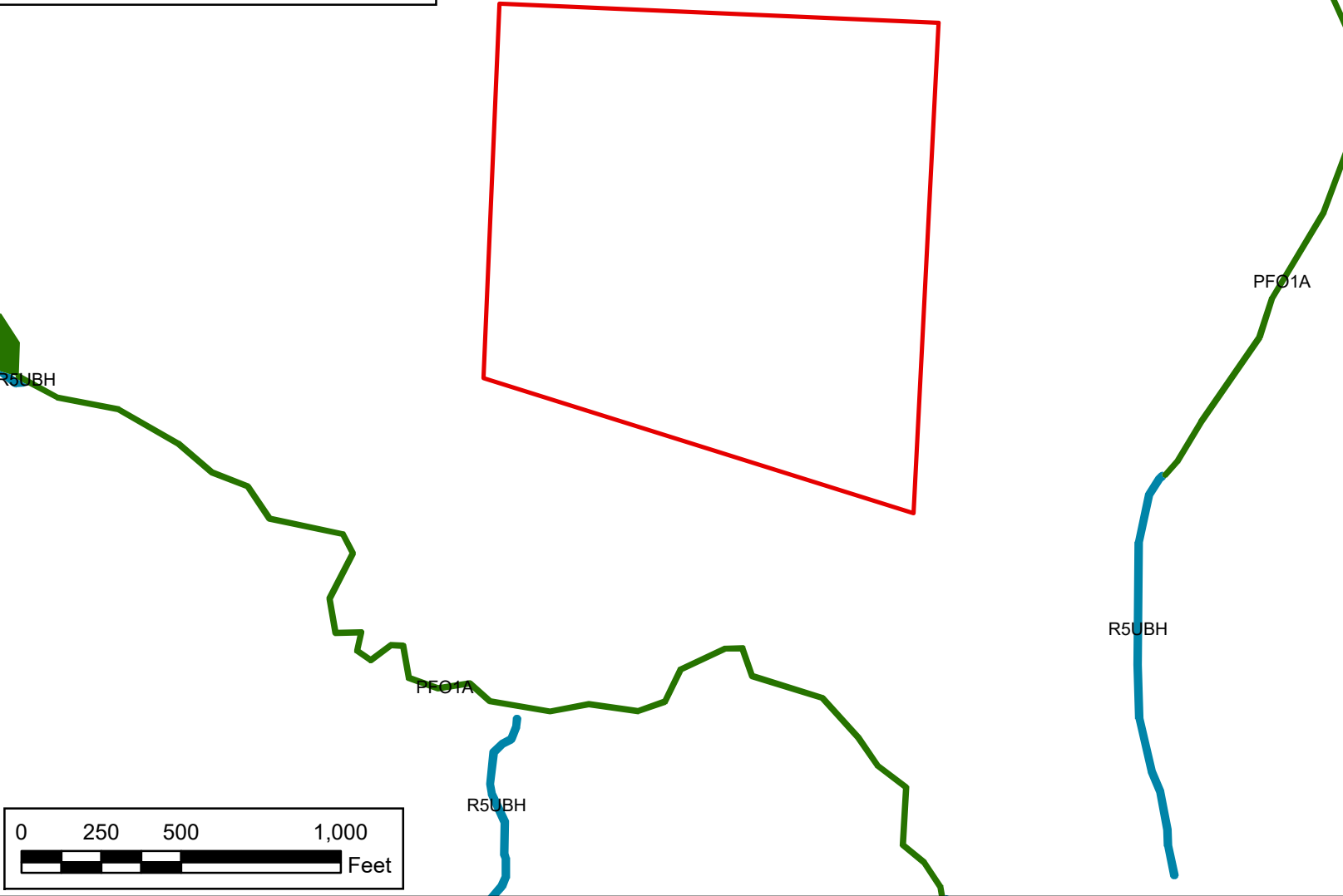
Title:
NATIONAL WETLANDS INVENTORY MAP

PROJECT STUDY AREA



Drawn By: JMK	Scale: 1" = 500'
Approved By: WBF	Date: 6/13/23

ECS Project No.
49:20447

FIGURE 4



Legend

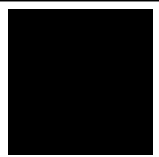
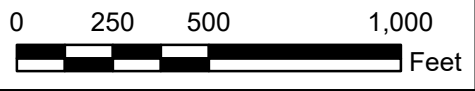
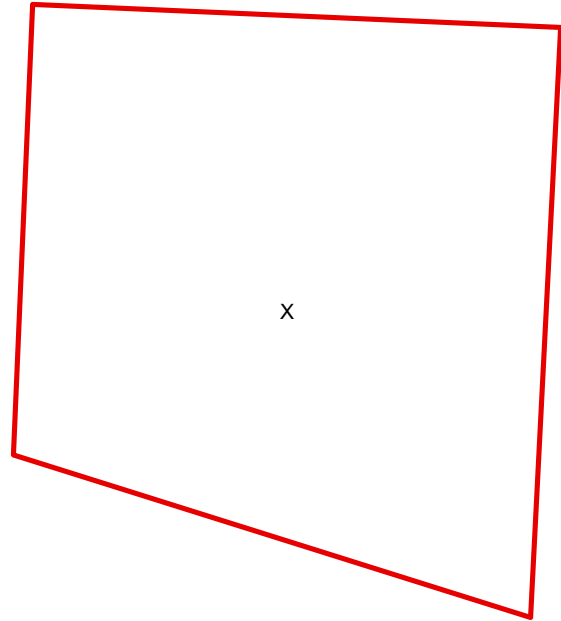
 Project Study Area

Flood Zone

 A

 AE

 X



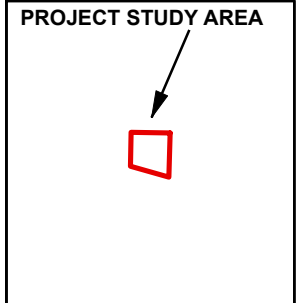
Client:

Project:
6K JAMES LAWRENCE
ROAD SITE

JAMES LAWRENCE
ROAD
JACKSON
MADISON COUNTY
TENNESSEE

Title: **FEMA - NFHL
FLOOD ZONE MAP**

**DATED: 8/3/2009
ID: 47113C0260E
MADISON COUNTY**




Drawn By: JMK	Scale: 1" = 500'
Approved By: WBF	Date: 6/13/23

ECS Project No.
49:20447


FIGURE 5


Legend

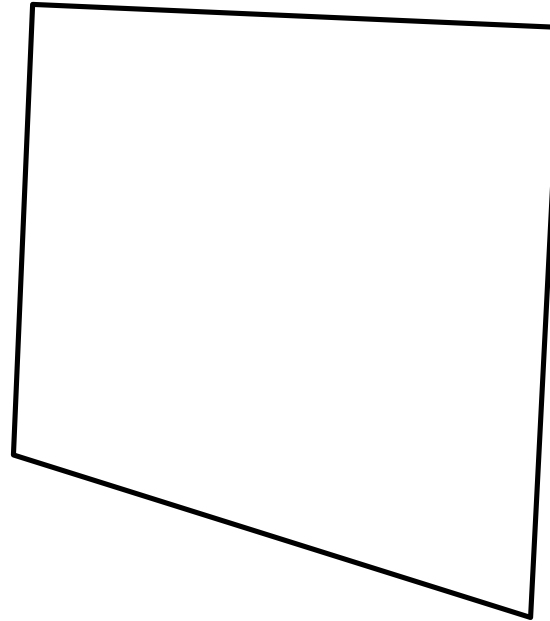
 Project Study Area

LiDAR Elevation

Value

 High : 443.55

 Low : 378.22




Client:

Project:
6K JAMES LAWRENCE
ROAD SITE

JAMES LAWRENCE
ROAD
JACKSON
MADISON COUNTY
TENNESSEE

Title:

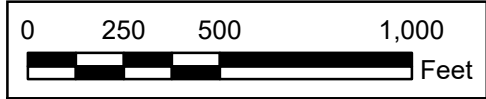
**TN-USGS
LiDAR ELEVATION
MAP**

PROJECT STUDY AREA






Drawn By: JMK	Scale: 1" = 500'
Approved By: WBF	Date: 6/13/23

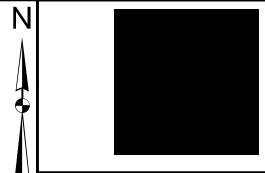
ECS Project No.
49:20447

FIGURE 6



Legend

-  Project Study Area
-  Wetland
-  Data Point
-  Non-Jurisdictional Drainage



Client:

Project:
6K JAMES LAWRENCE ROAD SITE

JAMES LAWRENCE ROAD
JACKSON
MADISON COUNTY
TENNESSEE

Title:
POTENTIAL WATERS OF THE US MAP

NOTES:
1. POTENTIAL JURISDICTIONAL WATERS OF THE US WERE IDENTIFIED DURING RECONNAISSANCE BY ECS ON JUNE 1, 2023.
2. FINDINGS ON THIS MAP HAVE NOT BEEN VERIFIED BY THE USACE AND TDEC AND ARE SUBJECT TO CHANGE.
3. THIS MAP SHOULD BE USED FOR PRELIMINARY PLANNING PURPOSES.

Drawn By: JMK	Scale: 1" = 250'
Approved By: WBF	Date: 6/13/23

ECS Project No.
49:20447

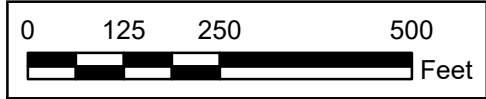
FIGURE 7

Non-Jurisdictional Drainage/
Wet-Weather Conveyance

Wetland A
35.591820, -88.935759
~0.3 Acres

DP-02

DP-01



Appendix II: Photographic Log



1 - Typical view of PSA



2 - Typical view of wetland A



3 - Typical view of DP-01



4 - Typical view of DP-02



5 - Typical view of hydric soil



6 - Typical view of non-jurisdictional drainage

Appendix III: USACE Wetland Data Forms and Stream Data Forms

Project/Site: 6K James Lawrence Site City/County: Jackson/Madison Sampling Date: 6/1/23
 Applicant/Owner: 6K Energy State: TN Sampling Point: DP-01
 Investigator(s): Justin Kelley, TN-QHP Section, Township, Range: _____
 Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): <10
 Subregion (LRR or MLRA): LRR P, MLRA 133A Lat: 35.591734 Long: -88.935538 Datum: _____
 Soil Map Unit Name: FcB: Feliciana silt loam NWI classification: Upland
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> _____ Surface Water (A1) _____ Aquatic Fauna (B13) _____ High Water Table (A2) _____ Marl Deposits (B15) (LRR U) <u>X</u> Saturation (A3) _____ Hydrogen Sulfide Odor (C1) _____ Water Marks (B1) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Sediment Deposits (B2) _____ Presence of Reduced Iron (C4) _____ Drift Deposits (B3) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Algal Mat or Crust (B4) _____ Thin Muck Surface (C7) _____ Iron Deposits (B5) _____ Other (Explain in Remarks) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) <u>X</u> FAC-Neutral Test (D5) _____ Sphagnum Moss (D8) (LRR T, U)
---	--

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (inches): <u>2</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No _____
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP-01

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>30</u> =Total Cover			
50% of total cover: <u>15</u> 20% of total cover: <u>6</u>			

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>
2. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
<u>40</u> =Total Cover			
50% of total cover: <u>20</u> 20% of total cover: <u>8</u>			

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>No</u>	<u>FAC</u>
2. <u>Solidago canadensis</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>
3. <u>Rumex conglomeratus</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>
4. <u>Apocynum cannabinum</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>
5. <u>Carex frankii</u>	<u>15</u>	<u>Yes</u>	<u>OBL</u>
6. <u>Juncus marginatus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
7. <u>Erigeron canadensis</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
8. <u>Lespedeza cuneata</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
<u>70</u> =Total Cover			
50% of total cover: <u>35</u> 20% of total cover: <u>14</u>			

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ =Total Cover			
50% of total cover: _____ 20% of total cover: _____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>75</u>	x 1 = <u>75</u>
FACW species <u>15</u>	x 2 = <u>30</u>
FAC species <u>15</u>	x 3 = <u>45</u>
FACU species <u>35</u>	x 4 = <u>140</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>140</u> (A)	<u>290</u> (B)
Prevalence Index = B/A = <u>2.07</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0¹

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?

Yes	No
<u>X</u>	<u> </u>

Remarks: (If observed, list morphological adaptations below.)

SOIL

Sampling Point: DP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 4/4						Loamy/Clayey	
1-16	10YR 4/2	90	10YR 5/6	10	C	PL/M	Loamy/Clayey	Prominent redox concentrations

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) **(LRR P, T, U)**
- 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- Muck Presence (A8) **(LRR U)**
- 1 cm Muck (A9) **(LRR P, T)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) **(LRR P, S, T, U)**
- Polyvalue Below Surface (S8) **(LRR S, T, U)**
- Thin Dark Surface (S9) **(LRR S, T, U)**
- Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) **(LRR U)**
- Depleted Ochric (F11) **(MLRA 151)**
- Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- Delta Ochric (F17) **(MLRA 151)**
- Reduced Vertic (F18) **(MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) **(LRR O)**
- 2 cm Muck (A10) **(LRR S)**
- Coast Prairie Redox (A16) **(outside MLRA 150A)**
- Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(LRR P, T)**
- Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- Red Parent Material (F21)
- Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

Project/Site: 6K James Lawrence Site City/County: Jackson/Madison Sampling Date: 6/1/23

Applicant/Owner: 6K Energy State: TN Sampling Point: DP-02

Investigator(s): Justin Kelley, TN-QHP Section, Township, Range: _____

Landform (hillside, terrace, etc.): _____ Local relief (concave, convex, none): None Slope (%): <10

Subregion (LRR or MLRA): LRR P, MLRA 133A Lat: 35.591891 Long: -88.935242 Datum: _____

Soil Map Unit Name: GrB: Grenada silt loam NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u> Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Marl Deposits (B15) (LRR U) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Sphagnum Moss (D8) (LRR T, U)

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP-02

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Solidago canadensis</u>	75	Yes	FACU
2. <u>Juncus effusus</u>	5	No	OBL
3. <u>Juncus marginatus</u>	5	No	FACW
4. <u>Erigeron canadensis</u>	2	No	FACU
5. <u>Scirpus atrovirens</u>	2	No	OBL
6. <u>Schizachyrium scoparium</u>	10	No	FACU
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
	99 = Total Cover		
	50% of total cover: <u>50</u>	20% of total cover: <u>20</u>	

Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>7</u>	x 1 = <u>7</u>
FACW species <u>5</u>	x 2 = <u>10</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>87</u>	x 4 = <u>348</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>99</u> (A)	<u>365</u> (B)
Prevalence Index = B/A = <u>3.69</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

 2 - Dominance Test is >50%

 3 - Prevalence Index is ≤3.0¹

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody Vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present?	Yes	No
	_____	<u>X</u>

Remarks: (If observed, list morphological adaptations below.)

SOIL

Sampling Point: DP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	10YR 4/4						Loamy/Clayey	
1-16	10YR 4/2	95	10YR 5/6	5	C	PL/M	Loamy/Clayey	Prominent redox concentrations

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Organic Bodies (A6) **(LRR P, T, U)**
- 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- Muck Presence (A8) **(LRR U)**
- 1 cm Muck (A9) **(LRR P, T)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) **(LRR P, S, T, U)**
- Polyvalue Below Surface (S8) **(LRR S, T, U)**
- Thin Dark Surface (S9) **(LRR S, T, U)**
- Barrier Islands 1 cm Muck (S12) **(MLRA 153B, 153D)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Marl (F10) **(LRR U)**
- Depleted Ochric (F11) **(MLRA 151)**
- Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- Delta Ochric (F17) **(MLRA 151)**
- Reduced Vertic (F18) **(MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- Anomalous Bright Floodplain Soils (F20) **(MLRA 149A, 153C, 153D)**
- Very Shallow Dark Surface (F22) **(MLRA 138, 152A in FL, 154)**

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) **(LRR O)**
- 2 cm Muck (A10) **(LRR S)**
- Coast Prairie Redox (A16) **(outside MLRA 150A)**
- Reduced Vertic (F18) **(outside MLRA 150A, 150B)**
- Piedmont Floodplain Soils (F19) **(LRR P, T)**
- Anomalous Bright Floodplain Soils (F20) **(MLRA 153B)**
- Red Parent Material (F21)
- Very Shallow Dark Surface (F22) **(outside MLRA 138, 152A in FL, 154)**
- Barrier Islands Low Chroma Matrix (TS7) **(MLRA 153B, 153D)**
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks: