Document Type: EA-Administrative Record
Index Field: Environmental Assessment
Project Name: Adamsville Solar
Project Number: 2022-13

ADAMSVILLE SOLAR
DRAFT ENVIRONMENTAL ASSESSMENT
McNairy and Hardin County, Tennessee

Prepared for:
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Knoxville, Tennessee

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November 2023

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SYMBOLS, ACRONYMS, AND ABBREVIATIONS

AADT	Average Annual Daily Traffic
AC	alternating current
AJD	approved jurisdictional determination
APE	area of potential effect
ARAP	Aquatic Resource Alteration Permit
BCC	birds of conservation concern
BCWMA	Beason Creek Wildlife Management Area
BEA	Bureau of Economic Analysis
BG	Block Group
BGEPA	Bald and Golden Eagle Protection Act
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
CAA	Clean Air Act of 1970
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction Stormwater Permit
CH_4	methane
CM	centimeters below surface
CO	carbon monoxide
CO_2	carbon dioxide
CT	Census Tract
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibels
DC	direct current
DNL	day-night average sound level
DOT	U.S. Department of Transportation
EA	Environmental Assessment
ECD	erosion control device
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
ft	feet
GHG	greenhouse gas
GPS	global positioning system
IC	Interconnection Customer
IEEE	Institute of Electrical and Electronics Engineers
IPaC	Information for Planning and Consultation
IRP	Integrated Resource Plan
kV	kilovolt
LPC	Local Power Company
MBTA	Migratory Bird Treaty Act
MSA	Micropolitan Statistical Area
msl	mean sea level
MVA	mega-volt ampere
MW	megawatts
N_2O	nitrous oxide

SYMBOLS, ACRONYMS, AND ABBREVIATIONS

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NFPA	National Fire Protection Association
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSCR	non-site cultural resources
NSSH	National Soil Survey Handbook
O_3	ozone
OHWM	ordinary high-water mark
OSHA	Occupational Safety and Health Administration
Pb	lead
PBPU	Paris Board of Public Utilities
PCS	power conversion station
PEL	permissible exposure limit
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
PGA	peak ground acceleration
PM_{10}	particulate matter whose particles are less than or equal to 10 micrometers
$PM_{2.5}$	particulate matter whose particles are less than or equal to 2.5 micrometers
POI	Point of Interconnection
PPA	Power Purchase Agreement
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
PSS	Palustrine Scrub-Shrub Wetland
PUB	Palustrine Unconsolidated-Bottom
PV	photovoltaic
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental conditions
RFFA	reasonably foreseeable future actions
RFP	Request for Proposal
ROW	right-of-way
SHPO	State Historical Preservation Officer
SIP	State Implementation Plan
SO_2	sulfur dioxide
SPCC	Spill Prevention, Countermeasure and Control
SRC	Silicon Ranch Corporation
STR	stream
SWPPP	Stormwater Pollution Prevention Plan
T&E	threatened and endangered
TDEC	Tennessee Department of Environment and Conservation
TDOT	Tennessee Department of Transportation

SYMBOLS, ACRONYMS, AND ABBREVIATIONS

THC	Tennessee Historical Commission
TLV	threshold limit value
TN	Tennessee
TVA	Tennessee Valley Authority
TWA	time weighted average
U.S.C.	United States Code
ug/m3	micrograms per cubic meter
US	United States
USACE	United States Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
WTL	wetland
WWC	wet weather conveyances

GLOSSARY OF TERMS

100-Year Floodplain	The area inundated by the 1 percent annual chance (or 100- year) flood.
Ambient Air	Outdoor air in locations accessible to the general public.
Area of Potential Effects (APE)	The geographic area or areas within which an action may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.
Attainment Areas	Those areas of the U.S. that meet NAAQS as determined by measurements of air pollutant levels.
Climate	A statistical description of daily, seasonal, or annual weather conditions based on recent or long-term weather data. Climate descriptions typically emphasize average, maximum, and minimum conditions for temperature, precipitation, humidity, wind, cloud cover, and sunlight intensity patterns; statistics on the frequency and intensity of tornado, hurricane, or other severe storm events may also be included.
Cumulative Impacts	Impacts that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions, regardless of what agency or person undertakes such actions (40 CFR § 1508.7).
Day/Night Average Sound Level (DNL)	A 24-hour average noise level rating with a 10 decibel (dB) penalty factor applied to nighttime noise levels. The DNL value is very similar to the community noise equivalent level value but does not include any weighting factor for noise during evening hours.
Decibel (dB)	A generic term for measurement units based on the logarithm of the ratio between a measured value and a reference value. Decibel scales are most associated with acoustics (using air pressure fluctuation data); but decibel scales sometimes are used for ground- borne vibrations or various electronic signal measurements.
Deciduous	Vegetation that sheds leaves in autumn and produces new leaves in the spring.
Direct Impacts	Effects that are caused by the action and occur at the same time and place (40 CFR § 1508.8).
Ecoregion	A relatively homogeneous area of similar geography, topography, climate, and soils that supports similar plant and animal life.
Emergent Wetland	Wetlands dominated by erect, rooted herbaceous plants, such as cattails and bulrush.

GLOSSARY OF TERMS

Endangered Species	A species in danger of extinction throughout all or a significant portion of its range or territory. Endangered species recognized by the Endangered Species Act (ESA), or similar state legislation have special legal status for their protection and recovery.
Environmental Justice	Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.
Erosion	A natural process whereby soil and highly weathered rock materials are worn away and transported to another area, most commonly by wind or water.
Evergreen	Vegetation with leaves that stay green and persist all year.
Floodplains	Any land area susceptible to inundation by water from any source. For purposes of the National Flood Insurance Program, the floodplain, at a minimum, is that area subject to a 1 percent or greater chance of flooding (100-year flood) in any given year.
Forest	Vegetation having tree crowns overlapping, generally forming 60-100 percent cover (Grossman et al. 1998).
Greenhouse Gas (GHG)	A gaseous compound that absorbs infrared radiation and re-radiates a portion of that back toward the earth's surface, thus trapping heat and warming the earth's atmosphere.
Habitat	A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.
Herbaceous Vegetation	Dominated by forbs, generally forming at least 25 percent cover; other life-forms with less than 25 percent cover (Grossman et al 1998).
Historic Property	Defined in 36 CFR § 800.16(l) as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places."
Indirect Impacts	Effects that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR § 1508.8).
Landscape Features	The land and water form, vegetation, and structures which compose the characteristic landscape.
Landslide	A slope failure that involves downslope displacement and movement of material either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces.
NatureServe	An international network of biological inventories (natural heritage programs or conservation data centers) that provides information about the location and status of animals, plants, and habitat communities, and establishes a system for ranking the relative rarity of those resources.

GLOSSARY OF TERMS

Maintenance Area	An area that currently meets federal ambient air quality standards, but which was previously designated as a nonattainment area. Federal agency actions occurring in a maintenance area are still subject to Clean Air Act conformity review requirements.
Mitigation	(a) Avoiding the impacts altogether by not taking an action or parts of an action, (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment, (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action, (e) Compensating for the impact by replacing or providing substitute resources or environments (40 CFR §1508.20).
National Ambient Air Quality Standards (NAAQS)	Uniform national air quality standards established by the USEPA that restrict ambient levels of certain pollutants to protect public health (primary standards) or public welfare (secondary standards). Standards have been set for ozone, carbon monoxide, particulate matter, sulfur dioxide, nitrogen dioxide, and lead.
National Pollutant Discharge Elimination System (NPDES) and Water Quality Certification	The NPDES permit program was established under the Clean Water Act and controls, among other things, the discharge of stormwater associated with certain construction activities involving disturbance of one or more acres. The NPDES program has been delegated in Tennessee to the Department of Environment and Conservation. In addition, Section 401 of the Clean Water Act requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States obtain a state certification that the discharge complies with the Clean Water Act.
Nitrogen Dioxide (NO_2)	A toxic, reddish gas formed by the oxidation of nitric oxide. Nitrogen dioxide is a strong respiratory and eye irritant. Most nitric oxide formed by combustion processes is converted into nitrogen dioxide by subsequent oxidation in the atmosphere. Nitrogen dioxide is a criteria pollutant, and is a precursor of ozone, numerous types of photochemically generated nitrate particles (including PAN), and atmospheric nitrous and nitric acids.
Nonattainment Area	An area that does not meet a federal or state ambient air quality standard. Federal agency actions occurring in a federal nonattainment area are subject to Clean Air Act conformity review requirements.

GLOSSARY OF TERMS

Ozone (O_3)	A compound consisting of three oxygen atoms. Ozone is a major constituent of photochemical smog that is formed primarily through chemical reactions in the atmosphere involving reactive organic compounds, nitrogen oxides, and ultraviolet light. Ozone is a toxic chemical that damages various types of plant and animal tissues, and which causes chemical oxidation damage to various materials. Ozone is a respiratory irritant and appears to increase susceptibility to respiratory infections. A natural layer of ozone in the upper atmosphere absorbs high energy ultraviolet radiation, reducing the intensity and spectrum of ultraviolet light that reaches the earth's surface.
Paleontology	A science dealing with the life forms of past geological periods as known from fossil remains.
Particulate Matter	Solid or liquid material having size, shape, and density characteristics that allow the material to remain suspended in the atmosphere for more than a few minutes. Particulate matter can be characterized by chemical characteristics, physical form, or aerodynamic properties. Categories based on aerodynamic properties are commonly described as being size categories, although physical size is not used to define the categories. Many components of suspended particulate matter are respiratory irritants. Some components (such as crystalline or fibrous minerals) are primarily physical irritants. Other components are chemical irritants (such as sulfates, nitrates, and various organic chemicals). Suspended particulate matter also can contain compounds (such as heavy metals and various organic compounds) that are systemic toxins or necrotic agents. Suspended particulate matter or compounds adsorbed on the surface of particles can also be carcinogenic or mutagenic chemicals. See PM_{10} and $PM_{2.5}$.
Peak Ground Acceleration (PGA)	A common measure of ground motion during an earthquake. The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g), which is approximately 980 centimeters per second squared. Unlike measures of magnitude, which provide a single measure of earthquake energy, PGA varies from place to place, and is dependent on the distance from the epicenter and the character of the underlying geology (e.g., hard bedrock, soft sediments, or artificial fills).
Physiographic Provinces	General divisions of land with each area having characteristic combinations of soil materials and topography.

GLOSSARY OF TERMS

PM_{10} (Inhalable Particulate Matter)	A fractional sampling of suspended particulate matter that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 50 microns penetrate to the lower respiratory tract (tracheo-bronchial airways and alveoli in the lungs). In a regulatory context, PM_{10} is any suspended particulate matter collected by a certified sampling device having a 50 percent collection efficiency for particles with aerodynamic equivalent diameters of 9.5 to 10.5 microns and a maximum aerodynamic diameter collection limit less than 50 microns. Collection efficiencies are greater than 50 percent for particles with aerodynamic diameters smaller than 10 microns and less than 50 percent for particles with aerodynamic diameters larger than 10 microns.
$PM_{2.5}$ (Fine Particulate Matter)	A fractional sampling of suspended particulate matter that approximates the extent to which suspended particles with aerodynamic equivalent diameters smaller than 6 microns penetrate the alveoli in the lungs. In a regulatory context, $PM_{2.5}$ is any suspended particulate matter collected by a certified sampling device having a 50 percent collection efficiency for particles with aerodynamic equivalent diameters of 2.0 to 2.5 microns and a maximum aerodynamic diameter collection limit less than 6 microns. Collection efficiencies are greater than 50 percent for particles with aerodynamic diameters smaller than 2.5 microns and less than 50 percent for particles with aerodynamic diameters larger than 2.5 microns.
Power Purchase Agreement (PPA)	A contract between two parties, one who generates and intends to sell electricity, and one who is looking to purchase electricity, defining the commercial terms for the sale of electricity between the two parties.
Prehistoric	Refers to the period wherein American Indian cultural activities took place before written records and not yet influenced by contact with non-native culture(s).
Prime Farmland	Generally regarded as the best land for farming, these areas are flat or gently rolling and are usually susceptible to little or no soil erosion. Prime farmland produces the most food, feed, fiber, forage, and oilseed crops with the least amount of fuel, fertilizer, and labor. It combines favorable soil quality, growing season, and moisture supply and, under careful management, can be farmed continuously and at a high level of productivity without degrading either the environment or the resource base. Prime farmland does not include land already in or committed to urban development, roads, or water storage.
Riverine	Having characteristics similar to a river.
Row Crops	Agricultural crops, such as corn, wheat, beans, cotton, etc., which are most efficiently grown in large quantities by planting and cultivating in lines or rows.

GLOSSARY OF TERMS

Scrub-Shrub	Woody vegetation less than about 20 feet tall. Species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.
State Historic Preservation Officer (SHPO)	The official within and authorized by each state at the request of the Secretary of the Interior to act as liaison for the National Historic Preservation Act.
State Implementation Plan (SIP)	Legally enforceable plans adopted by states and submitted to USEPA for approval, which identify the actions and programs to be undertaken by the State and its subdivisions to achieve and maintain national ambient air quality standards in a time frame mandated by the Clean Air Act.
Subsurface	Of or pertaining to rock or mineral deposits which generally are found below the ground surface.
Sulfur Dioxide (SO_2)	A pungent, colorless, and toxic oxide of sulfur formed primarily by the combustion of fossil fuels. It is a respiratory irritant, especially for asthmatics. A criteria pollutant, and a precursor of sulfate particles and atmospheric sulfuric acid.
Threatened Species	A species threatened with extinction throughout all or a significant portion of its range or territory. Threatened species recognized by the ESA or similar state legislation have special legal status for their protection and recovery.
Upland	The higher parts of a region, not closely associated with streams or lakes.
Wetlands	Areas inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances do or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, mud flats, and natural ponds.”
Wildlife Management Area	Land and/or water areas designated by state wildlife agencies, such as the Tennessee Department of Environment and Conservation, for the protection and management of wildlife. These areas typically have specific hunting and trapping regulations as well as rules regarding appropriate uses of these areas by the public.
Woodland	Open stands of trees with crowns not usually touching, generally forming 25 to 60 percent cover (Grossman et al. 1998).

CHAPTER 1 - INTRODUCTION

1.0 INTRODUCTION

The Tennessee Valley Authority (TVA) has entered into a power purchase agreement (PPA) with SR Adamsville, LLC (Adamsville Solar), a wholly owned subsidiary of Silicon Ranch Corporation (SRC) to purchase the power generated by Adamsville Solar (Project) in McNairy and Hardin Counties, Tennessee (TN). The Project is anticipated to provide up to 25 megawatts (MW) alternating current (AC) in generating capacity at the Point of Interconnection (POI). The proposed solar facility would be constructed and operated by Adamsville Solar. Under the terms of the conditional PPA between TVA and Adamsville Solar, dated December 6, 2022, TVA would purchase the electric output generated by the proposed solar facility for an initial term of 20 years, subject to satisfactory completion of all applicable environmental reviews. The POI would be a new switchyard built by SRC within the Project Site (Figure 1-1). The switchyard would transmit the electricity to the existing Local Power Company (LPC), Pickwick Electric Cooperative's (PEC's) transmission line (TL) that terminates at the North Adamsville substation. The substation would transmit the power to the TVA grid.

Adamsville Solar is located approximately 1.5 miles northeast of the City of Adamsville. The Project Site is a 295-acre property, consisting of approximately 170 acres that will be fenced and contain panels and an existing 0.56-mile right-of-way (ROW), and TL owned by PEC (Figure 1-1). While the design of the facility is being finalized, the conceptual plan includes approximately 74,682 First Solar Series 6+ or Series 7 modules being placed within the approximately 170-acre fenced area. Approximately 6.2 acres of interior access roads would be constructed to access the panels.

The proposed facility was designed to avoid cultural resources and minimize direct impacts to natural resources. The land would be acquired by SRC and leased to Adamsville Solar for the project. Under the PPA, Adamsville Solar would fund, build, own, and operate the solar energy facility.

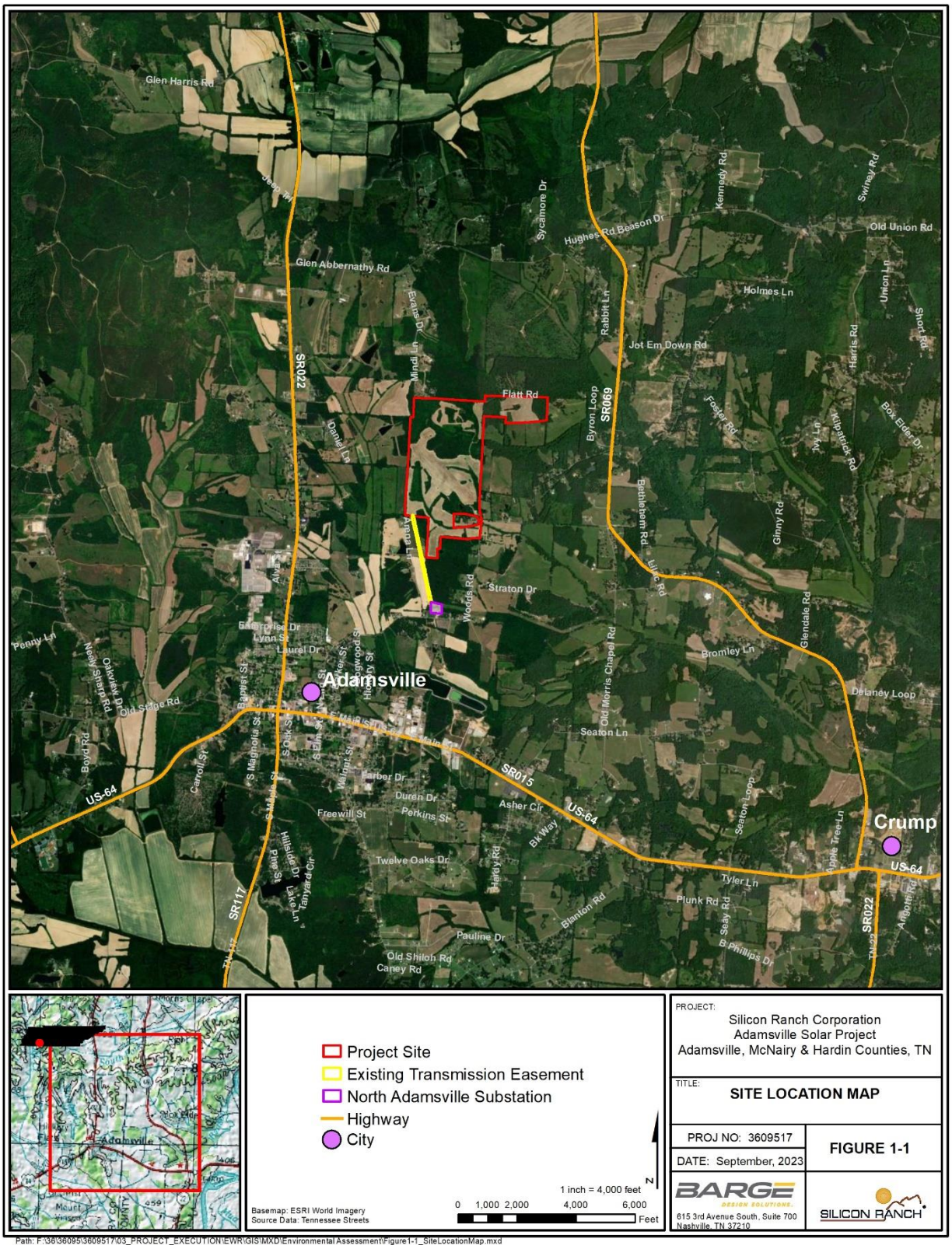

Figure 1-1. Adamsville Site Location Map

1.1 PURPOSE AND NEED FOR ACTION

TVA is a corporate agency of the United States and the largest public power provider in the country. Through our partnership with 153 local power companies, TVA supplies energy across 80,000 square miles for 10 million people, 750,000 businesses, and 56 large industrial customers, including military installations and the U.S. Department of Energy facilities at Oak Ridge, Tennessee. TVA's service area includes all of Tennessee and parts of six other southeastern states called the Tennessee Valley. Since 1933, TVA's mission has been to serve the people by improving life in the Tennessee Valley.

TVA produces or obtains electricity from a diverse portfolio of energy sources, including solar, hydroelectric, wind, biomass, fossil fuel, and nuclear. In June 2019, TVA completed an Integrated Resource Plan (IRP) and associated Environmental Impact Statement (TVA, 2019). The IRP identified the various resources that TVA intends to use to meet the energy needs of the TVA region over the 20-year planning period while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy while reducing environmental impacts. The 2019 IRP anticipates growth of solar in all scenarios analyzed, with most scenarios anticipating 5,000-8,000 MW and one anticipating up to 14,000 MW. TVA has begun the process of updating its IRP and will issue a new plan in 2024. With the demand for solar energy increasing, TVA has an expansion target of 10,000 MW of solar by 2035.

Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources (TVA, 2020). The PPAs are needed to help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and fulfill the renewable energy goals established in the 2019 IRP. The purpose of this Project is to construct a solar facility that provides cost-effective renewable energy consistent with the IRP and TVA goals.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The National Environmental Policy Act of 1969 (NEPA) requires federal agencies to evaluate the potential environmental impacts of their proposed actions. This Environmental Assessment (EA) was prepared consistent with 2022 Council on Environmental Quality's (CEQ) regulations for implementing NEPA at 40 CFR 1500-1508 (85 Federal Register [FR] 43304-43376, July 16, 2020) (CEQ, 2020). TVA's 2020 NEPA regulations at 18 CFR 1318 were also applied (85 FR 17434, Mar. 27, 2020) (TVA, 2020).

This EA identifies the Proposed and No Action Alternatives, describes the existing environment where the solar facility would be constructed (Project Site), analyzes potential environmental impacts associated with the Proposed Action and the No Action Alternatives, and identifies and characterizes potential cumulative impacts from the proposed Project in relation to other ongoing and reasonably foreseeable proposed activities within the surrounding area of the Project Site. TVA's Proposed Action, also referred to in this EA as the Preferred Alternative, would result in the construction and operation of the proposed solar facility by Adamsville Solar and actions taken by TVA to connect the solar facility to the TVA transmission system.

Considering the proposed project and identification of applicable laws, regulations, executive orders (EO), and policies, the following resources are discussed and analyzed in this EA: land use; geology, soils and prime farmland; water resources; biological resources; visual resources; noise; air quality and climate change; cultural resources; natural areas and recreation; utilities; waste management;

public and occupational health and safety; transportation; and socioeconomics and environmental justice (EJ).

Under the PPA, TVA's obligation to purchase renewable power is contingent upon the satisfactory completion of the appropriate environmental review and TVA's determination that the Proposed Action would be "environmentally acceptable." To be deemed acceptable, TVA must assess the impact of the Project on the human environment to determine whether (1) any significant impacts would result from the location, operation, and/or maintenance of the proposed Project and/or associated facilities, and (2) the Project would be consistent with the purposes, provisions, and requirements of applicable federal, state, and local environmental laws and regulations.

This EA consists of five chapters and three appendices:

- **Chapter 1.0:** Describes the purpose and need for the Project, public involvement, necessary permits or licenses, and the EA overview.
- **Chapter 2.0:** Describes the Proposed Action and No Action Alternatives, provides a comparison of alternatives, and discusses the Preferred Alternative
- **Chapter 3.0:** Discusses the affected environment and the potential direct, indirect, and cumulative impacts on these resource areas. Mitigation measures are also proposed, as appropriate.
- **Chapter 4.0:** Provides the List of Preparers of this EA and their role in the EA.
- **Chapter 5.0:** Provides the Literature Cited.
- **Appendix A:** Summary of the Environmental Features for the Adamsville Solar Project
- **Appendix B:** Adamsville Solar Site HD concurrence letter
- **Appendix C:** Cultural Resources Consultation Information

1.3 PUBLIC INVOLVEMENT

An electronic version of this Draft EA has been posted on the TVA website for a 30-day public comment period, which includes an option for the public to submit comments electronically. TVA has notified interested federally recognized Native American Tribes, elected officials, and other stakeholders that the draft EA is available for review and comment for a 30-day period. Public notices were published in local newspapers soliciting comments from other agencies, the public, and any interested organizations. In addition, Adamsville Solar plans to speak with members of the community and adjacent property owners about the proposed solar facility and answer questions.

Comments from the 30-day public review and comment period for the draft EA will be analyzed and a response matrix will be generated. The comments will be provided in the Final EA.

1.4 REQUIRED PERMITS AND LICENSES

Based on the scope of the proposed construction activities, as described in Chapter 2, the project would require an individual Construction Stormwater Permit (CGP) including a Stormwater Pollution

Prevention Plan (SWPPP) from the Tennessee Department of Environment and Conservation (TDEC) (TDEC, n.d.). The SWPPP would include the implementation of approved pollution prevention measures.

In addition, any proposed permanent wetland or stream impacts would require an Aquatic Resource Alteration Permit (ARAP) or a §401 Water Quality Certification (§401 certification) from TDEC. Additionally, a federal §404 permit may be required from the U.S. Army Corps of Engineers (USACE). If these permits are required, Adamsville Solar would obtain TDEC and USACE authorization for the project and comply with permit conditions and compensatory mitigation measures as required before construction begins.

Consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA) is underway regarding potential impacts to federally listed bats. The results of the coordination will be in the Final EA.

Building permits are not required in the unincorporated areas of either county. If open burning is determined to be the best method for wood waste management, a burn permit would be obtained through the Tennessee Department of Agriculture, Division of Forestry, and TDEC would be notified. A list of potential permits, approvals, and licenses required for the Project is presented in Table 1.4-1.

Table 1.4-1. Adamsville Solar Permit and Approval List

Permit/Approval	Associated Documentation	Lead Agency
Federal		
Endangered Species Act Section 7 (ESA)	Informal consultation presenting results of biological survey and protected species habitat assessment and impact determinations	U.S. Fish and Wildlife Service (USFWS)
Bald and Golden Eagle Protection Act (BGEPA)		
Section 404 of the Clean Water Act – Nationwide Permit 51	Approved Jurisdictional Determination (AJD) Package and concurrence letter	U.S. Army Corps of Engineers (USACE)
Farmland Protection Policy Act (FPPA)	None. FPPA applies to Projects receiving federal funding for construction. Adamsville Solar does not receive federal funding.	Natural Resources Conservation Service (NRCS)
Obstruction Evaluation/Airport Airspace Analysis	None. Per the FAA Notice Criteria Tool	Federal Aviation Administration (FAA)
State		
Section 106 National Historical Preservation Act consultation	Cultural Resources Survey Report/Results	Tennessee Historical Commission (THC or SHPO)
Aquatic Resource Alteration Permit (ARAP)/Section 401 Water Quality Certification	Hydrologic Determination (HD) Package and concurrence letter	TDEC – Division of Water Resources
Construction General Permit (NPDES) Permit No. TNR 100000	Stormwater Pollution Prevention Plan (SWPPP)	TDEC – Division of Water Resources
Encroachment Agreement	Permit Application	Tennessee Department of Transportation (TDOT)

CHAPTER 2 - ALTERNATIVES

2.0 ALTERNATIVES

This chapter explains the rationale for identifying the alternatives to be evaluated, including the No Action Alternative required by NEPA, describes each alternative, provides a comparison of alternatives with respect to their potential environmental impacts, and identifies the Preferred Alternative.

2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, TVA would not purchase the power generated by the Project under the 20-year PPA with Adamsville Solar, and TVA would not be involved with the Project. If TVA were to select this alternative, and Adamsville Solar elected not to proceed with the Project, then Adamsville Solar would not construct any facility on any tracts of land in McNairy and Hardin Counties, Tennessee, and PEC would not make the associated modifications to its transmission system. Existing conditions (e.g., land use, natural resources, visual resources, physical resources, and socioeconomics) in the Project Site would not change as a result of the Proposed Action, and agricultural activities would likely continue. TVA would continue to rely on other sources of generation described in the 2019 IRP (TVA 2019) to ensure an adequate energy supply and to meet its goals for increased renewable and low greenhouse gas (GHG)-emitting generation. Under the No Action Alternative, there would be no project-related changes to land use, natural resources, or socioeconomics in the immediate future.

The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative (Proposed Action) are measured.

2.2 PROPOSED ACTION ALTERNATIVE

Under the Proposed Action, Adamsville Solar would acquire approximately 295 acres of land in McNairy and Hardin Counties, Tennessee, and construct, operate, and maintain a single-axis tracking photovoltaic (PV) solar power facility of up to 25 MW AC generating capacity at the POI. The energy generated by the Project would be sold to TVA in accordance with the terms of the PPA. The Project Site would be located on two contiguous parcels owned by SRC of agricultural and forested land in McNairy and Hardin Counties, Tennessee. These parcels comprise the Project Site (Figure 2.2-1). Adamsville Solar would build a switchyard to connect to the existing North Adamsville 161-kilovolt (kV) substation via PEC's existing TL (Figure 2.2-1).

This EA assesses the impact of TVA's action of entering into the PPA with Adamsville Solar, the associated impacts of the construction and operation of the proposed solar facility by Adamsville Solar, and the transmission interconnections and switching stations by Adamsville Solar and TVA.

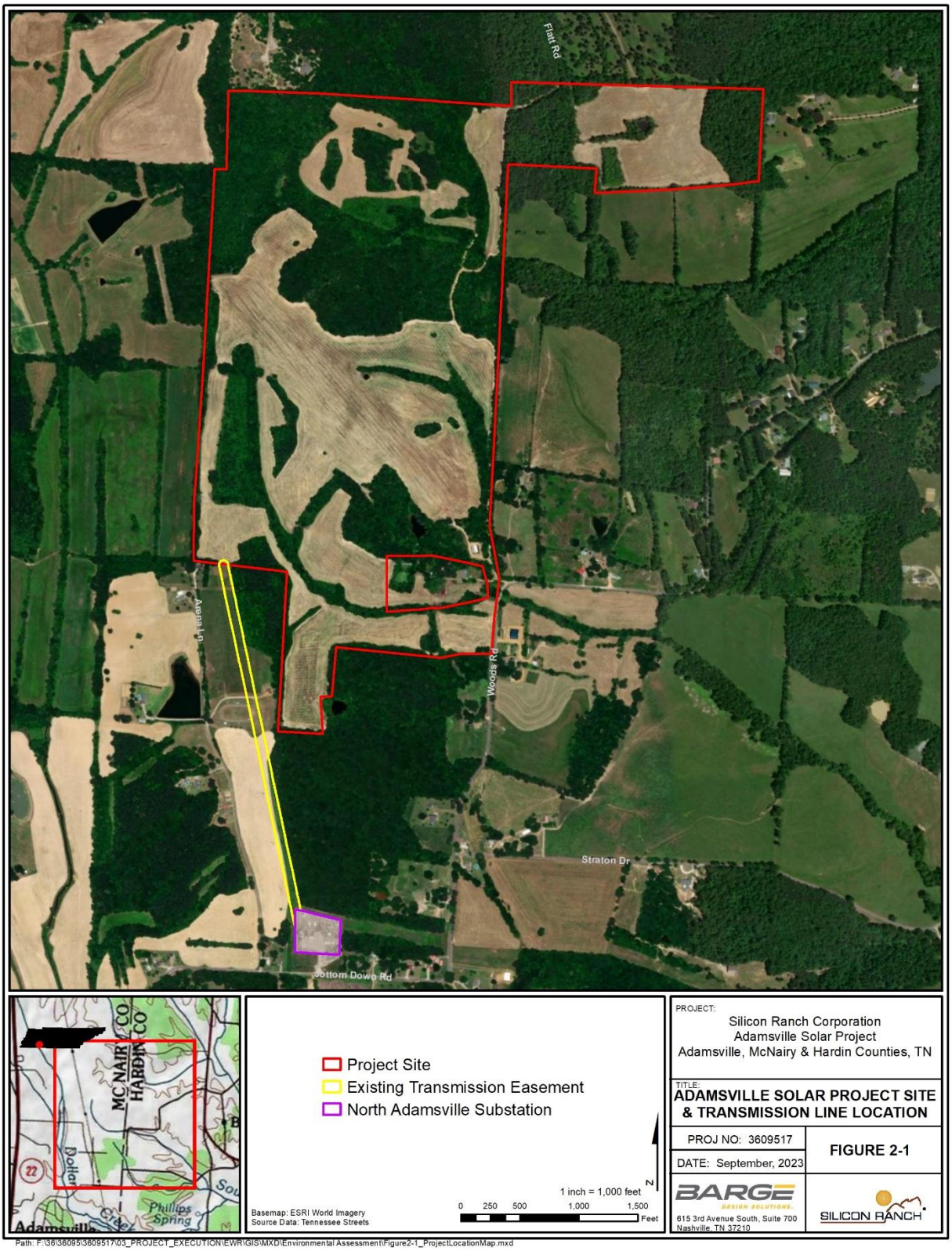

Figure 2.2-1. Adamsville Solar Project Site & Transmission Line Location Map

2.2.1 Project Description

The Project Site consists of two contiguous parcels of land owned by SRC. The Project Site is located approximately 1.5 miles northeast of the City of Adamsville, in McNairy and Hardin Counties, Tennessee. To reach the site from Adamsville, drive east on US highway 64 for 2.1 miles to the intersection with Old Morris Chapel Road. Turn left and drive north on Old Morris Chapel Road for two miles until it merges with County Road 69. Continue for 0.4 miles to the intersection with Woods Road. Turn left and follow Woods Road for one mile to the only access site to the property.

The Project Site layout is shown in Figure 2.2-2 and would occupy approximately 295 acres, of which, approximately 215 acres would be directly impacted. In addition to the solar arrays which would comprise the majority of the Project Site, the 0.56-mile PEC TL easement connecting Adamsville Solar to the North Adamsville Substation is also part of the Project. Approximately 46.6 acres of exclusion areas were identified by Adamsville Solar as being restricted from any development or construction activities. These areas, illustrated by red diagonal hatching on Figure 2.2-3, are considered not useable for the Project because the land it too constrained or has cultural features that will be avoided. There is one access point to the Project site, an existing unpaved road off Woods Road. SRC will add a gate to control access to the property (Figure 2.2-2).

PV power generation is the direct conversion of light into electricity at the atomic level. Some materials exhibit a property known as the photoelectric effect that causes them to absorb photons of light and release electrons. When these free electrons are captured, an electric current is produced, which can be used as electricity (TVA, 2014). The proposed facility would convert sunlight into direct current (DC) electrical within First Solar Series 6+ or Series 7 thin-film semiconductor PV modules (Figure 2.2-4). The solar arrays utilized for the proposed facility would be composed of ground-mounted thin film cells.

Each First Solar Series 6+ or Series 7 panel at Adamsville Solar would be capable of producing approximately 425-460 watts and would be mounted together in arrays. The arrays would connect to a total of forty 0.8 mega-volt ampere (MVA) power inverters to convert the DC electricity generated by the solar panels into AC electricity and eight 4.00 MVA transformers for the Project’s electrical collection system connecting to the existing North Adamsville 161 kV substation.

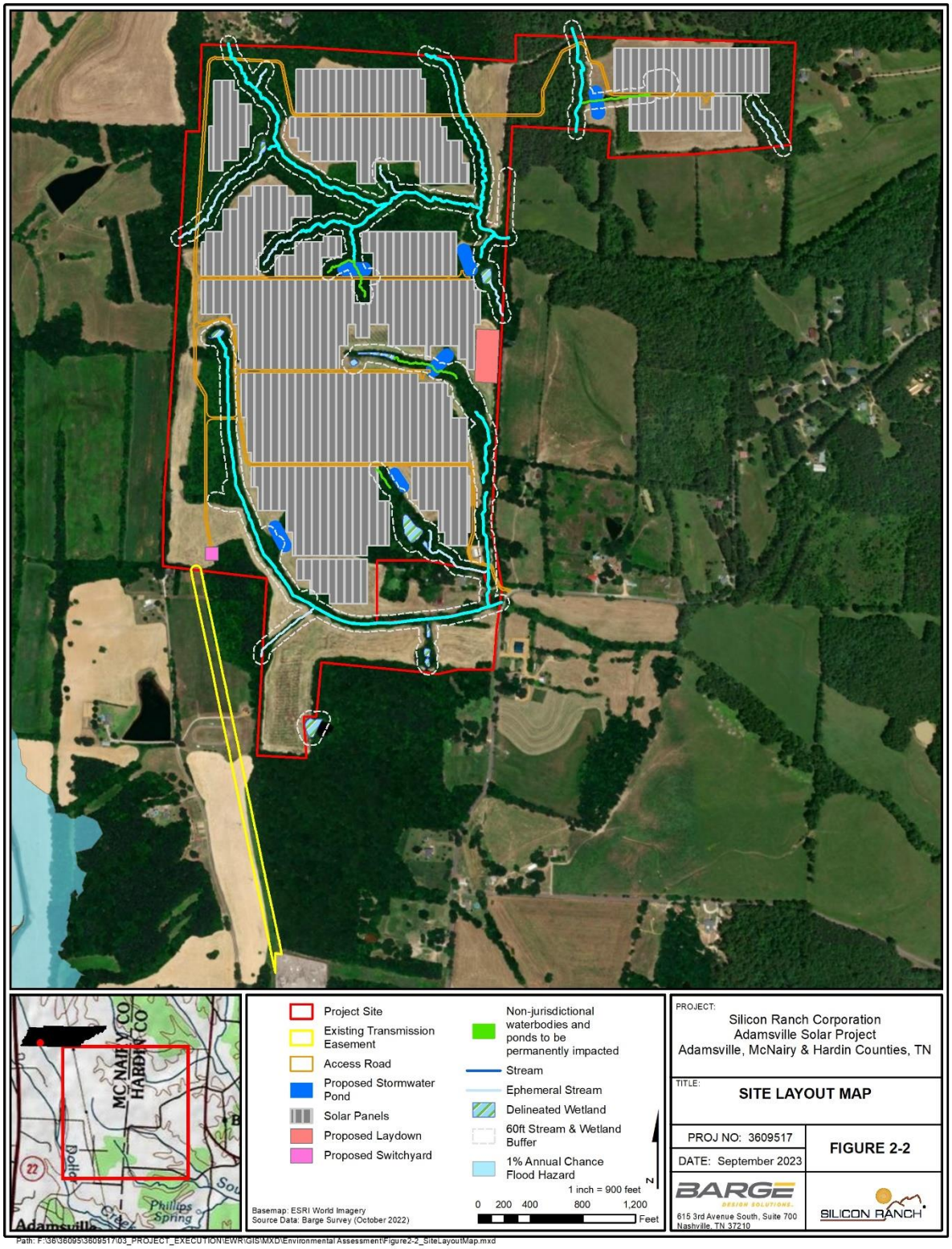

Figure 2.2-2 Site Layout Map

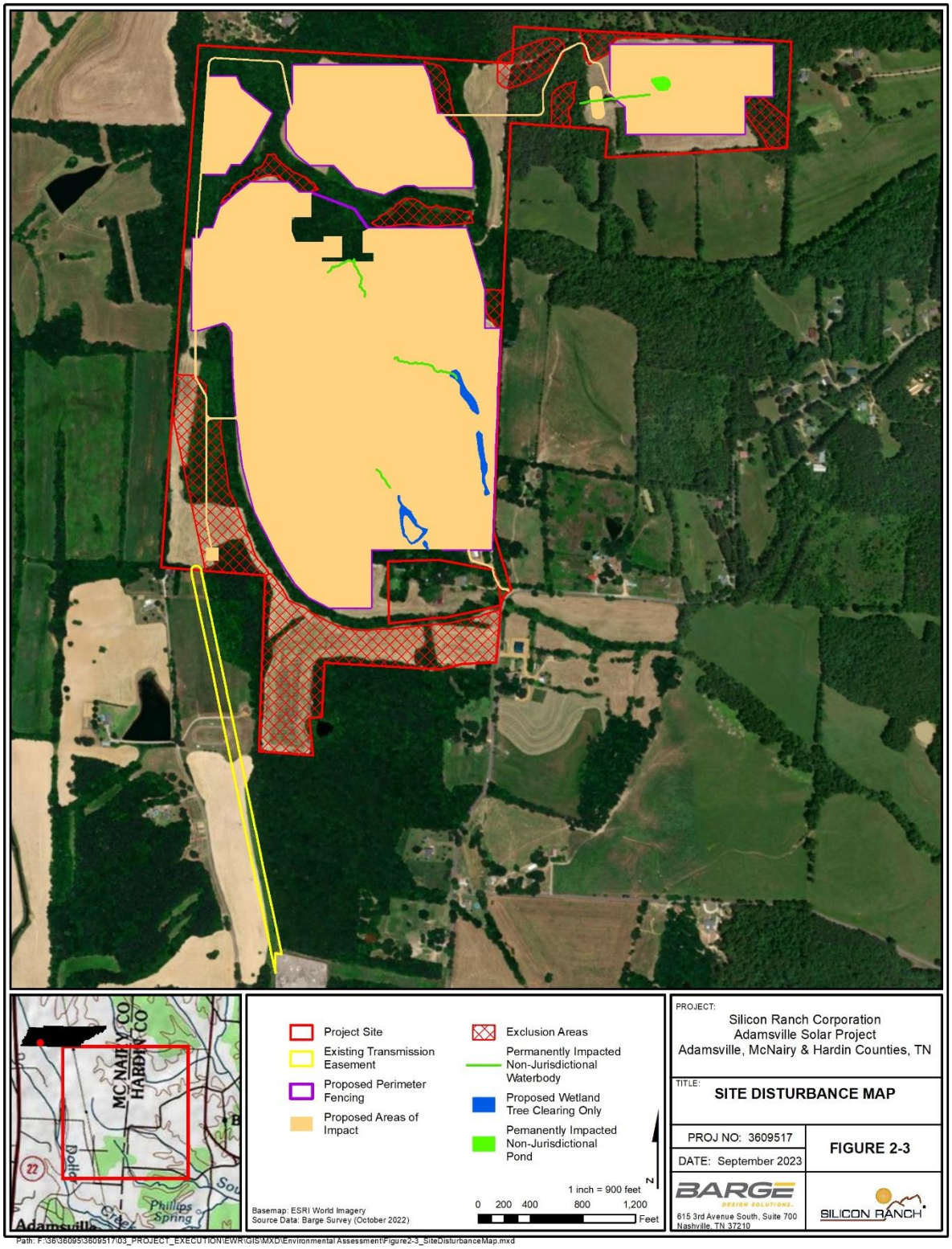

Figure 2.2-3. Site Disturbance Map

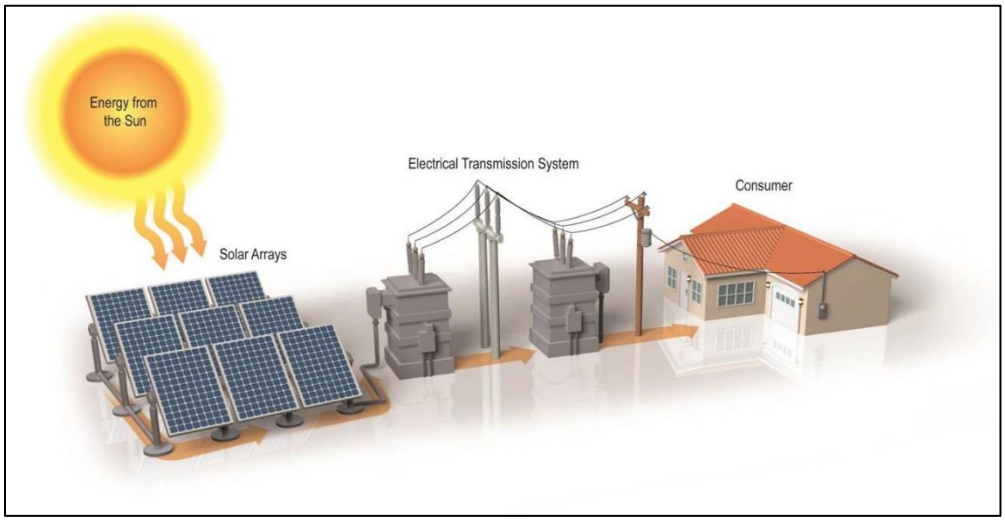

Figure 2.2-4. General energy flow diagram of PV solar system (not to scale)

The PV panels would be mounted on motor-operated axis tracker structures, commonly referred to as single-axis trackers. The axis trackers would be designed to pivot the panels along their north-south axes to follow the sun's path from the east to the west across the sky. The tracker assemblies would be constructed in parallel north-south rows using steel piles installed using either a vibratory pile driver or helical piles at varying depths below grade (Figure 2.2-5).

The PV modules would be electrically connected in series (called a "string") by wire harnesses that conduct DC electricity to combiner boxes. There would be approximately 753 13-string, 177 10-string, and 148 7-string trackers. Each combiner box would collect power from strings of modules and feed a power conversion station via cables placed in excavated trenches. The excavated trenches would vary in depth and width. Each trench would be backfilled with project-site native soil and then appropriately compacted. Above-ground cables would connect the modules to harnesses that lead wiring to combiner boxes.

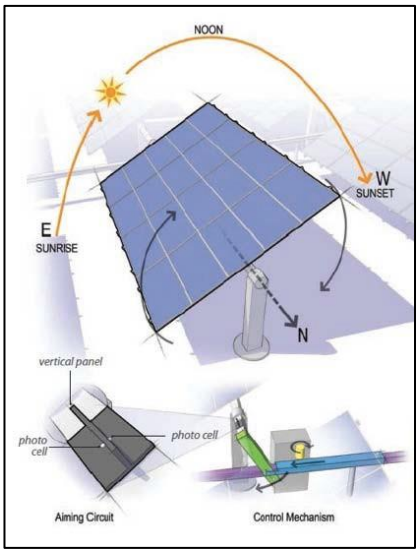

Figure 2.2-5. Diagram of single-axis tracking system (not to scale)

At the power conversion stations (PCSs) a total of forty 0.8 MW power inverters convert the DC electricity generated by the solar panels into AC electricity. The AC power from each inverter would be connected to eight pad-mounted 4.00 MVA transformers. Buried cables from each transformer would deliver AC electricity to the new onsite switchyard. All trenches for buried cables on the site would be backfilled with native soil, and the ground surface would be returned to its original grade. The switchyard would combine all the AC power from the collection circuits and increase its voltage to match the voltage of the connecting TL. The switchyard would include buses, circuit breakers, disconnect switches, and the main step-up transformer.

Of the energy produced from the 32 MVA site, 25 MW would be fed through the interconnection and sold to TVA. The loss of 7 MW is due to expected line loss before reaching the POI.

There would be several access roads internal to the site to allow access to the arrays and PCS skids for operations and maintenance purposes. These unpaved roads typically consist of compacted native soils or aggregate base gravel where needed. One temporary laydown or staging area would be used for employee parking and stockpiling and storage of construction materials during different phases of construction. Detention basins would be utilized onsite to protect against flooding and prevent downstream erosion into protected jurisdictional wetlands and waterways.

2.2.2 Solar Facility Construction

Construction access is expected to be from one location on Woods Road (Figure 2-2). Construction of the solar power facility generally requires site preparation (surveying and staking), removal of tall vegetation and small trees, moderate to substantial grading and clearing, installation of security fencing, installation of erosion control Best Management Practices (BMPs), and preparation of construction laydown areas before solar array assembly and construction. Construction includes driving steel piles for the tracker support structures, installing solar panels and electrical connections, and conducting system testing and verification. Tree removal would occur from October 15 to March 31.

Appropriate BMPs would be implemented and maintained during the construction and operation of the facility. SRC's standard practice, which Adamsville Solar would use, is to work with the existing landscape (e.g., slope, drainage, utilization of existing roads) where feasible to minimize or eliminate grading work to the greatest extent possible. Any required grading activities would be performed with portable earthmoving equipment, resulting in a consistent slope to the land. Prior to grading, native topsoil would be removed from the area to be graded and stockpiled onsite for redistribution over the disturbed area after the grading is completed. Silt fences, sedimentation basins, and other appropriate controls would be used as needed to minimize exposure of soil and to prevent eroded soil from leaving the work area. Disturbed areas may be seeded. If a seed mix is used, it would be obtained from a reputable seed dealer and follow any guidance established by the local Natural Resources Conservation Service (NRCS) office. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the site is permanently stabilized. Water would be used for soil compaction and dust control during construction.

Grading would consist of the excavation and compaction of earth to meet the final design requirements. Moderate to substantial grading is expected at the Project location as the site has some changes in elevation but would not require any offsite or onsite hauling. Some vegetation and untreated wood may be burned onsite. No burning of other construction debris is anticipated. If open burning is determined to be the best method for wood waste management, a burn permit would be obtained from the Tennessee Department of Agriculture, Division of Forestry. TDEC would be notified, and any additional permits needed to comply with local, state, and federal permitting requirements would be obtained.

To meet the buffer requirements for TDEC, all perennial and intermittent streams, wetlands, and TDEC jurisdictional ponds in the Project Site require a 60-foot buffer due to downstream presence of the state endangered Hardin crawfish (*Orconectes wrighti*) in Stratton Branch (an Exceptional Tennessee Water). Tree clearing within the buffer may be needed and will be permitted with TDEC

appropriately. Once sensitive areas are marked, construction areas would be mowed and cleared of vegetation and miscellaneous debris. Mowing would continue as needed to contain growth during construction.

Six onsite stormwater detention basins (totaling approximately 3 acres) would be constructed in appropriately designed locations on the Project Site (Figure 2.2-2). The final design and exact position of these conceptual drainage basins within the Project Site boundaries would be based on the most recent hydrology study and would function to temporarily store stormwater, minimize erosion, and reduce the rate of runoff. These basins would be constructed either by impoundment of a natural depression(s) or by excavating the existing soil. The bottom elevation and embankments of the ponds would be allowed to naturally reestablish native and/or non-invasive vegetation after construction (or be replanted as necessary) to provide natural stabilization, minimizing subsequent erosion. Water from the ponds would be released through specially designed outlet or discharge structures, which control the rate of outflow. If discharge is necessary, it would go onto adjacent uplands. Discharge into streams or wetlands will be avoided where possible. If discharge is unavoidable, BMPs will be used to address the discharge. Basins will be seeded to provide temporary and permanent stabilization.

Water would be needed for soil compaction and dust control during construction, including on access roads, as a standard BMP. Water would be required to a lesser extent during operations for minor dust control and domestic use. During construction, the primary water use would be for dust control during grading activities. As grading activities are completed, overall Project water requirements would decrease, and construction-related dust control would be the primary water use. Portable toilets would be available onsite for the duration of the construction period. There are no habitable buildings onsite that would need potable water or septic systems for waste disposal. Water in sufficient quantity and of the requisite quality is expected to be made available for this Project through use of onsite groundwater wells or delivery via water trucks.

Under the Proposed Action Alternative, Adamsville Solar would clear approximately 116 acres of trees within the 295-acre project footprint to accommodate the proposed solar facility and reduce shading on the panels. The current layout (subject to change) indicates up to 1.33 acres of non-mechanical tree clearing may be needed within wetlands to reduce shading of the panels. Stumps would be left in place to reduce ground disturbance within the wetland areas. The SRC site design team is working to avoid these wetland impacts if possible. The exact amount and location will be determined once the final layout is completed. If wetland impacts are unavoidable, SRC would apply for and obtain the required permits, and comply with any required mitigation. The SWPPP would reflect the proposed tree clearing, including a justification for impact and proposed erosion and sediment control measures to maintain water quality. Tree removal would occur from October 15 to March 31.

The interior access roads would be used for construction and maintenance during the life of the Project. Roads that cross streams will require culverts thus resulting in minor impacts to perennial and ephemeral streams. SRC anticipates the impacts of the stream crossings would require a general permit from TDEC and would qualify for a Nationwide Permit from the USACE. The appropriate permits will be applied for once the level of impact is determined.

The interior access roads would be used for construction and maintenance during the life of the Project. Roads that cross streams will require culverts thus resulting in minor impacts to unnamed

perennial and ephemeral streams. SRC anticipates the impacts of the stream crossings would require a general permit from TDEC and would qualify for a Nationwide Permit from the USACE. The appropriate permits will be applied for once the level of impact is determined.

To manage stormwater during construction, BMPs, including sediment traps and erosion control silt fences would be utilized. Avoided wetlands, streams and the 60-foot buffer would be protected by erosion control silt fences and sediment traps placed in strategic drainage areas to prevent sediment from entering onsite wetlands.

One 1.6-acre onsite laydown area would be required for worker assembly, vehicle parking, and material storage during construction (Figure 2.2-2). A temporary construction trailer, used for material storage and office space, would be parked onsite. Following completion of construction activities, all trailers, unused materials, and construction debris would be removed from the site. No operations and maintenance buildings or other permanent structures would be onsite.

Construction would be sequenced to minimize the time that bare soil on the disturbed areas is exposed. As described above, silt fences would surround the perimeter of the development footprint to be cleared and graded. Other appropriate controls such as temporary cover would be used as needed to minimize soil exposure and prevent eroded soil from leaving the work area. Disturbed areas including but not limited to road shoulders, laydown area, ditches, and other project-specific locations would be seeded post-construction. If conditions require, soil would be stabilized by mulch or seed. Where required, hay mulch would be applied at three tons per acre and well distributed over the area. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has returned to the pre-construction conditions or the site is considered permanently stable. As part of the National Pollutant Discharge Elimination System (NPDES) permit authorization (see Section 1.4), a site-specific SWPPP would be finalized with the final grading and civil design and would address all construction-related activities prior to construction commencement.

The design of the tracker support structures could vary depending on the final PV technology and vendor selected. Typical installations of this type are constructed using steel support piles. The driven steel pile foundation is typically galvanized and used where high load-bearing capacities are required and would be driven with a hydraulic ram machine. Soil disturbance is restricted to the pile insertion location with temporary disturbance from the hydraulic ram machinery, which is about the size of a small tractor. Adverse soil conditions may necessitate the use of screw piles which are driven into the ground with a truck-mounted auger. Screw piles create a similar soil disturbance footprint as driven piles.

Solar panels would be manufactured offsite and shipped to the site ready for installation. If concrete pads are required for the drive motors, they would be precast and brought to the site via flatbed truck. Once most components are placed on their respective foundations and structures, electricians and other workers would run electrical cabling throughout the solar field.

The Project would connect to the existing North Adamsville Tennessee 161 kV substation via the existing PEC TL, which is currently 12.5 kV but will be upgraded to 25 kV feeder by PEC. After the equipment is electrically connected, electrical service would be tested, and motors and their controllers would be checked. As the solar arrays are installed, the balance of the facility would

continue to be constructed and installed, and the instrumentation would be installed. Once all the individual systems have been tested, integrated testing of the Project would occur.

Within the 295-acre solar facility site, the approximately 170-acre area containing the solar arrays and associated electrical infrastructure would be securely fenced with 6-foot-high chain-link fencing with three strands of barbed wire on the top throughout construction and the operation of the project.

Construction activities would take approximately 10-12 months to complete using a crew of approximately 70-100 people at the peak of construction. Work would generally occur six days per week (Monday through Saturday) from 7 am to 5 pm. Additional hours could be necessary to make up schedule deficiencies or to complete critical construction activities. During the Project startup phase, equipment and system testing and similar activities could continue 24 hours per day, 7 days a week.

2.2.3 LPC Electrical Interconnection

The electrical interconnection of the solar facility would occur on the LPC PEC's existing TL, and the transfer of electricity to TVA's grid would occur at the North Adamsville substation.

2.2.3.1 Right-of-Way Clearing

The project does not include any new ROW clearing. The existing ROW is within an actively used agricultural field.

2.2.3.2 Transmission Line Upgrades

Adamsville Solar will transmit electricity to the North Adamsville substation via the PEC TL. PEC would install a conductor from the Interconnection Customer (IC) structure (switchyard on site) to the North Adamsville Substation. PEC will convert the existing 12.5 kV line to a 25 kV feeder. This will require installation of new power poles within the existing TL ROW.

2.2.3.3 Switchyard Construction

The Proposed Action includes the construction of one onsite Project Switchyard owned by SRC ("Project Switchyard") to connect the project to a 25kV distribution line for subsequent transfer to the North Adamsville substation offsite. The Project Switchyard would be near the southwestern boundary of the Project Site. The Project Switchyard will combine all the AC power from the collection circuits to a new overhead distribution line. This Project Switchyard would include pad mount vacuum breaker switchgear, disconnect switches, and distribution riser pole.

The Project Switchyard would occupy less than 0.2 acres and would consist of a 25 kV pad mount switchgear, single 25 kV gen-tie line, manually operated switches, a control enclosure for plant control, within a 7-foot-tall, fenced enclosure (height subject to change).

Concrete foundations and embedments for equipment would be installed with trenching machines, concrete trucks and pumpers, vibrators, forklifts, and boom trucks. Above-ground and below-ground conduits from this equipment would run to the control enclosure. A station service transformer would be installed for auxiliary AC power requirements, such as operating the solar

array tracker motors. Battery banks and chargers would be installed inside the enclosure to provide backup DC power. For personnel safety and equipment protection during faulted conditions, a ground grid would be installed in the area. This would consist of appropriately sized conductors meshed and buried below ground. Each piece of equipment and supporting structure within the substation

After the voltage step-up, the Project would be interconnected to the proposed 25 kV PEC TL to connect to the electrical system.

2.2.3.4 Transmission Line Operation and Maintenance

Periodic inspections of the TL would be performed by foot patrols to locate damaged conductors, insulators, or structures, and to discover any abnormal conditions that might hamper the normal operation of the line or adversely affect the surrounding area. Based on the site inspection, a corrective maintenance plan would be prepared and implemented. Provided the current agricultural land use continues, little ROW maintenance would be required in the future.

If agricultural activities ceased, PEC would begin vegetation management. PEC will follow their vegetation management standards which are based on National Electrical Safety Code requirements. Vegetation will be maintained in accordance with National Electrical Safety Code for the 25 kV TL. Vegetation management along the ROW would consist of periodic mowing, herbicide application and side trimming within the ROW, and felling of danger trees adjacent to the cleared ROW. Any herbicides used will be applied in accordance with the product label along with any state and federal laws and regulations. Only herbicides registered with the U.S. Environmental Protection Agency (USEPA) would be used. Other than vegetation management, little maintenance work would be required. TL structures and other components typically last several decades.

2.2.4 Operations

During operation of the solar facility, no major physical disturbance would occur. Routine maintenance would include periodic motor replacement, inverter air filter replacement, fence repair, vegetation control, and periodic array inspection, repairs, and maintenance. Traditional trimming and mowing would be performed periodically (about four mowing events per year) to maintain the vegetation at a height ranging from 6 inches to 2 feet. Selective use of herbicides may also be employed around structures to control weeds. Products would be used per state and federal regulations. To minimize any possibility of runoff or drift when using herbicides, care would be taken to follow manufacturer’s directions and avoid herbicide application prior to predicted rainfall events or high winds.

No major physical disturbance would occur because of facility operation. Moving parts of the solar facility would be restricted to the east-to-west facing tracking motion of the solar modules, which amounts to a movement of less than a one-degree angle every few minutes. This movement would barely be perceptible. In the late afternoon, module rotation would start to backtrack west to east in a similar slow motion to minimize shading. At sunset the modules would track to a flat stow position. Otherwise, the PV modules would simply collect solar energy and transmit it to the TVA distribution system. Except for fence repair, vegetation control, and periodic array inspection,

repairs, and maintenance, the facility would require relatively little human activity during operation. No water or sewer service or permanent lighting would be required onsite during operations.

The Project Site would not be staffed during operation. However, the site would be inspected weekly. Maintenance would be required biannually. This includes drawing transformer oil samples and identifying physical damage to panels, wiring, and interconnection equipment.

Precipitation in this region is adequate to remove dust and other debris from the PV panels while maintaining energy production. However, to ensure panel performance does not decrease due to buildup of dust and debris, panels would be washed if deemed necessary. Adamsville Solar would obtain water from nearby water sources such as wells or hydrants. If no local sources are available, Adamsville Solar would truck water to the site. In case of equipment failures, staff would respond as soon as possible.

The site vegetation would be maintained with mechanical equipment and potentially grazing animals to comply with SRC's vegetation management Scope of Work (SOW), allowing for safe and efficient operation of the power plant. In general, it is expected that four to five vegetation management events would occur during the March to October growing season. SRC reserves the right to use herbicides as needed to maintain safe working conditions at the site and protect/maintain site infrastructure. Typically, herbicide applications would be limited to broadleaf control along fence lines and bare ground spray around inverters and switchyard. If Adamsville Solar decides to self-perform vegetation management, full-time staff would be onsite. Further, to minimize any possibility of runoff or drift when using herbicides, care would be taken to follow manufacturer's directions and avoid herbicide application prior to predicted rainfall events or high winds.

2.2.5 Decommissioning and Reclamation

Following the expiration of the 20-year PPA with TVA, Adamsville Solar would reassess the site operation and determine whether to cease operation or attempt to enter into a new PPA or another arrangement. If TVA or another entity is willing to enter into such an agreement, the Project could continue operating. If no commercial arrangement is possible, or if TVA opts not to exercise their option for purchase at the end of the 20-year term, the facilities would be decommissioned and dismantled, and the Project Site restored.

In general, most decommissioned equipment and materials would be recycled. Key components, including the Series 6+ or 7 solar modules to be used by Adamsville Solar, realize high recycling rates at the component supplier's state-of-the-art recycling facilities. With respect to the Series 6+ or 7 solar modules, up to 90 percent of the semiconductor material can be reused in new modules and 90 percent of the glass can be reused in new glass products. Materials that cannot be recycled would be disposed of at approved facilities in accordance with federal, state, and local laws and regulations.

General decommissioning and reclamation activities are described below. Decommissioning activities would typically include:

- Dismantling and removal of above ground equipment (solar panels, panel supports, transformers, Project Substations, etc.)

- Removal of below-ground electrical connections
- Removal of posts
- Break-up and removal of concrete pads and foundations
- Abandonment of underground utilities
- Stabilization of site soils per NPDES construction permit (if required for decommissioning activities)
- Scarification of compacted areas within and contiguous to the solar facility

2.3 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

In determining the most suitable parcels for the Adamsville Solar Project Site, SRC worked in conjunction with PEC to determine a general region of their service territory that could support the development of the Project with an interconnection to a substation that could handle the electricity load.

With this information in mind, SRC conducted a site search in the general vicinity of the area that PEC advised might work for the Project. In this search, the SRC site search team utilized software to review the following criteria: stream and wetland mapping, topography maps, biological resources, cultural resource maps, substation and TL locations, subsurface geology, land value, road access, and more (Table 2.3-1).

During this search, the SRC site search team reviewed multiple potential alternate sites along with the Project Site. The Project Site was located and determined to be suitable for this solar Project because it contains enough acreage to support the full Project size while alternate sites were not large enough to support. Additionally, the Project Site is flat and will not require prohibitive amounts of grading, and it has enough space to have very minimal impacts to water and biological resources onsite. The Project Site is not affected by substantial flood plains while alternate sites were affected by flood plains. The interconnection opportunity was much more favorable for the Site compared to alternate possibilities as a PEC TL runs through the Site to allow for onsite POI less than three-quarters of a mile from the PEC substation. In comparison, alternate sites would have required additional TL buildouts a mile or longer to support interconnection. From a desktop search, there are many historical and cultural resources scattered throughout the area affecting other alternate sites, but in comparison, the Site has minimal cultural resources onsite. Finally, the cost of acquiring the Project Site was suitable to support the Project while other alternate sites had potential for being more expensive which would have hurt the viability of the Project.

With all these criteria in mind, SRC selected the current Project Site because it best reduced impacts to biological and cultural resources while utilizing an ideal interconnection location. In addition, as part of the proposal/project selection process, TVA considers multiple factors before selecting to pursue a PPA such as cost, schedule, developer’s experience, environmental and cultural resources, transmission, and economic development.

Table 2.3-1. Alternative Site Screening Process

Consideration	Adamsville	Potential Alternate Sites
Suitable Landscape	Yes	Yes
Suitably Sized and Contiguous Parcels	Yes	No
Suitable Geology	Yes	Yes
Minimal Biological Impacts	Yes	No
Minimal Stream & Wetland Impacts	Yes	No
Minimal Listed Species Impacts	Yes	Yes
Minimal Cultural Resources Impacts	Yes	No
Avoids Major Network Upgrades	Yes	No
Cost of Land Acquisition	Yes	No
Suitable Interconnection Requirements	Yes	No
Viable Access to Property	Yes	Yes

2.4 COMPARISON OF ALTERNATIVES

This EA evaluates the potential environmental effects that could result from implementing the No Action and Proposed Action Alternatives at the proposed solar facility in McNairy and Hardin Counties, Tennessee. The analysis of impacts in this EA is based on current and potential future conditions on the property and within the surrounding region. The summary and comparison of impacts by alternative for each resource area evaluated are in Table 2.4-1.

Table 2.4-1. Summary and Comparison of Alternatives by Resource Area

Resource Area	Impacts from the No Action Alternative (Status Quo)	Impacts from the Proposed Action
Land Use	No direct impacts anticipated. Land would remain primarily farmland and forested area. Indirect impacts are possible if current land uses are converted to residential, industrial, or become abandoned over time.	Minor direct adverse impacts to the Project Site. Land use on the Project Site would change from agricultural to industrial. As a relatively small portion of a very large land use category in the vicinity would be lost, the Proposed Action would have an overall minor adverse impact. McNairy and Hardin Counties do not require building permits in unincorporated parts of the County.
Geology, Soils and Prime Farmland	No direct impacts anticipated. Indirect impacts to geologic and paleontological resources are possible over time if current land uses change as a result of human activity. Continuing agricultural practices, if not properly implemented could result in soil degradation.	Minor adverse impacts to geology and paleontology at excavation locations within the Project Site. Minor adverse impacts to soils within the Project Site related to erosion and sedimentation from site construction and operation, in addition to maintenance activities. Prime farmland soils will not be used for agricultural purposes while the panels are in place. The percentage of prime farmland not available is small compared to the total acreage of prime farmland in McNairy and Hardin Counties. No indirect impacts anticipated within the Project Site.
Water Resources	No direct impacts anticipated. Indirect impacts to water resources could result due to the continuing use of the Project Site as agricultural land. Increases in erosion and sediment runoff could occur if farming practices were not maintained to prevent erosion and runoff. Erosion and sedimentation on the Project Site could alter runoff patterns and impact downstream surface water quality. If chemical fertilizers and pesticides are continually used, impacts to groundwater may occur if the local aquifers are recharged from surface water runoff.	Up to 1.33 acres of forested wetlands could be impacted if the SCR project design team cannot design the layout to avoid these impacts. Additionally, one or more stream crossing may be required for the interior access roads that would be constructed. These impacts would be permitted by TDEC and/or USACE. SRC will comply with any required mitigation. The required 60-foot buffer along streams and around wetlands and implementation of BMPs will help improve water quality and habitat conditions and minimize indirect impacts. Some minor indirect adverse impacts may result from sedimentation and runoff not controlled by BMPS.

Resource Area	Impacts from the No Action Alternative (Status Quo)	Impacts from the Proposed Action
Biological Resources	No direct impacts anticipated. Ongoing agricultural activity would continue impacts to biological resources would remain the same. If the land is taken out of agricultural use and restored to a natural condition, there would be direct and indirect positive benefits. Similarity, negative direct and indirect impacts could occur if the land is converted to residential or industrial uses.	**Vegetation:** Vegetation impacts would be minor. Conversion of approximately 99.5 acres of farmland to native and/or non-invasive to herbaceous land may result in some improvement for wildlife. Conversion of approximately 116 acres of forested land (including bat habitat) to herbaceous land representing a small loss of forested land compared to the acreages of forested land in Hardin and McNairy Counties and would result in minor adverse vegetation impacts. **Wildlife:** Overall, there would be minor direct and indirect impacts on wildlife. During construction, mobile species would be able to avoid construction activities by moving offsite. Once construction is completed, displaced species that can use industrialized/urbanized landscapes could move back onsite. **Rare, Threatened & Endangered Species:** No state or federal listed species were found onsite thus direct impacts to these species are not anticipated. Minor adverse impacts to federally listed bat species may occur due to removal of approximately 116 acres of potentially suitable bat roosting trees and foraging habitat.
Visual Resources	No direct or indirect impacts anticipated. Potential indirect impacts may occur if current land use changes to open field successional, residential, or industrial development over time.	Construction on the Project Site would convert farmland to commercial/industrial land use and alter the visual character of the Project Site. Heavy machinery would be present during construction and would change the visual characteristics from vantage points surrounding the Project Site. When operational, no visual impacts of the panels would be seen from any public road. If any adverse visual impacts to nearby residences are detected, SRC will address the impacts with the landowners.

Resource Area	Impacts from the No Action Alternative (Status Quo)	Impacts from the Proposed Action
Noise	No direct or indirect impacts anticipated. The land would remain agricultural and forested area. Potential minor direct impacts if current land use changes to residential or industrial development over time.	Construction noise would cause temporary and short-term adverse impacts to the ambient sound environment near the Project Site. The loudest noise would be due to pile driving but would be minimal and short-term. Negligible adverse indirect impacts associated with operation.
Air Quality and Climate Change	No direct or indirect impacts anticipated from ongoing agricultural activities. Some direct and indirect impacts may occur If land use changes.	Minor short-term direct and indirect impacts resulting from localized dust and exhaust fumes from equipment during construction. Negligible impacts due to operation activities.
Cultural Resources	No direct or indirect impacts anticipated. Some direct and indirect impacts may occur If land use changes.	No NRHP archaeological or architectural sites were identified. One site, 40HR604, was recommended as unassessed for NRHP. The site and its buffer will be avoided. Thus, no impacts to cultural resources are anticipated.
Natural Areas and Recreation	No direct or indirect impacts anticipated. Some direct or indirect impacts may occur If land use changes.	With no natural or recreational areas within 5 miles of the Project Site, there would not be any direct or indirect impact on these resources.
Utilities	No direct or indirect impacts anticipated. Some direct or indirect impacts may occur if existing utilities are expanded.	No direct or indirect impacts anticipated. Constructing the project would not significantly increase the need for any utilities.
Waste Management	No direct or indirect impacts anticipated.	No direct or indirect impacts anticipated. Constructing the project would not result in a significant increase in waste that would create concerns at the landfills used for this project.

Resource Area	Impacts from the No Action Alternative (Status Quo)	Impacts from the Proposed Action
Public and Occupational Health and Safety	No direct or indirect impacts anticipated.	Minor direct and indirect impacts may occur for workers on the Project Site during construction. This would be mitigated by implementing standard construction site practices and maintaining health and safety plans to comply with OSHA regulations.
Transportation	No direct or indirect impacts anticipated.	Minor direct and indirect impacts may occur for motorists using Woods Road during work hours due to increased traffic. Once construction is complete, there would be no direct or indirect impacts to transportation during the operational phase.
Socioeconomics	No direct or indirect impacts anticipated.	Minor direct and indirect impacts may occur due to the increased number of workers on the Project Site during construction. These impacts may be beneficial to local businesses.
Environmental Justice	No direct or indirect impacts anticipated.	No minority populations were identified in the EJ Analysis thus no direct or indirect impacts are anticipated. The potential exists for there to be low-income populations near the Project Site. The insignificant to minor impacts of the Proposed Action will not result in any disproportionally high and adverse impacts anyone living near the Project Site including any low-income populations

2.5 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Adamsville Solar would implement minimization and mitigation measures in relation to resources potentially affected by the Project. These have been developed with consideration of BMPs, permit requirements, and adherence to the SWPPP.

2.5.1 Standard Practices and Routine Measures

Adamsville Solar would implement the following minimization and mitigation measures in relation to potentially affected resources:

- Geology and Soils
    - Utilize standard BMPs, as described in A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities – Revision 3, the TVA's BMP manual (TVA 2022) to minimize erosion during construction, operation, and maintenance activities.
    - Install silt fences, sedimentation basins, and other appropriate controls as needed to minimize erosion and sedimentation.
    - Implement other soil stabilization and vegetation management to minimize exposure of soil and limit erosion of soil from the Project Site.
    - Make an effort to balance cut-and-fill quantities to alleviate the transportation of soils offsite during construction if necessary.
- Water Resources
    - Comply with the terms of the SWPPP prepared as part of the TDEC permitting process.
    - Comply with the terms of the TDEC ARAP and USACE Section 401 and 404 permits, including mitigation requirements as applicable.
    - Maintain existing landscape and aquatic resource buffers. If additional buffers are required by the county or state, Adamsville Solar would install landscape buffers along the Project Site boundary to minimize visual impacts from the proposed solar facility.
    - Implement other routine BMPs as necessary, such as nonmechanical tree removal within surface water buffers, placement of silt fences and sediment traps along buffer edges, selective herbicide treatment to restrict application near receiving water features, and proper vehicle maintenance to reduce the potential for adverse impacts to surface water and groundwater as identified in TVA's Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities (TVA, 2017).
    - Use only USEPA-registered and TVA- approved herbicides per label directions designed to restrict applications near receiving waters and to prevent unacceptable aquatic impacts in areas requiring chemical treatment.
    - Design the final layout to minimize direct and indirect impacts on aquatic features.

  - Comply with the conditions of the TDEC Section 401 and USACE 404 of the Clean Water Act (CWA) (33 U.S.C. § 1251 et seq.) permits and required compensatory mitigation, as applicable.
  - Protect intermittent streams by implementing Standard Stream Protection (Category A), Protection of Important Steams, Springs, and Sinkholes (Category B), or Protection of Unique Habitat (Category C) as defined by TVA (2017b).
  - Ensure construction and maintenance activities occur during dry periods as much as possible.
  - If hauled offsite for disposal, excavated material and debris when the facility is decommissioned and dismantled would be spoiled outside 100-year floodways.

- Biological resources
  - Revegetate with native and/or noninvasive vegetation to reintroduce habitat, reduce erosion, and limit the spread of invasive species consistent with EO 13112 (Invasive Species) for revegetating with noninvasive plant species as defined by TVA (2017a).
  - Tree removal will only occur from October 15 to March 31
  - Follow USFWS recommendations regarding biological resources, including pollinator species.
  - Use downward facing and timer- and/or motion-activated lighting to limit attracting wildlife, particularly migratory birds and bats.
  - Instruct personnel on wildlife resource protection measures, including (1) applicable federal and state laws such as those that prohibit animal disturbance, collection, or removal, (2) the importance of protecting wildlife resources, and (3) avoiding vegetation disturbance in undisturbed and buffer areas.
  - Implement Avian Power Line Interaction Committee guidelines to minimize impacts to birds during design and construction of TL system upgrades.

- Visual resources
  - Use downward-facing and timer- and/or motion-activated lighting to minimize impacts to surrounding areas.

- Noise
  - Limit construction activities primarily to daytime hours and ensure that heavy equipment, machinery, and vehicles utilized at the Project Site meet all federal, state, and local noise requirements.

- Air quality and GHG emissions
    - Comply with the conditions of the Tennessee Department of Agriculture, Division of Forestry burn permits if burning of vegetative debris is required and use BMPs such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust.
    - Maintain all vehicles and equipment to minimize GHG emissions.
- Waste management
    - Develop and implement a variety of plans and programs to ensure the safe handling, storage, and use of hazardous materials.
- Public and occupational health and safety
    - Implement BMPs for site safety management to minimize potential risks to workers.
- Transportation
    - Implement staggered work shifts during daylight hours to manage traffic flow near the Project Site.

2.6 THE PREFERRED ALTERNATIVE

The TVA-preferred alternative for fulfilling the purpose and need for this Project is the Proposed Action. The Proposed Action would produce renewable energy with only minor direct and indirect environmental impacts, would help meet TVA's renewable energy goals, and would help TVA meet customer driven energy demands on the TVA system.

CHAPTER 3 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing environmental, social, and economic conditions of the proposed Project Site and the surrounding areas that might be affected if the No Action Alternative or Proposed Action Alternative is implemented. This chapter also describes the potential environmental effects that could result from implementing the No Action or Proposed Action Alternatives.

In addition to the action alternatives identified in Chapter 2, this analysis also considers the past, present, and reasonably foreseeable future actions (RFFAs) listed in Table 3.1-1. These actions were identified within the overall 5-mile geographic area of analysis surrounding the proposed Project Site as having the potential to, in aggregate, result in larger and potentially adverse effects to the resources of concern. Potential cumulative effects for resources in which adverse effects from the proposed project are anticipated are discussed in each resource section.

Table 3.1-1. Summary of other past, present, or reasonably foreseeable future actions within a 5-mile radius of the Action Alternatives Action Description Project Type

Action	Local	State	Federal
Past	Based on imagery from Google Earth Pro, there has been little change in land use since 1985.	There is no known significant past activity within 5 miles of the Project Site.	There is no known significant past activity within 5 miles of the Project Site.
Present	Based on imagery from Google Earth Pro, there has been little change in land use since 1985.	There is no known present activity planned within 5 miles of the Project Site.	There is no known present activity planned within 5 miles of the Project Site.
Future	No future large scale development or road improvements are planned for either McNairy or Hardin Counties	There is no known future activity planned within 5 miles of the Project Site.	There is no known future activity planned within 5 miles of the Project Site.

3.1 LAND USE

This section describes an overview of the existing land use at and surrounding the Project Site and potential impacts to land use associated with the No Action and Proposed Action Alternatives. The Project Site is in McNairy and Hardin Counties, Tennessee, approximately 1.5 miles northeast of the City of Adamsville (Figure 2-1). The City of Savannah, Tennessee, is located approximately 7.5 miles east of the Project Site. The Project Site is not part of any recognized metropolitan or micropolitan area.

3.1.1 Affected Environment – Land Use

Land use is defined as the way people use and develop land, including uses such as agricultural, residential, recreational, and industrial uses. Many municipalities develop zoning ordinances and planning documents to control the direction of development and to keep similar land uses together. The Project Site is in an unincorporated part of McNairy and Hardin Counties. Neither County has any local zoning regulations; thus, building permits are not required.

The National Land Cover database classifications show cropland as the primary land use with lesser amounts of deciduous forest and some planted pine (Figure 3.1-1). The Project Site consists of nearly flat terrain and ranges in elevation from approximately 460 to 500 feet above mean sea level (msl). Stratton Branch, a tributary to Beason Creek, originates in the Project Site. The only structure on the Project Site is an equipment shed approximately 400 feet northwest of the Project Site entrance on Woods Road.

Land use to the west is primarily agricultural. To the north, east, and south, land use is also agricultural but is mixed with some forested land. Low-density rural residential development surrounds the Project Site to the north, west, and south. There is one residence that shares the access road to the Project Site and is surrounded by the Project Site. The City of Adamsville is approximately 1.5 miles to the northeast. There is no nearby industrial development.

3.1.2 Environmental Consequences – Land Use

This section describes the potential impacts to land use should the Proposed Action or No Action Alternatives be implemented.

3.1.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility and TL upgrades would not be constructed. There would not be any project-related impacts to land use. Existing land use would be expected to remain primarily farmland. Land use could change if agricultural land or forested areas are converted to another use such as residential or industrial.

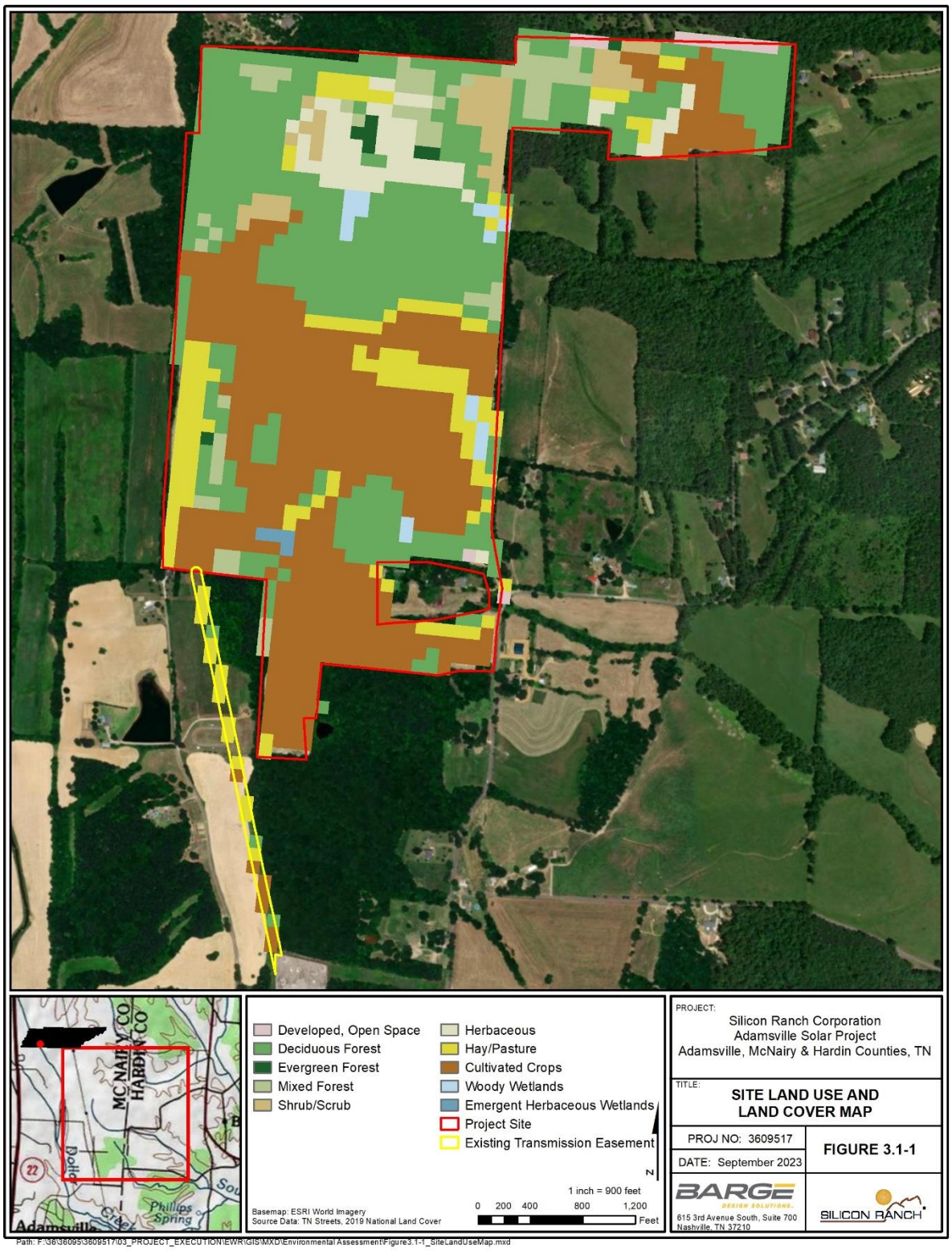

Figure 3.1-1. Site Land Use and Land Cover Map

3.1.2.2 Proposed Action

Land use on the Project Site would be converted from agricultural and forested to industrial. Figure 2.2-2 shows the Proposed Project layout of the solar array and associated facilities; Figure 2.2-3 shows the proposed ground disturbance and exclusion areas. Within the Project Site, jurisdictional streams (except for several road crossings), wetlands (except for limited tree removal) and culturally-sensitive areas would be avoided.

The surrounding area is primarily farmland and forested areas with some undeveloped land and low-density rural residential area. Conditions are not likely to change significantly over the next 20 years. As a relatively small portion of a very large land use category in the vicinity would be lost, the Proposed Action would have an overall minor adverse impact.

Decommissioning of the solar facility would remove above-ground equipment, concrete pads and foundations, posts, and below-ground electrical connections from the Project Site. Some underground utilities may be abandoned in place. Reclamation activities, including breaking up soil compacted areas, could allow a large portion of the Project Site to be returned to agricultural use. The activities associated with the Proposed Action would not have any indirect effects on land use within the Project Site.

3.2 GEOLOGY, SOILS, AND PRIME FARMLAND

The existing geological resources within the Project Site and the potential impacts on these geological resources associated with the No Action and Proposed Action Alternatives are discussed in this section. Geological resources analyzed include geology, paleontology, geologic hazards, soils, and prime farmland.

3.2.1 Affected Environment – Geology, Soils and Prime Farmlands

3.2.1.1 Geology

The Project Site and TL are in the Gulf Coastal Plain section of the Coastal Plain physiographic province in West Tennessee. As shown in Figure 3.2-1, the Site is primarily underlain Quaternary-aged deposits (alluvial deposits, high-level alluvial deposits) and Cretaceous-aged deposits (Demopolis Formation, Sardis Formation, and Coffee Sand). The loess deposits that characterize the area consist of floodplain silts that were distributed throughout the eastern portion of the Mississippi River alluvial valley by dust storms that occurred during the last ice age (Dockery and Thompson, 2016). These deposits consist of clayey and sandy silt up to 4 feet thick within the Project Site.

3.2.1.2 Paleontology

Paleontological resources are likely present in Western Tennessee. The Project Site was flooded by the ocean during the Cretaceous Age, leaving behind fossil beds including dinosaurs.

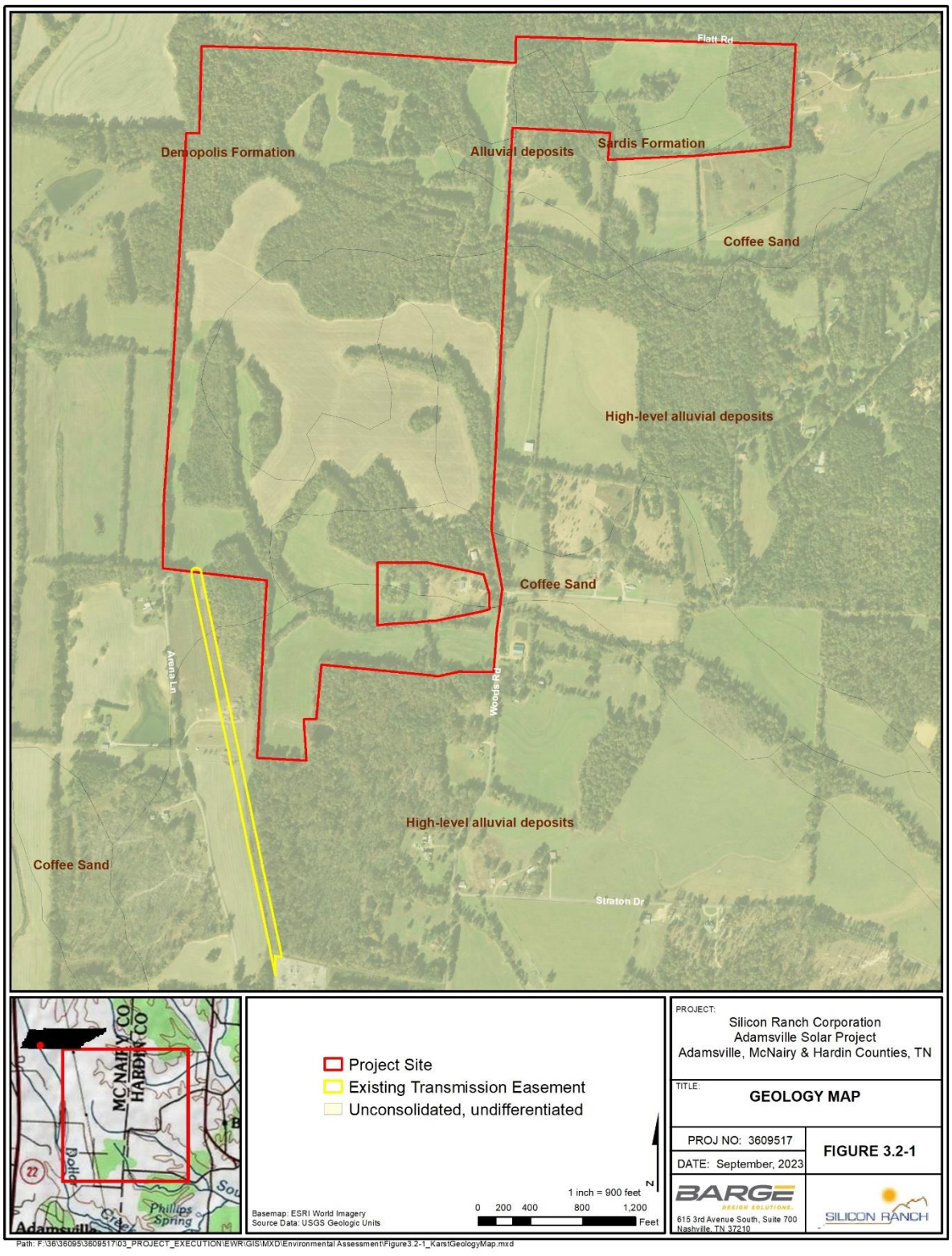

Figure 3.2-1. Geology Map

3.2.1.3 Geological Hazards

Potentially hazardous geological conditions can include the following: landslides, volcanoes, earthquakes/seismic activity, and subsidence/sinkholes. The Project Site is located on relatively stable ground. No potential geologic hazards were identified. No significant slopes are present within several miles; therefore, landslides are not a potential risk. No volcanoes are present within several hundred miles of the Project Site. Cretaceous and Quaternary-aged deposits do not develop the Karst topography seen in Middle and East Tennessee thus no sinkholes are expected to be found in the Project Site or vicinity.

Seismic activity at the Project Site could cause surface faulting, ground motion, ground deformation, and conditions including liquefaction and subsidence. The Modified Mercalli Scale is used within the United States to measure the intensity of an earthquake. The scale arbitrarily quantifies the effects of an earthquake based on the observed effects on people, the natural environment, and development. Mercalli intensities are measured on a scale of I through XII, with I denoting the weakest intensity and XII denoting the strongest intensity. The lower degrees of the scale generally deal with how people feel the earthquake. The higher numbers of the scale are based on observed structural damage. This value is translated into a peak ground acceleration (PGA) value to measure the maximum force experienced. The PGA is the maximum acceleration experienced by a building or object at ground level during an earthquake on uniform, firm-rock site conditions. The PGA is measured in terms of percent of "g," the acceleration due to gravity. The United States Geological Survey (USGS) Earthquake Hazards Program publishes a seismic hazard map (Figure 3.2-2) that displays the PGA with 10 percent (1 in 500-year event) probability of exceedance in 50 years. The potential ground motion for the proposed Project Site is in the 9-10%g range for a PGA with a 9-10 percent probability of exceedance within 50 years (USGS, n.d.). This indicates a relatively low chance of an earthquake causing damage to the Project Site.

3.2.1.4 Soils

A total of 27 soil units consisting of loams, silt loams, silty clay loams, and complexes were identified onsite (Figure 3.2-3). Paden silt loam, 2 to 5 percent slopes (PaB) is the dominant soil unit for the Project and accounts for 21.6 percent of the Project Site. Paden silt loam, 2 to 5 percent slopes, severely eroded is the second most dominant soil unit, which accounts for 19.0 percent of the Project Site. The complete Soil Survey is in in Appendix A.

Table 3.2-1 provides an overview of the soil characteristics. The percent slopes of the soils indicate that the majority of the Project Site is gently sloping, moderately well drained and the soils are not prone to flooding or ponding. Only the Waverly fine sandy loam (Wa) is considered hydric within the Project Site, and it accounts for 0.1 percent of the study area. However, the Iuka fine sandy loam, 0 to 2 percent slopes, occasionally flooded (Iu) is known to flood and could possibly harbor hydric soils.

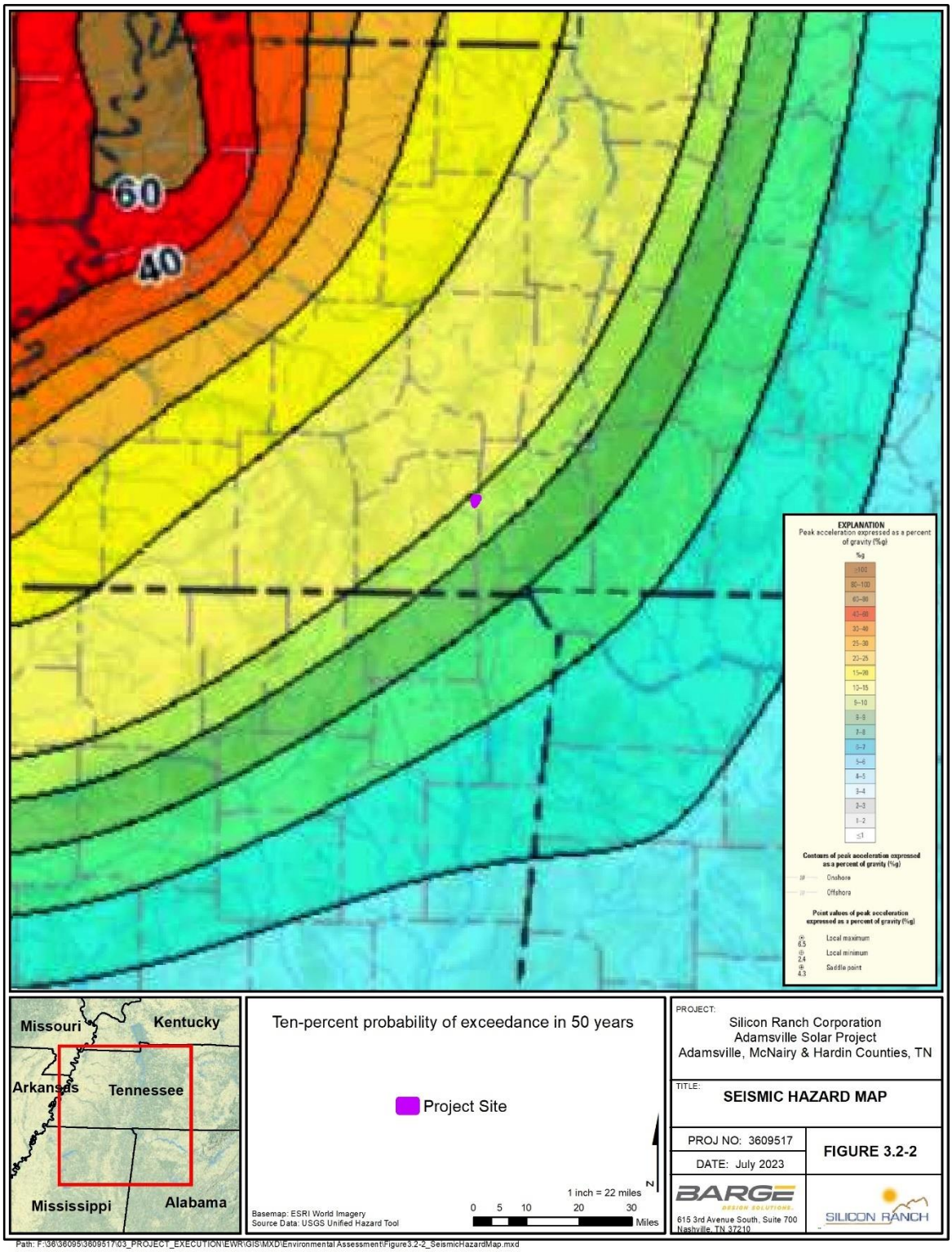

Figure 3.2-2. Earthquake hazard map showing peak ground accelerations having a 10 percent probability of being exceeded in 50 years, for a firm rock site.

Source: https://www.usgs.gov/maps/seismic-hazard-maps-conterminous-united-states-2014

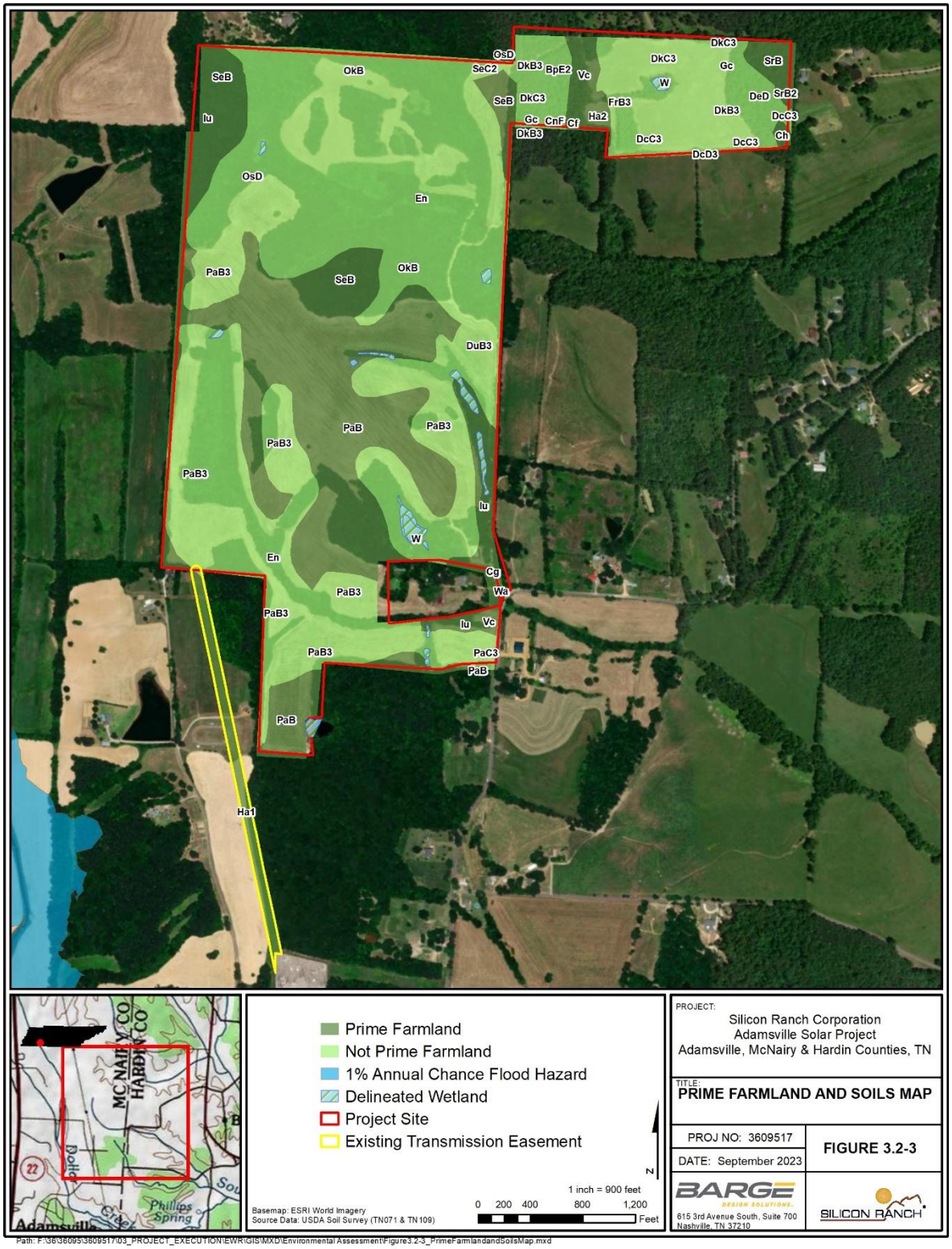

Figure 3.2-3. Prime Farmland and Soils Map

Table 3.2-1. Soil Type Occurrence on the Project Site

Soil Type	Acreage/ Percent	Prime Farmland	Parent Material	Slope %	Runoff Class	Drainage	Flooding/ Ponding	Hydric
Paden silt loam, 2 to 5 percent slopes (PaB)	65.6 (21.8%)	Yes	Loess or silty alluvium over loamy alluvium derived from interbedded sedimentary rock	2-5	NP	Moderately well drained	None/None	No
Paden silt loam, 2 to 5 percent slopes, severely eroded (PaB3)	56.6 (18.9%)	No	Loess or silty alluvium over loamy alluvium derived from interbedded sedimentary rock	2-5	NP	Moderately well drained	None/None	No
Oktibbeha and Sumter soils, 8 to 20 percent slopes (OsD)	51.9 (17.3)	No	Clayey marine deposits over residuum weathered from chalk	8-20	NP	Moderately well drained	None/None	No
Enville fine sandy loam, occasionally flooded (En)	41.1 (13.7)	No	Stratified loamy and/or sandy alluvium	0-2	NP	Somewhat poorly drained	None, Occasional /None	No
Silerton silt loam, 2 to 5 percent slopes (SeB)	17.8 (5.9%)	Yes	Loess over clayey marine deposits	2-5	NP	Well drained	None/None	No
Oktibbeha clay loam, 2 to 5 percent slopes (OkB)	12.9 (4.3%)	No	Clayey marine deposits over residuum weathered from chalk	2-5	NP	Moderately well drained	None/None	No
Dulac silt loam, 5 to 8 percent slopes, severely eroded (DkC3)	10.7 (3.6%)	No	Silty loess over clayey alluvium	5-8	High	Moderately well drained	None/None	No
Iuka fine sandy loam, 0 to 2 percent slopes, occasionally flooded (Iu)	7.4 (2.5%)	Yes	Coarse-loamy alluvium derived from sedimentary rock	0-2	Low	Moderately well drained	Occasional, None/None	No

Table 3.2-1. Soil Type Occurrence on the Project Site (cont.)

Soil Type	Acreage/ Percent	Prime Farmland	Parent Material	Slope %	Runoff Class	Drainage	Flooding/ Ponding	Hydric
Dulac silt loam, 2 to 5 percent slopes, severely eroded (DkB3)	5.5 (1.9)	No	Silty loess over clayey alluvium	2-5	Medium	Moderately well drained	None/None	No
Dexter clay loam, 5 to 8 percent slopes, severely eroded (DcC3)	4.5 (1.5%)	No	Loess over loamy alluvium	5-8	NP	Well drained	None/None	No
Vicksburg loam, local alluvium (Ochlockonee) (Vc)	3.5 (1.2%)	Yes	Loamy alluvium	1-3	NP	Well drained	None, Occasional /None	No
Freeland loam, 2 to 5 percent slopes, severely eroded (FrB3)	3.5 (1.2%)	No	Loess over loamy alluvium	2-5	NP	Moderately well drained	None/None	No
Boswell soils, 12 to 25 percent slopes, eroded (BpE2)	2.6 (0.8%)	No	Clayey marine deposits	12-25	NP	Moderately well drained	None/None	No
Dulac silt loam, 2 to 5 percent slopes, severely eroded (DuB3)	2.9 (1.0%)	No	Silty loess over clayey alluvium	2-5	Medium	Moderately well drained	None/None	No
Dexter loam, 8 to 12 percent slopes (DeD)	2.7 (0.9%)	No	Loess over loamy alluvium	8-12	NP	Well drained	None/None	No
Silerton silt loam, 2 to 5 percent slopes (SrB)	2.2 (0.7%)	Yes	Loess over clayey marine deposits	2-5	NP	Well drained	None/None	No

Table 3.2-1. Soil Type Occurrence on the Project Site (cont.)

Soil Type	Acreage/ Percent	Prime Farmland	Parent Material	Slope	Runoff Class	Drainage	Flooding/ Ponding	Hydric
Gullied land, clayey materials (Gc)	1.8 (0.6%)	No	NP	NP	NP	NP	NP	No
Hatchie loam (Ha)	1.2 (0.4%)	Yes	Loess over loamy alluvium	1-3	NP	Somewhat poorly drained	None/None	No
Hatchie silt loam, 0 to 2 percent slopes (Ha)	0.9 (0.3%)	Yes	Loess over loamy alluvium	0-2	Low	Somewhat poorly drained	None/None	No
Collins loam, local alluvium (Iuka) (Cg)	0.8 (0.3%)	Yes	Loamy alluvium	1-3	NP	Moderately well drained	None, Rare /None	No
Paden silt loam, 5 to 8 percent slopes, severely eroded (PaC3)	0.9 (0.3%)	No	Loess or silty alluvium over loamy alluvium derived from interbedded sedimentary rock	5-8	NP	Moderately well drained	None/None	No
Silerton silt loam, 5 to 8 percent slopes, eroded (SeC2)	0.8 (0.3%)	No	Loess over clayey marine deposits	5-8	NP	Well drained	None/None	No
Collins silt loam (Iuka) (Ch)	0.4 (0.1%)	Yes	Loamy alluvium	0-2	NP	Moderately well drained	None, Occasional /None	No
Silerton silt loam, 2 to 5 percent slopes, eroded (SrB2)	0.6 (0.2%)	Yes	Loess over clayey marine deposits	2-5	NP	Well drained	None/None	No

Table 3.2-1. Soil Type Occurrence on the Project Site (cont.)

Soil Type	Acreage/ Percent	Prime Farmland	Parent Material	Slope	Runoff Class	Drainage	Flooding/ Ponding	Hydric
Collins fine sandy loam (Iuka) (Cf)	0.3 (0.1%)	Yes	Loamy alluvium	0-2	NP	Moderately well drained	None, Occasional /None	No
Cuthbert fine sandy loam, 25 to 35 percent slopes (Luverne) (CnF)	0.4 (0.1%)	No	Stratified clayey and/or loamy marine deposits	25-35	NP	Well drained	None/None	No

NP – Not Provided in the Soil Survey

3.2.1.5 Prime Farmland

The National Soil Survey Handbook (NSSH) and 7 CFR 657 Prime and Unique Farmlands defines Prime Farmlands as follows: “Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops, and is also available for these uses (the land could be in cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). It has the soil quality, growing season and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management, according to acceptable farming methods. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding” (USDA, n.d.-a).

The FPPA (7 U.S.C. 4201 et seq.) requires federal agencies to minimize federal programs' impact on the unnecessary and irreversible conversion of farmland to nonagricultural uses (USDA, n.d.-b). Prime farmland is the most suitable land for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops.

As detailed in Table 3.2-1, 100.7 acres (33.7%) of the soils in the Project Site are prime farmland. Eleven soil types are classified as prime farmland: Paden silt loam, 2 to 5 percent slopes, Silerton silt loam, 2 to 5 percent slopes, Iuka fine sandy loam, 0 to 2 percent slopes, occasionally flooded, Vicksburg loam, local alluvium, Silerton silt loam, 2 to 5 percent slopes, Hatchie loam, Hatchie silt loam, 0 to 2 percent slopes, Collins loam, local alluvium (Iuka), Collins silt loam, Silerton silt loam, 2 to 5 percent slopes, eroded, and Collins fine sandy loam (Iuka). The remaining 16 non-prime farmland soil types comprise 66.8 percent of the Project Site.

Farmland of statewide importance is not federally recognized prime farmland, but land that is important in the production of food, feed, fiber, forage, and oilseed crops. Individual states delineate their own important farmland (USDA, n.d.-c). Farmland of Statewide Importance usually has areas of soils that nearly meet the requirements for prime farmland and produce high yields of crops when treated and managed using sound farming methods. There are no soils classified as Farmland of Statewide Importance in the Project Site.

Table 3.2-2 documents the changes in the number of farms and acreage of land in farms from 2012 to 2017 for McNairy and Hardin Counties and Tennessee. FPPA requires federal agencies to consider the adverse effects of their actions on prime or unique farmlands. The purpose of the Act is “to minimize the extent to which Federal programs contribute to the unnecessary conversion of farmland to nonagricultural uses” (USDA, n.d.-b).

Table 3.2-2. Farming Statistics for Hardin and McNairy Counties, Tennessee

	Number of Farms		Change 2012 - 2017		Land in Farms (Acres)		Change 2012 - 2017
	2012	2017			2012	2017	
Hardin County	589	583	-6 (-1.0%)		126,166	162,083	+35917 (-28.5%)
McNairy County	658	654	-4 (-0.6%)		129,982	139,025	+9043 (+7.0%)
Tennessee	68,050	69,983	+1933 (+2.8%)		10,867,812	10,874,238	+6426 (+0.6%)

Source: https://www.nass.usda.gov/AgCensus/

3.2.2 Environmental Consequences – Geology, Soils, and Prime Farmlands

This section describes the potential impacts to geology, paleontology, geologic hazards, soils, and prime farmland should the Proposed Action or No Action Alternatives be implemented.

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. There would not be any direct or indirect project-related impacts on geological, paleontological, soil resources, or prime farmlands. Existing land use would be expected to remain a mix of farmland and forested areas. If current land use remains unchanged, soil impacts from continued agricultural use could result from a depletion of nutrients, causing minor changes to the site. Should the Site be developed for some other purpose than agricultural use, changes to the soils onsite and possibly the geology could occur.

3.2.2.2 Proposed Action

Under the Proposed Action, construction and operation of the Project could result in minor direct impacts to geology and soil resources by contributing to erosion and sedimentation and in the conversion of approximately 33.7 percent of the Project Site's prime farmland. Approximately 99.5 acres of agricultural land and 116 acres of forested land would be cleared and graded for the solar facility and associated interconnection facilities. Clearing and grading would disturb existing soil profiles and any surficial paleontological resources. Both grading and mowing would cause minor, localized increases in erosion and sedimentation. BMPs to address erosion and sediment control would be implemented whenever necessary.

3.2.2.3 Geology and Paleontology

Under the Proposed Action Alternative, minor direct impacts to geology could occur. The solar arrays would be supported by steel piles that would be mechanically driven into the ground to a depth of 6 to 9 feet. Trenching depths of approximately 2 to 3 feet would also be required for underground wiring connections between solar panels. Onsite sedimentation basins would be shallow and, to the extent feasible, utilize the existing terrain without requiring extensive excavation. The PV panels would be connected with underground wiring placed in excavated trenches and

backfilled with Project-Site native soil. Due to the small sizes of the subsurface disturbances, only minor direct impacts to potential subsurface geological resources would be anticipated.

As excavation would be limited, only minor direct impacts to geological and paleontological resources would be anticipated from construction of the Project and any upgrades to the existing PEC ROW. Should paleontological resources be exposed during site construction (i.e., grading and foundation placement) or operation activities, a paleontological expert would be consulted to determine the nature of the paleontological resources, recover these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy. No indirect impacts to paleontological resources are anticipated.

3.2.2.4 Geologic Hazards

Hazards resulting from geological conditions would be minor because the Project Site is in a relatively stable geologic setting. There is a moderate potential for minor to moderate intensity seismic activity. The facility would be designed to comply with applicable seismic standards prescribed in state and local building codes. A seismic event could cause minor impacts to the Project Site and equipment on the site. The Project could be subject to potential adverse effects from ground failure associated with liquefaction during a strong seismic event. Structural damage to PV panels, PV panel support structures, and other associated equipment could occur. Since the site would not be staffed during operation, potential damage to onsite structures would pose minimal human risk. Geologic hazard impacts on the site would be unlikely to impact offsite resources.

3.2.2.5 Soils

Site preparation and construction of the solar arrays may require moderate to substantial grading. Any excess topsoil would be stockpiled and redistributed over the site as needed. Trenching depths of approximately 2 to 3 feet would also be required for underground wiring connections between solar panels. Soil from this work will be used to refill the trenches once the electrical wiring is in place. Additionally portions of the site could be temporarily affected during mowing/vegetative maintenance and construction activities. Soils located in areas where only vegetation clearing is proposed would remain unless a circuit trench or foundation is constructed. It is unlikely that offsite soil resources would be necessary for construction. However, no borrow materials, such as sand and gravel, or other aggregate from offsite sources, would be required. Upgrades within the existing TL will involve adding new poles and a TL. These activities will have a minor impact on existing soils.

Due to the project disturbance area being greater than one acre, a Construction General Permit and NPDES Permit for discharges of stormwater associated with construction activities would be required. Application for the permit would require submission of an SWPPP describing the management practices that would be utilized during construction to prevent erosion and runoff and reduce pollutants in stormwater discharges from the Project Site. Following construction, the implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during site operations.

Minor disturbance to soils would occur during operation of the Proposed Action. Creating a new semipervious surface, in the form of internal access roads, panel footings, and the foundations for the inverter stations and substation, would result in a minor increase in stormwater runoff and potentially increase soil erosion. The use of BMPs such as soil erosion and sediment control measures would minimize the potential for increased soil erosion and runoff.

During maintenance of the solar facility, minor disturbances could occur to soils. The Proposed Action would implement an integrated vegetation management plan including use of mechanical equipment and potentially grazing animals. Mechanized landscaping may include the use of lawnmowers, weed eaters, etc. Traditional trimming and mowing would be performed periodically to maintain the vegetation at a height ranging from 6 inches to 2 feet. Electric-powered equipment such as utility vehicles may be used on the site during operations and maintenance. Selective use of herbicides may also be employed around structures to control weeds. Products would be applied per local, state, and federal regulations. Weather events, e.g., predicted rainfall or high winds, would be considered prior to the application of herbicides in efforts to reduce potential runoff or drift.

3.2.2.6 Prime Farmland

The construction and operation of the Proposed Action Alternative would result in temporary adverse effects to prime farmland. Approximately 100.7 of the 295 acres (33.7%) are considered prime farmland (Table 3.2-1). Most of the solar arrays, which would cover approximately 79.7 acres of farmland within the Project Site, would be installed on 39.0 acres designated as prime farmland and 40.7 acres of non-prime farmland. Approximately 61.7 acres of prime farmland would not be disturbed. With no soil types that qualify as Farmland of Statewide Importance on the Project Site, there will not be any impacts to any Farmland of Statewide Importance.

Any area within the Project Site not developed for the solar facility would remain undeveloped with no agricultural or other activities, aside from general vegetation maintenance. Adhering to BMPs during construction and operation of the solar facility, including installing erosion control devices (ECDs) during stockpiling events, would preserve topsoil and limit erosion, resulting in negligible impacts to prime farmland. With limited excavation but moderate to substantial grading onsite, there is potential for mixing of some soil types.

Solar projects do not result in the permanent or irreversible conversion of farmland. During operations, soils would have an opportunity to develop in place with minimal ground disturbance and possibly regenerate while not in active agricultural production. When the solar and supporting materials are removed, the site could be readily returned to agricultural production. Based on the limited site disturbance, there would be minimal direct and indirect effects on prime farmland under the Proposed Action Alternative.

3.3 WATER RESOURCES

This section describes an overview of existing water resources within the Project Site and the potential impacts on these water resources that would be associated with the Proposed Action. Components of water resources that are analyzed include groundwater, surface water, floodplains, and wetlands.

3.3.1 Affected Environment – Water Resources

3.3.1.1 Groundwater

Groundwater is water found in cracks and spaces in rocks and soil. The source of groundwater in western Tennessee is primarily from rainfall. When rain falls to the ground, it will percolate through the soil and into the porous layer of rocks that make up the aquifer, a process known as recharging. Aquifers of sufficient size will store enough water that some can be withdrawn from them via wells. The City of Adamsville Utilities Department provides water to city residents and some areas outside of the city and uses groundwater as its source.

The Project Site is part of the Southeastern Coastal Plain Aquifer system. Only a small part of this aquifer is in Tennessee. Most of the aquifer is in Mississippi, Alabama, Georgia, and South Carolina. While the Southeastern Coastal Plain Aquifer is divided into four regional aquifers, only the lowermost regional aquifer, the Black Warrior River aquifer, and its overlying confining unit are present in Tennessee. The Black Warrior River aquifer consists of Late Cretaceous sands of fluvial and deltaic origin, interbedded with clay and minor gravel (USGS, 1995). An average of 54 inches of rain falls in the recharge area of the aquifer.

3.3.1.2 Surface Water

Surface waters are defined as open or flowing water features, typically consisting of streams, rivers, lakes, ponds, and wetlands. Surface water features are further segregated as having perennial, intermittent, and ephemeral flow. TDEC also designates certain surface water features as wet weather conveyances (WWCs). Perennial waters are permanent surface water features present throughout the year. Intermittent classification is generally restricted to streams with a well-defined channel but only contain water part of the year, typically during winter and spring seasons when the stream bed is below the water table. Ephemeral streams (those channels that have an ordinary high-water mark [OHWM] and are potentially federally jurisdictional) or WWCs are features that only flow in direct response to precipitation events and typically exist as topographic swales and dry drainages with poor bed/bank development.

The Project Site is mostly within the Milledgeville, Tennessee, topographic quadrangle, with the western side of the Project Site extending into the Leapwood topographic quadrangle. The TL portion of the Project Site extends into small sections of the Stantonville and Pittsburg Landing topographic quadrangles. The Project Site is located within the Beason Creek-Tennessee River watershed (060400010508). This watershed is located within the Lower Tennessee – Beech Rivers (06040001) HUC-8 watershed, which is within the Tennessee River Basin (Figure 3.3-1).

From October 24 through 26, 2022, biologists performed a field survey within the Project Site to determine the presence or absence of jurisdictional waters. Both the U.S. Army Corps of Engineers (USACE) (USACE, 1987). and Tennessee Department of Environment and Conservation (TDEC) methodologies were utilized to determine the jurisdiction of wetlands and non-wetland waters.

Twenty-five likely jurisdictional and twenty-one potentially non-jurisdictional features were identified within the Project Site, all of which were considered as streams, ephemeral channels, erosional swales, wetlands, ponds, or drainage ditches (Figures 3.3-2 and 3.3-3a-2d, Table 3.3-1). No surface water features were present along the TL. The features identified onsite are detailed in the Summary of Environmental Features for the Adamsville Solar Project (Appendix A).

On February 6, 2023, SRC submitted the Hydrologic Determination Report for Adamsville Solar in McNairy and Hardin Counties, Tennessee, report to TDEC. After reviewing the report, TDEC issued their hydrological determination letter on March 6, 2023. The report concluded that Streams 1 to 9 are jurisdictional (Table 3.3-1). Also on January 27, 2023, SRC submitted an approved jurisdictional request to the USACE. The USACE determination is pending and will be incorporated into the Final EA.

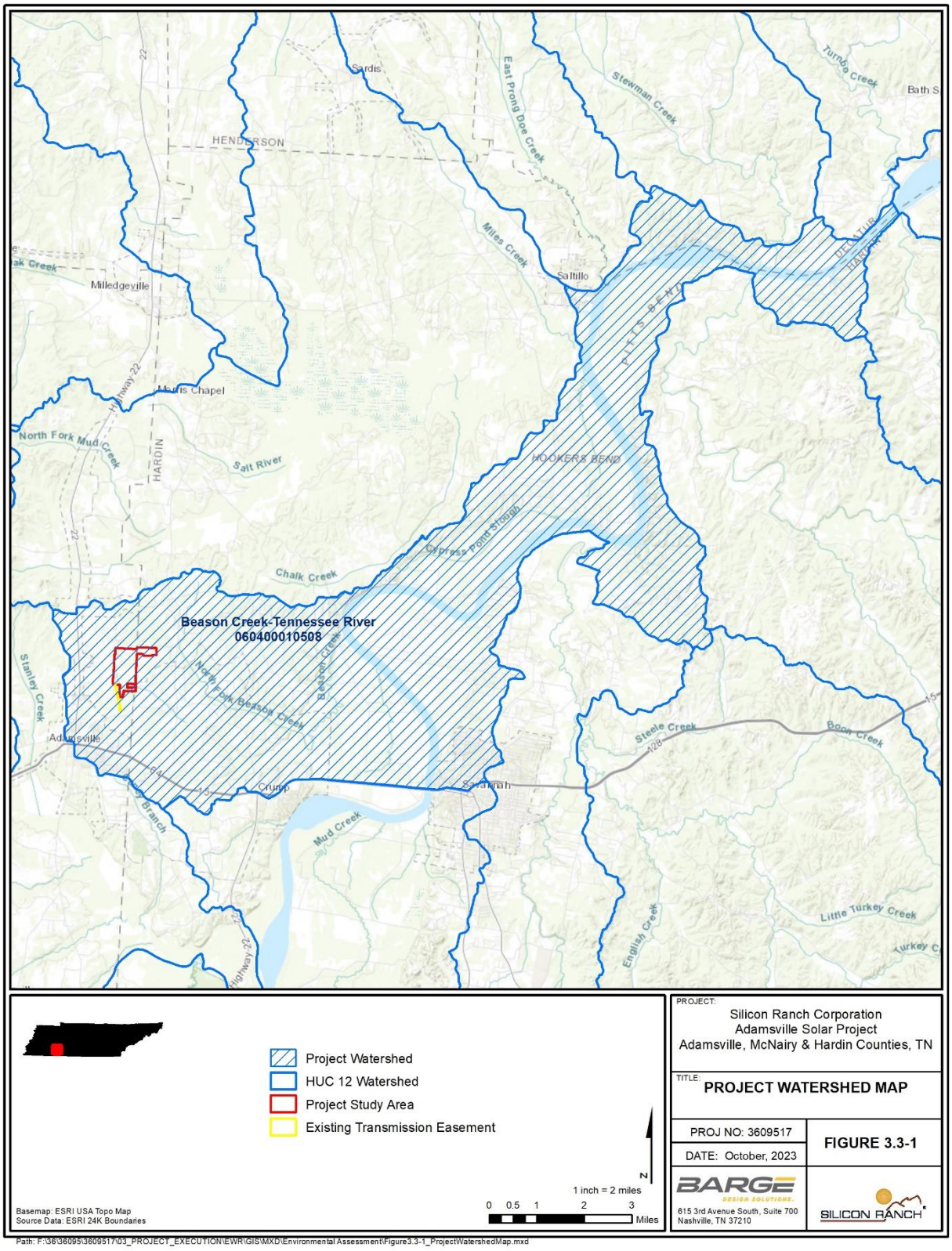

Figure 3.3-1. Watershed Map

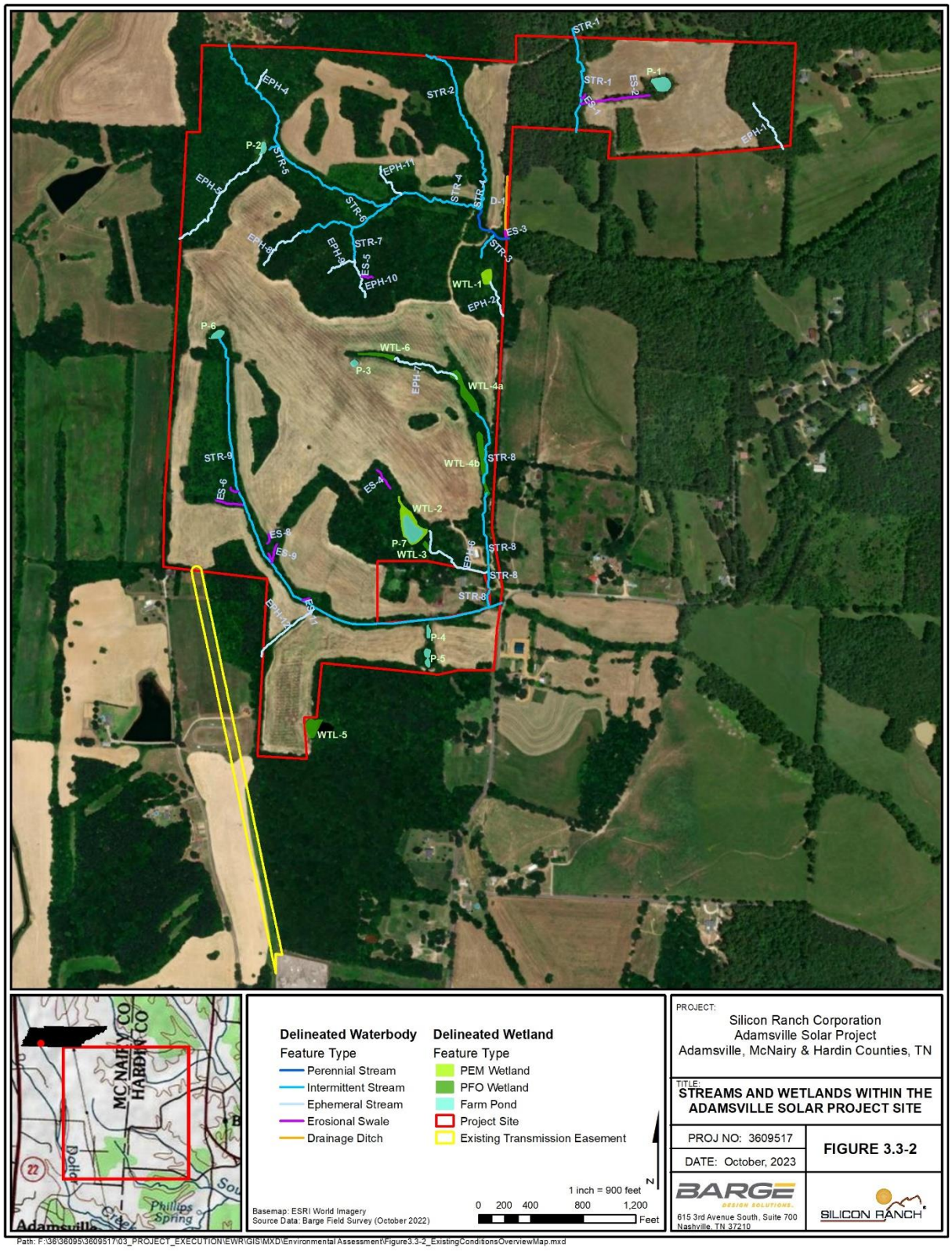

Figure 3.3-2. Drainages, Streams and Wetlands Within the Adamsville Solar Project Site

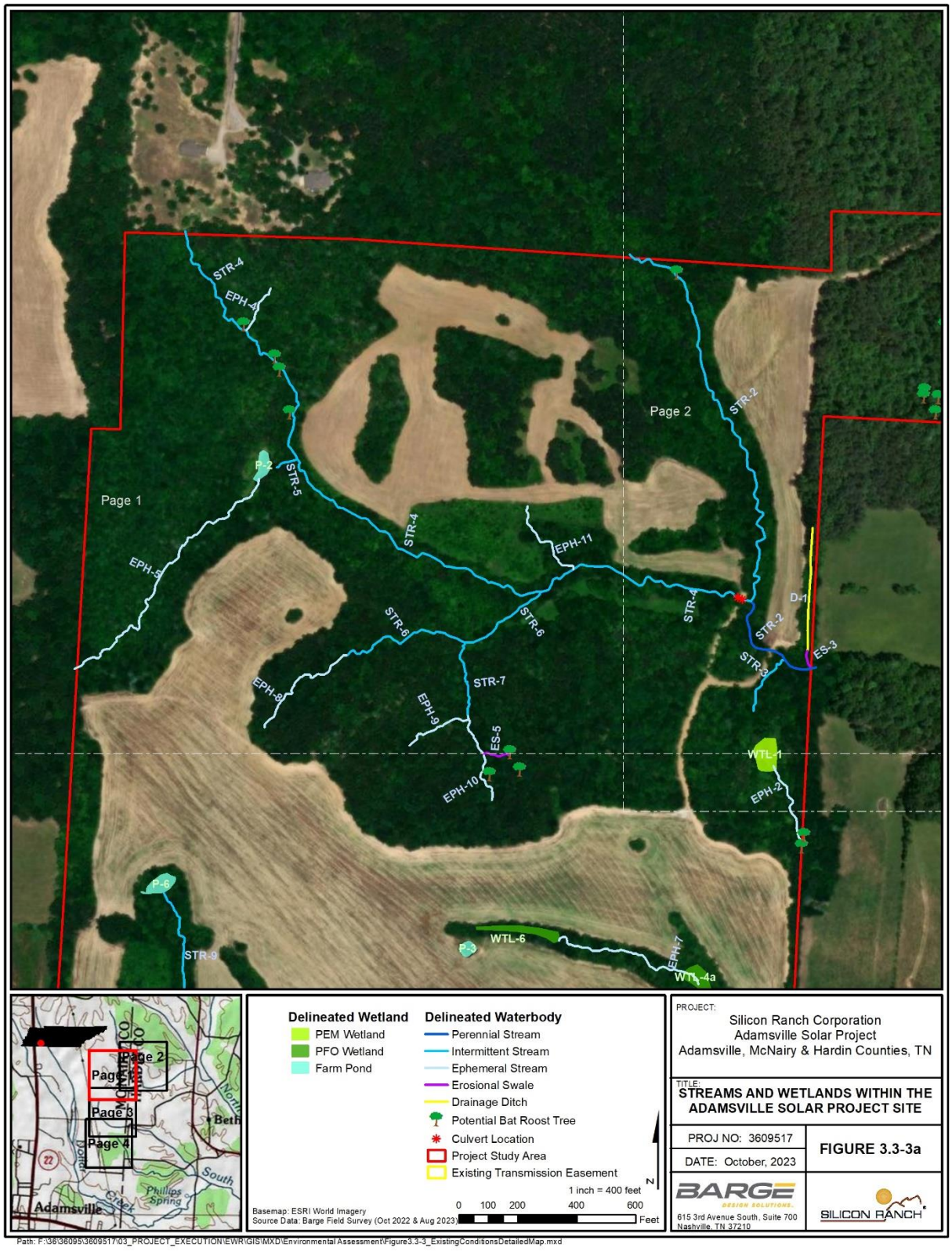

Figure 3.3-3a. Drainages, Streams and Wetlands Within the Adamsville Solar Project Site

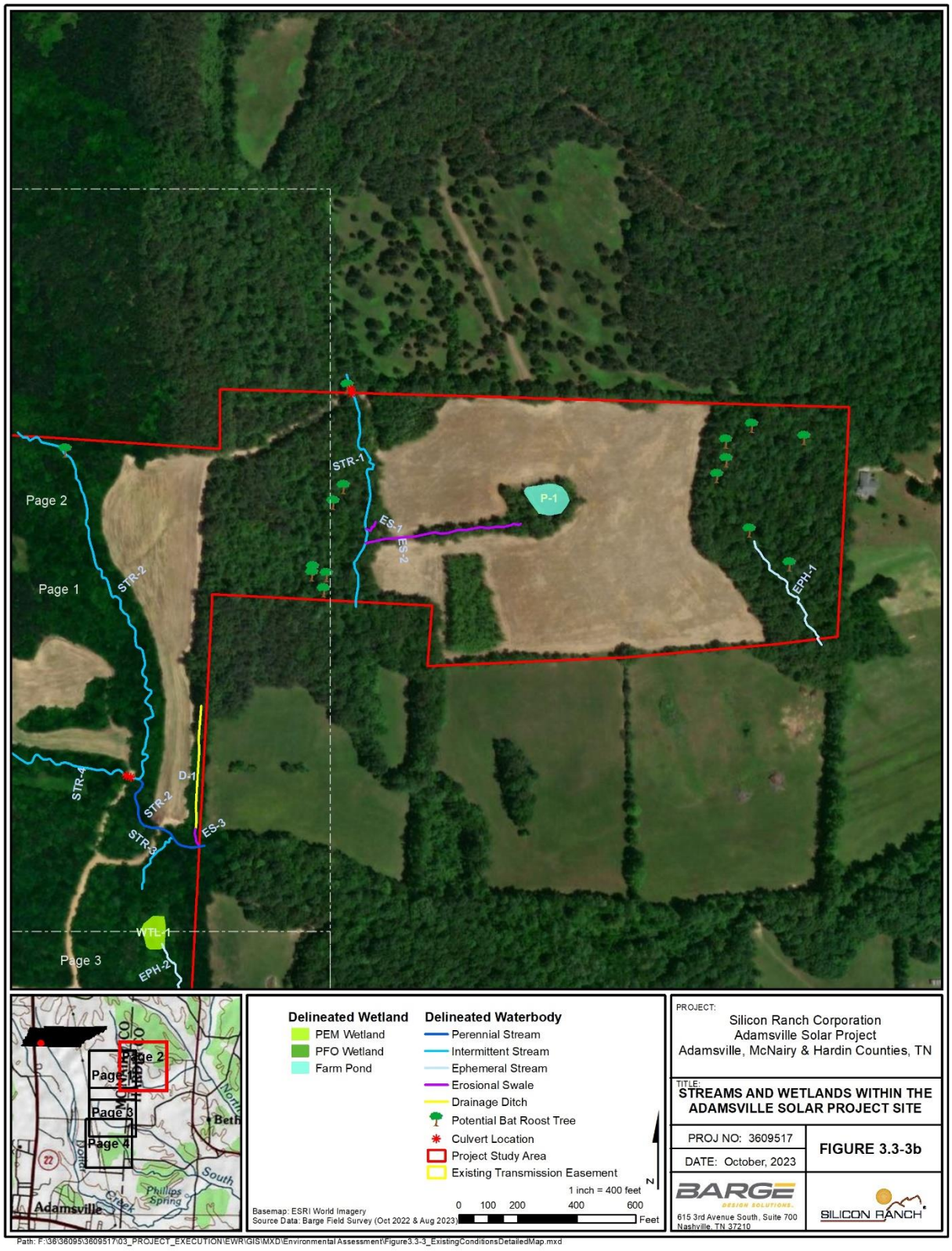

Figure 3.3-3b. Drainages, Streams and Wetlands Within the Adamsville Solar Project Site

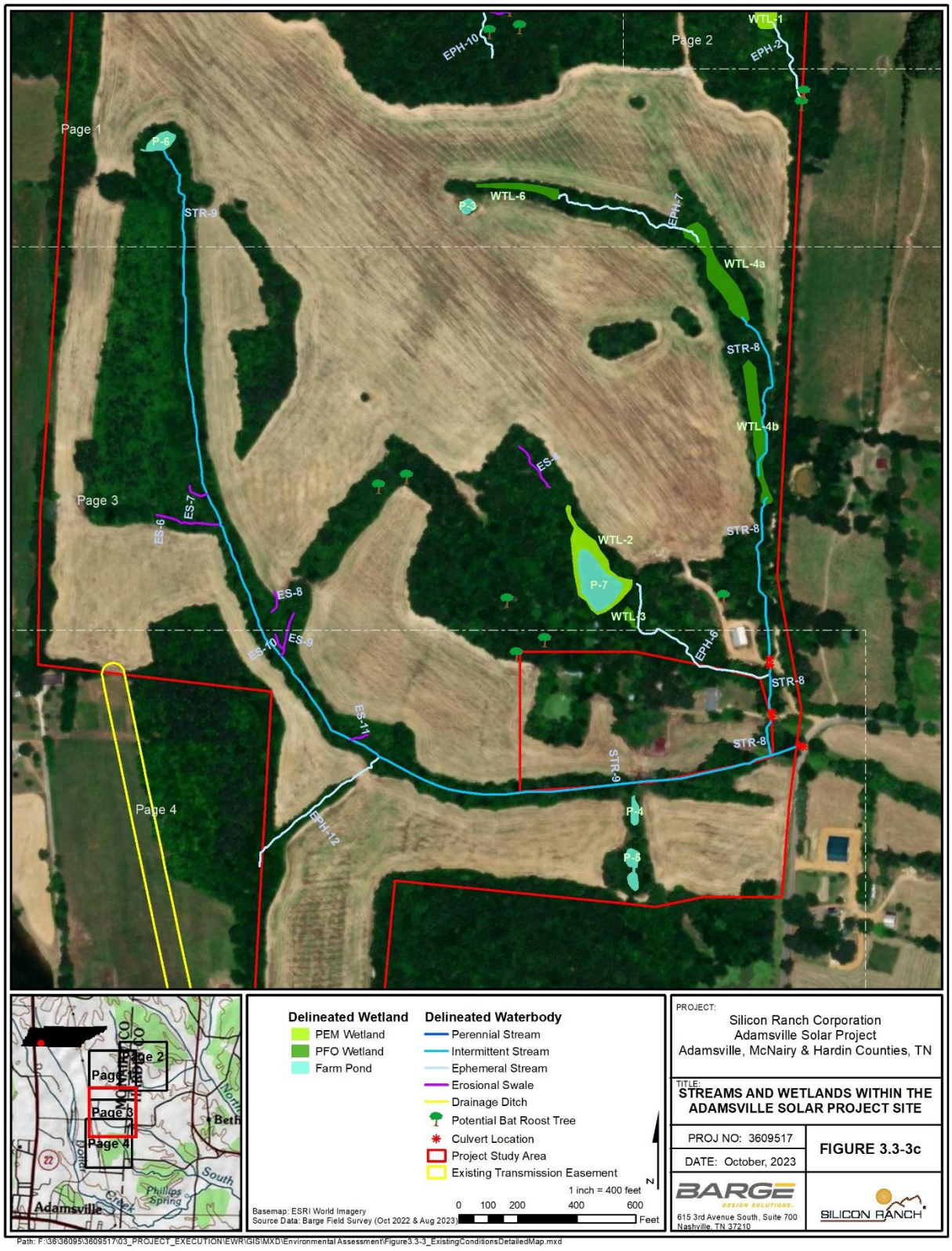

Figure 3.3-3c. Drainages, Streams and Wetlands Within the Adamsville Solar Project Site

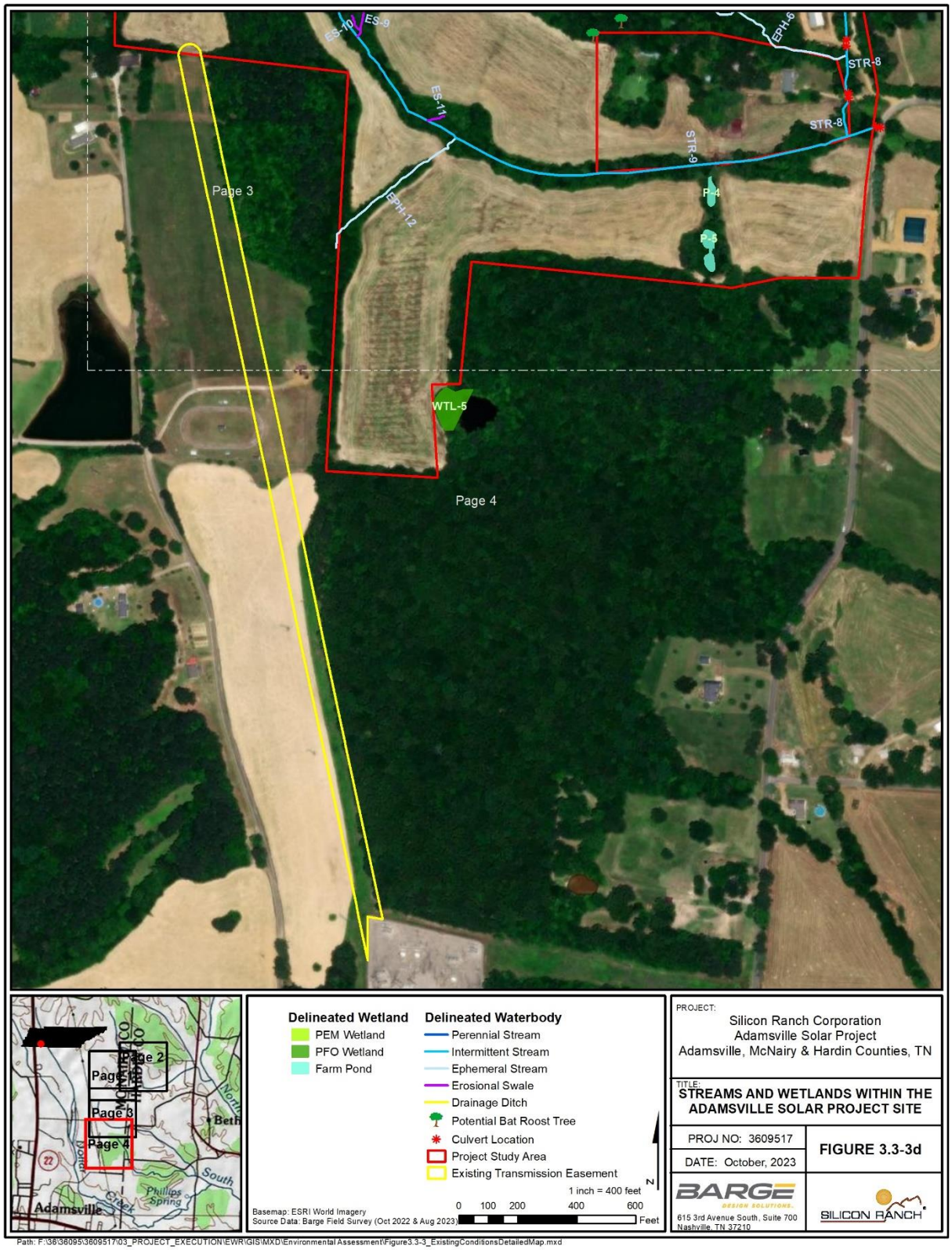

Figure 3.3-3d. Drainages, Streams and Wetlands Within the Adamsville Solar Project Site

Table 3.3-1. Streams, Swales, and Ditches Identified Within the Project Site

Waterbody I.D.	Description	Location Within Project Boundaries	Linear Feet within Project	HD Score	Federal Jurisdictional Status	State Jurisdictional Status
STR-1	Intermittent Stream	Start: 35.265904, -88.366872 End: 35.263796, -88.366722	851	25.75	Yes	Yes
STR-2	Intermittent / Perennial Stream	Start: 35.265238, -88.370731 End: 35.261523, -88.368481	1,918	24.25	Yes	Yes
STR-3	Intermittent Stream	Start: 35.261092, -88.369038 End: 35.261574, -88.368773	229	20.00	Yes	Yes
STR-4	Intermittent Stream	Start: 35.265350, -88.375633 End: 35.263886, -88.374391	2,879	23.75	Yes	Yes
STR-5	Intermittent Stream	Start: 35.263338, -88.374596 End: 35.263437, -88.374424	79	19.25	Yes	Yes
STR-6	Intermittent Stream	Start: 35.261626, -88.373680 End: 35.262126, -88.371565	801	22.00	Yes	Yes
STR-7	Intermittent Stream	Start: 35.260908, -88.372332 End: 35.261527, -88.372420	280	20.75	Yes	Yes
STR-8	Intermittent Stream	Start: 35.257766, -88.369098 End: 35.254549, -88.368724	1475	21.25	Yes	Yes
STR-9 (Stratton Branch)	Intermittent Stream	Start: 35.259266, -88.375762 End: 35.253793, -88.368341	3,788	21.00	Yes	Yes
EPH-1	Ephemeral Stream	Start: 35.264521, -88.362133 End: 35.263503, -88.36144	462	12.75	Unlikely[1]	No[2] (WWC)
EPH-2	Ephemeral Stream	Start: 35.259891, -88.368502 End: 35.260656, -88.368886	301	15.00	Unlikely[1]	No[2] (WWC)
EPH-4	Ephemeral Stream	Start: 35.265009, -88.374529 End: 35.264606, -88.374656	175	13.00	Unlikely[1]	No[2] (WWC)
EPH-5	Ephemeral Stream	Start: 35.261341, -88.376677 End: 35.263000, -88.374818	997	16.50	Potential[1]	No[2] (WWC)
EPH-6	Ephemeral Stream	Start: 35.255132, -88.370305 End: 35.254640, -88.369592	692	13.75	Potential[1]	No[2] (WWC)
EPH-7	Ephemeral Stream	Start: 35.258937, -88.371348 End: 35.258466, -88.369612	568	13.00	Unlikely[1]	No[2] (WWC)
EPH-8	Ephemeral Stream	Start: 35.261000, -88.374620 End: 35.261553, -88.373705	440	13.00	Unlikely[1]	No[2] (WWC)
EPH-9	Ephemeral Stream	Start: 35.260596, -88.372695 End: 35.260977, -88.372241	249	13.50	Unlikely[1]	No[2] (WWC)
EPH-10	Ephemeral Stream	Start: 35.260154, -88.371891 End: 35.261110, -88.372245	341	13.50	Unlikely[1]	No[2] (WWC)
EPH-11	Ephemeral Stream	Start: 35.262916, -88.371635 End: 35.262400, -88.371213	321	14.50	Unlikely[1]	No[2] (WWC)
EPH-12	Ephemeral Stream	Start: 35.252622, -88.374425 End: 35.253660, -88.373083	585	14.50	Unlikely[1]	No[2] (WWC)
ES-1	Erosional Swale	Start: 35.264601, -88.366535 End: 35.264580, -88.366694	58	12.50	Unlikely[1]	No[2] (WWC)
ES-2	Erosional Swale	Start: 35.264562, -88.364876 End: 35.264304, -88.366795	540	10.00	Unlikely[1]	No[2] (WWC)
ES-3	Erosional Swale	Start: 35.261691, -88.368482 End: 35.261482, -88.368464	64	10.75	Unlikely[1]	No[2] (WWC)

Waterbody I.D.	Description	Location Within Project Boundaries	Linear Feet within Project	HD Score	Federal Jurisdictional Status	State Jurisdictional Status
ES-4	Erosional Swale	Start: 35.256396, -88.371517 End: 35.256031, -88.371134	183	11.50	Unlikely[1]	No[2] (WWC)
ES-5	Erosional Swale	Start: 35.260586, -88.371729 End: 35.260569, -88.372101	94	11.50	Unlikely[1]	No[2] (WWC)
ES-6	Erosional Swale	Start: 35.255908, -88.375686 End: 35.255873, -88.375068	229	14.00	Unlikely[1]	No[2] (WWC)
ES-7	Erosional Swale	Start: 35.256217, -88.375532 End: 35.256118, -88.375238	79	12.75	Unlikely[1]	No[2] (WWC)
ES-8	Erosional Swale	Start: 35.255191, -88.374350 End: 35.255028, -88.374392	81	12.00	Unlikely[1]	No[2] (WWC)
ES-9	Erosional Swale	Start: 35.255043, -88.374113 End: 35.254695, -88.374301	153	10.75	Unlikely[1]	No[2] (WWC)
ES-10	Erosional Swale	Start: 35.254847, -88.374340 End: 35.254773, -88.374245	63	11.75	Unlikely[1]	No[2] (WWC)
ES-11	Erosional Swale	Start: 35.253829, -88.373228 End: 35.253813, -88.373467	61	11.00	Unlikely[1]	No[2] (WWC)
D-1	Drainage Ditch	Start: 35.262758, -88.368476 End: 35.261691, -88.368505	418	--	No	No

1: Federal jurisdiction status determined by observable connection to RPW and NonRPW WOTUS or significant nexus
2: State Status determined by HD score (<19 is a WWC)

3.3.1.3 Floodplains

A floodplain is the relatively level land area along a stream or river that is subject to periodic flooding. The area subject to a 1 percent chance of flooding in any given year is normally called the 100-year floodplain. The area subject to a 0.2 percent chance of flooding in any given year is normally called the 500-year floodplain. It is necessary to evaluate development in the 100-year floodplain to ensure that the project is consistent with the requirements of Executive Order (EO) 11988, Floodplain Management (EO 11988, 1977).

The Federal Emergency Management Agency (FEMA) produces maps which show the likelihood of an area flooding. These maps are used to determine eligibility for the National Flood Insurance Program. They do not identify any floodplains in the Project Site. The State of Tennessee also regulates the 100-year floodplains of perennial streams whose floodplains are not mapped on Flood Insurance Rate Maps. As described in Section 3.3.1.3 (Surface Waters) one perennial stream (STR-2) was found within the Project Site.

3.3.1.4 Wetlands

Wetlands are defined by the USACE as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE, n.d.). Six wetlands (WTL) were observed within the Project Site. All wetlands were observed as Palustrine Forested (PFO) and Palustrine Emergent (PEM) wetland features. Each wetland was verified with the positive identification of suitable hydrology, hydrophytic vegetation, and hydric soils according to the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region, Version 2.0 (USACE, 2010). The locations of the 1.77 acres of delineated wetlands are provided in Figures 3.3.2 and 3.3.3a-3d and Table 3.3-2. No

wetlands were present along the TL. The Atlantic and Gulf Coastal Plain Regional Wetland Determination Data Forms were completed at wetland and upland sample points and area provided in the Summary of Environmental Features for the Adamsville Solar Project (Appendix A)

Furthermore, seven man-made ponds (P) totaling 1.07 acres were identified within the Project Site (Table 3.3-2). These features were identified as Palustrine Unconsolidated-Bottom (PUB) features and are also described below. The details of the location and acreage are provided in the appendices of the Summary of Environmental Features for the Adamsville Solar Project (Appendix A).

On February 6, 2023, SRC submitted the Hydrologic Determination Report for the Adamsville Solar Site, in McNairy and Hardin Counties, Tennessee, report to TDEC. After reviewing the report, TDEC issued their hydrological determination letter on March 6, 2023. The report concluded that Wetlands 1 to 6 and Ponds 2 to 7 were jurisdictional (Table 3.3-2). Also on January 27, 2023, SCR submitted an approved jurisdictional request to the USACE. The USACE determination is pending and will be incorporated into the Final EA.

Table 3.3-2. Wetlands Within the Project Site

Waterbody I.D.	Description	Location Within Project Boundaries	Acreage within Project	Federal Jurisdictional Status	State Jurisdictional Status	TRAM Score Non-HGM
WTL-1	PEM	35.368964, -88.368964	0.17	Unlikely[1]	Yes	25
WTL-2	PEM	35.255617, -88.370881	0.36	Potential[1]	Yes	33
WTL-3	PFO	35.254955, -88.370303	0.04	Potential[1]	Yes	30
WTL-4a	PFO	35.258019, -88.369216	0.43	Yes[1]	Yes	25
WTL-4b	PFO	35.257025, -88.368970	0.37	Yes[1]	Yes	25
WTL-5	PFO	35.251105, -88.373150	0.27	Potential[1]	Yes	34
WTL-6	PFO	35.258019, -88.369216	0.13	Unlikely[1]	Yes	23
P-1	PUB	35.264760, -88.364552	0.27	No	No	N/A
P-2	PUB	35.263307, -88.374683	0.08	Yes[1]	Yes	N/A
P-3	PUB	35.258782, -88.372246	0.05	No[1]	Yes	N/A
P-4	PUB	35.253118, -88.370201	0.05	No[1]	Yes	N/A
P-5	PUB	35.252712, -88.370226	0.10	No[1]	Yes	N/A
P-6	PUB	35.259335, -88.375737	0.10	Potential[1]	Yes	N/A
P-7	PUB	35.255257, -88.370689	0.42	Potential[1]	Yes	N/A
1: Federal jurisdiction status determined by observable connection to RPW and NonRPW WOTUS, significant nexus, or is an isolated water						

3.3.2 Environmental Consequences – Water Resources

This section describes the potential impacts to water resources should the Proposed Action or No Action Alternative be implemented.

3.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar would not be constructed. There would not be any project-related impacts to water resources. Existing land use would remain primarily farmland and forested area, and water resources would not change. Indirect impacts to water resources could result due to the continuing use of the Project Site as agricultural land. Increases in erosion and sediment runoff could occur if forested land was cleared or farming practices were not maintained to prevent erosion and runoff. Erosion and sedimentation on the Project Site could alter runoff patterns and impact downstream surface water quality. In addition, if chemical fertilizers and pesticides are continually used, impacts to groundwater may occur if the local aquifers are recharged from surface water runoff.

3.3.2.2 Proposed Action

Under the Proposed Action, minor impacts from construction would be expected to groundwater, surface water, and wetlands as a result of the Proposed Action Alternative. To address these minor impacts, Adamsville Solar would obtain appropriate permits from TDEC and USACE and, if required by the permits, mitigate the impacts.

Groundwater

Direct adverse impacts to the supply and availability of groundwater are not anticipated with implementing the Proposed Action Alternative. During construction, hazardous materials would be onsite that could potentially contaminate groundwater resources, including petroleum products for fuel and lubrication of construction equipment, hydraulic fluids, and various other chemicals commonly used for general construction. A Spill Prevention, Countermeasure and Control (SPCC) Plan would minimize the potential for leaks or spills to occur and provide countermeasures for spill response. Appropriate BMPs would be followed, and an SPCC Plan would be prepared to minimize the potential for leaks or spills to occur and provide countermeasures for spill response.

Overall, direct and indirect impacts on local aquifers and groundwater are not anticipated due to the limited ground disturbance required for initial construction, operation, maintenance, or decommissioning and closure. If any wells are present onsite and are used, withdrawal of water will not exceed the capacity of the well. The presence of elevated PV panels would have relatively little effect on groundwater infiltration and surface water runoff. Rainwater would run off the panels to the adjacent ground where ground infiltration would occur, or it would run off and be collected within any onsite stormwater detention basins.

If the facility were to be decommissioned or closed, a Decommissioning and Closure Plan would be developed. The Decommissioning and Closure Plan would detail procedures to control erosion and sedimentation to comply with NPDES requirements and permits. Water usage for potential decommissioning and closure is not likely to exceed that used for operation and maintenance. Therefore, impacts to groundwater resulting from decommissioning and closure of the facility are not anticipated.

Surface Water

Construction and operation of Adamsville Solar would not impact any jurisdictional streams or ponds except for stream crossings based on the current project layout. No panels or other above-ground structures are expected to impact any state or federal jurisdictional streams or ponds. These areas would be avoided during construction to the greatest extent feasible, although minor work would be

expected to occur within the buffer zones. Construction and operation of Adamsville Solar would result in minimal impacts to jurisdictional resources. A total of five stream crossings will be required, which will be appropriately culverted and designed to maintain surface water flow of the crossed streams. One of the five crossing will utilize existing farm culverts but will be replaced to sustain construction equipment loads. Since all five crossings will be on separate jurisdictional streams throughout the project area, minor general permits will be required with the state and federal agencies. It is assumed that the crossing impacts will be minimal and therefore, no mitigation is proposed or anticipated for the project.

During construction, runoff of sediment and pollutants could temporarily impact surface water quality on the Project Site. The use of BMPs for controlling soil erosion and runoff would minimize these potential impacts to surface water. Additionally, construction of onsite stormwater detention basins would allow sediments to settle out prior to release.

In the operational phase there is a potential for beneficial impacts to streams and wetlands within the Project Site due to the reduction in annual agriculture activities and applications of pesticides and fertilizer within the Project Site. No indirect impacts to surface water are anticipated during the operational phase of the Project.

Floodplains

As a federal agency, TVA adheres to the requirements of EO 11988, Floodplain Management. The objective of EO 11988 is "…to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative" (EO 11988, 1977). The EO is not intended to prohibit floodplain development in all cases but rather to create a consistent government policy against such development under most circumstances (U.S. Water Resources Council, 1978). The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

As stated in Section 2.2.2, all streams would be protected by a 60-ft buffer. Based on photographs in the June 2023 Summary of Environmental Features (Appendix A), the width of STR-2 appears to be around 10 feet. The 60-ft stream buffer would provide a buffer greater than twice the width of the stream (20 feet); therefore, the project would be consistent with local floodplain regulations, and there would be no direct impacts to floodplains by implementing the Proposed Action. Demolition of existing structures on the Project Site could also occur if the project is not renewed at the end of the 20-year PPA. Demolition would be consistent with EO 11988, Floodplain Management, provided the demolition debris would be disposed of outside of floodways.

Wetlands

TVA is subject to EO 11990, Protection for Wetlands (EO, 11990, 1997), which mandates federal agencies avoid new construction in wetlands wherever practicable and otherwise minimize wetland destruction or degradation. During all stages of the design process, efforts have been made to avoid and minimize impacts to wetlands and waterbodies to the greatest extent practicable. The current layout shows potentially up to 1.33 acres of forested wetland impact in wetlands 1, 2, 4a, 4b, and 6 would be needed to reduce shading of the panels. The amount of impact may be further reduced as the final plans are prepared. Any wetland impacts would be subject to the terms and conditions of a general or individual ARAP from TDEC pursuant to Section 401 of the CWA. Until the USACE issues its final jurisdictional determination, it is not known if a USACE permit pursuant to Section 404 of the CWA (33 U.S.C. § 1251 et seq.) would be required. SRC would obtain the necessary permit(s) and follow the permit requirements to minimize impacts to wetlands before construction begins.

Additionally, with implementation of appropriate BMPs, impacts to wetlands would be further minimized during construction.

During construction, portable toilets would be provided for the construction workforce as needed. These toilets would be pumped out regularly, and the sewage would be transported by tanker truck to a publicly-owned wastewater treatment works that accepts pump out. Equipment washing and dust control discharges would be handled in accordance with BMPs described in the SWPPP for water-only cleaning. Proper implementation of these and other controls would result in avoidance of impacts to wetlands.

While operational, there is a potential for beneficial impacts on wetlands within the Project Site due to the reduction in annual agriculture activities and applications of pesticides and fertilizer within the Project Site. Additionally, using BMPs and implementing the SWPPP, indirect impacts to wetlands would be avoided.

State and Federal Concurrence

On March 6, 2023, TDEC released their official concurrence letter for the Project Site. The assigned TDEC agent for the Project concurred with the findings of the Hydrologic Determination Report, with the exception that all the ponds are jurisdictional to the state due to potential connection to groundwater. Considering newly acquired information from the geotechnical borings for the project, no groundwater table connection was observed within the proximity of P-1. Therefore, on May 19, 2023, TDEC confirmed that P-1 is a non-jurisdictional water of the state. The official TDEC Hydrologic Determination Concurrence Letters are provided in Appendix B. Currently the USACE Approved Jurisdictional Determination for the Project Site is still under review.

3.4 BIOLOGICAL RESOURCES

This section provides an overview of existing biological resources within the Adamsville Solar Project Site and the potential impacts to biological resources that would be associated with the Proposed Action and No Action Alternatives. The biological resources that have been analyzed below are vegetation, wildlife, and rare, threatened, and endangered species. Unless cited separately, information has been summarized from the Summary of Environmental Features for the Adamsville Solar Project report (Appendix A).

Biological resources are regulated by several federal laws. The laws relevant to biological resources in the vicinity of the Proposed Action include the following:

- The Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544)
- The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. §§ 703-712) (for actions of nonfederal entities)
- The EO 13186 (January 10, 2001) Responsibilities of Federal Agencies to Protect Migratory Birds
- Bald and Golden Eagle Protection Act
- Rules of the Tennessee Wildlife Resources Agency, Chapter 1660-01-32 (based on authority provided in Tennessee Code Annotated §§ 70-1-206, 70-8-104, 70-8-106 and 70-8-107)

The USEPA defines ecoregions as “areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources; they are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components” (US EPA, n.d.-a).The Project Site lies within the Southeastern Plains (65) Tennessee ecoregion and is further categorized into the Northern Hilly Gulf Coastal Plain (65e) sub-ecoregion region. The Northern Hilly Gulf Coastal Plain sub-ecoregion is comprised of north-south trending bands of sand and clay formations with elevations reaching over 650 feet.

The Southeastern Plains ecoregion is typically comprised of gently rolling hillslopes and isolated plains with an average elevation ranging between 250 to 500 feet. Streams in this ecoregion are typically low-gradient and are sandy-bottomed. Agriculture within the Northern Hilly Gulf Coastal Plain sub-ecoregion consists of hay, soybeans, corn, sorghum, wheat, and cotton. Native woodland within the sub-ecoregion was historically comprised of oak-hickory and oak-hickory-pine forest, with bottomland hardwoods along streams and rivers.

Desktop investigations were conducted prior to field delineations of the proposed Project Site. Wildlife, vegetation, and threatened and endangered (T&E) species were researched during the desktop investigations and verified through the field delineations. From October 24 through 26, 2022, biologists performed an onsite investigation for the Adamsville Solar Project. The investigation included the delineation of wetlands and watercourses, as well as identification of vegetative communities and habitat types that may be suitable for protected species with the state and federal agencies. Additionally, a site visit was performed by the same Barge biologist on August 30, 2023, to confirm or extend the delineated limits of features identified within the revised property limits of the project. The findings of this technical report are detailed in the Summary of Environmental Features for the Adamsville Solar Project report (Appendix A).

3.4.1 Affected Environment – Biological Resources

The existing biological resources at the Adamsville Solar Project Site include vegetation, wildlife, and rare, threatened, or endangered species.

3.4.1.1 Vegetation

The Project Site is partially utilized for agricultural purposes and is mostly comprised of cropland. In portions of the Project Site that have not been vegetatively maintained, natural and successional communities have developed which include oak-hickory forest, riparian forest, mixed-growth hardwood forest, successional hardwood forest, red cedar (*Juniperus virginiana*), shallow emergent marsh, and fallow fields. Additionally, planted stands of loblolly pine (*Pinus taeda*) were observed, which could potentially be for timber production. A vegetative community map is provided in Figure 3.4-1.

There were 59.4 acres of oak-hickory forests (mature, semi-mature, and young growth stages) observed throughout the Project Site. All three variable growth stages of the oak-hickory forest community were comprised of trees such as white oak (*Quercus alba*), southern and northern red oak (*Quercus falcata* and *Quercus rubra*), shagbark hickory (*Carya ovata*), pignut hickory (*C. glabra*), black cherry (*Prunus serotina*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), slippery elm (*Ulmus rubra*), common persimmon (*Diospyros virginiana*), and occasional saplings of red cedar. Common undergrowth includes woodland sedge (*Carex blanda*) and Christmas fern (*Polystichum acrostichoides*) The oak-hickory forest community is common throughout the Project’s ecoregion, and the observed overstory size for this forested community

averaged approximately 20 inches in diameter at breast height (DBH) within the mature stands, 16 inches in the semi-mature stand, and 8 inches in the young stands.

Riparian forests totaling 18.8 acres were observed in three separate areas within the Project Site and were observed with semi-mature and young growth stages. Both growth stages of the riparian forests were comprised of sweetgum (*Liquidambar styraciflua*), red maple, sycamore (*Platanus occidentalis*), green ash (*Fraxinus pennsylvanica*), box elder (*Acer negundo*), slippery elm, sugarberry (*Celtis laevigatta*), basswood (*Tilia americana*), and an undergrowth of rivercane (Arundinaria gigantea), Christmas fern (*Polystichum acrostichoides*), and catbrier (*Smilax rotundifolia*). The riparian forest community is common throughout the Project's ecoregion, and the observed overstory size for this forested community averaged approximately 14 inches in DBH in the semi-mature stand and 9 inches in the young stand.

There were 29.5 acres of mixed-growth hardwood forests observed in portions of the site that could have been historically impacted during the development of the agricultural farm fields and adjacent residential properties. This vegetative community was observed with variable growth stages of trees from both the oak-hickory forests and riparian forests, as well as planted pine trees. The mixed-growth hardwood forests were comprised of northern and southern red oak, post oak, tulip poplar (*Liriodendron tulipifera*), sweetgum, slippery elm, red maple, red bud (*Cercis canadensis*), red cedar, black cherry, American beech, green ash, and an undergrowth of Christmas fern and longleaf wood oats (*Chasmanthium sessiliflorum*). The overstory size for this forested community averaged approximately 12 inches in DBH and is common throughout the ecoregion.

Portions of the Project Site were recently disturbed or were utilized for timber harvesting; successional hardwoods were prevalent. The successional hardwood vegetative community encompasses approximately 17 acres of the Project Site. The successional hardwoods were established in areas that have naturally progressed to woody regions between actively maintained portions of the Project Site. While mostly comprised of tree species from the surrounding naturally forested communities, the successional hardwoods were also observed with sassafras (*Sassafras albidum*) and honey locust (*Gleditsia triacanthos*) trees and flowering dogwood (*Cornus florida*) shrubs. The overstory size for this forested community averaged approximately 6 inches in DBH and is common throughout the ecoregion.

In addition to disturbed portions of the site, red maple-hardwood swamp was observed in the southern portion of the Project Site, adjacent to a man-made pond. This vegetative community, which comprised less than 0.01 acres of land, was observed with hydrophytic species, such as red maple, slippery elm, and river birch (*Betula nigra*) trees, and rice cutgrass (*Leersia oryzoides*), woolgrass (*Scirpus cyperinus*), and beggar's tickseed (*Bidens connata*) in the understory. The overstory size for this forested community averaged approximately 7 inches in DBH and is common throughout the ecoregion.

Shallow emergent marsh and fallow fields were encountered where vegetative maintenance is sporadic or has ceased. Both the shallow emergent marsh and fallow field encompass approximately 4 acres of the Project Site each. The fallow field vegetative community was mostly documented within the existing electrical transmission easement and observed with upland terrestrial plants, such as orchard grass (*Dactylus glomerata*), red fescue (*Festuca rubra*), Queen Ann's lace (*Daucus carota*), and blackberry (*Rubus argutus*), whereas the shallow emergent marsh was comprised of hydrophytic plants such as woolgrass, fox sedge (*Carex vulpinoidea*), rice cutgrass, swamp smartweed (*Persicaria hydropiperoides*), and soft rush (*Juncus effusus*).

Cropland was observed as the most dominant vegetative community within the Project Site, which encompasses approximately 142 acres of the site. The observed cropland was cultivated with soy throughout. Man-made farm ponds were also observed within some of the forested areas and agricultural fields; these could potentially be utilized for irrigation of the adjacent fields or drinking water for historic livestock.

There are several invasive species present within the project Site. Japanese silt grass (*Microstegium vimineum*), honesuckle (*Lonicera maackii*), and Chinese privet (*Ligustrum sinense*) were common along field margins and younger growth stands of forest. Invasive animal species including European starlings (*Sturnus vulgaris*) and nine-banded armadillos (*Dasypus novemcinctus*) were observed throughout the project site.

3.4.1.2 Wildlife

Native wildlife was observed throughout the Project Site. Identified wildlife were observed utilizing the fragmented forested portions of the site and the surrounding residential and agricultural environments. A list of wildlife species observed during the October 2022 field inspection of the Project Site is provided in Table 3.4-1. The observed wildlife species list is a preliminary species presence record for the Project Site and can be seasonally biased.

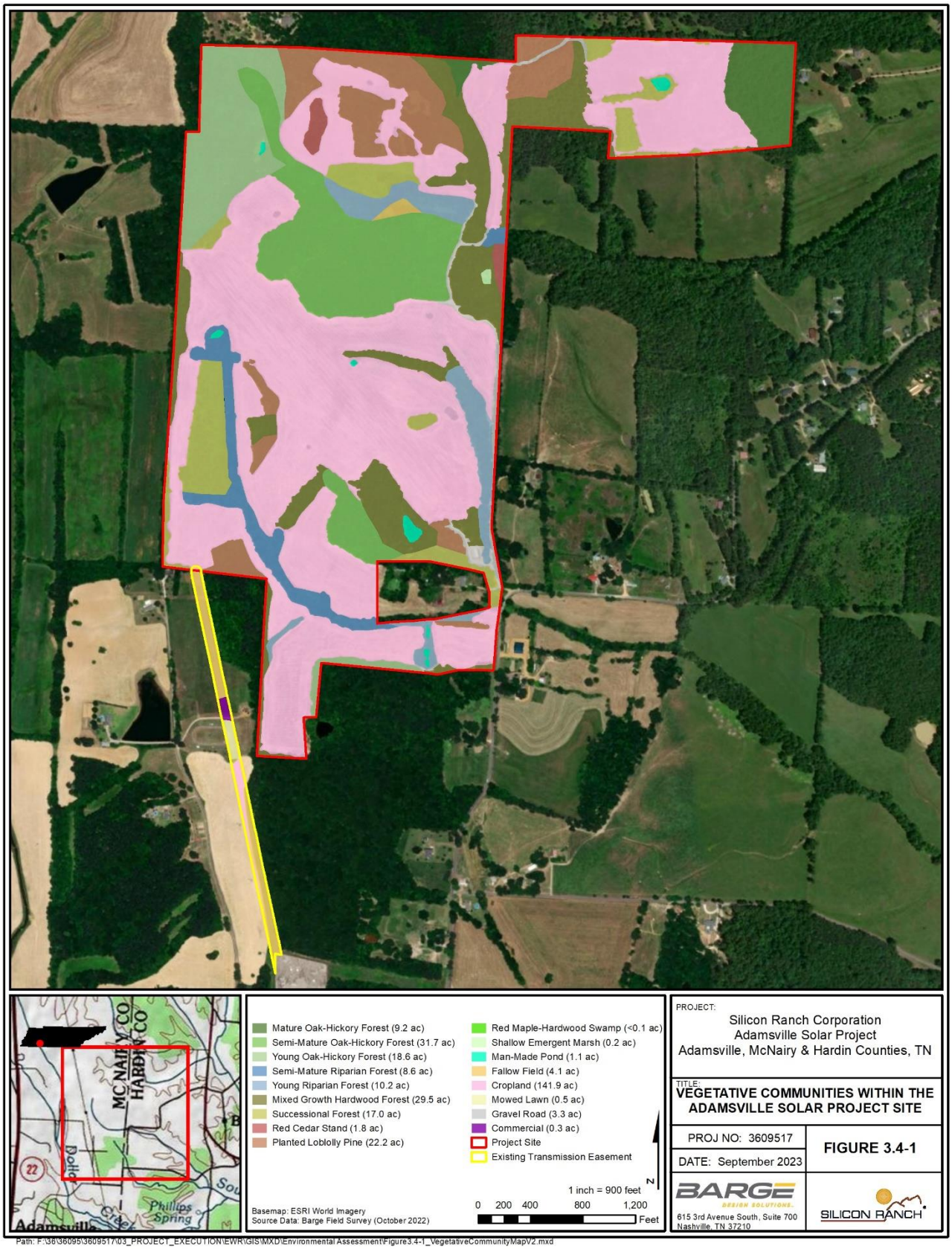

Figure 3.4-1. Vegetation Communities Within the Adamsville Solar Project Site

Table 3.4-1. Observed Wildlife within the Project Area

Common Name	Scientific Name
Birds	
American robin	*Turdus migratorius*
American crow	*Corvus brachyrhynchos*
American goldfinch	*Spinus tristis*
Barred owl	*Strix varia*
Barn swallow	*Hirundo rustica*
Blue jay	*Cyanocitta cristata*
Brown Thrasher	*Toxostoma rufum*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cooper's hawk	*Accipiter cooperii*
Dark-eyed junco	*Junco hyemalis*
Downy woodpecker	*Dryobates pubescens*
Eastern bluebird	*Sialia sialis*
Eastern towhee	*Pipilo erythrophthalmus*
Eastern phoebe	*Sayornis phoebe*
European starling	*Sturnus vulgaris*
Field sparrow	*Spizella pusilla*
Great Horned Owl	*Bubo virginianus*
Green heron	*Butorides virescens*
House finch	*Haemorhous mexicanus*
Louisiana waterthrush	*Parkesia motacilla*
Mourning dove	*Zenaida macroura*
Northern cardinal	*Cardinalis cardinalis*
Pileated woodpecker	*Dryocopus pileatus*
Red-bellied woodpecker	*Melanerpes carolinus*
Red-headed woodpecker	*Melanerpes erythrocephalus*
Red-shouldered hawk	*Buteo lineatus*
Red tailed hawk	*Buteo jamaicensis*
Tufted titmouse	*Baeolophus bicolor*
White-breasted nuthatch	*Sitta carolinensis*
White-throated sparrow	*Zonotrichia albicollis*
Wild Turkey	*Meleagris gallopavo*
Yellow-Belied sapsucker	*Sphyrapicus varius*
Yellow-rumped warbler	*Setophaga coronata*

Common Name	Scientific Name
Mammals	
Eastern chipmunk	*Tamias striatus*
Eastern cottontail	*Sylvilagus floridanus*
Eastern gray squirrel	*Sciurus carolinensis*
Eastern red bat	*Lasiurus borealis*
Evening bat	*Nycticeius humeralis*
Groundhog	*Marmota monax*
White-tailed deer	*Odocoileus virginianus*
Racoon	*Procyonidae lotor*
Red fox	*Vulpes vulpes fulvus*
Nine banded armadillo	*Dasypus novemcinctus*
Coyote	*Canis latrans*
Virginia opossum	*Didelphis virginiana*
Reptiles	
Black racer	*Coluber constrictor*
Eastern box turtle	*Terrapene carolina carolina*
Five-lined skink	*Plestiodon fasciatus*
Ground skink	*Scincella lateralis*
Northern water snake	*Nerodia sipedon*
Amphibians	
American toad	*Anaxyrus americanus*
Gray treefrog	*Hyla versicolor*
Green frog	*Lithobates clamitans*
Northern cricket frog	*Acris crepitans*
Southern leopard frog	*Lithobates sphenocephalus*
Spring peeper	*Pseudacris crucifer*
Upland chorus frog	*Pseudacris feriarum*
Invertebrates	
Cloudless sulfur	*Phoebis sennae*
Monarch butterfly	*Danaus plexippous*

Migratory Birds

The USFWS Information for Planning and Conservation (IPaC) Trust Resource website was evaluated for migratory bird species potentially present within the Project Site (USFWS, n.d.). The results are included in Appendix A.

The USFWS IPaC noted a lack of potential presence of migratory bird species of conservation concern within the project area. However, several migratory birds were observed during the October 2022 site inspection. Some of the observed migratory bird species identified within the forested and riparian environments of the Project Site include the yellow-rumped warbler (*Setophaga coronata*) and Louisiana waterthrush (*Parkesia motacilla*), and the barn swallow (*Hirundo rustica*) identified within the shrubby and anthropogenic portions of the Project Site. While the presence of these birds could be seasonally biased during the migration season, these birds could also be covered by the MBTA during their respective breeding seasons. The Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGPA) make it illegal to take, possess, import, export, transport, sell, or purchase any migratory bird or the part, nests, or eggs of such birds except under the terms of a valid federal permit.

3.4.1.3 Threatened and Endangered and Other Rare Species

The USFWS IPaC online resource was reviewed for potential presence of federally listed animal and plant species within the Project Site (USFWS, n.d.). Twenty-two species were identified as being potentially present within the Project Site. Sixteen species are currently listed as either threatened or endangered, two species are under review for listing, one species is a candidate for listing, two species are proposed for listing and one species is listed as being part of an experimental population (Table 3.4-2).

Additionally, TVA provided a heritage database query for the Project Site. The search criteria included aquatics (within the HUC boundary for the project), botany (within a 5-mile radius), known caves (within a 3-mile radius), terrestrial zoology (within a 3-mile radius), and natural areas (within a 3-mile radius). The records indicated 17 Tennessee state and/or federally listed species that are either deemed in need of management, threatened, or endangered. Of the 17 listed species on the TVA heritage database query, 10 overlapped with the USFWS IPaC review. Additionally, the heritage database query identified one natural area present within 3-miles of the project study area. Therefore, 25 state and federally listed species are listed as potentially occurring within the project area. The preliminary USFWS IPaC Resource List and the TVA heritage database query summary are provided in Appendix A.

Mammals

Suitable summer roosting habitat for the NLEB (*Myotis septentrionalis*) and foraging habitat for the gray bat (*Myotis grisescens*) was noted during the field inspection. More than 50 potential roost trees were observed and documented within the wooded portions of the Project Site (Figure 3.4-1). Furthermore, state threatened and federally proposed endangered tricolored bat (*Perimyotis subflavus*) (TCB) could potentially utilize the forested areas where there are live and dead leaf clusters of live or recently dead deciduous hardwood trees throughout the Project Site for summer roosting.

No suitable caves or potential hibernacula sites for all the federally listed bat species were observed within the Project Site. Due to the lack of caves within the Project Site and known caves within a 3-mile radius of the site, roosting habitat for gray bat (*Myotis grisescens*) is not anticipated.

Northern Long-eared bat

The NLEB is federally threatened. It can occur throughout Tennessee and 36 other states from New England to the Midwest. This bat hibernates in caves and mines in the winter and feeds and roosts in forested areas in the summer. NLEBs eat a wide range of insects and some spiders.

Tricolored bat

The tricolored bat is a candidate endangered species. The TCB occurs in every state east of the Mississippi River and the midwestern states including Texas. An opportunistic feeder, it prefers small insects. This bat hibernates in caves and mine in cooler states but may be found in culverts, tree cavities, and abandoned water wells in its southern range. During the summer it roosts in among live and dead leaf clusters of live or recently dead deciduous hardwood trees.

Table 3.4-2 Listed Species Potentially Within the Project Area

Common Name	Species	State Status	Federal Status	Habitat Type	State Rank	Habitat Present	Observed
	Mammal						
Gray bat	*Myotis grisescens*	Endangered	Endangered	Year-round resident in caves which mature females will roost in. During the summer months males and non-maternal females will utilize forested areas or anthropogenic resources.	S2	Yes (foraging habitat)	No
Northern long-eared bat	*Myotis septentrionalis*	Endangered	Threatened	Hibernates during winter in caves, or occasionally in abandoned mines. Summer roosting season in late spring and summer months. Females will roost on trees with exfoliating bark, and/or trees with cracks, crevices, and hollows. Will rarely roost in barns or other similar shed-like structures.	S1S2	Yes (summer roosting and foraging)	No
Tricolored bat	*Perimyotis subflavus*	Threatened	Proposed Endangered	Hibernates during winter in caves, or occasionally in abandoned mines. Summer roosting season in late spring and summer months. Females will roost in leaf clusters in living or dead trees, as well as utilize cavities in living or dead trees and anthropogenic structures.	S2S3	Yes (summer roosting and foraging)	No
	Birds						
Whooping Crane	*Grus americana*	Not Listed	Experimental Population, Non-Essential**	Breeds in freshwater marshes and prairies. Uses grain fields, shallow lakes and lagoons, and saltwater marshes on migration and in winter.	-	Yes	No
	Fish						
Highfin carpsucker	*Carpiodes velifer*	Deemed Need of Management	Not Listed	Known to inhabit medium to large rivers, mostly in Tennessee River drainage.	S2Se	No	No
Flame chub	*Hemitremia flammea*	Deemed Need of Management	Not Listed	Springs and spring-fed streams with lush aquatic vegetation; Tennessee	S3	No	No

Common Name	Species	State Status	Federal Status	Habitat Type	State Rank	Habitat Present	Observed
				and middle Cumberland River watersheds.			
Blue sucker	*Cycleptus elongatus*	Threatened	Not Listed	Swift waters over firm substrates in big rivers, known to occur in the Tennessee River drainage.	S2	No	No
	Reptiles						
Alligator Snapping Turtle	Macrochelys temminckii	Threatened	Proposed Threatened	Occurs in deep water of rivers, sloughs, oxbows, swamps, and lakes	S2S3	Yes	No
	Crayfish						
Hardin crayfish	*Orconectes (Faxonius) wrighti*	Endangered	Under Review	Small-medium sized streams with cobble-sand substrates, under rocks or in leaf litter; western tributaries of the Tennessee River in Hardin and McNairy Counties.	S2	No	No
	Mollusk						
Spectaclecase	*Margaitafera (Cumberlandia) monodonta*	Endangered	Endangered	Large rivers in firm mud, beneath rock slabs, between boulders, and under tree roots. Known to inhabit the Tennessee River drainage.	S2S3	No	No
Fanshell	*Cyprogenia stegaria*	Endangered	Endangered	Medium to large streams and rivers with coarse sand and gravel substrates; Cumberland and Tennessee River systems.	S1	No	No
Cracking pearlymussel	*Hemistena lata*	Endangered	Endangered	Medium-sized rivers of moderate current, deeply buried in mud, sand, gravel, and cobble substrates; Tennessee and Cumberland River systems.	S1	No	No
Pink mucket	*Lampsilis abrupta*	Endangered	Endangered	Large rivers, prefers sand-gravel or rocky substrates with moderate to strong current; Tennessee and Cumberland River systems.	S2	No	No
Ring pink	*Obovaria retusa*	Endangered	Endangered	Large rivers in gravel and sand bars; Tennessee and Cumberland River watersheds; many historic locations currently inundated.	S1	No	No
White wartyback	*Plethobasus cicatricosus*	Endangered	Endangered	Presumed to inhabit shoals and riffle in large rivers; Tennessee and Cumberland River systems. Very rare and possibly extirpated in TN.	S1	No	No
Orangefoot pimpleback	*Plethobasus cooperianus*	Endangered	Endangered	Large rivers in sand-gravel-cobble substrates in riffles and shoals in deep flowing water; Cumberland and Tennessee River systems.	S1	No	No

Common Name	Species	State Status	Federal Status	Habitat Type	State Rank	Habitat Present	Observed
Sheepnose	*Plethobasus cyphyus*	Endangered	Endangered	Large to medium-sized rivers, in riffles and coarse sand/gravel substrate; Tennessee and Cumberland River systems.	S2S3	No	No
Clubshell	*Pleurobema clava*	Endangered	Endangered	Small to medium-sized rivers and streams; deeply buried in sand/fine gravel or in clean, coarse sand/gravel runs; lower Cumberland and Tennessee Rivers.	SH	No	No
Rough pigtoe	*Pleurobema plenum*	Endangered	Endangered	Medium to large rivers in sand, gravel, and cobble substrates of shoals; Tennessee and Cumberland River systems.	S1	No	No
Slabside pearlymussel	*Pleuronaia dolabelloides*	Endangered	Endangered	Large creeks to moderate sized rivers, in riffle/shoals of sand, fine gravel, and cobble substrates with moderate current; Tennessee River watershed.	S2	No	No
Shortspire hornsnail	*Pleurocera curta*	Not listed	Under Review	Prefer large rivers and are primarily found on gravel, cobble, bedrock, and mud in moderate currents.	N/A	No	No
Rabbitsfoot	*Quadrula cylindrica*	Not Listed	Threatened	Small to medium sized rivers of moderate current with clear, relatively shallow water and a mixture of sand and gravel substrates.	N/A	No	No
			Insect				
Monarch butterfly	*Danaus plexippus*	Not Listed	Candidate	Fallow fields or prairies with a presence of milkweed (*Asclepias spp.*) host plants for larval development.	N/A	Yes	Yes
	Plant						
Price's potato-bean	*Apios priceana*	Endangered	Threatened	Thrives in open, wooded areas, often in forest gaps or along forest edges. Prefers mesic areas in open, low areas near streams or along the banks of streams and rivers. Grows in well-drained loams over limestone on rocky, sloping terrain.	S3	No	No
Whorled sunflower	*Helianthus verticillatus*	Endangered	Endangered	Grows in remnant prairie or woodland sites, as well as along roadsides, railroad tracks, and agricultural fields in moist soil.	S1	Yes	No

Bat Habitat

The quality of bat habitat within the Project Site was based on the density and maturity of the woodland. It was also based on the presence of potential bat roost trees and their location within the surrounding woodland. A bat habitat quality assessment was conducted following federal guidance in the Range-wide Indiana Bat & Northern Long-eared Bat Survey Guidelines (USFWS, 2023). Bat biologists categorized forested areas as being good, marginal, and poor bat habitat. A detailed discussion of the bat habitat type and quality is provided in Appendix A, Summary of the Environmental Features for the Adamsville Solar Project.

Potential roost trees were also rated on a similar scale. Each tree was rated on its sheltering habitat quality, proper solar exposure, obstructions for traveling in and out of the sheltered area, and its height above the forest floor. For example: a shagbark hickory, or dead tree, with many deep cracks and crevices, with little to no obstructing vines, and some solar exposure will be rated as “good,” whereas a “poor” potential roost tree could be a younger shagbark hickory, or dead tree, with shallow crevices and/or woodpecker holes, multiple obstructing vines, and little to no solar exposure.

The Project Site has approximately 148.8 acres of forested land. Within the 148.8 acres, there are multiple forested vegetative communities that were categorized on quality to provide suitable bat roosting habitat. These forested vegetative communities include mature, semi-mature, and young oak-hickory forest, mixed-growth hardwood forest, semi-mature and young riparian forest, successional forest, and planted stands of loblolly pine and red cedar. Additionally, more than 50 bat roost trees were identified within and immediately adjacent to the Project Site. These potential bat roost trees were observed as exfoliating bark on shagbark hickory trees, dead snags or stands, or cracks and crevices in living trees.

Table 3.4-3 summarizes the acres of good, marginal, and poor bat habitat. In total, 29.4 acres of the Project Site were rated as good, 41.2 acres were rated marginal, and 78.2 acres were rated as poor bat habitat (Table 3.4-3). The data forms for each forested vegetative community and its potential for bat habitat within the Project are provided in Appendix H of the Summary of the Environmental Features for the Adamsville Solar Project (Appendix A of this EA).

Table 3.4-3 Good, Marginal, and Poor Bat Habitat by Forest Type

Habitat type	Good (Acres)	Marginal (Acres)	Poor (Acres)
Mature oak-hickory	9.2	0	0
Semi-mature oak-hickory	20.2	11.6	0
Young oak-hickory	0	0	18.6
Mixed-growth hardwood	0	21	8.5
Red cedar stand	0	0	1.7
Semi-mature riparian	0	8.6	0
Young riparian	0	0	10.2
Successional	0	0	17
Planted loblolly pine	0	0	22.2
Totals	29.4	41.2	78.2

From May 20-24, 2023, certified biologists conducted a mist net survey according to the 2023 Range-Wide Indiana Bat and Northern Long-eared Survey Guidelines. The survey was conducted at 4 net sites for 20 net-nights to effectively survey the forested area within the Project Site.

A total of nine bats were captured during the survey effort. Bat species captured included eight eastern red bats (*Lasiurus borealis*) and one evening bat (*Nycticeius humeralis*). Five of the eight red bats were pregnant. No threatened or endangered bats were captured during survey efforts. The bat mist-net survey report and field data sheets are included in Appendix A.

Birds

The whooping crane (*Grus americana*) is federally listed as an endangered species wherever found, except where listed as a non-essential experimental population, such as within Tennessee. The last surviving wild population of this species migrates between Texas and Canada, but a non-essential experimental population migrates between summer breeding grounds in Wisconsin and wintering grounds in Florida, traveling directly through Tennessee. Migrating whooping cranes prefer to roost in shallow, freshwater wetlands and will sometimes venture into croplands to feed. While unlikely, especially due to the low number of surviving individuals of this species, the project study area does contain large areas of pastureland and West Fork Mulberry Creek that migrating whooping cranes could potentially utilize as a stopover point for feeding. However, the wetlands and other streams are likely too small to provide suitable temporary habitat for migrating members of this species.

Aquatic Organisms

TVA biologists conducted an aquatic survey of the perennial streams on the Project Site. Prior to visiting the Project Site, a desktop survey was conducted using existing natural heritage data, existing knowledge of the distribution of aquatic fauna and their preferred habitats, existing hydrologic data, and aerial imagery to analyze the proposed Adamsville Solar site. The onsite survey targeted perennial streams that were qualitatively surveyed for potential habitat for aquatic fauna.

Most streams were already in poor shape at Adamsville due to ongoing poor agricultural practices. The Hardin crayfish (*Faxonius wrighti*) is a Tennessee state endangered species that occurs in Beason Creek. Stratton Branch, which begins in the Project Site, flows into Beason Creek. Qualified TVA biologists opportunistically sampled suitable habitat for *Faxonius wrighti,* but no individuals were encountered onsite. Table 3.4-3 provides a list of the fish and crayfish species observed during the visit. None are state or federally listed species.

The alligator snapping turtle (*Macrochelys temminckii*) is listed as a federally proposed threatened species and a state threatened species and known to occur within slow moving, deep waters of rivers, sloughs, oxbows, swamps, and lakes in middle and west Tennessee. Based on the October 22 and August 2023 site inspections, only one perennial stream and seven farm ponds were delineated within and immediately adjacent to the project study area. However, the perennial stream was documented to lack deep water, sloughs, or adjacent oxbows to provide suitable habitat for alligator snapping turtle.

Insects

The monarch butterfly (*Danaus plexippus*), a candidate species for listing by USFWS, was observed throughout the Project site. Additionally, milkweed (Asclepias spp.), where this species lays its eggs, was observed sporadically along agricultural field and farm pond margins. While no eggs or larvae were observed, it is possible that this species could potentially reproduce within the Project Site.

Table 3.4-4. Aquatic Species Observed at Adamsville Solar

Species	Location	County	State
Fishes			
Lepomis cyanellus	Stratton Branch	Hardin	Tennessee
Semotilus atromaculatus	Stratton Branch	Hardin	Tennessee
Fundulus notatus	Stratton Branch	Hardin	Tennessee
Etheostoma proeliare	Unnamed tributary to North Fork Beason Creek	Hardin	Tennessee
Erimyzon oblongus	Unnamed tributary to North Fork Beason Creek	Hardin	Tennessee
Lepomis cyanellus	Unnamed tributary to North Fork Beason Creek	Hardin	Tennessee
Semotilus atromaculatus	Unnamed tributary to North Fork Beason Creek	Hardin	Tennessee
Crayfishes			
Cambarus striatus	Stratton Branch	Hardin	Tennessee
Procambarus acutus	Unnamed tributary to North Fork Beason Creek	Hardin	Tennessee

Source: TVA Aquatic T&E Species Technical Report

Plants

State and federally listed Price's potato bean (*Apios priceana*) and whorled sunflower (*Helianthus verticillatus*) are listed on the USFWS IPaC review for the Project Site. Price's potato bean prefers well-drained loams over limestone on rocky, sloping terrain, and the whorled sunflower prefers open prairies and will grow alongside roads, railroad tracks, agricultural fields, and transmission

easements. Due to a lack of limestone and rocky, sloping terrain habitat being observed during the October 2022 site inspection, Price's potato-bean is not anticipated to be within the Project Site.

The Project Site did include an existing transmission easement and many margins along agricultural fields, indicating that suitable habitat for the whorled sunflower does occur within the Project Site. As a result, a TVA-approved botanist surveyed the Project Site on September 17 and 18, 2022, for the whorled sunflower during the flowering season. The results of the survey did not find any whorled sunflowers within the Project Site (Appendix A).

Based on the field investigations, the bat mist-net survey, and the whorled sunflower survey, no state or federal listed species were observed within the Project Site.

3.4.2 Environmental Consequences – Biological Resources

This section describes the potential impacts to biological resources under the No Action and Proposed Action Alternatives.

3.4.2.1 No Action Alternative

Vegetation

Under the No Action Alternative, the Project would not be constructed and there would be no impacts to the existing vegetation in what would have been the Project Site. It is assumed that active farming, on the Project Site would continue and the forested areas would not be disturbed. Any agricultural or pastureland that became fallow would transition gradually from open grassland, shrubs, and young trees to a successional hardwood forest, and eventually to an oak-hickory or mixed-growth hardwood forest as described in Section 3.4.1.1. No indirect impacts to vegetation are anticipated.

Wildlife

Because agricultural activity is likely to continue if the Project is not constructed, the status of wildlife would not noticeably change. Farming activities would continue thus limiting new wildlife habitat from developing. The existing forested communities would continue to provide habitat for wildlife known to utilize these habitats as described in Section 3.4.1.2. If the land ceases to be used for agriculture, wildlife appropriate to the successional communities would move into the area. No indirect impacts to wildlife are anticipated.

Threatened & Endangered and Other Rare Species

Under the No Action Alternative, existing land uses will continue and there should be no direct or indirect impacts to T&E or other rare species. Ongoing farming activity is not conducive to supporting T&E and other rare species. Any agricultural or pastureland that became fallow would undergo a series of successional changes. During these changes, some habitat favorable to T&E and other rare species may develop. No indirect impacts to T&E species are anticipated.

3.4.2.2 Proposed Action

Vegetation

Under the Proposed Action, approximately 99.5 acres of agricultural land and 116 acres of forested land of the 295-acre Project Site would be required for the site's development. Due to ongoing agricultural practices, species diversity is low with the highest areas of diversity being the forested areas. Following construction of the solar facility, the remaining Project Site would be maintained to

prevent vegetation from growing above panel height. Creation of a grassland community maintained at a level below the panel height surrounding the solar panels is viewed as a positive change from agricultural land for wildlife.

Considering the amount of forested land in the area, both regionally and locally, clearing approximately 116 acres of trees would be regarded as minimal and have insignificant direct impacts. The surrounding area consists of similar vegetation communities, and the effects of the conversion of open land with areas maintained for hunting would be relatively small. Following construction, the solar facility will be maintained to prevent vegetation from growing above the panel height, converting some woody dominated vegetation communities to herbaceous species, and maintaining some open, cleared areas.

No adverse impact to unique vegetation communities is anticipated. Vegetation impacts would be further reduced as revegetation of the site would be accomplished using native and/or noninvasive species. Disturbed areas would be seeded post-construction using a mixture of certified weed-free, low-growing native and/or non-invasive grass seed obtained from a reputable seed dealer and in compliance with the requirements established by the local office of the NRCS. The Proposed Action would not significantly contribute to the spread of exotic or invasive species.

BMPs and appropriate erosion controls would be used as needed to minimize exposure of soil and limit erosion of soil from the Project Site. Disturbed areas would be seeded and stabilized post-construction. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas has become well-established and soil stabilized.

No indirect impacts to vegetation are anticipated. Much of the land to be disturbed for this project is agricultural land that does not have any unique vegetation or genetic qualities. Thus, no indirect impacts to the native and/or non-invasive vegetation in the region is anticipated from the conversion of 99.5acres of agricultural land to herbaceous land. Creation of a grassland community maintained at a level below the panel height surrounding the solar panels is viewed as a positive change from agricultural land for wildlife.

Wildlife

Overall, direct impacts on wildlife would be minor and insignificant. Wildlife present at the time of construction would be impacted, particularly when heavy machinery is used for vegetation clearing and driving piles. This machinery would result in the displacement of any wildlife (primarily common, habituated species) currently using the area. Direct effects to some individuals may occur if those individuals are immobile during the time of habitat removal. These effects would be more likely to occur if activities took place during breeding/nesting seasons or winter hibernation periods when animals are immobile in shallow burrows.

During construction habitat removal would likely disperse mobile wildlife into surrounding areas to find new food sources and shelter sources and reestablish territories. Upon completion of the Project, the site will be revegetated using a mixture of certified weed-free, low-growing native grass seed obtained from a reputable seed dealer and in compliance with the requirements established by the local office of the NRCS. Wildlife able to use this type of habitat is expected to return to the site upon completion of Proposed Action if they can access the site. Impacts to migratory bird species of conservation concern observed onsite would not occur if vegetation is removed during the winter tree clearing season (October 15 to March 31).

Approximately 46.6 acres of habitat is not proposed for development and would be available for wildlife use. Due to the amount of similarly suitable habitat in areas immediately adjacent to the

Project Site, populations of common wildlife species likely would not be impacted by the Proposed Action.

Some indirect impacts are expected. These impacts include loss of habitat to species migrating through the area that may not be there during construction but could return to the area upon migration only to find the habitat is no longer there.

Threatened & Endangered and Other Rare Species

Under the Proposed Action, federally listed T&E species are unlikely to be significantly affected. No currently federally listed species were observed during field surveys on or in the immediate vicinity of the Project Area. One insect, the monarch butterfly, is federally listed as a candidate species and was observed in the Project Site. This species was observed throughout the Project site. Additionally, milkweed (*Asclepias spp*.), where this species lays its eggs, was observed sporadically along agricultural field and farm pond margins. No eggs or larvae were observed. Roosting habitat for the NLEB, and the candidate TCB are present within the Project Site; however, no individuals of the two species were captured during the presence/absence mist-net survey performed per federal guidance. Some potential bat habitat will be lost. Of the approximate148.8 acres of potential summer roosting habitat for the northern long-eared bat, approximately 26.0 acres of good, 35.8 acres of marginal, and 54.0 acres of poor bat habitat will be removed. Tree clearing would be conducted only during the winter window (October 15 – March 31) when federally and state listed bats, as well as the TCB, are not present. Thus, implementing the Proposed Action will not adversely impact these species.

While it is unknown whether whooping cranes utilize the project study area as a stopover point during migration, the site does occur in the center of the documented migration route for the Wisconsin-Florida population. No evidence of the species was observed during the March 2023 site investigation, and it is likely that whooping cranes would prefer to utilize the large wetlands and neighboring croplands along the Tennessee River to the east. Since the population that migrates through Tennessee is listed as a non-essential experimental population, individuals are treated as a threatened species on National Wildlife Refuge and National Park land but as a proposed species on private land. However, whooping cranes are still entitled to protections under the Migratory Bird Treaty Act (MBTA) and state laws. Due to the unlikely nature of whooping cranes utilizing the project study area as a stopover site during migration, development of the site would likely cause little to no adverse impacts to the species.

Consultation with USFWS under Section 7 of the Endangered Species Act is underway. Due to probable absence of the NLEB and TCB bats as determined by mist net survey efforts, TVA has determined that the proposed actions may affect, but are not likely to adversely affect to the NLEB. For similar reasons, TVA has determined that proposed actions would not jeopardize the continued existence of the tricolored bat. Due to the lack of impacts to potential roosting habitat and lack of captures during mist-net surveys, TVA has also determined that the proposed actions may affect but are not likely to adversely affect the gray bat.

No other state or federal listed species in Table 3.4-2 were observed within the Project Site. The aquatic T&E species survey did not find any state or federal listed species. Thus, the Proposed Action will not adversely impact any of these species.

3.5 VISUAL RESOURCES

This section provides an overview of existing visual resources within and surrounding the Adamsville Project Site and potential impacts to visual resources that would be associated with the Proposed Alternative and No Action Alternative and how visual impacts will be addressed.

Visual resources are the characteristics of a place, both natural and man-made, that give a particular landscape its character and aesthetic quality. An observer's experience within or near a specific location can be determined by the visual resources surrounding that location. For example, an observer would likely have a much different reaction to viewing a forest than a commercial building complex. What a person sees of the visible environment from a particular vantage point is known as a viewshed. Visual resources are very important to people living in and travelling through an area. For this project, seeing solar panels replace agricultural land can trigger feelings that can be positive or negative depending on the individual's perspective.

3.5.1 Affected Environment – Visual Resources

The Project Site, located in McNairy and Hardin Counties, is approximately 1.5 miles northeast of the City of Adamsville. The land is mostly flat with a few small gently rolling hills. The Project Site is mostly agricultural land with some forested areas. The surrounding land is mostly agricultural land, some forested areas, and scattered rural residences. The existing TL traverses the edge of an agricultural field.

Two public roads, Woods Road and Arena Lane, provide access to the Project Site. The viewsheds constitute an almost completely agricultural setting. Man-made attributes include homes on adjoining properties and the existing PEC TL and North Adamsville substation. There are no retail businesses, commercial buildings, or industrial sites adjacent to the Project Site.

Figure 3.5-1 shows the locations of representative viewsheds from two vantage points along Woods Road and two along Arena Lane (Photos 3.5-1 to 3.5-4). The photos show the agricultural features of the Project Site and surroundings. Because no panels or the switchyard can be seen for either public road, the views in Photos 3.5-1 to 3.5-4 will not change except for the naturally occurring changes in forested areas and the planting and harvesting of crops over the year.

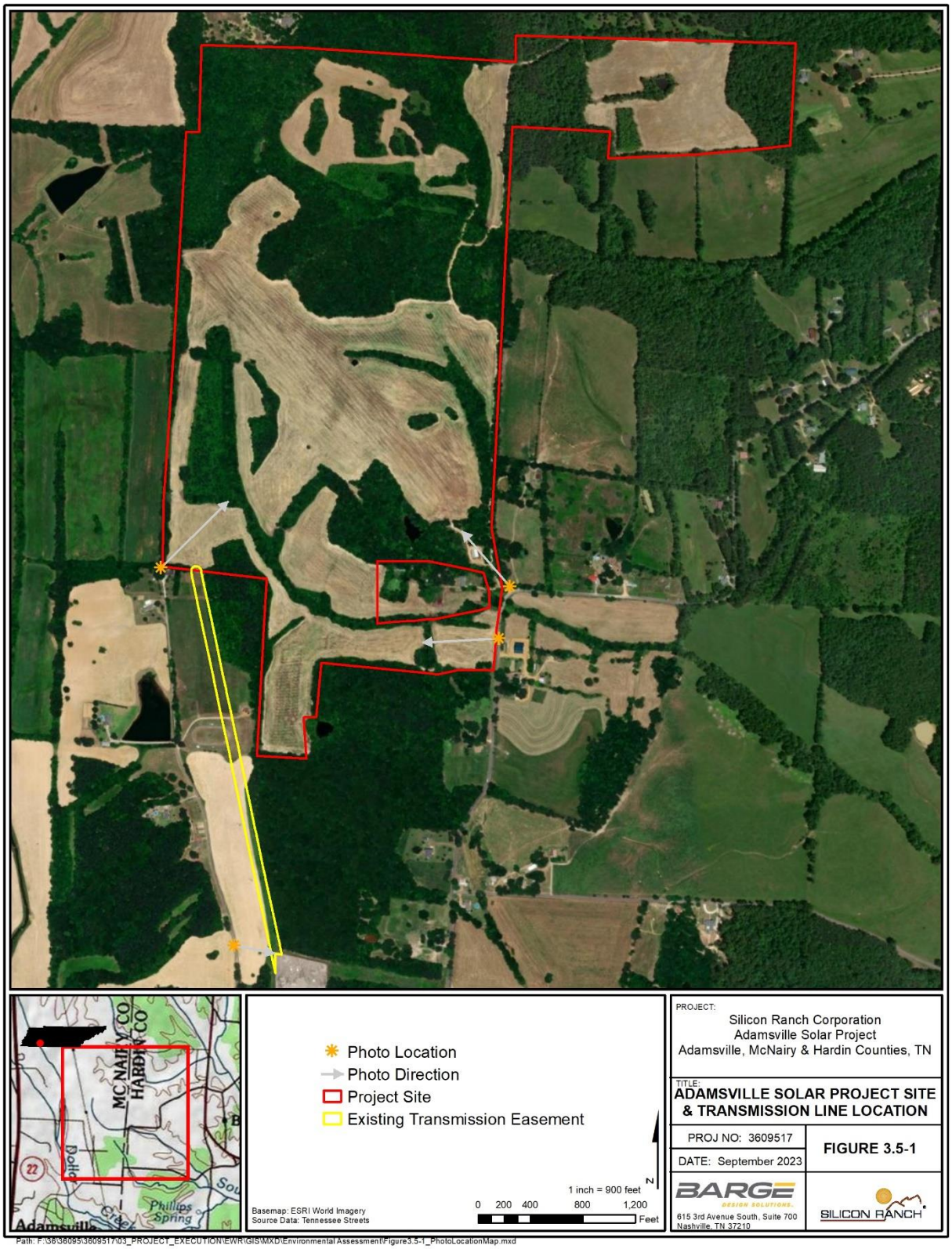

Figure 3.5-1. Photo Locations

Photo 3.5-1. Access Point to Project Site (dirt road branching to the right).

Photo 3.5-2. Agricultural field on Project Site. No panels planned for the visible area.

Photo 3.5-3. PEC Transmission Line and North Adamsville Substation

Photo 3.5-4. Agricultural field with PEC Transmission Line and forested area in the distance

3.5.2 Environmental Consequences – Visual Resources

This section describes the potential impacts to visual resources should the No Action or the Proposed Action Alternatives be implemented. For this analysis, the construction and operation phases are treated separately as construction would be temporary and have different visual impacts from the longer-term operation phase.

3.5.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be built and there would be no project-related changes to the area's visual character. Existing views and land use would be expected to remain unchanged except for any naturally occurring changes in the viewshed.

3.5.2.2 Proposed Action

The Proposed Action Alternative would result in installing approximately 74,682 individual solar panels arranged over roughly 171 acres on the 295-acre site. At full extension, these panels are roughly 10 feet in height, depending on grade. As a result, there will be visual impacts.

Construction on the Project Site would convert farmland to commercial/industrial land use and alter the visual character of the Project Site. Heavy machinery would be present during construction and would change the visual characteristics from vantage points surrounding the Project Site. In areas where grading would be necessary, changes to the ground surface's contour, color, and texture would be visible. ECDs such as silt fences would likely be visible from the properties adjacent to the Project Site. Visual impacts from construction would be minimal at night since most construction is anticipated to occur during the day. Erosion control silt fences and sediment traps would be removed once construction is complete, and the site has been stabilized.

During construction additional traffic would be seen on Wood Road. There would be minor temporary direct and indirect impacts to visual resources during the construction phase of the Proposed Action. Currently, there are no plans to access the Project Site from Arena Lane. Under the current project layout, no panels or the chain link fence surrounding the panels will be visible from the public roads or nearby residences. A few panels and some fence may be visible from part of the inholding property that is surrounded by the Project site. Overall, the visual alteration to a solar facility is anticipated to result in no direct adverse glare impacts along the existing roads and nearby residences.

Overall, there would be minor temporary direct and indirect impacts to visual resources during the construction and operation phases of the Proposed Action. During the operation phase of the Proposed Action, there would be no direct or indirect visual impacts from the panels as none would be visible from the public roads and all but one residence. Photo 3.5-5 shows typical solar panel arrays.

Photo 3.5-5. Single-axis, tracking photovoltaic system with panels close to maximum tilt

3.6 NOISE

This section provides an overview of the existing ambient sound environment in the Project Site, and the potential impacts to the ambient sound environment that would be associated with the Proposed Action and No Action Alternatives.

3.6.1 Affected Environment – Noise

Noise is generally described as unwanted sound, based on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is typically measured by decibels (dB), which expresses the ratio of one value of a physical property to another on a logarithmic scale. The weighted decibel, dBA, expresses loudness perceived by the human ear. A day-night average sound level of 55 dBA is commonly used as a threshold level for noise levels which could result in adverse impacts, and prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas (USEPA, 1974). The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dBA.

For point of reference, approximate noise levels (measured in dBA) of common activities/events are provided below.

- 0 dBA - the softest sound a person can hear with normal hearing
- 10 dBA - normal breathing

- 20 dBA - whispering at 5 feet
- 30 dBA - soft whisper
- 50 dBA - rainfall
- 60 dBA - normal conversation
- 110 dBA - shouting in the ear
- 120 dBA - thunder

The magnitude and frequency of environmental noise may vary considerably over the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetation cover. Noise levels occurring at night generally produce a greater annoyance than do the same levels occurring during the day. It is generally agreed that people perceive intrusive noise at night as being 10 dBA louder than the same level of noise during the day. This perception is largely because background environmental sound levels at night in most areas are about 10 dBA lower than those during the day.

3.6.1.1 Noise Regulations

The Noise Control Act of 1972 and its subsequent amendments delegate authority to the states to regulate environmental noise. It also directs government agencies to comply with local community noise statutes and regulations. McNairy and Hardin Counties have no federal, state, or local regulations for community noise. Further, because McNairy and Hardin Counties do not enforce zoning, there are no local noise ordinances that apply to the county.

USEPA guidelines recommend that the day-night average sound level (DNL) not exceed 55 dBA for outdoor residential areas (USEPA, 1974). This guidance is not a regulatory requirement. It is a recommendation considered sufficient to protect the public from adverse noise in typical outdoor and residential areas.

3.6.1.2 Background Noise Levels

Noise levels are variable depending on location and time of day. As sound is generated at a source and spreads out, the level of sound diminishes. Additional factors such as wind, climatic conditions, and vegetation can influence sound levels. An individual's sound exposure is determined by measurement of the noise that the individual experiences over a specified time interval.

Typical background day/night noise levels for rural areas range between 35 and 50 dBA. Noise levels are locally higher when farm equipment is in operation. Higher-density residential and urban areas' background noise levels range from 43 dB to 72 dB (USEPA, 1974). Background noise levels greater than 65 dBA can interfere with normal conversation, watching television, using a telephone, listening to the radio, and sleeping.

The Project Site is agricultural and forested area, with a few residences. There are no businesses or commercial noise generating facilities near the Project Site. Ambient noise at the Project Site consists mainly of agricultural, transportation, rural, and natural sounds (e.g., farming equipment, moderate traffic, moderate voice, wind, wildlife, and similar sounds). Generally, noise levels in these types of areas range from 45 to 55 dBA. Noise from businesses in the Town of Adamsville is not detectable at the Project Site.

Approximately 40 structures (residences, barns, and other structures) are within a half-mile of the Project Site boundary. Three residences closest to Project are approximately 210, 215, and 325 feet from the fence line enclosing the panels and there is forested area between the residences and the fence line.

3.6.2 Environmental Consequences – Noise

This section describes the potential impacts to the ambient sound environment should the Proposed Action or No Action Alternative be implemented.

3.6.2.1 No Action Alternative

Under the No Action Alternative, no noise impacts would occur from the construction or operation of the proposed solar facility, Existing land use would remain primarily agricultural land and the project would not result in related changes to noise level. No noise would be generated by the operation of the proposed solar facility. However, indirect impacts to noise levels in the vicinity of the Project Site are possible if the area becomes developed for residential or commercial purposes.

3.6.2.2 Proposed Action

Construction noise would cause temporary and short-term adverse impacts to the ambient sound environment near the Project Site. Nearby residents could experience elevated noise levels caused by construction equipment. Construction equipment typically results in a maximum noise level of 80-90 dBA, dropping to 71-81 dBA at 300 feet, and 50-60 dBA at 1,000 feet. However, most construction-related noise such as delivery trucks, dump trucks, water trucks, service trucks, bulldozers, chain saws, bush hogs, and other large mowers for tree clearing would remain under 65 dBA for nearby residences due to their distance from the sound source. Most of the proposed equipment would not be operating on the site for the entire construction period or at one time but would be phased in and out based on project progress. Typical noise levels of construction equipment used for construction of Adamsville Solar are provided in Table 3.6-1 (USDOT, 2006).

The construction work associated with pile driving would be the loudest and occur intermittently during daylight hours. However, except for short periods of time for three residences, most pile driving will occur at distances greater than 500 feet and there is a forested buffer between the residences and the pile driving. Therefore, impacts to noise due to pile driving would be minimal. Construction of the switchyard in the southwest portion of the Project Site would have similar impacts on noise levels.

Work would occur Monday through Saturday from 7 am to 5 pm. Construction workers would wear appropriate hearing protection in accordance with the Occupational Safety and Health Administration (OSHA) regulations.

Table 3.6-1 Possible Construction Equipment Noise Levels

Equipment Description	Impact Device?	Acoustical Usage Factor (%)	Spec. 721.560 L_{max} @ 50 feet (dBA, slow)	Actual Measured L_{max} @ 50 feet (dBA, slow) (Samples Averaged)	Number of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	N/A	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	N/A	0
Blasting	Yes	N/A	94	N/A	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	N/A	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS Signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	N/A	0
Grapple (on backhoe)	No	40	85	87	1

Table 3.6-1 Possible Construction Equipment Noise Levels (cont.)

Equipment Description	Impact Device?	Acoustical Usage Factor (%)	Spec. 721.560 L_{max} @ 50 feet (dBA, slow)	Actual Measured L_{max} @ 50 feet (dBA, slow) (Samples Averaged)	Number of Actual Data Samples (Count)
Horizontal Boring Hydraulic Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	N/A	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact Hammer (hoe ram)	Yes	20	90	90	212
Paver	No	50	85	77	9
Pickup Truck	No	40	55	75	1
Pneumatic Tools	No	50	85	85	90
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/Chipping Gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Scraper	No	40	85	84	12
Sheers (on backhoe)	No	40	85	96	5
Slurry Trenching Machine	No	50	82	80	75
Tractor	No	40	84	N/A	0
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

Following completion of the solar facility, the ambient sound environment is anticipated to return to existing noise levels or below by eliminating some of the seasonal use of agricultural equipment. The proposed inverters would produce minimal noise for residences more than 1,000 feet from the proposed inverters. A typical inverter, such as a Power Electronics 3510kVA model, has noise levels of less than 79 dB measured at 1 meter from the back of the unit. To avoid noise impacts, all inverters would be at least 750 feet from any nearby development. Maintenance activities, primarily mowing, would result in noise periodically; however, this noise would be similar to existing noises near the Project Site.

Overall noise impacts resulting from the Proposed Action Alternative would be temporary and minimal for residents living in proximity to the Project Site during construction, operation, and maintenance of the solar facility. No indirect noise impacts are anticipated.

3.7 AIR QUALITY AND CLIMATE CHANGE

This section describes an overview of existing air quality and GHG emissions within the Project Site and the potential impacts on air quality and GHG emissions that would be associated with the Proposed Action and No Action Alternatives.

3.7.1 Affected Environment – Air Quality and Climate Change

Air Quality Standards

The Clean Air Act (CAA), first enacted in 1963, and amended several times, regulates air emissions from stationary and mobile sources. The CAA also required USEPA to set National Ambient Air Quality Standards (NAAQS) for six principal pollutants known as "criteria" air pollutants: sulfur dioxide (SO_2), ozone (O_3), nitrogen dioxide (NO_2), particulate matter whose particles are less than or equal to 10 micrometers (PM10), particulate matter whose particles are less than or equal to 2.5 micrometers (PM2.5), carbon monoxide (CO), and lead (Pb) (Table 3.7-1) (USEPA, n.d.-b). These pollutants may be harmful to public health and the environment. Further, the CAA established two types of national ambient air quality standards. Primary standards are designed to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. The secondary standards protect public welfare and decreased visibility and damage to animals, crops, vegetation, and buildings (USEPA, n.d.-b). Pollutants are measured in three ways: parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic meter of air (µg/m3).

An area can either be in “attainment” meaning the area complies with the NAAQS or “nonattainment” meaning the area exceeds one or more of the six NAAQS. New sources located in or near “nonattainment” areas may be subject to more stringent air permitting requirements. Typically, a state agency must prepare and submit to USEPA a plan for implementation, maintenance, and enforcement for an area that does not meet the NAAQS. EPA Region IV office granted TDEC the authority to implement federal air pollution control regulations promulgated under the Clean Air Act.

Table 3.7-1. National Ambient Air Quality Standards

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.

(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (a) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (b)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

3.7.1.1 Regional Air Quality

The Project Site is in McNairy and Hardin Counties, Tennessee. There are no air quality monitoring sites within 50 miles of the Project Site.

Per the USEPA Tennessee Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants website, McNairy and Hardin Counties, Tennessee, are not listed as having been in nonattainment for any of the NAAQS pollutants since 1992 (USEPA, n.d.-b). Thus, the CAA regulations would not require any further analysis of air quality.

3.7.1.2 Regional Climate

Weather conditions determine the potential for the atmosphere to disperse emissions of air pollutants. McNairy and Hardin Counties' climate is characterized by long, hot, and muggy summers with short, very cold, and wet winters. Spring temperatures range from 40°F to 72°F. Summer temperatures range from 67°F to 90°F with the average temperature being 82°F. Fall temperatures range from 52°F to 73°F, and winter temperatures range from 33°F to 54°F. Precipitation is highest from early December through the end of May (Weather Spark, n.d.). Precipitation averages 58 inches per year including an average of 2 inches of snow (U.S. Climate Data, n.d.). McNairy and Hardin Counties average 205 sunny days (Best Places, McNairy County, n.d.; Best Places, Hardin County, n.d.). In the past year, there have been three days of heat or excessive heat, two days of drought conditions, two days of cold/wind chill, and two days of ice storms (Storm Events Database, n.d.).

3.7.1.3 Greenhouse Gas Emissions

GHGs are chemical compounds in the Earth's atmosphere that trap and convert sunlight into infrared heat. Gases exhibiting greenhouse properties come from both natural and man-made sources. Carbon dioxide, methane, and nitrous oxide are among the most common GHGs emitted from natural processes and human activities.

According to the USEPSA's Overview of Greenhouse Gasses website (USEPA, n.d.-c), carbon dioxide (CO_2) is the main GHG accounting for 79 percent of the GHG emissions in the U.S. in 2020 (USEPA, n.d.-b). Methane (11%), nitrous oxide (7%), and fluorinated gases (3%) comprise the other GHGs. CO_2 is naturally present in the atmosphere, but many scientists believe that the excess CO_2 released by combustion of fossil fuels is dramatically accelerating the release of CO_2 into the atmosphere. Excess CO_2 trapped in the atmosphere absorbs energy from the sun acting as insulation in the stratosphere thereby warming the atmospheric temperature (global warming). Many scientists believe that climate change associated with global warming will produce negative economic and social consequences across the globe through changes in weather (e.g., more intense hurricanes, greater risk of forest fires, flooding).

The impact of global warming is a planet-wide issue. There are many plans to reduce CO_2 in the atmosphere via carbon sequestration. The effectiveness of this varies from country to country. The U.S has reduced CO_2 emissions by approximately 8 percent between 1990 and 2020, methane emissions by 17 percent, and nitrous oxide emissions by 5 percent; fluorinated gasses emissions have increased by 90 percent primarily due to a 28 percent increase in hydrofluorocarbons which are used as a substitute for ozone-depleting substances. (USEPA, n.d.-b). A typical solar panel is estimated to reduce CO_2 emissions by 900 kg of CO_2 per year.

3.7.2 Environmental Consequences – Air Quality and Climate Change

This section describes the potential impacts to climate and air quality should the Proposed Action or No Action Alternatives be implemented.

3.7.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. No project-related impacts to air quality or climate change would occur as the proposed solar facility would not be built. No air pollutants or GHG emissions would be generated by equipment or vehicles from construction or operation of the solar facility. Existing land use would remain an agricultural, forested, and rural residential mix, with little effect on climate and air quality.

3.7.2.2 Proposed Action

Construction

Under the Proposed Action Alternative, minor impacts on air quality would occur during the facility's construction. Only minimal air impacts would be expected, as construction might result in localized dust and fumes from equipment. The construction would likely involve using diesel-powered machinery that would create small amounts of airborne dust and debris. Internal combustion engines' emissions associated with diesel fuels would generate local emissions, including carbon monoxide, nitrogen oxides, and sulfur dioxide during construction (an increase of GHG during construction). Also, during clearing, trees would be burned and result in a minor increase in GHG emissions. The impacts on air quality would be expected to be minimal and short-lived and would remain well below the applicable ambient air quality standard.

Vehicle traffic on internal unpaved haul-roads and soil disturbance may create short-term fugitive dust issues during construction. BMP control and suppression measures, including covered loads and wet suppression, will minimize fugitive dust emissions. In addition, standard erosion control measures, such as redistribution of removed topsoil and reseeding, would minimize the potential for wind erosion.

Trees and other tall vegetation removed during construction to accommodate the panel layout would represent a minor loss of sequestered carbon, as well as potential future carbon sequestration. Emissions from construction would have at most, a minor transient impact on air quality, which would remain well below the applicable ambient air quality standards.

Overall, by implementing BMPs, there will be minor and temporary impacts to air quality. Further, CO_2 emissions produced during construction would not have a measurable impact on GHGs emissions atmosphere. No indirect impacts to air quality or GHGs are anticipated from construction activities.

Operations

The operation of the solar facility would result in minimal impacts due to operation activities such as facility inspections, repairs to panels, and periodic mowing. However, a minor reduction in new GHG emissions is expected as the emissions-free power generated by the solar facility would reduce the need for power that would otherwise be generated in part by fossil fuels. This reduction would result in minor beneficial impacts to air quality (TVA, 2019). The solar facility would be part of the cleaner, lower-emitting generating portfolio described in the 2019 IRP (TVA, 2019). While the reductions in air pollutants and CO_2 emissions attributable to the solar facility would be relatively minor, they would be a component of TVA's projected significant overall reductions, the associated beneficial impacts to air quality, and the reduced impacts from climate change.

No indirect impacts to regional climate are expected during the operational phase. The ground below the modules is shaded, reducing the ground temperature proportionally, and lowering the ambient

air temperature below the array. On a hot sunny summer day, the top side of the panels would be hot to the touch. The heat from the panels may radiate just above the panels (inches) where it cools to ambient temperature. Further, there is no research that suggests the shading below the array or the atmosphere above the array is negatively impacting the community or surrounding environments.

The Proposed Action Alternative would change the surface characteristics somewhat, but it would have little effect on soil permeability and hydrologic characteristics of the developed area. Vegetation would still grow under and around the solar panels, tending to maintain a landscape with significant evapotranspiration of precipitation instead of creating significant rainfall runoff, which happens with urban and industrial development. Agricultural practices, which currently raise dust and combustion byproducts, would be discontinued at the Project Site. Therefore, operations could ultimately result in a minor beneficial impact to local air quality. No indirect impact to air quality is anticipated.

3.8 CULTURAL RESOURCES

This section describes an overview of existing cultural resources within the Project Site and the potential impacts on these cultural resources that would be associated with the Proposed Action and No Action Alternatives. Components of cultural resources that are analyzed include precontact and historic archaeological and architectural resources.

3.8.1 Affected Environment – Cultural Resources

Cultural resources are precontact and historic archaeological sites, districts, buildings, structures, objects, and locations of historic events of importance. Cultural resources listed or determined to be eligible for listing on the National Register of Historic Places (NRHP) maintained by the National Park Service are considered historic properties. As a federal corporate agency, TVA is required by Section 106 of the National Historic Preservation Act (NHPA) to evaluate the potential effects of its actions on historic properties (36 CFR Part 800). When a TVA action would adversely affect a historic property, TVA must consider ways to avoid or minimize the adverse effect in consultation with state historic preservation officers, federally-recognized Indian tribes, and other stakeholders. If avoidance or minimization are not feasible, measures to mitigate the adverse effect must be taken.

The NRHP lists buildings, districts, sites, structures, and objects significant to local, state, or national history and prehistory. Additionally, cultural resources may be eligible for listing on the NRHP if the cultural resource meets one of the following criteria:

> *Criterion A:* made a significant contribution to American history; for example, literature, ethnic heritage, health/medicine, and transportation
>
> *Criterion B:* related to the life of significant persons; examples of National Register properties nominated under *Criterion B* include George Washington's Mt. Vernon estate
>
> *Criterion C*: embodied distinctive characteristics of a type, period, or method of construction including works of a master or buildings that possess high artistic value
>
> *Criterion D*: yielded important information about history or prehistory. This category is typically the most relevant criterion for archaeological resources.

TVA is required by the NHPA and by NEPA to consider the possible effects on historic properties for proposed solar facilities. This is accomplished through a four-step review process outlined in section 106 of the NHPA (36 CFR Part 800). These steps are:

1. Initiation (defining the undertaking and the area of potential effect [APE] and identifying the parties to be consulted in the process)

2. Identification (studies to determine whether cultural resources are present in the APE and whether they qualify as historic properties)

3. Assessment of adverse effects, if any (determining whether the undertaking would damage the qualities that make the property eligible for the NRHP)

4. Resolution of adverse effects (by avoidance, minimization, or mitigation).

As the lead NEPA agency, TVA must consult with the appropriate State Historic Preservation Officer (SHPO), federally-recognized American Indian tribes that have an interest in the Project, and any other party with a vested interest in the Project. As part of the evaluation process for this Project, an archaeological survey and architectural survey were conducted by Tennessee Valley Archaeological Research (TVAR) to determine the presence of precontact and historic cultural resources that are listed on or potentially eligible for the NRHP. The archaeological survey area consists of the 295-acre tract of land where the solar array is to be constructed. The architectural APE consisted of a 0.5-mile radius surrounding the solar array's footprint. Areas within the survey radius that were determined not to be within view of the solar array due to terrain, vegetation, and/or modern built environments were not considered part of the APE.

3.8.1.1 Previous Surveys

TVAR's background and literature search found no archaeological resources within the APE. Additionally, no cemeteries are documented within the 0.5-mile background study area. According to NRHP records, there are 11 NRHP listed properties in Hardin County and 3 in McNairy County, none of which are in the background survey area. Background architectural research found four previously recorded architectural resources within the APE in Hardin County (HR-70, HR-76, HR-77, and HR-227) but none in McNairy County. None of the previously identified architectural resources are within the viewshed of the proposed solar array, and therefore are outside of the architectural APE.

3.8.1.2 Survey Results

TVAR conducted the archaeological survey between October 13, 2022, and February 9, 2023. The architectural field investigations were conducted between February 8-9, 2023. The locations within the archaeological survey area that are accessible by foot and that have surface visibility equal to or greater than 50 percent were examined along transects placed at intervals no greater than 15 meters. Systematic shovel testing was conducted at 30-meter intervals in all areas characterized by surface visibility of less than 50 percent or that demonstrate the potential for containing archaeological deposits. Shovel tests were 30-centimeter x 30-centimeter square holes excavated to a depth of 70 centimeters below surface (cmbs) or until impenetrable substrate, subsoil, or the water table is encountered.

Archaeological Survey Results

The archaeological survey resulted in the identification and evaluation of five archaeological resources (Table 3.8-1) and nine non-site cultural resources (NSCR) (Table 3.8-2). Due to lack of historical and/or architectural significance, as well as insufficient integrity, TVA recommends all five newly recorded archaeological resources and the nine NSCR resources as ineligible for NRHP listing under Criteria A, B, and C. However, the 40HR604 site likely represents an early nineteenth

century occupation that may contain some intact deposits. TVA recommends the boundaries of this site plus a 20-meter buffer be added to the exclusion area of the Project Site.

Table 3.8-1. Summary of Archaeological Sites Identified during the Survey

Inventory Number	Architectural Style/Property Type	Recommended NRHP Status
40HR602	Early nineteenth to early twentieth century artifact scatter	Not Eligible
40HR603	Early to mid-twentieth century house site	Not Eligible
40HR604	Early nineteenth century artifact scatter	Not Eligible
40MY166	Early twentieth century house site	Not Eligible
40MY167	Early to mid-twentieth century farmstead site	Not Eligible

Table 3.8-2. Summary of Non-Site Cultural Resources Identified during the Survey

NSCR 1	Native American	Not Eligible
NSCR 2	Twentieth Century	Not Eligible
NSCR 3	Twentieth Century	Not Eligible
NSCR 4	Twentieth Century	Not Eligible
NSCR 5	Twentieth Century	Not Eligible
NSCR 6	Twentieth Century	Not Eligible
NSCR 7	Twentieth Century	Not Eligible
NSCR 8	Native American, Twentieth Century	Not Eligible
NSCR 9	Late Twentieth Century	Not Eligible

Architectural Survey Results

TVAR recorded three architectural resources in Hardin County and three architectural resources in McNairy County (Table 3.8-3). None warranted further investigation due to lack of historical and/or architectural significance, as well as insufficient integrity.

TVA consulted the SHPO and federally-recognized Indian tribes with respect to the findings of the cultural resources survey. In a letter dated June 26, 2023, the SHPO concurred with TVA's eligibility recommendations and that the project would have no effect to historic properties (Appendix C). Of the Tribes who were consulted, TVA received one response from the Chickasaw Nation with no objections to the proposed undertaking.

Table 3.8-3. List of Recorded Architectural Resources within the APE

Inventory Number	Architectural Style/Property Type	Recommended NRHP Status
HR-IP-00002	1956 Ranch house with associated outbuildings	Not Eligible
HR-IP-00003	1960 Single-family ranch house	Not Eligible
HR-IP-00004	ca. 1930 Culvert over Stratton Branch	Not Eligible
MY-IP-00001	1941 Single-family vernacular bungalow	Not Eligible
MY-IP-00002	1968 Single-family ranch house	Not Eligible
MY-IP-00003	1959 Single-family massed-plan house	Not Eligible

3.8.2 Environmental Consequences – Cultural Resources

3.8.2.1 No Action Alternative

Under the No Action Alternative, the existing land use would be expected to remain unchanged. Ground disturbing agricultural practices at the Project Site would continue to potentially impact intact cultural resources at the surface or within the first 8 to 10 inches of soil. Therefore, no significant impacts to cultural resources would be anticipated as the site would not be developed as a solar facility.

3.8.2.2 Proposed Action

The Proposed Action would not impact any listed or eligible NRHP archaeological or architectural sites. Site 40HR601 was recommended as unassessed for NRHP inclusion based on research potential. An existing unpaved farm access road runs through the middle of this archeological site. Adamsville Solar proposes to utilize a portion of this existing road that passes through the outer edge of the proposed 20-meter buffer as an internal access road. In this area, an existing culverted road crosses a stream feature. Depending on the condition of the culvert, there may be an opportunity to utilize this crossing in order to avoid building another crossing on this stream feature. The viability of the culvert is still to be determined, but if it is suitable as-is or can be upgraded to become viable, it would be a good option to minimize effects to the stream feature and associated buffer. The 20-meter buffer on the eastern side of resource 40HR604 potentially renders this culvert inaccessible without crossing into the buffer or into the stream buffer. As a result, SRC has obtained agreement from consulting parties and TVA to reduce the buffer to 5-meters along this eastern portion of the cultural resource buffer to preserve the possibility of utilizing the existing culvert to cross this stream. Disturbance in this above referenced area would be limited to what is necessary in order to support the development, construction, and operation of an access road and culvert if the culvert is deemed viable for the purposes of the SR Adamsville solar project.

Should previously undiscovered cultural resources be identified during Project Site construction or operations, a Secretary of the Interior qualified archaeologist and TVA and consulting parties will be consulted before any further action is taken.

3.9 NATURAL AREAS AND RECREATION

This section describes an overview of existing natural areas and recreation areas surrounding the Project Site and potential impacts to these areas associated with the No Action and Proposed Action Alternatives.

3.9.1 Affected Environment – Natural Areas and Recreation

Natural areas are managed areas such as National Wildlife Refuges, Natural Areas listed by the TDEC, Wildlife Management Areas (WMA) listed by the Tennessee Wildlife Resource Agency, ecologically significant sites, and river segments listed in the Nationwide Rivers Inventory. The level of public use is variable but tends to be less intensive than recreational areas. Recreation areas, including federal, state, or local areas, are designed to offer a higher level of public use. The only natural or recreation area within a 5-mile radius of the Project Site is Beason Creek Wildlife Management Area (BCWMA) located approximately 3 miles from the Project Site (Figure 3.9-1).

3.9.2 Environmental Consequences – Natural Areas and Recreation

This section describes the potential impacts to natural areas and recreation areas should the Proposed Action or No Action Alternatives be implemented.

3.9.2.1 No Action Alternative

Under the No Action Alternative, the area within the proposed Project Site and vicinity would remain in its current condition. Adopting the No Action Alternative would not directly or indirectly impact natural areas or recreation areas because no project-related activities would occur. While natural ecological processes and anthropogenic disturbances would continue, changes would not result from the proposed Project.

3.9.2.2 Proposed Action

Due to the 3-mile distance between the Project Site and BCWMA, no part of the Project would impact this nature area. Thus, implementing the proposed action would have no direct or indirect impact on BCWMA.

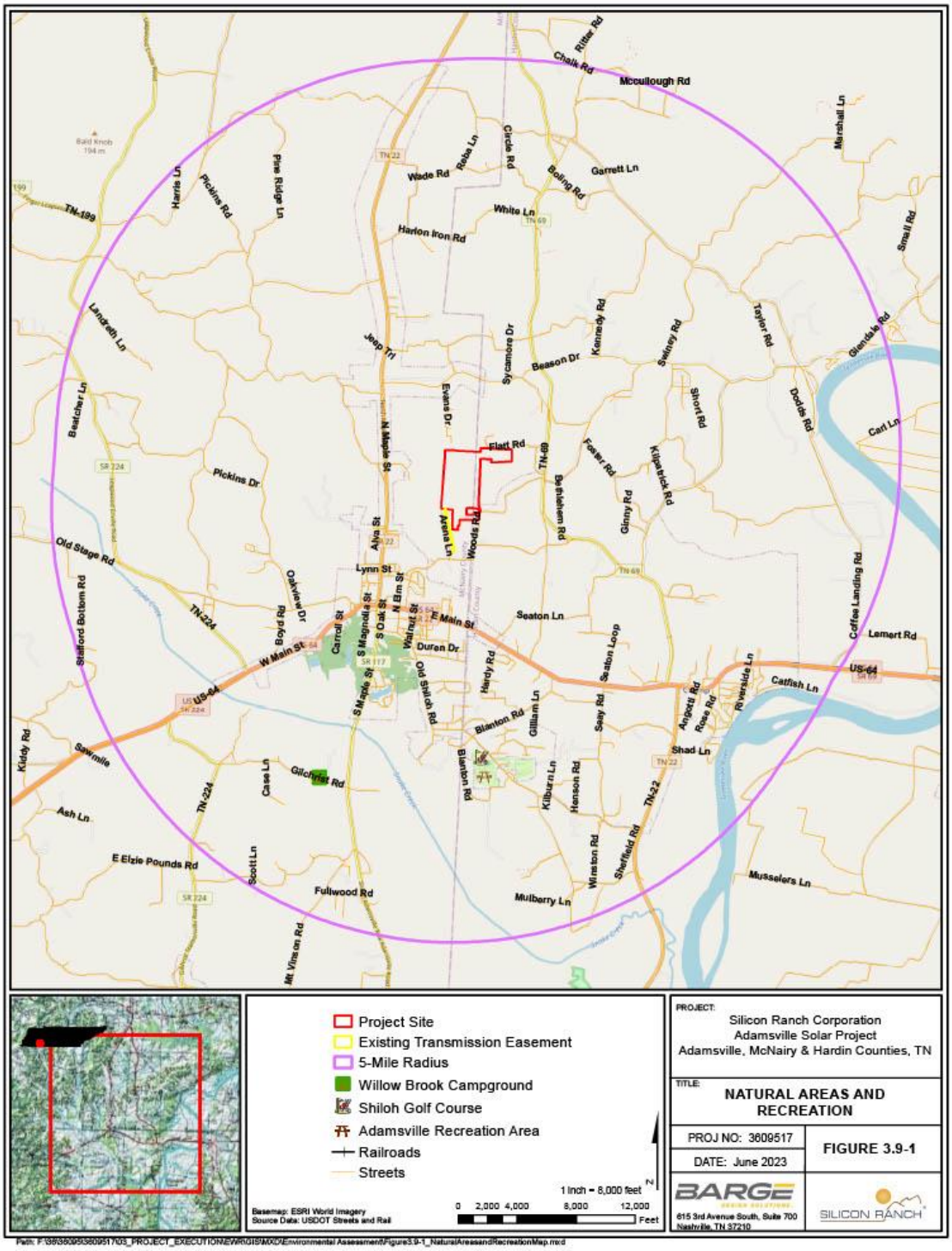

Figure 3.9-1. Natural Areas and Recreation

3.10 UTILITIES

This section describes an overview of existing utilities within and near the Project Site and the potential impacts on these utilities that would be associated with the No Action and Proposed Action

Alternatives. Specific utility components analyzed below include electrical service, natural gas, water supply, and communications.

3.10.1 Affected Environment – Utilities

The City of Adamsville provides natural gas, water, and sewer service to City residents. However, only water is provided to the Project Site. McNairy and Hardin Counties have full digital telecommunications capabilities. AT&T and Charter Communications are the two franchised local telephone companies.

3.10.1.1 Electrical Service

PEC provides electrical service to all of McNairy County and parts of three other countries including Hardin County.

3.10.1.2 Natural Gas

No natural gas service is available at the Project Site.

3.10.1.3 Water Supply

The City of Adamsville Utilities Department provides water to the Project Site. The utility obtains water from groundwater sources.

3.10.1.4 Communication Resources

McNairy and Hardin Counties have full digital telecommunications capabilities from multiple providers.

3.10.2 Environmental Consequences – Utilities

This section describes the potential impacts to utilities should the Proposed Action or No Action Alternatives be implemented.

3.10.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Consequently, there would be no related impacts to utilities. Existing land use would be expected to remain primarily agricultural land and existing onsite utilities would likely remain unchanged, with the exception of potential upgrades and maintenance.

3.10.2.2 Proposed Action

Under the Proposed Action, TVA would connect the solar facility to the North Adamsville substation via the existing PEC TL (Figure 2-2). Electrical service to the Project Site is available from PEC. A service drop would be installed during construction to provide construction power. Once the Project enters the operation phase, PEC would provide the required back-up power for controls. Given the low-level of electric demand during construction and operation, no changes to the PEC distribution system would be expected, and there would be no impacts to the local utility or its customers. Implementation of the Proposed Action would result in additional renewable energy resources in the region which would constitute a beneficial impact to electrical services in the region.

Water would be needed for soil compaction and dust control during construction and to a lesser extent for domestic use during operations (i.e., washing solar panels). There will be no habitable

buildings onsite and no need for potable water. Portable toilets would be available onsite for the duration of the construction period. Water for fugitive dust control and other needs would be obtained from the City's water line or provided via water trucks or wells if there are any usable wells onsite during construction and, if needed, during decommissioning.

Natural gas service would not be required during the construction or operation of the Project. No communication resources are anticipated to be acquired through the local providers. Adamsville Solar would have a dedicated communications system to remotely monitor the Project facility and operations.

Overall, no direct or indirect impacts to utilities would be anticipated as a result of implementation of the Proposed Action. No indirect impacts to utilities would occur under the Proposed Action.

3.11 WASTE MANAGEMENT

This section describes an overview of existing waste management within the Project Site and the potential impacts to waste management that would be associated with the Proposed Action and No Action Alternatives. Components of waste management that are analyzed include solid and hazardous waste and materials.

3.11.1 Affected Environment – Waste Management

Virtually all human activity generates some type of waste. Once created, waste must be managed. Management includes disposal, recycling, reuse, storage, and release into the environment. Waste is regulated by the Resource Conservation and Recovery Act (RCRA) of 1976 and its amendments. The Act delegates USEPA to regulate hazardous wastes. The regulations for this are found in Title 40, Part 261 of the Code of Federal Regulations (CFR). USEPA can also delegate authority to control waste to the states.

RCRA defines solid wastes as, "any garbage or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, resulting from industrial, commercial, mining, and agricultural operations, and from community activities" (USEPA, n.d.-d). For regulatory purposes, the RCRA considers all solid waste as either non-hazardous waste or hazardous waste. RCRA defines a hazardous waste as, "a waste with properties that make it dangerous or capable of having a harmful effect on human health or the environment" (USEPA, n.d.-d). Non-hazardous waste is all waste that is not classified as hazardous waste. The Adamsville Solar project would generate non-hazardous and hazardous wastes and would comply with the requirements of RCRA, the Solid and Hazardous Wastes Rules and Regulations of the State of Tennessee (TDEC DSWM Rule 0400 Chapters 11 and 12, respectively), and local regulations related to disposal of the non-hazardous and hazardous wastes resulting from the construction, maintenance, and decommissioning of the Project.

To determine if any hazardous wastes were present on the Project Site, a Phase I Environmental Site Assessment (ESA) was conducted on the Project Site on June 28, 2023. A Phase I ESA is conducted to look for the Recognized Environmental Conditions (RECs). A REC is defined as, "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property" (American Society for Testing and Materials, 2021). Based on an environmental database search; review of available subsurface and geological information, aerial photographs, and topographic maps; review of reasonably ascertainable data from state and federal regulatory agencies and utility companies, file searches, and permit reviews; and an onsite visit, the investigation concluded there were no RECs identified at the Project Site.

Construction and decommissioning will generate some hazardous waste. During the operation phase, there should be very little to no hazardous waste generated. All federal, state, and local regulations will be followed for handling, storing, and disposing of hazardous materials.

Landfills

Solid waste and recyclable materials collection in McNairy County, where most of the Project is located, is provided at the Project Site by the McNairy County Office of Solid Waste and Recycling.

The McNairy County Landfill, located at 770 Airport Road, Selmer, Tennessee, may be used for construction and demolition debris and scrap metals. Disposal of other non-hazardous waste will be determined at a future date but will be disposed of in an approved landfill. Any hazardous waste generated during construction and operation would be sent to an approved landfill. The landfill(s) to be used would be determined later.

Construction and decommissioning would generate some hazardous waste. During the operation phase, there should be very little to no hazardous waste generated. All federal, state, and local regulations would be followed for handling, storing, and disposing of hazardous materials.

3.11.2 Environmental Consequences – Waste Management

3.11.2.1 No Action Alternative

Under the No Action Alternative, the project would not be constructed and there would not be any new direct or indirect impacts to non-hazardous and hazardous waste generated. Existing land use would be expected to remain primarily agricultural, and existing waste management conditions would be expected to remain as they are at present.

3.11.2.2 Proposed Action

Construction and operation of the Proposed Action would result in the generation of hazardous and nonhazardous solid and liquid waste. All materials determined to be waste would be evaluated and managed per the Solid and Hazardous Wastes Rules and Regulations of the State of Tennessee (TDEC DSWM Rule 0400 Chapters 11 and 12, respectively).

Hazardous Waste

During construction, operation and maintenance, and decommissioning, small amounts of hazardous waste would be generated. Hazardous waste that may be generated during construction and decommissioning includes hydraulic fluids, used oil, paint and paint thinner, other petroleum-based fluids, and any materials saturated with these fluids. No hazardous waste would be generated during operation. Hazardous waste generated during decommissioning would include substances such as diesel fuel, hydraulic fuel, and lube oil.

BMPs would be implemented in order to minimize the potential of a spill and to instruct onsite workers on how to contain and clean up spills. Details regarding the handling of fuel spills would be included in the SWPPP. Each spill, regardless of amount, would be cleaned up within 48 hours and a spill report completed. Copies of spill and cleanup reports would be kept onsite. To prevent public access to hazardous materials, the Project Site would be surrounded by security fencing during both construction and operational phases and access gates would normally remain locked.

To the extent possible, hazardous waste would be recycled. Collection and disposal of these wastes would be conducted in accordance with applicable regulatory requirements to minimize health and safety effects. All hazardous waste would be transferred to an approved landfill or processing center.

Details concerning hazardous materials that could be present during construction and decommissioning and their handling are included in Tables 3.11-1, 3.11-2, and 3.11-3.

During construction of the proposed solar facility, hazardous materials would be stored onsite in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of these materials. Fuel for construction vehicles may be stored onsite during construction. Fueling of construction vehicles would occur within the construction area. Appropriate safety protocols would be followed during fueling.

During operation, solar panels do not pose a threat to contaminate the soil. Upon expiration of the 20-year PPA or an amended or alternative PPA for the sale of power after the 20-year period, Adamsville Solar would develop a decommissioning plan to document the recycling and/or disposal of solar facility components following applicable local, state, and federal laws and regulations. Impacts from hazardous waste stored at the Project Site during the construction and operation of the proposed facility would be insignificant.

Overall, by following guidance in the SWPPP and implementing BMPs, minimal direct impacts from hazardous waste storage and spills are anticipated. Additionally, no indirect impacts from hazardous water storage or spills are anticipated.

Solid (Non-Hazardous Waste)

Under the Proposed Action, construction activities and facility operation would generate non-hazardous solid waste. Worn or broken metal and machine parts, defective or broken electrical materials, other scrap metal and plastic, broken down module boxes, empty containers, paper, glass, and other miscellaneous solid waste would be generated throughout all phases of the proposed Project. Waste would be disposed of utilizing contracted refuse collection and recycling services. The waste would be placed in construction debris containers and may be taken to the Hardin County Landfill. Bulk chemicals would be stored in storage tanks or returnable delivery containers. Decommissioned equipment and materials, including PV panels, racks, and transformers, would be recycled. Management methods for handling non-hazardous waste are provided in Table 3.11-4. All applicable federal and state regulatory requirements would be followed.

Overall, by implementing BMPs, minimal direct impacts from non-hazardous waste are anticipated. Additionally, no indirect impacts from non-hazardous waste are anticipated.

Table 3.11-1. Summary of Special Handling Precautions for Large Quantity Hazardous Materials

Hazardous Material	Use	Relative Toxicity[1] and Hazard Class[2]	Permissible Exposure Limit (PEL)	Storage Description; Capacity	Storage Practices and Special Handling Precautions
Diesel Fuel	Equipment Generator refueling	Low toxicity; Hazard class II Combustible liquid	PEL: none established TLV: 100 mg/m^3	Carbon steel tank (3,600 gallons)	Secondary containment, overfill protection, vapor recovery, spill kit.
Hydraulic fluid (if applicable)	Tracker drive units	Low to moderate toxicity; Hazard Class IIIB combustible liquid	TWA (oil mist): 5 mg/m^3 STEL: 10 mg/m^3	Hydraulic drive tank, approximately 20 gallons per tracker drive unit (if applicable) throughout solar field. Carbon steel tank, maintenance inventory in 55-gallon steel drums.	Found only in equipment with a small maintenance inventory. Maintenance inventory stored within secondary containment; alternative measures to secondary containment for equipment would be implemented at the project.
Lube Oil	Lubricate rotating equipment (*e.g.,* tracker drive units)	Low toxicity Hazard class – NA	None established	Carbon steel tank, maintenance inventory in 55-gallon steel drums.	Secondary containment for tank and for maintenance inventory

PEL – permissible exposure limit
TLV – threshold limit value
TWA – time weighted average
STEL – short-term exposure limit

[1] Low toxicity is used to describe materials with an NFPA Health rating of 0 or 1. Moderate toxicity is used describe materials with an NFPA rating of 2. High toxicity is used to describe materials with an NFPA rating of 3. Extreme Toxicity is used to describe materials with an NFPA rating of 4.

[2] NA denotes materials that do not meet the criteria for any hazard class defined in the 1997 Uniform Fire Code.

Table 3.11-2. Summary of Construction Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	Onsite Treatment	Waste Management Method/Offsite Treatment
Construction waste - Hazardous	Empty hazardous material containers	TBD	Intermittent	None	Return to vendor or dispose at permitted hazardous waste disposal facility
Construction waste – Hazardous	Solvents, used oil, paint, oily rags	TBD	Intermittent	None	Recycle or use for energy recovery

Table 3.11-3. Summary of Operation Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	Waste Management Method	
				Onsite	Offsite
Used Hydraulic Fluid, Oils and Grease – Non-RCRA Hazardous	Tracker drives, hydraulic equipment	<500 gallons/year	Intermittent	Accumulated for <90 days	Recycle
Oily rags, oil absorbent, and oil filters – Non-RCRA Hazardous	Various	One 55-gallon drum every 3 months	Intermittent	Accumulated for <90 days	Sent offsite for recovery or disposed at Class I landfill
Spent batteries – Universal Waste	Rechargeable and household	<400	Continuous	Accumulate for <1 year	Recycle
Spent batteries – Hazardous	Lead acid		Intermittent	Accumulated for <90 days	Recycle
Spent fluorescent bulbs – Universal Waste	Facility lighting	TBD, likely minimal to none	Intermittent	Accumulate for <1 year	Recycle

Table 3.11-4. Summary of Construction Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	Onsite Treatment	Waste Management Method/Offsite Treatment
Construction waste – Non-hazardous	Scrap wood, concrete, steel, glass, plastic, cardboard, paper	TBD, assumed ~20,000 cubic yards	Intermittent	None	Recycle wherever possible, otherwise dispose to Class III landfill
Sanitary waste – Non-hazardous	Portable chemical toilets - sanitary waste		Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary wastewater treatment plant
Office waste – Non-hazardous	Paper, aluminum, food		Intermittent	None	Recycle or dispose to Class III landfill

Wastewater

Wastewater generated from portable toilets would be removed by a licensed contractor and disposed of in an approved facility. No direct or indirect impacts from wastewater generated at the Project Site are expected.

3.12 PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

This section describes an overview of existing public health and safety and the potential impacts associated with the Proposed Action and No Action Alternatives. Public health issues include emergency response and preparedness to ensure Project construction and operation do not pose

a threat to public health and safety. Safety issues include occupational (worker) safety in compliance with OSHA standards.

3.12.1 Affected Environment – Public and Occupational Health and Safety

The Project Site is currently private property used primarily for agriculture. The are no residences on the property. Public emergency services in the area include urgent care clinics, hospitals, law enforcement services, and fire protection services. A brief description of the public emergency services relative to the project location is provided below:

- Law enforcement for most of the Project Site is provided by the McNairy Sheriff's Office headquartered in Selmer, Tennessee, approximately 14 miles west of the Project Site. A smaller part of the Project Site is in Hardin County and is under the jurisdiction of the Hardin County Sheriff's Office headquartered in Savannah, Tennessee, approximately 7 miles southeast of the Project Site.
- There is one urgent care facility in Adamsville approximately 2.4 road miles from the entrance to the Project Site.
- The closest hospital is the Hardin Medical Center in Savannah, Tennessee, approximately 9 miles south of the Project Site.
- The Adamsville Volunteer Fire Department is located approximately 2.2 road miles from the entrance to the Project Site.

3.12.2 Environmental Consequences – Public and Occupational Health and Safety

This section describes the potential impacts to public and occupational health and safety should the No Action or Proposed Action Alternatives be implemented.

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no project-related impacts on public health and safety would result. Existing land use would remain primarily agriculture. No changes to existing public health and safety would occur.

3.12.2.2 Proposed Action

Under the Proposed Action Alternative, during construction, workers on the Project Site would have an increased safety risk. Standard construction site practices such as establishing and maintaining health and safety plans to comply with OSHA regulations would be developed to reduce risk. Health and safety plans emphasize BMPs for site safety to minimize risk to construction staff. These plans may include the use of personal protective equipment, regular safety inspections, use of equipment guards, and establishment of emergency shutdown procedures.

Fuel for construction vehicles may be stored onsite during construction. An SPCC plan would be developed and implemented to minimize the potential of a spill and provide detailed instructions for onsite personnel on how to contain and clean up any potential spills. Hazardous materials stored on the site would not be available to the public. Emergency response for any potential incidents on the Project Site would be provided by the local, regional, and state law enforcement, fire, and emergency responders.

The solar project is not anticipated to cause electromagnetic interference levels such that there will be impacts on nearby residents. SRC intends to design, construct, and operate the electrical systems of the proposed solar project using standard industry practices with sufficient setbacks to reduce or eliminate electromagnetic frequency and interference exposure to adjacent property owners.

Potential public health and safety hazards could result in increased traffic on nearby roadways due to site construction. Communication of increased industrial traffic and establishment of traffic procedures to minimize potential safety concerns would be addressed in the health and safety plans followed by the construction contractor. No impacts to public and occupational health are anticipated from the proposed TVA substation.

No direct or indirect public health or safety hazards are anticipated as a result of operations. Overall, impacts to public health and safety in association with implementation of the Proposed Action would be considered temporary and minor.

3.13 TRANSPORTATION

This section describes an overview of existing transportation resources and the potential impacts on these transportation resources that would be associated with the Proposed Action and No Action Alternative. Components of transportation resources that are analyzed include roads, traffic, railroads, and airports.

3.13.1 Affected Environment – Transportation

3.13.1.1 Roads

The Project Site is in rural McNairy and Hardin Counties, 1.5 miles northeast of the City of Adamsville and approximately 8 miles west of Savannah, Tennessee. Only Woods Road, a county road, provides access to the Project Site. From the Project Site travelling north and east, Woods Road terminates at State Highway 69. Travelling south from the Project site, Woods Road ends at Elm Road. Elm Road continues west and south to the intersection at US Highway 64 in Adamsville.

Other secondary roads access the rural residences and the agricultural areas that predominate the region. All primary and secondary roads are two-lane. No public roads are present within the Project Site boundaries although there are several unpaved farm roads that provide vehicular access to the agricultural fields. There are no rail lines or airports within the 5-mile radius of the Project Site.

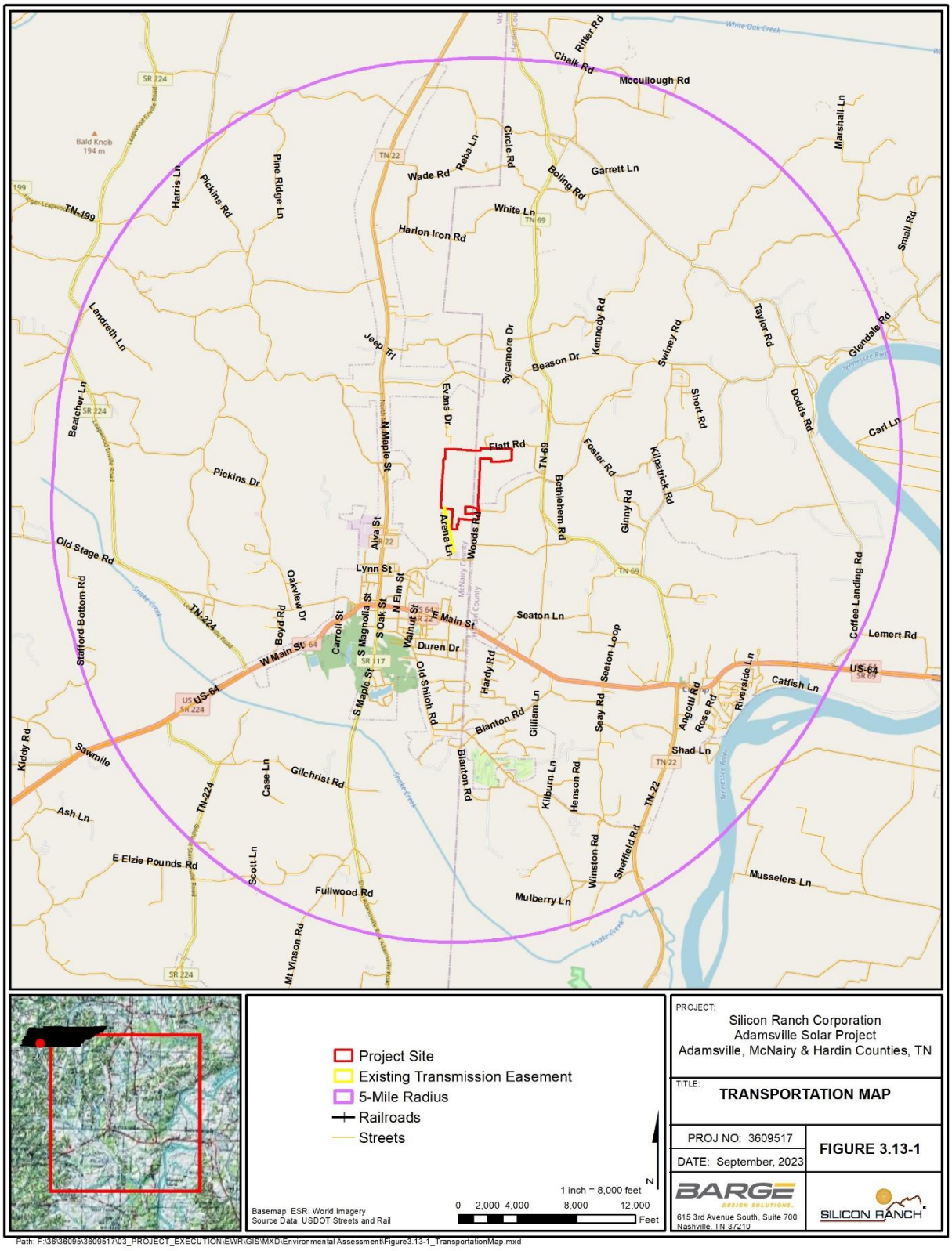

Figure 3.13-1. Transportation Map

3.13.1.2 Traffic

There are two existing two-way Tennessee Department of Transportation (TDOT) stations (Location ID 36000013 and 36000015) on Old Morris Chapel Road (TDOT, n.d.). At Location 36000013, approximately 1.5 miles north of the intersection with Woods Road, the annual average daily traffic (AADT) was 2172 in 2022 and 2373 in 2021. At Location 35000015, approximately 1.2 miles south of the intersection with Woods Road, the AADT count was 641 in 2022 and 592 in 2021. The values provided are AADT volumes based on a 24-hour, two-directional count at a given location. The raw traffic data is mathematically adjusted for vehicle type, determined by an axle correction factor. The data are then statistically corrected by a seasonal variation factor that considers the time of year and day of the week. These data were obtained from the TDOT Transportation Data Management system (TDOT, n.d.).

3.13.2 Environmental Consequences – Transportation

This section describes the potential impacts to transportation resources should the Proposed Action or No Action Alternatives be implemented.

3.13.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no project-related impacts on transportation resources would result. Existing land use would be expected to remain primarily agricultural and rural residential. The existing transportation network and traffic conditions would be expected to remain as they are at present.

3.13.2.2 Proposed Alternative

During construction of the solar facility, approximately 70 - 100 workers would be present at the site from 7 am to 6 pm, up to six days a week (Monday through Saturday) for approximately eight months. Most of the workers would likely come from the local or regional area; 25 to 50 percent of the workforce would likely come from out-of-state. If necessary, workers from outside the area would stay in hotels in Adamsville or Savannah, Tennessee. Workers would either drive their vehicles or carpool to the Project Site. Parking would be on the site during the day. Some work teams may visit local restaurants and businesses during work hours. Additional traffic due to deliveries and waste removal would consist of approximately 15 vehicles per day during construction.

During construction, increased traffic will impact roads in the immediate vicinity of the Project Site, primarily Elm Road, Old Morris Chapel Road, and Woods Road. Traffic flow around the worksite would be heaviest at the beginning of the workday, at lunch, and the end of the workday. During the day traffic counts on Old Morris Chapel Road will increase during construction due to the delivery of construction equipment and supplies. Deliveries and most workers would access the Project Site by turning off Old Morris Chapel Road onto Woods Road. Should traffic flow be a problem for local residences or businesses, Adamsville Solar would consider staggering work shifts to space out traffic flow to and from the Project Site. The use of such mitigation measures would minimize potential adverse impacts to traffic and transportation to less than significant levels.

Several onsite 16-20-foot-wide maintenance roads would be constructed and maintained on the Project Site. These roadways would serve as periodic access for site inspection and maintenance but would be closed to through traffic.

The proposed solar facility would not be staffed during operation but would be inspected weekly. Maintenance would be required quarterly for equipment failures and would require minimal

personnel. Therefore, the operation of the solar facility would not have a noticeable impact on local roadways.

Overall, the Proposed Action would not result in any long-term noticeable direct or indirect impacts to transportation.

3.14 SOCIOECONOMICS

This section describes an overview of existing socioeconomic conditions within the Project Site and the potential impacts that would be associated with the Proposed Action and No Action Alternatives. Components of socioeconomic resources that are analyzed include population, employment, and income.

3.14.1 Affected Environment – Socioeconomics

The proposed Project Site is in the north central parts of McNairy and Hardin Counties, Tennessee. Most of the Project Site is adjacent to McNairy County's eastern border. A smaller part of the Project site is along Hardin County's western border (Figure 2-2). The majority of the Project Site in the U.S. Census Bureau's (USCB's) Census Tract (CT) 9301, Block Group (BG) 2. A small portion of the Project Site is in Census Tract 9202 Block Group 3.

3.14.1.1 Population

Population trends and projections are presented in Table 3.14-1. The population of McNairy and Hardin Counties, the State of Tennessee, and the United States all showed slight to modest growth from 2010 to 2020 (Middleton and Murray, 2009). The population of CT 9301, BG 3 also showed modest growth from 2010 to 2020, but there was a slight decrease in population in CT 9202, BG 2 from 2010 to 2020 (USCB, 2017). By 2030, the population of McNairy County is projected to have moderate growth, but the Hardin County population is projected to have a slower growth rate. Tennessee and the U.S. are projected to show moderate growth by 2030 (Middleton and Murray, 2009).

Table 3.14-1. 2013 – 2030 Population Data

Area	2010	2020	Projection 2030	Percent Increase 2010 - 2020	Percent Increase 2010 - 2030
McNairy County	25,434	26,262	27,412	8.54%	7.78%
Hardin County	25,953	26,590	26,391	2.45%	1.69%
Census Tract 9301, Block Group 2	1,862	1,846	NA	-0.86%	NA
Census Tract 9202 Block Group 3	1,308	1,405	N/A	7.41%	N/A
Tennessee	6,229,564	6,860,486	7,397,302	10.13%	18.75%
United States	308,745,538	331,449,281	355,100,730	7.35%	15.01%

Source: USCB Table P1 and UT Center for Business and Economic Research (2009)

Employment and Income

The U.S. Bureau of Labor Statistics (USBLS) reported that in 2022 the total number of people employed in McNairy and Hardin Counties was 7998 and 9660, respectively (USBLS, n.d.). The

unemployment rates in Table 3.14-2 are slightly higher than the 3.4 percent unemployment rate in Tennessee and 3.6 percent national unemployment rate. The per capita personal income in McNairy and Hardin Counties, using 2021 inflation-adjusted dollars, in 2021 was $25,537 and $20,973, respectively (Table 3.14-1). These values are 22.40 percent and 30.29 percent less than the state average per capita income (USCB, n.d.-a). The per capita income in CT 9202, BG 3 is 9.5 percent less than Hardin County and for CT 9301, BG 3, the per capita income is 8.6 percent less than McNairy County (Table 3.14-3).

Table 3.14-2 Labor Force Data in 2022 for McNairy and Hardin Counties, Tennessee

County	Labor Force	Employed	Unemployed	Unemployment Rate (%)
McNairy	8,382	7,998	384	4.6
Hardin	10,064	9,660	404	4.0

Source: USBLS Labor Force by County, 2022 Table

Table 3.14-3 Per Capita Income in 2021 for McNairy and Hardin Counties, Tennessee

	Tennessee	Hardin County	McNairy County	CT 9202, BG 3	CT 9301, BG 2
Per capita income in the past 12 months	32,908	25,537	22,939	23,105	20,973

Source: USCB Table B19301 ACS 5-Year Estimate

3.14.2 Environmental Consequences – Socioeconomics

This section describes the potential impacts to socioeconomic resources should the Proposed Action or No Action Alternatives be implemented. Social and economic issues considered for evaluation within the impact area include change due to current and projected population levels, change in expenditures for goods and services, and short-term or long-term impacts on employment and income.

3.14.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no project-related socioeconomic impacts would occur within McNairy and Hardin Counties. Significant changes to the unemployment rate and per capita income would be unlikely. Therefore, no beneficial socioeconomic impacts from a change in population, employment, or expenditures would occur under the No Action Alternative.

3.14.2.2 Proposed Action

Under the Proposed Action Alternative, the proposed solar facility would be constructed. Approximately 70-100 workers would be employed during construction, lasting approximately eight months. Construction of the proposed facility could have short-term beneficial economic impacts due to the purchase of materials, equipment, and services and a temporary increase in employment, income, and population. The beneficial economic impacts would be local or regional, depending on where the goods, services, and workers were obtained. It is likely some construction materials and services would be purchased locally in the McNairy and Hardin County area, as well as in adjacent counties and cities.

Operation of the facility would not increase local employment as no workers would be needed for day-to-day operation of the solar facility. One or two employees would visit the Project Site as needed for scheduled/preventative maintenance and for unscheduled maintenances or outages. While periodic maintenance activities, primarily mowing, would be done by local workers, this would not increase employment.

Overall, socioeconomic impacts for the operation of the Project are anticipated to be positive and long-term, although small relative to the total economy of the region. Although it is too early to quantify, the project would benefit the local tax base through the increased property taxes due to site improvements.

3.15 ENVIRONMENTAL JUSTICE

This section describes an overview of EJ considerations within the Project Site and the potential EJ impacts that would be associated with the Proposed Action and No Action Alternatives. Components of EJ that are analyzed include minority and low-income population.

3.15.1 Affected Environment – Environmental Justice

The 1994 Presidential Executive Order (EO) 12898, Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to make "achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands" (EO 12898, 1994). While the directive's intent is clear, the methods to determine if minority or low-income populations are present are variable.

Two reports provide the best guidance on how to determine if a minority or low-income population is present in a defined area. The 1997 Environmental Justice Guidance Under the National Environmental Policy Act (EJ Guidance) report from the CEQ describes procedures for assessing if a minority or low-income population is present (CEQ, 1997). The 2016 report, Promising Practices for EJ Methodologies in NEPA Reviews (Promising Practices) prepared by Federal Interagency Working Group on Environmental Justice & NEPA Committee (Working Group), recommends using multiple methods to determine if minority or low-income populations are present in the area being studied (Working Group, 2016). The report also provides specific guidance on how to conduct the analyses. TVA supports the use of these reports when determining if minority or low-income populations are present in a project area.

Identifying and Assessing Minority Populations

EO 12898 defines minority as "individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic" (EO 12898, 1994). The EJ Guidance report states that a minority population should be identified when either, (a) the minority population of the affected area exceeds 50 percent or (b) 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. A minority population exists "if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds" (CEQ, 1997).

For minority populations Promising Practices recommends using the No Threshold Analysis and, in concert, the Fifty Percent and Meaningfully Greater Analyses (Working Group, 2016). A minority population is present using the No Threshold Analysis if the percentage of minorities in the CT and BG is greater than or equal to the percentage of minorities in the reference population which, for these analyses, is the county. The USCB defines a CT as "small, relatively permanent statistical subdivisions of a county or statistically equivalent entity that can be updated by local participants prior to each decennial census as part of the Census Bureau's Participant Statistical Areas Program" (USCB, n.d.-b). Each CT is further subdivided into one or more BGs. A BG represents the smallest geographic unit of analysis used by the USCB.

Per the Working Group (2016), a minority population exists in the Fifty Percent Analysis when the minority population exceeds 50 percent of the total population within a defined area. A minority population exists in the Meaningfully Greater Analysis if the percentage of minorities within a CT and BG is 10 percent greater than the percentage of minorities in a reference community. For these analyses, the defined area is the CT and BG, and the reference community is the county. A minority community is present if the percentage of minorities in the CT and BG exceeds the percentage of minorities in the county by either ten or 20 percent. TVA uses the 10 percent value to identify a minority population.

Identifying and Assessing Low-income Populations

Guidance in the 1997 Environmental Justice report (CEQ, 1997) specifies that low-income populations are to be identified using the annual statistical poverty threshold from USCB Current Population Reports Series P-60 on Income and Poverty. The most recent report, Poverty in the United States: 2021 (USCB, 2022) defines poverty "by comparing pretax money income to a poverty threshold that is adjusted by family composition." The 2021 poverty threshold for individuals under age 65 was $14,097 (USCB, 2022). TVA considers low-income individuals to be those who earn less than twice the poverty threshold. The poverty and low-income thresholds were compared to the per capita income for the CT and BGs and county. If the per capita income is lower than the threshold values, a poverty or low-income population was recorded.

Promising Practices recommends two methods of analysis for determining if a low-income population is present: Alternative Criteria Analysis and Low-Income Threshold Criteria Analysis (Working Group, 2016). Both use quantitative measures to determine if a minority population is present. A low-income population exists in the Alternative Criteria Analysis when the percentage of low-income population exceeds 50 percent of the total population within a defined area. A low-income population exists in the Low-Income Threshold Analysis if the percentage in the CT and BG is equal to or greater than that of the reference community (county).

Environmental Justice Analysis Procedures

USEPA's Environmental Justice Screening and Mapping Tool (EJScreen) provides an initial assessment for the presence of minority or low-income populations in the project area (USEPA, n.d.-e). EJScreen also allows users to specify a buffer around a Project Site and provide the percentage of minority and low-income individuals within the buffer. For these projects, a 1-mile buffer is used. If there is an EJ issue arising from a solar facility, it is usually limited to glint and glare problems which are rarely an impact more than 1 mile from the Project Site.

Data from the USCB website data.census.gov are used to conduct the analyses described in Promising Practices. These analyses assess the presence or absence of minority and low-income populations at the BG and county level.

Environmental Justice Analysis Results

The proposed facility is within CT 9202, BG 3 and CT 9301, BG 2. However, TVA suggests that if a project is close to one or more adjacent BGs, the analyses for minority and low-income populations should be conducted for the adjacent CT and BGs. A small portion of CT 9301, BG 3 is within 1 mile of the end of the PEC TL. An analysis of the residences within 1 mile of the project boundary that are in CT 9301 BG 3 was done using the current Google Earth aerial photo. The analysis shows there are numerous businesses and one residence inside the 1-mile buffer. Considering this finding, CT 9301, BG 3 will not be included in the analyses below.

Adamsville Solar Minority Population EJ Analysis

Results of the EJScreen pre-decisional tool are presented in Table 3.15-1. The data suggest no predominately minority populations exist within a 1-mile buffer of the Project Site, CT 9202, BG 3 and CT9301 BG 2, or McNairy and Hardin Counties (USCB, n.d.-d). An aerial photo showing the project boundary and the 1-mile buffer is provided in Figure 3.15-2.

Table 3.15-1. EJScreen Report

Geographic Unit	Geographic Unit Population	Percent Minority Population	Percent Low-Income Population
One-mile Buffer*	889	3.0	51.0
CT 9202, BG 3*	1457	4.1	55.7
CT 9301 BG 2	2021	3.0	48.6
McNairy County**	25,502	10.6	42.7
Hardin County	26,231	8.5	43.7

* Data from EJScreen

** Data from the USCB website, Table B03002, Hispanic or Latino Origin by Race and Table C17002, Ratio of Income to Poverty Level in the Past 12 Months using the 2021 5-year American Community Survey (ACS) database.
A minority of low-income population may be present if the percentage exceeds 50 percent

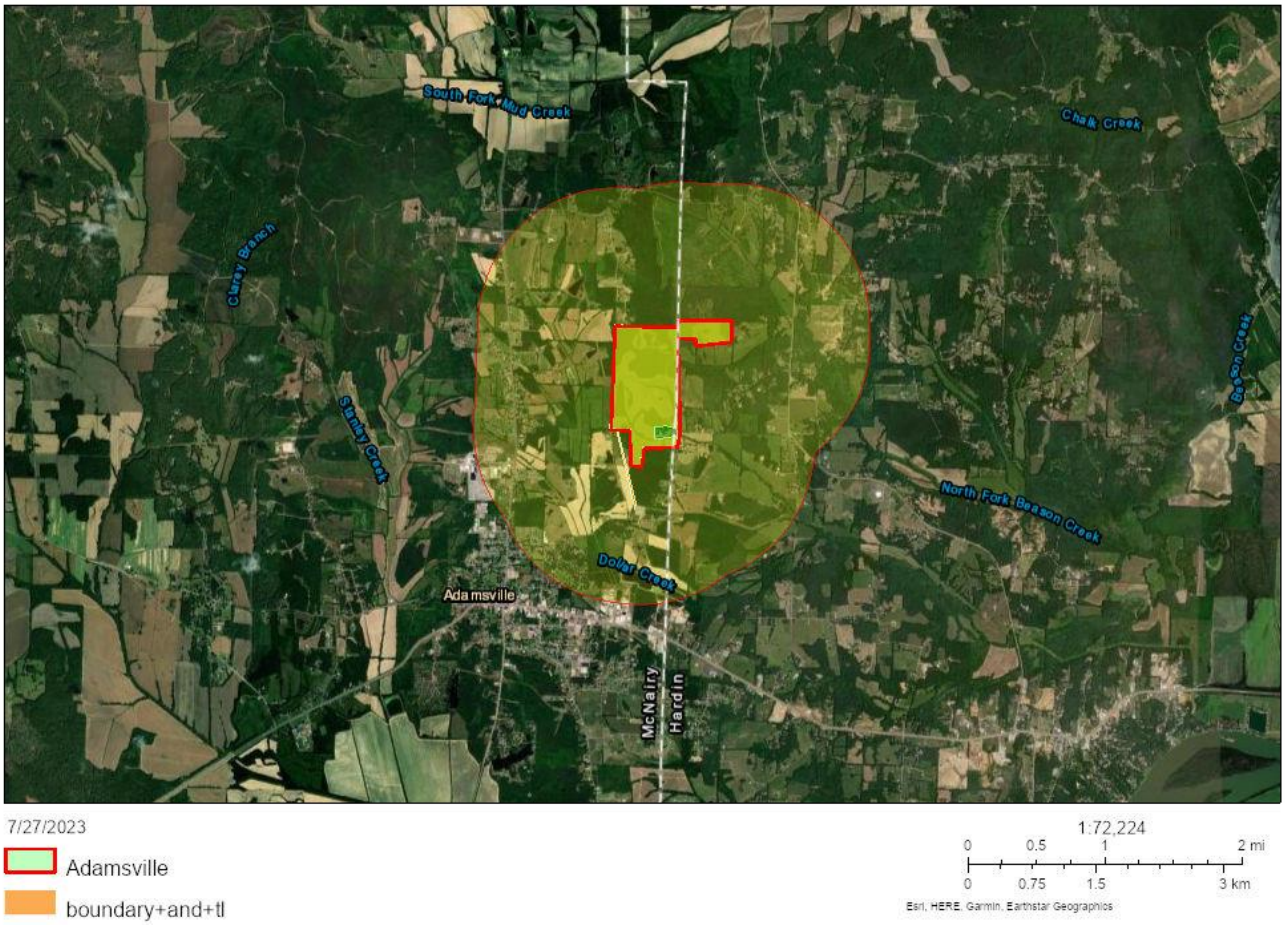

Figure 3.15-1. Environmental Justice Affected Area

Results of the No Threshold Analysis indicate the percent minority populations in CT 9202, BG 3 and CT 9301, BG 2 are less than the minority percentage in Hardin and McNairy Counties, respectively (reference communities), indicating there is no minority population in CT 9202 BG 3 or CT 9302, BG 2 (Table 3.15-2) (USCB, 2017).

Table 3.15-2. No Threshold Analysis for Minority Population

Geographic Unit	Total Population	Total Minority Population	Percent Minority Population	Minority Population Present
Hardin CT 9202, BG 3	1457	59	4.0	No
Hardin County	26,722	2289	8.5	N/A
McNairy CT 9301, BG 2	2021	60	3.0	No
McNairy County	25,916	2757	10.6	N/A

Data from USCB Table P1, Race using the 2020 DEC Redistricting Data (PL-94-171)
Minority population present if percentage > 50 percent in any geographic unit or CT, BG percentage ≥ County percentage

Results of the Fifty Percent Analysis indicate there are no minority populations in CT 9202, BG 3 and CT 9301, BG 2 or McNairy and Hardin Counties because the minority percentage for CT 9202, BG 3 and CT 9301, BG 2 and the counties are less than 50 percent. (Table 3.15-3) (USCB, n.d.-c).

Table 3.15-3. Minority Population Using the Fifty Percent Analysis

Geographic Unit	Total Population	Total Minority Population	Percent Minority Population	Exceeds 50 % of Geographic Unit	Minority Population Present
Hardin CT 9202, BG 3	1457	59	4.0	No	No
Hardin County	26,722	2289	8.5	No	No
CT 9301, BG 2	2021	60	3.0	No	No
McNairy County	25,916	2757	10.6	No	No

Data from the USCB website, Table B03002, Hispanic or Latino Origin by Race using the 2021 5-year ACS database.
Minority population present if the percentage of minorities residing within the geographic unit of analysis meets or exceeds 50percent,

Results of the Meaningfully Greater Analysis in Table 3.15-4 show the percentage of minorities in CT 9202, BG 3 (4.0 percent) is not meaningfully greater than the percentage of minorities in Hardin County using the 10 percent value (8.5 percent +10 percent = 8.59 percent) (USCB, n.d.-d). The percentage of minorities in CT 9301, BG 2 (5.3 percent) is not meaningfully greater than the percentage of minorities in McNairy County using the 10 percent value (10.6 percent + 10 percent = 10.7 percent).

Table 3.15-4. Minority Population Using the Meaningfully Greater Analysis

Geographic Unit	Percent Minority Population	Meaningfully Greater at 10%
Hardin CT 9202, BG 3	4.0	No
Hardin County	8.5	N/A
McNairy CT 9301, BG 2	3.0	No
McNairy County	10.6 (14.74%)*	N/A

Data from the USCB website, Table B03002, Hispanic or Latino Origin by Race using the 2021 5-year ACS database.

* Minority population present if the CT, BG percent minority population is ten percent greater than the County minority percentage indicated in parentheses.

Adamsville Solar Low-income EJ Analysis

Results of the EJScreen pre-decisional tool are presented in Table 3.15-1. The data indicate that there may be a predominately low-income population in CT 9202, BG 3 and within the 1-mile buffer but not in CT 9301, BG 2, or in the reference communities, Hardin and McNairy Counties.

Comparing the per capita income of residents in CT 9202, BG 3, CT 9301 BG 2, and Hardin and McNairy Counties to the poverty and low-income thresholds indicates there is no geographic unit in poverty but all units do have low-income populations (Table 3.15-5) (USCB, n.d.-a).

Table 3.15-5. Poverty and Low-income Threshold Analysis

Geographic Unit (GU)	Per capita Income (PCI)	Poverty Population if GU PCI < Poverty Threshold ($14,097)	Low-income Population if GU PCI < 2X Poverty Threshold ($28,194)
Hardin CT 9202, BG 3	$23,105	No	Yes
Hardin County	25,537	No	Yes
McNairy CT 9301, BG 2	$20,973	No	Yes
McNairy County	$22,939	No	Yes

Per capita income from 2021 ACS 5-Year Estimates

Results of the Alternative Criteria Analysis obtained from the USCB Map website and Table C17002 Ratio of Income to Poverty Level in the Past 12 Months indicate there is a low-income population within CT 9202, BG 3 but not in CT 9301, BG 2 or Hardin and McNairy Counties (Table 3.15-6) (USCB, n.d.-d).

Table 3.15-6. Low-Income Population Using Alternative Criteria Analysis

Geographic Unit	Total Number of Individuals	Number of Low-income Individuals	Percent Low Income	Exceeds 50 % of Geographic Unit	Minority Population Present
Hardin CT 9202, BG 3	1,457	812	55.73	Yes	Yes
Hardin County	26,231	11,455	43.7	No	No
McNairy CT 9691, BG 2	2,021	983	48.6	No	No
McNairy County	25,502	10,886	42.7	No	No

Data from the USCB website, Table C17002, Ratio of Income to Poverty Level in the Past 12 Months using the 2021 5-year ACS database.

Results of the Low-Income Threshold Analysis obtained from the USCB Map website and Table C17002 Ratio of Income to Poverty Level in the Past 12 Months indicate a low-income population is present in CT 99202, BG 3 but not in CT 9301, BG 2. (Table 3.15-7) (USCB, n.d.-d).

Table 3.15-7. Low Income Threshold Analysis

Geographic Unit	Total Number of Individuals	Number of Low-income Individuals	Percent Low Income Population	Is the CT and BG $\geq$ County	Minority Population Present
Hardin CT 9202, BG 3	1,457	812	55.73	Yes	Yes
Hardin County	26,231	11,455	43.7	N/A	N/A
McNairy CT 9301, BG 2	2,021	983	48.6	Yes	Yes
McNairy County	25,502	10,886	42.7	N/A	N/A

Data from EJScreen

Data from the USCB website, Table C17002, Ratio of Income to Poverty Level in the Past 12 Months using the 2021 5-year ACS database

Table 3.15-8 summarizes the results of the analyses conducted to determine if minority or low-income population are present in the CT and BG or counties in which Adamsville Solar is located.

Table 3.15-8. Adamsville EJ Analysis Summary

Minority					Minority			
CT 9301, BG 2					***CT 9202, BG 3***			
Analysis	**Yes**	**No**	**N/A**		**Analysis**	**Yes**	**No**	**N/A**
EJScreen		X			EJScreen		X	
No Threshold		X			No Threshold		X	
Fifty Percent		X			Fifty Percent		X	
Meaningfully Greater		X			Meaningfully Greater		X	
Result	*No*				*Result*	*No*		

Low-income					Low-income			
EJScreen		X			EJScreen	X		
Poverty/Low-income	X				Poverty/Low-income	X		
Alternative Criteria		X			Alternative Criteria	X		
Low-income Threshold	X				Low-income Threshold	X		
Result	*Possible*				*Result*	*Yes*		

Minority					Minority			
McNairy County					***Hardin County***			
Analysis	**Yes**	**No**	**N/A**		**Analysis**	**Yes**	**No**	**N/A**
EJScreen		X			EJScreen		X	
No Threshold			N/A		No Threshold			N/A
Fifty Percent		X			Fifty Percent		X	
Meaningfully Greater			N/A		Meaningfully Greater			N/A
Result	*No*				*Result*	*No*		

Low-income					Low-income			
EJScreen		X			EJScreen		X	
Poverty/Low-income	X				Poverty/Low-income	X		
Alternative Criteria		X			Alternative Criteria		X	
Low-income Threshold			X		Low-income Threshold			X
Result	*Possible*				*Result*	*Possible*		

3.15.2 Environmental Consequences – Environmental Justice

When a minority or low-income population is present within or adjacent to a project site, an EJ analysis is needed to determine if the proposed action will have disproportionally high and adverse impacts on the minority and/or low-income populations. The analysis considers project impacts to human health and the environment on EJ populations. The EJ analysis is prepared before the project begins so that the project can be designed to avoid or minimize adverse impacts to any identified EJ population(s). Paraphrasing the CEQ guidance (CEQ, 1997), three factors must be considered for health effects in an EJ analysis:

- Whether health effects are significant or above generally accepted norms,
- Whether the risk or rate of hazard exposure by a minority population, low-income population, to an environmental hazard is significant and appreciably exceeds or is likely to appreciably exceed the risk or rate to the general population or other appropriate comparison group; and
- Whether health effects occur in a minority population, low-income population, affected by cumulative or multiple adverse exposures from environmental hazards.

Adverse health effects may include bodily impairment, infirmity, illness, or death.

For disproportionally high and adverse environmental effects, CEQ's guidance (CEQ, 1997) also considers three factors:

- Whether there is or will be an impact on the natural or physical environment that significantly and adversely affects a minority population or low-income population. Such effects may include ecological, cultural, human health, economic, or social impacts on minority communities or low-income communities when those impacts are interrelated to impacts on the natural or physical environment
- Whether environmental effects are significant and are or may be having an adverse impact on minority populations or low-income populations that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison groups
- Whether the environmental effects occur or would occur in a minority population or low-income population affected by cumulative or multiple adverse exposures from environmental hazards.

3.15.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed, and no project-related EJ impacts would occur. Further, no disproportionately high and adverse impact on minority and low-income populations in the vicinity of the Project Site would occur.

3.15.2.2 Proposed Action

The results of the analyses indicate there is no minority population present in any of the geographic units analyzed. However, the mixed findings for CT 9202, BG 3, CT 9301, BG 2, and McNairy and Hardin Counties (Tables 3.15-5, 3.25-6, and 3.15-7) indicate low-income populations are present in each geographic unit. As a result, SRC prepared the EJ analysis described below.

EJ Analysis

This EJ Analysis examined the potential for the Project to have disproportionately high and adverse human health and environmental effects on one or more low-income populations that are within the two CTs and BGs containing the Project Site. The analysis has determined that no impacts resulting from constructing the solar facility will have an adverse impact on human health or the environment to anyone living near the Project Site.

Conversion of the land from agricultural to industrial and the potential change to the visual effects are the most notable changes that will occur. Any adverse visual impacts would be offset by using existing vegetation to reduce or eliminate the visibility of the panels from public and private access

points and would be supplemented with fencing and planting new vegetation if necessary. Constructing the project does not result in a long-term increase to air pollution, the release of GHGs, noise, hazardous materials, or traffic. The Project will not result in a permanent change to the socioeconomics of the area or create undo impacts on solid waste and utilities. No recognized natural areas or recreational facilities will be impacted. The Project will result in minor impacts to surface and groundwater, biological, and cultural resources; however, these impacts are offset by buffers protecting the resources and will not have an adverse impact on low-income populations.

Persons living adjacent to the Project site, including any low-income populations, may experience short-term impacts from an increase in traffic and noise during construction along with minor short-term direct and indirect air quality impacts resulting from localized dust and exhaust fumes from equipment during construction, but these impacts will end once construction is completed. Some minor long-term beneficial impact may result from the decreased use of pesticides and fertilizers on farmland that is converted to solar panels.

None of the impacts mentioned above rises to a level where they would create human health or environmental impacts that meet or exceeds the factors CEQ uses to determine when a low-income population would be disproportionately and adversely impacted by the project.

3.16 CUMULATIVE EFFECTS

The 2022 version of the Council on Environmental Quality's (CEQ) NEPA regulations, Title 40, Chapter V, Subchapter A, defines cumulative effects as, "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (CEQ, 2022).

Desktop research of potential past, present, and future actions in the McNairy and Hardin County area was conducted. Resources examined included:

- Aerial imagery from 2019 to 2023 within a 5-mile radius of the Project Site was examined. No major land use changes were observed.
- Documents available on the McNairy and Hardin Counties websites were reviewed. No other actions that would add to the cumulative effects of the Proposed Action were found.
- TDOT's FY2024-2026 Comprehensive Multimodal Program (TDOT, 2023) does not list any state-funded road projects for Hardin or McNairy Counties in FY 24, 25, or 26.
- A review of the McNairy and Hardin Counties Chambers of Commerce websites did not find any new business-related projects that would, combined with the Proposed Action, result in cumulative impacts to the region.
- Local news articles

The desktop research did not identify any past, present, or foreseeable future local projects that could combine with the Proposed Action to cause cumulative impacts that may significantly affect the environment.

CHAPTER 4 – LIST OF PREPARERS

4.0 LIST OF PREPARERS

Table 4-1 summarizes the expertise and contribution made to the EA by the Project Team.

Table 4-1. Environmental Assessment Project Team

Name/Education	Experience	Project Role
TVA		
Elizabeth Smith	13 years in NEPA compliance, document preparation, and project management.	TVA Project Manager, TVA NEPA Coordinator, NEPA Compliance, Document Preparation, and Technical Editor
Michaelyn Harle	22 years in archaeology and cultural resources management	Supervisor/ Archaeologist
Emily Kathryn McCann	7 years' experience in field biology, environmental reviews, NEPA and ESA compliance, and consulting with Federal agencies.	Biological Compliance
Ashley Pilakowski	11 years in environmental planning, policy and project management	Project Manager, Solar Coordination & Integration
Carrie Williamson	10 years in Floodplains and Flood Risk; 3 years in River Forecasting; 11 years in Compliance Monitoring	Floodplains and Flood Risk
Elizabeth Hamrick	19 years working in wildlife biology, threatened and endangered species surveys, research, and habitat restoration, 14 years technical writing, 10 years compliance with NEPA and ESA	Terrestrial Zoology
Todd Amacker	12 years T&E aquatic fauna in the American Southeast; 7 year NEPA and ESA Compliance	Aquatic Ecology, Aquatic T&E Species

Fallon Parker Hutcheon	4 years in wetland delineation, wetland impact analysis, and NEPA and CWA compliance	Wetland Biologist
Jessica Coleman	23 years of experience in communications, public relations and marketing.	Business Communications Consultant
David Mitchell	18 years of experience with botany, ecosystem restoration, land management; 6 years of project/program management in environmental research	Vegetation, Threatened and Endangered Plants
Chloe Sweda	5.5 years in Natural Resource Management	Natural Areas
Sara Bayles	3 years of experience in outdoor recreation management.	TVA Watershed Representative
Kris Thoemke, Ph.D., CEP B.S. Zoology Ph.D. Biology	12 years NEPA experience; 30+ years of experience in environmental services	NEPA Project Coordinator Document Preparation
Nick Carmean	11 years in regulatory compliance, preparation of NEPA/environmental review documents, protected species surveys, stream and wetland delineation, and permitting	Field Work Document Preparation Document Review
Frank Amatucci	Nine years in regulatory compliance, protected species surveys, stream and wetland delineation, and permitting	Field Work Document Preparation
Cameron Brueck	Two years in preparing regulatory compliance documentation, protected species surveys, and stream and wetland delineation.	Field Work Document Preparation
Chelsea Sachs	Four years in environmental geology, field work, and regulatory compliance	Field Work Document preparation

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