

SR Ripley II Solar Facility
DRAFT ENVIRONMENTAL ASSESSMENT
Lauderdale County, Tennessee

Prepared for:
Tennessee Valley Authority
Chattanooga, Tennessee

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TABLE OF CONTENTS

TABLE OF CONTENTS	I
SYMBOLS, ACRONYMS, AND ABBREVIATIONS	VII
GLOSSARY OF TERMS	XI
CHAPTER 1 – INTRODUCTION	1
1.1 Purpose and Need for Action	3
1.2 Scope of This Environmental Assessment	3
1.3 Public and Agency Involvement.....	5
1.4 Required Permits, Approvals, and Coordination.....	5
CHAPTER 2 – ALTERNATIVES	9
2.1 No Action Alternative	9
2.2 Proposed Action Alternative	9
2.2.1 Project Description.....	9
2.2.2 Construction.....	13
2.2.3 Electrical Interconnection.....	15
2.2.4 Operations	17
2.2.5 Decommissioning and Reclamation	18
2.3 Alternatives Eliminated from Further Consideration	18
2.4 Comparison of Alternatives	19
2.5 Best Management Practices and Mitigation Measures	25
2.5.1 Standard Practices and Routine Measures	25
2.5.2 Non-Routine Mitigation Measures	27
2.6 The Preferred Alternative	27
CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES	29
3.1 Identification of Other Actions	29
3.2 Land Use	30
3.2.1 Affected Environment	30
3.2.2 Environmental Consequences.....	33
3.2.2.1 No Action Alternative.....	33
3.2.2.2 Proposed Action Alternative.....	33
3.2.2.3 Cumulative Impacts.....	33
3.3 Geology, Soils, and Prime Farmland	33
3.3.1 Affected Environment	33
3.3.1.1 Geology.....	33
3.3.1.2 Paleontology.....	34
3.3.1.3 Geological Hazards	34
3.3.1.4 Soils.....	34
3.3.1.5 Prime Farmland.....	39
3.3.2 Environmental Consequences.....	41
3.3.2.1 No Action Alternative.....	41
3.3.2.2 Proposed Action Alternative	41
3.3.2.3 Cumulative Impacts.....	43
3.4 Water Resources.....	43
3.4.1 Affected Environment	43
3.4.1.1 Groundwater.....	43

3.4.1.2	Surface Water	43
3.4.1.3	Floodplains	52
3.4.2	Environmental Consequences.....	54
3.4.2.1	No Action Alternative.....	54
3.4.2.2	Proposed Action Alternative.....	54
3.5	Biological Resources.....	63
3.5.1	Affected Environment	63
3.5.1.1	Vegetation	63
3.5.1.2	Wildlife.....	66
3.5.1.3	Aquatic Life	70
3.5.1.4	Rare, Threatened, and Endangered Species	71
3.5.2	Environmental Consequences.....	77
3.5.2.1	No Action Alternative.....	77
3.5.2.2	Proposed Action Alternative.....	77
3.5.2.3	Cumulative Impacts.....	80
3.6	Visual Resources	81
3.6.1	Affected Environment	81
3.6.2	Environmental Consequences.....	86
3.6.2.1	No Action Alternative.....	86
3.6.2.2	Proposed Action Alternative.....	86
3.6.2.3	Cumulative Impacts.....	89
3.7	Noise	89
3.7.1	Affected Environment	89
3.7.1.1	Noise Regulations	89
3.7.1.2	Background Noise Levels	90
3.7.2	Environmental Consequences.....	93
3.7.2.1	No Action Alternative.....	93
3.7.2.2	Proposed Action Alternative.....	93
3.7.2.3	Cumulative Impacts.....	94
3.8	Air Quality and Climate Change.....	94
3.8.1	Affected Environment	94
3.8.1.1	Regional Air Quality	95
3.8.1.2	Regional Climate.....	95
3.8.1.3	Greenhouse Gas Emissions	95
3.8.2	Environmental Consequences.....	95
3.8.2.1	No Action Alternative.....	95
3.8.2.2	Proposed Action Alternative.....	95
3.8.2.3	Cumulative Impacts.....	97
3.9	Cultural Resources.....	98
3.9.1	Affected Environment	98
3.9.1.1	Previous Surveys	99
3.9.1.2	Archaeological Survey Results	99
3.9.1.3	Architectural Survey Results	101
3.9.2	Environmental Consequences.....	103
3.9.2.1	No Action Alternative.....	103
3.9.2.2	Proposed Action Alternative.....	103
3.9.2.3	Cumulative Impacts.....	104
3.10	Natural Areas and Recreation.....	104
3.10.1	Affected Environment	104
3.10.2	Environmental Consequences.....	106
3.10.2.1	No Action Alternative.....	106

3.10.2.2 Proposed Action Alternative	106
3.10.2.3 Cumulative Impacts	106
3.11 Utilities	106
3.11.1 Affected Environment	106
3.11.1.1 Telecommunications	106
3.11.1.2 Electricity	106
3.11.1.3 Natural Gas	106
3.11.1.4 Water and Sewer	106
3.11.2 Environmental Consequences	106
3.11.2.1 No Action Alternative	106
3.11.2.2 Proposed Action Alternative	107
3.11.2.3 Cumulative Impacts	107
3.12 Waste Management	107
3.12.1 Affected Environment	107
3.12.2 Environmental Consequences	108
3.12.2.1 No Action Alternative	108
3.12.2.2 Proposed Action Alternative	108
3.12.2.3 Cumulative Impacts	111
3.13 Public and Occupational Health and Safety	111
3.13.1 Affected Environment	111
3.13.2 Environmental Consequences	112
3.13.2.1 No Action Alternative	112
3.13.2.2 Proposed Action Alternative	112
3.13.2.3 Cumulative Impacts	113
3.14 Transportation	113
3.14.1 Affected Environment	113
3.14.1.1 Roads	113
3.14.1.2 Road Traffic	113
3.14.1.3 Rail and Air Traffic	114
3.14.2 Environmental Consequences	114
3.14.2.1 No Action Alternative	114
3.14.2.2 Proposed Action Alternative	114
3.14.2.3 Cumulative Impacts	115
3.15 Socioeconomics	115
3.15.1 Affected Environment	115
3.15.1.1 Population and Demographics	117
3.15.1.2 Employment and Income	117
3.15.2 Environmental Consequences	119
3.15.2.1 No Action Alternative	119
3.15.2.2 Proposed Action Alternative	119
3.15.2.3 Cumulative Impacts	120
3.16 Environmental Justice	120
3.16.1 Affected Environment	120
3.16.1.1 Minority Populations	121
3.16.1.2 Low-Income Populations	124
3.16.1.3 Environmental Justice Indices	126
3.16.2 Environmental Consequences	129
3.16.2.1 No Action Alternative	129
3.16.2.2 Proposed Action Alternative	129
3.16.2.3 Cumulative Impacts	132
CHAPTER 4 – LIST OF PREPARERS	133

4.1 List of Preparers 133

CHAPTER 5 – REFERENCES CITED 137

List of Tables

Table 1-1. Permits, approvals, and coordination list 5

Table 2-1. Comparison of impacts by alternative 20

Table 3-1. Summary of other past, present, or RFFAs within 10 miles of the Project site 29

Table 3-2. Land cover types on the Project site 31

Table 3-3. Soils on the Project site 37

Table 3-4. Summary of jurisdictional watercourses within the Project site 46

Table 3-5. Summary of non-jurisdictional watercourses within the Project site 47

Table 3-6. Summary of open waters within the Project site 49

Table 3-7. Summary of wetlands within the Project site 50

Table 3-8. Proposed Action Alternative stream impacts within the Project site 59

Table 3-9. Vegetation communities on the Project site 64

Table 3-10. Common wildlife species observed on the Project site 67

Table 3-11. Migratory bird species of concern potentially occurring on the Project site 69

Table 3-12. Aquatic species encountered on the Project site 71

Table 3-13. Federally and state-listed species potentially occurring on the Project site 72

Table 3-14. Summary of suitable bat habitat stands 75

Table 3-15. Viewpoints in the vicinity of the Project site 84

Table 3-16. Common indoor and outdoor noise levels 90

Table 3-17. Summary of construction waste streams and management methods 110

Table 3-18. Summary of operation waste streams and management methods 110

Table 3-19. 2021 AADT counts near the Project site 114

Table 3-20. Population trends in the Project area for socioeconomics, county, and state 117

Table 3-21. Employment and income in the Project area for socioeconomics, county, and state 118

Table 3-22. Top industries in the Project area for socioeconomics, county, and state 118

Table 3-23. Minority percentages and ethnicities in the Project area for EJ, county, and state 122

Table 3-24. Poverty in the Project area for EJ, county, and state 124

Table 3-25. BG EJ indices percentile comparisons to the state for the Project area for EJ 127

Table 3-26. Summary of impacts to EJ communities and mitigation measures 131

Table 4-1. SR Ripley II Environmental Assessment Project Team 133

List of Figures

Figure 1-1. SR Ripley II Project site in Lauderdale County, Tennessee 2

Figure 2-1. Aerial photo showing the 490-acre Project site 10

Figure 2-2. Aerial photo showing the proposed layout of SR Ripley II components 11

Figure 2-3. General energy flow diagram of PV solar system (not to scale) 12

Figure 2-4. Diagram of single-axis tracking system (not to scale)..... 13

Figure 2-5. Aerial photo showing the proposed TL upgrade areas 17

Figure 3-1. Land cover in the Project area 32

Figure 3-2. Soils on the Project site..... 36

Figure 3-3. Farmland classifications on the Project site 40

Figure 3-4. Delineated wetlands, watercourses, and ponds on the northern portion of the Project site..... 51

Figure 3-5. Delineated wetlands, watercourses, and ponds on the southern portion of the Project site..... 52

Figure 3-6. Floodplains in the Project area 53

Figure 3-7. Proposed Project components in relation to delineated wetlands, watercourses, and ponds on the northern portion of the Project site 57

Figure 3-8. Proposed Project components in relation to delineated wetlands, watercourses, and ponds on the southern portion of the Project site 58

Figure 3-9. Proposed Project components in relation to floodplains in the Project area 62

Figure 3-10. Vegetations communities on the Project site 65

Figure 3-11. Bat habitat on the Project site 76

Figure 3-12. Agricultural land on the Project site..... 82

Figure 3-13. Forested land on the Project site 82

Figure 3-14. Viewpoints in the vicinity of the Project site 85

Figure 3-15. Single-axis, tracking PV system with panels near maximum tilt as viewed from the east or west..... 87

Figure 3-16. The backside of the solar panels in early morning or late afternoon configuration 87

Figure 3-17. Noise receptors within 0.5 mile of the Project site boundary 92

Figure 3-18. Architectural resources in the vicinity of the Project site..... 102

Figure 3-19. Natural areas, parks, and recreation in the vicinity of the Project site 105

Figure 3-20. USCB BGs in the Project area 116

Figure 3-21. Minority populations in the Project area for EJ..... 123

Figure 3-22. Low-income populations in the Project area for EJ..... 125

List of Appendices

- Appendix A – Geological Resources-Related Supporting Information
- Appendix B – Water Resources-Related Supporting Information
- Appendix C – Biological Resources-Related Correspondence and Supporting Information
- Appendix D – Cultural Resources-Related Correspondence and Supporting Information
- Appendix E – Public Notice

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SYMBOLS, ACRONYMS, AND ABBREVIATIONS

AADT	Annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
AC	Alternating current
ACS	American Community Survey
AFL	Addendum Field Locus
AIF	Addendum Isolated Find
APE	Area of Potential Effect
APLIC	Avian Power Line Interaction Committee
ARAP	Aquatic Resource Alteration Permit
BG	Block group
BLS	Bureau of Labor Statistics
BMP	Best management practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO ₂	Carbon dioxide
CT	Census tract
CWA	Clean Water Act
dB	Decibel
dBA	A-weighted decibel
DBH	Diameter at breast height
DC	Direct current
DWR	Division of Water Resources
EA	Environmental assessment
EFO	Environmental Field Office
EIS	Environmental impact statement
EJ	Environmental justice
EMF	Electromagnetic field
EO	Executive Order
ESA	Endangered Species Act
°F	Degree Fahrenheit
FEMA	Federal Emergency Management Agency
FL	Field locus

FR	Federal Register
GHG	Greenhouse gas
HD	Hydrological determination
HDR	HDR Engineering, Inc.
HS	Historic Structure
HUC	Hydrologic unit code
HUD	U.S. Department of Housing and Urban Development
IF	Isolated find
IPaC	Information for Planning and Consultation
IRP	Integrated Resource Plan
JD	Jurisdictional determination
kV	Kilovolt
L _{dn}	Day-night average sound level
LF	Linear feet
LUST	Leaking underground storage tank
MBTA	Migratory Bird Treaty Act
MPT	Main power transformer
MVT	Medium voltage transformer
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NIOSH	National Institute for Occupational Safety and Health
NLCD	National Land Cover Database
NO ₂	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NWP	Nationwide Permit
OHWM	Ordinary high-water mark
OSHA	Occupational Safety and Health Act
PEM	Palustrine emergent wetland
PFO	Palustrine forested wetland

PM _{2.5}	Particulate matter less than or equal to 2.5 micrometers
PPA	Power purchase agreement
PSS	Palustrine scrub-shrub wetland
PUBH	Palustrine unconsolidated bottom
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
RFFA	Reasonably foreseeable future action
RFP	Request for proposal
RNHD	Regional Natural Heritage Database
ROW	Right-of-way
SHPO	State Historic Preservation Office
SMZ	Streamside management zone
SPCC	Spill Prevention, Control, and Countermeasure
SRC	Silicon Ranch Corporation
SWPPP	Stormwater Pollution Prevention Plan
TDEC	Tennessee Department of Environment and Conservation
TDOA	Tennessee Division of Archaeology
TDOT	Tennessee Department of Transportation
TerraX	TerraXplorations, Inc.
THC	Tennessee Historical Commission
TL	Transmission line
TRAM	Tennessee Rapid Assessment Method
Tribes	Federally Recognized Indian Tribes
TVA	Tennessee Valley Authority
U.S.	United States
U.S.C.	U.S. Code
US 51	U.S. Route 51
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
UST	Underground storage tank

WOTUS

Waters of the U.S.

WWC

Wet weather conveyance

GLOSSARY OF TERMS

100-Year Floodplain	The area subject to a one percent chance of flooding in any given year.
Ambient Air	Outdoor air in locations accessible to the general public.
Area of Potential Effects (APE)	The geographic area(s) 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 National Ambient Air Quality Standards (NAAQS) as determined by measurements of air pollutant levels.
Best Management Practice (BMP)	A practice chosen to minimize environmental effects to a variety of environmental resources. BMPs are typically standard practices and not customized for a particular proposed action.
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 Code of Federal Regulations [CFR] § 1508.7).
Day/Night Average Sound Level (L_{dn})	A 24-hour average noise level rating used to assess noise impacts for land uses where people sleep and there is a heightened sensitivity to nighttime noise.
Decibel (dB)	A generic term for measurement units based on the logarithm of the ratio between a measured value and a reference value. Decibel (dB) scales are most commonly associated with acoustics (using air pressure fluctuation data); but dB scales sometimes are used for ground-borne vibrations or various electronic signal measurements. The adjusted noise metric that most closely duplicates human perception of noise is known as the A-weighted dB.
Deciduous	Vegetation that sheds leaves in autumn and produces new leaves in the spring.
Direct Impacts	Impacts 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	Wetland dominated by erect, rooted herbaceous plants, such as cattails and bulrush.
Endangered Species	A species in danger of extinction throughout all or a significant portion of its range or territory and listed as endangered by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) following the procedures outlined in the Endangered Species Act (ESA) and its implementing regulations (50 CFR § 424).
Environmental Assessment (EA)	A document prepared for a proposed action that does not qualify as a categorical exclusion (CE) to determine whether an environmental impact statement (EIS) is necessary, or a finding of no significant impact (FONSI) can be prepared. An EA concisely communicates information and analyses about issues that are potentially significant and reasonable alternatives.
Environmental Justice (EJ)	The just treatment and meaningful involvement of all people regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other federal activities that affect human health and the environment.
Ephemeral Stream	Rain-dependent stream that flows only after precipitation.
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 by a flood of selected frequency. For purposes of the National Flood Insurance Program, the floodplain, at a minimum, is that area subject to a one 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).
Forested Wetland	Wetland dominated by trees.
Generation Tie (gen-tie) Line	A dedicated transmission line that connects a solar facility to the existing electrical grid.
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	Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP; 36 CFR § 800.16(I)).
Indirect Impacts	Impacts 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).
Intermittent Stream	Seasonal stream that flows during certain times of the year when smaller upstream waters are flowing and when groundwater provides enough water for stream flow.
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.
Large	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA's current practice. Refers to environmental impacts that are clearly noticeable and are sufficient to destabilize important attributes of the resource.
Liquefaction	A condition in which a saturated cohesion-less soil may lose shear strength because of a sudden increase in pore water pressure caused by an earthquake.
Maintenance Area	An area that currently meet NAAQS, but which was previously designated as a nonattainment area. Federal agency actions occurring in a maintenance area are still subject to Clean Air Act (CAA) conformity review requirements.
Minor	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA's current practice. Refers to environmental impacts that are not detectable or are so minor that they would not noticeably alter any important attribute of the resource.
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).

Moderate	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA's current practice. Refers to environmental impacts that are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
National Ambient Air Quality Standards (NAAQS)	Uniform national air quality standards established by the U.S. Environmental Protection Agency (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 Environmental Policy Act (NEPA)	The federal law that establishes a national policy on the environment and requires federal agencies to consider the effects of their proposed actions on the environment before final decisions are made and involve the public in the decision making. NEPA does not mandate particular results or substantive outcomes.
National Historic Preservation Act (NHPA)	The 1966 federal law that establishes a national preservation program and a system of procedural protections that requires federal agencies to identify and protect historic resources, including archaeological resources, at the federal level and indirectly at the state and local level. NHPA authorizes the establishment of the NRHP.
National Pollutant Discharge Elimination System (NPDES) and Water Quality Certification	The NPDES permit program was established under the Clean Water Act (CWA) and controls, among other things, the discharge of stormwater associated with certain construction activities involving disturbance of one or more acres. In Tennessee, the NPDES program has been delegated to the Tennessee Department of Environment and Conservation. In addition, Section 401 of the CWA requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the U.S. obtain a state certification that the discharge complies with the CWA.
National Register of Historic Places (NRHP)	A list of places and objects maintained by the National Park Service based on their integrity of location, design, setting, materials, workmanship, feeling and association, and: 1) association with important historical events; or 2) association with the lives of significant historic persons; or 3) embodiment of distinctive characteristics of a type, period, or method of construction or represent the work of a master, or have high artistic value; or 4) have yielded or may yield information important in history or prehistory.
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.
Nitrogen Dioxide (NO₂)	A toxic, reddish gas formed by the oxidation of nitric oxide. NO ₂ is a strong respiratory and eye irritant. Most nitric oxide formed by combustion processes is converted into NO ₂ by subsequent oxidation in the atmosphere. NO ₂ is a criteria pollutant, and is a precursor of ozone, numerous types of photochemically generated nitrate particles, and atmospheric nitrous and nitric acids.

No Action Alternative	The alternative in a NEPA study that would continue with the present course of action and in which the proposed activity would not take place. The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured.
No Impact (or “absent”)	One of four descriptors used to characterize the level of impact in a manner that is consistent with TVA’s current practice. Refers to a resource that is not present or, if present, would not be affected by project alternatives under consideration.
Nonattainment Area	An area that does not meet NAAQS. Federal agency actions occurring in a federal nonattainment area are subject to CAA conformity review requirements.
Ozone (O₃)	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 tissue 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 (PM)	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. PM 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 PM 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 PM also can contain compounds such as heavy metals and various organic compounds that are systemic toxins or necrotic agents. Suspended PM or compounds adsorbed on the surface of particles can also be carcinogenic or mutagenic chemicals. See PM _{2.5} .
Particulate Matter ≤2.5 microns (PM_{2.5}) (Fine Particulate Matter)	A fractional sampling of suspended PM 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 PM 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.

Perennial Stream	A stream that typically has flowing water in it year-round.
Photovoltaic (PV) Power Generation	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.
Physiographic Provinces	General divisions of land with each area having characteristic combinations of soil materials and topography.
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.
Preferred Alternative	The action alternative in a NEPA study which the agency believes would fulfill its statutory mission and responsibilities, considering economic, environmental, technical and other factors, and would meet a proposed project's purpose and need.
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 oil seed 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.
Purpose and Need	A statement by an agency in a NEPA document to describe what it is trying to achieve by proposing an action. The purpose and need statement explain why an action is necessary and serves as the basis for identifying the reasonable alternatives that meet the purpose and need.
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.
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 Office (SHPO)	The official within and authorized by each state at the request of the Secretary of the Interior to act as liaison for the NHPA.

Subsurface	Of or pertaining to rock or mineral deposits which generally are found below the ground surface.
Sulfur Dioxide (SO₂)	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 likely to become endangered within the foreseeable future throughout all or a significant portion of its range or territory and which has been listed as threatened by USFWS or NMFS following the procedures set out in the ESA and its implementing regulations (50 CFR § 424).
Upland	The higher parts of a region, not closely associated with streams or lakes.
Wet Weather Conveyance	Man-made or natural watercourses, including natural watercourses that have been modified by channelization: that flow only in direct response to precipitation runoff in their immediate locality; whose channels are at all times above the ground water table; that are not suitable for drinking water supplies; and in which hydrological and biological analyses indicate that, under normal weather conditions, due to naturally occurring ephemeral or low flow there is not sufficient water to support fish, or multiple populations of obligate lotic aquatic organisms whose life cycle includes an aquatic phase of at least two months.
Wetland	An area inundated by surface or groundwater with a frequency sufficient to support, and under normal circumstances does 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 Wildlife Resources Agency, 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).

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CHAPTER 1 – INTRODUCTION

The Tennessee Valley Authority (TVA) entered into a power purchase agreement (PPA) with SR Ripley II, LLC, a wholly owned subsidiary of Silicon Ranch Corporation (SRC), in December 2022, to purchase the electric power generated by a proposed solar photovoltaic (PV) facility in Lauderdale County, Tennessee. The solar facility, known as SR Ripley II, would be owned by SRC and operated by SR Ripley II, LLC. The facility would have a generating capacity of 30 megawatts (MW) alternating current (AC). Ripley Power and Light would connect the solar facility to TVA's existing Ripley–Covington 161-kilovolt (kV) transmission line (TL) via a new approximately 0.3-mile-long 34.5-kV dedicated TL called a generation tie (gen-tie) line from a proposed on-site switchgear to the existing on-site Ripley Power and Light East Industrial Park station (substation). Under the terms of the PPA, TVA would purchase the electricity generated by the solar facility for a term of 20 years, subject to satisfactory completion of all applicable environmental reviews. In addition to purchasing the electric output under the PPA with SR Ripley II, LLC, TVA also proposes to install fiber-optic overhead ground wire (OPGW) on a 0.75-mile length of the Ripley–Covington 161-kV TL, on portions of the TL that are on site. Together, the associated construction and operation of SR Ripley II and the TVA TL upgrade areas are herein referred to as both the "Project" and the "Proposed Action."

Following a detailed investigation of various alternatives (see Section 2.3), the proposed solar PV facility has been designed to occupy approximately 194 acres of a 490-acre Project site located within the metropolitan limits of Ripley in southeastern Lauderdale County (Figure 1-1). The solar facility would consist of arrays of thin-film PV panels attached to ground-mounted single-axis trackers, central inverters, transformers, a switchgear, an operations and maintenance building, access roads, and all associated cabling and safety equipment.

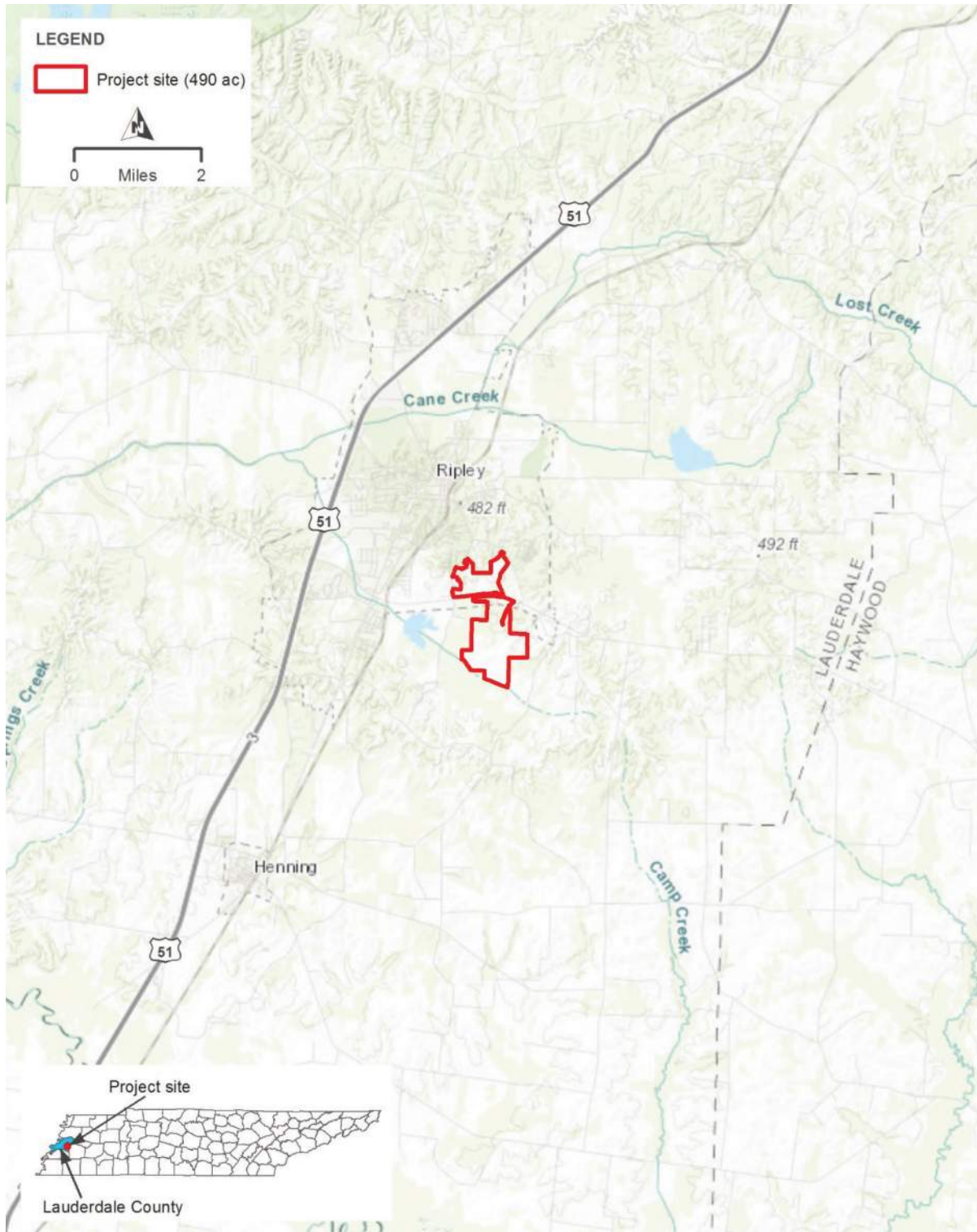


Figure 1-1. SR Ripley II Project site in Lauderdale County, Tennessee

1.1 Purpose and Need for Action

TVA is a corporate agency of the United States (U.S.) and the largest public power provider in the country. Through TVA's partnership with 153 local power companies, TVA supplies electricity 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 most of Tennessee and parts of six adjacent states. Since 1933, TVA's mission has been to serve the people of the Tennessee Valley region to make life better.

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 (EIS). The 2019 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 with fewer environmental impacts. The 2019 IRP recommends the expansion of solar generating capacity of up to 14,000 MW by 2038 (TVA 2019)¹. With the demand for solar energy increasing, TVA has an expansion target of 10,000 MW of solar by 2035 (TVA 2021).

Customer demand for cleaner energy prompted TVA to release a request for proposal (RFP) for renewable energy resources, the 2020 Renewable RFP. In response to this RFP, TVA received multiple proposals from solar developers, including SR Ripley II, LLC. The resulting PPAs, including the SR Ripley II, LLC PPA, would help TVA meet immediate needs for additional renewable generating capacity in response to customer demand and contribute to the fulfillment of the 10,000 MW of solar by 2035 target. The Proposed Action would provide cost-effective renewable energy consistent with the 2019 IRP and TVA goals.

1.2 Scope of This Environmental Assessment

The National Environmental Policy Act (NEPA; 42 U.S. Code [U.S.C.] §§ 4321 et seq.) 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 Code of Federal Regulations (CFR) 1500-1508 (87 Federal Register [FR] 23453, April 20, 2022). TVA's 2020 NEPA regulations at 18 CFR 1318 were also applied (85 FR 17434, March 27, 2020).

TVA's Proposed Action, including connection to the existing substation on the Project site, would result in the construction and operation of the proposed solar facility by SR Ripley II, LLC. The scope of this EA covers the impacts of the construction and operation of the solar facility and associated transmission system components. The full extent of the TL upgrade activities includes the installation of a new approximately 0.3-mile-long 34.5-kV gen-tie line from a proposed on-site switchgear to the existing on-site Ripley Power and Light substation and the installation of new OPGW on an approximately 0.75-mile on-site portion of the Ripley–Covington 161-kV TL. The description of the anticipated impacts of these upgrades in Chapter 3 is based on the best information available during the preparation of

¹On May 19, 2023, TVA published a Notice of Intent in the Federal Register announcing its plans to prepare an EIS associated with the implementation of the updated IRP, initiating the 45-day scoping period, which concluded on July 3, 2023. The 2019 IRP remains valid and guides future generation planning consistent with least-cost planning principles.

the Draft EA. If TVA determines, because of continuing analyses, that the TL upgrade activities are likely to result in adverse impacts and associated mitigation measures are outside the range of those described in this Draft EA, TVA will seek additional public comments on those aspects of the Proposed Action.

This EA describes the existing environment in the Project area (i.e., the potentially affected area within and beyond the Project site and varies by each resource area), analyzes potential environmental impacts associated with the Proposed Action and the No Action Alternative, and identifies and characterizes potential cumulative impacts from the proposed Project in relation to other past, present, and reasonably foreseeable future actions (RFFAs) within the surrounding area of the Project site.

Under the terms of 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 "environmentally acceptable," TVA must assess the impact of the Project on the human environment to determine whether (1) any significant impacts would result from the construction, 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.

Based on internal scoping and identification of applicable laws, regulations, executive orders (EOs), and policies, TVA identified the following resource areas for analysis 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, parks, and recreation; utilities; waste management; public and occupational health and safety; transportation; socioeconomics; and environmental justice.

This EA consists of five chapters discussing the Project alternatives, resource areas potentially impacted, and analyses of these impacts. Additionally, this document includes five appendices containing supporting information. The structure of the EA is outlined below:

- **Chapter 1:** Describes the purpose and need for the Project, public involvement, necessary permits or licenses, and the EA overview.
- **Chapter 2:** Describes the Proposed Action and No Action Alternatives, provides a comparison of alternatives, and discusses the Preferred Alternative.
- **Chapter 3:** 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:** Contains the List of Preparers of this EA.
- **Chapter 5:** Contains the References Cited in preparation of this EA.
- **Appendix A:** Geological Resources-Related Supporting Information
- **Appendix B:** Water Resources-Related Supporting Information
- **Appendix C:** Biological Resources-Related Correspondence and Supporting Information

- **Appendix D:** Cultural Resources-Related Correspondence and Supporting Information
- **Appendix E:** Public Notice

1.3 Public and Agency Involvement

SRC has worked with the city of Ripley and Lauderdale County to introduce the Project to local officials. SRC has mailed post cards to adjacent landowners and will host community meetings to provide further information if deemed necessary based on feedback.

TVA posted the draft EA for a 30-day public review and comment period on its website (<http://tva.com/nepa>), published a notice of availability in newspapers that serve the Lauderdale County area, sent postcards to residents within one mile of the Project site, and notified local, state, and federal agencies and federally recognized tribes that the draft EA is available for review and comment as of July 15, 2024. Following the closure of the public review and comment period on August 16, 2024, TVA will carefully review all submitted comments. The subsequent final EA will be revised as appropriate in response to the comments received and will contain TVA’s responses to the comments.

1.4 Required Permits, Approvals, and Coordination

Construction of SR Ripley II would require federal and state permits and/or coordination, as well as certification for the proper installation of some Project components, including the associated transmission interconnection (Table 1-1). Adherence to permit or certification conditions helps to avoid, minimize, or mitigate environmental impacts, as discussed in relation to specific resource areas in Chapter 3.

Table 1-1. Permits, approvals, and coordination list

Permit/Approval/Coordination	Justification	Lead Agency
Federal		
Endangered Species Act (ESA) Section 7 Consultation	In compliance with Section 7 of ESA, TVA is consulting with the U.S. Fish and Wildlife Service (USFWS) on Project effects on federally listed species and habitat.	USFWS
Bald and Golden Eagle Protection Act (BGEPA)	Prohibits the take of bald and golden eagles without prior authorization by USFWS. Take includes the killing, injuring, or disturbing of present or nesting eagles.	USFWS
Migratory Bird Treaty Act (MBTA)	Prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by USFWS. EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to conserve migratory birds and implement the MBTA.	USFWS
Clean Water Act (CWA) Section 404 Nationwide Permit (NWP) or Individual Permit	NWPs are required for impacts to U.S. Army Corps of Engineers (USACE)-jurisdictional waters that are less than 0.5 acre. An Individual permit is required if the impacts were to exceed 0.5 acre.	USACE

Permit/Approval/ Coordination	Justification	Lead Agency
State		
CWA Section 401 Water Quality Certification Aquatic Resource Alteration Permit (ARAP)	Required for impacts to Tennessee state waters.	Tennessee Department of Environment and Conservation (TDEC) Division of Water Resources (DWR)
National Pollutant Discharge Elimination System (NPDES) Stormwater Construction General Permit	As the construction disturbance would be greater than one acre, the Project requires a NPDES Stormwater Construction General Permit for discharges into waters of the U.S. (WOTUS). This includes submission of a Notice of Intent (NOI), erosion and sediment control plans, and a stormwater pollution prevention plan (SWPPP).	TDEC DWR – NPDES Stormwater Permitting Program
National Historic Preservation Act (NHPA) Section 106 Consultation	In compliance with Section 106 of NHPA, TVA is consulting with the Tennessee Historical Commission (THC), acting as the Tennessee State Historic Preservation Office (SHPO), and federally recognized tribes with interests in the Project area on Project effects on historic properties (i.e., eligible for the National Register of Historic Places [NRHP]) and other cultural resources (Appendix D).	THC and federally recognized tribes
Encroachment Agreement	Required for aboveground or below ground installation of utilities within state, federal-aid metro-urban, or state-aid highway system road right-of-way (ROWs).	Tennessee Department of Transportation (TDOT)
Septic System Permit	Required for installation of a septic system. The permit involves on-site evaluations to determine if site and soil conditions are suitable for on-site wastewater systems.	TDEC Environmental Field Office (EFO)
Well Installation Notification	Required for installation of a well on the Project site.	TDEC EFO
Burn Permit	May be required for the open burning of any vegetation cleared from the Project site.	Tennessee Division of Forestry
Natural Heritage Program Consultation	Informal consultation with TDEC recommended if Project triggers an ARAP and state-protected species may be impacted.	TDEC Division of Natural Areas

Permit/Approval/ Coordination	Justification	Lead Agency
County/Municipal		
Zoning Permit	Required if an area has zoning requirements and the Project intersects a Federal Emergency Management Agency (FEMA) special flood hazard area. The Project does not intersect a FEMA special flood hazard area. The northern portion of the Project site is partially located within areas zoned as High Density/Mobile Home and General Business and is subject to zoning restrictions. The southern portion of the Project site is in an unincorporated area that has no zoning requirements. Coordination with the city of Ripley and Lauderdale County regarding any necessary zoning changes or permits may be required.	City of Ripley

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CHAPTER 2 – ALTERNATIVES

This chapter describes the two alternatives evaluated in this EA (the No Action Alternative and the Proposed Action Alternative), explains the rationale for identifying the alternatives to be evaluated, provides a comparison of the potential environmental impacts of the evaluated alternatives, 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 (i.e., TVA would not be involved with the Project), and SR Ripley II, LLC would not construct the proposed solar PV facility. Existing conditions (e.g., land use, natural resources, visual resources, physical resources, and socioeconomics) in the Project area would not change as a result of the Proposed Action. TVA would continue to rely on other sources of generation described in the 2019 IRP to ensure an adequate energy supply and to meet its goals for increased renewable energy generation. The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured.

2.2 Proposed Action Alternative

Under the Proposed Action Alternative, TVA would execute the PPA to purchase the power generated by the proposed solar PV facility. SR Ripley II, LLC would construct, operate, and maintain a 30-MW AC single-axis tracking PV solar power facility on the 490-acre site located in Lauderdale County. Ripley Power and Light would connect the solar facility to TVA's existing Ripley–Covington 161-kV TL via a new approximately 0.3-mile-long 34.5-kV dedicated gen-tie from a proposed on-site approximately 0.5-acre switchgear to the existing on-site Ripley Power and Light substation. Access to the switchgear would be from an access road from State Route 19 or from Highland Street Extended. TVA would install OPGW on approximately 0.75 mile of the portions of the Ripley–Covington 161-kV TL that are on the Project site.

2.2.1 Project Description

The 490-acre Project site is bisected by northwest–southeast-oriented State Route 19 and bounded to the north by Eastland Avenue within the metropolitan limits of Ripley in southeastern Lauderdale County (Figure 2-1). 194 acres of the 490-acre property will be directly impacted by the placement of fencing, panels, and roads. The Project site consists primarily of agricultural fields used for cultivating cotton, soybeans, and corn. TVA's existing Ripley–Covington 161-kV TL traverses the Project site in a north–south and east–west orientation. The perimeter of the developed facilities would be enclosed with security fencing. The remaining areas would be undeveloped while allowing for related agricultural or vegetation management activities. Approximately four acres of access roads would be constructed or improved to access Project components. Approximately three acres of these access roads would be located within the fenced-in panel areas and approximately one acre of access roads would be outside of the fenced-in panel areas.

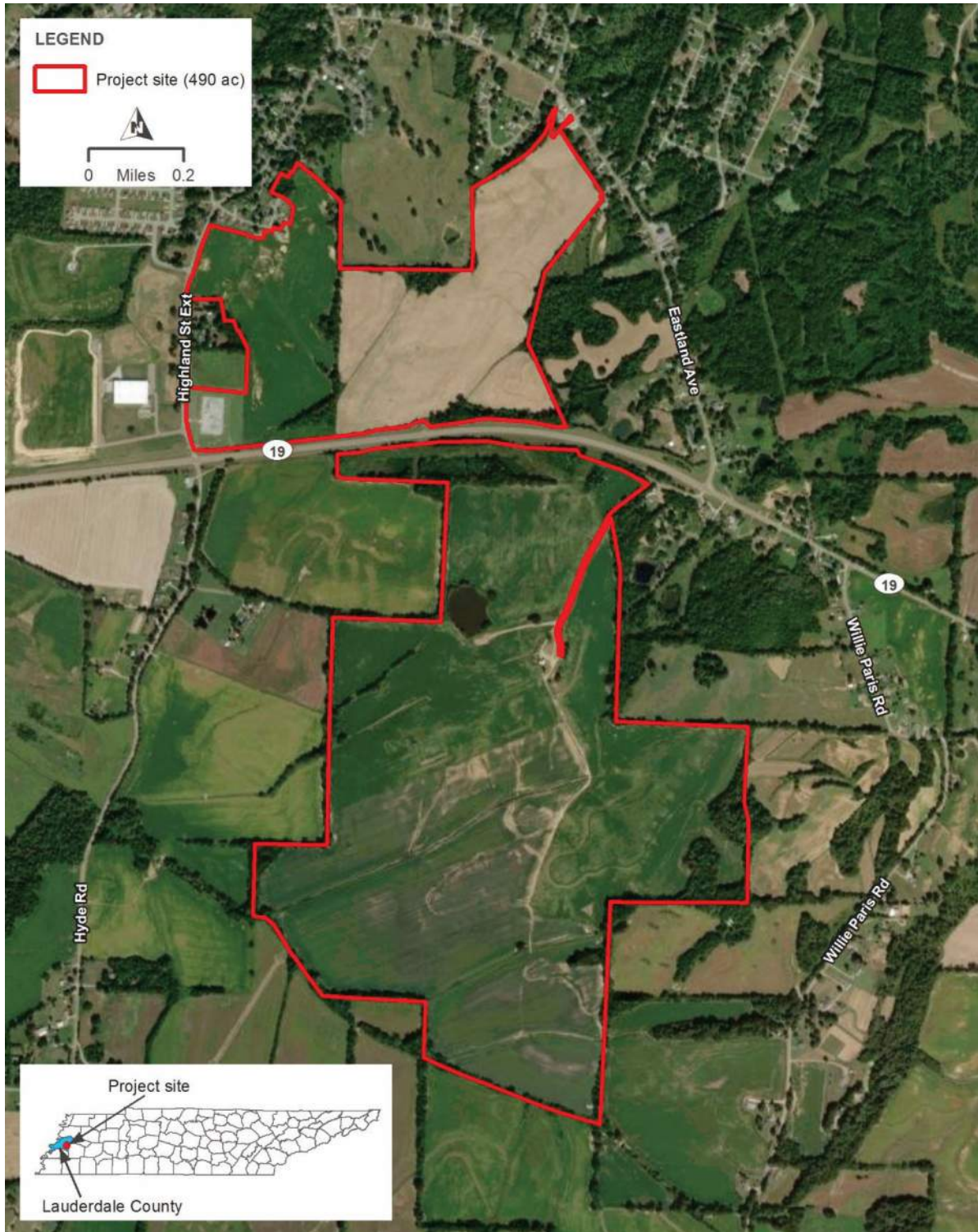


Figure 2-1. Aerial photo showing the 490-acre Project site

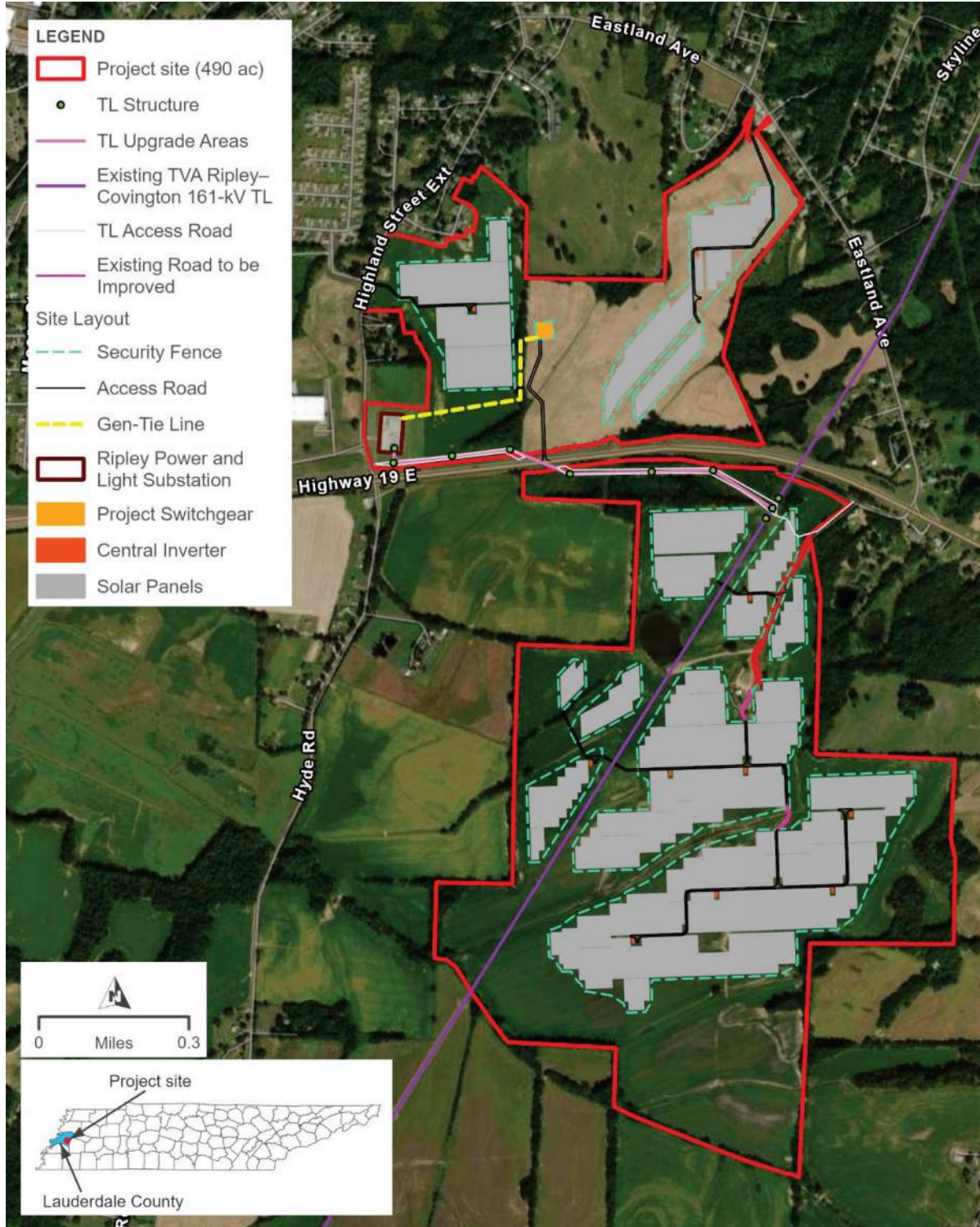


Figure 2-2. Aerial photo showing the proposed layout of SR Ripley II components

Figure 2-2 shows the Project site with the locations of major Project components. Other temporary or permanent components include construction laydown areas, security and communications equipment, and an operations and maintenance building. Also, if determined necessary, the Project would include water wells and a septic system or pump-out septic holding tank.

The PV panels (i.e., modules) would convert sunlight into direct current (DC) electrical energy. 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).

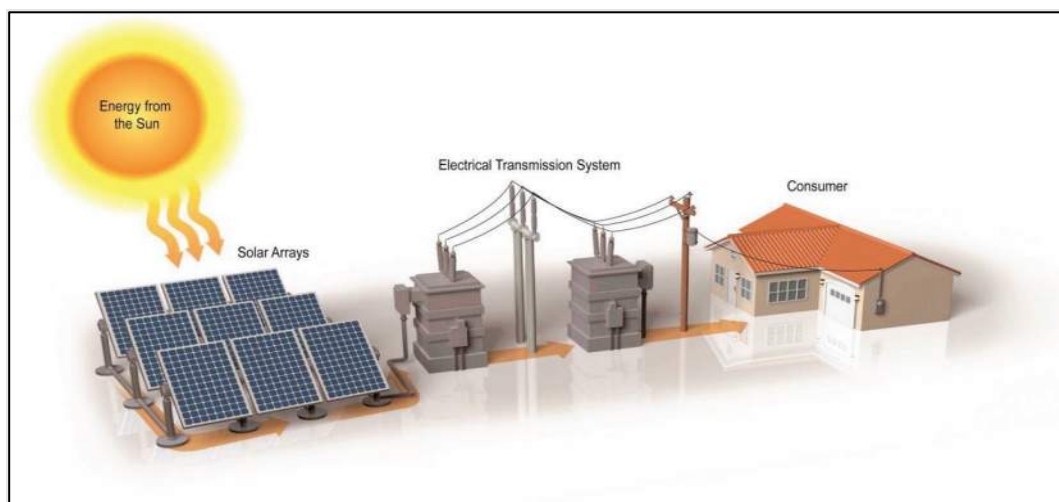


Figure 2-3. General energy flow diagram of PV solar system (not to scale)

The Project would be composed of anti-reflective PV modules mounted together in arrays. Groups of modules would be connected electrically in series to form “strings” of modules, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project site’s high design temperature. The modules, approximately 6.6 feet by four feet in size, would be in individual blocks consisting of the PV arrays on steel piles and an inverter station on a concrete pad. Inverter stations convert the DC electricity generated by the modules into AC electricity. Blocks of PV arrays and other facility components would be enclosed by chain-link security fencing. The portions of the Project site outside the fenced-in areas would not be developed.

The modules would be attached to single-axis trackers that follow the path of the sun from the east to the west across the sky (Figure 2-4). The inverter specification would fully comply with the applicable requirements of the National Electrical Code and Institute of Electrical and Electronics Engineers standards. Each inverter would be collocated with a medium voltage transformer (MVT) that would step-up the AC voltage to minimize the AC cabling electrical losses between the central inverters and the proposed on-site Project switchgear. Underground AC power cables would connect all the MVTs to the main power transformer(s) (MPT) located within the Project switchgear. Compacted gravel or dirt access roads would provide access to each inverter block and the Project switchgear.

2.2.2 Construction

As part of NPDES permit authorization (Section 1.4), the 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 solar facility site would be prepared by surveying, staking, and installing about 42,000 feet of six-foot-tall chain-link security fencing topped with three strands of barbed wire around the 11 large blocks of facility components and Project switchgear. Entrances to the solar facility would be protected by locked, double-swing gates. The Project site would be accessible only to TVA; SR Ripley II, LLC; and their agents and contractors.

Construction assembly areas (laydown areas) would be established for worker assembly, safety briefings, vehicle parking, and material storage during construction. The laydown areas would likely be graveled and would be placed to avoid cultural, biological, and water resources to the greatest extent practicable. Temporary construction trailers for material storage and office space would be parked on-site. In accordance with TVA requirements, minimum 50-foot streamside management zones (SMZs) surrounding wetlands as well as intermittent and perennial streams would be established as impact avoidance measures prior to any clearing, grubbing, grading, or utility line installation activities conducted by the construction contractor (TVA 2022a). Apart from non-mechanical removal of trees and other tall vegetation and leaving roots in place to prevent shading of the PV panels, these SMZs would be avoided during construction to the greatest extent practicable. Within SMZs, tree and vegetation removal would be conducted using non-mechanical means and the roots would be left in place. The SMZs would be marked and protected by silt fences and sediment traps in strategic drainage areas, and other erosion prevention and sediment control best management practices (BMPs) would be implemented, as detailed in the site-specific SWPPP.

Construction activities would be sequenced to minimize the time that bare soil in disturbed areas is exposed. Construction areas would be cleared of debris and tall vegetation, mowed, and lightly graded, as needed, for construction and placement of the solar

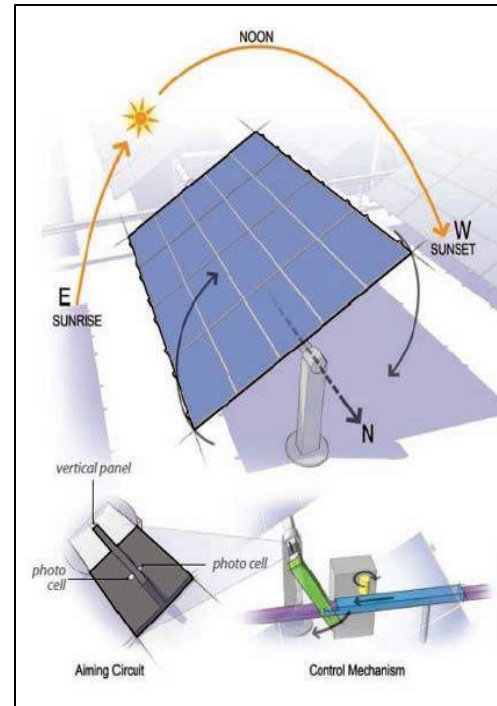


Figure 2-4. Diagram of single-axis tracking system (not to scale)

modules, gravel access roads, switchgear, accompanying electrical components, and other Project components. Vegetation clearing would occur where Project components are planned and, to minimize tree shading, within a 200-foot-wide area surrounding proposed PV panel locations. Four on-site buildings have the potential to be demolished. Clearing of approximately 51 acres of trees and other tall vegetation, outside of SMZs, would be accomplished with chain saws, skidders, bulldozers, tractors, and/or low-ground pressure feller-bunchers. Because the area to be cleared is primarily open agricultural land, minimal vegetative debris would accumulate during site preparation. Any vegetative debris that accumulates on-site would be disposed of by open burning or chipping. If chipping is selected, the chips would be stockpiled in locations outside of the developed solar facility and environmentally sensitive areas and used as erosion-control mulch or disposed of in accordance with appropriate regulations. If burning is selected, only vegetation and untreated wood would be burned in accordance with any local ordinances or burn permits, as presented in Section 1.4, and would be avoided on days air quality alerts have been issued, as much as feasible. If burning needs to be conducted during April and May, when there is some potential for bats to present on the landscape and more likely to enter torpor due to colder temperatures, burns will only be conducted if the air temperature is 55 degrees Fahrenheit (°F) or greater. No burning of other construction debris is anticipated. A tree removal schedule would be finalized as the solar facility construction plan is finalized. If necessary, formal consultation with USFWS would be pursued. Construction debris would be recycled or hauled to a nearby disposal site, as discussed in Section 3.12, in accordance with federal, state, and local laws and regulations. Mowing would continue as needed to contain plant growth during construction.

SR Ripley II, LLC would work with the existing landscape (e.g., slope, drainage, utilization of existing roads) where feasible and minimize or eliminate grading work to the greatest extent possible. Grading activities would be performed with earthmoving equipment and would result in a consistent slope. Prior to any major grading, efforts would be made to preserve native topsoil as much as economically feasible. Native topsoil would be removed from the area to be graded and stockpiled on-site, avoiding sensitive resources in accordance with the SWPPP, for redistribution over the disturbed area after the grading is completed. Off-site sediment migration would be minimized by the placement of silt fences around each area of ground disturbance on the Project site. Other appropriate controls, such as temporary vegetative cover, would be used as needed to minimize exposure of soil and to prevent eroded soil from leaving the work area. To manage stormwater during construction, on-site temporary sedimentation basins, sediment traps, or diversion berms would be constructed within the disturbed area of the Project site. Any sedimentation basins and traps necessary during construction would comply with TDEC requirements and would be constructed either by impoundment of natural depressions or by excavating the existing soil.

The floor and embankments of the sedimentation basins would be allowed to naturally revegetate or replanted as necessary after construction to provide natural stabilization and minimize subsequent erosion. Once sufficient revegetation cover is achieved, the Project site would be considered stabilized and temporary construction BMPs would be discontinued and/or removed. Other disturbed areas would be seeded after construction using a mixture of non-invasive grass seeds. The seed mix would be selected by guidance established by the local Natural Resources Conservation Service office.

If conditions require, soil may be further stabilized by mulch or sprayable fiber mat. Hydroseeding may be employed as an alternative measure for areas with steep slopes.

Where required, hay mulch would be applied at three tons per acre and distributed over the area. Erosion control measures would be inspected and maintained until vegetation in the disturbed areas is stable.

During construction, water would be used as needed for soil compaction and dust control and for sewer treatment, if determined necessary. Water in sufficient quantity and quality would be provided by delivery via existing municipal water-supply infrastructure at the Project site, water trucks, or by new on-site wells. City water already on the Project site is provided via a well through city of Ripley. If selected, wells would be located to provide access for construction water and to reduce the potential for any substantial groundwater level drawdown. If water quality is unsuitable for potable use without disinfection at a minimum, a potable water treatment system would be installed. If needed, SR Ripley II, LLC would perform initial groundwater drilling and testing to gather information on aquifer characteristics and develop a plan for the well design. Wells would be constructed using conventional well drilling techniques. A truck-mounted drilling rig would set up at the identified location(s). If necessary, gravel would be used to temporarily stabilize the surface at these location(s). Water-based drilling mud would be collected and dewatered, with runoff occurring locally into nearby field areas. Dewatered muds would be non-toxic and may be spread as subsoil during site grading. If determined necessary, sewer treatment would be accomplished through use of a pump-out septic holding tank.

The single-axis trackers would likely be attached to driven galvanized steel pile foundations, depending on results of the upcoming geotechnical survey. The piles would be driven with a hydraulic ram to a depth typically less than 20 feet and surface disturbance is typically limited to areas in which the small tractor-sized hydraulic ram machinery operates, including the pile insertion location. Screw piles are another option for PV foundations; these are drilled into the ground with a truck-mounted auger. Screw piles create a similar soil disturbance footprint as driven piles.

The PV modules would be manufactured off-site and shipped to the Project site ready for installation. The AC collection cables would be installed underground throughout the solar facility in trenches three- to four-feet deep and one- to four-feet wide. The trenches would be backfilled with the excavated soil and then compacted. AC collection cables would be installed by boring beneath streams and wetlands and paved roads and/or as overhead lines mounted on poles. These methods would avoid impacts to waters and appropriate permits would be applied as necessary.

The MPT(s) would be installed on a concrete foundation. An underground or aboveground electrical cable would be installed to connect the MPT to the MVTs through a circuit breaker. As the solar arrays are installed, the balance of the facility, including instrumentation, would continue to be constructed and installed.

Subject to weather, construction activities would take approximately 12 months to complete using a crew of up to 200 workers sourced locally to the greatest extent possible. Work would generally occur during daylight hours, Monday through Saturday. Night-time construction could be necessary to make up schedule deficiencies or to complete critical construction activities and would require temporary lighting.

2.2.3 Electrical Interconnection

Under the Proposed Action, the solar facility would connect to TVA's existing Ripley–Covington 161-kV TL, which traverses east-west and north-south within the Project site

(Figure 2-5). To interconnect to TVA's existing electrical grid, Ripley Power and Light would connect the solar facility to TVA's existing Ripley–Covington 161-kV TL via a new approximately 0.3-mile-long 34.5-kV dedicated gen-tie from a proposed on-site switchgear to the existing on-site Ripley Power and Light substation.

Associated with the interconnection, TVA would install OPGW on the approximately 0.75 mile-portion of existing Ripley–Covington 161-kV TL that traverses east–west through the Project site, from the portion of the Ripley–Covington 161-kV TL where the TL diverges from a north–south trajectory at structure 247A to Ripley Power and Light East Industrial Park station, referred to herein as the substation. Installation of OPGW would be performed either using ground equipment or by helicopter. A lineman would work from structure to structure unclipping the existing overhead ground wire (OHGW) and installing a pulley. Access to the structures would be via existing roads. A small rope would be pulled from structure to structure. The rope would be connected to the conductor and ground wire and used to pull these down the line through pulleys suspended from the insulators. A bulldozer and specialized tensioning equipment would be used to pull conductors and ground wires to the proper tension. Crews would then clamp the wires to the insulators and remove the pulleys. Upgrades to existing TL structures to support this effort may include the addition of ground wire suspension arms to select TL structures. TVA TL upgrades, including the installation of OPGW and the addition of ground wire suspension arms, would be limited to access routes within the existing 100-foot ROW (referred to herein as the TL upgrade areas). TVA would also perform telecommunication upgrades at the Ripley 161-kV substation and Covington 161-kV substation.

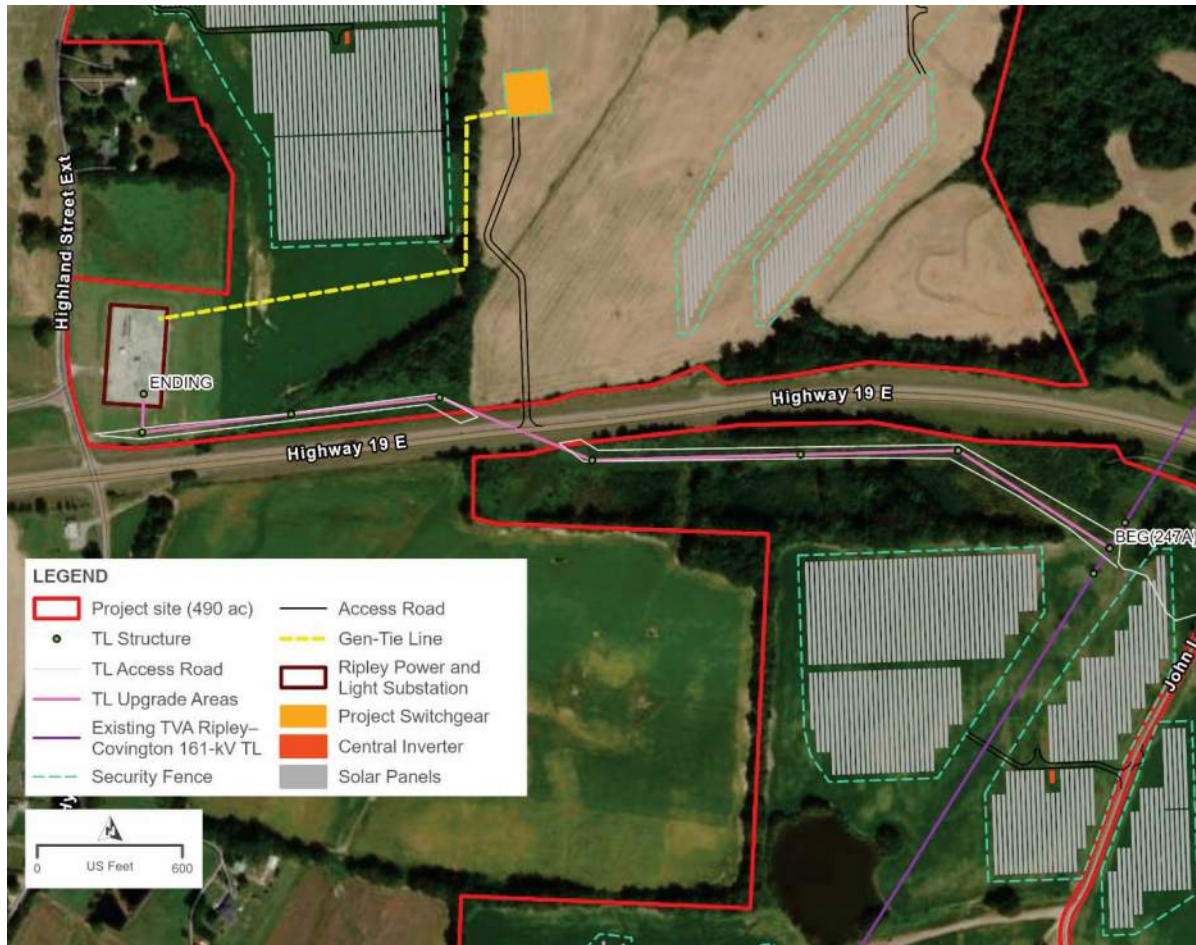


Figure 2-5. Aerial photo showing the proposed TL upgrade areas

2.2.4 Operations

During operation of the solar facility, no major physical disturbance would occur. 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 maximizes the collection of solar energy by rotating with the sun and is barely perceptible. In the late afternoon, module rotation would start to move from west-to-east in a similar slow motion to minimize row-to-row shading. At sunset, the modules would track to a flat or angled stow position.

Except for fence repair, vegetation control, and periodic array inspection, repairs, and maintenance, SR Ripley II would have relatively little human activity during operation. During operations, SR Ripley II would require small groups of workers to be on-site occasionally to manage the facility and conduct regular inspections, maintenance, and repairs, as well as some part-time permanent staff and/or contract employees to manage the land, potentially including grazing by sheep as a substitute for mowing. Inspections would include identifying any physical damage to panels, wiring, central inverters, transformers, and interconnection equipment, and drawing transformer oil samples. Vegetation on developed portions of the Project site would be maintained to a height of about 12 to 18 inches. U.S. Environmental Protection Agency (USEPA)-registered and TVA-approved pesticides, in accordance with TVA BMPs, may be selectively used alongside trimming and mowing to maintain vegetation and limit invasive species. Trees

and other tall vegetation near the solar arrays would be managed to prevent shading of the PV panels. The remaining areas would be undeveloped while allowing for related agricultural or vegetation management activities.

Precipitation in the region is typically adequate to remove dust and other debris from the PV modules while maintaining energy production. If necessary, module washing would occur on an as-needed basis depending on energy production and amount of precipitation and would comply with proper BMPs to prevent as much soil erosion and/or stream and wetland sedimentation as possible (TVA 2022a). Module washing would likely not produce a discharge waste stream. Water during operation and maintenance would be made available via existing municipal water-supply infrastructure at the Project site, water trucks, or on-site wells as described in Section 2.2.2.

The proposed solar facility would be monitored remotely to identify any security or operational issues. If a problem is discovered during non-working hours, a local repair crew or law enforcement personnel would be contacted if an immediate response were warranted.

2.2.5 Decommissioning and Reclamation

SR Ripley II, LLC would operate the Project and sell power to TVA under the terms of a 20-year PPA. At the end of the 20-year PPA, SR Ripley II, LLC would assess whether to cease operations at the solar facility or to replace equipment, if needed, and attempt to enter into a new PPA with TVA or make some other arrangement to sell the power.

When operations cease, the facility would be decommissioned and dismantled, and the Project site would be restored per Project decommissioning requirements. The decommissioning process would be coordinated with the city of Ripley and Lauderdale County. Decommissioning actions would include the removal of aboveground and below-ground components to a depth of at least three feet. Decommissioning could take several months; therefore, access roads, security fencing, and electrical power would remain in place for use by the decommissioning and restoration workers until it is no longer needed. The solar panels that are most likely to be used are manufactured by First Solar. Most of the decommissioned equipment and materials would be recycled through SolarCycle or a similar solar panel recycling service. Materials that cannot be recycled would be disposed of at an approved facility in accordance with federal, state, and local laws and regulations. Other wastes, including batteries, would be disposed of off-site and/or recycled in accordance with manufacturer recommendations and appropriate regulations and industry BMPs. Overall, the Project site would be returned to a tillable state and revegetated.

2.3 Alternatives Eliminated from Further Consideration

In determining the suitability for development of a site within TVA's service area that would meet customer needs and the goals of expanding TVA's renewable energy portfolio, multiple factors were considered. This process involved screening potential locations and ultimately eliminating those sites that did not have the needed attributes. This process of review and refinement ultimately led to the consideration of the current proposed Project site.

The site screening process involves several iterations beginning with the general solar resource (the amount of insolation) and the availability of nearby appropriately sized electric infrastructure for interconnection with sufficient available transmission capacity for the

proposed solar facility. This is followed by screening for suitable large scale landscape features that would allow for utility-scale solar development including:

- Generally flat landscape with minimal slope, with preference given to disturbed contiguous land with no on-site infrastructure or existing tall infrastructure in the immediate vicinity;
- Land having sound geology for construction suitability, with minimal and/or avoidable floodplains or large forested or wetland areas;
- Large contiguous parcels of land with compatible local zoning and located away from densely populated areas; and
- Ability to avoid and/or minimize impacts to known sensitive biological, visual, and cultural resources.

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. As a result of this screening process, the current Project in Lauderdale County was selected for potential solar development.

2.4 Comparison of Alternatives

This EA evaluates the potential environmental impacts that would result from implementing the No Action Alternative or the Proposed Action Alternative. The analysis of impacts in this EA is based on current and potential future conditions on the Project site and surrounding area. A comparison of impacts by alternative is provided in Table 2-1.

Table 2-1. Comparison of impacts by alternative

Resource Area	No Action Alternative	Proposed Action Alternative
Land Use	<p>No direct or indirect Project-related impacts on land use.</p> <p>No impacts if existing land use remained primarily agricultural land.</p>	<p>Minor, temporary direct impacts during construction; minor, long-term direct impacts during operation due to land use change from agricultural to solar. Some agriculture may continue to take place on the Project site.</p> <p>Minor permanent impacts to zoning land use upon appeal and approval.</p>
Geology, Soils, and Prime Farmland	<p>No direct or indirect Project-related impacts on geology, soils, and prime farmland.</p> <p>Geology/Soils: Minor impacts if the current land use practices changed or proper BMPs were not followed.</p> <p>Prime Farmland: Minor impacts if agricultural practices continued and proper conservation practices were not followed.</p>	<p>Geology: Minimal direct impacts resulting from implementation of on-site sedimentation basins and utilization of existing terrain with minor excavation.</p> <p>Soils: Minor direct impacts resulting from minor increases in erosion and sedimentation during construction and operation; while in operation, the Project would have beneficial effects to soil health with the maintenance of permanent vegetative cover.</p> <p>Prime Farmland: Minor direct impacts from removal of approximately 160 acres of prime farmland from row cropping for the duration of the Project. However, following decommissioning, the Project site could be returned to agricultural use with little reduction in soil productivity or long-term impacts to prime farmland.</p>

Resource Area	No Action Alternative	Proposed Action Alternative
Water Resources	<p>No direct Project-related impacts on water resources.</p> <p>Groundwater: Minor indirect impacts if the local aquifers were recharged from runoff containing chemical fertilizers and pesticides.</p> <p>Surface Water: Minor indirect impacts if agricultural practices continued and were not accompanied by proper BMPs.</p> <p>Floodplains: Impacts associated with current land uses would continue.</p>	<p>Groundwater: Possible minimal direct impacts if wells are chosen as a method to provide water for construction needs; minor beneficial indirect impacts to groundwater due to reduction in fertilizer and pesticide use and maintenance of permanent vegetative cover.</p> <p>Surface Water: Minor indirect impacts could occur from stormwater runoff during construction with use of BMPs. Minor permanent adverse impacts to three intermittent streams and 30 wet weather conveyances (WWCs). Minor temporary and permanent impacts to three intermittent streams (S008, S010, and S013) and 11 WWCs. Access routes in the TL upgrade areas would require matting of one scrub/shrub wetland (W009) and temporary crossings of two intermittent streams (S011 and S014) and two WWCs. Potential moderate permanent impacts to a forested wetland (W008) due to tree removal and conversion from forested to herbaceous (0.56 acres) would occur to prevent solar panel shading. Permitting would be sought for the features indicated above and for any additional features that would be impacted, as appropriate, for temporary and permanent impacts and associated conditions would be followed, including compensatory mitigation if necessary. Erosion control measures would be employed during construction to minimize sediment runoff. Wetlands and perennial and intermittent streams would be avoided to the extent practicable by certain distances during construction and operations.</p> <p>Floodplains: No direct Project-related impacts on floodplains.</p>

Biological Resources	No direct or indirect Project-related impacts to vegetation; wildlife; aquatic life; or rare, threatened, and endangered species.	<p>Vegetation: Minor direct impacts to vegetation by clearing approximately 51 acres of trees in forested vegetation communities and other tall vegetation at a maximum within the Project site. Minor beneficial indirect impacts as agricultural land returns to native herbaceous habitat. Herbaceous vegetation communities within the TL upgrade areas would experience minor and temporary impacts during TL upgrade activities. The area would be allowed to revegetate after completion.</p> <p>Wildlife: Minor direct and indirect impacts to common wildlife due to changes to habitat and existence of Project components; the Project is not anticipated to substantially affect populations of migratory bird species of concern.</p> <p>Aquatic Life: Minor impacts from minor increases in erosion and sedimentation during construction and operation. The use of BMPs would reduce the risk of soil erosion and pesticide runoff into streams.</p> <p>Rare, Threatened, and Endangered Species: Implementation of the Proposed Action is not likely to adversely affect federally listed species, including federally listed bat species that potentially occur in the Project area, and would result in minor to minimal impacts to state-listed species. Federally listed bat species may be affected due to removal of up to 53 acres of foraging habitat made up of forested and herbaceous vegetation communities, including nine potentially suitable bat roosting trees; under ESA Section 7, TVA is consulting with USFWS on Project effects to listed species. Forested areas could provide suitable habitat for the eastern woodrat. Up to the total forest area on the Project site of approximately 51 acres could be cleared for the Project. Due to the location of potential suitable habitat, including flowering plants, for the monarch butterfly occurring on the fringes, where the solar facility would generally not be developed, minimal to negligible impacts are anticipated. Wetlands and forests on the Project site provide suitable foraging and nesting habitat for the little blue heron. Nesting habitat could be impacted as approximately 51 acres of forested land may be cleared on the Project site, however, similar suitable habitat is available adjacent to the Project site. Only 0.56 acres of wetlands are expected to be impacted, therefore impact to foraging habitat for the little blue heron are expected to be minimal. Habitat for other listed species identified as potentially occurring on the Project site was not found, thus no impact is expected.</p>
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Resource Area	No Action Alternative	Proposed Action Alternative
Visual Resources	<p>No direct or indirect Project-related impacts on visual resources.</p> <p>Minor impacts to visual resources if current land use practices continue.</p>	<p>Temporary, minor impacts on visual resources due to altering the visual character of the Project area and increased activity during construction.</p> <p>Temporary, minor impacts on visual resources in the vicinity of the TL upgrade areas during installation of OPGW, modifications to the existing TL, and other equipment, associated with the TL upgrade activities.</p> <p>Long-term, minimal to minor impacts on visual resources in the vicinity of the new approximately 0.3-mile 34.5-kV gen-tie line.</p> <p>During operations, direct long-term impacts in the immediate vicinity, minimal on a larger scale, due to variation of the visual attributes of the Project area as distance from the Project increases.</p>
Noise	<p>No direct or indirect Project-related impacts on noise.</p>	<p>Temporary, moderate adverse impacts to the ambient noise environment in the Project area would occur during construction; minimal to negligible impacts during operation and maintenance.</p> <p>Temporary, moderate impacts to the ambient noise environmental in the TL upgrade areas due to OPGW installation by helicopter.</p>
Air Quality and Climate Change	<p>No direct or indirect Project-related impacts on air quality and greenhouse gas (GHG) emissions.</p> <p>Minor impacts to air quality if current land use practices continue.</p>	<p>Air Quality: Minor, direct impacts to air quality during construction of the Project.</p> <p>Regional Climate: Minimal to negligible impacts to average temperatures and annual precipitation runoff amounts of the developed area.</p> <p>Greenhouse Gas Emissions: Impacts from GHG emissions during construction would be negligible; long-term beneficial effects due to the nearly emissions-free solar generation, offsetting the need for power that would otherwise likely be generated by the combustion of fossil fuels.</p>
Cultural Resources	<p>No direct or indirect Project-related impacts on cultural resources.</p> <p>Minor impacts if current land use practices continue.</p>	<p>Archaeological Resources: No adverse effects on NRHP-listed or eligible archaeological sites.</p> <p>Architectural Resources: No adverse effects on NRHP-listed or eligible architectural resources.</p>
Natural Areas, Parks, and Recreation	<p>No direct or indirect Project-related impacts on natural areas, parks, and recreation.</p>	<p>No direct or indirect Project-related impacts on natural areas, parks, and recreation.</p>

Resource Area	No Action Alternative	Proposed Action Alternative
Utilities	<p>No direct or indirect Project-related impacts on utilities.</p> <p>Negligible to minor impacts if current land use practices continue.</p>	<p>Potential short-term, minor impacts to local utilities (electricity and telecommunication connections) when bringing the solar facility on-line, conducting TL upgrade activities, or during routine maintenance of the facility.</p> <p>Long-term, minor beneficial impacts to electrical services across the region due to additional renewable energy resources.</p>
Waste Management	<p>No direct or indirect Project-related impacts on waste management.</p> <p>Negligible to minor impacts if current land use practices continue.</p>	<p>Minor and temporary impacts during construction due to on-site storage and use of petroleum-based oils, fuels, and general construction waste.</p>
Public and Occupational Health and Safety	<p>No direct or indirect Project-related impacts on public health and safety.</p> <p>Minor impacts if current land use practices continue.</p>	<p>Minor, temporary impacts during construction that would be minimized with adherence to Occupational Safety and Health Act (OSHA) regulations and health and safety plans.</p>
Transportation	<p>No direct or indirect Project-related impacts on transportation.</p>	<p>Minor, temporary direct impacts to transportation during construction would be minimized through appropriate mitigation.</p>
Socioeconomics	<p>No direct or indirect Project-related impacts on socioeconomics.</p>	<p>Short-term beneficial economic impacts would result from construction, including the purchase of materials, equipment, and services and a temporary increase in employment, income, and population.</p> <p>Beneficial, long-term direct impacts to economics and population from Project operations. The local tax base would increase from construction of the solar facility and would be beneficial to Lauderdale County and the vicinity.</p> <p>Minor, long-term direct impacts to the local agricultural economy due to the removal of approximately 160 acres of prime farmland from row cropping for the duration of the Project.</p>
Environmental Justice	<p>No direct or indirect Project-related impacts on minority or low-income populations.</p>	<p>Temporary negligible to minor impacts to communities with EJ concerns.</p> <p>Beneficial economic impacts would result from construction, including the purchase of materials, equipment, and services and a temporary increase in employment, income, and population.</p>

2.5 Best Management Practices and Mitigation Measures

SR Ripley II, LLC and TVA would implement minimization and mitigation measures in relation to resources potentially affected by the construction and operation of the Project. These include standard BMPs and permit requirements, as well as Project-specific measures. These practices and measures are summarized in this section.

2.5.1 Standard Practices and Routine Measures

SR Ripley II, LLC and TVA would implement the following minimization and mitigation measures in relation to potentially affected resources:

- Geology and Paleontology
 - Should paleontological resources be exposed during site construction or operation activities, a paleontological expert would be consulted to evaluate the nature of the paleontological resources, recover these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.
- Soils
 - Install silt fences along the perimeter of vegetation-cleared areas;
 - Implement other soil stabilization and vegetation management measures to reduce the potential for soil erosion during site operations; and
 - Make an effort to balance cut-and-fill quantities to alleviate the transportation of soil off-site during construction.
- Water resources
 - Comply with the terms of the SWPPP prepared as part of the NPDES permitting process;
 - Comply with the terms of TDEC ARAP and USACE Section 401 and 404 permits and associated mitigation, and compensatory mitigation per EO 11990, Protection of Wetlands, as applicable;
 - Use BMPs for controlling soil erosion and runoff, such as the use of 50-foot SMZs surrounding intermittent and perennial streams and wetlands according to their rating as defined by TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities (2022a)*: Standard Stream Protection (Category A), Protection of Important Streams, Springs, and Sinkholes (Category B), or Protection of Unique Habitat (Category C);
 - Implement other routine BMPs as necessary, such as non-mechanical tree removal within surface water SMZs, placement of silt fences and sediment traps along SMZ edges;
 - Use only USEPA-registered and TVA- approved pesticides per label directions designed to restrict applications near receiving waters and to prevent unacceptable aquatic impacts in areas requiring chemical treatment (TVA 2022a); and
 - Ensure construction and maintenance activities occur during dry periods as much as possible.

- Biological resources
 - Revegetate with non-invasive grasses to reintroduce habitat, reduce erosion, and limit the spread of invasive species (per EO 13112, Invasive Species);
 - Minimize direct impacts to most migratory birds and federally listed bats by following appropriate TVA BMPs when possible (TVA 2022a);
 - Follow USFWS recommendations regarding biological resources;
 - Use only USEPA-registered and TVA approved pesticides and herbicides in accordance with label directions designed in part to restrict applications near receiving waters and to prevent unacceptable aquatic impacts in areas requiring chemical treatment;
 - Coordinate with U.S. Department of Agriculture (USDA) and/or USFWS if active osprey and eagle nests are identified during aerial nest surveys of the TL upgrade areas to develop avoidance and minimization measures and ensure compliance under federal law prior to commencement of construction activities; and
 - Implement Avian Power Line Interaction Committee (APLIC) guidelines to minimize impacts to birds during the TL upgrade activities (APLIC and USFWS 2005).
- 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.
 - Pile-driving within 5,322 feet of the nearest residences would be scheduled during daylight hours Monday through Friday to minimize impacts to the residences.
 - Pile-driving within 4,976 feet of Forerunner Church would be scheduled outside of church services.
- Air quality and climate change
 - Comply with local ordinances or burn permits and avoid burning on days air quality alerts have been issued, as much as feasible, 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 and maintain equipment in good condition.
- Waste management
 - Develop and implement a variety of plans and programs to ensure 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
 - Post a flag person during heavy commute periods, prioritize access for local residents, and implement staggered work shifts during daylight hours to manage construction traffic flow near the Project site; and

- Obtain a TDOT Commercial Driveway Permit for Project related driveways in use during facility operations.
- Environmental justice
 - TVA will send postcard notification of the availability of the Draft EA to residences within one mile of the project area.

2.5.2 Non-Routine Mitigation Measures

- Cultural resources
 - Exclude two archaeological sites identified within the Project site from development or disturbance, in accordance with an Avoidance Agreement between TVA and SR Ripley II, LLC.

2.6 The Preferred Alternative

TVA's preferred alternative for fulfilling its purpose and need is the Proposed Action Alternative. This alternative would generate renewable energy for TVA and its customers with only minor environmental impacts due to the implementation of BMPs and minimization and mitigation efforts, as described in Section 2.5. Implementation of the Project would help meet TVA's renewable energy goals and would help TVA meet customer-driven energy demands on the TVA system.

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CHAPTER 3 – 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 are implemented. This chapter also describes the potential environmental effects that could result from implementing the No Action or Proposed Action Alternative.

3.1 Identification of Other Actions

In addition to the No Action and Proposed Action alternatives identified in Chapter 2, this analysis also considers the past, present, and RFFAs listed in Table 3-1. These actions identified within 10 miles of the Project site were identified as having the potential to, in aggregate, result in larger and potentially adverse effects to the resources of concern. Potential cumulative impacts for resources in which adverse impacts from the proposed Project are anticipated are discussed in each resource section.

Table 3-1. Summary of other past, present, or RFFAs within 10 miles of the Project site

Action	Description	Project Type
Chisholm Lake Road Bridge Replacement	A bridge replacement on Chisholm Lake Road, four miles northwest of the Project site.	Past
Lauderdale Community Hospital	A critical access hospital, four miles northwest of the Project site.	Past
Walker East Industrial Park	A proposed 122-acre industrial site in Ripley, a half-mile west of the Project site.	RFFA
Ripley Surface Transportation Block Grant Program Project (Volz Road)	A proposed resurfacing and construction of pipe culverts, guardrail, endwalls, box bridges, and signs along Volz Road from State Route 209 to State Route 3, one mile west of the Project site.	RFFA
Ripley Power and Light Building	An existing 97,500-square-foot industrial building available for lease or purchase on a 13-acre site, 1.5 mile west of the Project site.	RFFA
American Way Site	A proposed 21-acre industrial site in Ripley, three miles north of the Project site.	RFFA
109 Industrial Drive	An existing 34,000-square-foot industrial building available for lease or purchase on a six-acre site, three miles north of the Project site.	RFFA
Hutcherson Building	An existing 43,000-square-foot industrial building available for lease or purchase on a five-acre site, three miles north of the Project site.	RFFA

Action	Description	Project Type
Interstate 69 – Segment 8	A proposed extension of the Interstate 69 corridor. Segment 8 includes a 65-mile-long new four-lane divided interstate route from Dyersburg to Millington. Both build alternatives would extend northeast-southwest through the Project area but not interfere with the Project site. Build Alternative G is two miles east of the Project site and Build Alternative R is three miles west of the Project site.	RFFA
Intersection Improvement (State Route 3 at Curve Nankipoo Road)	A proposed improvement of the intersection of State Route 3 at Curve Nankipoo Road, six miles northeast of the Project site.	RFFA
Briadco Tool Building	An existing 20,000-square-foot industrial building available for purchase on a nine-acre site, eight miles southwest of the Project site.	RFFA
Rialto Industrial Site	A proposed 165-acre industrial site in Covington, nine miles southwest of the Project site.	RFFA

Sources: Construction Bid Source 2022; TDOT 2023a, 2023b; TVA Economic Development 2024; USDA 2022

3.2 Land Use

3.2.1 Affected Environment

Land use is defined as the way people use and develop land, including leaving land undeveloped or using land for agricultural, residential, commercial, and industrial purposes. The area surrounding the Project site consists of agricultural, forested, and rural-residential land. Consistent with the surrounding area, imagery data collected from the National Land Cover Database (NLCD) show the Project site as primarily cultivated crops, hay/pasture, and deciduous forest (Multi-Resolution Land Characteristics Consortium [MRLC] 2021; Table 3-2Figure 3-1). The 490-acre Project site generally consists of flat to gently sloping land that ranges in elevation from approximately 328 to 476 feet above mean sea level. Elevation is higher in the northeast portions of the Project site, decreasing towards the southwest. According to historical aerial imagery and topographic quadrangle maps, land use in the Project area has remained relatively unchanged and dominated by agriculture and residential land since at least 1947 (HDR Engineering, Inc. [HDR] 2022; Appendix A). No parks or other public outdoor recreation facilities occur in the Project area.

The Project site is currently zoned for High Density/Mobile Home and General Business. Allowable uses for the area zoned for High Density/Mobile Home include single and multifamily residential buildings, churches, schools, and farming except for commercial animal, poultry farms or kennels. Allowable uses for the area zoned for General Business include banks, hotels and motels, and any retail businesses where the main function is the sale of goods (Ripley Municipal Planning Commission 2022, City of Ripley n.d.). SR Ripley II, LLC is coordinating with the city of Ripley and Lauderdale County regarding zoning changes from High Density/Mobile Home and General Business to Light Industrial.

Table 3-2. Land cover types on the Project site

NLCD Land Cover Type	Approximate Area (acres)	% of Project site
Cultivated Crops	405	83%
Deciduous Forest	14	3%
Developed, Low Intensity	3	<1%
Developed, Medium Intensity	1	<1%
Developed, High Intensity	<1	<1%
Developed, Open Space	9	2%
Hay/Pasture	48	10%
Mixed Forest	2	<1%
Open Water	3	<1%
Shrub/Scrub	4	<1%
Woody Wetlands	1	<1%
Total	490	100%

Source: MRLC 2021

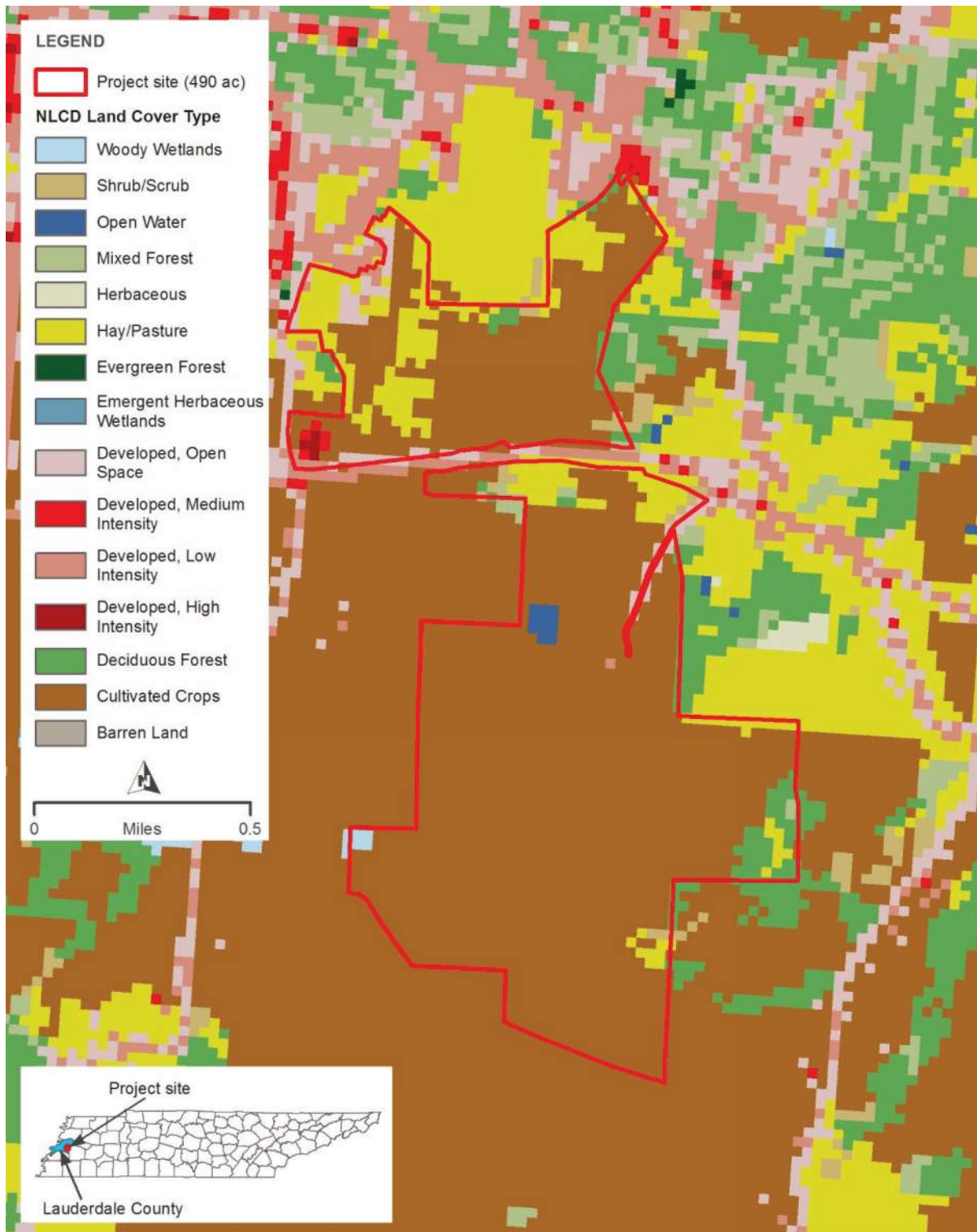


Figure 3-1. Land cover in the Project area

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to land use would result. Existing land use would likely remain primarily agricultural land for the foreseeable future.

3.2.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the development of the solar facility would result in the long-term change in land use from primarily agricultural land dominated by cultivated crops to primarily light industrial. A small portion of the facility site comprising the Project switchgear would change to light industrial-only land use. Neither Lauderdale County nor the city of Ripley have publicly available land use plans. The Project site is zoned by the city of Ripley for High Density/Mobile Home and General Business. The solar facility is not an allowable use under this zoning. SR Ripley II, LLC is coordinating with the city of Ripley and Lauderdale County regarding zoning changes from the High Density/Mobile Home and General Business to Light Industrial. This change has been approved by the city of Ripley Planning Commission and at the first public reading by the mayor and Board of Alderman. Following a public comment period and a second public reading, the Project site would be rezoned to Light Industrial. Permits for the construction and operation of the solar facility would be sought if necessary (Ripley Municipal Planning Commission 2022, City of Ripley n.d.). The Proposed Action would have minor negative impacts on land use in the area. Ripley Power and Light's installation of the approximately 0.3-mile 34.5-kV gen-tie line would not change current land uses. Following decommissioning the Project site would remain under the Light Industrial zoning classification.

3.2.2.3 Cumulative Impacts

The RFFAs, such as the potential developments of the Walker Industrial Park, American Way Site, Interstate 69 – Segment 8, and Lauderdale Community Hospital Construction, would contribute to additional changes in land use from agricultural and forested land to industrial in the area. Neither Lauderdale County nor the city of Ripley have publicly available land use plans. The Proposed Action, when considered with the past and RFFAs, could have minor, cumulative impacts on land use in the area, including the development of up to about 300 acres for industrial uses.

3.3 Geology, Soils, and Prime Farmland

3.3.1 Affected Environment

3.3.1.1 Geology

The Project site is in Lauderdale County, approximately 48 miles northeast of Memphis in the Gulf Coast Coastal Plain Physiographic Province, which is characterized by low rolling hills and wide stream valleys consisting of loess deposited during the Quaternary age (Greene and Wolfe 2000). The Project site lies on top of the Mississippi Embayment, which is a geologic basin filled with 3,000 feet or more of Cretaceous to Recent age sediments deposited primarily in a Coastal Plain setting. The sedimentary sequence is dominated by unconsolidated sand, silt, and clay with minor lignite bedding (Hosman and Weiss 1991). The alluvium consists of irregular lenses of fine sand, silt, and clay in the upper part and coarse sands, gravelly sands, and sandy gravels in the lower part. The alluvium varies in thickness from about a few feet in some areas to 45 feet to 90 feet adjacent to the loess bluffs to as much as 175 feet in the floodplain. The alluvium is underlain by a series of highly consolidated clays and dense sands of the Claiborne Group (Hardeman et al. 1966).

3.3.1.2 Paleontology

During the Precambrian Eon, the area that is now present-day Tennessee was in the southern hemisphere and covered by a shallow, tropical sea that was home to diverse species of sea life. By the Paleozoic Era, Tennessee was located along the southern border of present-day North America and was still covered by sea water. These shallow waters were home to brachiopods, trilobites, crinoids, bryozoans, corals, and various other sea life. During the Late Carboniferous period, mountain building in the eastern portion of Tennessee caused an abundance of soil to be carried throughout central and western Tennessee. Rivers flowing towards the shallow sea in the western portion of the state deposited this sediment resulting in the formation of swampy deltaic environments. Decaying plant life within these deltaic environments would eventually form coal deposits throughout Tennessee. Tennessee was above sea level throughout the Mesozoic Era until the Cretaceous period when shallow seas began to again cover Western Tennessee. These shallow seas across the western portion of Tennessee were home to crinoids, oysters, snails, and various other marine life (The Paleontology Portal 2021).

The Eocene-age Clairborne Formation, which underlies the Project area, generally thickens westward across Lauderdale County and may reach a thickness of over 400 feet in the vicinity of the Project area (Russell and Parks 1975). Therefore, fossils of cultural significance are unlikely to be identified within the Project area.

3.3.1.3 Geological Hazards

Examples of common geological hazards include landslides, volcanoes, earthquakes/seismic activity, and karst topography. The Project site is located on low undulating terrain. 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. Due to the presence of unconsolidated silts, sands, and gravels which are not susceptible to sinkhole development, sinkholes would be a minimal risk on or in the vicinity of the Project site.

The Project site is located within the southeastern edge of the New Madrid Seismic Zone, which is a 150-mile-long seismic zone extending from Illinois to Arkansas and into portions of five states. The largest seismic events in the area occurred between 1811 and 1812 (USGS 2021). Seismic instrumentation was installed in 1974 to monitor the area and since then, approximately 4,000 earthquakes have been recorded; however, they are typically too small to be felt. While the New Madrid Fault Line is considered a potential source of intraplate earthquakes in the region, the faults responsible for associated seismic activity are ancient (i.e., no recent faulting) and deep seated. Land movement along the fault system is minimal to none and global positioning system measurements from a recent study indicated that faults are moving less than 0.2 millimeters per year, which could indicate that the potential for larger earthquakes in the area has diminished (Gardner 2009).

3.3.1.4 Soils

The Project site contains 15 soil types. Most of the soils on the Project site are composed of Adler silt loam, zero to two percent slopes, occasionally flooded (27.2 percent); Memphis silt loam, five to eight percent slopes, moderately eroded, northern phase (22.9 percent); Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase (20.3 percent); Loring silt loam, two to five percent slopes, severely eroded (6.5 percent); Memphis silt loam, eight to 12 percent slopes, severely eroded, northern phase (5.6 percent); and Loring silt loam, five to eight percent slopes, severely eroded (5.2 percent); with other soil types consisting of less than three percent each (USDA 2023a; Figure 3-2,

Table 3-3). Most of the soils on the Project site are not hydric. However, the Center silt loam, zero to three percent slopes and Convent silt loam, occasionally flooded soils have a hydric rating of one to 32 percent. Hydric soils are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA 2024).

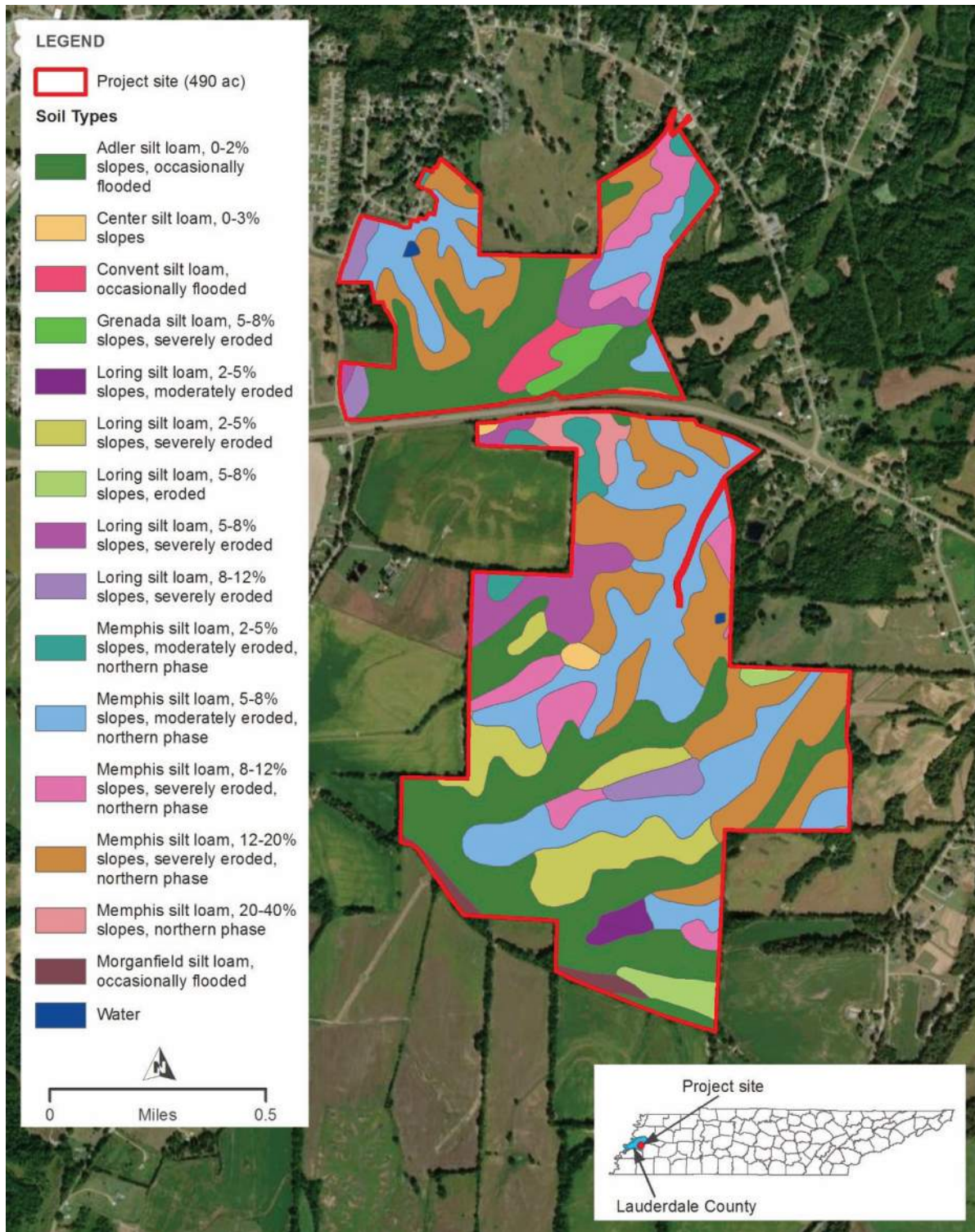


Figure 3-2. Soils on the Project site

Table 3-3. Soils on the Project site

Soil Type	Acreage and % of Project site	Prime Farmland	Hydric Rating	Drainage Class	Flooding/Ponding	Parent Material	Landform
Adler silt loam, 0 to 2 percent slopes, occasionally flooded (Ad)	133.2 (27.2%)	Yes	0	Moderately well drained	Occasional/ No	Coarse-silty alluvium	Natural levees, alluvial fans
Center silt loam, 0 to 3 percent slopes (Ce)	2.3 (0.5%)	Yes	9	Somewhat poorly drained	No/No	Loess	Flats, stream terraces
Convent silt loam, occasionally flooded (Ct)	5.6 (1.2%)	Yes (if drained)	8	Somewhat poorly drained	Occasional/ No	Silty alluvium	Floodplains
Grenada silt loam, 5 to 8 percent slopes, severely eroded (GrC3)	6.1 (1.2%)	No	0	Moderately well drained	No/No	Loess	Loess hills
Loring silt loam, 2 to 5 percent slopes, eroded (LoB2)	4.0 (0.8%)	Yes	0	Moderately well drained	No/No	Loess	Loess hills
Loring silt loam, 2 to 5 percent slopes, severely eroded (LoB3)	31.8 (6.5%)	No	0	Moderately well drained	No/No	Loess	Loess hills
Loring silt loam, 5 to 8 percent slopes, eroded (LoC2)	7.6 (1.5%)	No	0	Moderately well drained	No/No	Loess	Loess hills
Loring silt loam, 5 to 8 percent slopes, severely eroded (LoC3)	25.4 (5.2%)	No	0	Moderately well drained	No/No	Loess	Loess hills
Loring silt loam, 8 to 12 percent slopes, severely eroded (LoD3)	10.9 (2.2%)	No	0	Moderately well drained	No/No	Loess	Loess hills
Memphis silt loam, 2 to 5 percent slopes, moderately eroded, northern phase (MeB2)	12.4 (2.5%)	Yes	0	Well drained	No/No	Fine-silty noncalcareous loess	Loess hills

Soil Type	Acreeage and % of Project site	Prime Farmland	Hydric Rating	Drainage Class	Flooding/Ponding	Parent Material	Landform
Memphis silt loam, 5 to 8 percent slopes, moderately eroded, northern phase (MeC2)	112.5 (22.9%)	No	0	Well drained	No/No	Fine-silty noncalcareous loess	Loess hills
Memphis silt loam, 8 to 12 percent slopes, severely eroded, northern phase (MeD3)	27.3 (5.6%)	No	0	Well drained	No/No	Fine-silty noncalcareous loess	Loess hills
Memphis silt loam, 12 to 20 percent slopes, severely eroded, northern phase (MeE3)	99.4 (20.3%)	No	0	Well drained	No/No	Fine-silty noncalcareous loess	Loess hills
Memphis silt loam, 20 to 40 percent slopes, northern phase (MeF)	6.4 (1.3%)	No	0	Well drained	No/No	Fine-silty noncalcareous loess	Loess hills
Morganfield silt loam, occasionally flooded (Mo)	4.9 (1.0%)	Yes	0	Well drained	Occasional/ No	Silty alluvium	Floodplains
Water (W)	0.6 (0.1%)	No	0	Not applicable	Not applicable	Not applicable	Not applicable
Total Prime Farmland	162.4 (33.1%)						

Source: USDA 2023a

3.3.1.5 Prime Farmland

Prime farmland is land that is the most suitable for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops. Prime farmlands have the best combination of soil type, growing season, and moisture supply and are available for agricultural use (i.e., not water or urban built-up land). The Farmland Protection Policy Act (7 U.S.C. § 4201 *et seq.*), requires federal agencies to consider the adverse effects of their actions on prime or unique farmlands. The purpose of the Farmland Protection Policy Act is “to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.” Based on soils data obtained from the USDA Web Soil Survey, approximately 162 acres (33 percent) of the Project site are designated as prime farmland, as illustrated in Figure 3-3. Table 3-3 describes the soil types, including those classified as prime farmland, located on the Project site.

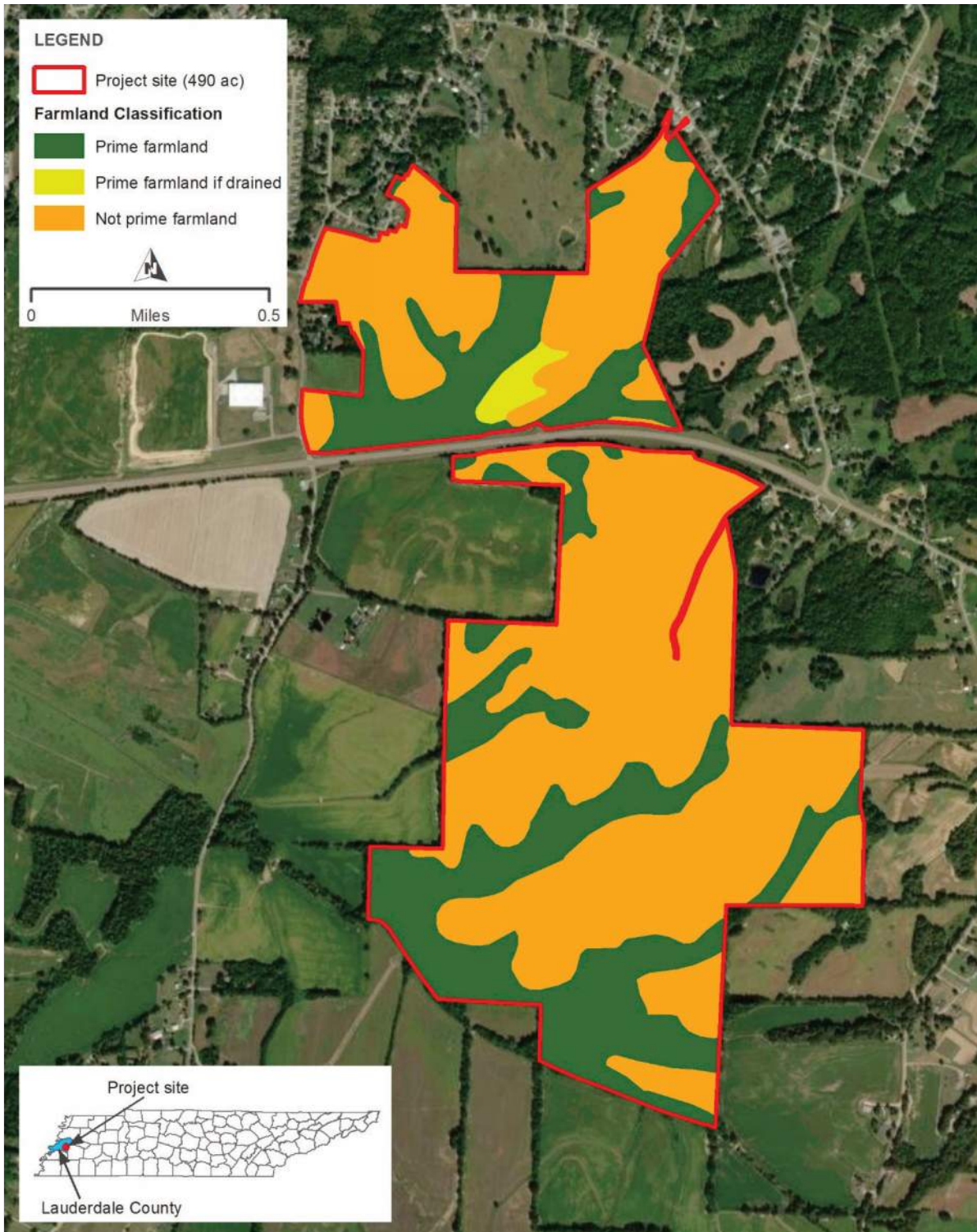


Figure 3-3. Farmland classifications on the Project site

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no direct or indirect Project-related impacts on geological resources, paleontological resources, soils, or prime farmlands would result. Existing land use would likely remain primarily agricultural land for the foreseeable future.

3.3.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, direct impacts to soil and prime farmland resources would occur as a result of construction and operation of the Project. Impacts to geology would be minimal due to the depth of superimposed soil on the bedrock. Approximately 40 percent (194 acres) of the 490-acre Project site would be cleared and/or graded for the solar facility and associated interconnection facilities. Grading and clearing for the solar facility would cause minor, localized increases in erosion and sedimentation, resulting in minor impacts to geology and soils.

3.3.2.2.1 Geology and Paleontology

Under the Proposed Action, impacts to geological resources are unlikely due to the depth to bedrock. On-site sedimentation basins would be shallow and, to the extent feasible, utilize the existing terrain without requiring extensive excavation. Other excavations would be no more than a few feet deep. The steel piles supporting the solar arrays would either be driven or screwed into the ground to a depth typically less than 20 feet.

Should paleontological resources be exposed during site construction or operation activities, a paleontological expert would be consulted to evaluate the nature of the paleontological resources, recover these resources, analyze the potential for additional impacts, and develop and implement a recovery plan/mitigation strategy.

3.3.2.2.2 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 small 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 Project site would not be staffed during operation, potential damage to on-site structures would pose very limited risk to humans. Geologic hazard impacts on-site would be unlikely to impact off-site resources.

Ripley Power and Light's proposed overhead connection associated with the 34.5-kV gen-tie line would be designed to comply with applicable standards. Potential impacts from seismic activity would be minimal and unlikely to cause adverse impacts to the proposed structures. Further, modifications to the existing Ripley Power and Light substation would occur within its existing footprint. The seismic activity resulting from these modifications would not result in new impacts to the Ripley Power and Light substation.

3.3.2.2.3 Soils

During construction, soils on the 194 acres proposed for development of the solar facility would be disturbed from site preparation and construction activities. Any stockpiled soils from the area where vegetation clearing and grading occurs, including topsoils, would be replaced following cut-and-fill activities to the extent practical and, therefore, likely not require off-site hauling of soils. Topsoils should be separated during stockpiling in order to preserve and redistribute after disturbance (TDEC 2012). Should borrow material such as sand, gravel, rip rap, or other aggregate, such as large rocks, be required for Project site activities, these resources may be obtained either from on-site sources, if available, or from nearby permitted off-site sources.

The creation of small areas of new impervious surface, in the form of foundations for the central inverters and the Project switchgear, and associated components, would result in a minor increase in stormwater runoff and potential increase in soil erosion. Revegetation with noninvasive grasses, along with use of BMPs described in the SWPPP (see Section 1.4), such as soil erosion and sediment control measures, would minimize the potential for increased soil erosion and runoff. Following construction, implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during facility operations.

During operation and maintenance of the solar facility and associated interconnection facilities, minor disturbance could occur to soils. Routine maintenance would include periodic motor replacement; inverter air filter replacement; fence repair; vegetation control; and periodic PV array inspection, repairs, and maintenance. The Project would implement mechanized landscaping using lawnmowers and weed eaters. Trimming and mowing would likely be performed several times per year, depending on growth rate, to maintain an appropriate groundcover height of about 12 to 18 inches. While mowing would be the primary means of maintaining growth of vegetation on-site, grazing sheep may also be used. Selective spot applications of herbicides may be employed around facilities and structures to control weeds. Herbicides would be applied by a professional contractor or a qualified Project technician. These maintenance activities would not result in any adverse impacts to soils during operation.

3.3.2.2.4 Prime Farmland

Approximately 40 percent (194 acres) of the 490-acre Project site would be developed into the solar facility, and 19 acres of the developed area are prime farmland. The remaining 143 acres of prime farmland on the Project site would also no longer be used as farmland.

Any area within the Project site not developed for the solar facility would be undeveloped while allowing for related agricultural or vegetation management activities. Adhering to BMPs during construction and operation of the solar facility, including installing ECDs during stockpiling events, would preserve topsoil and limit erosion, resulting in negligible impacts to prime farmland. Due to the limited amount of grading and excavation onsite, most soils would remain in-situ.

Moreover, 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 adverse impacts on prime farmland under the Proposed Action. Following decommissioning of

the solar facility, the Project site could be returned to agricultural use with little reduction in soil productivity or long-term impacts to prime farmland.

3.3.2.3 Cumulative Impacts

The RFFAs, such as the potential developments of the Walker Industrial Park, American Way Site, Interstate 69 – Segment 8, and Lauderdale Community Hospital Construction, together with the Proposed Action, could disturb subsurface materials in the area, create new impervious surfaces in the area, and remove current prime farmland from production in the area, resulting in minor, cumulative impacts on geology, soils, and prime farmland, including the development of up to about 300 acres for industrial uses.

3.4 Water Resources

3.4.1 Affected Environment

3.4.1.1 Groundwater

Groundwater is water located beneath the ground surface, within soils and subsurface formations known as hydrogeological units or aquifers. Aquifers have sufficient permeability to conduct groundwater infiltration and to allow economically significant quantities of water to be produced by man-made water wells and natural springs.

In the state of Tennessee water wells are managed by TDEC Division of Water Resources under the Tennessee Water Action of 1963. Drilling of a water well must be conducted by a licensed well drilling contractor and pumps must be installed by a licensed installer. Well construction standards are stated in the Tennessee Department of Environment and Conservation Water Resources Division Water Well Licensing Regulations and Well Construction Standards (Chapter 0400-45-09). Prior to well installation, a Notice of Intent (NOI) to Drill a Well must be submitted to TDEC at least one hour prior to drilling activities.

Review of the TDEC Water Well Desktop Application plots several residential and irrigation wells on nearby properties. The wells are installed in unconsolidated materials at depths ranging from 105 to 205 feet below ground surface and reported well yield ranged from 10 to 900 gallons per minute. Water withdrawals of 10,000 gallons or more on any day in Tennessee must be registered with TDEC Division of Water Resources under the Water Resources Information Act of 2002, TCA, Section 69-7-301. This information is filed using the Water Pumpage Data Report form (CN-1119) and Water Withdrawal Registration form (CN-1226).

The Project area is underlain by the extensive Mississippi Embayment aquifer system (Lloyd and Lyke 1995). Groundwater recharge and discharge correspond to topographic highs and lows, respectively. The direction of groundwater flow in the vicinity of the Project may be affected by agricultural pumping and local surface water bodies; however, it would likely flow into tributaries of Cane Creek.

3.4.1.2 Surface Water

Surface water is any water that flows above ground and includes, but is not limited to, streams, ditches, ponds, lakes, and wetlands. TDEC also designates certain surface watercourses as WWCs. Streams are classified as either perennial, intermittent, or ephemeral based on the occurrence of surface flow. Perennial streams are relatively permanent waters with perennial flow from the groundwater table, which is generally located above the streambed throughout the year. Intermittent streams usually have baseflow at least once per year, typically, in the winter

and spring. Ephemeral streams are above the groundwater table and convey flow only during, and for a short duration after (generally less than 48 hours), and in direct response to, a precipitation event. In Tennessee, any water course or ditch that carries water only in direct response to a precipitation runoff and is not a stream, is classified as a WWC. Wetlands are those areas inundated by surface water or groundwater such that vegetation adapted to saturated soil conditions is prevalent. Examples of wetlands include swamps, marshes, bogs, and wet meadows.

Surface waters with certain physical and hydrologic characteristics (defined bed and bank, ordinary high-water mark, or specific hydrologic, soil, and vegetation criteria) are considered WOTUS. Regulatory guidance for the definition of WOTUS is subject to change as USEPA and USACE issue relevant rulings. Currently in Tennessee, potential for federal jurisdiction was evaluated based on USACE 2008 Rapanos Guidance as well as the current understanding of the *Sackett v. EPA* ruling (e.g., identifying relatively permanent waters that are indistinguishable from other relatively permanent waters). See the Aquatic Ecology and Wetlands Assessment (Appendix B) for further information on regulatory guidance.

CWA is the primary federal statute that governs the discharge of pollutants and fill materials into WOTUS under Sections 402, 404, and 401. The limits on activities affecting CWA Section 404 WOTUS are defined through a jurisdictional determination accepted by USACE as described above. CWA Section 404 NWP would be required for impacts to jurisdictional waters that are less than 0.5 acre. NWPs are issued by USACE to authorize the construction, expansion, or modification of certain activities that would discharge dredged or fill material into WOTUS, provided the proposed activities meet specific criteria. Solar facility impacts are often authorized under Number 12 (Utility Line Activities), Number 14 (Linear Transportation Projects), and/or Number 51 (Land-Based Renewable Energy Generation Facility). If impacts exceed 0.5 acre, a USACE Individual Permit must be used to authorize impacts to WOTUS. State agencies have jurisdiction over water quality. The limits on activities affecting CWA Section 401 state waters are defined by both a USACE jurisdictional determination and a hydrological determination accepted by TDEC DWR. Project site development would also be subject to potential permitting through TDEC DWR via an application for an ARAP (Tennessee's Section 401 permit). General ARAP permits are triggered by specific types of impact activities (e.g., road crossings or utility crossings) or triggered by impacts to feature type (e.g., wetland alterations), and each General ARAP has different impact thresholds for triggering an Individual ARAP. Depending on the extent of impacts, mitigation may be required for certain features.

The Project site is in the Cane Creek watershed (10-digit Hydrologic Unit Code [HUC] 0801020807) of the Lower Hatchie River watershed. The on-site surface waters drain south and east into various ditches and tributaries that flow into Hyde Creek, which flows northwest along the southern boundary of the Project site into Cane Creek, approximately three miles from the Project site boundary (USGS 2022).

Field surveys were conducted in September 2022 and November 2023 on the Project site to determine the presence of wetlands, streams, and open waters and assess their quality (Appendix B). Water resources were delineated according to USACE 1987 *Wetland Delineation Manual* and the 2010 USACE *Atlantic and Gulf Coastal Plain Regional Supplement (Version 2.0)*. Jurisdictional WOTUS were determined per the pre-2015 regulatory regime consistent with the Supreme Court's decision in *Sackett v. Environmental Protection Agency*. Wetland and open water features were classified according to the Cowardin naming convention (Cowardin et

al. 1979). Wetland quality was assessed using the Tennessee Rapid Assessment Method (TRAM). Streams were determined utilizing the methodology and guidance provided in *Regulatory Guidance Letter 05-05* and the 2020 TDEC DWR *Guidance for Making Hydrologic Determinations (Version 1.5)*. Hydrologic Determination (HD) will be requested from TDEC, and Jurisdictional Determination (JD) will be requested from USACE. The pending USACE JD verification and TDEC HD will confirm the jurisdictional status of the onsite federal and state waters, respectively.

One perennial stream (S001 [Hyde Creek]; 819 linear feet [LF]), 17 intermittent streams (19,932 LF), and 65 WWCs (23,250 LF) were delineated on the Project site (Table 3-4; Table 3-5; Figure 3-4; Figure 3-5). Detailed tables and figures of individual surface waters and wetlands are included in the Aquatic Ecology and Wetlands Assessment Technical Report (Appendix B).

Table 3-4. Summary of jurisdictional watercourses within the Project site

Feature Identifier	Flow Regime	Cowardin Classification ¹	TDEC HD (Score) ²	TVA SMZ Category ³	Presumed Jurisdiction		Average OHWM ⁴ (ft)	LF within Project Site
					Section 404	Section 401		
S001	Perennial	R5UB	Stream [24]	A	Yes	Yes	12	819
S002	Intermittent	R4SB5	Stream [21.5]	A	Yes	Yes	4	4,083
S003	Intermittent	R4SB5	Stream [16]	A	Yes	Yes	8	473
S004	Intermittent	R4SB5	Stream [15]	A	Yes	Yes	5	1,565
S005	Intermittent	R4SB5	Stream [20]	A	Yes	Yes	5	2,779
S006	Intermittent	R4SB5	Stream [23]	A	Yes	Yes	6	1,748
S007	Intermittent	R4SB5	Stream [19.5]	A	Yes	Yes	6	701
S008	Intermittent	R4SB5	Stream [19.25]	A	Yes	Yes	4	1,105
S009	Intermittent	R4SB5	Stream [19]	A	Yes	Yes	5	488
S010	Intermittent	R4SB5	Stream [21]	A	Yes	Yes	6	1,565
S011	Intermittent	R4SB5	Stream [19.5]	A	Yes	Yes	4	356
S012	Intermittent	R4SB5	Stream [20]	A	Yes	Yes	4	218
S013	Intermittent	R4SB5	Stream [20]	A	Yes	Yes	4	2,147
S014	Intermittent	R4SB5	Stream [22.5]	A	Yes	Yes	3	340
S015	Intermittent	R4SB5	Stream [19]	A	Yes	Yes	5	1,204
S016	Intermittent	R4SB5	Stream [23.5]	A	Yes	Yes	3	944
S017	Intermittent	R4SB3	Stream [23]	A	Yes	Yes	18	98
S018	Intermittent	R4SB5	Stream [21.5]	A	Yes	Yes	6	118
Total:							20,751	

1. R4SB3: Riverine Intermittent, Cobble-Gravel Streambed; R4SB5: Riverine Intermittent, Mud Streambed; R5UB: Riverine Unknown Perennial, Unconsolidated Bottom (Cowardin et al. 1979).

2. When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators (denoted as a score of “P”) are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey. A watercourse is considered a stream if the secondary indicators score greater than 19 or else is considered a wet weather conveyance (WWC).
3. Streamside Management Zones (SMZs) surrounding streams and wetlands according to their rating as defined by TVA 2022a. Categories include: A = Standard Stream Protection; B = Protection of Important Streams, Springs, and Sinkholes; C = Protection of Unique Habitat; and Best Management Practices (BMPs) for wet weather conveyances.
4. OHWM: Width of stream at ordinary high-water mark.

Table 3-5. Summary of non-jurisdictional watercourses within the Project site

Feature Identifier	Cowardin Classification ¹	TDEC HD (Score) ²	TVA SMZ Category ³	Presumed Jurisdiction		Average Width	LF within Project Site
				Section 404	Section 401		
E001	R6	WWC [15]	BMPs	No	No	4	105
E002	R6	WWC [12]	BMPs	No	No	2	57
E003	R6	WWC [14]	BMPs	No	No	2	64
E004	R6	WWC [13.5]	BMPs	No	No	2	624
E005	R6	WWC [13.5]	BMPs	No	No	2	867
E006	R6	WWC [10]	BMPs	No	No	2	194
E007	R6	WWC [14.5]	BMPs	No	No	3	126
E008	R6	WWC [13]	BMPs	No	No	2	29
E009	R6	WWC [18.5]	BMPs	No	No	3	278
E010	R6	WWC [12]	BMPs	No	No	2	341
E011	R6	WWC [18]	BMPs	No	No	4	831
E012	R6	WWC [12]	BMPs	No	No	2	231
E013	R6	WWC [9.5]	BMPs	No	No	2	57
E014	R6	WWC [15.5]	BMPs	No	No	5	904
E015	R6	WWC [11.5]	BMPs	No	No	2	173
E016	R6	WWC [17.5]	BMPs	No	No	4	255
E017	R6	WWC [8.5]	BMPs	No	No	1	307
E018	R6	WWC [14]	BMPs	No	No	2	879
E019	R6	WWC [13]	BMPs	No	No	2	867
E020	R6	WWC [12]	BMPs	No	No	2	400
E021	R6	WWC [10.5]	BMPs	No	No	3	205
E022	R6	WWC [11]	BMPs	No	No	2	295
E023	R6	WWC [11.5]	BMPs	No	No	2	311
E024	R6	WWC [11]	BMPs	No	No	2	187
E025	R6	WWC [11]	BMPs	No	No	4	133
E026	R6	WWC [11.5]	BMPs	No	No	1	121
E027	R6	WWC [12]	BMPs	No	No	2	409
E028	R6	WWC [18]	BMPs	No	No	3	587
E029	R6	WWC [11]	BMPs	No	No	2	131

Feature Identifier	Cowardin Classification ¹	TDEC HD (Score) ²	TVA SMZ Category ³	Presumed Jurisdiction		Average Width	LF within Project Site
				Section 404	Section 401		
E030	R6	WWC [13.5]	BMPs	No	No	2	134
E031	R6	WWC [15]	BMPs	No	No	2	871
E032	R6	WWC [12]	BMPs	No	No	1	778
E033	R6	WWC [15.5]	BMPs	No	No	2	306
E034	R6	WWC [15.5]	BMPs	No	No	2	210
E035	R6	WWC [13]	BMPs	No	No	2	321
E036	R6	WWC [11.5]	BMPs	No	No	2	396
E037	R6	WWC [7.5]	BMPs	No	No	1	1,004
E038	R6	WWC [9]	BMPs	No	No	2	207
E039	R6	WWC [10]	BMPs	No	No	2	321
E040	R6	WWC [14]	BMPs	No	No	2	456
E041	R6	WWC [11]	BMPs	No	No	2	188
E042	R6	WWC [10]	BMPs	No	No	1	330
E043	R6	WWC [14.5]	BMPs	No	No	2	76
E044	R6	WWC [15.5]	BMPs	No	No	2	438
E045	R6	WWC [18]	BMPs	No	No	2	161
E046	R6	WWC [17]	BMPs	No	No	2	105
E047	R6	WWC [13.5]	BMPs	No	No	3	50
E048	R6	WWC [11.5]	BMPs	No	No	2	626
E049	R6	WWC [16]	BMPs	No	No	1	150
E050	R6	WWC [13.5]	BMPs	No	No	1	330
E051	R6	WWC [10.5]	BMPs	No	No	1	163
E052	R6	WWC [17.5]	BMPs	No	No	5	135
E053	R6	WWC [17.5]	BMPs	No	No	2	85
E054	R6	WWC [15.5]	BMPs	No	No	2	336
E055	R6	WWC [12.5]	BMPs	No	No	2	75
E056	R6	WWC [13]	BMPs	No	No	2	583
E057	R6	WWC [13]	BMPs	No	No	2	192
E058	R6	WWC [13]	BMPs	No	No	2	93
E059	R6	WWC [14]	BMPs	No	No	5	224
E060	R6	WWC [13]	BMPs	No	No	2	1,216
E061	R6	WWC [13]	BMPs	No	No	2	156
E062	R6	WWC [13]	BMPs	No	No	2	571
E063	R6	WWC [13]	BMPs	No	No	2	160
E064	R6	WWC [13]	BMPs	No	No	2	423
E065	R6	WWC [13]	BMPs	No	No	2	1,517
Total:							23,250

¹ R6: A wetland, spring, stream, river, pond, or lake that exists for a short period (Cowardin et al. 1979).

² When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators (denoted as a score of “P”) are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey. A watercourse is considered a stream if the secondary indicators score greater than 19 or else is considered a wet weather conveyance (WWC).

³ Streamside Management Zones (SMZs) surrounding streams and wetlands according to their rating as defined by TVA 2022a. Categories include: A = Standard Stream Protection; B = Protection of Important Streams, Springs, and Sinkholes; C = Protection of Unique Habitat; and Best Management Practices (BMPs) for WWCs.

One pond, P001, was identified on the Project site. This pond is 2.9 acres (Table 3-6; Figure 3-4; Figure 3-5). Detailed tables and figures of individual surface waters and wetlands are included in the Aquatic Ecology and Wetlands Assessment Technical Report (Appendix B).

Table 3-6. Summary of open waters within the Project site

Feature Identifier	Cowardin Classification ¹	TVA SMZ Category ²	Presumed Jurisdiction		Acreage within Project site
			Section 404	Section 401	
P001	PUBHh	A	Yes	Yes	2.9
Total:					2.9

¹PUBH: Palustrine Unconsolidated Bottom, Permanently Flooded, Diked/Impounded (Cowardin et al. 1979).

² Streamside Management Zones (SMZs) surrounding aquatic features according to their rating as defined by TVA 2022a. Categories include: A = Standard Stream Protection; B = Protection of Important Streams, Springs, and Sinkholes; C = Protection of Unique Habitat; and Best Management Practices (BMPs) for WWCs.

A total of 12 wetlands (4.06 acres) were identified on the Project site, including seven palustrine emergent wetlands (PEM) totaling 0.65 acres; three palustrine forested wetlands (PFO) totaling 1.08 acres; one PEM/PFO wetland totaling 1.43 acres; and one PFO/palustrine scrub-shrub (PSS) wetland of 0.9 acres (Table 3-7; Figure 3-4; Figure 3-5). Detailed tables and figures of individual surface waters and wetlands are included in the Aquatic Ecology and Wetlands Assessment Technical Report (Appendix B). TVA is subject to EO 11990, Protection of Wetlands.

Table 3-7. Summary of wetlands within the Project site

Feature Identifier	Cowardin Classification ¹	TRAM Functional Capacity (Score) ²	TVA SMZ Category	Presumed Jurisdiction		Acreage within Project Site
				Section 404	Section 401	
W001	PEM	Low [16]	A	No	Yes	0.04
W002	PEM	Low [16]	A	No	Yes	0.13
W003	PEM	Low [12]	A	No	Yes	0.06
W004	PFO	Low [29]	A	No	Yes	0.30
W005	PFO	Low [32]	A	No	Yes	0.04
W006	PEM	Low [15]	A	No	Yes	0.14
W007	PEM/PFO	Moderate [58]	A	Yes	Yes	PEM: 0.35 PFO: 1.08
W008	PFO	Low [37]	A	Yes	Yes	0.74
W009	PFO/PSS	Low [27]	A	Yes	Yes	PFO:0.30 PSS: 0.60
W010	PEM	Low [9]	A	No	Yes	0.20
W011	PEM	Low [9]	A	No	Yes	0.05
W012	PEM	Low [12]	A	No	Yes	0.03
<i>Presumed Jurisdictional under Section 404 Total:</i>						3.07
<i>Presumed Non-Jurisdictional Under Section 404 Total:</i>						0.99
Total:						4.06

¹ PEM: Palustrine Emergent Wetland; PSS: Palustrine Scrub/Shrub Wetland; PFO: Palustrine Forested Wetland (Cowardin et al. 1979).

² When applying Tennessee Rapid Assessment Method (TRAM) methodology, wetlands are scored into three categories based on wetland function, condition, and quality: low (scores 0-29), good/moderate (30-59), and superior (60-100).

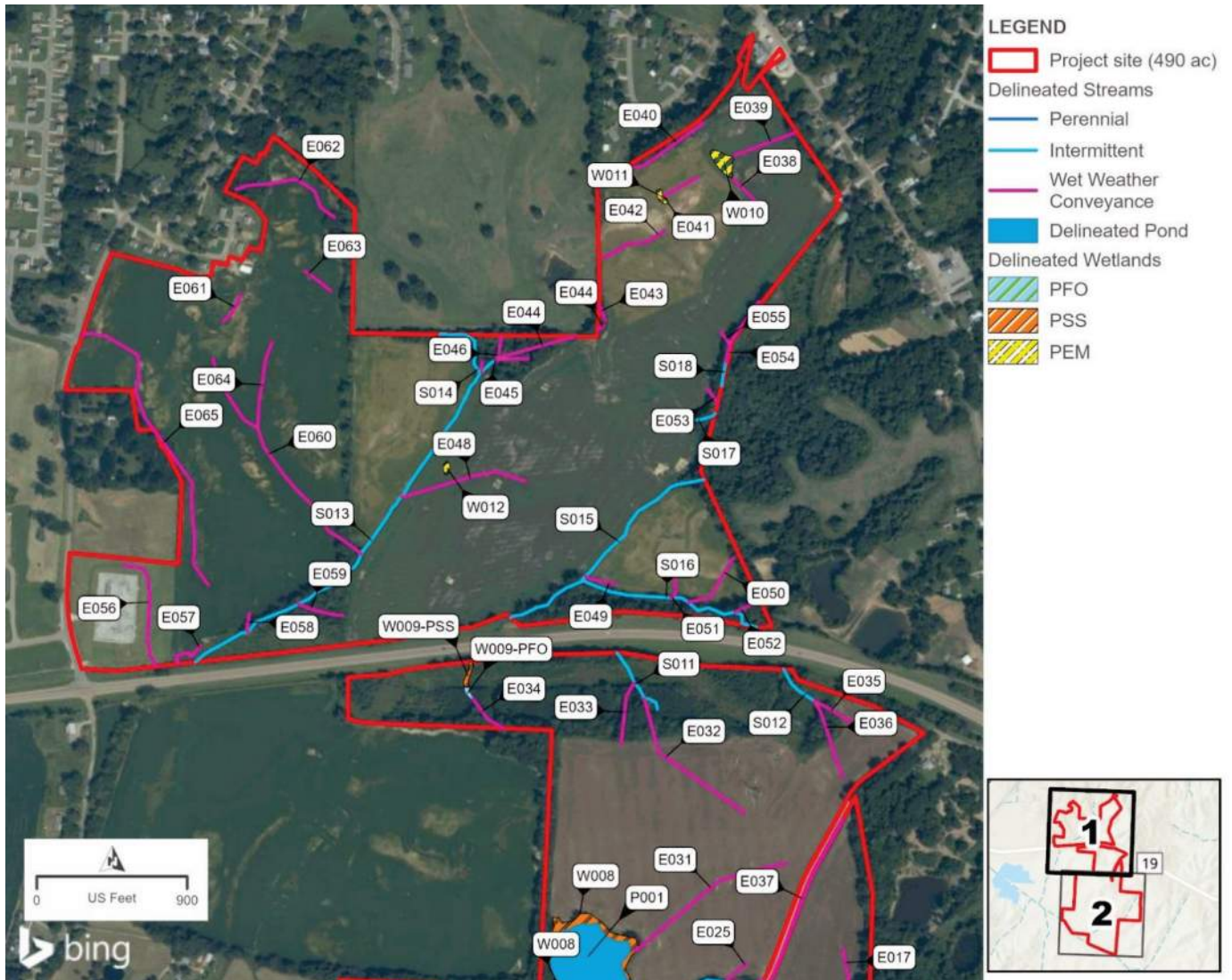


Figure 3-4. Delineated wetlands, watercourses, and ponds on the northern portion of the Project site

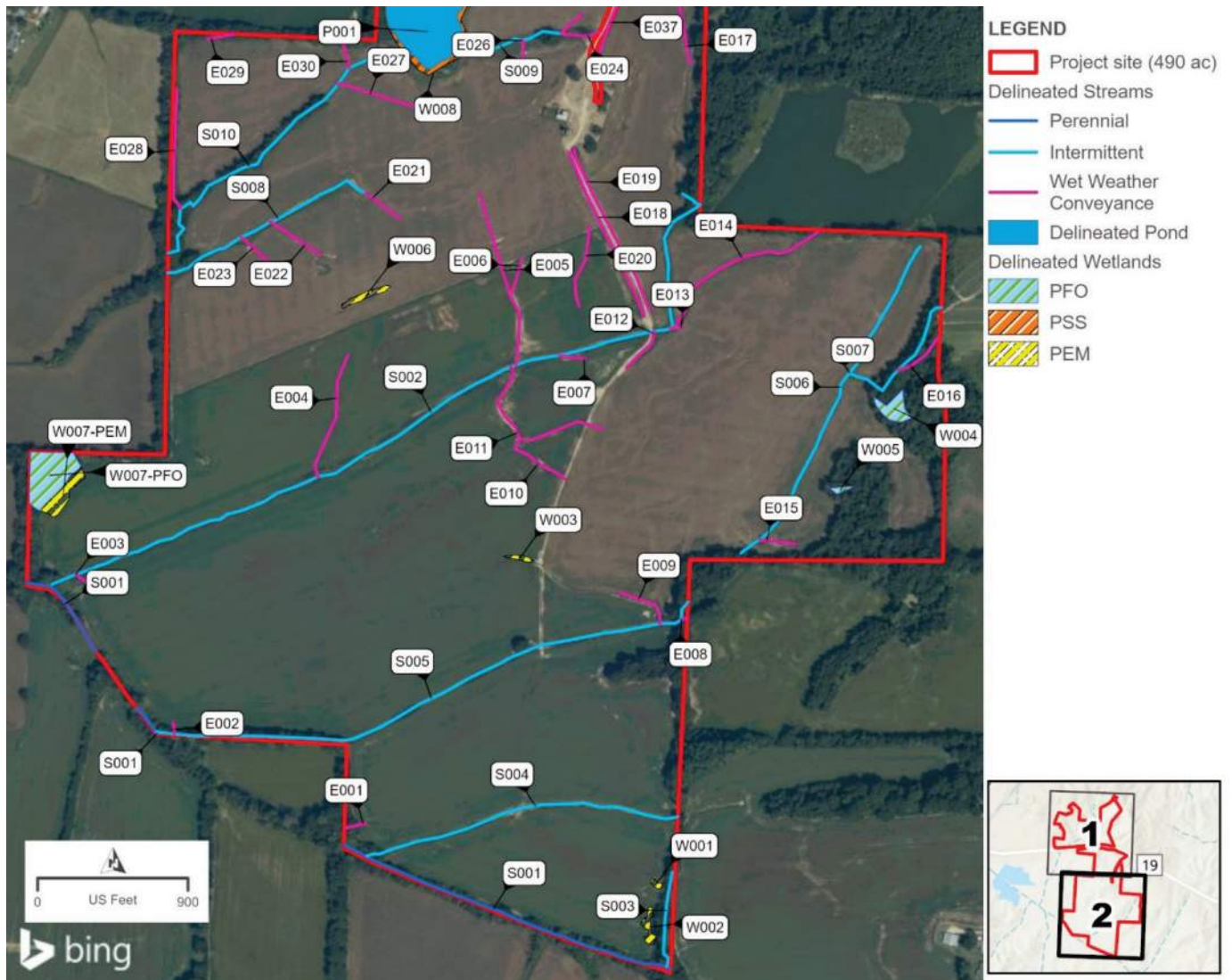


Figure 3-5. Delineated wetlands, watercourses, and ponds on the southern portion of the Project site

3.4.1.3 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 one-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 a floodplain to ensure that the Project is consistent with EO 11988, Floodplain Management and local floodplain development regulations.

Based on Lauderdale County Flood Insurance Rate Map Panels 47097C0357D and 47097C0359D, approximately 52 acres of the Project site are within the FEMA-identified 100-year floodplain (Figure 3-6; FEMA 2021).

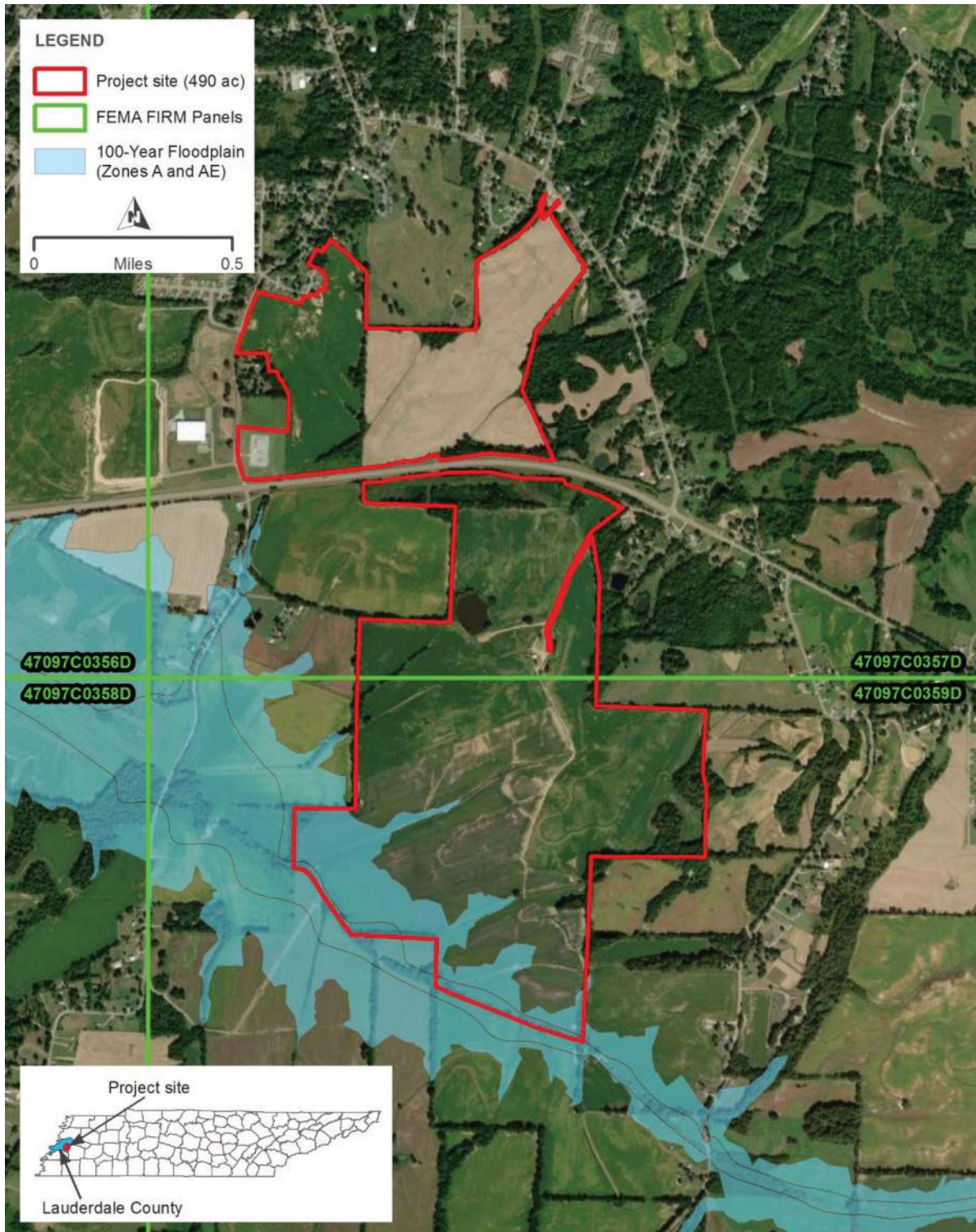


Figure 3-6. Floodplains in the Project area

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no direct Project-related impacts to water resources would likely occur. Existing land use would likely remain primarily agricultural land for the foreseeable future, and water resources would remain as they are at the present time. Indirect impacts to water resources could occur due to continuing agricultural use of the Project site. Erosion and sedimentation on-site could alter runoff patterns on the Project site and impact downstream surface water quality. In addition, if the local aquifers are recharged from surface water runoff, chemical fertilizer and pesticide use could impact both the surface water and groundwater.

3.4.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, minor direct impacts to streams and wetlands would result from construction and operation of the Project.

3.4.2.2.1 Groundwater

Minor adverse impacts to the supply and availability of groundwater may be encountered with implementation of the Proposed Action Alternative. Many neighboring residential and agricultural properties rely on water wells for potable and irrigation water. Pumping of groundwater for construction activities could modify stable conditions currently exhibited in private wells. TDEC regulations require daily reporting of water greater than 10,000 gallons per day, monitoring the aquifer. Due to the type of lithology and underlying aquifer, significant impacts are not anticipated.

3.4.2.2.1.1 Construction-related Water Needs

Direct adverse impacts to the supply and availability of groundwater are not anticipated with implementation of the Proposed Action Alternative. During construction, hazardous materials would be on-site that could contaminate groundwater resources, including petroleum products for fuel and lubrication of construction equipment, hydraulic fluids, and a variety of other chemicals commonly used for general construction projects. Implementation of a well head protection program and a Spill Prevention, Control, and Countermeasure (SPCC) Plan would reduce the potential for leaks or spills from construction equipment and outline procedures and protocols to quickly address potential spills that may occur. Pollution to groundwater from sedimentation could occur during construction activities resulting from erosion. Appropriate BMPs would be followed, and all proposed Project activities would be conducted in a manner to ensure waste materials are contained and the introduction of pollutants to the receiving waters would be minimized. A general construction stormwater permit would be needed as more than one acre would be disturbed. This permit also requires the development and implementation of a SWPPP.

Water and sewer services would be required during construction of the Project. Construction-related water use would support site preparation and grading activities. The primary use of water during construction would be for compaction and dust control during grading and earthwork. Smaller quantities of water would be required for other minor uses.

Water used during construction would be provided via existing municipal water-supply infrastructure at the Project site, delivery by water trucks, or on-site wells. If wells are selected, SR Ripley II, LLC would conduct groundwater drilling and testing to gather information on aquifer characteristics and develop a plan for the well design. If required, water-based drilling

muds would be collected and dewatered, with runoff occurring locally into nearby field areas. Dewatered muds would be non-toxic and could be distributed as subsoil during site grading. If necessary, sewer treatment would be accomplished through use of a pump-out septic holding tank. If installed, groundwater wells and the septic holding tank would be appropriately permitted and constructed to avoid impacts to groundwater.

3.4.2.2.1.2 Operation- and Maintenance-related Water Needs

The primary uses of water during operation and maintenance would be for dust control, equipment washing, and potential restroom facilities. The internal access roads would not be heavily traveled during normal operation; therefore, water use for dust control would be infrequent. Precipitation in the region is typically adequate to remove dust and other debris from the PV modules while maintaining energy production; therefore, manual module washing is not anticipated unless a site-specific issue is identified. If necessary, module washing would occur no more than twice a year.

Equipment washing and any potential dust control discharges would be handled in accordance with BMPs for water-only cleaning. Water needs during operation and maintenance would be provided either via the existing municipal water-supply infrastructure at the Project site, water trucks, or on-site wells. Operation- and maintenance-related water needs would not adversely affect groundwater resources.

3.4.2.2.1.3 Decommissioning and Site Reclamation-related Water and Wastewater Needs

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.

Conditions may change by the time facility closure and decommissioning becomes necessary. A final Decommissioning and Closure Plan would be created based on site conditions at the time of facility closure.

The Project would comply with NPDES requirements by preparing and implementing a SWPPP and filing a NOI to comply with the General Construction Stormwater NPDES Permit. The plan would include procedures to be followed during decommissioning to prevent erosion and sedimentation, non-stormwater discharges, and contact between stormwater and potentially polluting substances.

Decommissioning and site reclamation would likely be staged in phases, allowing for a minimal amount of disturbance and requiring minimal dust control and water usage. It is anticipated that water usage during decommissioning and site reclamation would not exceed construction or operational water usage.

3.4.2.2.1.4 Overall Groundwater Impacts

Overall, impacts on local aquifers and groundwater are anticipated to be minor to minimal due to the limited volume of groundwater required for initial construction, operation, maintenance, or decommissioning and closure. Implementation of BMPs and a Decommissioning and Closure Plan would reduce the potential for hazardous materials to reach groundwater resources

throughout construction and operation of the facility. The use of BMPs and a SWPPP would reduce the possibility of on-site hazardous materials reaching the groundwater during operation or maintenance.

Additionally, minor, indirect beneficial impacts to groundwater could occur from the discontinued use of broad applications of pesticides and fertilizers due to change from row crops to permanent vegetative cover.

3.4.2.2.1.5 Cumulative Impacts

The slight increase in impervious surface resulting from development of the solar facility may inhibit groundwater infiltration and recharge to the local aquifer. Any change would be minor with little effect on groundwater quantity or quality. Due to the relatively small increase of impervious surfaces that would change as a result of the Project and RFFAs, cumulative impacts of past and RFFAs, including the Proposed Action, on groundwater would likely be minor.

3.4.2.2.2 Surface Water

Under the Proposed Action Alternative, with the use of BMPs such as maintenance of SMZs, per TVA BMPs, around perennial and intermittent streams and similar SMZs around wetlands, as well as implementation of erosion control measures to minimize sediment runoff during construction, direct impacts to surface water would be minor. During the facility design process, impacts to on-site watercourses have been avoided or minimized to the maximum extent practicable. Care has also been taken to avoid impacts to wetlands, where practicable; therefore, this Project is consistent with the requirements of EO 11990, Protection of Wetlands. Appropriate BMPs would be implemented during operation of the Project.

The construction and operation of the Project would temporarily and permanently affect three intermittent streams and 30 WWCs (82 LF and 9,281 LF, respectively). Figure 3-7 and Figure 3-8 illustrate watercourse, wetland, and pond locations relative to Project components. Due to the construction of road crossings using culverts, three intermittent streams (S008, S010, and S013) totaling an estimated 82 LF, summarized in Table 3-8, and 11 WWCs totaling an estimated 377 LF would be permanently affected. If access to the switchgear from Highland Street Extended is chosen, impacts to S013 would be avoided and additional impacts to three additional WWCs would occur. Additionally, the Project would affect 30 WWCs totaling an estimated 8,903 LF due to the placement of solar panels and/or other Project components. Impacts caused by the construction of Project components to WWCs would entail piling placement and grading where necessary for solar array or central inverter installation but would not require CWA Section 404/401 permitting.

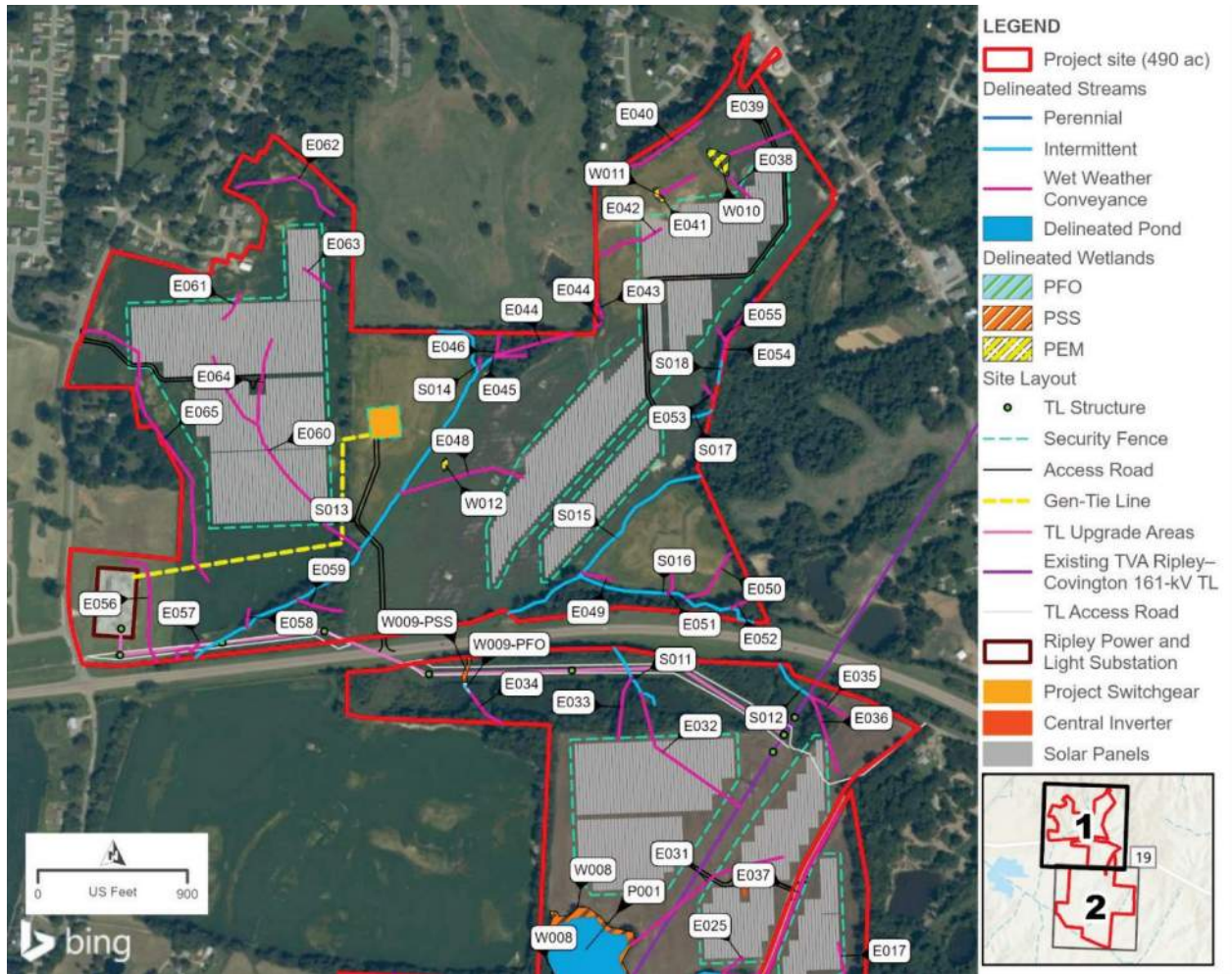


Figure 3-7. Proposed Project components in relation to delineated wetlands, watercourses, and ponds on the northern portion of the Project site

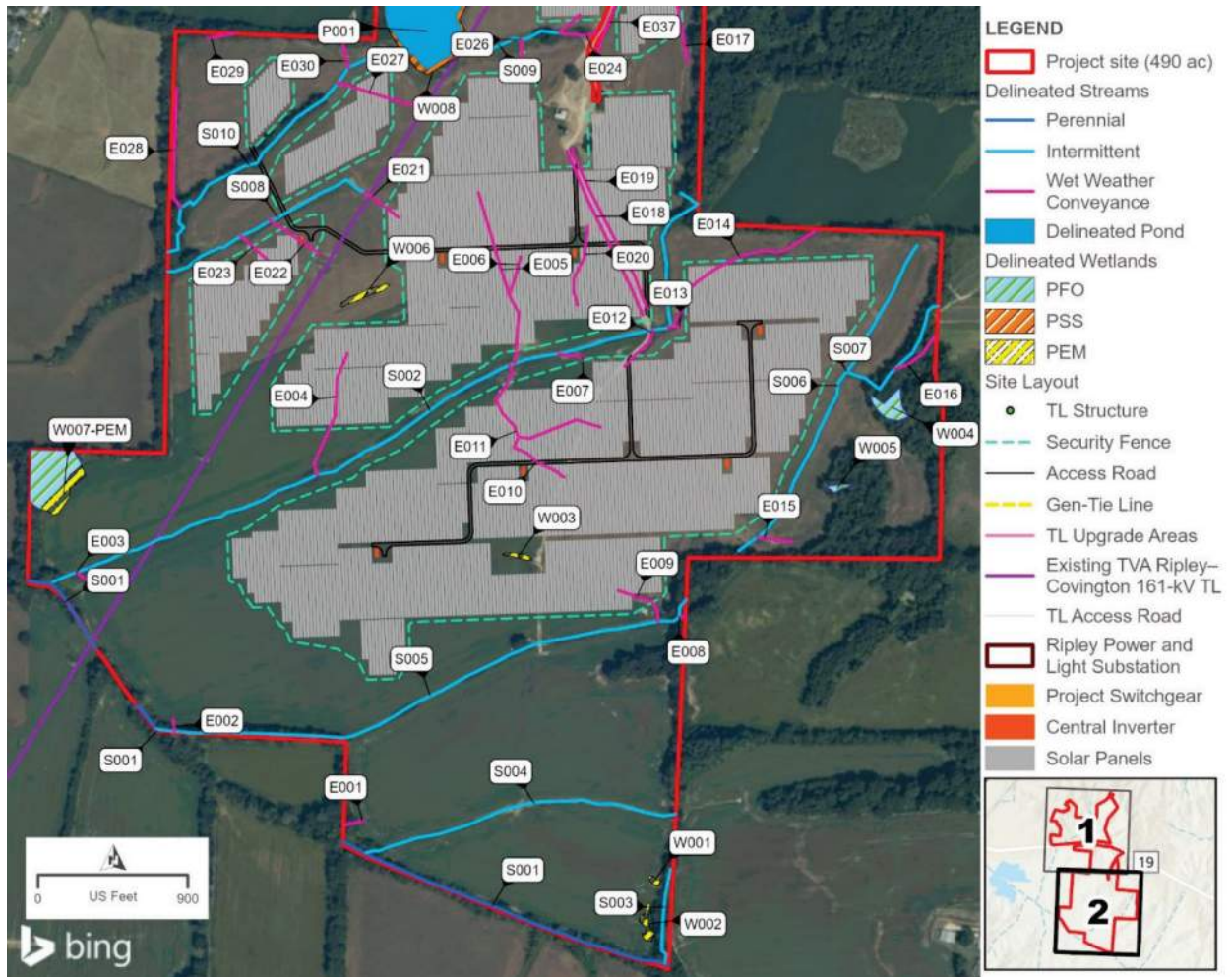


Figure 3-8. Proposed Project components in relation to delineated wetlands, watercourses, and ponds on the southern portion of the Project site

Table 3-8. Proposed Action Alternative stream impacts within the Project site

Feature Identifier	Flow Regime	HD Recommendation ¹	TVA SMZ Category ²	Impacts		Estimated Impact (LF)
				Duration	Type	
S008	Intermittent	Stream	A	Temporary	Dewatering	25
				Permanent	Fill (Culvert)	25
S010	Intermittent	Stream	A	Temporary	Dewatering	28
				Permanent	Fill (Culvert)	28
S013 ³	Intermittent	Stream	A	Temporary	Dewatering	29
				Permanent	Fill (Culvert)	29
Total Permanent Impacts						82
Total Temporary Impacts						82

¹ When applying HD methodology, watercourses are scored based on primary and secondary field indicators. Primary indicators are individual or combinations of field characteristics that, under normal circumstances and in the absence of any directly contradictory evidence, are considered to be definitive for jurisdictional purposes. Secondary indicators are evaluated if none of the primary indicators are present at the time of survey.

² SMZs surrounding streams and wetlands according to their rating as defined by TVA 2022a. Categories include Standard Stream Protection (Category A), Protection of Important Streams, Springs, and Sinkholes (Category B), or Protection of Unique Habitat (Category C).

³ If access to the switchgear from Highland Street Extended is chosen, impacts to S013 would be avoided. Total impacts would amount to 53 LF.

Appropriate BMPs and mitigation measures would be applied to S008, S010, and S013 for anticipated road crossings. The Project anticipates seeking a CWA Section 401 General ARAP for Construction or Removal of Minor Road Crossings and a CWA Section 404 NWP 14 for Linear Transportation Projects; if necessary, the Project would obtain a CWA Section 401 Individual ARAP or CWA Section 404 Individual Permit and would adhere to required compensatory mitigation. Construction equipment would avoid crossing streams to the maximum extent practicable. However, if necessary, temporary stream crossings would be utilized with adherence to BMPs to minimize impacts to stream banks and channels and be considered under the appropriate CWA Section 404/401 permits as needed. Vegetation clearing at stream crossings would be minimized to the maximum extent practicable. Surface water impacts to potentially jurisdictional waters are not anticipated from the installation of electrical cables due to the use of underground installation by boring or by attaching overhead cables to poles. If underground installation is chosen at the method of installation, the Project would pursue an ARAP for Utility Crossings. Appropriate BMPs would be implemented during construction and operation of the Project. If required, mitigation would be purchased to offset impacts for these features. If additional watercourse impacts are identified appropriate permitting would be sought and BMPs would be applied.

Wetlands and their SMZs located on the Project site would be subject to hand clearing while leaving stumps in place if deemed necessary to reduce shading of the solar panels. Permanent impacts to 0.56 acres of one forested wetland (W008) that is within the 200-foot-wide area surrounding proposed panel locations would be caused by clearing to reduce solar panel shading. W008 would be permanently impacted by conversion from forested to herbaceous. TVA BMPs, such as 50-foot SMZs and silt fencing, would be maintained and applied as applicable. If further impacts to wetlands are identified the Project would apply for CWA Section 401 or 404 permitting as necessary. If required, mitigation would be purchased to offset impacts for these features. Appropriate BMPs would be implemented during construction and operation of the Project.

SRC will submit a TVA approved JD request to USACE and obtain the necessary permit(s), before construction begins, and will follow the permit requirements and mitigation measures to minimize impacts to wetlands.

3.4.2.2.1 Electrical Interconnection

Ripley Power and Light's construction of the new approximately 0.3-mile 34.5-kV gen-tie line that would be necessary to interconnect the solar PV facility to TVA's existing electrical transmission network could result in stream and wetland impacts. No new poles would be installed in wetlands or streams or, to the extent practicable, within the 50- to 60-foot SMZs around the wetlands and streams. Typically, gen-tie installation requires vehicular access to each gen-tie structure to perform either boring underground or overhead installation. Three WWCs (E056, E060, E065) intersect the proposed gen-tie line location; these watercourses do not require CWA Section 401 or 404 permitting. Temporary stream crossings and other construction and maintenance activities associated with the installation of the 34.5-kV gen-tie line would comply with appropriate state permit requirements and TVA requirements as described in TVA's BMP manual (TVA 2022a).

TL upgrade activities to TVA's existing electrical transmission network would result in minor stream and wetland impacts. The installation of approximately 0.75 mile of OPGW and addition of ground wire suspension arms on the existing Ripley–Covington 161-kV TL would likely require vehicular access along the 100-foot ROW to each TL structure to perform aerial work.

TL upgrade activities along the Ripley–Covington 161-kV TL would lead to minor temporary impacts to one scrub/shrub wetland (W009) from matting. Prior to placing matting the wetland may be hand cleared while leaving stumps in place. After the TL upgrade activities are completed, matting will be taken up and the wetland will be allowed to revegetate and return to pre-matting conditions. Thus, impacts to W009 are anticipated to be temporary. Two intermittent streams (S011 and S014) and two WWCs (E056 and E057) would experience minor temporary or permanent impacts depending on the method employed to cross the watercourses.

Access across wetlands located in the ROW would be conducted in accordance with wetland BMPs to minimize soil compaction and ensure only temporary impacts result (TVA 2022a). This includes use of low ground pressure equipment, wetland mats, and dry season work scheduling. Temporary stream crossings and other construction and maintenance activities associated with the TL upgrade activities would comply with appropriate state permit requirements and TVA requirements as described in TVA's BMP manual (TVA 2022a).

3.4.2.2.2 Cumulative Impacts

Similar to the Project, the past and RFFAs are subject to CWA jurisdiction, ensuring current and foreseeable wetland impacts are considered, permitted, and/or mitigated in accordance with wetland regulations. This regulatory oversight ensures maintenance of the chemical, biological, and physical integrity of the aquatic environment, including wetlands, within these watersheds for the long term. Cumulative effects are considered in the CWA permitting process to ensure individual waterbody impacts do not collectively result in degradation to WOTUS, including jurisdictional wetland and stream resources. Due to implementation of BMPs and adherence to NWP and ARAP conditions and wetland mandates, regulation, permitting, and mitigation; the Project is not anticipated to contribute to cumulative stream and wetland impacts at the watershed scale.

3.4.2.2.3 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, Floodplain Management). 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.

The solar facility components, Project switchgear, and 34.5-kV gen-tie line would be located outside both FEMA-identified 100-year floodplains and floodplains of unmapped streams (Figure 3-9). Therefore, the Project would be consistent with EO 11988, and no impacts to floodplains and their natural and beneficial values would occur.

3.4.2.2.3.1 Cumulative Impacts

Because the Project would not affect floodplains, the Proposed Action would not result in cumulative impacts to wetlands and their natural and beneficial values.

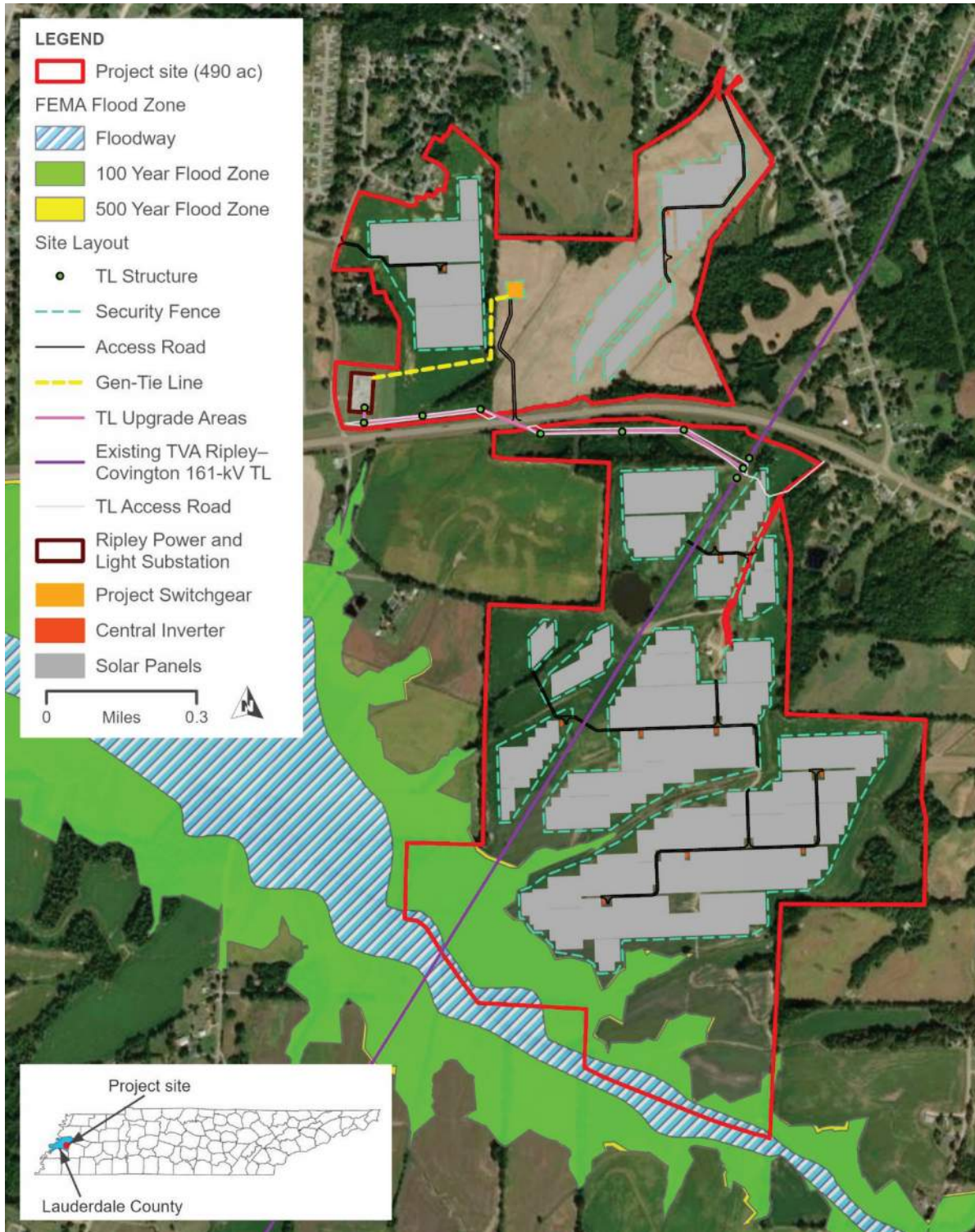


Figure 3-9. Proposed Project components in relation to floodplains in the Project area

3.5 Biological Resources

3.5.1 Affected Environment

The Project area lies in the Mississippi Valley Loess Plains Level III ecoregion, while the Project site is located within the Loess Plains Level IV ecoregion (USEPA 2022). This ecoregion is a productive agricultural area of soybeans, cotton, corn, milo, and sorghum crops, along with livestock and poultry. Natural plant communities in this ecoregion are oak-hickory and southern floodplain forests, although most of the forest cover has been removed for cropland. Some less-disturbed bottomland forest and cypress-gum swamp habitats remain in the area.

Habitat assessments were conducted by HDR environmental scientists in September 2022, presence/absence surveys were conducted by TVA biologists for threatened and endangered plant and aquatic species in April 2023, bat mist netting surveys were conducted by Environmental Solutions & Innovations, Inc. bat biologists in June 2023, and a federal and state protected plant species and habitat survey was conducted by environmental consultant Dan Spaulding on the Project site in October 2023 (Appendix C). Results of the background research and field surveys are described in this section.

3.5.1.1 Vegetation

Field surveys of the Project site, conducted between September 2022 as well as October and November 2023, focused on documenting plant communities, invasive plants, and the presence of threatened and endangered plant species on portions of the Project site that would be disturbed by the Project. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys consist of row crops, dry deciduous forest, mesic deciduous forest, herbaceous, and wet deciduous forest. The plant communities observed on the Project site are common and well represented throughout the region. The structure and species composition of forest stands on the Project site varies, but no forested areas on the Project site had the structural characteristics indicative of old growth forest (Bureau of Land Management 2024). Factors like soils, slope, and landscape help determine the type of forest present, but previous land use is an important factor determining the number and type of species a forest stand supports. The forest stands present on the Project site are heavily disturbed by human activities and contain a large proportion of invasive species.

Most of the Project site is comprised of agricultural fields, 430 acres (88 percent), with forested edges. Current management activities on the Project site are focused on production of cotton, soybean, and corn, with crop harvesting underway at the time of the 2022 surveys. Forested areas comprise approximately 51 acres (10 percent) of the Project site. Most large contiguous forest stands are in the central and southeastern sections of the Project site with other smaller forested areas located along streams and fields. Average diameter at breast height (DBH) in these forest areas is 20–40 inches. Table 3-9 provides a summary of the vegetation community types with four of the community types occupying less than four percent of the Project site. Figure 3-10 displays the locations of the plant communities in the Project site. See Appendix C for further information.

Table 3-9. Vegetation communities on the Project site

Vegetation Community	Approximate Area (acres)	% of Project site
Row Crops (cotton, soybean, and corn)	430	88%
Dry Deciduous Forest	30	6%
Mesic Deciduous Forest	16	3%
Herbaceous	7	1%
Wet Deciduous Forest	4	<1%
Open Water	3	<1%
Total	490	100%

Dry and mesic deciduous forests, characterized by canopies composed of more than 70 percent deciduous trees, border the agricultural fields on the Project site and feature a diverse array of tree species. Wet deciduous forests exist around the pond and several of the wetlands on the Project site. Dominant tree species within the forested areas along the Project site boundary include black walnut, black willow, American sycamore, sugar maple, white oak, sugarberry, black cherry, and Osage orange. Common overstory and midstory plants found in the forested areas consisted of black willow, sugar maple, and sugarberry. The shrub layer of the forested areas contains highbush blueberry and sassafras. Average DBH of overstory species is approximately 20–40 inches. Common herbaceous plants found in the herb layer includes the following species: cinnamon fern, proso millet, royal fern, valley redstem, nutgrass, and redtop panic grass. Common vine plants found in the forested areas include poison ivy, crossvine, greenbriers, and Virginia creeper. At several locations within wet deciduous forest habitat, the forest surrounds open water which support species like black willow and black alder. Forested wetlands on site include hydrophytic species listed above such as sycamore, black willow, and American elm (Appendix C).

Herbaceous vegetation communities are defined as non-cultivated areas with herbaceous species accounting for greater than 70 percent of total cover. Several emergent wetlands on the Project site are dominated by herbaceous vegetation, primarily proso millet due to the disturbed nature of the area (Appendix C).

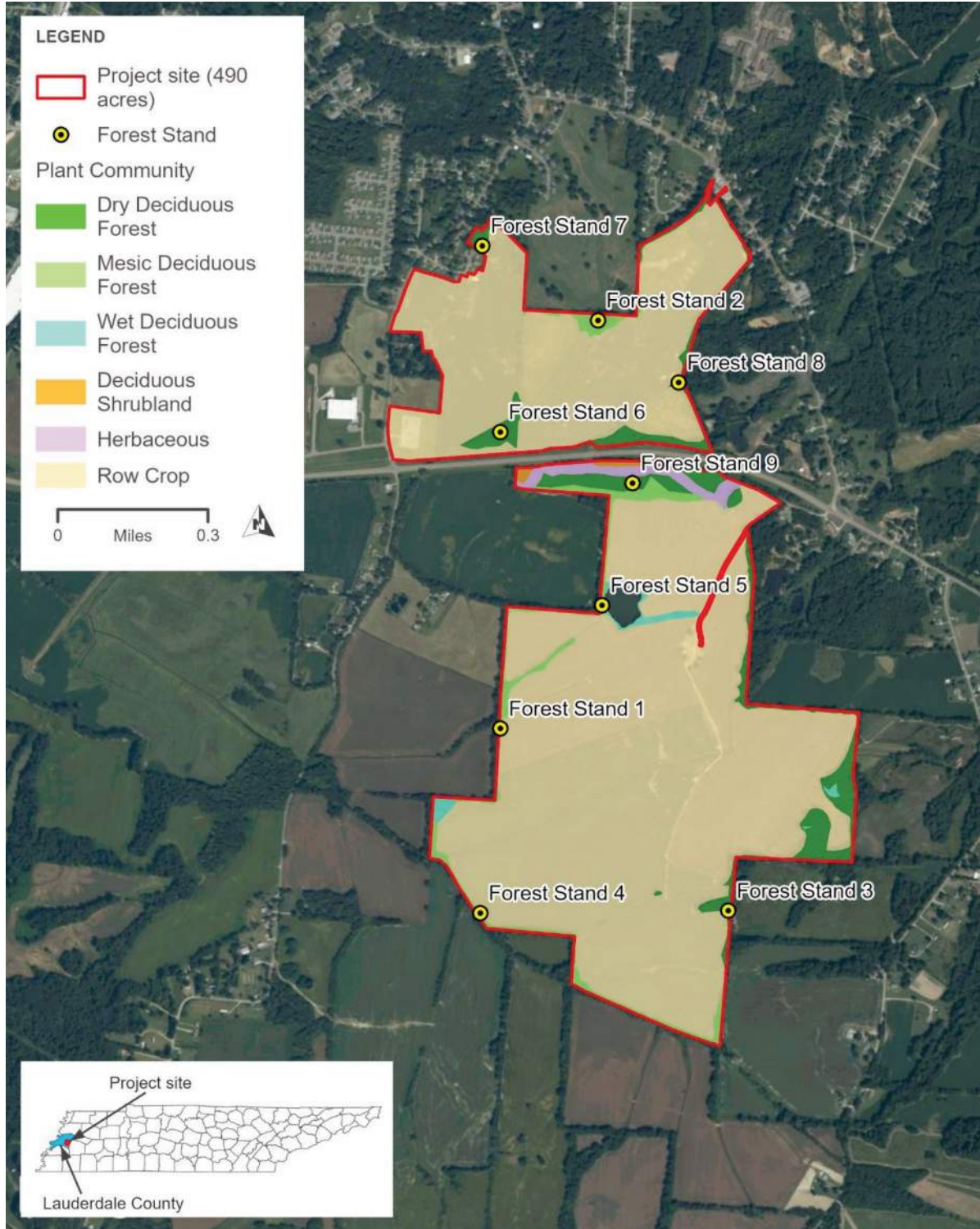


Figure 3-10. Vegetations communities on the Project site

3.5.1.1.1 Non-Native and Invasive Plants

Noxious weeds are defined as any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the U.S., the public health, or the environment (USDA 2023b). USDA maintains a list of federally recognized noxious weeds (USDA 2010, 2012). No federally noxious weeds were observed on the Project site.

Seven non-native invasive species were documented on the Project site, including black alder, autumn-olive, Japanese honeysuckle, Japanese stiltgrass, Johnson grass, Chinese privet, and multiflora rose. These species are most often found in ruderal forested areas, along field edges, and in areas prone to disturbance. Japanese honeysuckle, Japanese stiltgrass, Chinese privet, black alder, and multiflora rose were found in some of the forested stands. Invasive plants were found in both forest and herbaceous vegetation areas. These species occur on about 15 percent of the Project Site and in both forest and herbaceous vegetation areas.

3.5.1.2 Wildlife

Vegetation communities described in the prior section provide suitable habitat for many common wildlife inhabiting the region, both seasonally and year-round. The majority of the Project site is made up of agricultural fields, hayfields/pastureland, and other herbaceous areas, such as lawns, that offer habitat to bird species such as the grasshopper sparrow, sedge wren, and eastern meadowlark among others (Nocera and Koslowsky 2011). Mammals potentially present in fields or pasture include the northern short-tailed shrew, coyote, and eastern harvest mouse among others (Map of Life 2023). Reptiles with the potential to occur in agricultural portions of the Project site include the garter snake, black rat snake, kingsnake, and copperhead (David 2020).

Forested vegetation communities are also present on the Project site. These vegetation communities offer habitats to bird species such as the blue jay, warbling vireo, and tufted titmouse among others. Mammals with a potential to occur within forested areas on the project site include the Appalachian cottontail, eastern gray squirrel, long-tailed weasel, and woodland vole among others. Amphibian species such as the spring peeper could also be present in forested areas on the Project site. Reptiles with the potential to occur in forested areas of the Project site include species such as the coal skink and southeastern five-lined skink among others (TWRA 2024).

The wetlands on the Project site offer habitats to a wide variety of species, including birds such as the American bittern, Virginia rail, and Acadian flycatcher among others. Mammals that frequent wetland habitats include species such as the bobcat, swamp rabbit, racoon, and marsh rat. Amphibian species with potential to occur within wetlands on the Project site include species such as the northern cricket frog or green tree frog among others. Reptiles that could potentially inhabit wetlands on the Project site could include species such as the eastern wormsnaek, common king snake, or eastern mud turtle among others (TWRA 2024).

Pedestrian surveys of the Project site for terrestrial wildlife were conducted simultaneously with the vegetation survey in September 2022 and in November 2023. Table 3-10 includes a list of species that were either directly observed on the Project site or whose evidence (i.e., tracks, scat, remains) was identified during the field survey. Additional details on field observations are provided in Appendix C.

Table 3-10. Common wildlife species observed on the Project site

Species Observed (Common Name)	Scientific Name	Notes/Habitat Observed
Birds		
Woodpecker sp.		Flying around a tree and pecking at tree within upland forested habitat
Northern cardinal	<i>Cardinalis cardinalis</i>	Flying around low-hanging branches within scrub/shrub habitat
American crow	<i>Corvus brachyrhynchos</i>	Flying overhead
Red-tailed hawk	<i>Buteo jamaicensis</i>	Flying overhead
Killdeer	<i>Charadrius vociferus</i>	In agricultural fields and roadbeds in open areas
Black vulture	<i>Coragyps atratus</i>	Flying overhead
Blue jay	<i>Cyanocitta cristata</i>	Flying overhead
European starling	<i>Sturnus vulgaris</i>	Flying overhead
Carolina wren	<i>Thryothorus ludovicianus</i>	Flying overhead
Amphibians		
Spring peeper	<i>Pseudacris crucifer</i>	Heard near pond
American toad	<i>Anaxyrus americanus</i>	In damper forested areas throughout the site
Green treefrog	<i>Hyla cinerea</i>	Within a smaller wetland
Reptiles		
Five-lined skink	<i>Plestiodon fasciatus</i>	In forested areas
Invertebrates		
Grasshopper sp.		Flying through the cotton and soybean fields
Paper wasp		In nest bordering forested wetland
Mammals		
White-tailed deer	<i>Odocoileus virginianus</i>	In forested area
Tracks/Scat/Remains		
Turtle sp. remains		Near a dry pond
Deer tracks and scat		In several locations across the site
Raccoon tracks		In several of the creek beds throughout the site

3.5.1.2.1 Migratory Birds

EO 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) directs federal agencies to take certain actions to conserve migratory birds and implement the MBTA. The MBTA prohibits the “take” of migratory birds. The regulatory definition of “take” as defined by 50 CFR § 10.12, “means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue hunt, shoot, wound, kill, trap, capture, or collect.” The following prohibitions apply to migratory bird nests: “possession, sale, purchase, barter, transport, import and export, take, and collect.” The MBTA is executed and enforced by USFWS. TVA and SR Ripley II, LLC and its contractors would act in compliance with the MBTA.

Approximately 290 birds have been identified in Lauderdale County (eBird 2023), and additional species may occur regularly. USFWS maintains a list of migratory birds of conservation concern (USFWS 2021). These species are not listed under the ESA but are a high conservation priority of USFWS and without additional conservation action are likely to become candidates for listing under the ESA. Thirty-nine species of birds of conservation concern are listed for Bird Conservation Region 27, Southeastern Coastal Plain, which contains the Project site. Of these 39 species, at least 18 potentially occur with some regularity on or in the immediate vicinity of the Project site based on habitat observed (Table 3-11).

Both bald and golden eagles are protected by the MBTA and the Bald and Golden Eagle Protection Act (BGEPA). Bald eagles typically utilize forested areas adjacent to large bodies of water for nesting and roosting habitat. These birds nest and roost in tall, mature coniferous or deciduous trees that afford a wide view of the surroundings. Although bald eagles are frequently observed in Lauderdale County (eBird 2023), the suitability of the Project site as habitat for the bald eagle is low due to the absence of large water bodies on or nearby the Project site.

The golden eagle is a rare winter resident in Tennessee and most reports of the species have been in the vicinity of reservoirs near a mix of forest and open habitats for foraging. One golden eagle has been reported from Lauderdale County (eBird 2023) and the golden eagle is not likely to occur on the Project site.

Osprey typically inhabit areas along large rivers, lakes, and reservoirs and 24 observations were made in Lauderdale County (eBird 2023). While osprey are no longer listed as endangered in the state of Tennessee, they are a species of interest to TVA. In Tennessee, osprey arrive in March to begin their breeding season, building nests and raising young from April through July. Osprey build nests in trees and man-made structures (e.g., transmission structures) near or over water. Forested areas located along streams and open water features may provide suitable habitat for osprey on the Project site. Suitable habitat was observed within the larger open waters located on the northeastern and southeastern portions of the Project site, but no individuals were observed nesting on utility poles and no nests were located during the field surveys.

Table 3-11. Migratory bird species of concern potentially occurring on the Project site

Common Name	Scientific Name	Season of Occurrence	Likelihood of Presence	Habitat Description
Eastern whip-poor-will	<i>Antrostomus vociferus</i>	Spring through fall	Likely	Inhabits deciduous and mixed forests with open understory and forest edges; reported from vicinity
Chimney swift	<i>Chaetura pelagica</i>	Spring through fall	Likely	Nests in chimneys and less frequently large, open-topped hollow trees; reported from vicinity and likely forages over Project site
Chuck-will's-widow	<i>Antrostomus carolinensis</i>	Spring through fall	Possible	Inhabits oak and pine woodlands and edges of swamps
Lesser yellowlegs	<i>Tringa flavipes</i>	Spring and fall	Possible	Inhabits extensive emergent wetlands and seasonally flooded agricultural fields with sparse, low vegetation
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	Year-round	Likely	Inhabits open forests and pine savannahs, reported from vicinity
Wood thrush	<i>Hylocichla mustelina</i>	Spring through fall	Likely	Inhabits deciduous and mixed forests with shrubs in understory; reported from vicinity
Bachman's sparrow	<i>Thryomanes bewickii</i>	Spring through fall	Possible	Inhabits brushy areas, thickets and scrub in open country, open and riparian woodland; reported from vicinity
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Spring through fall	Possible	Inhabits grasslands of intermediate height and are often associated with clumped vegetation interspersed with patches of bare ground; reported from vicinity
Henslow's sparrow	<i>Centronyx henslowii</i>	Spring	Likely	Inhabits open fields and meadows with grass interspersed with weeds or shrubby vegetation, especially in damp or low-lying areas; reported from vicinity

Common Name	Scientific Name	Season of Occurrence	Likelihood of Presence	Habitat Description
Field sparrow	<i>Spizella pusilla</i>	Year-round	Likely	Inhabits grasslands with scattered shrubs and saplings, recently clear-cut areas; reported from vicinity
Rusty blackbird	<i>Euphagus carolinus</i>	Winter	Possible	Inhabits forested wetlands
Prothonotary warbler	<i>Protonotaria citrea</i>	Spring through fall	Possible	Inhabits forested wetlands with areas of standing water
Kentucky warbler	<i>Geothlypis formosa</i>	Spring through fall	Likely	Inhabits moist deciduous forest with shrubby understory
Cerulean warbler	<i>Setophaga cerulea</i>	Spring through fall	Unlikely	Inhabits large tracts of mature deciduous forest with scattered canopy gaps
Prairie warbler	<i>Setophaga discolor</i>	Spring through fall	Likely	Inhabits brushy fields and recently harvested, regenerating woodlands
Osprey	<i>Pandion haliaetus</i>	Spring through fall	Possible	Inhabits areas near large bodies of water, may nest on TLs
Bald eagle	<i>Haliaeetus leucocephalus</i>	Year-round	Unlikely	Inhabits coasts, rivers, large lakes; in migration, also mountains, open country.
Golden eagle	<i>Aquila chrysaetos</i>	Winter	Unlikely	Inhabits open mountains, foothills, plains, open country

Source: USFWS 2021; NatureServe 2023; TWRA 2023a

3.5.1.3 Aquatic Life

A desktop review of existing natural heritage data, existing knowledge of the distribution of aquatic fauna and their preferred habitats, existing hydrologic data, and aerial imagery was conducted to analyze the proposed Project site prior to aquatic field surveys. During HDR field surveys, environmental scientists observed the following species: leopard frogs, green frogs, cricket frogs, unidentified tadpole species, and western mosquito fish with streams throughout the Project site. Additionally, pond sliders were observed in a pond on the Project site.

Field surveys of the Project site for aquatic species were conducted by TVA biologists in April 2023 (Appendix C). Most streams encountered on the Project site were degraded due to ongoing agricultural practices. These streams were generally channelized and actively eroding, creating an incised stream channel that supports very little aquatic life. Fish and crayfish sampling was conducted in Hyde Creek and associated tributaries. One fish (black bullhead) and one crayfish (warpaint mudbug) were collected in unnamed tributaries to

Hyde Creek; one fish (western mosquito fish) was collected in Hyde Creek during the sampling and all species are relatively common. A list of aquatic species encountered during the aquatic surveys are included in Table 3-12.

Table 3-12. Aquatic species encountered on the Project site

Species Observed (Common Name)	Scientific Name	Notes/Habitat Observed
Amphibians		
Leopard frog	<i>Lithobates pipiens</i>	In multiple streams throughout the site
Green frog	<i>Lithobates clamitans</i>	In multiple streams throughout the site
Cricket frog	<i>Acris spp.</i>	In streams and ponded areas throughout the site
Tadpole sp.	<i>Lithobates spp.</i>	In many puddles and streams throughout the site
Reptiles		
Pond slider	<i>Trachemys scripta</i>	In pond on the site
Fish		
Black bullhead	<i>Ameiurus melas</i>	In unnamed tributary to Hyde Creek
Western mosquito fish	<i>Gambusia affinis</i>	In Hyde Creek
Crayfish		
Warpaint mudbug	<i>Lacunicambarus erythrodractylus</i>	In burrows alongside unnamed tributary to Hyde Creek
Insects		
Caddisfly	<i>Trichoptera</i>	In many drainages throughout the site
Midge	<i>Ceratopogonidae</i>	In many drainages throughout the site
Mayfly	<i>Ephemeroptera</i>	In many drainages throughout the site
Scud	<i>Amphipoda</i>	In many drainages throughout the site
Fly larva sp.	<i>Psychoda spp.</i>	In many drainages throughout the site

3.5.1.4 Rare, Threatened, and Endangered Species

Rare, threatened, and endangered species are regulated by both the federal and state governments. Following TVA (2023a) guidelines, HDR reviewed the TVA Regional Natural Heritage Database (RNHD; TVA 2022c) for aquatic species within the Cane Creek watershed (HUC 0801020807), plant species within five miles of the Project site, known caves within three miles of the Project site, terrestrial species within three miles of the Project sites, and natural areas within three miles of the Project site. HDR also reviewed TDEC Rare Species Data Viewer (TDEC 2024) for state or federal species of conservation concern with potential to occur on the Project site and within a three-mile radius of the Project site. In conjunction with the TVA RNHD, the USFWS Information for Planning and Consultation (IPaC) for federal species of conservation concern was examined for species with potential to occur on the Project site and Lauderdale County (USFWS 2024). The compiled animal species lists are included in Appendix C.

Based on this research as well as field surveys conducted in September 2022 and April 2023, the Project site contains suitable or potentially suitable habitat for three federally listed bat species, one federally listed reptile, and one insect that is a candidate for listing as well as one mammal species in need of management, one state-listed fish species, two

fish species in need of management, and three bird species in need of management (Table 3-13). No designated critical habitat for federally listed species occurs on or in the vicinity of the Project site. No caves or other unique terrestrial animal habitats were observed during field reviews or are known within three miles of the Project site. No state- or federally listed plant species are known within five miles of the Project site and none were observed during field surveys. No federally listed plant species are known within Lauderdale County. Five plant species of special concern and two state-listed plant species are known within Lauderdale County, but none are anticipated to occur on the Project site due to the absence of suitable habitat.

Table 3-13. Federally and state-listed species potentially occurring on the Project site

Common Name	Scientific Name	Status ¹		Likelihood of Presence	Habitat Description
		Federal	State		
Mammals					
Northern long-eared bat	<i>Myotis septentrionalis</i>	E	--	Possible	Inhabits a variety of habitats including wet meadows, damp woods, uplands, abandoned structures, and sinkhole fissures/karst features; found statewide.
Indiana bat	<i>Myotis sodalis</i>	LE	E	Possible	Inhabits various habitats including wet meadows, damp woods, and uplands, including abandoned structures
Tri-colored bat	<i>Perimyotis subflavus</i>	PE	T	Possible	Inhabits open-grassy fields, hayfields, shrubby fields, fence rows, and edges of woods
Eastern woodrat	<i>Neotoma floridana illinoensis</i>	--	D	Possible	Inhabits forested areas
Reptiles					
Alligator snapping turtle	<i>Macrochelys temminckii</i>	PT	T	Unlikely	Inhabits deep pools in large rivers, lakes and swamps
Fish					
Alligator gar	<i>Atractosteus spatula</i>	--	D	Unlikely	Inhabits sluggish pools of large rivers, oxbows, swamps, and backwaters
Blue sucker	<i>Cycoreon elongatus</i>	--	T	Unlikely	Inhabits swift waters over firm substrates in big rivers
Plains minnow	<i>Hybognathus placitus</i>	--	D	Unlikely	Inhabits clear to highly turbid rivers and creeks with sandy bottoms
Insects					
Monarch butterfly	<i>Danaus plexippus</i>	C	--	Possible	Inhabits meadows and grasslands with nectar producing plants and milkweed.
Birds					
Little blue heron	<i>Egretta cerulea</i>	--	D	Possible	Forages in wetlands and along shorelines, nests in forest near water bodies
Cerulean warbler	<i>Setophaga cerulea</i>	--	D	Unlikely	Inhabits extensive mature deciduous forest with scattered canopy gaps
Swainson's warbler	<i>Limnithlypis swainsonii</i>	--	D	Unlikely	Inhabits bottomland forests with thick shrub, cane, and/or sapling understory

Chapter 3 – Affected Environment and Environmental Consequences

Common Name	Scientific Name	Status ¹		Likelihood of Presence	Habitat Description
		Federal	State		
Plants					
Tissue sedge	<i>Carex hyaline</i>	--	S	Unlikely	Inhabits forested bottomland swamps and riverbanks
Featherfoil	<i>Hottonia inflata</i>	--	S	Unlikely	Inhabits ditches, wet sloped areas, and ponded areas. In Tennessee most likely to occur in Reelfoot Lake
Cedar elm	<i>Ulmus crassifolia</i>	--	S	Unlikely	Inhabits bottomland swamps and along stream and river banks
Lake cress	<i>Neobeckia aquatica</i>	--	S	Unlikely	Inhabits slow moving shallow open waters
Red starvine	<i>Schisandra glabra</i>	--	T	Unlikely	Inhabits loess bluffs along the Mississippi River
Ovate-leaved arrowhead	<i>Sagittaria platyphylla</i>	--	S	Unlikely	Inhabits swamps
Butternut	<i>Juglans cinerea</i>	--	T	Unlikely	Inhabits well-drained bottomland and floodplain forests

Sources: USFWS 2024; TVA 2022c; TDEC 2024

¹ Status Codes: C = Candidate for listing; D = Deemed in Need of Management; E = Endangered; LE = Listed Endangered; S = Special Concern; T = Threatened; PE = Proposed Endangered; PT = Proposed Threatened

² TWRA 2023b; USFWS 2006; USFWS 2015

One state species deemed in need of management that could occur on the Project site is the eastern woodrat. This species inhabits forested areas. Suitable habitat was observed on the Project site, but no individuals were observed during field surveys.

The northern long-eared bat, Indiana bat, and tri-colored bat could also occur on the Project site. During the summer, the Indiana bat and northern long-eared bat roost singly or in colonies underneath bark, in cavities, or crevices of both live and dead trees of varying size, age, and species (USFWS 2015). The Indiana bat and northern long-eared bat overwinter in large numbers in caves and cave-like structures such as mines and railroad tunnels. The tricolored bat roosts in trees, cliffs, and sometimes buildings in the summer (TWRA 2024b). This species hibernates in caves, rock crevices, and mines (TWRA 2024b). The little brown bat may also occur on the Project site and was targeted in mist net surveys in anticipation of its potential status change. During the summer, male little brown bats can be solitary or living in small colonies that inhabit in rocky crevices, hollow trees, loose bark, or under shingles or sidings of building and females of this species lives in nursery colonies in the spring and summer, which could be cliff crevices, hollow trees, under loose bark, or in undisturbed buildings (TWRA 2024a). In winter, the little brown bat hibernates in caves.

Approximately 53 acres was considered suitable summer foraging and roosting habitat for the Indiana bat, northern long-eared bat, tricolored bat, and little brown bat (Figure 3-11). These areas consist of trees of varying ages, including dead snags, that have exfoliating bark, crevices, or cracks. Foraging habitat for these species is present in the Project site over ponds, wetlands, open agricultural fields, and streams. Additional foraging habitat occurs within forested habitat, forest edges, and tree lines. Foraging habitat for these species is present in the TL upgrade area over wetlands, open agricultural fields, forest edges, and tree lines. The water resources for these bat species include a pond primarily fed by rainwater and stream channels located on the Project site and TL upgrade area. No suitable overwinter habitat exists for the federally listed bat species.

The 53 acres of suitable summer bat habitat on the Project site was categorized on quality of potential summer roosting habitat (Table 3-14). While most bat habitat is found in forested areas on the Project site, some bat habitat was identified across surface waters and in herbaceous vegetation communities. High quality habitat contains mature forest with several trees that have a DBH of >15 inches, is near waterways, and has low density understory. The high quality habitat is located on the western and northern perimeters of the Project site and in the area between two fields in the eastern portion of the Project site. Bat habitat categorized as high quality account for approximately 31 acres of the Project site. Moderate quality habitat contains several suitable roosting trees that have a DBH of 3-15 inches and a denser understory. The moderate quality habitat consists of mixed deciduous forest located along the northern border of the Project site and centrally around an agricultural freshwater pond. These areas were considered to have moderate quality habitat due to historic agricultural use and few trees with exfoliating bark. The moderate quality habitat accounts for approximately 15 acres of the forested area on the Project site. Low quality habitat contains younger trees that have grown close together (TVA 2023a). Low quality habitat was observed south of State Route 19 on the Project site. The seven acres of low-quality habitat consisted of mixed deciduous trees with a high percentage of sapling and vine vegetation and herbaceous vegetation communities. The buildings and culverts were inspected for bat habitat, but none were deemed as suitable habitat due to active human use and frequent water flow, respectively (Appendix C).

A mist net survey for bats was conducted on the Project site for four nights in June 2023. Eight eastern red bats, a common species found across Tennessee, were captured during the survey. No threatened, endangered, or proposed species were captured. Further detail on the mist net survey can be found in Appendix C.

Table 3-14. Summary of suitable bat habitat stands

Stand Number	Habitat Suitability	Area (acres)
Stand 1	High	3.7
Stand 2	High	2.6
Stand 3	High	13.5
Stand 4	Low/Moderate	6.3
Stand 5	High/Moderate	9.6
Stand 6	Moderate	3.1
Stand 7	High	1.1
Stand 8	Low/Moderate	6.0
Stand 9	Low	6.6
Total:		52.5

The alligator snapping turtle is unlikely to occur within the Project site. This species inhabits large bodies of water, which were not observed during the field surveys. The alligator gar, blue sucker, and plains minnow are unlikely to occur within the Project site due to the absence of suitable habitat.

Meadows and grasslands with nectar-producing plants are present on the Project site and may provide suitable habitat for the monarch butterfly. Due to the time of year the survey was performed, milkweed was not in bloom and not easily identified and no milkweed was observed at the time of survey.

Due to the presence of wetlands and forests, the little blue heron could be present on the Project site. The cerulean warbler and Swainson's warbler are not anticipated to inhabit the Project site as suitable habitat was not observed for these species.

None of the plant species listed in Table 3-13 or suitable habitat for these species were observed during field surveys.

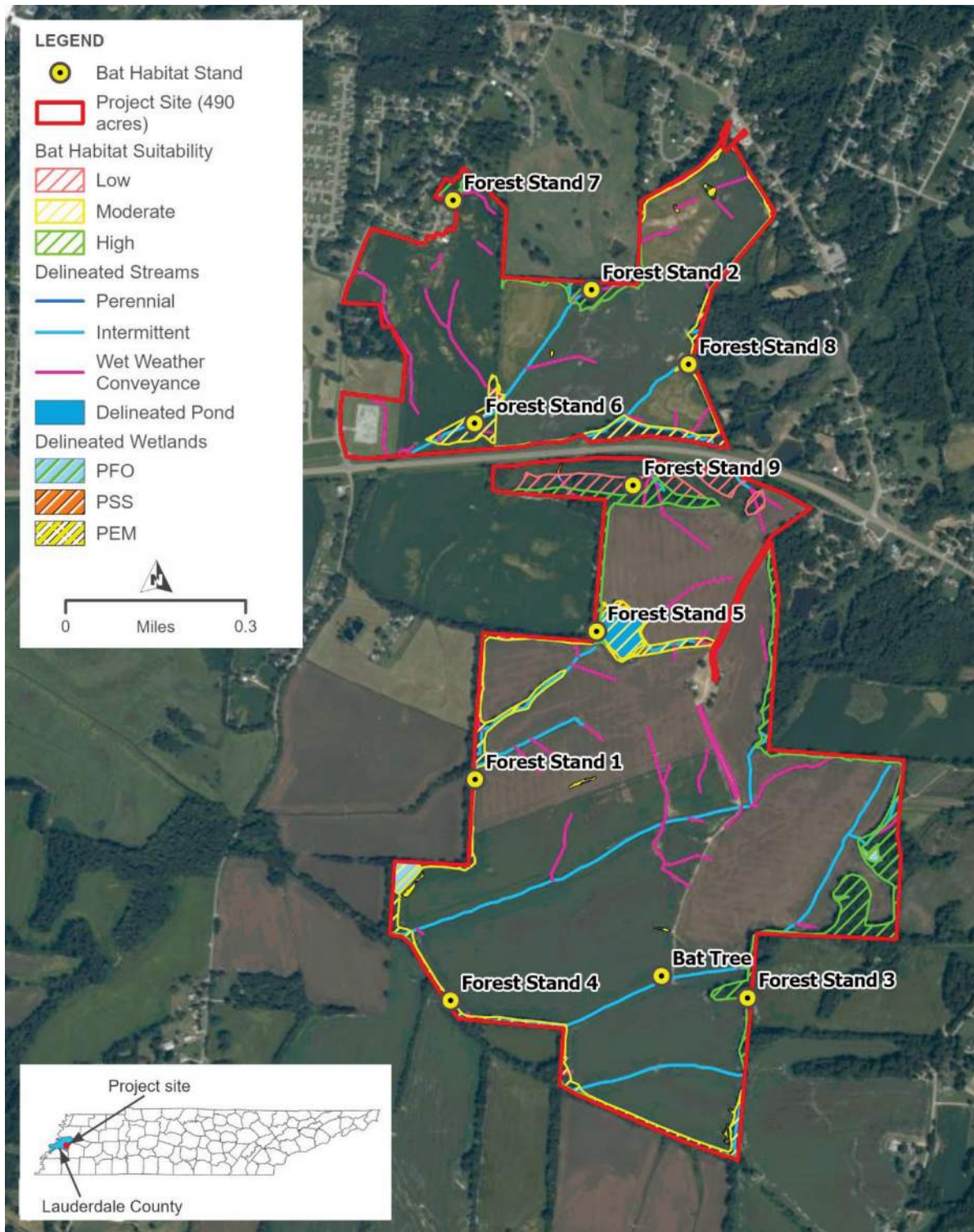


Figure 3-11. Bat habitat on the Project site

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to biological resources would occur. Existing land use would likely remain primarily agricultural land for the foreseeable future.

3.5.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, direct impacts to vegetation and wildlife would result from construction and operation of the Project.

3.5.2.2.1 Vegetation

Under the Proposed Action Alternative, construction of the solar facility would have minor impacts to vegetation. Most of the Project site consists of agricultural fields (430 acres) that have been regularly disturbed and are managed for crop production. About nine to 30 acres of dry deciduous forest, six to 16 acres of mesic deciduous forest, and two to four acres of wet deciduous forest would be cleared because of Project site construction, totaling approximately 17 acres at a minimum and up to 51 acres of permanent impacts. Additional mixed deciduous trees occur outside of the Project footprint. These areas support native and non-native species and have low conservation value. The forested areas, primarily consisting of deciduous trees, do not support rare or uncommon plant communities. The Project site's forest cover is representative of the local areas forest cover, which is made up of cropland interspersed with oak-hickory and southern floodplain forests (Griffith et al. 1998)

Clearing and grading activities would temporarily remove vegetation from the Project site. Following construction, disturbed portions within the fenced-in areas of the solar facility would be seeded with non-invasive grasses. Vegetation on the 194 acres of developed portions and within a 200-foot shade reduction buffer around the fenced-in solar panels (approximately 159 acres) of the Project site would be maintained to control growth through occasional mowing. Soil erosion and sediment control measures would be used to minimize the potential for increased soil erosion and runoff. Following construction, implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during facility operation. The remaining areas would be undeveloped while allowing for related agricultural or vegetation management activities. These portions of the Project site would eventually succeed from cropland to shrubland and eventually forest.

Herbaceous vegetation communities are within the TL upgrade areas and could be disturbed during TL upgrade activities. Impacts are anticipated to be minor and temporary, as the area would be allowed to revegetate after the completion of TL upgrade activities.

3.5.2.2.1.1 Non-Native and Invasive Plants

Under the Proposed Action Alternative, non-native and invasive plant species on the Project would be removed or graded and cleared during construction and managed with selective herbicides as needed during operation. To minimize the introduction and spread of invasive species, standard operating procedures would be consistent with EO 13112 (Invasive Species) for revegetating the area with non-invasive plant species.

3.5.2.2.2 Wildlife

Under the Proposed Action Alternative, the Project site would be cleared of debris and tall vegetation, mowed, and lightly graded, as needed for installation of the solar arrays and associated infrastructure. Direct effects to some individual animals would occur to those

individuals that are immobile during the time of habitat removal (e.g., during breeding/nesting and hibernation seasons). Habitat removal would likely disperse mobile wildlife into surrounding areas in attempts to find new food resources, shelter, and to reestablish territories. Security fencing would enclose discrete blocks of solar arrays, leaving corridors which would allow wildlife to travel across the Project site. Due to the large amount of already disturbed habitat being impacted, and the amount of similarly suitable habitat in areas immediately adjacent to the Project site, impacts to populations of common wildlife species are anticipated to be minimal to negligible.

3.5.2.2.1 Migratory Birds

Of the 39 birds of conservation concern, 18 could occur with some regularity on or in the immediate vicinity of the Project based on suitable available habitat. The clearing of forest would eliminate potential habitat for the Kentucky warbler, chuck-will's-widow, eastern whip-poor-will, chimney swift, wood thrush, rusty blackbird, prothonotary warbler, cerulean warbler, and red-headed woodpecker as well as other more common migratory birds inhabiting forests. The removal of wooded and brushy fencerows and scattered large trees would eliminate potential habitat for the prairie warbler, Henslow's sparrow, Bachman's sparrow, and field sparrow. Areas of the TL ROWs that are not maintained as grassland or cropland would provide habitat for the prairie warbler. The removal of open fields and croplands would eliminate potential habitat for the lesser yellowlegs and the grasshopper sparrow. The Project would establish 50-foot SMZs surrounding wetlands and intermittent streams that would include maintaining the existing riparian vegetation when possible. Therefore, the Project effects to wetlands and riparian vegetation would result in a negligible to minor adverse impact to populations of migratory birds.

Although construction and operation of the Project may reduce the foraging potential on the Project site, the Project is not anticipated to have an adverse effect on populations of migratory birds that require open country with scattered trees and shrubs, such as the prairie warbler, grasshopper sparrow, field sparrow, Bachman's sparrow, and Henslow's sparrow. Similar habitat type is available adjacent to the Project site, within Lauderdale County, and within adjacent counties, and would likely absorb displaced individuals.

51 acres of forested area would be cleared to minimize shading of the solar panels on the Project site. Impacts on mature, deep, and shady bottomland forest, which provides habitat for species such as the wood thrush, prothonotary warbler, rusty blackbird, chuck-will's-widow, and Kentucky warbler would occur. Taking into consideration the total of approximately 108,180 acres of forested land in Lauderdale County, the Project would have minor adverse effects on these species. Any effects would be limited in scale relative to the surrounding available habitat.

Overall, while the implementation of the Project would reduce habitat for some migratory bird species, particularly those occupying crop fields and open grassland habitats, the effect on migratory birds, while adverse, would be localized and minor.

Bald eagles are unlikely to nest or forage on the Project site due to its distance from large waterbodies; however, potential habitat exists along the existing Ripley–Covington 161-kV TL as bald eagles may nest on TL structures. Prior to construction activities, TVA would perform an aerial nest survey of each pole structure to identify active eagle nests, and if identified, TVA would engage USDA-Wildlife Services or USFWS as appropriate to provide guidance on avoidance and minimization measures and ensure compliance under federal law prior to commencement of work. With these measures, Project actions would not

impact bald eagles and would, therefore, be in compliance with the National Bald Eagle Management Guidelines (USFWS 2007). Suitable non-breeding roosting and foraging habitat for golden eagles exists on the Project site. However, due to the rarity of golden eagles in the region and the availability of suitable roosting and foraging in nearby similar habitat, the Project would likely not impact golden eagles.

Osprey typically inhabit areas along large rivers, lakes, and reservoirs and have been observed in Lauderdale County (eBird 2023). They forage over rivers and lakes and nest in trees or man-made structures (e.g., transmission structures) near or over water. Ospreys are unlikely to nest or forage on the Project site due to its distance from large waterbodies (TWRA 2023c). No individuals or nests were observed on the Project site.

3.5.2.2.3 Aquatic Life

Under the Proposed Action Alternative, impacts to aquatic life are expected to be minor or negligible. Potential impacts to aquatic species from the Project may result from herbicide runoff into streams. Indirect impacts to aquatic species may also occur due to minor increases in erosion and sedimentation during construction and operations. Streamside management zones, or vegetative buffers, would be left intact on the Project site. Thus, the changes would occur due to minor increases in erosion and sedimentation during construction and operations. These Project effects would be temporary and minimized by adherence to soil management BMPs.

Ephemeral streams and WWCs documented on the Project site only flow in response to precipitation events and do not support aquatic life. Ground disturbances surrounding ephemeral streams, in the form of installing small-diameter PV array pilings and trenching for installation of electrical cables, would be relatively minimal, and BMPs would be implemented to prevent or reduce surface water runoff from carrying suspended solids into adjacent waterbodies (TVA 2022b).

Due to the construction of road crossings using culverts, three intermittent streams (S008, S010, and S013) totaling an estimated would be permanently affected. If access to the switchgear from Highland Street Extended is chosen, impacts to S013 would be avoided. Applicable CWA Section 404 and 401 permits would be obtained from USACE and TDEC for any stream alterations, and application of the terms and conditions of these permits would further minimize impacts to aquatic species.

3.5.2.2.4 Rare, Threatened, and Endangered Species

The northern long-eared bat, Indiana bat, tricolored bat, little brown bat, eastern woodrat, monarch butterfly, and little blue heron could occur on the Project site.

Forested areas provide potential roosting and/or foraging habitat for the four bat species. No suitable winter roosting habitat exists for the federally listed bat species. Minimal to negligible impacts are anticipated for the northern long-eared bat, Indiana bat, tricolored bat, and little brown bat due to the absence of hibernacula documented within five miles of the Project site and the anticipation of tree clearing associated with the Project. Up to the total forested area on the Project site and additional suitable bat habitat area, approximately 53 acres, may be cleared for the Project. This includes up to approximately 31 acres of high-quality bat habitat, 15 acres of moderate-quality bat habitat, and seven acres of low-quality bat habitat. However, no listed bat species were caught during the mist net survey conducted on the Project site. If burning needs to be conducted during April and May, when there is some potential for bats to be present on the landscape and more likely to enter torpor

due to colder temperatures, burns will only be conducted if the air temperature is 55 degrees Fahrenheit (°F) or greater. Taking into consideration the total of approximately 108,180 acres of forested land in Lauderdale County that provides potential bat habitat, clearing the existing vegetation, including 53 acres of existing bat habitat on the Project site, and light grading would be considered minor impacts due to the abundance of nearby habitat (NLCD 2021). While bat foraging habitat would be affected and that could result in effects to federally listed bat species, the amount of forested area to be removed is relatively small with consideration to the available acreage in the region. As the Project may affect the federally listed bat species, TVA is consulting with USFWS under ESA Section 7. If necessary, formal consultation with USFWS would be pursued.

Forested areas could provide suitable habitat for the eastern woodrat. Up to the total forest area on the Project site of approximately 51 acres could be cleared for the Project. Similar habitat is adjacent to the Project site, so the Project is not anticipated to have an impact on these species.

Due to the location of potential suitable habitat, including flowering plants, for the monarch butterfly occurring on the fringes, where the solar facility would generally not be developed, minimal to negligible impacts are anticipated.

Wetlands and forests on the Project site provide suitable foraging and nesting habitat for the little blue heron. Nesting habitat could be impacted as approximately 51 acres of forested land may be cleared on the Project site, however, similar suitable habitat is available adjacent to the Project site. Only 0.56 acres of wetlands are expected to be impacted, therefore impact to foraging habitat for the little blue heron are expected to be minimal.

No suitable habitat was observed in the Project site for the alligator snapping turtle, alligator gar, blue sucker, plains minnow, cerulean warbler, Swainson's warbler, tissue sedge, feather foil, cedar elm, lake cress, red starvine, ovate-leaved arrowhead, or butternut. Therefore, these species are not anticipated to be impacted by the Project.

3.5.2.3 Cumulative Impacts

RFFAs may occur at multiple locations near the Project site, and these other projects would affect vegetation and wildlife habitat. However, given that agriculture is the dominant land use in the areas suited for development, future development would likely not result in substantial impacts to identified critical or unique terrestrial habitats. Considering the total of approximately 108,180 acres of forested land in Lauderdale County, habitat impacts by RFFAs are likely to be minimal (NLCD 2021). While RFFAs in the surrounding region could remove available habitats for wildlife in the foreseeable future, the impacts of the Project would not result in substantial cumulative impacts to vegetation and wildlife due to the small area of vegetation to be removed and the type of forest and other vegetative communities to be removed. Past and RFFAs in the surrounding region and their associated direct and indirect impacts are reasonably certain to gradually degrade existing streams and aquatic species on the Project site over the next several decades. Overall, because the impacts to federally and state-listed species would be avoided or minimized in consultation with USFWS, cumulative effects to threatened and endangered species would be minor.

3.6 Visual Resources

3.6.1 Affected Environment

Visual resources are composed of the visible character of a place and include both natural and human-made attributes. Visual resources influence how an observer experiences a particular location and distinguishes it from other locations. Such resources are important to people living in or traveling through an area and can be an essential component of historically and culturally significant settings. For this analysis, the scenery management system and associated analytical assessment procedures developed by the U.S. Forest Service are adapted for use within a natural and human-built environment and integrated with planning methods used by TVA (TVA 2016; USDA 1995). The general Project area viewshed is evaluated based on its scenic attractiveness and scenic integrity. Scenic attractiveness is a measure of the scenic beauty of a landscape based on perceptions of the visual appeal of landforms, waterways, vegetation, and the human-built environment. Scenic attractiveness is assessed as either distinctive, typical/common, or indistinctive. As adapted for this analysis, scenic integrity measures the degree of visual unity of the natural and cultural character of the landscape. Scenic integrity is evaluated as either low, moderate, or high. This analysis also considers the existing character of the Project site as an important factor in understanding the affected environment.

The Project site is comprised of agricultural fields situated on the outskirts of rural-residential areas within the city of Ripley and just outside the city limits in unincorporated Lauderdale County. The northern portion of the Project site borders a small neighborhood on Robinson Circle and a few single-family homes along Eastland Avenue. The southern portion is adjacent to a few isolated single-family homes as well as the Wood Family Cemetery. The Project site is predominantly flat to gently sloping undeveloped agricultural land with forested areas bordering the Project site which also serve as riparian SMZs along on-site streams. Scenic attractiveness of the general Project area viewshed is rated as typical or common of a rural agricultural and rural residential area. Scenic integrity is assessed as moderate due to the relative unity of the surrounding natural and cultural character. Figure 3-12 and Figure 3-13 show general views of the Project site.



Figure 3-12. Agricultural land on the Project site



Figure 3-13. Forested land on the Project site

Prominent visual receptors (viewpoints) surrounding the Project site, where the changes to the appearance of the Project site (i.e., the visual effects) would be most readily observed, include along State Route 19, small residential concentrations along Highland Street Extended, Sadler Street, Crescent Drive, Bluebird Street, and Eastland Avenue, as well as isolated single family homes along John Lamar Road and Hyde Road (Table 3-15 Figure 3-14). The Wood Family Cemetery is also located just east of the Project site off Willie Paris Road and is overgrown and within a forested area.

Table 3-15. Viewpoints in the vicinity of the Project site

Receptor Location	Description	Receptor Type	Views to Project site
State Route 19	Two-lane paved public road that extends east–west bisecting the Project site and intersects with US 51 to the northwest and Interstate 40 in the city of Brownsville to the southeast.	Road travelers	Partially obscured by mixed deciduous trees in fencerows and woodlots
Highland Street Extended	Two-lane paved public road that extends north–south approximately 0.3 mile west of the Project site, intersects with Eastland Avenue to the north and State Route 19 to the south.	Residential concentration of single-family homes Road travelers	Partially obscured by mixed deciduous trees in fencerows and woodlots
Sadler Street	Two-lane paved public road that intersects with Highland Street Extended.	Residential concentration of single-family homes	Partially obscured by mixed deciduous trees in fencerows and woodlots
Crescent Drive	Two-lane paved public road that intersects with Highland Street Extended and Bluebird Street.	Residential concentration of single-family and multi-family homes	Partially obscured by scattered individual mature deciduous trees and mixed deciduous trees in fencerows and woodlots
Bluebird Street	Two-lane paved public road that intersects with Crescent Drive and Eastland Avenue.	Residential concentration of single-family and multi-family homes	Partially obscured by scattered individual mature deciduous trees and mixed deciduous trees in fencerows and woodlots
Lynn Street	Two-lane paved public road that intersects with Robinson Circle and Eastland Avenue.	Residential concentration of single-family homes	Partially obscured by mixed deciduous trees in fencerows
Robinson Circle	Two-lane paved public road that intersects with Lynn Street and Eastland Avenue.	Residential concentration of single-family homes	Partially obscured by mixed deciduous trees in fencerows
John Lamar Road	Two-lane paved access road that intersects with State Route 19.	Two residential single-family isolated homes Road travelers	Partially obscured by mixed deciduous trees in fencerows and woodlots

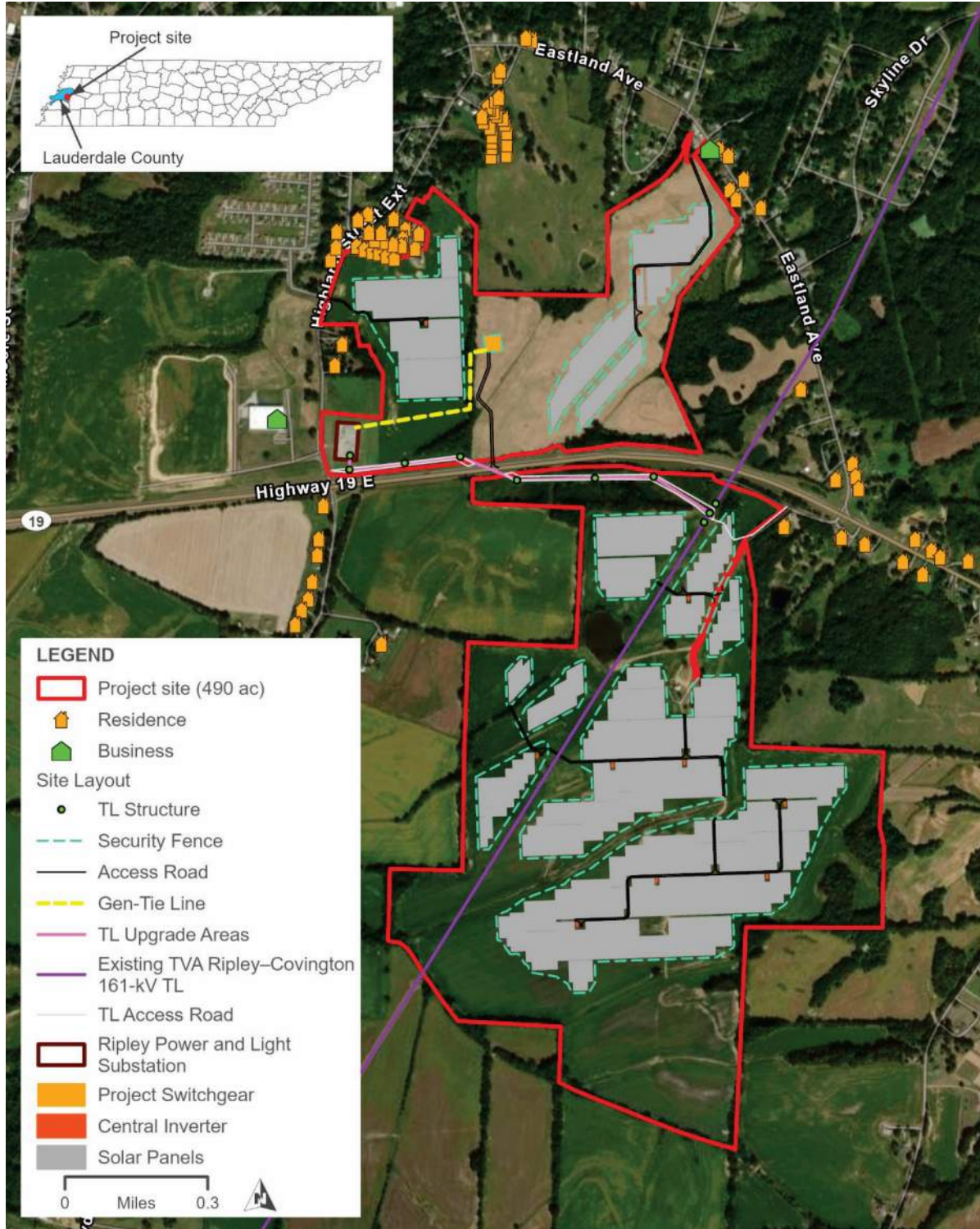


Figure 3-14. Viewpoints in the vicinity of the Project site

Long-range views from viewpoints near the Project site, primarily along or off State Route 19, Highland Street Extended, Sadler Street, Crescent Drive, Bluebird Street, Eastland Avenue, Hyde Road, and John Lamar Road are largely obscured by mixed deciduous trees in fencerows and woodlots.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to visual resources would result. Existing views of the Project site, primarily agricultural land, would remain relatively unchanged. Visual changes may occur over time as vegetation on the Project site changes. For example, if the Project site were no longer cultivated or mowed, vegetation would change from low-profile plants to shrubs and trees.

3.6.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, SR Ripley II, LLC would construct and operate a 30-MW AC single-axis tracking PV solar power facility. Visual concerns are often associated with both large- and small-scale solar facilities and their electrical infrastructure. The Project site generally consists of predominantly flat to gently sloping farmland with woodlots and forested fencerows bordering parts of the Project site. Construction of the proposed facilities would convert what is currently primarily agricultural land to an industrial use mostly consisting of low-profile PV arrays. Figure 3-14 shows the proposed Project elements and the locations of nearby vantage points (receptors) from which Project elements may be visible. Figure 3-15 and Figure 3-16 show representative views of the type of solar panels proposed for the Project. In the morning, when panels would be facing east, the more pronounced visual effects of the glossy front PV panel surfaces would largely occur from vantage points to the east of the Project site, along State Route 19 and Eastland Avenue. In the evening, when panels would be facing west, the more pronounced visual effects would largely occur from vantage points to the west of the Project site, along State Route 19, Highland Street Extended, Sadler Street, Crescent Drive, and Bluebird Street.



Figure 3-15. Single-axis, tracking PV system with panels near maximum tilt as viewed from the east or west



Figure 3-16. The backside of the solar panels in early morning or late afternoon configuration

Construction activities would temporarily alter the visual character of the Project area. During construction, heavy machinery would be present, changing the appearance from area vantage points. Within the 194-acre area to be developed for the Project, trees and other tall vegetation would be removed, and portions of the area would be graded, changing the contour, color, and texture of the scenery attributes. During and after grading, the Project site would appear as a mixture of neutral colors such as browns and grays due to earthmoving, road construction, and installation of concrete pads. Water would be used to keep soil from aerosolizing; thus, dust clouds are not anticipated. Visual impacts from construction would be minimal at night, as most construction is anticipated to occur during the day. Overall, there would be minor direct and indirect impacts to visual resources in the Project area during the construction phase of the Proposed Action. However, these impacts would be temporary, lasting approximately 12 months, subject to weather.

The manufactured, structured appearance of the built facility would be most apparent from vantage points surrounding the Project site along State Route 19, Highland Street Extended, Sadler Street, Crescent Drive, Bluebird Street, and Eastland Avenue. The perimeter of the 11 large blocks of facility components and Project switchgear would be enclosed with six-foot-tall chain-link security fencing topped with three strands of barbed wire.

The Project would be more visually intrusive in the morning and late afternoon, when the panels would be facing east or west, respectively, at their maximum tilt, with the upper edge of the panels about eight feet from the ground. This effect would not be present at midday when the panel profile would be flat and about five feet tall. The anti-reflective PV panel surfaces would minimize glare and reflection.

The visual alteration from agricultural and forested land in an area where scenic integrity is rated as moderate to high due to the relative unity of the surrounding natural and cultural character to a large solar facility would likely result in moderate adverse visual impacts. Overall, the visual effects of the built facility would likely be minor due to the visibility of relatively small portions of the facility components. Visual effects from the Project would be minimal on a larger scale, due to variation of the visual attributes of the Project area as distance from the Project increases.

Currently undeveloped portions of the Project site presently used as agricultural fields would remain undeveloped while allowing for related agricultural or vegetation management activities, resulting in minor visual changes.

Ripley Power and Light would install a new approximately 0.3-mile 34.5-kV gen-tie line from the proposed Project switchgear to the existing Ripley Power and Light substation in the western portion of the Project site. The new TL structures would be visible to travelers along State Route 19, travelers and residences along Highland Street Extended and Hyde Road, and residences along Sadler Street. Other equipment associated with the 34.5-kV gen-tie line may also be visible. Because this area is already crossed by several TLs with prominent TL structures and the viewshed has been altered, the addition of an approximately 0.3-mile 34.5-kV gen-tie line would likely result in minimal to minor impacts to the scenery at viewpoints near the western portion of the Project site.

TVA would perform network upgrades to approximately 0.75 mile of its existing Ripley–Covington 161-kV TL. This extent of the TL is located within the Project site through a mix of forested areas and agricultural fields along State Route 19 and within view of some small

residential concentrations. If used, a helicopter would be visible to these residences during the installation of OPGW in the vicinity. Other equipment associated with the TL upgrade activities may also be visible. Overall, the TL upgrade activities would likely result in temporary, minimal to minor impacts to the scenery at viewpoints in the vicinity of the TL upgrade areas.

3.6.2.3 Cumulative Impacts

The Proposed Action would alter the visual character of the Project site by converting a large area of agricultural land to numerous low-profile parallel rows of PV panels and a switchgear. Much of the developed Project site would not be visible from nearby public roads and residences. The visual impacts at other locations around the Project site perimeter would be low to moderate and mostly at middle-ground distances. The potential industrial development of RFFAs in the Project area (up to 300 acres) could result in greater visual impacts due to the size of the buildings and supporting infrastructure. Because the visual impacts of the Proposed Action would be comparatively low and localized, the Proposed Action has little potential to result in adverse cumulative visual impacts.

3.7 Noise

3.7.1 Affected Environment

3.7.1.1 Noise Regulations

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). The human ear does not perceive all sound frequencies equally well. Therefore, measured sound levels are adjusted or weighted to correspond more closely to noise perceived by human hearing. The adjusted noise metric that most closely duplicates human perception of noise is known as the A-weighted decibel (dBA). The threshold of human hearing is zero decibels (dB), and the threshold of discomfort or pain is around 120 dB.

The Noise Control Act of 1972, along with its subsequent amendments, delegates authority to the states to regulate environmental noise and directs government agencies to comply with local community noise statutes and regulations. Although there are no federal, state, or local regulations for community noise in Lauderdale County, the Project site is within the city limits of Ripley and is subject to the Ripley Municipal Code. As stated in the Ripley Municipal Code (MTAS 1994):

The erection (including excavation), demolition, alteration, or repair of any building in any residential area or section or the construction or repair of streets and highways in any residential area or section, other than between the hours of 7:00 A.M. and 6:00 P.M. on week days, except in case of urgent necessity in the interest of public health and safety, and then only with a permit from the building inspector granted for a period while the emergency continues not to exceed thirty (30) days. If the building inspector should determine that the public health and safety will not be impaired by the erection, demolition, alteration or repair of any building or the excavation of streets and highways between the hours of 6:00 P.M. and 7:00 A.M. and if he shall further determine that loss or inconvenience would result to any party in interest through delay, he may grant permission for such work to be done between the hours of 6:00 P.M. and 7:00 A.M. upon application being made at the time the permit for the work is awarded or during the process of the work.

However, part of the Project site is zoned as High Density/Mobile Home and General Business, and only some parcels are considered residential districts (Ripley Municipal Planning Commission 2022).

A day-night average sound level (L_{dn}) is a 24-hour noise descriptor used to assess noise impacts for land uses where people sleep and there is a heightened sensitivity to nighttime noise. The L_{dn} noise metric is recommended by USEPA and has been adopted by most federal agencies (USEPA 1974). The USEPA 1974 guidelines recommend that L_{dn} not exceed 55 dBA for outdoor residential areas. The U.S. Department of Housing and Urban Development (HUD) considers a L_{dn} of 65 dBA or less to be compatible with residential areas (HUD 1985). Common indoor and outdoor noise levels from various noise sources are listed in Table 3-16.

Table 3-16. Common indoor and outdoor noise levels

Common Outdoor Noises	Sound Pressure Levels (dB)	Common Indoor Noises
	110	Rock Band at 5 meters (16.4 feet)
Jet Flyover at 300 meters (984.3 feet)		
	100	Inside Subway Train (New York)
Gas Lawn Mower at 1 meter (3.3 feet)		
	90	Food Blender at 1 meter (3.3 feet) Garbage Disposal at 1 meter (3.3 feet)
Diesel Truck at 15 meters (49.2 feet)		
	80	Shouting at 1 meter (3.3 feet)
Gas Lawn Mower at 30 meters (98.4 feet)		
	70	Vacuum Cleaner at 3 meters (9.8 feet)
Commercial Area		
	60	Normal Speech at 1 meter (3.3 feet) Large Business Office
Quiet Urban Daytime		
	50	Dishwasher Next Room
Quiet Urban Nighttime Quiet Suburban Nighttime		
	40	Small Theater, Large Conference Room Library
Quiet Rural Nighttime		
	30	Bedroom at Night Concert Hall (Background)
	20	Broadcast and Recording Studio
	10	
	0	Threshold of Hearing

Source: American Association of State Highway and Transportation Officials (AASHTO) 1993

3.7.1.2 Background Noise Levels

The Project site is comprised of agricultural fields situated on the outskirts of rural-residential areas within the city of Ripley and just outside the city limits in unincorporated Lauderdale County. The northern portion of the Project site borders a small neighborhood

on Robinson Circle and a few single-family homes along Eastland Avenue. The southern portion is adjacent to a few isolated single-family homes as well as the Wood Family Cemetery. Ambient noise at the Project site consists mainly of agricultural sounds, such as noises from farm machinery; natural sounds, such as from wind and wildlife; and moderate traffic sounds. Noise levels of these types generally range from 45 to 55 dBA (U.S. Department of Transportation [USDOT] 2006). Traffic noise levels along State Route 19, which extends east–west bisecting the Project site, likely range from 70 to 80 dBA at a distance of 50 feet (Corbisier 2003).

The Project site and a surrounding 0.5-mile radius were examined to identify potential noise-sensitive receptors. Noise-sensitive receptors are defined as those locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. Approximately 417 noise-sensitive receptors are within the area examined (Figure 3-17). These include residences, apartment buildings, farm buildings, garages, storage buildings, one church, one commercial building, one vacant building, and one industrial building with each building generally counted as one receptor. No receptors exist on the Project site as the several buildings presently on the site are no longer occupied or used and would be demolished as part of the Proposed Action. Residential concentrations are primarily located near the northern portion of the Project site, while a few residences and other building classifications are scattered outside of the eastern and western boundaries of the Project site. The nearest residence is approximately 150 feet from the nearest proposed PV array. The Forerunner Church is approximately 1,250 feet from the nearest proposed PV array.

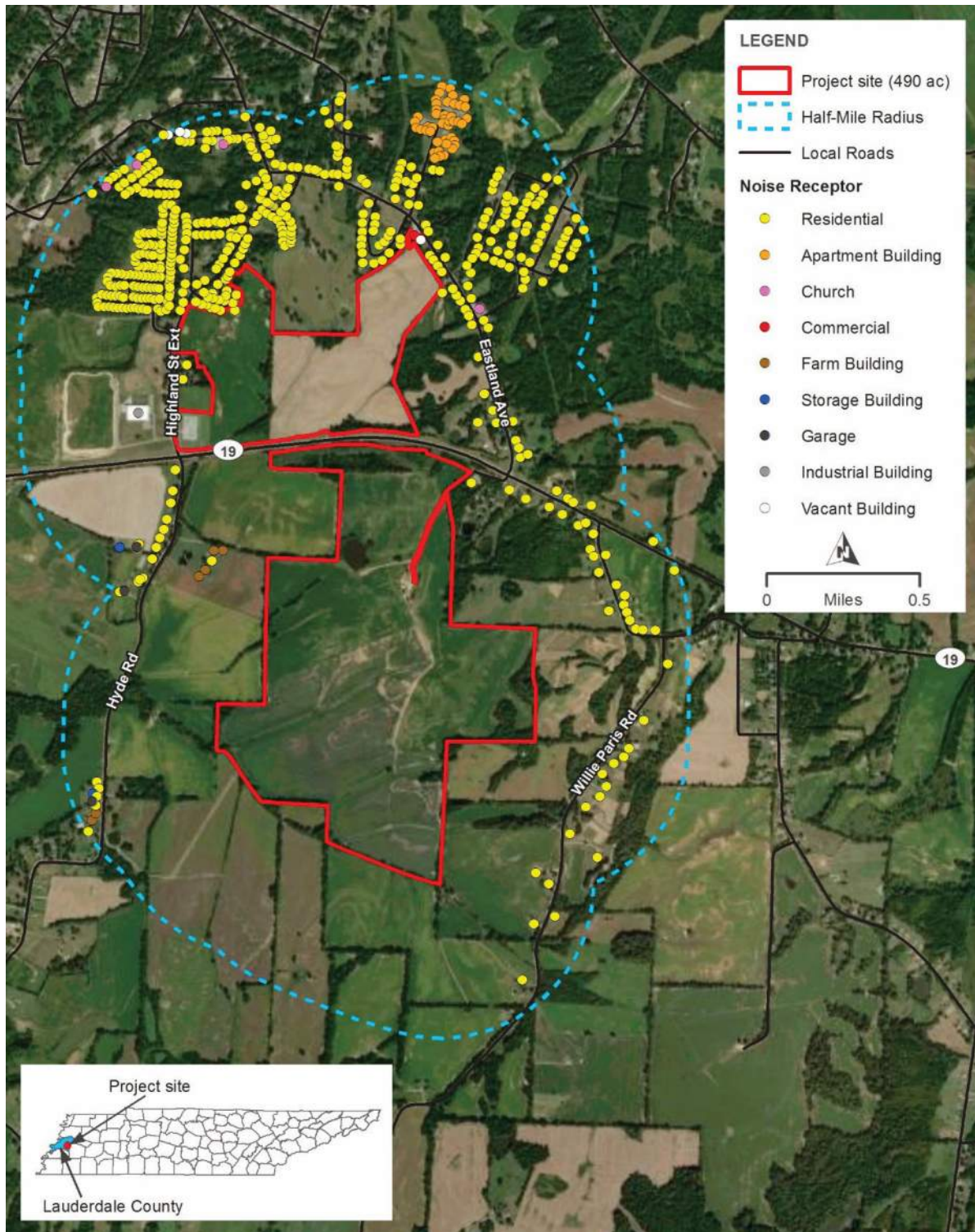


Figure 3-17. Noise receptors within 0.5 mile of the Project site boundary

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts on the ambient sound environment would occur. Existing land use would remain primarily agricultural land for the foreseeable future, and the ambient sound environment would likely remain as it is at present.

3.7.2.2 Proposed Action Alternative

Direct and indirect noise impacts associated with implementation of the Proposed Action would primarily occur during construction. Construction equipment produces a range of sounds. Noisy construction equipment, such as delivery trucks, dump trucks, water trucks, service trucks, bulldozers, chain saws, bush hogs, or other large mowers for tree clearing, produce maximum noise levels of approximately 84 to 85 dBA at a distance of 50 feet. These types of equipment would be used for approximately 12 months at the Project site.

Construction noise would cause temporary and minor adverse impacts to the ambient sound environment in the Project area. Several residences and a few nonresidential buildings would experience heightened noise during construction, primarily from pile-driving activities. However, when agricultural activities are more active in the spring, early summer, fall, and early winter, ambient sounds in the surrounding area are often higher than the typical 45 to 55 dBA in the surrounding area, and these existing noises would help offset effects from the Project during this time. The area adjacent to the northern portion of the site would not receive this benefit as there is minimal farmland nearby. Additionally, construction would primarily occur during daylight hours, between sunrise and sunset in compliance with the Ripley Municipal Code; therefore, the Project would not affect ambient noise levels at night during most of the construction period. Most of the proposed equipment would not be operating on-site for the entire construction period but would be phased in and out according to the progress of the Project.

The activity producing the most noise for an extended period would be pile-driving during the construction of the array foundations, which would be completed in approximately three months. Standard construction pile drivers are estimated to produce between 90 to 95 dBA at a distance of 50 feet (USDOT 2006). These noise levels would typically diminish with distance from the PV arrays at a rate of approximately six dBA per each doubling of distance. The nearest residence and church are approximately 150 feet and 1,250 feet, respectively, from the nearest proposed PV array. Based on straight line noise attenuation, it is estimated that noise levels from pile-driving would attenuate to approximately 81 to 86 dBA or less at the nearest residence and approximately 62 to 67 dBA or less at the Forerunner Church. These noise levels are above HUD and USEPA guidelines of 65 and 55 dBA, respectively. Based on straight line noise attenuation, the distances required for pile-driving to attenuate to 55 dBA or less at the nearest residence and church are 5,322 feet and 4,976 feet, respectively. Therefore, pile-driving within 5,322 feet of the nearest residences would be scheduled during daylight hours Monday through Friday to minimize impacts to the residences and pile-driving within 4,976 feet of Forerunner Church would be scheduled outside of church services to minimize impacts to the church. Construction workers would wear appropriate hearing protection in accordance with OSHA regulations. Pile-driving activities would result in temporary, moderate noise impacts. Noise-sensitive receptors near the TL upgrade areas would temporarily experience heightened noise primarily during the installation of OPGW by helicopter. Pile-driving activities and the installation of OPGW by helicopter would result in temporary, moderate noise effects.

Following completion of construction activities, the ambient sound environment would return to existing levels or below existing levels by eliminating seasonal use of some agricultural equipment. The moving parts of the PV arrays would be electric-powered and produce little noise. The central inverters would produce noise levels of approximately 62 dBA at 50 feet, and the Project switchgear would emit approximately 50 dBA at 300 feet. As no noise receptors are within 50 feet of the proposed inverter locations or 300 feet of the Project switchgear, noise impacts from these Project components are anticipated to be minimal to negligible. Thus, noise impacts from the operation of the Project are not anticipated. The periodic mowing of the Project site to manage the height of vegetation surrounding the solar panels would produce noise levels comparable to those resulting from current row crop operations.

Overall, implementation of the Proposed Action would result in moderate, temporary adverse impacts to the ambient noise environment in the Project area during construction, and negligible to minimal impacts during operation and maintenance of the solar facility.

3.7.2.3 Cumulative Impacts

RFFAs would likely result in noise impacts in the Project area. Four RFFAs are within three miles of the Project site (Walker Industrial Park, American Way Site, Ripley Surface Transportation Block Grant Program Project [Volz Road], and both build alternatives of the proposed Interstate 69 – Segment 8). If there is overlap in the construction schedules of these projects and the Proposed Action, cumulative impacts to noise receptors during the construction period could occur. This would result in minor, short-term noise impacts.

3.8 Air Quality and Climate Change

3.8.1 Affected Environment

Ambient air quality is determined by the type and concentration of pollutants emitted into the atmosphere, the size and topography of the airshed in question, and the prevailing meteorological conditions in that airshed. Through the passage of the Clean Air Act of 1970 and subsequent amendments, the U.S. Congress mandated the protection and enhancement of air quality for the nation. USEPA established the National Ambient Air Quality Standards (NAAQS) for the following criteria pollutants to protect the public health and welfare: sulfur dioxide, ozone, nitrogen dioxide (NO₂), particulate matter whose particles are less than or equal to 2.5 micrometers (PM_{2.5}), particulate matter whose particles are less than or equal to 10 micrometers, carbon monoxide (CO), and lead (USEPA 2023a).

The primary NAAQS were promulgated to protect public health, and the secondary NAAQS were promulgated to protect public welfare (e.g., visibility, crops, forests, soils, and materials) from any known or anticipated adverse effects of air pollutants. Areas in compliance with the NAAQS are designated as attainment areas and areas in violation of the NAAQS are designated as nonattainment areas (USEPA 2022). New sources potentially located in or near these nonattainment areas may be subject to more stringent air permitting requirements. Nonattainment areas are usually listed by county. Areas that cannot be classified based on available information for a particular pollutant are designated as unclassifiable and are treated as attainment areas unless proven otherwise. Areas that were formerly designated as nonattainment for a pollutant and later come into compliance are categorized under the term “maintenance” for that pollutant for the next 20 years, assuming they continue to meet the NAAQS for that pollutant. If an area remains in attainment for a 20-year maintenance period, the status is reassigned to normal attainment.

3.8.1.1 Regional Air Quality

The Project site is within a rural agricultural area situated on the outskirts of rural-residential areas within the city of Ripley and just outside the city limits in unincorporated Lauderdale County. Residential concentrations are primarily located near the northern portion of the Project site, while a few residences and other building classifications are scattered outside of the eastern and western boundaries of the Project site. Lauderdale County has no active air quality monitoring sites listed in USEPA’s national database for NAAQS-regulated pollutants and is in attainment for all NAAQS as are the adjacent counties (USEPA 2023b; 2023c). The nearest active monitoring sites are in Dyersburg (PM_{2.5}), Millington (ozone), and Jackson (PM_{2.5}), approximately 23 miles northeast, 29 miles southwest, and 39 miles east of the Project site, respectively (USEPA 2023d).

3.8.1.2 Regional Climate

Climate conditions, and therefore daily weather conditions, determine the potential for the atmosphere to disperse emissions of air pollutants. Based on climate data from the Ripley observation station, approximately one mile east of the Project site, the coldest month is January, with average maximum and minimum temperatures of approximately 48°F and 29°F, respectively. The warmest month is July, with average maximum and minimum temperatures of approximately 90°F and 70°F, respectively. Precipitation is highest in May and averages approximately 57 inches per year (National Oceanic and Atmospheric Administration [NOAA] 2021). On average, approximately 29 tornados occur in Tennessee each year (NOAA 2023).

3.8.1.3 Greenhouse Gas Emissions

GHGs are specific gases that trap heat in the atmosphere and include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases (USEPA 2023e). GHG emissions include natural and man-made compounds that disperse throughout the earth’s atmosphere. GHGs act as insulation and contribute to the maintenance of global temperatures. As the levels of GHG emissions in the atmosphere increase, the result is an increase in temperature on earth, commonly known as global warming. This can result in altered precipitation patterns, increased intensity of storms, sea level rise, and other changes.

Apart from water vapor, the primary GHG emitted by human activities in the U.S. is CO₂, representing approximately 79 percent of total GHG emissions in the U.S. (USEPA 2023e). The largest source of CO₂ and of overall GHG emissions is fossil fuel combustion, accounting for 92 percent of CO₂ emissions (USEPA 2023f). GHG emissions from the TVA power system are described in the IRP (TVA 2019).

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed. Therefore, no Project-related impacts on climate or air quality would result. Existing land use would likely remain primarily agricultural land for the foreseeable future, with little effect on climate and air quality. The main source of emissions in the Project area would continue to be from sources such as automobiles and agricultural equipment.

3.8.2.2 Proposed Action Alternative

Under the Proposed Action, minor direct impacts to air quality would result from the construction of the Project and minimal impacts would occur during operation. The effects of the GHG emissions expected during construction would be negligible. The Proposed

Action would have longer term, minor beneficial impacts to air quality by increasing the capacity of non-emitting generating facilities providing power to the TVA system and offsetting the need for new fossil fuel power generation and its associated emissions.

3.8.2.2.1 Regional Air Quality

3.8.2.2.1.1 Construction-related Impacts

Most potential air quality impacts associated with the Proposed Action would occur during construction. Construction activities would create emissions from construction equipment and vehicles, contracted employees' personal vehicles, and fugitive dust suspension from clearing, grading, and other activities. Tree debris from clearing would be removed by either burning or chipping. Burning debris would generate temporary localized air quality impacts due to smoke particles and gases. Any such burning would be done in accordance with local ordinances or burn permits and would likely not have any health consequences for this rural area.

Combustion of gasoline and diesel fuels by internal combustion engines (haul trucks and off-road vehicles) would generate local emissions of particulate matter, nitrogen oxides, CO, volatile organic compounds, and sulfur dioxide. The total amount of these emissions would be small and, overall, would result in negligible air quality impacts.

Fugitive dust emissions, a contributor to PM_{2.5} (Chen et al. 2019), from vehicular traffic over paved and unpaved roads would be composed mainly of particles that would be deposited near the roadways, along the routes taken to reach the Project site. As necessary, fugitive dust emissions from construction areas and paved and unpaved roads would be mitigated using BMPs including wet suppression and establishing a speed limit, which would also maintain equipment in good condition. Wet suppression can reduce fugitive dust emissions from roadways and unpaved areas by as much as 95 percent (USEPA 1998). Therefore, direct impacts to air quality associated with construction activities would likely be minor.

3.8.2.2.1.2 Operation- and Maintenance-related Impacts

The operation of the Project is not anticipated to have any negative impacts to regional air quality. Agricultural practices, which currently raise dust and emit combustion byproducts, would be discontinued at the Project site. Therefore, operations could ultimately result in a minor beneficial impact to local air quality.

3.8.2.2.2 Regional Climate

3.8.2.2.2.1 Construction-related Impacts

No noticeable direct or indirect impacts to the local or regional climate would be associated with the construction of the proposed Project.

3.8.2.2.2.2 Operation- and Maintenance-related Impacts

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. The changes that occur in urban development from increased impervious surfaces and lack of evapotranspiration can create a "heat island" effect. It is not expected that the solar array will create a "heat island" effect because there will still be substantial evapotranspiration occurring at the site as vegetation would grow under and around the solar panels. 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 would change the surface characteristics somewhat, but it would have little effect on soil permeability and hydrologic characteristics of the developed area.

3.8.2.2.3 Greenhouse Gas Emissions

3.8.2.2.3.1 Construction-related Impacts

The use of construction equipment would cause a minor increase in GHG emissions during construction activities. Combustion of gasoline and diesel fuels by internal combustion engines (trucks and off-road vehicles) at the Project site would generate emissions of CO₂ and very small amounts of other GHG emissions such as methane and nitrous oxide. Additional GHG emissions would result from transporting materials and workers to the Project location, and elsewhere in the U.S. or globally from production and transportation of the facility components. The production of facility components would likely represent the largest portion of the Project-related GHG emissions. The total GHG emissions due to construction should eventually be offset by Project operation over the long term, assuming the electricity generated by the Project would reduce the need for some new fossil-fuel-based electricity generation and its associated GHG emissions.

Tree and other tall vegetation removal during construction of the Project would result in a minor loss of potential carbon sequestration, especially given that most of the Project site is currently fields and open land. Trees and other tall vegetation currently remove CO₂ from the air and sequester it as biomass. The loss of this carbon sink would constitute a minor adverse direct and indirect impact as sequestration would have continued for the life of the vegetation and long into the future, assuming that other changes at the Project site did not result in any deforestation. The loss of the carbon sink from tree removal would be at least partially offset by the increased sequestration of CO₂ by the permanent grass-dominated vegetation that would be maintained on the Project site.

3.8.2.2.3.2 Operation- and Maintenance-related Impacts

The operation of the Project is not anticipated to have any negative impacts from GHG emissions. No emissions would be produced by the operation of the solar facility or electrical lines. Minor emissions would occur during maintenance activities, including facility inspections and periodic mowing. Conversely, the nearly emissions-free power generated by the solar facility would offset the need for new power that would otherwise be generated, at least in part, by the combustion of fossil fuels. The reduction in GHG emissions resulting from the operation of the solar facility would have little noticeable effect on regional or larger scales. It would, however, be a component of the larger ongoing system-wide reduction in GHG emissions from the TVA power system through reducing the need for some fossil-fuel-based electricity generation. The adverse impacts of GHG emissions are described in the U.S. Global Change Research Program's (USGCRP) Fourth National Climate Assessment (USGCRP 2018), and the beneficial impacts of TVA's reduction in GHG emissions are described in the TVA IRP (TVA 2019).

3.8.2.3 Cumulative Impacts

Past and RFFAs would likely contribute a substantially higher percentage of air pollutant emissions, including GHGs, to the region than the Proposed Action. This includes both temporary construction and long-term operational emissions. Additionally, the operational emissions from these other actions would likely have at least minor negative impacts on air quality in the region. However, the Proposed Action would provide at least a minor beneficial impact on air quality in the region due to producing renewable energy that reduces the need for certain fossil-fueled utility power generation. In addition, all other

actions would likely comply with applicable air quality requirements and permitting and would implement emissions reduction actions as part of construction activities (e.g., wet suppression to reduce fugitive dust).

3.9 Cultural Resources

3.9.1 Affected Environment

Cultural resources are properties and places that illustrate aspects of Precontact or historic times or have long-standing cultural associations with established communities and/or social groups. Cultural resources may include archaeological sites, unmodified landscapes and discrete natural features, modified landscapes, human-made objects, structures such as bridges or buildings, and groups of any of these resources, sometimes referred to as districts.

Section 106 of the NHPA, as amended (54 U.S.C. § 300101 *et seq.*), addresses the effects of federal and/or federally funded projects on tangible cultural resources—that is, physically concrete properties—of historic value. The NHPA provides for a national program to support both public and private efforts to identify, evaluate, and protect the nation’s important cultural resources. Once identified, these resources are evaluated for inclusion in the NRHP maintained by the National Park Service. Tangible cultural resources may qualify for inclusion in the NRHP if they are 50 years of age or older (unless in exceptional cases) and if found to embody one or more of four different types of values, or criteria, in accordance with 36 CFR § 60.4.

Cultural resources that are listed or considered eligible for listing in the NRHP are called “historic properties.” Federal agencies are required by the NHPA to consider the possible effects of their undertakings on historic properties and take measures to avoid, minimize, or mitigate any adverse effects. “Undertaking” includes any project, activity, or program that has the potential to affect a historic property and that is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency.

Evaluating an undertaking’s effects on historic properties is accomplished through a four-step review process outlined in Section 106 of the NHPA (36 CFR § 800). These steps are initiation, identification, assessment of adverse effects, and resolution of any adverse effects. A project may have effects on a historic property that are not adverse. However, if the agency determines that the undertaking’s effect on a historic property would diminish any of the qualities that make the property eligible for the NRHP (based on the criteria for evaluation at 36 CFR § 60.4), the effect is said to be adverse. Examples of adverse effects would be ground disturbing activity in an archaeological site or erecting tall buildings or structures within the viewshed of a historic building in such a way as to diminish the historic building’s integrity of feeling or setting and its ability to convey its historic and/or architectural significance. Adverse effects must be resolved. Resolution may consist of avoidance (such as redesigning a project to avoid impacts or choosing a project alternative that does not result in adverse effects), minimization (such as redesigning a project to lessen the effects or installing visual screenings), or mitigation. Adverse effects to archaeological sites are typically mitigated by means of excavation to recover the important scientific information contained within the site. Mitigation of adverse effects to historic buildings and structures sometimes involves thorough documentation of the resource by compiling historic records, studies, and photographs.

Agencies are required to consult with the appropriate SHPOs, federally recognized Indian tribes (Tribes) that have an interest in the undertaking, and any other party with a vested interest in the undertaking. Through various regulations and guidelines, federal agencies are encouraged to coordinate Section 106 and NEPA review to improve efficiency and allow for more informed decisions. Under NEPA, impacts to cultural resources that are part of the affected human environment but not necessarily eligible for the NRHP must also be considered. Generally, these considerations as well as those of NRHP-eligible traditional cultural resources (also called traditional cultural properties; see Parker and King [1998]) are accomplished through consultation with parties having a vested interest in the undertaking, as described above.

3.9.1.1 Previous Surveys

A search of the archaeological records maintained by Tennessee Division of Archaeology (TDOA) was conducted to determine the presence of recorded cultural resources within the archaeological area of potential effect (APE; the original 435-acre Project site plus an adjacent 55-acre addendum parcel added later in the planning process, resulting in an expanded 490-acre Project site) or vicinity. The review revealed that one previous survey of TVA's existing Ripley–Covington 161-kV TL ROW, was conducted within a one-mile radius at the Project site. This survey identified three archaeological sites that were previously identified within the archaeological APE (Barbour and Southard 2023a).

Site 40LA216, 40LA217, and 40LA218 were recorded as a historic artifact scatter. Several historic ceramic and glass fragments were recovered with dates ranging from 1780 to 1925 across these sites and were attributed to several structures in the vicinity. Given the low-density nature and lack of diversity in the recovered assemblages, the sites are listed as not eligible for the NRHP.

3.9.1.2 Archaeological Survey Results

3.9.1.2.1 Original 435-acre Project site

A Phase I archaeological survey was conducted by TerraXplorations, Inc. (TerraX) on the original 435-acre Project site from May 25 to July 7, 2021, to determine the presence of archaeological resources (Barbour and Southard 2023a). The entire archaeological APE was subjected to an intensive archaeological survey consisting of pedestrian survey and systematic shovel testing. A total of 965 shovel tests were excavated on the original 435-acre Project site, resulting in the identification of three archaeological sites (40LA231, 40LA232, and 40LA233), five isolated finds (IF) (IF-1, IF-2, IF-3, IF-4, and IF-5), and three field loci ([FL]-1, FL-6, and FL-15) (Barbour and Southard 2023a). Additionally, the three previously recorded sites (40LA216, 40LA217, and 40LA218) located in the archaeological APE were relocated by the current survey efforts. The historic artifacts from relocated sites during the current investigation were consistent with the historic artifact assemblages from the previous investigation. As a result, the findings from this investigation were incorporated into those previously identified sites. The site boundaries of 40LA217 and 40LA218 were slightly expanded through delineation efforts. All archaeological sites, with the exception of Sites 40LA231, 40LA232, 40LA233, and FL-15, are recommended as not eligible for the NRHP under Criteria A through D because of lack of integrity and significance, and no further work is recommended at these sites.

Site 40LA231 is an early- to mid-nineteenth-century historic artifact scatter, and possibly associated with the historic Wood Family Cemetery (FL-15). Several artifacts were located in what appear to be intact deposits dating to the early- to mid-nineteenth century. Given

the derived ages of other historic scatters in the survey area, the early date for Site 40LA231 and the presence of intact deposits warrants further investigation. As such, 40LA231 is recommended as potentially eligible for NRHP listing under Criterion D. The site is recommended to be avoided, along with a 20-meter buffer to create an exclusion area from development.

The walkover visit to FL-15, the Wood Family Cemetery, determined that the cemetery is located in a rectangular stand of trees that has maintained its shape through several land development episodes, indicating the boundary likely extends into the area located within the archaeological APE. The architectural survey recommended that the Wood Family Cemetery eligible for NRHP listing under Criterion A and B, and Criteria Considerations C and unassessed under D, however SHPO did not agree with the assessment. After further discussions with the SHPO, the Wood Family Cemetery was found to be not eligible under Criteria A and B as due to lack of significance. SHPO concurred with this determination in a letter dated March 27, 2024. A 20-meter buffer surrounding the visible edges of the cemetery was created for avoidance.

Sites 40LA232 and 40LA233 are multi-component artifact scatters. The historic components date to 1930 for 40LA232 and 1947 for 40LA233. Until the late-twentieth century, several structures were located within the 40LA232 and 40LA233 site areas. The precontact components associated with these sites consist of lithic debitage. As such, a time period cannot be assigned at this time. Due to their lack of integrity and data potential, the investigated portions of 40LA232 and 40LA233 within the archaeological APE are unlikely to yield information regarding the history of this region. However, as they were not able to be fully delineated due to survey area constraints, they are recommended as having an unknown/unassessed eligibility for the NRHP under Criterion D, and no further work is recommended at these sites within the boundaries of the archaeological APE.

TVA consulted with THC and the following Federally recognized Indian tribes (Tribes) (Absentee Shawnee Tribe of Indians of Oklahoma, Cherokee Nation, The Chickasaw Nation, Eastern Shawnee Tribe of Oklahoma, Jena Band of Choctaw Indians, Mississippi Band of Choctaw Indians, The Osage Nation, Quapaw Nation, Shawnee Tribe, and United Keetoowah Band of Cherokee Indians in Oklahoma) on these NRHP eligibility determinations in a letter dated May 25, 2023. In a letter dated March 1, 2024, THC concurred that no archaeological resources eligible for listing in the NRHP would be affected by this undertaking. TVA received responses from two consulting Tribes, The Chickasaw Nation and The Shawnee Tribe, with agreement to TVA's findings and determinations.

3.9.1.2.2 Addendum Parcel

A Phase I archaeological survey was conducted by TerraX on the addendum parcel from November 8 to November 11, 2023, to determine the presence of archaeological resources (Barbour and Southard 2023b). A total of 177 shovel tests were excavated on the addendum parcel, resulting in the identification of an addendum FL (AFL-1) and addendum IF (AIF-1). In addition to shovel testing, five deep auger tests were excavated in specific shovel tests on the addendum parcel to test for the presence of potentially deeply buried deposits. All five tests were negative for deeply buried cultural deposits. Given that these resources could not be associated with historical structures (HS) predating 1950, AFL-1 and AIF-1 do not qualify as archaeological sites per TDOA guidelines. AFL-1 and AIF-1 are recommended not eligible for NRHP inclusion under Criterion D, and no further work is

recommended at these sites. THC concurred that no archaeological resources eligible for listing in the NRHP will be affected by the undertaking in a letter dated March 1, 2024.

3.9.1.3 Architectural Survey Results

3.9.1.3.1 Original 435-acre Project site

A Phase I architectural resources survey was conducted by TerraX on the original 435-acre and a 0.5-mile viewshed buffer of the Project site from October 31 to November 5, 2022, to determine the presence of architectural resources (Shane et al. 2023a). During the architectural resources survey, TerraX recorded 113 primary historic-age architectural resources or HS in the 0.5-mile buffer of the original 435-acre Project site (Shane et al. 2023a; Appendix D; Figure 3-18). None of these resources were previously recorded. Additionally, only one resource (HS-112, the Wood Family Cemetery) was located on the original 435-acre Project site. TerraX determined that two resources are individually eligible for listing in the NRHP (HS-112 and HS-113) and 40 resources are eligible as contributing resources to NRHP-eligible historic districts (HS-26–HS-43 and HS-55–HS-76).

The Crescent Heights Historic District (HS-113), consisting of 18 contributing resources (HS-26–HS-43), is recommended under Criteria A and C as it reflects the growth of public-funded housing in Ripley during the mid-century.

The remaining 72 resources were determined to lack the historical significance or architectural or engineering distinction necessary for listing in the NRHP and are therefore recommended not eligible for listing. Therefore, a finding of no historic properties affected was recommended. TVA consulted with THC on these NRHP eligibility determinations in a letter dated May 30, 2023. In a letter dated June 16, 2023 (Appendix D), THC concurred with TVA's NRHP eligibility determination of HS-113. In a letter dated March 27, 2024, THC concurred that the Wood Family Cemetery (HS-112) is not eligible under Criteria A and B due to the inability to associate the resource with significant events/individuals and does not retain integrity. Evaluations revealed that a grouping of three buildings, two religious (HS-99 and HS-100) and one residential (HS-101), are potentially eligible structures associated with the Forerunner Baptist Church (Figure 3-18). The church (HS-99) is currently an African American church with an associated Sunday school and offices building (HS-100) and a parsonage (HS-101). Current research indicates that the church buildings were constructed in 1943 and 1965. However, the current congregation of the Forerunner Baptist Church was not established until 2002. Due to the age of the church building, further research on the connection to the African American community of Ripley is required to make a determination on the eligibility of the church and its associated buildings. This further research includes, but is not limited to, an evaluation for NRHP eligibility under the "Historic Rural African American Churches in Tennessee, 1850-1970" Multiple Property Documentation Form.

3.9.1.3.2 Addendum Parcel

A Phase I architectural resources survey was conducted by TerraX on the addendum parcel from November 7 to November 10, 2023, to determine the presence of architectural resources (Shane et al. 2023b; Appendix D). During the architectural resources survey, TerraX recorded 85 primary historic-age architectural resources in the 0.5-mile APE (Shane et al. 2023b). None of these resources were previously recorded. Additionally, only one resource (HS-12, a residential outbuilding) was located on the addendum parcel. Only HS-115, Rice Park Office Building and surrounding park, is eligible for listing in the NRHP. In the letter dated March 27, 2024, THC concurred that there would be no adverse effect on the Rice Park Office Building by proceeding with the proposed project.

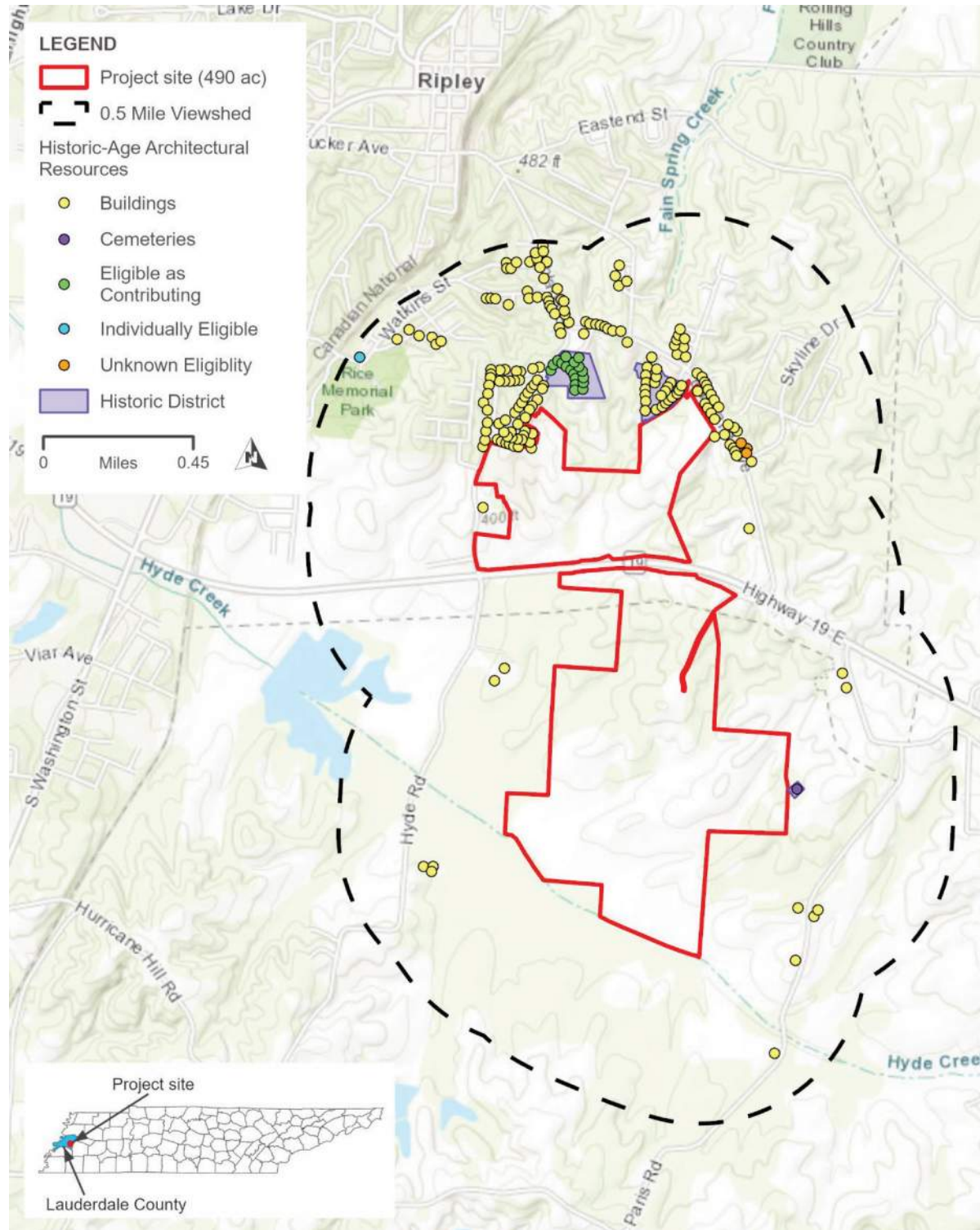


Figure 3-18. Architectural resources in the vicinity of the Project site

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, there would be no Project-related impacts to cultural resources.

3.9.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, SR Ripley II, LLC would construct and operate a 30-MW AC single-axis tracking PV solar power facility. Site 40LA231 and the Wood Family Cemetery (FL-15/HS-112) would each be avoided by all Project-related ground-disturbing activities through the placement of orange barrier fencing along the full extent of each site's boundary during construction. The project will avoid development in the areas of Site 40LA231 and the Wood Family Cemetery (FL-15/HS-112). The use of orange barrier fence to demarcate the boundary of 40LA231 and Wood Family Cemetery would be employed to avoid impacting the sites. In addition, a 20-meter buffer around the Wood Family Cemetery was created for avoidance. The footprints of both areas have been provided to ensure that the areas are avoided. TVA also determined that 40LA231 and Wood Family Cemetery would not be affected by the Project, in accordance with an Avoidance Agreement between TVA and SRC.

The Project would result in the installation of panels to the north of Site 40LA231 and to the west and south of the Wood Family Cemetery. The Project would consist of solar panels that are eight feet in height when they are fully upright in the early morning and late afternoon and five feet high at midday, when they are lying flat as well as security fencing that is eight feet in height. The Wood Family Cemetery is located in a rectangular stand of mature trees that would remain as a visual buffer, minimizing the visual effects of the Project. The Crescent Heights Historic District and Rice Park Office Building and surrounding park would not be affected by the Proposed Action Alternative. In a letter dated March 27, 2024, THC concurred that Forerunner Baptist Church, the Crescent Heights Historic District, and Rice Park Office Building would not be adversely affected by the undertaking. Should previously undiscovered cultural resources be identified during construction or operation, construction in the affected area would be immediately stopped and the discovery location secured against further disturbance, pending completion of consultation with appropriate stakeholders. TVA and THC would be consulted before any further action is taken.

No cultural resources or historic properties would be affected by installation of the 34.5-kV gen-tie line. AFL-1 and AIF-1, located on the addendum parcel within 0.3-mile of the 34.5-kV gen-tie line, were recommended not eligible for NRHP inclusion under Criterion D, and no further work is recommended at these sites.

Equipment access would be conducted to minimize soil compaction and other effects should cultural resources be present. This includes use of light duty or low ground pressure equipment, or the use of wetland mats, per the conditions of TVA's Section 106 Programmatic Agreement (TVA 2020). For any additional maintenance activities, TVA would follow the stipulations in TVA's Section 106 Programmatic Agreement by consulting with the THC and Tribes with interests in the Project area on Project effects on historic properties eligible for NRHP (Appendix D). TVA did not receive any concerns from consulting Tribes.

3.9.2.3 Cumulative Impacts

The Project would avoid all the NRHP-eligible or undetermined cultural resources on the Project site. The Project would have visual effects on Site 40LA231; however, the Wood Family Cemetery, the Crescent Heights Historic District, and Rice Park office building and surrounding park, would not be adversely affected due to modern intrusions and/or setbacks from the resources. While the RFFAs may have adverse impacts on cultural resources, the Project would not contribute to cumulative impacts because the Project would not impact any listed or eligible NRHP archaeological or architectural sites. TVA consulted with THC on these NRHP eligibility determinations (Appendix D).

3.10 Natural Areas and Recreation

3.10.1 Affected Environment

Natural areas include managed areas such as wildlife management areas, national wildlife refuges, habitat protection areas, ecologically significant sites, and streams listed on the Nationwide Rivers Inventory (NRI) due to their high scenic, recreational, and other values. Parks and recreation facilities include boat ramps, community centers, swimming pools, and other public and private places devoted to recreation. This section addresses the natural areas, parks, or recreation areas that are on, immediately adjacent to (within 0.5 mile), or within five miles of the Project site (Figure 3-19).

Rice Park, Ripley City Park, and Holly Street Park are located approximately 0.5 mile, 1.2 miles, and 1.6 miles northwest of the Project site, respectively. Rice Park and Ripley Park both offer baseball diamonds and leisurely outdoor activities. Park goers at Ripley Park can also utilize tennis and basketball courts, playground equipment, and a splash pad. Holly Street Park consists of a basketball court.

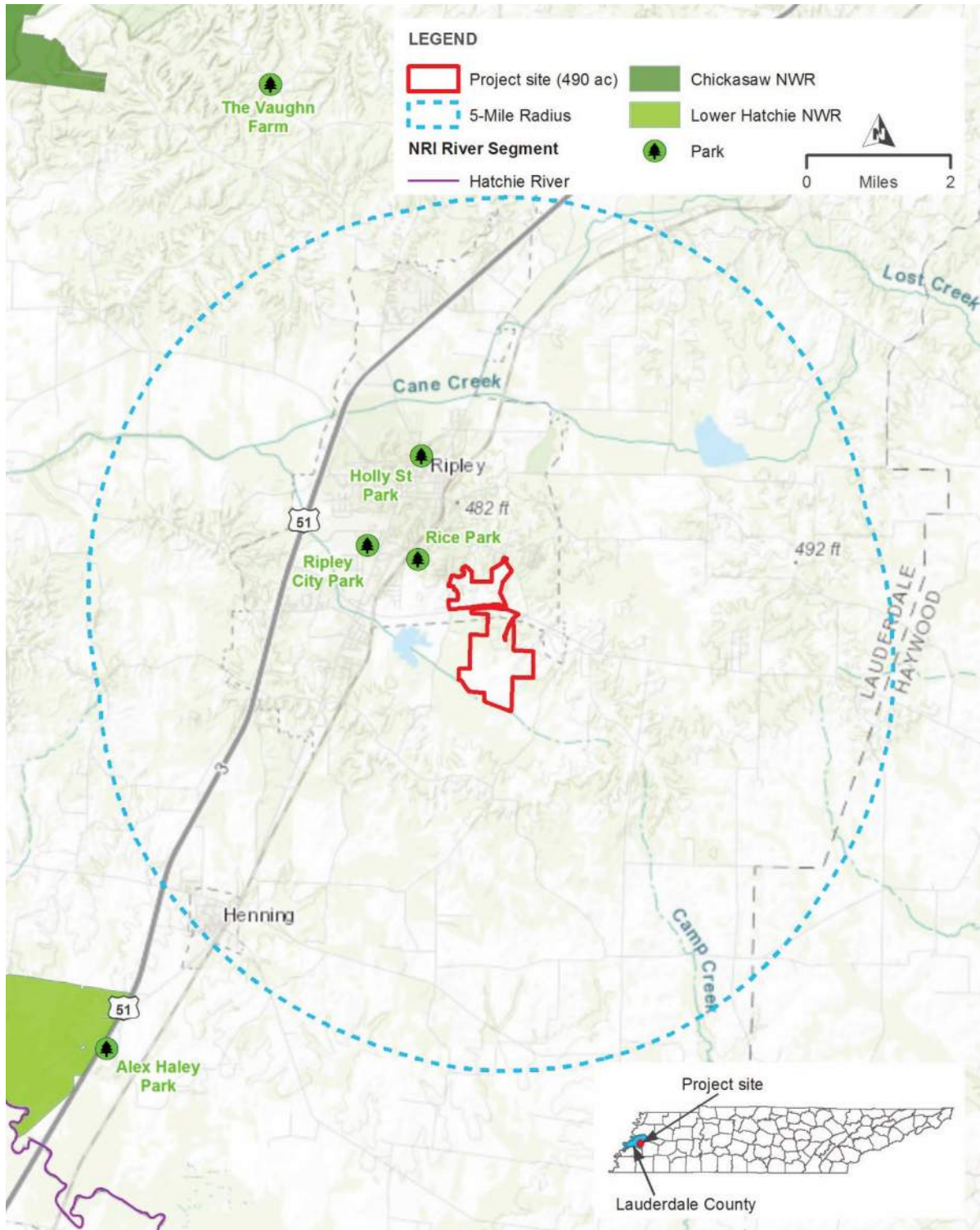


Figure 3-19. Natural areas, parks, and recreation in the vicinity of the Project site

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to natural areas, parks, and recreation would occur.

3.10.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the proposed solar facility would be constructed; however, because developed outdoor recreation areas are located sufficiently distant from the Project, no Project-related impacts to natural areas, parks, and recreation would occur.

3.10.2.3 Cumulative Impacts

The RFFAs such as the potential development of the industrial sites (up to 300 acres) would reduce the suitability of lands for recreation and management of natural areas within Lauderdale County. This would decrease the amount of potentially available land to support dispersed outdoor recreation activities such as hunting, fishing, or nature observation. The combined effect of these future land development actions and the Project would likely result in a slight reduction in resources for dispersed recreation. However, in view of the relatively large amounts of rural and undeveloped lands within the county, cumulative impacts on dispersed recreation opportunities would likely be minor.

3.11 Utilities

3.11.1 Affected Environment

The Project site is within a rural-residential area of Lauderdale County, partially within the city limits of Ripley. This section describes utility services in the Project area and the effects of the alternative actions on those services.

3.11.1.1 Telecommunications

In addition to various mobile providers, telecommunication services in the Project area are provided by AT&T, Spectrum, EarthLink, HughesNet, and Aeneas Communications.

3.11.1.2 Electricity

Electrical service is provided by Ripley Power and Light, which purchases power generated by TVA (TVA 2023b). TVA's existing Ripley–Covington 161-kV TL crosses the northern portion of the Project site in a north–south orientation.

3.11.1.3 Natural Gas

Natural gas service is provided by Ripley Gas, Water & Wastewater (Ripley Gas, Water & Wastewater 2023). There are no known natural gas pipelines on the Project site.

3.11.1.4 Water and Sewer

Water and sewer services are provided either by Ripley Gas, Water & Wastewater or through private wells and private septic systems (Ripley Gas, Water & Wastewater 2023).

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, there would be no Project-related impacts to utilities. Existing land use would remain a mix of agricultural and forested land for the foreseeable future, and existing on-site utilities would likely remain unchanged, except for potential upgrades and maintenance.

3.11.2.2 Proposed Action Alternative

Modifications to existing utilities would occur with implementation of the Proposed Action Alternative. This would include Project-related TL upgrade activities along TVA’s existing Ripley–Covington 161-kV TL. Electrical service for the Project would be provided by Ripley Power and Light. A service drop would be installed during construction to provide construction power and Ripley Power and Light would coordinate with customers if outages were necessary. The Project would obtain water by delivery via water trucks, accessing existing municipal water-supply infrastructure at the Project site, or installing on-site wells. There are no plans for additional features to be built off-site for water or sewer infrastructure.

Short-term adverse impacts to local utilities such as electrical service due to brief outages could occur when bringing the solar facility online or during routine maintenance of the solar facility. If outages on the Ripley–Covington 161-kV TL or other TLs are required, TVA would work with Ripley Power and Light to provide alternative means of providing electrical service to the area to avoid service interruptions. TVA would also try to perform these outages at low-impact times, such as overnight, to maintain power service to Ripley Power and Light.

No long-term adverse impacts would likely be associated with the Project. Implementation of the Proposed Action Alternative would result in additional renewable energy resources in the region and would, thus, constitute a beneficial impact to electrical services across the region.

3.11.2.3 Cumulative Impacts

The Project could cause occasional, short-term adverse impacts to local utilities such as electricity connections when installing the 34.5-kV gen-tie line, conducting TL upgrade activities, bringing the solar PV facility on-line, or during routine maintenance of the facility. Thus, the Project, along with the past and RFFAs, may contribute to some minor short-term outages in the Project area as these facilities are constructed or maintained. Given the nature of the Proposed Action, long-term cumulative adverse impacts to utilities are not anticipated.

3.12 Waste Management

3.12.1 Affected Environment

“Hazardous materials” and “hazardous waste” are substances that, because of their quantity, concentration, or characteristics (physical, chemical, or infectious), may present a danger to public health and/or the environment if released. These substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. §§ 9601 *et seq.*) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act ([RCRA]; 42 U.S.C. §§ 6901 *et seq.*). Regulated hazardous wastes under RCRA include any solid, liquid, contained gaseous, or semisolid waste or combination of wastes that exhibit one or more of the hazardous characteristics of ignitability, corrosivity, toxicity, or reactivity, or is listed as a hazardous waste under 40 CFR § 261. Storage and use of hazardous materials and wastes are regulated by local, state, and federal laws and regulations including the Emergency Planning and Community Right-to-Know Act (42 U.S.C. §§ 116 *et seq.*) and RCRA.

According to historical aerial imagery and topographic maps obtained from a Phase I Environmental Site Assessment, land use in the Project area has remained relatively

unchanged and dominated by agriculture and residential land since at least 1947 but likely earlier, based on historical trends. Primary changes since the 1950s include the addition and removal of residences and the extension of State Route 19 east of the Project site boundaries (USGS 1956, 1986). No recommendations were identified on the Project site during the Phase I Environmental Site Assessment.

Within the city limits of Ripley, solid waste is collected via curbside collection through Lauderdale County for a fee (TDEC 2011). Waste is collected at the Lauderdale County Landfill. Various vendors offer hazardous waste removal.

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related waste would be generated and no impacts to waste management resources would occur. Existing land use would remain primarily agricultural land for the foreseeable future, and existing waste management conditions would remain as they are at present.

3.12.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, storage and use of liquid materials in the form of petroleum-based oils and fuels, and generation of liquid and solid wastes in the form of used oil, construction debris, packing materials, and general construction waste would occur during construction and would be moderate and temporary. Waste would be disposed of utilizing contracted refuse collection and recycling services. All applicable federal, state, and local regulatory requirements would be followed in the collection and disposal of waste to minimize health and safety effects. Decommissioned equipment and materials, including PV panels, racks, and transformers, would be recycled through SolarCycle or a similar solar panel recycling service. Materials that cannot be recycled would be disposed of at an approved facility in accordance with applicable local, state, and federal laws and regulations.

3.12.2.2.1 Materials Management

During construction of the proposed solar facility, materials would be stored on-site in storage tanks, vessels, or other appropriate containers specifically designed for the characteristics of these materials. The storage facilities would include secondary containment in case of tank or vessel failure. Construction- and decommissioning-related materials stored on-site would primarily be liquids such as used oil, diesel fuel, gasoline, hydraulic fluid, and other lubricants associated with construction equipment. Safety Data Sheets for all applicable materials present on-site would be made readily available to on-site personnel.

Fueling of some construction vehicles would occur in the construction area. Other mobile equipment would return to the on-site laydown areas for refueling. Special procedures would be identified to minimize the potential for fuel spills, and spill control kits would be carried on all refueling vehicles for activities such as refueling, vehicle or equipment maintenance procedures, waste removal, and tank clean-out. A fuel truck may be stored on-site for approximately 12 months during construction of the Project. The total volume of the on-site tanks would exceed 1,320 gallons, the threshold above which a SPCC plan would be required (40 CFR § 112). The facility would fall under USEPA's SPCC requirements of "oil-filled operational equipment" and a Tier I Qualified Facility; therefore, no double-walled protection would be required, and the SPCC plan would not have to be

certified by a Professional Engineer (USEPA 2010). The SPCC plan would be prepared prior to construction to prevent oil discharges during facility operation.

During operation, bulk chemicals would be stored in storage tanks and other chemicals would be stored in returnable delivery containers. Chemical storage areas would be designed to contain leaks and spills. The transport, storage, handling, and use of chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards. While the various transformers would contain oil, there would be no separate transformer oil stored on-site related to transformers. The quantities of these materials stored on-site would be evaluated to identify the required usage and to maintain sufficient inventories to meet use rates without stockpiling excess chemicals.

In addition to the chemicals listed above, small quantities (less than 55 gallons, 500 pounds, or 200 cubic feet) of janitorial supplies, office supplies, laboratory supplies, paint, degreasers, pesticides, air conditioning fluids (chlorofluorocarbons), gasoline, hydraulic fluid, propane, and welding rods typical of those purchased from retail outlets may also be stored and used at the facility. Flammable materials (e.g., paints, solvents) would be stored in flammable material storage cabinet(s) with built-in containment sumps. Due to the small quantities involved and the controlled environment, a spill could be cleaned up without environmental consequences.

SR Ripley II, LLC would develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials (e.g., Hazardous Material Business Plan). Facility personnel would be supplied with appropriate personal protective equipment and would be properly trained in the use of personal protective equipment as well as the handling, use, and cleanup of hazardous materials used at the facility and the procedures to be followed in the event of a leak or spill. Adequate supplies of appropriate cleanup materials would be stored on-site.

3.12.2.2 Waste Management

Construction, operation, and decommissioning of the Project would generate solid waste. Construction of the solar facility is estimated to result in the generation of approximately 6,083 to 12,167 cubic yards of solid waste (152 to 304 truckloads at 40 cubic yards each) consisting of construction debris and general trash, including pallets and flattened cardboard module boxes. SR Ripley II, LLC estimates that an additional 281 to 563 truckloads would be required for hauling equipment for a total of 433 to 867 truckloads during construction. Information on wastes anticipated to be generated during Project construction is provided in Table 3-17.

Table 3-17. Summary of construction waste streams and management methods

Waste stream	Origin and composition	Estimated frequency of generation	On-site treatment	Waste management method/off-site treatment
Construction waste – hazardous	Empty hazardous material containers	Intermittent	None	Return to vendor
Construction waste – hazardous	Used oil, hydraulic fluid, oily rags	Intermittent	None	Recycle, remove to off-site disposal location
Construction waste – non-hazardous	Steel, glass, plastic, wood/pallets, cardboard, paper	Continuous	None	Recycle wherever possible, otherwise dispose to Class I 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

The anticipated quantities of waste produced during Project operations are summarized in Table 3-18. Universal wastes and unusable materials produced as a result of implementation of the Proposed Action would be handled, stored, and managed in accordance with federal and state requirements.

Table 3-18. Summary of operation waste streams and management methods

Waste stream	Origin and composition	Estimated amount	Estimated frequency of generation	Waste management method	
				On-site	Off-site
Used hydraulic fluid, oils, and grease – petroleum-related wastes	Tracker drives, hydraulic equipment	333 gallons per year	Intermittent	Accumulate for <90 days	Recycle
Oily rags, oil absorbent, and oil filters – petroleum-related wastes	Various	One 55-gallon drum every three months	Intermittent	Accumulate for <90 days	Sent off-site for recovery or disposed at Class I landfill
Spent batteries	Lead acid/lithium ion	333	Every 10 years	Accumulate for <90 days	Recycle

Waste collection and disposal would be conducted in accordance with applicable regulatory requirements to minimize health and safety effects. To the extent possible, waste would be recycled. Materials that cannot be recycled would be disposed of at an approved facility to be determined by the designated contractor(s). No waste oil would be disposed of on the Project site.

If necessary, SR Ripley II, LLC or the construction contractor would obtain a hazardous waste generator identification number from the State of Tennessee prior to generating any hazardous waste. Tennessee has not established state-specific spill prevention plans in addition to the federal SPCC plan requirements. However, the state requires many types of facilities to maintain a current contingency plan, including hazardous waste treatment, storage, and disposal facilities; underground storage tanks that contain oil or hazardous substances; sites seeking NPDES permits for discharges; sites storing hazardous substances in aboveground storage tanks; and sites storing used oil. Standards for hazardous waste treatment, storage, and disposal facilities fall under Rule 0400-12-01-05. Copies of any spill and cleanup reports would be kept on-site.

SR Ripley II, LLC, through designated contractor and subcontractor personnel, would be responsible for daily inspection, cleanup, and proper labeling, storage, and disposal of all refuse and debris produced. Disposal containers such as dumpsters or roll-off containers would be obtained from a proper waste disposal contractor. Records of the amounts generated would be provided to the designated SR Ripley II, LLC environmental specialist.

3.12.2.2.3 Wastewater

Wastewater potentially generated during construction or operation may include domestic sewage and wastewater from non-detergent equipment washing and dust control. Portable toilets or other temporary facilities would be used for the construction workforce. Water used for equipment washing and dust control would be handled in accordance with BMPs described in the Project stormwater/BMP plan. If an additive is required to help facilitate the cleaning process, the wastewater stream or the waste product would need to be evaluated to ensure it is properly disposed of according to applicable federal, state, and local regulations. With application of these BMPs, no adverse effects would be anticipated from wastewater generated during the Project.

3.12.2.3 Cumulative Impacts

Past and RFFAs, together with the Proposed Action, would create new waste streams within the area. Storage and use of liquid materials in the form of petroleum-based oils and fuels, and generation of liquid and solid wastes in the work of used oil, construction debris, packing materials, and general construction waste would also occur. Overall, the Project effects, likely similar to the past and RFFAs, would be mitigated through implementation of BMPs for waste and wastewater, SPCC plans, and hazardous material business plans. With proper planning and implementation of BMPs, adverse reasonably foreseeable environmental trends and planned actions from the Project in relation to waste management would not occur.

3.13 Public and Occupational Health and Safety

3.13.1 Affected Environment

The Project site is currently private property and agricultural land use dominates. Public emergency services in the area include urgent care clinics, hospitals, law enforcement services, and fire protection services.

The Mid-South Convenient Care clinic, located on U.S. Route 51 (US 51) in Ripley, approximately four miles (six-minute drive) northwest of the Project site, is the closest urgent care center to the Project site. The Lauderdale Community Hospital is the closest hospital, located on Asbury Avenue in Ripley, approximately 3.5 miles (five-minute drive) northwest of the Project site.

Law enforcement services in the city of Ripley are provided by the Ripley Police Department, approximately 1.5 miles (four-minute drive) northwest of the Project site. Law enforcement services in Lauderdale County are provided by the Lauderdale County Sheriff's Department in Ripley, approximately three miles (five-minute drive) northwest of the Project site. Fire protection services are provided by the Ripley Fire Department, approximately 1.5 miles (four-minute drive) northwest of the Project site.

The Tennessee Emergency Management Agency has the responsibility and authority to coordinate with state and local agencies in the event of a release of hazardous materials.

3.13.2 Environmental Consequences

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 public health and safety would result. Existing land use would remain primarily agricultural land for the foreseeable future, and existing public health and safety issues would likely remain as they are at present.

3.13.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, workers on the Project site would have an increased safety risk during construction of the proposed solar facility. However, because construction work has known hazards, the standard practice is for contractors to establish and maintain health and safety plans in compliance with OSHA regulations. Health and safety plans emphasize BMPs for site safety management to minimize potential risks to workers. Examples of BMPs include employee safety orientations; establishment of work procedures and programs for site activities; use of equipment guards, emergency shutdown procedures, lockout procedures, site housekeeping, and personal protective equipment; regular safety inspections; and plans and procedures to identify and resolve hazards.

Potential public health and safety hazards could result from increased traffic on roadways due to construction of the Project. Residential and other human use areas along roadways used by construction traffic to access the Project site would experience increased employee, commercial, and industrial traffic. Awareness of these residences and establishment of traffic procedures to minimize potential safety concerns would be addressed in the health and safety plans followed by construction contractor(s).

Approximately 2,500 gallons of fuel for vehicles would be kept on the Project site in storage tanks during construction of the proposed solar facility. An SPCC plan would be implemented to minimize the potential of a spill and to instruct on-site workers on how to contain and clean up any potential spills. The 11 blocks of PV arrays and the switchgear would be securely fenced during construction and for the duration of operation, and access gates would normally remain locked. General public health and safety would not be at risk in the event of an accidental spill on-site. Emergency response would be provided by the local, regional, and state law enforcement, fire, and emergency responders.

During operation, solar PV systems generate electromagnetic fields (EMF). However, according to a study published by North Carolina State University (2017), solar PV technologies and solar inverters do not pose human health risks. EMF produced by electricity has enough energy to produce heat but not enough to remove electrons from a molecule or damage DNA. Distance from the EMF source and security fencing proposed to surround separate portions of the Project, renders the exposure to EMF insubstantial and, therefore, not harmful to human health. The strength of the EMF present at the perimeter of

a solar facility is substantially lower than the typical exposures to EMF from household sources such as refrigerators and microwave ovens (National Institute for Occupational Safety and Health [NIOSH] 2014).

Most of the increased safety risk occurs during construction, which should be completed within approximately 12 months, and the risks that have been identified are known, manageable risks. Overall, impacts to public health and safety in association with implementation of the Proposed Action would be considered temporary and minor.

3.13.2.3 Cumulative Impacts

As with the past and RFFAs, the Project would comply with OSHA regulations and health and safety plans to prevent or minimize the negative effects of worker-related accidents. The Project would also comply with SPCC plans, hazardous material plans, and other waste management BMPs to avoid or minimize related health and safety issues. With proper planning and implementation of BMPs, cumulative impacts from the Project in relation to public health and safety would not occur.

3.14 Transportation

3.14.1 Affected Environment

3.14.1.1 Roads

The Project site is bisected by northwest-southeast-oriented State Route 19 and bounded to the north by Eastland Avenue. State Route 19 is a two-lane paved public road that intersects with US 51 to the northwest and Interstate 40 in the city of Brownsville to the southeast. Eastland Avenue is a two-lane paved public road that extends northwest-southeast along the northern boundary of the Project site. Highland Street Extended, a two-lane paved public road that extends north-south approximately 0.3 mile west of the Project site, intersects with Eastland Avenue to the north and State Route 19 to the south. Hyde Road, a two-lane paved public road that extends north-south approximately 0.3 mile west of the Project site, intersects with State Route 19 to the north and Hurricane Hill Road to the south. Willie Paris Road, a two-lane paved public road that extends north-south approximately 0.3 mile east of the Project site, intersects with State Route 19 to the north and Hurricane Hill Road to the south. The Project site is also bisected by several unnamed private dirt roads.

3.14.1.2 Road Traffic

Existing traffic volumes on some of the roads in the Project area were determined using 2021 Annual Average Daily Traffic (AADT) counts measured at existing TDOT traffic count stations (TDOT 2023c). Eight TDOT stations are located within one mile of the Project site. Table 3-19 shows the 2021 AADT counts at these stations.

Table 3-19. 2021 AADT counts near the Project site

Station	Roadway	Distance from the Project	AADT
42	Eastland Ave	620 ft east	2,474
110	Highland St Ext	0.2 mi west	2,068
60	Willie Paris Rd	0.3 mi southeast	272
72	Highland St	0.6 mi northwest	4,194
41	Eastend St	0.8 mi north	1,422
100	S Jefferson St	0.9 mi northwest	2,298
101	Knee St	1.0 mi west	1,845
109	State Route 19	1.0 mi west	4,476

Source: TDOT 2023c

3.14.1.3 Rail and Air Traffic

The closest rail line is operated by Canadian National Railway Company and is located approximately one mile west of the Project site. The closest general aviation airport is the Covington Municipal Airport in Covington, located approximately nine miles southwest of the Project site. The closest major airport, and the only one in the vicinity with regular commercial passenger service, is the Memphis International Airport in Memphis, approximately 51 miles southwest of the Project site.

3.14.2 Environmental Consequences**3.14.2.1 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 remain primarily agricultural land for the foreseeable future, and the existing transportation network and traffic conditions would likely remain as they are at present.

3.14.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, the development of the solar facility would result in minor direct impacts to road traffic due to an increase in construction related traffic in the vicinity of the Project site. Subject to weather, construction activities would take approximately 12 months to complete using a crew of approximately 200 workers maximum. Work would generally occur during daylight hours for five to six days a week. Some of these construction workers would likely come from the local area or region. Other workers could come from outside the region, and if so, many would likely stay in local hotels in the vicinity. It is anticipated that workers would drive personal vehicles to the Project site. Some of the individual workers and work teams would likely visit local restaurants and other businesses.

Due to the proximity of the Project site to the city of Ripley, possible moderate traffic impacts along State Route 19, State Route 209, US 51, Highland Street, Highland Street Extended, and Eastland Avenue could occur, as a portion of the construction workers would likely commute to the Project site from and through Ripley. During construction, increased traffic would result in moderate impacts to roads in the immediate vicinity of the Project site, primarily State Route 19, Highland Street, Highland Street Extended, and Eastland Avenue. Traffic flow around the Project site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Use of mitigation measures, such as posting a flag person during heavy commute periods to manage traffic flow, prioritizing access for local

residents, and implementing staggered work shifts during daylight hours, would reduce potential adverse impacts to traffic and transportation.

Construction equipment and material delivery and waste removal would require an average of two to three flatbed semi-trailer trucks or other large vehicles visiting the Project site each day. The Project site would be accessed via routes that do not have load restrictions. These vehicles should be easily accommodated by existing roadways; therefore, only minor impacts to transportation resources in the Project area would result from construction vehicle activity.

Construction and operation of the Project would have no effect on operation of airports in the region. The operation of the Project would not affect commercial air passenger or freight traffic in the region and would not adversely affect any aerial crop dusters operating in the vicinity of the Project site. The Project would also obtain a TDOT Commercial Driveway Permit for driveways necessary for the Project site during operations.

Overall, direct impacts to transportation resources associated with implementation of the Proposed Action would be anticipated to be minor during construction due to the influx of workers and truckloads of construction equipment, materials, and waste removal traveling to and from the Project site. These impacts would be temporary and minimized through appropriate mitigation. The Proposed Action would not result in any indirect impacts to transportation.

3.14.2.3 Cumulative Impacts

The Project would implement minimization and mitigation measures if Project construction would likely disrupt normal traffic patterns; thus, Project effects to road traffic would be temporary, minor, and minimized or mitigated. Effects to local, regional, and major airports are not anticipated. Past and RFFAs would also likely result in minor impacts to transportation. The proposed extension of Interstate 69 and the potential development of the industrial sites (up to 300 acres) could contribute to cumulative impacts to traffic depending on the timing of those projects. However, impacts would be short-term, and coordination could occur to minimize impacts to local commuters. Overall, with implementation of minimization and mitigation measures, the Project is likely not contribute to cumulative impacts to area transportation.

3.15 Socioeconomics

3.15.1 Affected Environment

The Project site is within the metropolitan limits of Ripley in southeastern Lauderdale County. The Project site and a surrounding one-mile radius (defined as the Project area for socioeconomics) were examined to identify U.S. Census Bureau (USCB) 2020 Census Tract (CT) block groups (BGs). The Project site overlaps CT 505.05 BG 1 and CT 505.06 BG 1 and is within one mile of CT 505.04 BG 3, CT 505.05 BGs 2-4 and CT 505.06 BG 2, and CT 506.00 BG 1 (Figure 3-20). CT 505.05 encompasses the portion of the city of Ripley east of State Route 209 and north of State Route 19. CT 505.06 encompasses the small portion of the city of Ripley south of State Route 19 and the unincorporated portion of southeastern Lauderdale County north of Hurricane Hill Road and Taxpayer Road. Lauderdale County is primarily rural and includes only small clusters of densely populated areas.

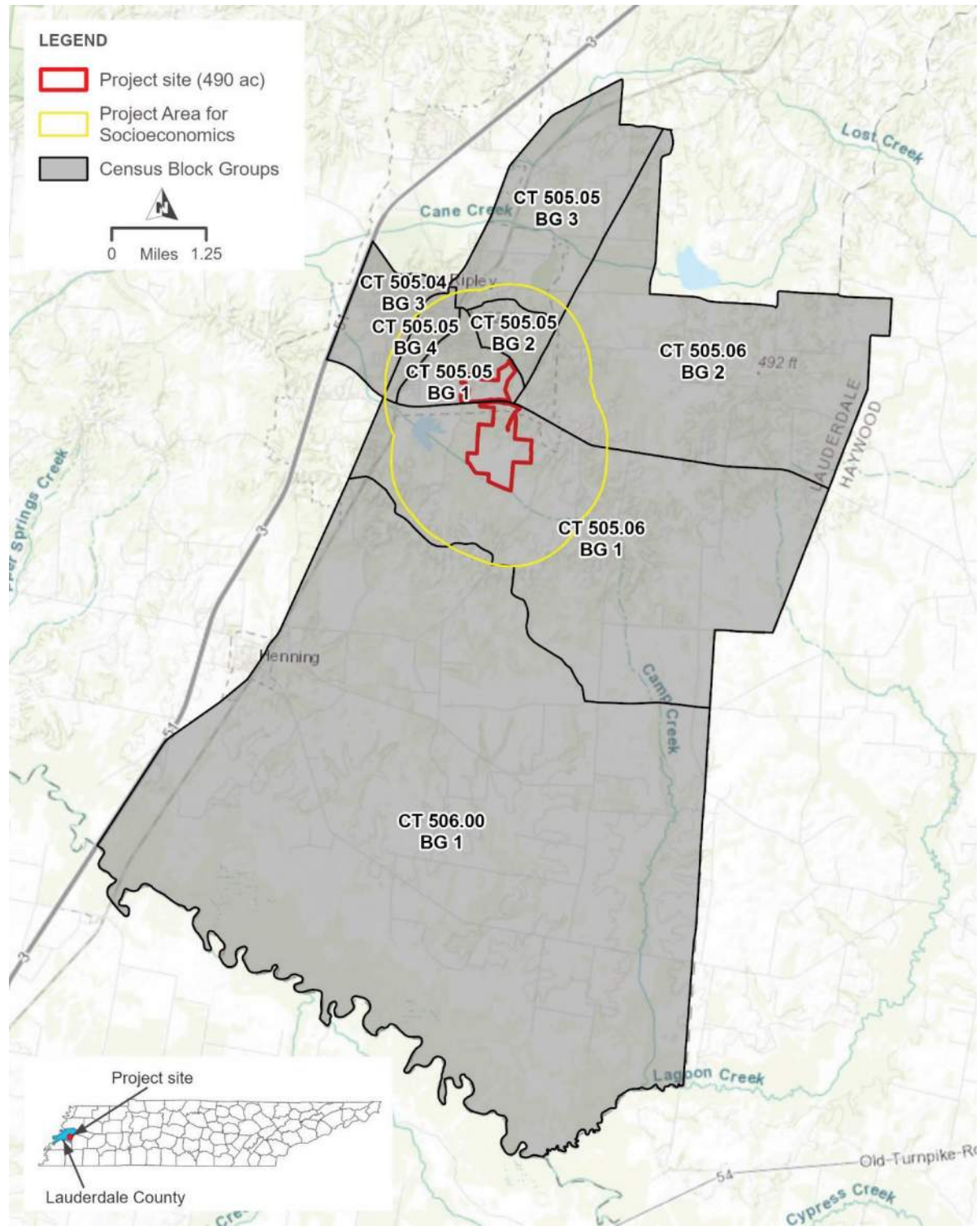


Figure 3-20. USCBA BGs in the Project area

3.15.1.1 Population and Demographics

Population data for the affected BGs, the county, and the state are provided in Table 3-20, based on the 2010 Census and 2020 Census. As shown, from 2010 to 2020, all affected BGs and the county recorded population losses while the state recorded population growth (USCB 2010; USCB 2020). The Tennessee State Data Center (2022) projects that the population of the county would continue to decrease, and the population of the state would continue to increase by 2040.

Table 3-20. Population trends in the Project area for socioeconomics, county, and state

Geographic Area	2010 Census	2020 Census	Percent Change 2010-2020	Projection 2040	Percent Change 2020-2040
CT 505.04 BG 3	--	1,626	--	--	--
CT 505.05 BG 1*	1,885	1,396	-25.9	--	--
CT 505.05 BG 2	1,076	883	-17.9	--	--
CT 505.05 BG 3	506	505	-0.2	--	--
CT 505.05 BG 4	685	682	-0.4	--	--
CT 505.06 BG 1*	1,266	1,133	-10.5	--	--
CT 505.06 BG 2	1,254	1,166	-7.0	--	--
CT 506.00 BG 1	792	717	-9.5	--	--
Lauderdale County	27,815	25,143	-9.6	24,706	-1.7
Tennessee	6,346,105	6,910,840	8.9	7,888,046	14.1

Sources: Tennessee State Data Center 2022; USCB 2010; USCB 2020

* Project site lies partially within CT 505.05 BG 1 and CT 505.06 BG 1.

“—” indicates that no data is available.

3.15.1.2 Employment and Income

Employment and income data for the affected BGs, the county, and the state are provided in Table 3-21, based on the 2022 American Community Survey (ACS) and Bureau of Labor Statistics (BLS). As shown, six of the eight affected BGs have higher percentages of civilians in the labor force than the county. CT 505.05 BG 2 has a much lower percentage of civilians in the labor force and median household income than both the other affected BGs, the county, and the state.

Table 3-21. Employment and income in the Project area for socioeconomics, county, and state

Geographic Area	% Civilian Labor Force, 2022 ACS	Unemployment Rate, 2022 ACS	Unemployment Rate, Mar. 2024, BLS	Median Household Income, 2022 ACS
CT 505.04 BG 3	45.0	7.6	--	\$38,415
CT 505.05 BG 1*	51.6	14.9	--	\$41,692
CT 505.05 BG 2	44.4	13.4	--	\$23,000
CT 505.05 BG 3	54.5	5.7	--	\$48,478
CT 505.05 BG 4	55.3	10.0	--	\$40,375
CT 505.06 BG 1*	62.3	3.8	--	\$44,760
CT 505.06 BG 2	60.7	2.8	--	\$55,179
CT 506.00 BG 1	49.8	8.4	--	\$23,169
Lauderdale County	49.1	6.1	4.5	\$46,702
Tennessee	61.9	5.0	3.2	\$64,035

Sources: USCB 2022b; USCB 2022c; BLS 2024a; BLS 2024b

* Project site lies partially within CT 505.05 BG 1 and CT 505.06 BG 1.

"—" indicates that no data is available.

The top three industries for the affected BGs, the county, and the state are provided in Table 3-22, based on the 2022 ACS. Manufacturing, retail trade, and public administration are important industries for the area (USCB 2022d).

Table 3-22. Top industries in the Project area for socioeconomics, county, and state

Geographic Area	Ranking		
	Highest Percentage	Second Highest Percentage	Third Highest Percentage
CT 505.04 BG 3	Retail trade (23.2%)	Educational services, and health care and social assistance (17.2%)	Construction (12.1%)
CT 505.05 BG 1*	Manufacturing (29.6%)	Retail trade (22.1%)	Transportation and warehousing, and utilities (11.3%)
CT 505.05 BG 2	Manufacturing (26.4%)	Public administration (25.2%)	Educational services, and health care and social assistance (19.1%)
CT 505.05 BG 3	Manufacturing (40.3%)	Retail trade (26.4%)	Other services, except public administration (11.1%)
CT 505.05 BG 4	Retail trade (28.6%)	Manufacturing (17.2%)	Public administration (16.2%)
CT 505.06 BG 1*	Manufacturing (29.6%)	Wholesale trade (23.3%)	Public administration (9.3%)

Geographic Area	Ranking		
	Highest Percentage	Second Highest Percentage	Third Highest Percentage
CT 505.06 BG 2	Manufacturing (32.4%)	Educational services, and health care and social assistance (22.4%)	Public administration (8.9%)
CT 506.00 BG 1	Manufacturing (30.5%)	Educational services, and health care and social assistance (25.6%)	Retail trade (24.1%)
Lauderdale County	Manufacturing (29.0%)	Educational services, and health care and social assistance (17.3%)	Retail trade (11.2%)
Tennessee	Educational services, and health care and social assistance (22.3%)	Manufacturing (12.9%)	Retail trade (11.7%)

Source: USCB 2022d

* Project site lies partially within CT 505.05 BG 1 and CT 505.06 BG 1.

3.15.2 Environmental Consequences

3.15.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed; therefore, no Project-related impacts to socioeconomics would occur. Existing socioeconomic conditions would remain as they are at present or change at approximately the current rate.

3.15.2.2 Proposed Action Alternative

Under the Proposed Action Alternative, a new solar facility would be built in the Project area. Subject to weather, construction activities would take approximately 12 months to complete using a crew of approximately 200 workers maximum. Work would generally occur during daylight hours for five to six days a week. Short-term beneficial economic impacts would result from construction activities associated with the Project, including the purchase of materials, equipment, and services and a temporary increase in employment and income. This increase 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 Lauderdale County and/or in adjacent counties. Most of the other components of the solar and transmission facilities would be acquired from outside the local area. Also, some of the construction workforce would likely be sought locally or within the region. The direct impact to the economy associated with construction of the Project would be short-term and beneficial.

Most of the indirect employment and income impacts would come from the expenditure of the wages earned by the workforce involved in construction activities, as well as the local workforce used to provide materials and services. This could result in increased sales to businesses nearby and on route to the Project site. Therefore, construction of the proposed solar facility could have minor, beneficial, short-term, indirect impacts to the local economy in Lauderdale County.

During operations, the Project may require small groups of staff to be on-site occasionally to manage the facility and conduct regular inspections, as well as some part-time permanent staff and/or contract employees that manage vegetation on the Project site. Therefore, operation of the solar facility would have minor beneficial impacts on employment and the populations in Lauderdale County. The Project has been designed to minimize impacts to adjacent and nearby properties and is unlikely to negatively affect area property values.

Overall, socioeconomic impacts for the operation of the proposed solar facility would be beneficial and long-term, but minor relative to the total economy of the region. The local tax base would increase from construction of the solar facility and would be most beneficial to Lauderdale County and the vicinity.

3.15.2.3 Cumulative Impacts

Economic benefits of the Proposed Action and the past and RFFAs considered for this analysis include the purchase of materials, equipment, and services, and moderate short- to long-term increases in employment and income. These increases would be local or regional, depending on where the goods, services, and workers have been or are obtained. Overall, short- to long-term, moderate beneficial cumulative impacts to socioeconomics would result from implementation of the Proposed Action in combination with the other actions considered in the area. Indirect, cumulative impacts to socioeconomics would also occur from the expenditure of wages earned by the workforce involved in construction activities and facility operation.

3.16 Environmental Justice

3.16.1 Affected Environment

Environmental justice (EJ) is defined in EO 14096 as “just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other federal activities that affect human health and the environment.” EJ-related impacts are analyzed to identify and address, as appropriate, disproportionate and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations, as guided by EO 12898 and EO 14096.

CEQ offers guidance for identifying communities with EJ concerns (CEQ Guidance; CEQ 1997). Based on CEQ Guidance, communities with EJ concerns were identified using the 2022 ACS and the thresholds or definitions as follows:

- Minority populations exceeding 50 percent, where minority populations are defined as people who identify themselves as Asian or Pacific Islander, American Indian or Alaskan Native, Black (not of Hispanic origin), Hispanic, some other race, or those indicating two or more races (i.e., all USCB race and ethnic categories apart from One Race White);
- Low-income populations, where per capita income is at or below the annual statistical poverty threshold from the USCB Current Population Reports Series P-60 on Income and Poverty, \$15,225 or the official poverty rate for the US as a whole, 11.5 percent (USCB 2023);
- Groups demonstrating differential patterns of consumption of natural resources among minority and low-income populations, or tribal populations.

The Project site and a surrounding one-mile radius were examined to identify USCB 2020 CT BGs; this is defined as the Project area for EJ. Within the Project area and in addition to the above thresholds, minority EJ populations were defined as the BGs with minority percentages that were 10 percent or more above the state percentage or both the county and state percentages. In other words, each BG's minority percentage, must be at least 110 percent of the state's and/or county's minority percentage to qualify as an EJ population in this analysis. The pertinent thresholds will be displayed in each of the following tables. Low-income EJ populations were also defined as the BGs with poverty rates that were five percent or more above the state percentage or both the county and state percentages. Low-income populations can also be defined by per capita income measurements that were five percent or more below the state measurement or both the county and state measurements. In other words, each BG's per-capita income, must be at least 105 percent of the per capita income measurement of the state and/or county or at least 95 percent of the per capita income of the state and/or county to qualify as an EJ population in this analysis. The pertinent thresholds will be displayed in each of the following tables. BGs meeting these thresholds are identified as the areas where the chance for amplified environmental and human health effects to minority and low-income populations may be greatest (i.e., the qualifying communities with EJ concerns).

3.16.1.1 Minority Populations

According to the 2022 ACS, minority populations in all BGs except three are higher than the county and the state (Table 3-23; Figure 3-21; USCB 2022e). Overall minority percentages and Black or African American percentages of CT 505.05 BGs 1-3, CT 505.06 BG 1, and CT 506.00 BG 1 exceeded the 50-percent threshold noted in CEQ Guidance. Additionally, the remaining CT BGs exceed the minority and Black percentages in Tennessee, indicating that these CTs have a higher percentage of minority communities than is typical of the state. All BGs qualify as minority communities with EJ concerns due to meeting or exceeding the thresholds for the state or the county and the state.

No tribal areas are known to exist within a one-mile radius of the Project site (BIA 2018). However, an officially recognized community of the Mississippi Band of Choctaw Indians resides in Henning, Tennessee, approximately four miles southwest of the Project site and within Lauderdale County (Hébert 2013). Additionally, no groups demonstrating differential patterns of consumption of natural resources among minority or low-income populations were observed.

Table 3-23. Minority percentages and ethnicities in the Project area for EJ, county, and state

Geography	% Minority	% White ^{1*}	% Black / African Am. ⁺	% Am. Indian / Alaska Native [#]	% Asian [^]	% Native Hawaiian / Pacific Islander ^{>}	% Some Other Race ^{**}	% Two or More Races ^{##}	% Hispanic / Latino ^{2*}
Tennessee	28.7	79.5	17.3	1.8	2.6	0.2	5.8	6.9	6.3
Lauderdale County	41.2	63.8	36.1	1.0	0.5	0.0	2.5	3.8	1.7
<i>Minority EJ Thresholds to Meet or Exceed</i>									
State	31.7	--	19.1	2.0	2.9	0.2	6.4	7.6	7.0
County	45.5	--	39.9	1.1	0.6	0.0	2.8	4.2	1.9
CT 505.04 BG 3	38.8	65.2	29.9	0.0	0.0	0.0	5.8	1.0	5.8
CT 505.05 BG 1*	94.1	11.0	93.1	1.0	0.0	0.0	0.4	5.0	0.0
CT 505.05 BG 2	80.5	25.8	80.5	0.0	0.0	0.0	0.0	6.3	0.0
CT 505.05 BG 3	77.9	22.1	77.9	0.0	0.0	0.0	0.0	0.0	0.0
CT 505.05 BG 4	36.3	65.4	34.6	1.7	0.0	0.0	0.0	1.7	0.0
CT 505.06 BG 1*	70.2	30.8	69.2	1.0	0.0	0.0	0.0	1.8	0.0
CT 505.06 BG 2	34.9	60.9	34.9	0.0	0.8	0.0	0.0	0.0	0.0
CT 506.00 BG 1	73.3	40.9	62.9	0.0	2.6	0.0	9.0	15.4	26.7

Source: USCB 2022e; * Table ID: B03002; + Table ID: B02009; # Table ID: B02010; ^ Table ID: B02011; > Table ID: B02012; ** Table ID: B02013; ## Table ID: C02003

¹ Race percentages are provided for those reporting a particular race alone or in combination.

² This group is calculated separately from the other ethnicities and may include overlap from the other categories, as the USCB does not consider Hispanic or Latino a "race."

* Project site lies partially within CT 505.05 BG 1 and CT 505.06 BG 1.

Bolded cells indicate that percentages exceed the 50 percent threshold noted in CEQ Guidance.

Yellow highlighted cells indicate BGs with minority percentages that are at least 10 percent greater than the state.

Green highlighted cells indicate BGs with minority percentages that are at least 10 percent greater than both the county and state.

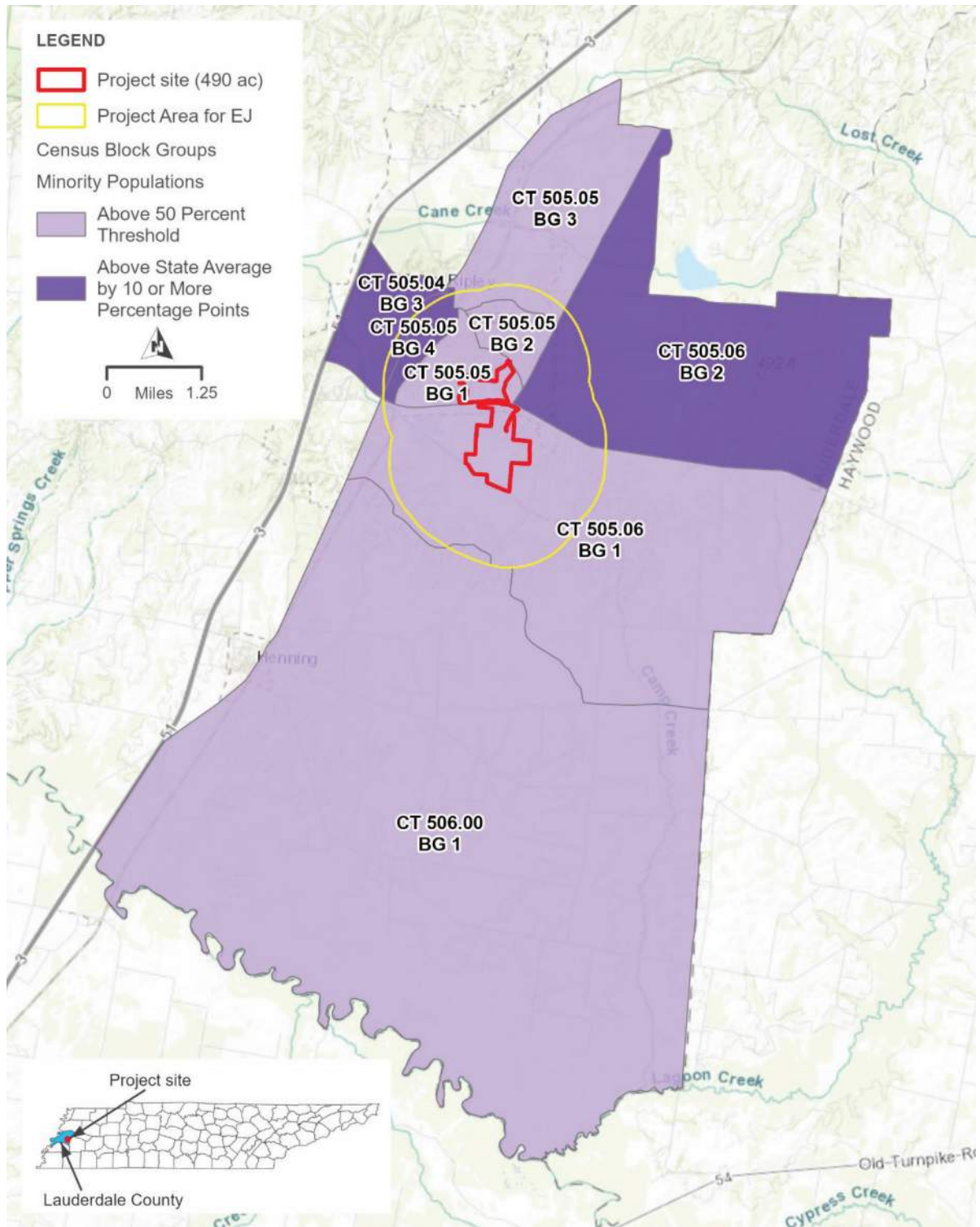


Figure 3-21. Minority populations in the Project area for EJ

3.16.1.2 Low-Income Populations

According to the 2022 ACS, the poverty rates of CT 505.05 BGs 1, 2 and 4 and CT 506.00 BG 1 are much higher than the other BGs, the county, and the state (Table 3-24; Figure 3-22; USCB 2022f). Poverty rates of the county, state, and all BGs except for CT 505.05 BG 3 and CT 505.06 BG 2 exceed 11.5 percent, the official 2022 poverty rate for the U.S. as a whole, indicating that they all have high percentages of people living in poverty. Per capita income in CT 505.05 BGs 1 and 2, CT 505.06 BG 1, and CT 506.00 BG 1 was lower than the other BGs, the county, and the state (USCB 2022g). However, the BGs, county, and state all had per capita income amounts that were higher than the U.S. per capita income poverty threshold of \$15,225. All BGs qualify as low-income EJ populations due to meeting or exceeding the thresholds for the percent of persons below poverty level for the state or the county and the state and/or meeting or being under the threshold for per capita income.

Table 3-24. Poverty in the Project area for EJ, county, and state

Geography	Per Capita Income	Percent of Persons Below Poverty Level
Tennessee	\$36,040	13.3
Lauderdale County	\$24,358	18.0
<i>Low-Income EJ Thresholds</i>		
<i>State</i>	\$34,914	14.0
<i>County</i>	\$23,169	18.9
CT 505.04 BG 3	\$28,415	13.4
CT 505.05 BG 1*	\$20,344	27.3
CT 505.05 BG 2	\$17,532	39.4
CT 505.05 BG 3	\$24,904	6.4
CT 505.05 BG 4	\$28,607	27.5
CT 505.06 BG 1*	\$21,057	16.5
CT 505.06 BG 2	\$30,937	10.3
CT 506.00 BG 1	\$18,810	32.0

Source: USCB 2022f; USCB 2022g

* Project site lies partially within CT 505.05 BG 1 and CT 505.06 BG 1.

Bolded cells indicate that percentages exceed 11.5 percent, the official 2022 poverty rate for the U.S.

Yellow highlighted cells indicate BGs with low-income rates that are at least five percent different than the state.

Green highlighted cells indicate BGs with low-income rates that are at least five percent different than both the county and state.

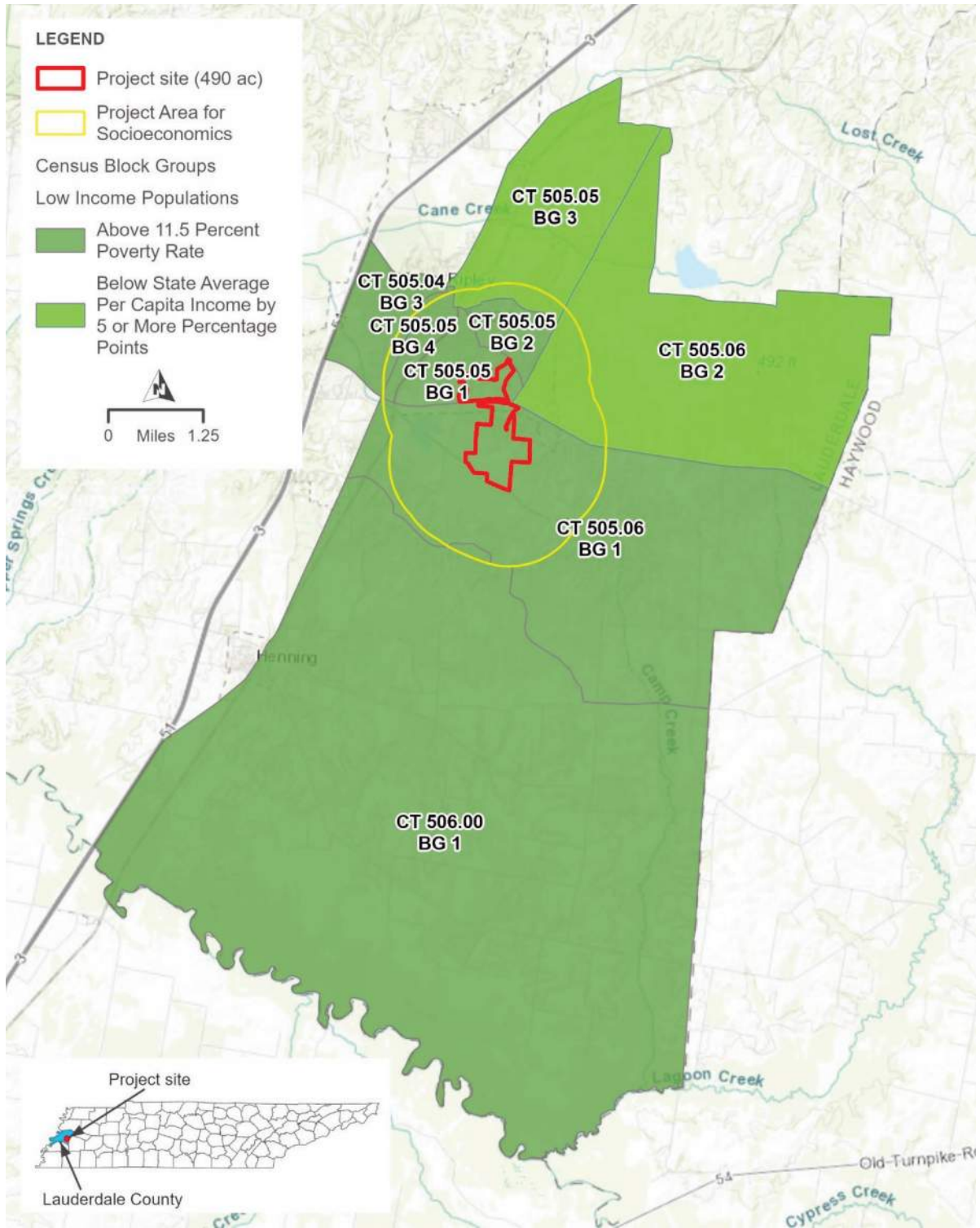


Figure 3-22. Low-income populations in the Project area for EJ

3.16.1.3 Environmental Justice Indices

The USEPA EJScreen tool was used to consider 13 different environmental indicators (i.e., EJ indices) in the Project area in comparison to the state (USEPA 2023g). These EJ indices were examined to determine the risk of negative health impacts for residents living within the Project area, as all BGs in the Project area qualify as EJ populations. The 13 EJ indices that were examined included PM_{2.5}, ozone, diesel particulate matter, air toxics cancer risk, air toxics respiratory hazard index, toxic releases to air, traffic proximity and volume, lead paint, Superfund proximity, risk management plan (RMP) facility proximity, hazardous waste proximity, underground storage tanks (USTs) and leaking UST (LUST), and wastewater discharge. EJ indices of 50 or greater were considered to have above average pollution levels (above the 50th percentile as compared to the state). The results of this examination indicated that the majority of the BGs in the Project area generally contained above average levels of pollution.

The 13 environmental indicators measure pollutants that may impact human health. All BGs in the Project area had percentiles of 50 or greater in at least two EJ indicators. Two of the BGs examined scored above average pollution and indicated five EJ indices above the 50th percentile as compared to the state (Table 3-25Table). The remaining six BGs had below-average pollution percentiles (below the 50th percentile) with only two to three EJ indices each above the 50th percentile. The highest percentile (99th) in the BGs occur in CT 505.04 BG 3; CT 505.05 BGs 1, 2, and 4; and CT 505.06 BG 1 for wastewater discharge.

Table 3-25. BG EJ indices percentile comparisons to the state for the Project area for EJ

Geography	PM _{2.5}	Ozone	Diesel Particulate Matter	Air Toxics Cancer Risk	Air Toxics Respiratory Hazard index	Toxic Releases to Air	Traffic Proximity and Volume	Lead Paint	Superfund Proximity	RMP Facility Proximity	Hazardous Waste Proximity	USTs LUSTs	Wastewater Discharge
<i>Lauderdale County</i>													
CT 505.04 BG 3	38	18	33	0	2	50	50	44	53	31	44	78	99
CT 505.05 BG 1*	37	17	31	0	2	47	25	35	54	32	42	66	99
CT 505.05 BG 2	37	17	31	0	2	50	22	70	55	28	48	45	99
CT 505.05 BG 3	37	17	31	0	2	67	34	88	56	24	64	44	97
CT 505.05 BG 4	37	17	31	0	2	49	53	89	54	30	47	90	99
CT 505.06 BG 1*	37	18	21	0	2	40	30	63	55	34	32	30	99
CT 505.06 BG 2	37	18	21	0	2	47	9	44	58	25	41	0	95
CT 506.00 BG 1	49	20	22	0	2	45	12	55	53	52	21	17	46

Source: USEPA 2023g

* Project site lies partially within CT 505.05 BG 1 and CT 505.06 BG 1.

Bolded cells indicate EJ indices levels of 50 or greater, considered to have above average pollution levels (above the 50th percentile as compared to the state).

3.16.2 Environmental Consequences

3.16.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar facility would not be constructed, and there would be no changes to the Project area attributable to the Proposed Action; therefore, no disproportionate and adverse human health or environmental effects on minority or low-income populations would occur.

3.16.2.2 Proposed Action Alternative

Based on the analyses presented in Section 3.16.1, including the results of the USEPA EJSscreen analyses, minority and low-income populations are present in the Project area at higher rates than the county and state. The Project area also has a poverty rate that is higher than the official U.S. poverty rate of 11.5 percent.

3.16.2.2.1 Construction-related Impacts to Communities with EJ Concerns

During construction, communities with EJ concerns would experience temporary and minor impacts to the ambient noise environment in the Project area. Several residences and a few nonresidential buildings, such as Forerunner Church, would experience heightened noise during construction, primarily from pile-driving activities and installation of OPGW in the TL upgrade areas by helicopter. Construction would primarily occur during daylight hours, Monday through Saturday, and on each day between sunrise and sunset in compliance with the Ripley Municipal Code; therefore, the Project would not affect ambient noise levels at night during most of the construction period. The activity producing the most noise for an extended period would be pile-driving during the construction of the array foundations, which would be completed in approximately three months. Pile-driving within 5,322 feet of the nearest residences would be scheduled during daylight hours Monday through Friday to minimize impacts to the residences and pile-driving within 4,976 feet of Forerunner Church would be scheduled outside of church services to minimize impacts to the church. The Forerunner Church usually has services on Tuesday evenings and throughout the day on Sunday. Construction related impacts such as noise or dust should not highly impact this community since they are not present during construction hours.

Construction related short-term adverse impacts to utilities, including potential planned electrical service outages, could occur when bringing the solar facility online, conducting TL upgrade activities, or during routine maintenance of the solar facility. If outages on the Ripley–Covington 161-kV TL or other TLs are required, TVA would work with Ripley Power and Light to provide alternative means of providing electrical service to the area to avoid service interruptions. TVA would also try to perform these outages at low-impact times, such as overnight, to maintain power service to the Ripley Power and Light service area.

Public health and safety of the EJ population would have temporary and minor effects from the possibility of increased employee, commercial, and industrial traffic. However, this is a common problem during construction and there are traffic procedures that can be used to minimize potential safety concerns. Emergency response would be provided by the local, regional, and state law enforcement, fire, and emergency responders.

Two BGs are above the 50th percentile as compared to the state for traffic proximity and volume, indicating that these BGs already experience certain traffic related stressors (Table 3-25). Transportation effects associated with construction activities would be concentrated on public roads in the immediate vicinity of the Project site. Due to an increase in construction and worker traffic during construction, there could be a temporary, moderate increase in traffic that is not likely to increase the risk to the public. Therefore,

there would be a minor, temporary effects related to increased traffic and driver safety. Use of mitigation measures as appropriate, such as posting a flag person during heavy commute periods to manage traffic flow, prioritizing access for local residents, and implementing staggered work shifts during daylight hours, could minimize potential adverse impacts to traffic to minor levels.

3.16.2.2.2 Operation- and Maintenance-related Impacts to Communities with EJ Concerns

The most noticeable long-term impacts to communities with EJ concerns would be changes to visual resources, impacts to cultural resources, and conversion of land use from agricultural land to industrial. Wastewater discharge potential during construction and operation is also considered as seven of the eight BGs in the Project area are impacted by waste water discharge. Visual effects of the built facility would likely be minor due to the visibility of relatively small portions of the facility components.

The cultural resources within the Project's viewshed may also be impacted by the Proposed Action. The Crescent Heights Historic District is recommended for NRHP listing as it reflects the growth of public-funded housing in Ripley during the mid-century. Forerunner Baptist Church is another NRHP eligible site that is within the viewshed of the Proposed Action. Additionally, the Rice Park Office Building, which is eligible for NRHP listing, and the surrounding park are located in the Project's viewshed. THC concurred that the Forerunner Baptist Church, Crescent Heights Historic District, and Rice Park Office Building would not be adversely affected by the undertaking.

The development of the solar facility would result in the long-term change in land use from primarily agricultural land dominated by cultivated crops to primarily industrial land. This change would happen due to a change in zoning, which is described in greater detail in Section 3.2. The change in zoning category to light industrial is expected to have negligible negative impacts to the community while the solar facility is operational. Land use conversion would also have long-term impacts on the agricultural industry in the Project area; however, agricultural industries are not a top employer in the Project area for EJ qualifying BGs as described in Section 3.15.1.2 and Table 3-22.

Seven of the eight BGs in the Project area are above the 50th percentile as compared to the state for wastewater discharge, indicating that these BGs already experience certain wastewater discharge related stressors (Table 3-25). Wastewater potentially generated during construction or operation may include domestic sewage and wastewater from non-detergent equipment washing and dust control. Another source of wastewater is the waste from portable toilets or other temporary facilities that would be used for the construction workforce. This wastewater will be periodically pumped to tanker trucks by licensed contractors and sent to a sanitary wastewater treatment facility. Water used for equipment washing and dust control would be handled in accordance with BMPs described in the Project stormwater/BMP plan. With application of these BMPs, no adverse effects would be anticipated from wastewater generated during the Project; and communities with EJ concerns would not experience disproportionate effects.

Long-term operation and maintenance related impacts to visual resources, cultural resources, and land use would result in minor to negligible impacts to communities with EJ concerns. No adverse impacts to cultural resources of importance to EJ communities or viewsheds of EJ communities are anticipated as a part of the Proposed Action. Land use

changes would be unlikely to impact communities with EJ concerns as agriculture is not a main industry in the Project area.

3.16.2.2.3 Summary of EJ Impacts

Direct and indirect impacts that occur due to the project could have negligible to minor impacts on minority and low-income EJ communities. Most impacts would occur during the 12-month construction period. Off-site impacts would be minor or mitigated as described in Table 3-26. The standard practices, BMPs, and mitigation efforts that can minimize potential impacts are summarized in Table 3-26 by resource area.

Table 3-26. Summary of impacts to EJ communities and mitigation measures

Resource Area	Descriptors of Impact	Standard Practices, BMPs, and Mitigation Measures
Noise	Temporary, Minor, Direct	Construction to occur during daylight hours, Monday through Saturday, and on each day between sunrise and sunset in compliance with the Ripley Municipal Code
Utilities	Long term yet short instances, Direct	Scheduling outages at low-impact times Work with Ripley Power and Light to provide alternative means of providing electrical service to the area to avoid service interruptions
Public and Occupational Health and Safety	Temporary, Minor, Indirect and Direct	Using traffic procedures designed to minimize potential safety concerns as needed
Visual Resources	Long term, Minor, Direct	None proposed
Cultural Resources	No adverse affects	None proposed
Land Use	Long term, Minor, Indirect	None proposed
Transportation	Short term, Minor, Direct	Posting a flag person during heavy commute periods to manage traffic flow Prioritizing access for local residents and implementing staggered work shifts during daylight hours
Waste Management	Short term, Minor, Direct	Pumping wastewater from portable toilets into tanker trucks to get sent to a sanitary wastewater treatment plant Following BMPs for dust control and equipment washing

The Project is expected to have beneficial effects to the local economy by providing construction employment opportunities that would potentially benefit low-income populations.

SRC and TVA would conduct various public involvement activities. SRC has worked with the city of Ripley and Lauderdale County to introduce the Project to local officials. SRC sent

postcards to adjacent landowners to inform them of the Proposed Action. TVA has posted the draft EA for a 30-day public review and comment period on the TVA website, published a notice of availability in newspapers that serve the Lauderdale County area, sent postcards to residents in the Project area, and notified local, state, and federal agencies and federally recognized tribes that the draft EA is available for review and comment. Following the closure of the public review and comment period, TVA will carefully review all submitted comments. The subsequent final EA will be revised as appropriate in response to the comments received and will contain TVA's responses to the comments.

3.16.2.3 Cumulative Impacts

As with past and RFFAs, the Project would consider impacts to communities with EJ concerns within the Project boundaries and surrounding area. With proper planning, community input, and aligning goals with community desires, cumulative impacts from the Project in relation to EJ would be minimized. However, as past and RFFAs were analyzed within a 10-mile radius of the Project site and communities with EJ concerns have been identified within the Project area, these communities may possibly experience cumulative disproportionate or adverse effects due to their presence in the area.

RFFAs, as explained in section 3.1, include multiple industrial facilities and road improvements. The nature of the industries that would come to the buildings available for lease or purchase are not known, but increased industrialization could exacerbate already high EJ indicators depending on the emissions and byproducts of the industries. Depending on the emissions, this could impact the overall health of the community. If these industrial facilities are successful, they could lead to increased changes in land use and zoning to accommodate industrial rather than agricultural uses. The Volz Road project could increase traffic in the area which would have a cumulative impact with the traffic caused by the project if they occur concurrently. Expansion of the highway and road improvements are expected to benefit the community by allowing for more connection between opportunities, which could benefit low-income EJ communities. The impacts from noise, utilities, visual resources, and waste management resource areas are not expected to have cumulative impacts with past actions or RFFAs due to their limited and local impact to the Project area.

CHAPTER 4 – LIST OF PREPARERS

4.1 List of Preparers

Table 4-1 presents the members of the Project team and summarizes the expertise of each member and their contributions to this EA.

Name/Education	Experience	Project Role
TVA		
<i>Erica McLamb</i> B.S., Marine Biology	23 years in ecological evaluations, environmental permitting, and regulatory and NEPA compliance	NEPA Project Manager
<i>Jesse Troxler</i> M.S. and B.S., Wildlife and Fisheries Science	19 years conducting field biology, 10 years technical writing, 8 years NEPA and ESA compliance	Terrestrial Ecology, Threatened and Endangered Species (Animals)
<i>Michaelyn Harle</i> Ph.D., M.A., and B.A., Anthropology	22 years in archaeology and cultural resources management	Cultural Resources, NHPA Section 106 compliance
<i>Emily Kathryn McCann</i> M.S. and B.S., Biology	7 years in field biology, environmental reviews, NEPA and ESA compliance, and consulting with federal agencies	Biological compliance
<i>David Mitchell</i> M.S., Soil and Water Science and B.S., Environmental Horticulture	18 years in botany, ecosystem restoration, and land management, 6 years in project/program management in environmental research	Vegetation, Threatened and Endangered Species (Plants)
<i>Fallon Parker Hutcheon</i> M.S., Environmental Studies and B.S., Environmental Horticulture	5 years in wetland delineation, wetland impact analysis, and NEPA and CWA compliance	Wetland Biologist
<i>Matthew Reed</i> M.S. Wildlife and Fisheries Science; QHP	14 years working with threatened and endangered aquatic species in the Southeastern United States; 10 years in ESA, NEPA, and CWA compliance and stream assessments	Aquatic Ecology, Aquatic T&E Species
<i>Cory Chapman</i> B.S., Wildlife and Fisheries Science	6 years working with aquatic fauna, 2 years in environmental reviews	Aquatic Ecologist
<i>Carrie Williamson, P.E., CFM</i> M.S. and B.S., Civil Engineering	11 years in floodplains and flood risk, 3 years in river forecasting, 11 years in compliance monitoring	Floodplains and Flood Risk

Name/Education	Experience	Project Role
HDR		
<i>Nicole Guigou</i> Ph.D., Aquatic Resources and Integrative Biology M.S. and B.S., Biology	15 years in wetland delineations and endangered species management, 11 years in environmental permitting and regulatory compliance	EA Project Manager (former)
<i>Karsen Williams</i> M.S., Coastal, Marine, and Wetland Studies B.S., Environmental Science	4 years in environmental consulting	EA Project Manager (current)
<i>Harriet Richardson Seacat</i> M.A. and B.A., Anthropology	22 years in anthropology, archaeology, history, and NHPA and NEPA documentation	EA Project Principal, NEPA lead and technical advisor
<i>Charles P. Nicholson</i> Ph.D., Ecology and Evolutionary Biology M.S., Wildlife Management B.S., Wildlife and Fisheries Science	17 years in wildlife and endangered species research and management, 27 years in NEPA compliance	QA/QC Lead
<i>Miles Spenrath</i> B.S., Environment and Natural Resources	12 years in NEPA compliance and documentation	Land Use; Soils; Prime Farmland; Visual Resources; Noise; Air Quality and Climate Change; Natural Areas, Parks, and Recreation; Utilities; Public and Occupational Health and Safety; Transportation; Socioeconomics; Environmental Justice; GIS Mapping; Draft EA comment management and resolution; Administrative record
<i>Mark Filardi</i> M.S. and B.S., Geology	24 years in hydrogeology and contaminated site assessment and remediation	Geology, Groundwater, Waste Management
<i>Kylie Gambrell</i> B.S., Earth and Environmental Sciences and B.A., Anthropology	1 year in NEPA compliance and documentation	Draft EA comment management and resolution, administrative record
<i>Ivan Maldonado</i> B.S., Natural Resource and Environmental Economics	10 years in wetland delineations and environmental permitting	Water Resources, Biological Resources
<i>Al Myers</i> Completed credits toward B.S., Business Administration	24 years in administration	Overall formatting, appendices compilation, PDF creation

Name/Education	Experience	Project Role
<i>Kristi Nichols, RPA</i> M.A. and B.A., Anthropology	26 years in archaeology, cultural resource management, and NHPA Section 106 compliance	Cultural Resources
<i>Caroline Ryciuk</i> M.A., Anthropology	3 years in anthropology and ethnography	Socioeconomics, Environmental Justice
<i>Erin Settevendemio</i> M.S., Fisheries and Aquatic Sciences	14 years in fisheries, wetland science, and USACE and FERC documentation	Biological Resources
<i>Brian Spillane</i> B.S., Geology	10 years in hydrogeology and environmental site assessment and remediation	Geology, Groundwater, Waste Management
<i>Lyranda Thiem</i> M.S. and B.S., Biology	4 years in ecology and biology, 2 years in stream and wetland delineations, permitting, and habitat evaluation	Water Resources, Biological Resources

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CHAPTER 5 – REFERENCES CITED

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