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OPTIMIST SOLAR AND BESS PROJECT
DRAFT ENVIRONMENTAL ASSESSMENT
Clay County, Mississippi

Prepared for:
TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

Submitted by:
MS Solar 7, LLC

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April 2022

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Acronyms and Abbreviations

Abbreviation	Term/Phrase/Name
4CEPA	Four County Electric Power Association
AADT	Average annual daily traffic
AC	Alternating current
AFB	Air Force Base
AMSL	Above mean sea level
APE	Area of potential effects
ASTM	American Society for Testing and Materials
BCC	Bird of Conservation Concern
BESS	Battery energy storage system
BMP	Best management practice
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
dBA	A-weighted decibel
DC	Direct current
EA	Environmental assessment
EDR	Environmental Data Resources, Inc.
EJSCREEN	Environmental Justice Screening and Mapping Tool
EIS	Environmental impact statement
EO	Executive Order
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GHG	Greenhouse gas
HUC	Hydrologic unit code
IPaC	Information for Planning and Consultation
IRP	Integrated Resource Plan
kV	Kilovolt
L_{DN}	Day-night sound level
L_{EQ}	Equivalent sound level
Li-ion	Lithium ion
MDAH	Mississippi Department of Archives and History

Abbreviation	Term/Phrase/Name
MDEQ	Mississippi Department of Environmental Quality
MDOT	Mississippi Department of Transportation
MDWFP	Mississippi Department of Wildlife, Fisheries, and Parks
MFC	Mississippi Forestry Commission
MLRA	Major Land Resource Area
MNHP	Mississippi Natural Heritage Program
MS Solar 7	MS Solar 7, LLC
MW	Megawatt
MWh	Megawatt hour
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO_2	Nitrogen dioxide
NOI	Notice of Intent
NLEB	Northern long-eared bat
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	New South Associates
NWP	Nationwide Permit
OSHA	Occupational Safety and Health Administration
PM	Particulate matter
PPA	Power purchase agreement
POI	Point of interconnection
Project	Optimist Solar Project
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
ROW	Right-of-way
SHPO	State Historic Preservation Office
SO_2	Sulfur dioxide
Solar Facility	Optimist Solar and BESS Facility
SPCC	Spill Prevention, Control, and Countermeasures
SWPPP	Stormwater Pollution Prevention Plan
TVA	Tennessee Valley Authority

Abbreviation	Term/Phrase/Name
TVARAM	Tennessee Valley Authority Rapid Assessment Method
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	Volatile organic compound
WOTUS	Waters of the U.S.

Glossary of Terms

Area of Potential Effects: The Area of Potential Effects for cultural resources includes areas within a ½ mile radius that are within the visual line of sight of the parcels where above ground facilities are proposed.

Collection Lines: Collection lines are typically buried (at least three feet under the surface) electrical connections that are installed between different sections of arrays and other facilities within the Project Site. If the Project substation is not co-located with the arrays, the collection lines would be routed to a central location and a single medium voltage collector line would be installed to the Project substation. The single approximately 3-mile-long collector line could be installed overhead, buried, or a combination of the two.

Fencerow: A fencerow is typically located along the perimeter of a parcel that is comprised of agricultural land, pastureland, or open space. It may actually contain a fence or did at one point in the past. There is typically a row of trees or shrubs that grows along the fencerow.Many of the parcels associated with the Optimist Solar Facility have fencerows along the perimeter of the parcels.

Gen-Tie: Approximately 3-mile-long dedicated transmission line called a generation tie ("gen-tie") would connect the proposed Optimist Substation to TVA's West Point Substation, in the case that the Project substation is co-located with the arrays.

Optimist Solar and Battery Energy Storage System (BESS) Facility: The Optimist Solar and BESS Facility (or "Solar Facility") includes the solar arrays, inverters, collection lines, permanent access roads, the BESS, the Optimist Substation, and other related facilities. The Solar Facility would result in 200 MW of AC generating capacity and an additional 50 MW/200 MWh of battery energy storage.

Optimist Substation: The Optimist Substation is MS Solar 7's proposed substation for the Project. It would be located adjacent to Barton Ferry Road in the eastern portion of the Project Site along with the BESS. However, the substation and BESS may be located at the western end of the Project Site in either of the parcels adjacent to the TVA's West Point Substation.

Project or Proposed Action: The Project or Proposed Action includes the proposed Solar Facility, collection lines, gen-tie, Optimist Substation, TVA interconnection, and the Power Purchase Agreement (PPA) between TVA and MS Solar 7, LLC. Total land impacts for implementation of the Project or Proposed Action would be less than the overall Project Site.

Project Area: The "Project Area" includes the Project Site, as defined below, and the land, roadways, businesses, and homes in the vicinity of the Project Site.

Project Site: The Project Site includes the 29 parcels encompassing approximately 2,952 acres where impacts could occur during construction, operation, or both. Because the Project layout is still preliminary and subject to change, MS Solar 7 has identified a Project Site that is larger than what would likely be needed.

West Point Substation: The West Point Substation is TVA's existing 500-kV substation, located along TVA Road at the western end of Yokohama Boulevard.

Chapter 1 – Introduction

The Tennessee Valley Authority (TVA) has entered into a Power Purchase Agreement (PPA) with MS Solar 7, LLC (herein referred to as "MS Solar 7") to purchase electric power and renewable energy credits generated by the proposed Optimist Solar Project (Project) in Clay County, Mississippi. The Project would be constructed by MS Solar 7 and is expected to generate up to 200 megawatts (MW) of alternating current (AC) output with a 50 MW AC – 200-megawatt hour (MWh) battery energy storage system (BESS). Under the terms of the PPA betweenTVA and MS Solar 7, dated December 14, 2020, TVA would purchase the electric output and renewable energy credits generated by the proposed Solar Facility for an initial term of 20 years, starting upon commercial operation and subject to satisfactory completion of all applicable environmental reviews.

The Project Site is located northeast of the city of West Point, Mississippi (Figure 1-1). The proposed Optimist Solar Project would occupy portions of 29 individual parcels, which in their entirety encompass approximately 2,952 acres of land, that MS Solar 7 would purchase for the facility. The Project would consist of multiple parallel rows containing approximately 618,000 solar photovoltaic (PV) panels on single-axis tracking structures, direct current (DC) and AC inverters, transformers, combiner boxes, switchgear, internal site access roads, substation and BESS, and other ancillary infrastructure occupying approximately 1,540 acres. The remaining acreage would support the interconnection (hereby referred to as gen-tie) to TVA's existing West Point Substation adjacent to the Project Site or remain undeveloped.

The generated power would be delivered to the electrical grid via a 161-kilovolt (kV) interconnection to the TVA transmission system. TVA's point of interconnection (POI) with the Project would be at the existing TVA West Point Substation. All interconnection work would occur at the existing TVA West Point Substation or on the Project Site.

1.1 PURPOSE AND NEED FOR ACTION

TVA is a corporate agency of the United States that provides electricity for business customers and local power companies serving nearly 10 million people in parts of seven southeastern states in a region called the Tennessee Valley. TVA's mission is to serve the people of the Tennessee Valley region, and it does that through three main areas of work – energy, the environment, and economic development.

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) (TVA 2019a, 2019b). The IRP identified the various resources that TVA intends to use to meet the energy needs of the TVA region over the 20-year planning period while achieving TVA's objectives to deliver reliable, low-cost, and cleaner energy and reducing environmental impacts. These energy resources from the 2019 IRP included the addition of between 1,500 and 8,000 MW (AC) of solar capacity by 2028 and up to 14,000 MW by

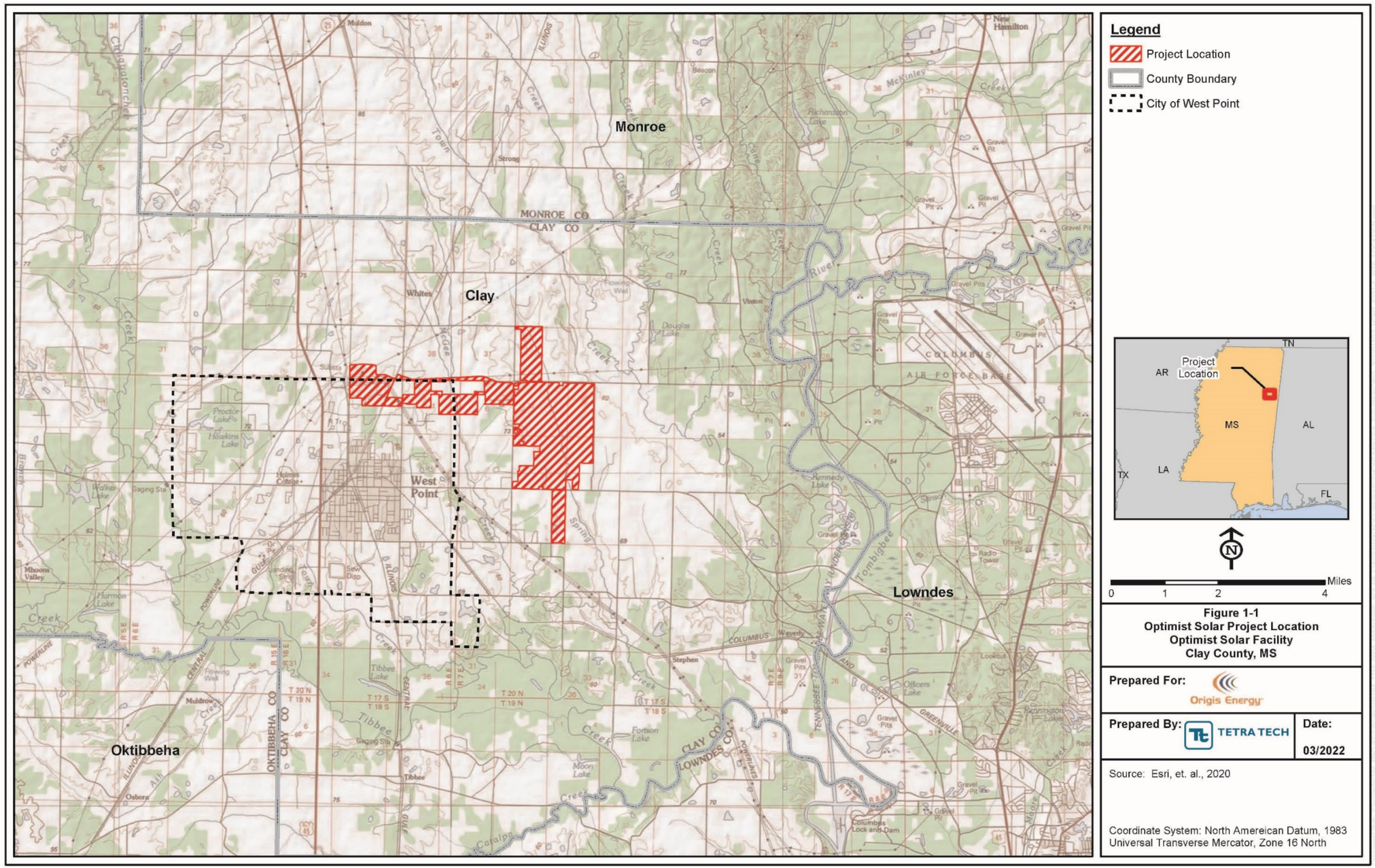


Figure 1-1
Optimist Solar Project Location
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020

Coordinate System: North Amereican Datum, 1983
Universal Transverse Mercator, Zone 16 North

Not for Construction

2038 (TVA 2019a). Customer demand for cleaner energy prompted TVA to release a Request for Proposal (RFP) for renewable energy resources (2020 Renewable RFP). The resulting MS Solar 7 PPA would help TVA meet immediate needs for additional renewable generating capacity in response to customer demands and fulfill the renewable energy goals established in the 2019 IRP. The Proposed Action would provide cost-effective renewable energy consistent with the IRP and TVA goals.

1.2 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

Pursuant to the National Environmental Policy Act of 1969 (NEPA), and its implementing regulations promulgated by the Council on Environmental Quality (CEQ) under Title 40, Code of Federal Regulations (CFR), §§ 1500-1508, Federal agencies are required to evaluate the potential environmental impacts of their proposed actions. Therefore, this Environmental Assessment (EA) was prepared in accordance with NEPA and TVA's Procedures for Implementing NEPA (18 CFR Part 1318; updated March 27, 2020) to assess TVA's Proposed Action and the associated impacts of the construction, operation, and interconnection.

TVA's Proposed Action would result in the construction and operation of the proposed Solar Facility by MS Solar 7, and would include actions to be taken by TVA to connect the Solar Facility to the TVA transmission system. The scope of this EA covers the impacts related to the construction and operation of the proposed solar and BESS facilities, gen-tie, and Project substation. It also considers impacts related to TVA's interconnection to the West Point Substation.

This EA describes the existing environment at the Project Site (Figure 1-1), analyzes potential environmental impacts associated with the Proposed Action and the No Action Alternatives, and identifies and characterizes potential cumulative impacts from the proposed Project in relation to other ongoing and reasonably foreseeable future proposed activities within the surrounding area of the Project Site.

Under the PPA, TVA's obligation to purchase power is contingent upon the satisfactory completion of the appropriate environmental reviews and TVA's determination that the Proposed Action will 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 location, operation, and/or maintenance of the proposed Project and/or associated facilities, and (2) the Project would be consistent with the purposes, provisions, and requirements of applicable federal, state, and local environmental laws and regulations.

Based on internal scoping and identification of applicable laws, regulations, executive orders, and policies, TVA identified the following resource areas for analysis within this EA: Land Use; Geology, Soils, and Prime Farmland; Water Resources; Biological Resources; Visual Resources; Noise; Air Quality and Greenhouse Gas (GHG) Emissions; Cultural Resources; Utilities; Waste Management; Public and Occupational Health and Safety; Transportation; Socioeconomics; and Environmental Justice.

This EA consists of five chapters discussing the Project alternatives, potentially impacted resource areas, and analyses of these impacts. Additionally, this document includes four appendices that contain more detail on technical analyses, supporting information, and correspondence. The organization of the EA is as follows:

- Chapter 1: Describes the purpose and need for the Project, the decision to be made, related environmental reviews and consultation requirements, 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: Provides the list of preparers for this EA.
- Chapter 5: Provides references cited in this EA.

1.3 PUBLIC INVOLVEMENT

A copy of this draft EA has been sent to local, state, and federal agencies and individuals who indicated an interest in the Project. TVA has notifiedy interested federally recognized Native American Tribes, elected officials, and other stakeholders that the draft EA is available for review and comment for a 30-day period. An electronic version of the document is posted on the TVA website where comments can also be submitted electronically. Public notices have been published in local newspapers soliciting comments from other agencies, the general public, and any interested organizations. TVA will carefully review any comments received on the draft EA and address them, as appropriate, in the final EA

1.4 PERMITS AND APPROVALS

1.4.1 Solar Facility

Section 404 of the Clean Water Act (CWA) prohibits the discharge of dredged or fill material into waters of the U.S. (jurisdictional waters), including wetlands and streams, unless authorized by the U.S. Army Corps of Engineers (USACE). The Project layout was designed to avoid wetlands and streams, as discussed in greater detail in Section 3.3 of this EA. The proposed Project impacts are expected to be minimal and occur due to the installation of access road crossings, and are anticipated to fall under the threshold of Nationwide Permit (NWP) 14. Section 404 permits require water quality certification as set forth in Section 401 of the CWA prior to discharging fill materials into waters of the U.S. The Mississippi Department of Environmental Quality (MDEQ) Stormwater and 401 Water Quality Branch administers the Section 401 water quality certification program in conjunction with the USACE. MDEQ also administers the National Pollution Discharge Elimination System (NPDES) construction stormwater permitting program in Mississippi. The proposed Project would require coverage under General Permit MSR10 for discharge of storm water from large construction projects (MDEQ 2022a). MS Solar 7 would file a Notice of Intent (NOI), including a site-specific Storm Water Pollution Prevention Plan (SWPPP).

No ordinances or requirements specific to solar and BESS facilities exist in Clay County or the City of West Point; however, both the County and City have development review processes that would apply to the Project. If any Project construction activities would occur within a floodplain, MS Solar 7 would obtain a floodplain development permit from Clay County or the City of West Point as applicable. If open burning of debris from tree clearing on the Project Site is planned, the appropriate open burning permits would be obtained from the Mississippi Forestry Commission (MFC).

1.4.2 TVA's West Point Substation

Construction of TVA's approximate 0.4-mile transmission line would either be included within the NOI and the SWPPP for the Optimist Solar Project Construction Stormwater General Permit (submitted by MS Solar 7) or subject to a separate NOI submitted directly by TVA. All other construction associated with the interconnection would take place within the existing West Point Substation. TVA is not proposing any new or rebuilt aboveground transmission lines associated with the Project.

Chapter 2 – Description of the Alternatives

This section provides a description of the analysis and criteria used in identifying the Preferred Alternative. It provides a description of alternatives considered and compares the alternatives to the Proposed Action. This EA evaluates two alternatives: The No Action Alternative and the Proposed Action Alternative.

2.1 NO ACTION ALTERNATIVE

The No Action Alternative provides a baseline of conditions against which the impacts of the Proposed Action Alternative are measured. Under the No Action Alternative, TVA would not purchase the power generated by the Project under the 20-year PPA with MS Solar 7 (i.e., TVA would not be involved with the Project). If TVA were to select this alternative and MS Solar 7 elected not to proceed with the Project, then MS Solar 7 would not construct or operate the Solar Facility. Existing conditions (land use, natural resources, visual resources, physical resources, and socioeconomics) at the Project Site would remain unchanged. TVA would continue to rely on other sources of generation described in the 2019 IRP (TVA 2019a) to ensure an adequate energy supply and to meet its goals for increased renewable energy and low GHG-emitting generation.

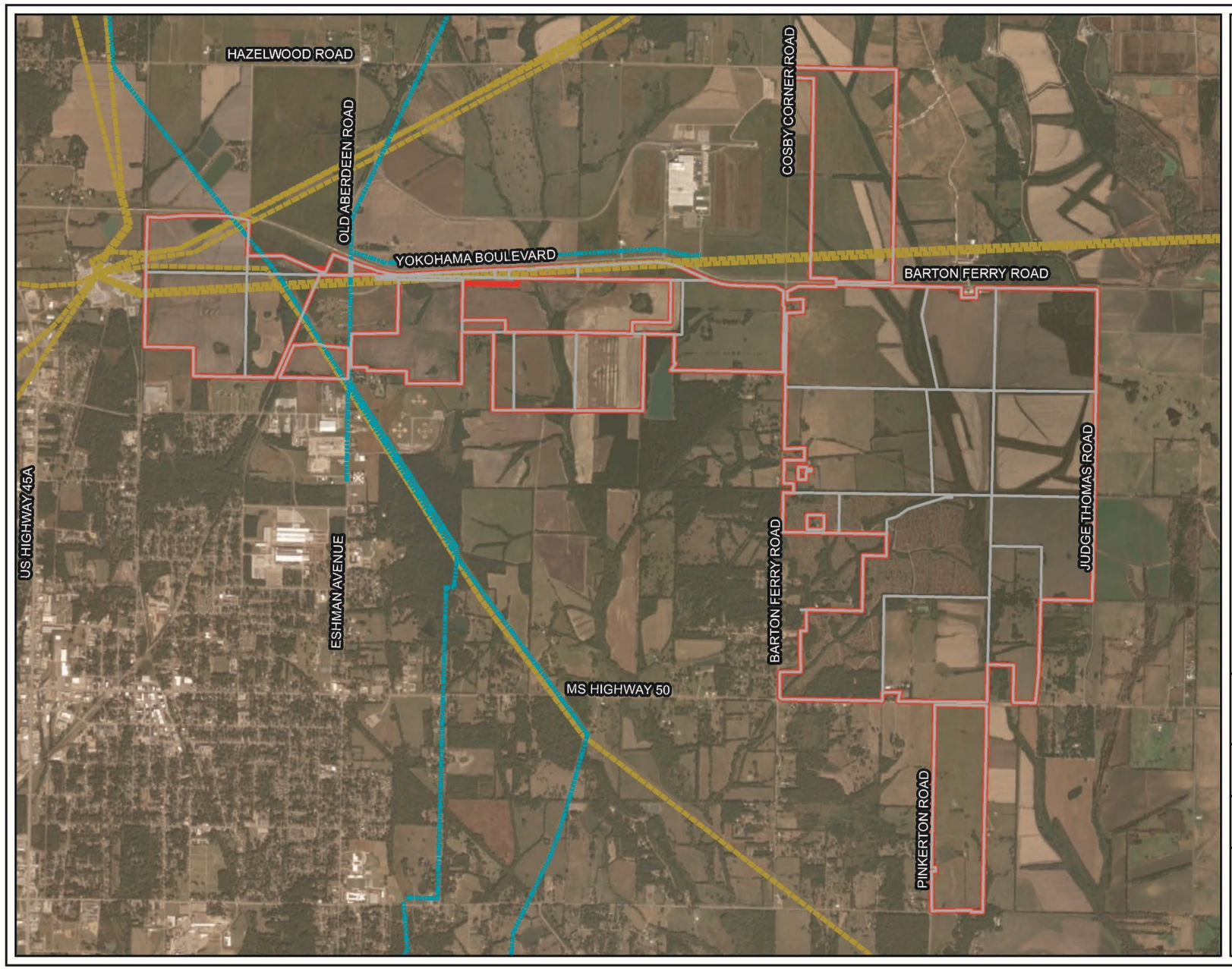
2.2 PROPOSED ACTION ALTERNATIVE

Under the Proposed Action Alternative, MS Solar 7 would construct and operate an up to 200 MW AC single-axis tracking PV solar facility with a 50 MW AC – 200 MWh BESS in Clay County, Mississippi (referred to as the Solar Facility), and TVA would purchase the renewable energy from the facility under the 20-year PPA with MS Solar 7. The Solar Facility would occupy portions of 29 individual parcels, which in their entirety encompass approximately 2,952 acres of land that make up the Project Site. Approximately 1,540 acres would be used for the PV arrays, inverters, transformers, internal site access roads, Project substation, other ancillary infrastructure, and construction laydown and parking areas. In addition, depending on the route selected, approximately 63 to 83 acres would be used for the installation of the gen-tie and TVA interconnection between the Project substation, located near the solar arrays, and TVA's West Point Substation along an easement in the parcels near the northern limits of the city of West Point. The easement parcels may also be used for installation of a collector line if the Project substation and BESS were constructed on a parcel within the Project Site adjacent to the West Point Substation. The power generated from the Solar Facility would be sold to TVA under the terms of the PPA. The Project would connect to the existing TVA electrical network via TVA's West Point Substation. Figure 2-1 provides an overview of the Project Area as well as the parcel boundaries of properties that would be affected during construction.

As discussed in Section 1.2, this EA assesses (1) the impact of TVA's action to enter into the PPA with MS Solar 7, (2) the associated impacts of the construction and operation of the Solar Facility by MS Solar 7, and (3) impacts associated with the interconnection by TVA.

2.2.1 Project Description

The proposed Solar Facility and associated TVA interconnection components would occupy portions of the Project Site that are predominantly comprised of cultivated agricultural fields and pastureland (Figure 2-1). The perimeter of the developed facilities would be enclosed with security fencing. Within the limits of the fenced facility would be the arrays of solar panels, inverters, electrical cabling, combiner boxes, switchgear, Project substation, BESS,



Legend

- Site Boundary
- Parcel
- Electrical Transmission Line
- Natural Gas Pipeline

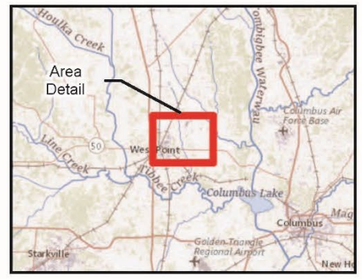


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Figure 2-1
Optimist Solar Project Site
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Clay County, 2019; Esri, et. al., 2020; Ventyx, 2021

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

Not for Construction

and other related infrastructure such as access roads and a maintenance building. The remaining portions of the Project Site would support temporary construction laydown and parking areas, structures and access roads associated with the gen-tie and interconnection, or remain undeveloped. Additional information regarding existing land use conditions is detailed in Section 3. Figure 2-2 shows the preliminary layout of the Solar Facility within the Project Site. Figure 2-3 shows layout configuration options for the substation and BESS and collector lines within the Project Site.

The Optimist Solar Facility would convert sunlight into DC electrical energy within the PV panels (modules) as generally depicted in Figure 2-4. 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 energy as photons of light and then release energy as electrons. When the free electrons are captured, an electric current is produced, which can be used as electricity (TVA 2014).

The Project would be composed of PV modules mounted together in arrays. Groups of panels would be connected electrically in series to form “strings” of panels, with the maximum string size chosen to ensure that the maximum inverter input voltage is not exceeded by the string voltage at the Project’s high design temperature. The panels would be located in blocks consisting of the PV arrays and an inverter station on a concrete pad or steel piles, which converts DC electricity generated by the solar panels into AC electricity. The modules would be attached to single-axis trackers that allow all the panels to pivot along an axis that follows the path of the sun from east to west across the sky. The trackers would be attached to steel pile foundations.

Electrical cables that connect the modules to each other are typically mounted on the back of the modules using cable trays or wire harnesses. Several rows of modules are then collected in a combiner box located at the end of one of the rows, and the output of the combiner boxes and would then be connected by underground DC cabling to central inverters that would convert the DC electricity into AC electricity so that it could be transmitted to the electrical grid. Each inverter would have a collocated medium-voltage transformer that increases the AC voltage to account for the standard electrical loss between the central inverters and the onsite Project substation. From the medium-voltage transformers, a network of underground AC powercables would connect to a single main power transformer that would be located within the 161-kV Project substation. Cables would be installed in trenches approximately 3- to 5-feet deep and 2- to 12-inches wide.

The preferred location for the Optimist 161-kV Substation would be in an area of the Project Site located south of Barton Ferry Road adjacent to the arrays (Figure 2-2). MS Solar 7 is also considering options with the Project substation and BESS located on one of two different parcels adjacent to the West Point Substation. Three options for the location of the Project substation and BESS are shown on Figure 2-3 and are all located within the Project Site study area. Power lines would be installed on poles over the 3- to 4.1-mile-long gen-tie/collector line route through the easement parcels. The lines would also be installed underground or directionally bored as necessary to avoid impacts to streams and wetlands along the route.

Other Project components would include security equipment, facility access roads, communications equipment, meteorological stations, operations and maintenance building, and Project water well and septic system. Access to the substation, BESS, and operations and maintenance building would be from Barton Ferry Road. Earth-compacted roads would provide access to each inverter block for the purposes of operations, maintenance, and repairs.

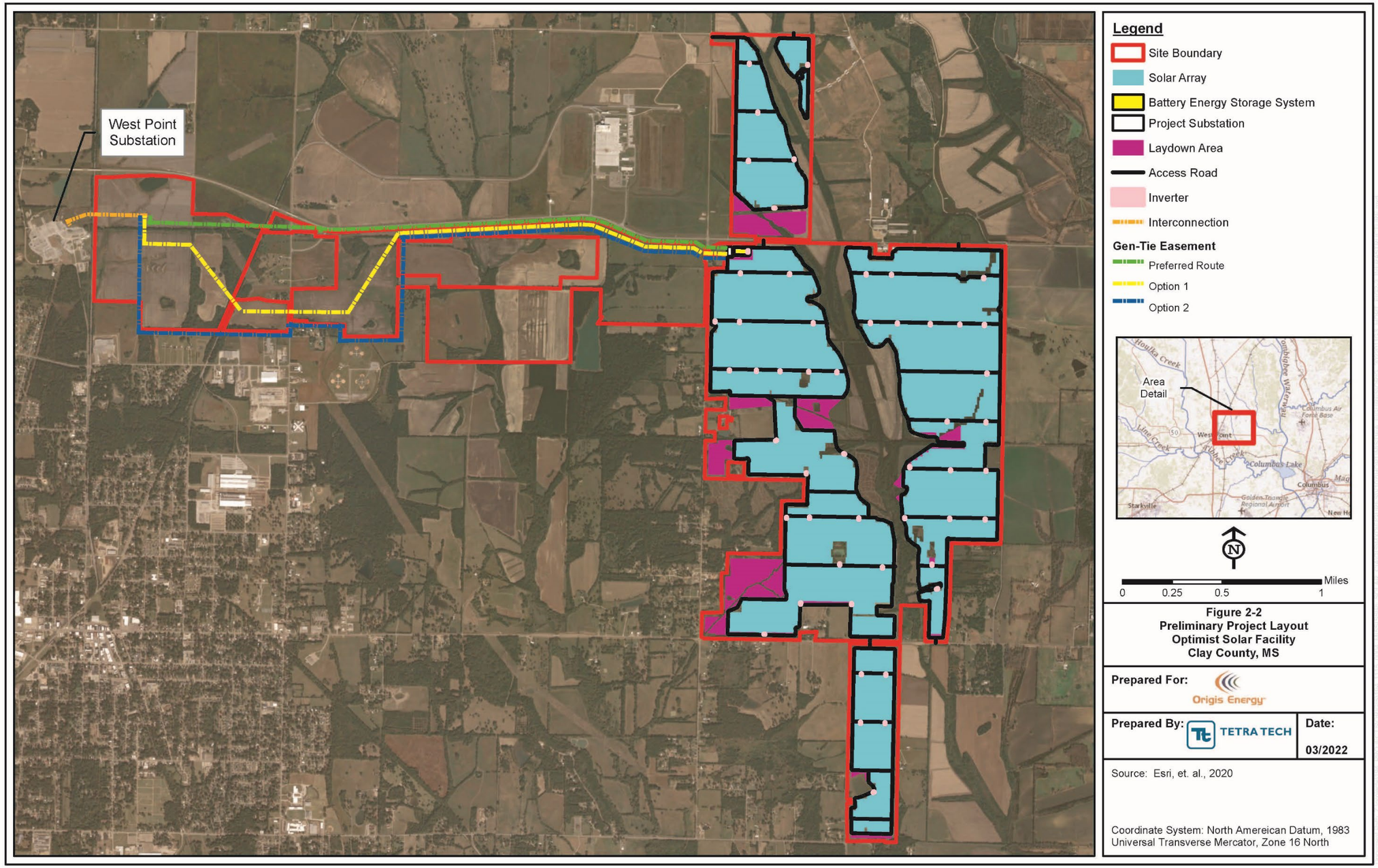

Figure 2-2
Preliminary Project Layout
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

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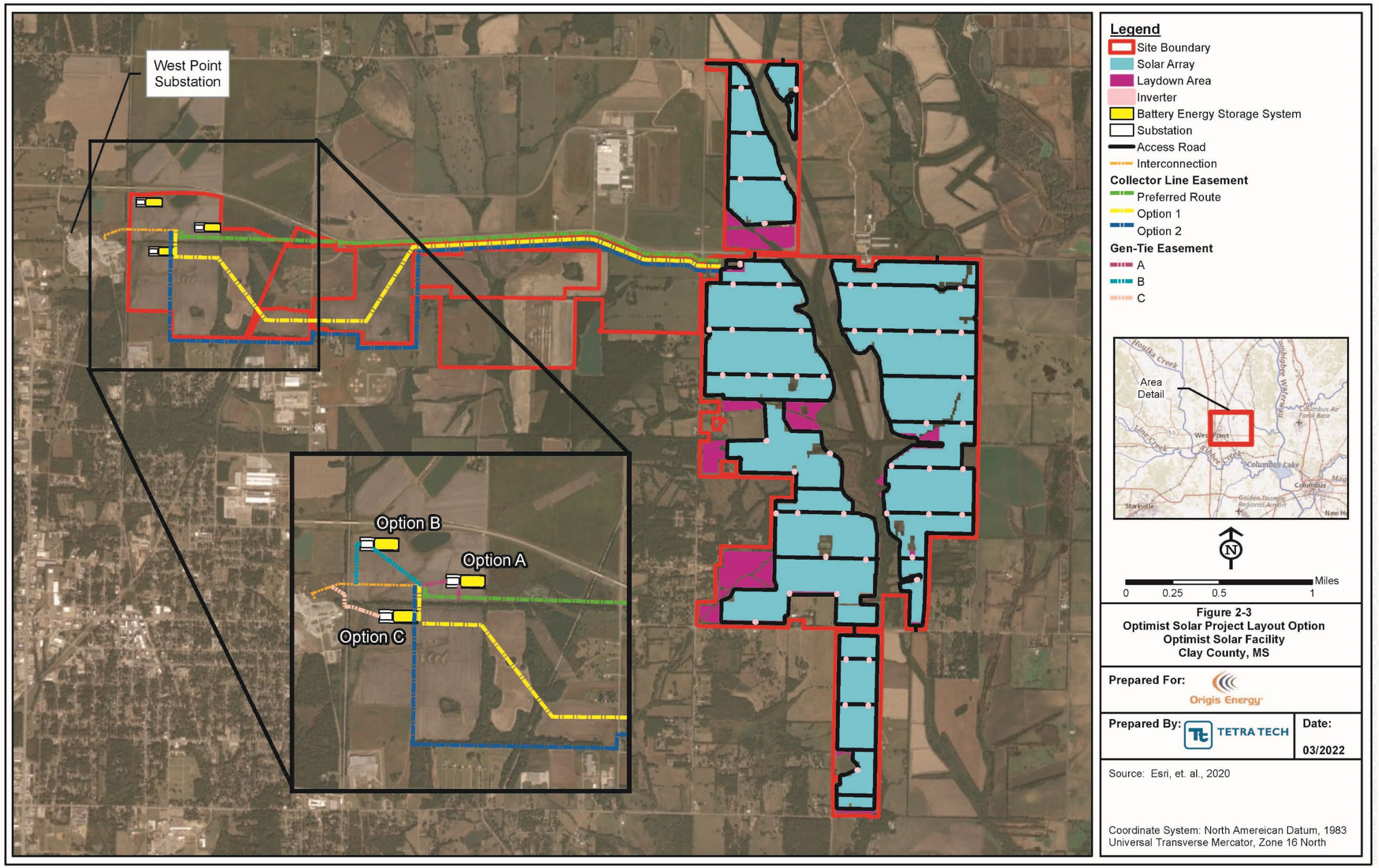

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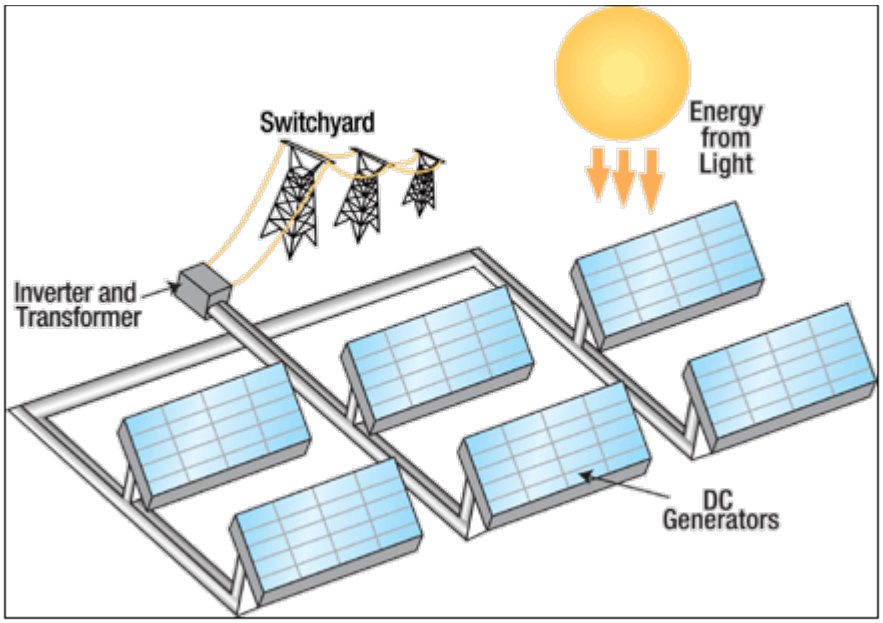

Figure 2-4. PV Solar System Energy Flow Diagram

2.2.2 Solar Facility and BESS Construction

Construction would take approximately 16 months to complete using construction crews totaling approximately 250 workers during the peak phases of construction. Work would generally occur up to seven days a week during daylight hours. Additional hours after dark could be necessary to make up schedule slippages or to complete critical construction activities. Night-time construction, if necessary, would require lighting in some areas of the Project Site. Any night-time lighting would be downward-facing and timer- and/or motion-activated to minimize impacts to wildlife and any surrounding receptors, including nearby households.

Site preparation is generally required prior to construction of a solar facility and assembly of the solar arrays. Site preparation typically includes surveying and staking, removal of tall vegetation/small trees, light grading, clearing and grubbing, installation of security fencing around components, erosion prevention and sediment control best management practices (BMPs), and preparation of construction laydown areas. Solar array assembly and construction include driving steel piles into the ground for the tracker support structures, installation of solar panels, and electrical connections and testing/verification.

Approximately 118 acres of the Project Site would be used as construction laydown areas for worker assembly, safety briefings, vehicle parking, temporary offices, and material storage during construction. Some of these assembly areas, which would be spread out across the Project parcels, would be staged within the locations proposed for the PV arrays. The laydown areas would be used for the duration of construction. Temporary construction trailers for equipment storage and office space would be parked onsite. Following completion of construction activities, most trailers, unused materials, and construction debris would be removed from the Project Site. If appropriate, an operations and maintenance building would utilize one of the last remaining construction trailers. Construction materials would be transported by truck and/or rail to the Project Site, where materials would be staged, assembled,and moved into place.

Tall vegetation would be removed within the approximate 3-mile-long easement for the proposed gen-tie line. Tree clearing during construction would be accomplished by mechanically cutting and trimming with specialized equipment. As with tree clearing associated with the solar facility, and in accordance with the MDEQ NPDES General Construction Permit conditions (*T-5; T-3(6)*), minimum 25-foot buffers surrounding streams and wetlands, supplemented with additional erosion and sediment controls which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer, would be maintained as a minimization measure during these clearing activities.

Transmission structures for the proposed gen-tie would be sited to avoid stream and wetland impacts. The types and heights of the transmission structures will be determined based on the length of the spans between each structure. Most transmission structures would be directly imbedded in holes augured into the ground to approximate maximum depths of 30 to 45 feet. The holes would be backfilled with the excavated material; if warranted due to soil conditions, gravel or a concrete-and-gravel mixture would be used. Poles (or turning structures) at angles (angle points) in the gen-tie line may require supporting screw-, rock-, or log-anchored guy wires. If required or preferred, some structures may be installed on reinforced concrete foundations. Access roads would be needed to allow vehicular access to each pole structure on the proposed gen-tie route during construction and during operations. Existing access roads would be used as much as possible, and any new access roads would be designed to avoid impacts to streams and wetlands. Access roads (for operations) are typically 12 to 20-feet wide and are surfaced with dirt, mulch, or gravel. Construction may result in greater road width disturbance for staging and construction.

MS Solar 7 would use the existing landscape, such as slope, drainages, and access roads where feasible, minimizing grading work where practicable. Grading activities would be performed using mobile earthmoving equipment. Construction would be sequenced to minimize the time that bare soil on the disturbed areas is exposed. Prior to any major grading, efforts would be made to preserve native topsoil, which would be removed from the area to be graded and stockpiled on site for redistribution over the disturbed area after the grading is completed. After construction, the disturbed areas would be seeded with a native seed mixture of certified weed-free, low-growing, noninvasive grasses, and herbaceous plants. Flowering vegetation also would be used, if available, to attract pollinator species such as honeybees and butterflies. Erosion control measures (BMPs) would be regularly inspected and maintained until vegetation in the disturbed areas has been established to the extent it meets construction stormwater permit restoration requirements. Water would be used for fugitive dust control and/or soil compaction during construction on an as-needed basis. Water used during construction would either be trucked in from a municipal source or withdrawn from an onsite water well.

To manage stormwater during construction, onsite temporary sedimentation basins, sediment traps, or diversion berms would be constructed within the disturbed area of the Project Site. If needed, a diversion berm would be constructed along portions of the Project Site perimeter to contain stormwater onsite. Any necessary sedimentation basins and/or traps would be compliant with MDEQ requirements. If necessary, sedimentation basins and traps would be constructed either by impoundment of natural depressions or by excavating the existing soil. The floor and embankments of the basins would be allowed to naturally reestablish native vegetation after construction (or replanted as necessary) to provide natural stabilization and minimize subsequent erosion. Sediment traps would be placed in strategic drainage areas to prevent sediment from entering onsite jurisdictional streams and

wetlands. Offsite sediment movement would be minimized by the placement of silt fencing around each area of ground disturbance within the Project Site. These stormwater management measures (BMPs) would minimize the potential for sediment to enter onsite jurisdictional streams and wetlands and to minimize sediment migration offsite during construction. Once sufficient revegetation cover is achieved, the Project Site would be considered stabilized and temporary construction BMPs would be discontinued and/or removed.

Construction activities would be sequenced to minimize the time that bare soil in disturbed areas is exposed. In addition to the silt fencing described above, other appropriate controls, such as temporary cover, would be used as needed to minimize exposure of soil and eroded soil from leaving the work area. Disturbed areas, including road shoulders, construction office and laydown areas, ditches, and other Project-specific locations, would be seeded post-construction. If conditions require, soil may be further stabilized by mulch or sprayable fiber mat. As part of NPDES permit authorization (see Section 1.4.1), the site-specific SWPPP would be finalized with the final grading and civil design and would address all construction-related activities prior to initiating construction.

The design of the tracker support structures could vary depending on the final PV technology and vendor selected. Pending completion of the geotechnical survey for the Project Site, the trackers are assumed to be attached to driven steel pile foundations. The steel pile foundations are typically galvanized and used where high load-bearing capacities are required. The pile is driven with a hydraulic ram. Soil disturbance is restricted to the pile insertion location to a depth typically less than 10 feet below grade; there is also potential for temporary soil disturbance from the hydraulic ram machinery, which is about the size of a small tractor. The tracker design and pile foundation design would be sealed by a registered Professional Engineer and Structural Engineer, respectively. Screw piles are another option for PV foundations which are drilled into the ground with a truck-mounted auger, although typically reserved for use in specific soil conditions. Screw piles create a similar soil disturbance footprint as driven piles.

Solar panels would be manufactured offsite and shipped to the Project Site ready for installation. All final electrical collection cables would be underground, and electricians and assistants would run the electrical cabling throughout the Solar Facility. The panels within an array are connected to each other by cables typically mounted on the back of the modules using cable trays or wire harnesses. Several rows of modules would then be collected in a combiner box located at the end of one of the rows. The output of the combiner boxes would then be connected by underground electrical cables and delivered to the inverters. The trenches to hold the cabling would be approximately 3- to 5-feet deep and 2- to 12-inches wide. The trenches would be backfilled with native soil and appropriately compacted. Collection cables would be installed by boring under streams and wetlands or floodplains.

MS Solar 7 is proposing using a pre-engineered metal structure enclosure on a concrete foundation to house the BESS. The exact size and specifications of the enclosure would be contingent on the battery chemistry and other parameters, although the enclosure is anticipated to be similar to a shipping container, measuring approximately 8 feet wide by 40 feet long. The enclosure would be furnished with a fire suppression system, ventilation and air conditioning system, and supporting electrical equipment. The BESS enclosure would be designed and installed in conformance with all applicable standards and electrical codes. Chemical fire suppression systems are typically utilized for BESS installations. The BESS would be collocated with the Project substation and occupy approximately 3 acres

either adjacent to Barton Ferry Road near the PV arrays or at one the parcels adjacent to the West Point Substation.

Lithium ion (Li–ion) batteries are most commonly used for utility-scale energy storage, accounting for more than 90 percent of such installations. Li-ion batteries use the exchange of lithium ions between electrodes to charge and discharge the battery. Li-ion batteries are typically characterized as power devices capable of short durations or stacked to form longer durations of power. It should be noted that the battery component of the BESS has not yet been finalized, and MS Solar 7 is also considering battery technology other than Li-ion batteries.

After the equipment is electrically connected, electrical service would be tested, motors would be checked, and control logic would be verified. As the solar arrays are installed, the balance of the facility would continue to be constructed and installed, and instrumentation would be installed. Following the testing of all of the individual systems, integrated testing of the Project would occur. Electrical interconnection details are provided in the following section.

2.2.3 TVA Electrical Interconnection

Under the Proposed Action, TVA would construct the POI within the existing TVA West Point Substation. The proposed Project substation would be located approximately 3 miles east of the West Point Substation. MS Solar 7 would construct a gen-tie from the Project substation to a “dead end” pole in the parcel within the Project Site immediately east the West Point Substation. TVA would construct a 0.4-mile-long transmission line from the “dead end” pole to the POI within the West Point Substation. The Project substation could be located on one of the parcels adjacent to the West Point Substation within the Project Area, as shown on Figure 2-3. Depending on the location, a gen-tie would connect the Project substation to the “dead end” pole where it would connect with the TVA transmission line or TVA would construct a transmission line connecting the Project substation with the West Point Substation.

2.2.4 Operations

Operation of the Optimist Solar Facility would require 3 to 4 full-time employees to manage the Solar Facility and conduct regular inspections. Inspections would include identifying any physical damage of panels, wiring, inverters, transformers, and interconnection equipment, and drawing transformer oil samples. Vegetation on developed portions of the Project Site would be maintained to control growth and prevent overshadowing or shading of the PV panels. Trimming and mowing would likely be performed several times per year, depending on growth rate, to maintain an appropriate ground cover height of no more than approximately 12 to18 inches. During operation of the Solar Facility, selective use of U.S. Environmental Protection Agency (USEPA)-approved spot herbicides may also be employed around structures to control invasive weeds.

The proposed Solar Facility would be monitored remotely from Origis Energy’s Control Center in Austin, Texas, 24 hours a day, seven days a week to identify security or operational issues. In the event a problem is discovered during non-working hours, a repair crew or law enforcement personnel would be contacted if an immediate response were warranted.

Moving parts of the Solar Facility would be restricted to the east-to-west tracking motion of the single-axis solar modules, which amounts to a movement of less than a one degree angle every few minutes. This movement 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. Otherwise, the PV modules would simply collect solar energy and transmit it to the TVA power grid. With the exception of fence repair, vegetation control, periodic array inspection, equipment repairs, and maintenance, the Solar Facility would have relatively little human activity during operation. No significant physical disturbances would occur during operation.

Permanent lighting is anticipated as a potential onsite need during facility operations. Permanent lighting would be downward-facing and timer- and/or motion-activated to minimize impacts to surrounding areas.

The onsite operations and maintenance building would be located adjacent to the solar arrays. It would require a water source and a septic system.

Rainfall in the region should be adequate to remove dust and other debris from the PV panels while maintaining acceptable energy production; therefore, manual panel washing is not anticipated unless a site-specific issue is identified. If necessary, module washing would occur no more than twice a year and would comply with appropriate BMPs.

2.2.5 Decommissioning and Reclamation

MS Solar 7 would operate the Project and sell power to TVA under the terms of the PPA for the first 20 years of its life. At the end of the term of the PPA, MS Solar 7 would assess whether to cease operations at the Solar Facility or to replace equipment and attempt to enter into a new PPA or make some other arrangement to sell the power. If operations cease, the facility would be decommissioned and dismantled, and the Project Site would be restored. In general, most decommissioned equipment and materials would be recycled. Materials that could not be recycled would be disposed of at an approved facility in accordance with federal, state, and local laws and regulations. As MS Solar 7 would purchase the land required for the Solar Facility from the landowners, site control would be maintained for longer than the 20-year PPA period, and MS Solar 7 may attempt to renegotiate further PPA terms with TVA. At the end of the 20-year contract period, TVA may also choose to purchase and operate the facility. If additional PPA terms are arranged or if TVA chooses to operate the facility, these activities would be evaluated through separate NEPA processes.

2.3 COMPARISON OF ALTERNATIVES

This EA evaluates the potential environmental effects that could result from implementation of the No Action Alternative or the Proposed Action Alternative at the proposed Project Site in Clay County, Mississippi. The analysis of impacts described in this EA is based on current conditions as well as potential future conditions on the parcels associated with the Project and the surrounding area. A comparison of potential impacts from each alternative is summarized in Table 2-1.

Table 2-1. Comparison of Impacts by Alternative

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
Land Use	No direct or indirect impacts anticipated.	Conversion of agricultural/pastureland to industrial uses such as solar generation is consistent with Clay County's Comprehensive Plan. Zoning change would be required for construction within the City of West Point. Minor changes from Project construction would not result in a long-term adverse direct impact.

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
Geology, Soils, and Prime Farmlands	No direct or indirect changes anticipated.	Geology: Minor direct impacts on potential shallow subsurface geological resources.
		Soils: Minor, direct, adverse impacts on soils from potential minimal increases in erosion and sedimentation during construction. Once stabilized and facility is operational, impacts on soils would be offset by the beneficial effects to soil health with the use of native and noninvasive vegetation.
		Farmlands: Minor, direct adverse impacts from the removal of approximately 1,378 acres of prime farmland from agricultural use for the duration of the Project.
Water Resources	No direct or indirect changes to current conditions anticipated.	Groundwater: Negligible direct impacts on the supply from use of a new water well during operation of Solar Facility. Minor beneficial effects are anticipated from the reduction in fertilizer and pesticide use and restoration of native vegetation.
		Surface water: Minor beneficial impacts on surface water due to the reduction in fertilizer and pesticide use once agricultural operations have ceased. Minor short-term impacts from erosion and sedimentation during construction (until site is stabilized).
		Wetlands: Minimal permanent impacts on wetlands. Proposed placement of permanent structures (i.e., culverts, road improvements) in wetlands along an existing access road.
		Floodplains: There are approximately 361 acres of Federal Emergency Management Agency (FEMA) designated floodplain within the Project Site. MS Solar 7 would not install arrays or other structures within the floodplain. Potential for poles to be placed in floodplains along easement route.
Biological Resources	No direct or indirect impacts anticipated.	Vegetation: Minor direct impacts to vegetation by clearing of approximately 172 acres of forest within the portion of the Project Site proposed for development and revegetating this portion of the Project Site.
		Wildlife: Minor adverse impacts to common species due to changes to habitat during construction. The Project is not anticipated to significantly affect populations of migratory bird species of concern. Impacts to nesting species of concern would be mitigated to an extent by the proposed restrictions on tree clearing during the northern long-eared bat pup season (June 1 – July 31).
		Rare, Threatened and Endangered Species: With seasonal restrictions on tree removal in suitable bat habitat and use of BMPs, the Project is not expected to significantly affect federally or state-listed species. Consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA is

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
		underway regarding potential impacts to federally listed bats.
Visual Resources	No direct or indirect impacts anticipated.	Minor temporary impacts on visual resources would occur due to the alteration of the existing agricultural viewshed and increased activity during construction. During operation of the Solar Facility, moderate direct impacts in the immediate Project vicinity due to the presence and quantity of PV panels. Impacts on residents on adjoining properties and visitors travelling on roadways in the vicinity would be minimized through the presence of existing natural screening buffers including forest areas. If existing buffers are not sufficient in shielding residents from the Solar Facility, MS Solar 7 would install privacy fence or shrubbery along the perimeter of the Project Site on a case-by-case basis.
Noise	No direct or indirect impacts anticipated.	Minor temporary noise impacts would be experienced during construction. Negligible adverse impacts from noise associated with operation and maintenance.
Air Quality and Greenhouse Gas Emissions	No direct or indirect impacts anticipated.	Air Quality: Minor direct impacts on air quality could occur during site preparation involving heavy, earth moving construction equipment (temporary emissions). No adverse impacts on air quality from operations.
		GHG: Temporary and minor increases in GHG emissions would be expected during construction from operation of equipment. However, a net positive impact would occur from operation of nearly emissions-free power generation by the Solar Facility, offsetting the need for power that would otherwise be generated by the combustion of fossil fuels.
Cultural Resources	No direct or indirect impacts anticipated.	Archaeological Resources: No impacts on any National Register of Historic Places (NRHP)-listed or eligible archaeological sites.
		Architectural Resources: Recommendation of no adverse effect on architectural resources.
Utilities	No direct or indirect impacts anticipated.	No direct or indirect adverse impacts are anticipated to utilities. Long-term beneficial impact to electrical services across the region.
Waste Management	No direct or indirect impacts anticipated.	No impacts on waste management would be anticipated.
Public and Occupational Health & Safety	No direct or indirect impacts anticipated.	Minor, temporary impacts during construction. No public health or safety hazards would be anticipated during operation.

Resource Area	Impacts from the No Action Alternative	Potential Impacts from the Proposed Action Alternative
Transportation	No direct or indirect impacts anticipated.	Due to increases from workers commuting to and from the Project Site during construction, a minimal impact on traffic flow would be anticipated during construction. Negligible direct impacts and no indirect impacts on transportation would occur during operation.
Socioeconomics	No direct or indirect impacts anticipated.	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. Positive, long-term, direct impacts on economics and population from Project operation. The local tax base would increase from construction of the Solar Facility which would benefit Clay County, the City of West Point, and the Golden Triangle region of eastern Mississippi.
Environmental Justice	No direct or indirect impacts anticipated.	There would not be disproportionately high or adverse direct or indirect impacts on minority or low-income populations.

2.4 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

MS Solar 7 would implement minimization and mitigation measures for resources potentially affected by the Project. These measures would be developed in conjunction with industry-proven BMPs, requirements of regulatory permits, and adherence to the following plans:

- SWPPP,
- Spill Prevention, Control, and Countermeasures (SPCC) Plan, and
- Unanticipated Discovery Plan for Cultural Resources.

Additional details are provided in sub-sections 2.5.1 and 2.5.2.

2.4.1 Optimist Solar Facility

MS Solar 7 would implement the following minimization and mitigation measures in relation to potentially affected resources:

- Land use and visual resources
  - Where existing natural buffers are not sufficient in shielding residents on adjoining parcels from the Solar Facility, MS Solar 7 would install a privacy fence or shrubbery along the perimeter of the Project Site
- Geology and soils:
  - Install silt fencing along the perimeter of areas that would be cleared, consistent with local and state stormwater regulations
  - Implement other soil stabilization and vegetation management measures to reduce the potential for soil erosion during site operations
  - Make an effort to balance cut-and-fill quantities to alleviate the transportation of soils off-site during construction

- Water resources:
  - Regarding revegetation and restoration following site disturbance, maintain stormwater BMPs in each area according to the TVA BMP Manual (TVA 2017) until stabilization (adequate vegetation regrowth) has been achieved
  - Avoid direct impacts on perennial and intermittent streams by maintaining a 25-foot riparian buffer at perennial and intermittent streams and wetlands in accordance with MDEQ NPDES General Construction Permit conditions
  - Avoid construction within floodplains. Road improvements would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot
  - Use only USEPA-registered and TVA approved herbicides in accordance with label directions designed
- Biological resources:
  - Plant or seed with noninvasive vegetation and include native and naturalized plant species to create beneficial habitat, reduce erosion, and limit the spread of invasive species
  - Plant vegetation that benefits pollinator species to the extent practicable
  - Install timer- and/or motion-activated downward facing security lighting to limit attracting wildlife, such as migratory birds and bats
  - Avoid or minimize direct impacts on nesting and migratory birds and bats, as well as federally listed species, by clearing trees outside of the northern long-eared bat (NLEB) pup season (June 1–July 31)
  - Install temporary construction fencing around sensitive natural resources that should be avoided
- 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:
  - Emphasize BMPs for site safety management to minimize potential risks to workers
  - Use dust mitigation activities such as watering dry exposed soils, covering open-body trucks, and establishing a speed limit to minimize fugitive dust
- Transportation:
  - Should traffic flow become a problem, consider implementation of staggered worker shifts during construction and a flag person along the roadside during deliveries that may coincide with heavy commute times to manage the flow of traffic near the Project Site

2.4.2 TVA Electrical Interconnection

TVA employs standard Good Utility Practices when constructing, operating, and maintaining transmission lines, structures, and the associated right of way (ROW) and access roads. Some of the more specific routine measures that would be taken to reduce the potential for adverse environmental effects during the construction, operation, and maintenance of the proposed interconnection to the West Point Substation are as follows:

- TVA would employee standard BMPs, as described in A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities – Revision 3, TVA's BMP manual (TVA 2017), to minimize erosion during construction, operation, and maintenance activities.
- To minimize the introduction and spread of invasive species at the Project Site, access roads, and adjacent areas, TVA would follow standard operating procedures consistent with Executive Order (EO) 13112 (Invasive Species) for revegetating the areas with noninvasive plant species as defined by TVA (2017).
- In areas requiring chemical treatment, only USEPA-registered and TVA approved herbicides would be used in accordance with label directions designed, in part, to restrict applications near receiving waters and to prevent impacts to aquatic resources.

Further guidance for clearing and construction activities can be found in Appendix A.

2.5 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 direct and indirect environmental impacts due to the implementation of BMPs and minimization and mitigation efforts, as described in Section 2.5.1 and Section 2.5.2. 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.

Chapter 3 – Affected Environment and Environmental Consequences

3.1 LAND USE

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. This section provides an overview of the existing and surrounding land use at the Project Site and the potential impacts on land use associated with the No Action and Proposed Action Alternatives.

3.1.1 Affected Environment

Most of the Project Site is in the unincorporated portion of Clay County (Figure 1-1). The county does not have a land use plan for unincorporated areas nor are the unincorporated areas subject to zoning restrictions.

Portions of the Project Site are within the corporate limits of the City of West Point. The City has established zoning districts (West Point 2004) and adopted a zoning and land development ordinance (West Point 2000). Current zoning for the portions of the Project Site within the City is A-O, Agricultural Open District (West Point 2004). There are no City ordinances specific to solar and/or BESS facilities. In areas zoned A-O, public utility facilities are “major conditional uses” subject to approval by the Board of Mayor and Selectmen in accordance with the procedures established in Chapter 5, Part 4 of the Development Code (West Point 2000).

The City of West Point has developed a Comprehensive Plan (West Point 2017a). The plan addresses land within the city limits and a comprehensive planning area that extends east of the city and north to the Clay County/Monroe County line, encompassing most of the land associated with the Project. Chapter 4 of the land development ordinance (West Point 2000) requires all development within the city be in accordance with the applicable provisions of the Comprehensive Plan. The plan’s Future Land Use map (Map 5.1) designates much of the area along Yokohama Boulevard from U.S. Highway 45 Alternate to the Yokohama Tire plant as Heavy Industrial (I-2), including a portion of the Project Site.

Images generated using the U.S. Geological Survey (USGS) National Land Cover Database (USGS 2019) show the Project Site as primarily pasture (60 percent) and cultivated crops (32 percent) with scattered areas of woody wetlands, some forested areas, and minimal development (Figure 3-1). Agricultural, rural-residential, and undeveloped land uses dominate the landscape in all directions from the Project Site with the exception of the Yokohama Tire plant, the West Point Substation, and development to the southwest in the City of West Point. Small residential areas are located along Barton Ferry Road, Mississippi Highway 50, and Judge Thomas Road adjacent to the portion of the Project Site in which the PV arrays would be located.

Available historical aerial photographs and topographic quadrangles show that current land use of the Project Site has remained primarily agriculture/pasture with no significant land use changes in recent history (USGS 2022a). Over this time, land uses in the vicinity have been primarily agricultural and rural residential. The major elements, such as US Highway 45, US Highway 45 Alternate, Mississippi Highway 50, the TVA’s West Point Substation and associated transmission lines were present by 1953 except for the addition of several

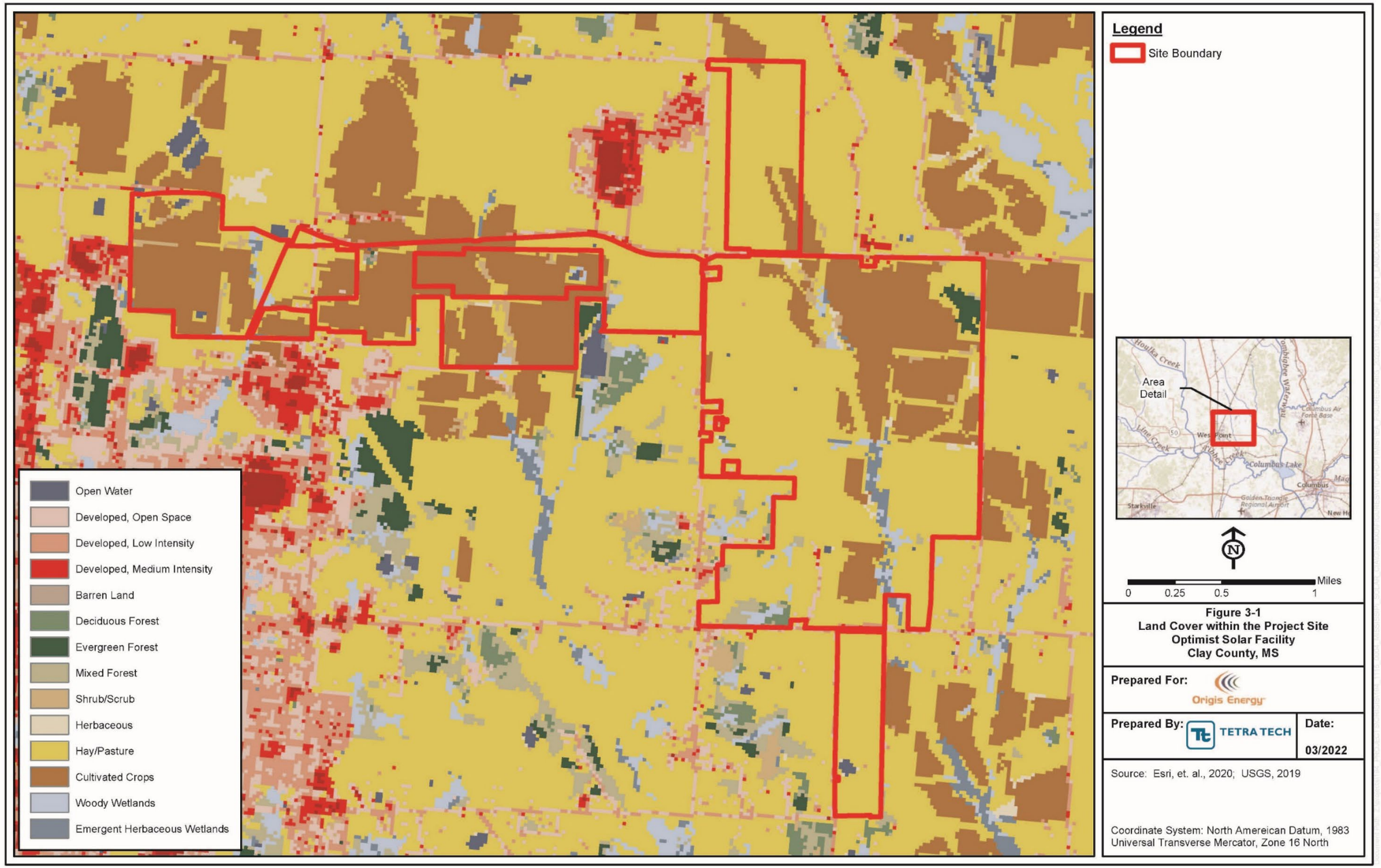

Figure 3-1
Land Cover within the Project Site
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH **Date:** 03/2022

Source: Esri, et. al., 2020; USGS, 2019

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

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transmission lines by the 1980s. The Yokohama Tire plant was constructed between 2013 and 2015 on more than 500 acres of land north of the Project Site (Yokohama Tire 2015). Construction of Yokohama Boulevard was also completed at that time.

3.1.2 Environmental Consequences

3.1.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed; therefore, no Project-related impacts to land use would be expected. Agriculture would likely continue to be the primary activity and land use within the Project Site.

3.1.2.2 Proposed Action Alternative

Under the Proposed Action, approximately 1,540 acres of mostly agricultural land (cultivated crops/pasture) would be converted to renewable energy production. In planning and designing the Solar Facility, MS Solar 7 has limited development to cropland and pastureland to the extent practicable, thus minimizing tree clearing and avoiding impacts to wetlands.

Most of the Project Site is rural with no zoning restrictions. A zoning change would be needed for development in the portion of the Project Site within the City of West Point (not including gen-tie or collector lines). The preferred location for the Project substation/BESS and preferred routing of the gen-tie/collector line (Figure 2-2) are entirely in Clay County, as are the Options A and B Substation/BESS locations just to the south of Yokohama Boulevard (Figure 2-3). The Option C Substation/BESS location and both Options 1 and 2 gen-tie/collector line routes fall within the city limits and would require a zoning change for the BESS. However, the Substation/BESS and the gen-tie/collector lines require a small land commitment. Most of the land in that portion of the Project Site would continue to be used for agriculture. That portion of the Project Site includes several existing transmission lines traversing the agricultural fields and terminating at the West Point Substation.

The development of the Project Site for industrial purposes is compatible with future land use plans for the area adjacent to Yokohama Boulevard as identified in the City of West Point's Comprehensive Plan. There are existing industrial land uses in the area directly north and to the southwest of the Project Site. The addition of the solar facility would result in an expansion of industrial land use in Clay County to the northeast of the city of West Point, where agricultural use currently dominates. Undeveloped areas of the Project Site along the gen-tie/collector line route could remain in agricultural use during operation of the Solar Facility. Minor direct impacts are anticipated from the conversion of pasture and actively cultivated crops in agricultural land use to renewable energy production.

There are no protected lands within the vicinity of the Project Site. The West Point Sportsplex is located east of Eshman Avenue on property directly south of the Project Site. Development of the Project would not impact the public recreational activities or facilities.

The Solar Facility would be compatible with surrounding land use. Development within the Project Site would be consistent with local land use planning and zoning. If operations cease, the facility would be decommissioned and dismantled, and the Project Site restored (see Section 2.2.5). Some of the Project Site could be returned to agricultural use or used for other development purposes as allowed by local zoning regulations and land use plans. In summary, implementation of the Proposed Action would have minor impacts on land use, locally and regionally.

3.2 GEOLOGY, SOILS, AND PRIME FARMLAND

3.2.1 Affected Environment

Geology

The Project Site lies within the Black Belt Prairie physiographic region of Mississippi (MSU 2016). The Black Belt Prairie is an important agricultural region abundant with soils rich in organic matter but thick with clay, making tree growth difficult (Mississippi University 1943). The underlying bedrock within the solar facility consists of marly chalk and calcareous clay of the Mooreville Chalk geologic unit in the Selma Group. Part of the gen-tie route to the west has Demopolis chalk as the underlying bedrock, which contains less clay than the Mooreville unit (Horton 2017).

Geological Hazards

The USGS places the Project Site in an area of "unconsolidated calcareous or carbonate rocks at or near the land surface" in a region with humid climate. In the humid parts of the United States (areas receiving greater than 30 inches of mean annual precipitation), most karst features such as caves and sinkholes occur in carbonate (limestone and dolomite) rocks (Weary and Doctor 2014), such as the geologic units described above. No caves, karst terrain, or other unique geological features (e.g., limestone or chalk outcrops) were observed during 2021 ecological field surveys (Tetra Tech 2021a, 2021b).

Earthquakes and ground failures are uncommon in Mississippi; however, these events can pose threats to human life and property. Mississippi has been affected by numerous shocks in neighboring states; the greatest risk to Mississippi from earthquakes is from a strong earthquake in the New Madrid Seismic Zone, the southern end of which is approximately 40 miles from the northwest corner of Mississippi and 175 miles from the Project Site (MDEQ 2021). In 1811 and 1812, a series of great earthquakes near the New Madrid, Missouri area were felt in Mississippi as far south as the Gulf Coast and caused the banks of the Mississippi River to cave in as far south as Vicksburg. Shaking from earthquakes can cause ground failure of various types, including liquefaction and landslides. USGS has estimated a 25-40 percent chance of a magnitude 6.0 and greater earthquake in the next 50 years within the New Madrid seismic zone and about a 7-10 percent probability of a repeat of the 1811-1812 earthquakes in the same time period, but cannot accurately predict where the earthquakes might occur or how far shaking effects would carry (USGS 2009).

The USGS Earthquake Hazards Program publishes seismic hazard map data layers that display the peak ground acceleration with two percent probability of exceedance in 50 years (Petersen et al. 2014); the potential ground motion for the Project Site is 0.1 acceleration of gravity (g). A 0.1 g earthquake will have a strong perceived shaking with a light potential for structural damage (USGS 2000).

Soils

The Project Site is located within Major Land Resource Area (MLRA)-135A (Alabama and Mississippi Blackland Prairie), which is characterized by young soils without an illuvial "B" horizon (inceptisols) and soils with high clay content that shrink and swell depending on moisture content (vertisols) (NRCS 2022a). The major soil resource concerns are water erosion, maintaining productivity of the soils, conserving organic matter content, and management of soil moisture. The infestation of Johnsongrass is a management concern in cultivated areas. Conservation practices on cropland generally include systems of crop residue management, cover crops, crop rotations, water disposal, pest management, and nutrient management (NRCS 2022a).

Based on the Natural Resources Conservation Service (NRCS) Soil Survey, 13 soil types are found in the Project Site (Figure 3-2). In general, silty clay soils are the dominant soil type (76.6 percent) followed by silt loam (20.7 percent), and other textures. Although 13 soil types are documented within the Project Site, approximately 83 percent of the soil cover is represented by these three soil types: Okolona silty clay (37.0 percent), Griffith silty clay (25.6 percent), and Kipling silt loam (20.7 percent). The Okolona series consists of deep, well drained, very slowly permeable soils in uplands of the Blackland Prairie MLRA. These are nearly level to gently sloping soils (0 to 5 percent) that formed in calcareous clayey material that is underlain by marly clay and chalk. These soils have very high shrink-swell potential. The Griffith series consist of moderately well drained, very slowly permeable soils on floodplains. These nearly level (0 to 2 percent) soils formed in clayey alluvium along streams that drain areas of the Blackland Prairie. The Kipling series consists of very deep, somewhat poorly drained, very slowly permeable soils on uplands and terraces of the Blackland Prairie. They formed in clayey marine sediments (NRCS 2022b).

Three soil types classified as hydric (Griffith silty clay, Leeper silty clay, and Una clay loam), represent 28 percent (823.7 acres) of the Project Site.

Prime Farmland

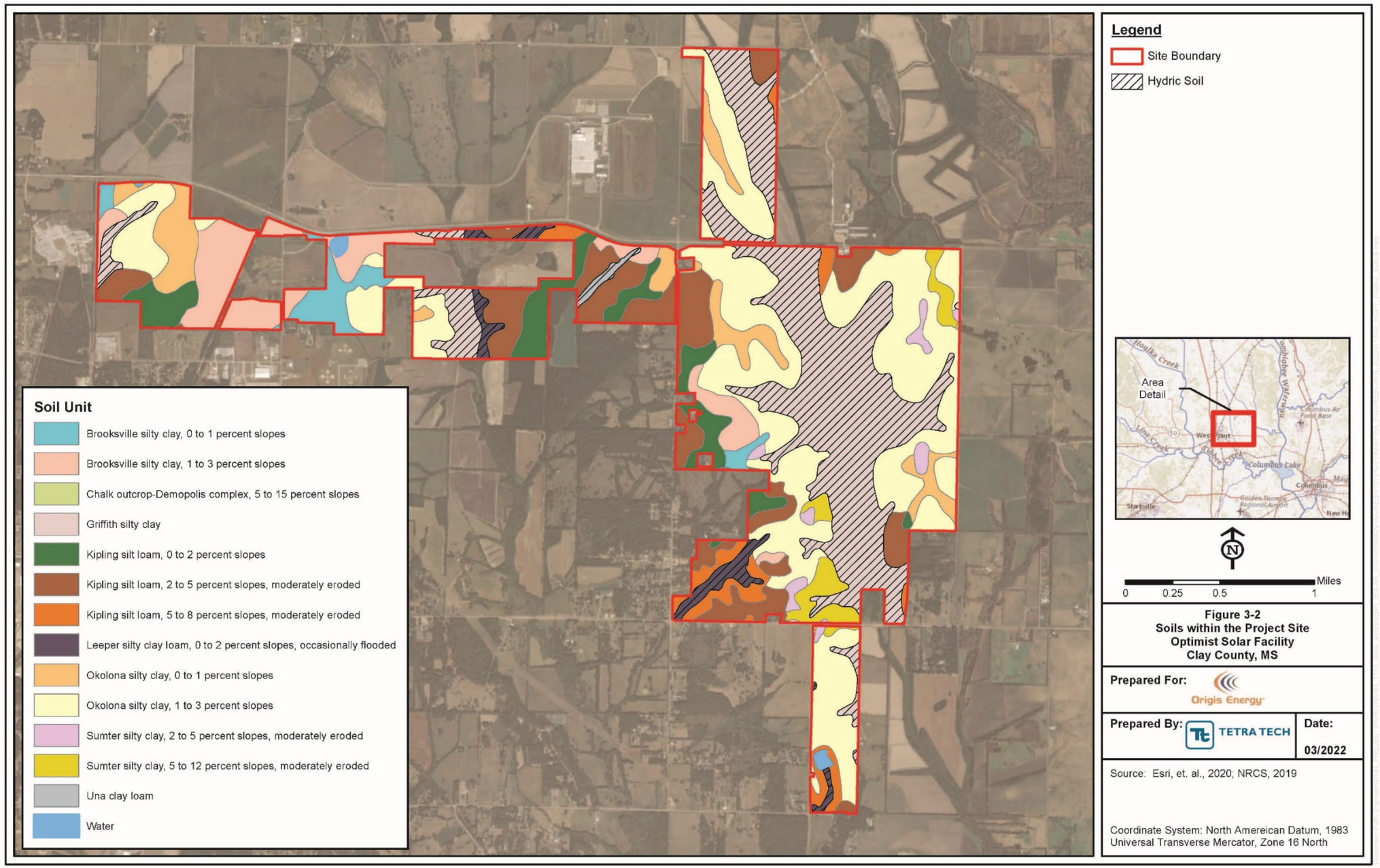
Prime farmland, as defined by the U.S. Department of Agriculture (USDA), is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. It has the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding (7 CFR 657).

Mississippi recognizes two categories of Important Farmlands: (1) Prime Farmland and (2) Additional Farmland of Statewide Importance. There are 2,742 acres of prime farmland within the Project Site (92.9 percent); 823.7 of those acres are considered prime farmland if drained and protected from flooding/not frequently flooded during the growing season (Figure 3-3). Another 127.4 acres are classified as Farmland of Statewide Importance (4.3 percent).

3.2.2 Environmental Consequences

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed; therefore, no Project-related impacts to geology or soil resources would be expected. Agriculture would likely continue to be the primary activity within the Project Site.



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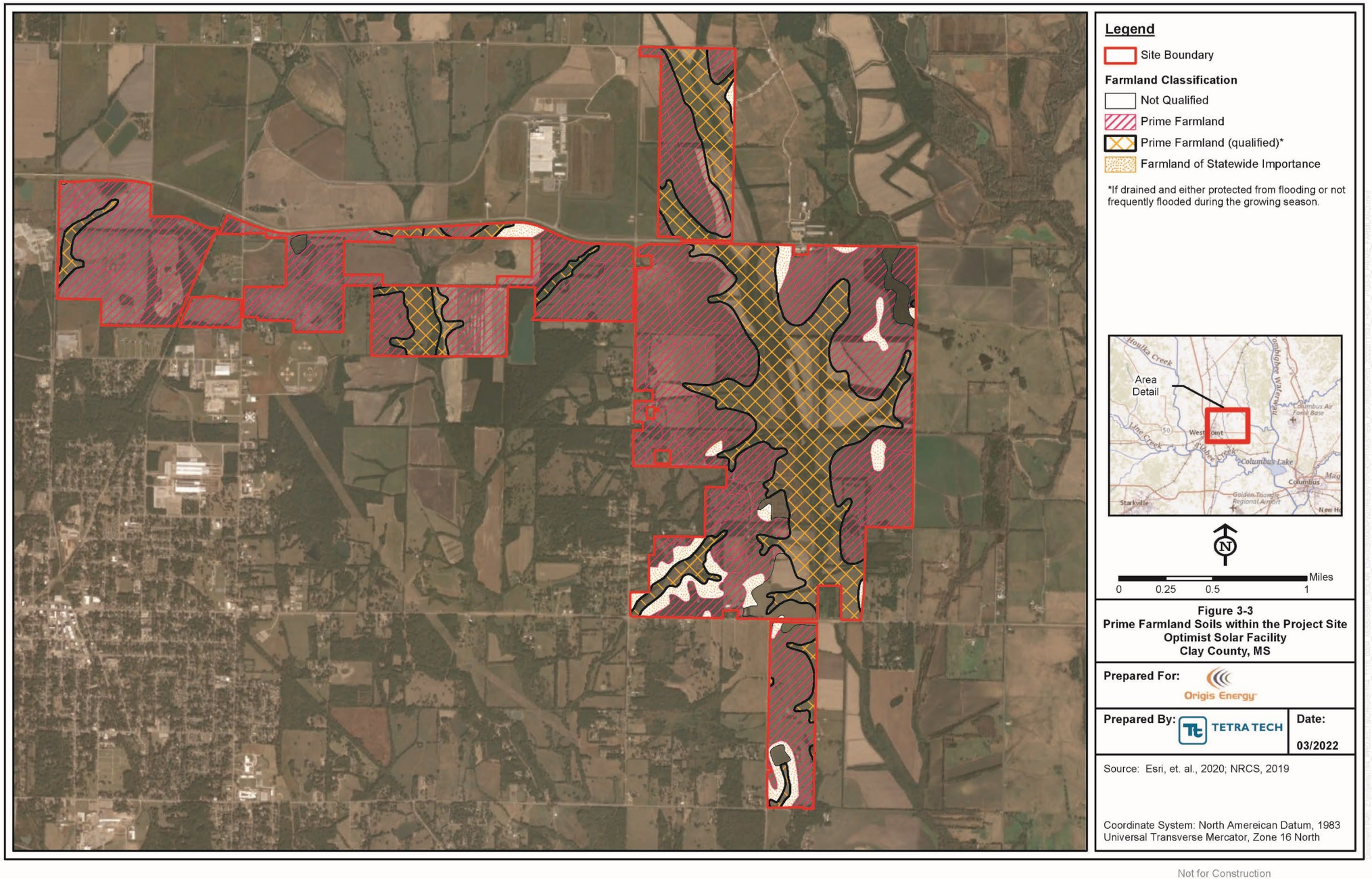


Legend

Site Boundary

Farmland Classification

Not Qualified

Prime Farmland

Prime Farmland (qualified)*

Farmland of Statewide Importance

*If drained and either protected from flooding or not frequently flooded during the growing season.

Figure 3-3
Prime Farmland Soils within the Project Site
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020; NRCS, 2019

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

Not for Construction

3.2.2.2 Proposed Action Alternative

Under the Proposed Action, minor short-term direct impacts from construction would be expected on soil resources. Approximately 52 percent (1,540 acres) of the 2,952-acre Project Site would be cleared and/or graded for the solar facility. Grading and clearing would cause temporary increases in erosion and sedimentation until the site is stabilized with native grasses and forbs.

Geology

Under the Proposed Action, minor excavations may occur for construction of the Project substation, BESS, gen-tie/collector lines, and stormwater retention areas. Pilings to support the solar arrays would be driven or screwed to depths of six to ten feet. Trenching up to approximately three to five feet for underground wiring connections between solar panels would also be required. Streams and wetlands will be crossed using horizontal directional drilling. These parameters are dependent upon geotechnical investigations and structural and electrical engineering. Due to potential shallow subsurface disturbances, minor direct impacts to geological resources are anticipated.

Geological Hazards

The Project Site is in an area with carbonate bedrock geology, which is associated with a risk for sinkholes, though none are documented, and none have been observed within the Project Site. As discussed previously, there is some potential for seismic activity of small to moderate intensity. The solar and BESS facilities would be designed to comply with applicable standards. In the unlikely event that seismic activity and/or sinkholes would occur in the Project Site, only minor impacts to the facilities and associated infrastructure are expected. Impacts to resources outside of the Project Site from geological hazards associated with construction of the proposed Project are unlikely.

Soils

Minor, long-term adverse impacts to topography and soils within the Project Site would occur, as substantial earth-moving activity would be required. Soil disturbance (grading) would be required for construction of the solar array, BESS, substation, and laydown areas. Soils would also be disturbed by grading for roads and trenching for collection lines. New impervious surface will be required in the form of foundations for the central inverters, the BESS, and the Project substation, which would result in a minor increase in stormwater runoff and potential increase in soil erosion. Short-term, minor soil erosion at the solar development would occur, and construction traffic would cause minor short-term erosion before the site is revegetated. Implementation of BMPs during the construction period would reduce the potential for soil erosion from the construction site impacting down-gradient and downstream locations. Recommended BMPs to reduce soil erosion and sedimentation include, but are not limited to, topsoil segregation, silt fences, straw bale dikes, diversion ditches, riprap channels, water bars, water spreaders, and other measures prescribed in the TVA BMP Manual (TVA 2017). Clearing and grubbing would not be conducted during periods of wet weather. Building the proposed structures during dry periods and implementing proper construction techniques would minimize possible downstream impacts to water quality. A SWPPP would be developed in accordance with the CWA, the Mississippi Commission on Environmental Quality Regulations for Water Quality Criteria for Intrastate, Interstate, and Coastal Waters (11 Miss. Admin. Code Pt. 6, R. 2), and the MDEQ Large Construction Storm Water General Permit (MDEQ 2022a).

The Project Site would be revegetated with fast-growing annual species and long-lived perennial species. Native grasses and forbs would be selected based upon the seasonal

recommendations found in the Native Seed Table provided in the TVA BMP Manual (TVA 2017). Routine maintenance would include periodic motor replacement, inverter air filter replacement, fence repair, vegetation control, and periodic array inspection, repairs, and maintenance. MS Solar 7 would maintain the vegetation year-round through regular mowing coupled with annual and spot spraying.

Prime Farmland

Most of the soil (97 percent) within the Project Site would be considered Prime Farmland (including qualified lands that are protected from flooding or not frequently flooded during the growing season) or Farmland of Statewide Importance under the Farmland Protection Policy Act. Impacts to farmland would be adverse, as approximately 1,378 acres of prime farmland (designated and qualified) would be disturbed (i.e., graded). Topsoil would be segregated and stockpiled prior to excavations and redistributed during final restoration. The loss of farmland would be small (1.1 percent) when compared to the 124,418 acres in Clay County identified as “land in farms” in the 2017 Census of Agriculture (USDA 2017).

If operations cease, the facility would be decommissioned and dismantled, and the Project Site restored (see Section 2.2.5). Once restored, the Project Site could be returned to agricultural and pastureland uses with a no loss to soil productivity and potentially an increase in soil productivity after a prolonged rest period.

No federal funds or grants will be used to fund the Project. TVA is purchasing the power generated by the Optimist Solar Project; therefore, coordination with the Natural Resources Conservation Service to establish a Farmland Conversion Impact Rating is not necessary.

3.3 WATER RESOURCES

3.3.1 Affected Environment

Groundwater

Mississippi, Arkansas, and Louisiana comprise Segment 5 of the Groundwater Atlas of the United States, which is divided into four physiographic provinces (Renken 1998). The Project Site lies within the eastern section of the Coastal Plain province, which is characterized by low hills, low cuesta ridges, and gentle lowlands. Fine-grained strata of clay, chalk, and mudstone underlie the low-lying areas; coarse sand and gravel underlie low ridges and hills.

Primary aquifer systems near the Project Site are the Southeastern Coastal Plain aquifer system (which contains the Black Warrior River aquifer) and the Mississippi Embayment aquifer system (which contains the McNairy-Nacatoch aquifer). These aquifer systems are within rocks of Cretaceous to Quaternary age, which are comprised predominantly of poorly consolidated to unconsolidated clastic sedimentary rocks (Renken 1998). In general, the most permeable Coastal Plain aquifers consist of sand and some gravel and are separated by silt, clay, marl, or chalk confining units. Clay County lies within both aquifers where a confining unit separates them. In Mississippi, the Black Warrior River aquifer includes unnamed water-yielding rocks of Early Cretaceous age and the Tuscaloosa Group, the McShan and the Eutaw Formations, and the Coffee Sand of Late Cretaceous age. The Black Warrior River aquifer is confined by a thick sequence of clay and marl of the Selma Group, which effectively separates it from overlying rocks of the Mississippi Embayment aquifer system. The McNairy-Nacatoch aquifer comprises sand of Late Cretaceous age. The McNairy Sand in Mississippi is considered a member of the Ripley Formation but is of formational rank where it extends into Tennessee and the northern part of the Mississippi Embayment. A confining unit separates the McNairy-Nacatoch aquifer from part of the

underlying Southeastern Coastal Plain aquifer system in Mississippi. The aquifer is interbedded with and grades into chalk and clay as it extends southward. Deltaic deposits of sand, minor gravel, and clay compose the aquifer where it extends northward into Tennessee and southeastern Missouri (Renken 1998).

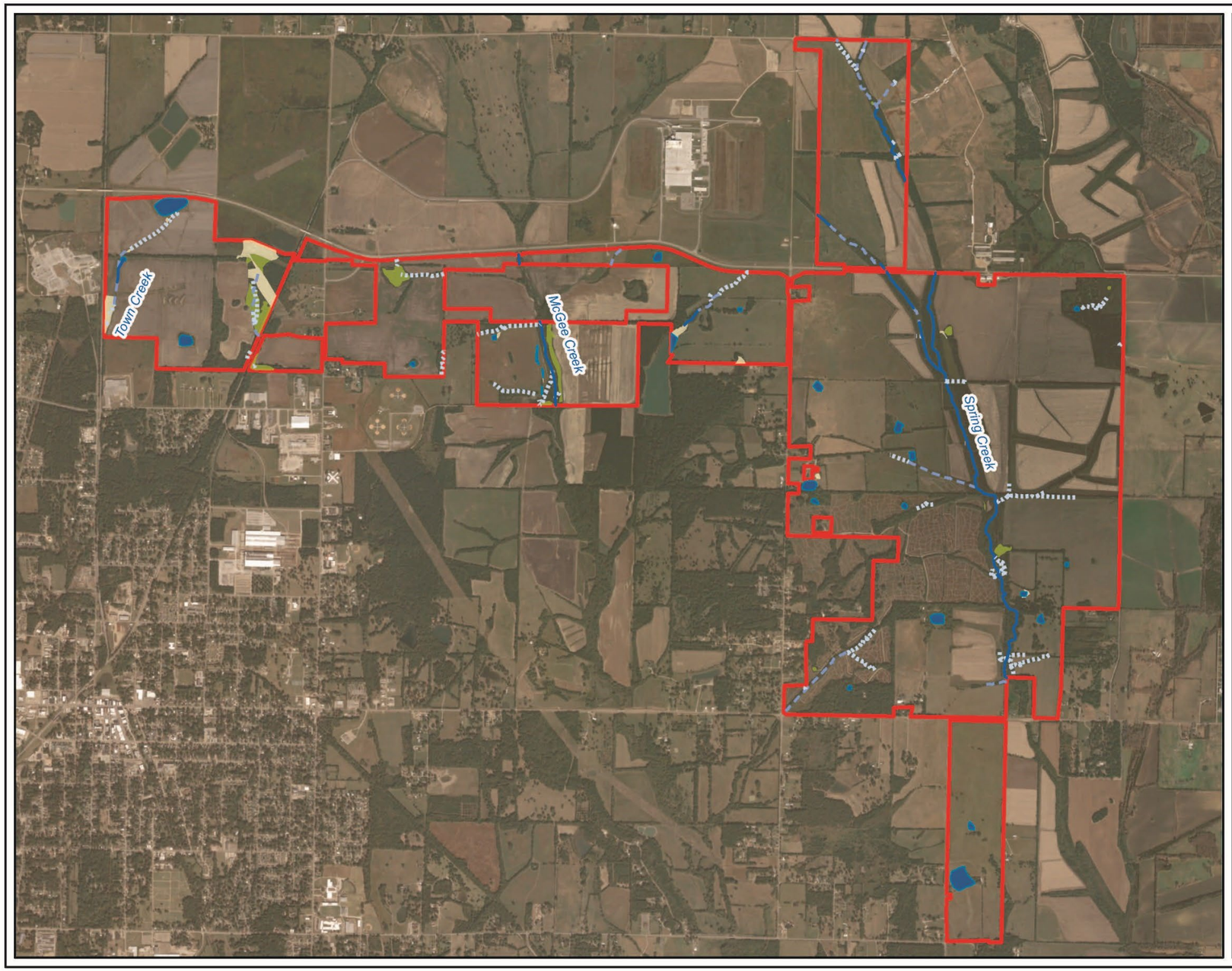
According to the Mississippi State Department of Health (2021), the state uses 3.5 billion gallons of water per day, of which 75 percent is supplied by groundwater (roughly 2.5 billion gallons per day). The state of Mississippi relies heavily on the Mississippi Embayment aquifer system for agricultural and municipal water supply (Clark et al. 2011). There are no USEPA-designated sole source aquifers in Clay County (USEPA 2020a). Due to population growth, urban sprawl, and climate change, the demand for groundwater continues to increase.

Surface Water and Wetlands

The Project Site is within the USEPA Blackland Prairie Ecoregion (Level 4) and is primarily within the Tibbee sub-basin (8-digit Hydrologic Unit Code [HUC] 03160104), though the northeastern corner of the Project Site lies within the Upper Tombigbee sub-basin (HUC 03160101) (Chapman et al. 2004; USGS 2021). The Project falls within the Muldron, Strong, and Waverly, MS (2020) U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps. The Project Site is drained by Spring Creek, which flow southeast to Columbus Lake and eventually the Tombigbee River (Figure 3-4). The areas along the proposed gen-tie routes are drained primarily by McGee Creek, and the most western parcels are drained by Town Creek; both streams flow south to Tibbee Creek, Catalpa Creek, and finally the Tombigbee River (USGS 2022b).

Field delineations of the Project Site surface water features were conducted November 16-November 20, 2020; March 15-March 18, 2021; and July 19-July 22, 2021 (Tetra Tech 2021a). The wetland delineation followed the methodology in the USACE Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the USACE Wetland Delineation Manual: Atlantic Gulf Coastal Plain (Version 2.0) (USACE 2010). Wetlands identified within the Project Site were categorized following the Cowardin classification system (Cowardin et al. 1979). Streams and waterbodies were mapped along their ordinary high water marks (OHWMs). Additionally, wetlands were evaluated by their functions using a TVA-developed modification of the Ohio Rapid Assessment Method specific to the TVA power service area (TVA Rapid Assessment Method or “TVARAM”).

The field-based delineation identified 26 wetlands (43.35 acres), 75 stream reaches (54,490 linear feet), and 25 open waterbodies (22.33 acres) within the Project Site (Tetra Tech 2021a). Vegetation in the palustrine forested (PFO) wetlands was dominated by alligatorweed (*Alternanthera philoxeroides*), black willow (*Salix nigra*), buttonbush (*Cephalanthus occidentalis*), Cherokee sedge (*Carex cherokeensis*), common boneset (*Eupatorium perfoliatum*), Eastern cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), longleaf woodoats (*Chasmanthium sessiliflorum*), Osage orange (*Maclura pomifera*), pinkweed (*Persicaria penslyvanica*), river oats (*Chasmanthium latifolium*), sugarberry (*Celtis laevigata*), sugarcane plumegrass (*Saccharum giganteum*), water hickory (*Carya aquatica*), and willow oak (*Quercus phellos*). Dominant vegetation in the palustrine emergent (PEM) wetlands included barnyardgrass (*Echinochloa crus-galli*), blunt spikerush (*Eleocharis obtusa*), broadleaf cattail (*Typha latifolia*), bushy bluestem (*Andropogon glomeratus*), buttercup (*Ranunculus bulbosus*), cherrybark oak (*Quercus pagoda*), creeping primrosewillow (*Ludwigia repens*), pinkweed, river oats, roughleaf dogwood (*Cornus drummondii*), sugarberry, and soft rush (*Juncus effusus*). Dominant vegetation in the



Legend

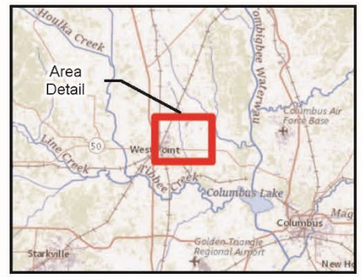
- Site Boundary
- Delineated Open Waterbody

Delineated Wetland-Cowardin

- Palustrine Emergent
- Palustrine Forested
- Palustrine Scrub-Shrub

Stream Flow Regime

- Ephemeral
- Intermittent
- Perennial



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Miles
0 0.25 0.5 1

Figure 3-4
Delineated Surface Waters and Wetlands
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020; Tetra Tech, 2021a

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

Not for Construction

palustrine scrub-shrub (PSS) wetland consisted of swamp cottonwood (*Populus heterophylla*) and giant goldenrod (*Solidago gigantea*).

Using the TVARAM, the delineated wetlands were scored to determine their function, condition, and quality (Appendix C). Nine wetlands were determined to have superior function, 14 wetlands were determined to have good/moderate function, and three wetlands were determined to have low function (Table 3-1).

Table 3-1. Delineated Wetlands for Optimist Solar Project

Wetland Number	Delineated Acreage	Wetland Type	TVARAM Score	TVARAM Category
W-1	0.19	PFO	77	Superior
W-2	0.14	PFO	53	Moderate
W-3	0.01	PSS	26	Low
W-4	0.13	PFO	43	Moderate
W-5	0.72	PFO	68	Superior
W-6	0.21	PEM	43	Moderate
W-7	1.54	PFO	47	Moderate
W-8	0.30	PEM	36	Moderate
W-9	0.16	PFO	35	Moderate
W-10	0.31	PEM	34	Moderate
W-11	12.29	PEM	69	Superior
W-12	0.33	PFO	57	Moderate
W-13	2.07	PFO	69	Superior
W-14	7.90	PFO	72	Superior
W-15	1.79	PFO	46	Moderate
W-16	1.38	PEM	64	Superior
W-18	3.35	PEM	56	Moderate
W-19	0.21	PEM	34	Moderate
W-20	0.27	PEM	37	Moderate
W-21	4.20	PFO	56	Moderate
W-22	0.60	PEM	55	Moderate
W-23	1.94	PEM	29	Low
W-24	0.08	PFO	71	Superior
W-25	0.66	PFO	81	Superior
W-26	0.06	PEM	22	Low
W-27	4.26	PFO	81	Superior
TOTAL	43.35			

Source: Tetra Tech. 2021a.

A total of 55 ephemeral stream reaches (22,700 linear feet), 13 intermittent stream reaches (12,344 linear feet), and seven perennial stream reaches (19,445 linear feet) were identified in the Project Site.

The perennial streams within the Project Site had average top of bank widths ranging from three to 30 feet (Tetra Tech 2021a). Most reaches of Spring Creek (S-8, S-12, S-22) were determined to be perennial; however, some northern reaches were determined to be ephemeral and intermittent. Within the Project Site, flows trended south and were turbid during all days of observation. McGee Creek (S-54) was very turbid and moderate erosion of the stream banks was observed. Town Creek (S-63) was heavily disturbed by agricultural practices and the beaver impoundment located at W-18. The flow trended south and was slightly turbid. Aquatic life was observed in perennial reach S-52. Spring Creek was listed as impaired by sediment for aquatic life use support from the headwaters to the mouth of Tennessee-Tombigbee Waterway in Mississippi's 2020 Section 303(d) List of Impaired Water Bodies (MDEQ 2020). Spring Creek remains on the Draft 2022 Section 303(d) List of Impaired Water Bodies (MDEQ 2022b). McGee Creek (from headwaters to mouth at Tibbee Creek) and Town Creek (at West Point from headwaters to Tibbee Creek) are also listed as biologically impaired for aquatic life use support on the 2020 list and draft 2022 list.

Intermittent streams had average top of bank widths ranging from 0.5 to 20 feet; ephemeral streams averaged approximately two to six feet wide at top of bank and served as local drainage features leading to intermittent and perennial streams (Tetra Tech 2021a). Many of the open waterbodies were connected to streams within the Project Site. Wetland fringe and/or emergent vegetation was observed along the banks of several waterbodies.

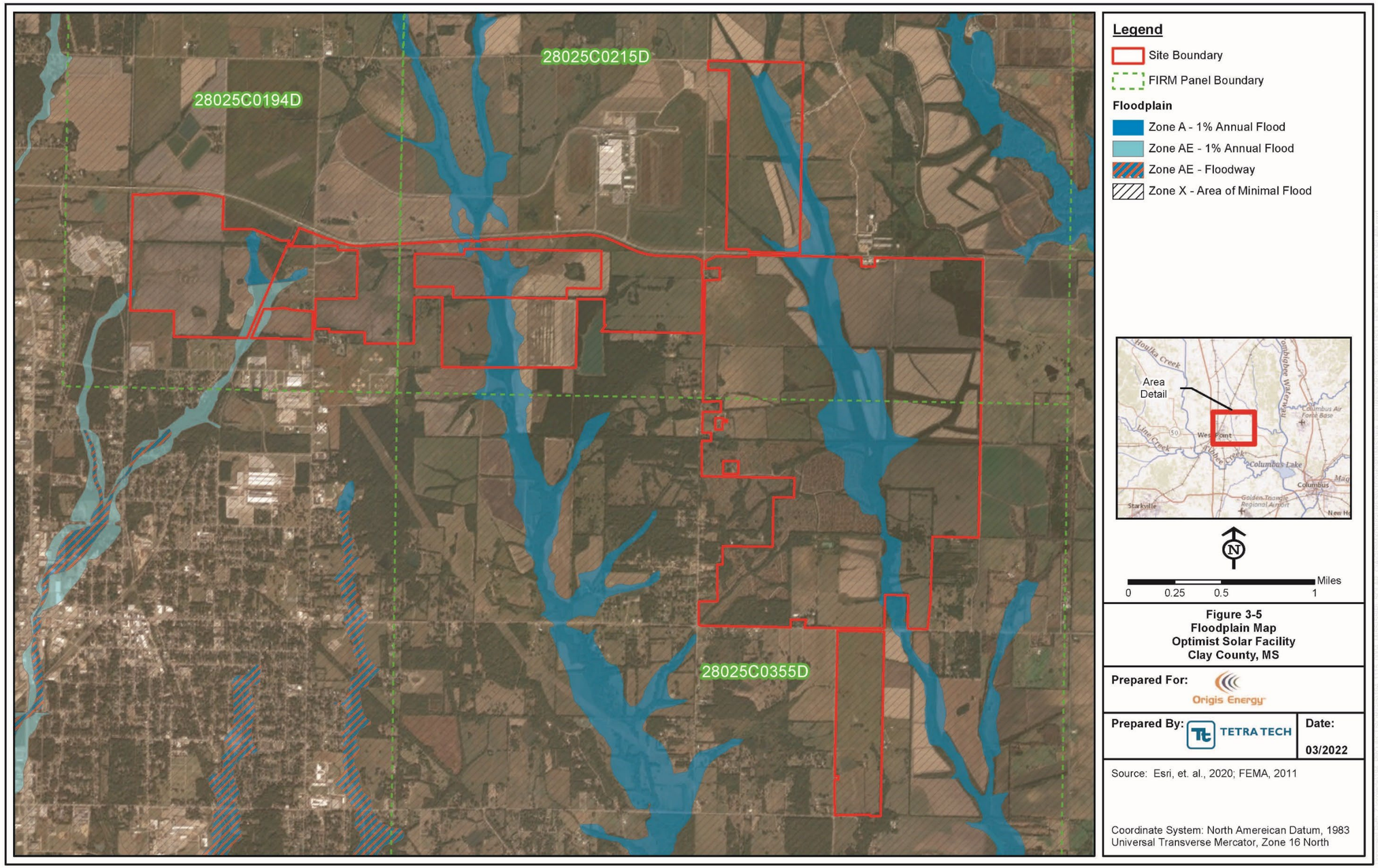
Although these findings are based upon a survey employing USACE-approved protocols, the USACE (Mobile District) must make the official determinations on the presence or absence of jurisdictional wetlands on the Project Site through the jurisdictional determination process. A preliminary jurisdictional determination request was submitted to USACE in November 2021; verification has not yet been received.

Floodplains

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

Portions of the Project Site would be located within the 100-year floodplains of Town Creek, McGee Creek, Spring Creek and their tributaries, and are shown as FEMA designated floodplains (FEMA Flood Insurance Rate Map [FIRM] Panels 28025C0355D, 28025C0215D, and 28025C0194D, all with effective dates of May 3, 2011) (FEMA 2011). Approximately 361 acres within the Project Site are designated as 100-year floodplain (Figure 3-5).

Clay County's Flood Prevention Ordinance requires that new construction implement methods that minimize flood damage (Clay County 2011). The ordinance calls for an evaluation concluding no rise in the flood elevation and/or construction at 18 inches or 2 feet above the base flood elevation (264 feet). The city of West Point requires a floodplain development permit for activities on the Project Site and within the Town Creek and McGee Creek floodplains as shown on FIRM Panels 28025C0194D (with a base flood elevation of 235 feet) and 28025C0215D (with a base flood elevation of 210 feet) (West Point 2017b).


28025C0215D
28025C0194D
28025C0355D
Legend
Site Boundary
FIRM Panel Boundary
Floodplain
Zone A - 1% Annual Flood
Zone AE - 1% Annual Flood
Zone AE - Floodway
Zone X - Area of Minimal Flood
Area Detail
Houlka Creek
Tombigbee Waterway
Columbus Air Force Base
West Point
Columbus Lake
Columbus
Starkville
Golden Triangle Regional Airport
N
Miles
0
0.25
0.5
1
Figure 3-5
Floodplain Map
Optimist Solar Facility
Clay County, MS
Prepared For:
Origis Energy
Prepared By:
TETRA TECH
Date:
03/2022
Source: Esri, et. al., 2020; FEMA, 2011
Coordinate System: North Amereican Datum, 1983
Universal Transverse Mercator, Zone 16 North
Not for Construction

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed; therefore, no Project-related impacts to water resources would be expected. Agriculture would likely continue to be the primary activity within the Project Site.

3.3.2.2 Proposed Action Alternative

Under the Proposed Action, minor short-term impacts from construction would be expected on streams, wetlands, and floodplains from erosion and sedimentation of exposed soils throughout the Project Site. Minor direct impacts to streams may be anticipated from construction (e.g., culvert crossings) and operation of the Project; all stream crossings for electrical lines are planned to be performed using directional boring methods. Beneficial, indirect impacts to groundwater and surface water could result from the change in land use, including a reduction in fertilizer and pesticide runoff, the improvement of water quality by filtering through native and/or noninvasive vegetation, and the reduced likelihood of erosion and sedimentation.

Groundwater

Under the Proposed Action, no direct adverse impacts to groundwater are anticipated. The potential for groundwater contamination (e.g., by accidental spills of hazardous materials, such as petroleum products and hydraulic fluids) from construction and operation activities would be limited through implementation of the BMPs prescribed in TVA's *A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Construction and Maintenance Activities* (TVA 2017). Most of the land proposed for Project use is actively cultivated cropland that is frequently treated with fertilizers, herbicides, and pesticides. There are no plans to use agricultural chemicals during construction or operation of the Project, nothing beyond limited use of fertilizer and spot treatment of weeds during re-vegetation of disturbed areas. Therefore, impacts from use of agricultural chemicals during facility construction on groundwater would be minimal.

Construction activities requiring water would primarily be for dust control and compaction during grading activities for access roads, pads, and foundations for structures; this water would likely be provided via truck or drawn from existing groundwater wells or a new well. A water source would be required for the operations and maintenance building and potentially for washing the panels during operation. Wells must be drilled by a water well contractor licensed in the state of Mississippi and follow standards that ensures groundwater resources are protected. Groundwater withdrawal volumes are expected to be minimal and would not impact groundwater resources.

If operations cease, the facility would be decommissioned and dismantled in accordance with industry best practices, and the Project Site would be restored to reduce the potential for hazardous materials to reach groundwater resources. In general, most decommissioned equipment and materials would be recycled. Materials that could not be recycled would be disposed of at an approved facility in accordance with federal, state, and local laws and regulations.

Surface Water and Wetlands

The Proposed Action may result in minor permanent impacts to streams and/or wetlands. Under EO 11990 (Protection of Wetlands), federal agencies are required to avoid, to the extent possible, the long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoid direct or indirect support of new construction in wetlands

wherever there is a practicable alternative. Under Section 404 of the CWA, unavoidable significant impacts (greater than 0.1 acre) to WOTUS would likely require compensatory mitigation.

Final site design has not yet been determined, but the preliminary design indicates that no direct impacts to surface water features are anticipated. All waterbody crossings with electrical lines will be completed using directional boring to avoid direct impacts to surface water features. No temporary or permanent road stream crossings are anticipated, with the exception of improvement of the southern access road for Substation/BESS Option C. Improvements to the existing access road and culvert crossings would result in minor, direct, permanent impacts to the jurisdictional stream(s). The discharge of dredged or fill material due to road improvements and culvert installation along Stream S-45 would cause the loss of approximately 0.0092 acre of streambed at each crossing (assuming two culverts need improvements), for a total of 0.02 acre loss of WOTUS; these activities would fall under USACE NWP 14. If complete avoidance of stream features is not possible, implementation of the USACE and MDEQ Section 404 and 401 permit requirements and the Project's MDEQ-approved SWPPP to control erosion and sediment runoff would ensure that impacts to streams are minor and temporary.

Project facilities and supporting infrastructure have been sited to maintain a minimum 25-foot setback from all streams and wetlands. Temporary impacts to streams (stream sedimentation caused by increased erosion and runoff) would be minimized by adhering to approved BMPs and NPDES permit requirements. BMPs to reduce soil erosion and sedimentation include, but are not limited to, topsoil segregation, silt fences, straw bale dikes, diversion ditches, riprap channels, water bars, water spreaders, and other measures prescribed in the TVA BMP Manual (TVA 2017).

If operations cease, the facility would be decommissioned and dismantled in accordance with industry best practices. The Project Site would be restored in accordance with NPDES permit requirements to minimize erosion and sedimentation.

Improved water quality is a potential benefit of facility development and operation. For example, use of fertilizers, which encourage growth of nuisance algae in local streams, would be substantially reduced as agricultural operations are replaced by a Solar Facility. Cattle would no longer graze around Project Site streams, which would reduce erosion of stream banks, reduce downstream siltation, and slow eutrophication (from manure).

Floodplains

As a federal agency, TVA adheres to EO 11988. 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 or indirect support of floodplain development wherever there is a practicable alternative..." The EO is not intended to prohibit floodplain development in all cases, but rather to create a consistent government policy discouraging such development under most circumstances. The EO requires that agencies avoid the 100-year floodplain unless there is no practicable alternative.

Under the Proposed Action, the laydown areas, Project substation, BESS, operations and maintenance building, and PV panels and inverters would be located outside the 100-year floodplain. Assuming the panels will be elevated a minimum of four feet, all areas of the Project Site with flood inundation depths greater than three feet would be avoided (Kimley Horn 2021). The access roads would be located outside of the 100-year floodplain with one exception. The existing access road for Substation/BESS Option C would require road and

culvert improvements at the intermittent stream crossing within the Town Creek floodplain. Consistent with EO 11988, access roads are considered to be repetitive actions in the 100-year floodplain that should result in only minor impacts. To minimize adverse impacts, any road improvements would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot.

The underground collection lines would be installed via directional bore under the floodplain at Spring Creek. The proposed gen-tie/collector line is expected to span overhead or be installed via directional bore to cross the floodplains of McGee Creek and Town Creek. Activities installed under the streambed are not subject to EO 11988. Poles associated with the gen-tie/collector line may be located within the floodplain. Some tree clearing may occur within floodplains, which would result in a slight increase in flood storage capacity, which would result in a beneficial impact to floodplains. Consistent with EO 11988, the installation of underground utility lines, access roads, culverts, and fencing are considered repetitive actions in the 100-year floodplain, which would result in minor impacts (46 FR 22845). To minimize adverse impacts, appropriate BMPs would be used during construction. Authorization from the City of West Point and/or Clay County would be obtained as needed for the aforementioned improvements within the floodplain.

By adhering to the following mitigation measures, the proposed solar facility and transmission construction and transmissionupgrades would have no significant impact on floodplains and their natural and beneficial values:

- Standard BMPs would be used during construction
- Any road improvements done within the floodplain would be done in such a manner that upstream flood elevations would not be increased by more than 1.0 foot
- Flood-damageable portions of the solar panels would be located at least one or more feet above the 100-year flood elevation

3.4 BIOLOGICAL RESOURCES

This section describes the existing biological resources of the Project Site and the potential impacts to those resources that would be associated with the No Action and Proposed Action Alternatives. The biological resources of interest are vegetation, wildlife, and rare, threatened, and endangered species.

3.4.1 Affected Environment

The Project Site (Figure 3-4) is drained by Spring Creek, McGee Creek, and Town Creek and is predominantly made up of cropland and pastures, with scattered wetlands that are mostly associated with these streams and their tributaries. A general wildlife and vegetation characterization of the ecological communities in the Project Site was performed in 2021, which included identifying predominant vegetation and wildlife, noting invasive floral species present, and identifying and evaluating unique plant and wildlife habitats, if present. A habitat suitability assessment for federally and/or state-protected species was performed, as well as limited surveys for the species themselves. The Project Site and the adjacent existing TVA substation were evaluated. Field surveys were conducted on April 14-April 15; April 25-April 27; and July 22-July 23, 2021. Unless otherwise noted, information for this section has been summarized from the Optimist Solar Project Wetland Delineation Report and the Optimist Solar Project Protected Species and Ecological Assessment (Tetra Tech 2021a; 2021b; 2022a).

Natural Areas

Natural areas include managed areas such as Wildlife Management Areas, National Wildlife Refuges and Habitat Protection Areas, ecologically significant sites, and river segments listed in the Nationwide Rivers Inventory. According to the TVA Regional Natural Heritage Database, there are 15 natural areas within five miles of the Project Site (TVA 2022). These sites include the Buttahatchee River (including designated habitat and a macrosite); the Tennessee-Tombigbee (Ten-Tom) Waterway (including a mitigation protection planning site); multi-use conservation and recreational areas for Pryor Farms, Waverly Ferry, Barton Ferry, and Town Creek; the Ten-Tom Columbus Reservoir Reservation; the Young Family Limited Partnership; and USFWS designated critical habitat for the ovate clubshell (*Pleurobema perovatum)*, southern clubshell (*Pleurobema decisum*), orangenacre mucket (*Hamiota perovalis*), and the Alabama moccasinshell (*Medionidus acutissimus),* along the Buttahatchee River (approximately five miles northeast of the Site) and Yellow Creek (approximately 12 miles southeast of the Site). The closest natural areas to the Project Site are the Pryor Farms, Waverly Ferry, Barton Ferry, and Town Creek recreational areas, and the Tennessee-Tombigbee Waterway, all approximately four to five miles east of the Project Site.

Vegetation

Tetra Tech biologists conducted a preliminary assessment of Project Site vegetation communities using the USGS GAP Analysis database, the USGS National Land Cover Database, and recent aerial photography. They determined that five community types were present: Row Crops (includes fallow fields), Pasture, Riparian/Alluvial Forest, Old Field (fields transitioning post-agricultural production), and Upland Forest. These vegetation communities were verified in the field by contract botanists in spring and summer 2021. The approximate acreage of these vegetative communities is provided in Table 3-2. Representative photographs and maps are provided in the Protected Species and Ecological Assessment (Appendix D).

Table 3-2. List of Habitat Types in the Project Site

Habitat Type	Habitat Acreage	Habitat Type Percentage
Row Crops	1,087	36.8
Pasture	1,078	36.5
Riparian/Alluvial Forest	455	15.4
Old Field	230	7.8
Upland Forest	34	1.2

In addition to these terrestrial habitats, the Project Site contained approximately 43 acres of wetlands, 22 acres of open water (farm ponds), and several small streams; however, these wetlands and waterbodies made up a small fraction (approximately 2 percent) of the total Project Site.

Corn and soybeans were the major row crops. In the pasture areas, most vegetation was herbaceous. Dominant plants observed in these areas included hairy buttercup (*Ranunculus sardous*), white clover (*Trifolium repens*), Cherokee sedge (*Carex cherokeensis*), and tall fescue (*Festuca arundinacea*). Other plant species commonly observed included bristle thistle (*Cirsium horridulum*); little bluestem (*Schizachyrium scoparium*); eastern red cedar saplings (*Juniperus virginiana*); dwarf dandelion (*Krigia*

caespitosa); Long's sedge (*Carex longii*); Leavenworth's sedge (*Carex leavenworthii*); curly dock (*Rumex crispus*); flat-stem bluegrass (*Poa* spp.); little barley (*Hordeum pusillum*); path rush (*Juncus tenuis*); ironweed (*Vernonia gigantea*); Persian clover (*Trifolium resupinatum*); and ryegrass (*Lolium perenne*).

Old fields were primarily associated with a commercial quail hunting operation using the eastern portion of the Site and appeared to be managed (including prescribed burns) for quail (northern bobwhite; *Colinus virginianus*) habitat. Old field habitats were typically open, dominated by low-growing herbaceous vegetation (grasses, forbs, and sedges), with widely scattered shrubs and trees (small oaks and cedars). The following plant species were dominant: bushy bluestem (*Andropogon glomeratus*), hairy buttercup, little bluestem, late-flowering thoroughwort (*Eupatorium serotinum*), and tall fescue. Other commonly observed species included Long's sedge; Leavenworth's sedge; white clover; Cherokee sedge; bristle thistle; red cedar; fox sedge (*Carex vulpinoidea*); greenbriers (*Smilax* sp.); common goldenrod (*Solidago altissima*); peppervine (*Ampelopsis arborea)*; shiny wedgescale (*Sphenopholis nitida*); fleabane (*Erigeron philadelphicus*); horseweed (*Conyza canadensis*); dog-fennel (*Eupatorium capillaceum*); dogbane (*Apocynum cannabinum*); butterweed (*Packera glabella*); red clover (*Trifolium pratense*); narrowleaf vetch (*Vicia angustifolia*); curly dock; quaking grass (*Briza minor*); purple false foxglove (*Agalinis purpurea*); lyre-leaf sage (*Salvia lyrata)*; cudweed (*Gamochaeta* spp.); groundsel (*Packera anonyma*); hairy lovegrass (*Eragrostis hirsuta*); and sheep sorrel (*Rumex acetosella*).

Riparian/alluvial forests were characterized by sugarberry (*Celtis laevigata*), Osage orange (*Maclura pomifera*), and green ash (*Fraxinus pennsylvanica*). Other commonly observed species included eastern red cedar; box-elder (*Acer negundo*); cottonwood (*Populus deltoides*); Shumard oak (*Quercus shumardii*); redbud (*Cercis canadensis*); black walnut (*Juglans nigra*); persimmon (*Diospyros virginiana*); shagbark hickory (*Carya ovata*); eastern hop-hornbeam (*Carpinus caroliniana*); American elm (*Ulmus americana*); water oak (*Quercus nigra*); willow oak (*Quercus phellos*); and cherrybark oak (*Quercus pagoda*). Commonly observed shrubs included silky dogwood (*Cornus amomum*); elderberry (*Sambucus canadensis*); switchcane (*Arundinaria gigantea*); Chinese privet (*Ligustrum sinense*); deciduous holly (*Ilex deciduous*); and red buckeye (*Aesculus pavia*).

The upland forest consisted of a small area with a dense canopy and limited ground cover. It was part of the area managed for quail and included the following dominant tree species: post oak (*Quercus stellata*), black oak (*Quercus velutina)*, water oak, southern red oak (*Quercus falcata*), and eastern hop-hornbeam. Other commonly observed species included eastern red cedar; mockernut hickory (*Carya tomentosa*); white ash (*Fraxinus americana*); black cherry (*Prunus serotina*); pignut hickory (*Carya glabra*); basswood (*Tilia americana)*; winged elm (*Ulmus alata*); redbud; American elm; persimmon; willow oak; and sugarberry.

Although the Project Site has been converted to agricultural use (probably in the 19th century) and is subject to periodic disturbance, including various land management activities and agricultural operations, invasive plants were not prevalent. The following invasive/exotic plants were observed during the survey: Chinese tallowtree (*Triadica sebifera*); Chinese privet; Japanese honeysuckle (*Lonicera japonica*); wild garlic (*Allium vineale)*; hairy buttercup; white clover; tall fescue; curly dock; flat-stem bluegrass; Persian clover; ryegrass; and red clover. Only one of these plants, Chinese tallow tree, is identified as a noxious weed in the state of Mississippi (Invasive.org 2018). Many of the other plants observed were exotic but not necessarily aggressively invasive: principally, the herbaceous species such as curly dock, ryegrass, and red clover. Although small portions of pastures contained hairy buttercup, white clover, and/or tall fescue, no sections of the Project Site were dominated or overgrown with invasive plant species.

Wildlife and Fish

Wildlife surveys were conducted in spring and summer 2021. Thirty-three bird species were observed during the surveys. A few species, such as the American bullfrog (*Lithobates catesbeianus*), were identified by their calls. One mammal, the raccoon (*Procyon lotor*), was identified by its tracks. Table 3-3 lists species identified by biologists conducting vegetation, habitat, and wetland surveys in April and July 2021. None of these species is state or federally listed.

Aquatic habitat within the Project Site included the mainstems of Town, McGee, and Spring creeks and their tributaries, as well as wetlands/open waters areas (Figure 3-4). All of the streams were moderately-sized or smaller; no rivers or shoal/riffle areas were present.

Table 3-3. Wildlife Observed during Surveys

Common Name	Scientific Name
Mammals	
Beaver	*Castor canadensis*
Rabbit (cottontail)	*Sylvilagus sp.*
Raccoon	*Procyon lotor*
White-tailed deer	*Odocoileus virginianus*
Birds	
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
Barn swallow	*Hirundo rustica*
Blue jay	*Cyanocitta cristata*
Blue-gray gnatcatcher	*Polioptila caerulea*
Brown thrasher	*Toxostoma rufum*
Brown-headed cowbird	*Molothrus ater*
Canada goose	*Branta canadensis*
Carolina chickadee	*Poecile carolinensis*
Carolina wren	*Thryothorus ludovicianus*
Cattle egret	*Bubulcus ibis*
Common starling	*Sturnus vulgaris*
Double-crested cormorant	*Phalacrocorax auritus*
Eastern bluebird	*Sialia sialis*
Eastern meadowlark	*Sturnella magna*
Eastern phoebe	*Sayornis phoebe*

Common Name	Scientific Name
Eastern towhee	*Pipilo erythrophthalmus*
Field sparrow	*Spizella pusilla*
Great blue heron	*Ardea herodias*
Great egret	*Ardea alba*
Killdeer	*Charadrius vociferus*
Mourning dove	*Zenaida macroura*
Northern cardinal	*Cardinalis cardinalis*
Northern mockingbird	*Mimus polyglottos*
Red-eyed vireo	*Vireo olivaceus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoenicus*
Rock dove	*Columba livia*
Song sparrow	*Melospiza melodia*
Tufted titmouse	*Baeolophus bicolor*
Turkey vulture	*Cathartes aura*
White-eyed vireo	*Vireo griseus*
Yellow-billed cuckoo	*Coccyzus americanus*
Amphibians and Reptiles	
American bullfrog	*Lithobates catesbeianus*
Cricket frog	*Acris crepitans*
Little brown skink	*Scincella lateralis*
Yellow-bellied slider	*Trachemys scripta scripta*
Insects	
Black swallowtail butterfly	*Papilio polyxenes*
Eastern pondhawk	*Erythemis simplicicollis*
Eastern tiger swallowtail	*Papilio glaucus*
Fire ant	*Solenopsis invicta*
Ichneumon wasp	*Ophion sp.*

Source: Tetra Tech. 2021b.

Additionally, habitat in the largest streams (mainstems) was severely degraded. The channels were deeply incised with unstable, eroding banks, and sedimentation was extensive with silt, sand, and areas of exposed (scoured) claypan. No riffles were observed, and currents were generally low. Wetted widths ranged from approximately 10 to 25 feet, and depths were mostly less than five feet. Vegetated riparian areas were mostly narrow and surrounded by agricultural fields. The smaller streams also were degraded with incised channels, extensive sedimentation, no riffles, and few rocky substrates. Most streams had very turbid water. Cattle have access to many sections of streams within the Project Site and have contributed significantly to the observed habitat and water quality degradation. While the TVA Regional Natural Heritage Database indicated that 84 rare fish and mussel species occur within a ten-mile radius of the Project, only nine were within Clay County, and none appeared in the HUC-wide query (TVA 2021).

No unique habitats were observed during the 2021 surveys. No caves, karst terrain, or other unique geological features (e.g., limestone or chalk outcrops) were present. The Mississippi Natural Heritage Program (MNHP) is responsible for both the Natural Areas Registry and the identification, conservation, and protection of rare and exemplary natural communities (MNHP 2021a). None of the special habitats that the Mississippi Natural Areas Registry normally deems worthy of registration (e.g., old-growth forest, remnant prairie, longleaf pine savannah, pitcher plant bog, beech-magnolia streamside forest) were present. No “exemplary” natural communities (particularly good examples of a native community type), thus meriting preservation) appeared to be present.

Rare, Threatened, and Endangered Species

An Official Species List was obtained from the USFWS Information for Planning and Consultation (IPaC) tool (Appendix D). The query generated a list of 11 federally protected species that may occur within the boundary of the proposed Project and/or may be affected by the proposed Project (USFWS 2021a). These species included the NLEB (*Myotis septentrionalis*); wood stork (*Mycteria americana*); Price’s potato bean (*Apios priceana*); southern combshell (*Epioblasma penita*); orangenacre mucket; Alabama moccasinshell; inflated heelsplitter (*Potamilus inflatus*); black clubshell (*Pleurobema curtum*); southern clubshell; ovate clubshell; and heavy pigtoe (*Pleurobema taitianum*). The Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) also reported the Alabama sturgeon (*Scaphirhyncus suttkusi*), flat pigtoe (*Pleurobema marshalli*) and the stirrupshell (*Theliderma stapes*), and five additional state-listed species (discussed below) have potential to occur within Clay County (MNHP 2021a).

A list of protected species and habitats with potential to occur in or near the Project Site was also obtained from TVA’s Regional Natural Heritage Database, and consultations with TVA biologists were held to appropriately design biological surveys and assessments (TVA 2021). The query results did not return any state or federally protected species within the Project Site; however, TVA biologists requested further information regarding the NLEB, the wood stork, and Price’s potato bean. A habitat assessment and acoustic survey (Appendix D) were performed to assess bat roosting and foraging habitat as well as presence; wood stork foraging habitat and potato bean habitat were assessed at the time of the ecological survey. A target list of species is provided in Table 3-4.

Table 3-4. Species of Concern with Potential to Occur in or near the Project Site[1]

Common name	Scientific name	Status[2]	
		Federal	State
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	T	-
Birds			
Bewick's wren	*Thryomanes bewickii*	-	E
Grasshopper sparrow	*Ammodramus savannarum*	BCC	S3B, S3N
Lesser yellowlegs	*Tringa flavipes*	BCC	-
Osprey	*Pandion haliaetus*	-	S3B, S1S2N
Painted bunting	*Passerina ciris*	-	S3B
Prothonotary warbler	*Protonotaria citrea*	BCC	-
Southeastern American kestrel	*Falco sparverius paulus*	BCC	-
Swainson's warbler	*Limnothlypis swainsonii*	-	S2S3B
Swallow-tailed kite	*Elanoides forficatus*	BCC	E
Wood stork	*Mycteria americana*	T	E
Wood thrush	*Hylocichla mustelina*	BCC	-
Reptiles			
Black-knobbed map turtle	*Graptemys nigrinoda*	-	E
Fish			
Alabama sturgeon	*Scaphirhyncus suttkusi*	E	E
Crystal darter	*Crystallaria asprella*	-	E
Frecklebelly madtom	*Noturus munitus*	-	E
Mussels			
Alabama moccasinshell	*Medionidus acutissimus*	T	E
Black clubshell	*Pleurobema curtum*	E	E
Delicate spike	*Elliptio arctata*	-	E
Flat pigtoe	*Pleurobema marshalli*	E	E
Heavy pigtoe	*Pleurobema taitianum*	E	E
Inflated heelsplitter	*Potamilus inflatus*	T	E
Monkeyface	*Theliderma metanevra*	-	E
Orangenacre mucket	*Hamiota perovalis*	T	E
Ovate clubshell	*Pleurobema perovatum*	E	E
Southern clubshell	*Pleurobema decisum*	E	E

Common name	Scientific name	Status[2]	
		Federal	State
Southern combshell	*Epioblasma penita*	E	E
Stirrupshell	*Theliderma stapes*	E	E
Plants			
Price's potato bean	*Apios priceana*	T	-
Stemless evening primrose	*Oenothera triloba*	-	S1
White-flower beardtongue	*Penstemon tenuiflorus*	-	S2S3B

[1]Sources include USFWS IPaC; Mississippi Natural Heritage Program and spatial data request from MNHP staff; Mississippi Museum of Natural Science "Endangered Species of Mississippi"; Tennessee Valley Authority Regional Natural Heritage Database
[2] E = Endangered; T = Threatened; BCC = Bird of Conservation Concern; S# = State Rank (critically imperiled (1), imperiled (2), vulnerable (3), apparently secure (4), secure (5), B = breeding population, N = non-breeding)

Federally Listed Species

The NLEB is not currently listed as threatened or endangered by MDWFP, but it is listed as threatened under the Endangered Species Act. There are no known NLEB hibernacula within the state and the only known summer site is at the Tripoli Chalk Mine approximately 60 miles north-northeast of the Project Area (MBWG 2020). NLEBs arrive at hibernacula in August or September, begin hibernation in October and November, and leave hibernacula in March or April (78 FR 61046). During the spring, summer, and early fall, NLEBs roost in forested habitat typically within 50 miles of wintering sites (78 FR 61046). Suitable summer habitat for the NLEB has been described as "forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors" (USFWS 2020). Other important features of suitable habitat are connectivity and setting. Individual trees greater than 1,000 feet from forested habitat are not suitable, nor are trees found in highly developed urban areas (82 FR 60362). The Project is located within the bat's known geographic range and the USFWS White Nose Syndrome Zone (USGS 2022c).

Potentially suitable NLEB habitats within the Project Site were identified using aerial imagery and then defined by three categories: summer roosting habitat, winter habitat, and foraging habitat. A field habitat assessment was conducted on March 23-March 26 and July 19-July 20, 2021. All potentially suitable areas were visited on foot to delineate and quantify potential NLEB summer roosting habitat (Figure 3-6). Additionally, foraging habitat and potential winter habitat were recorded. All man-made structures within NLEB potential roosting habitat were considered possible roost structures. This habitat assessment resulted in 137.7 acres of high-quality potential roosting habitat, 266.1 acres of medium quality potential roosting habitat, and 109.4 acres of low-quality potential roosting habitat. Additionally, 21 forested areas contained areas with suitable water resources that could be used by foraging bats. No winter habitat was identified within the Project Site.

Due to the high-quality roosting habitat identified during the assessment, an acoustic survey was conducted August 4-August 15, 2021. The summer presence/absence survey was conducted in accordance with the USFWS Range-Wide Indiana Bat Survey Guidelines (USFWS 2020). Based on the 513 acres identified as suitable roosting habitat in the bat habitat assessment, it was determined that four sites or eight detector stations operating 32 nights were necessary to meet the guidelines. Survey results including manual vetting of

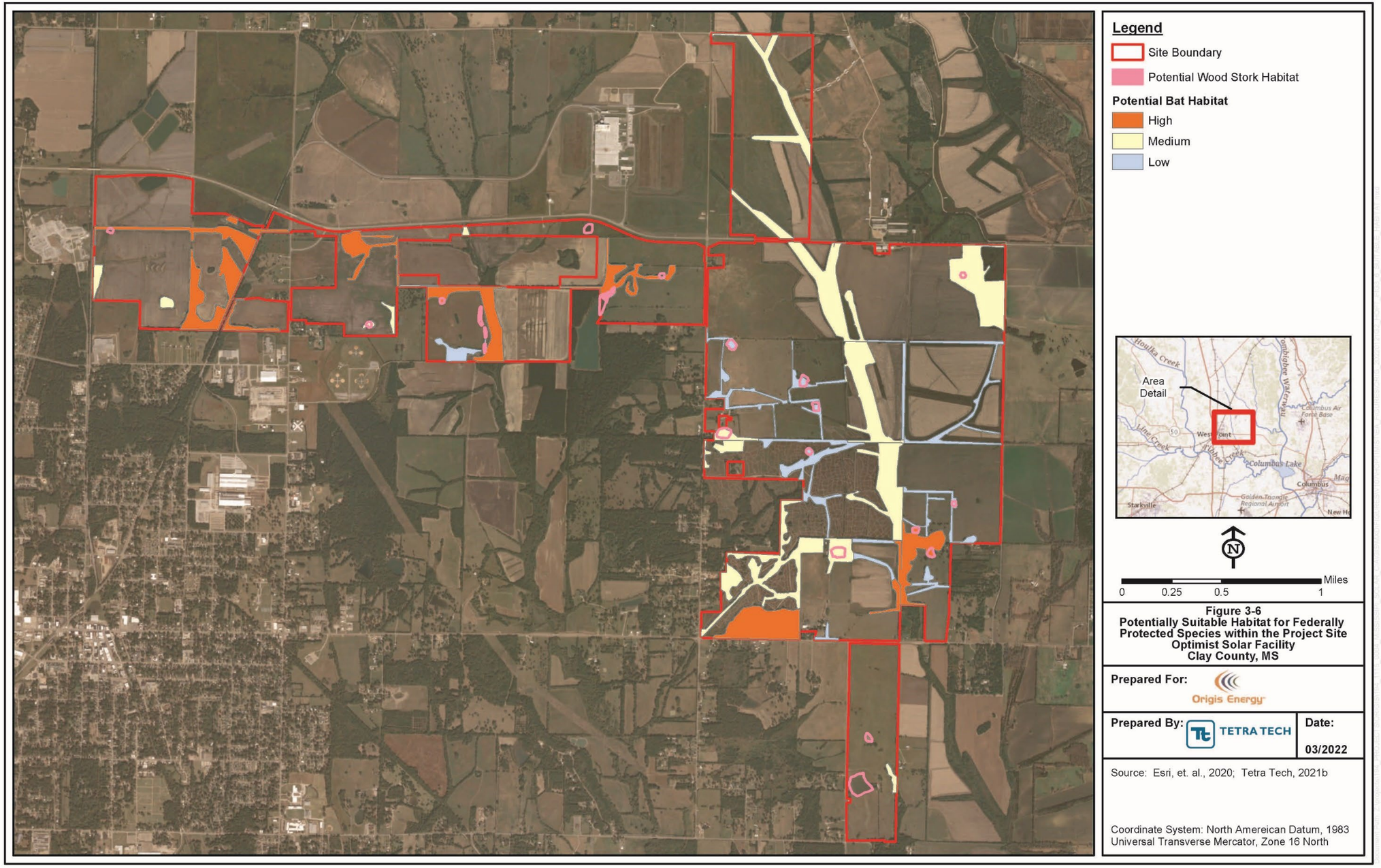


Figure 3-6
Potentially Suitable Habitat for Federally Protected Species within the Project Site
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020; Tetra Tech, 2021b

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

Not for Construction

recorded calls did not confirm the presence of NLEB. The potential presence of nine species was detected at the Project during the survey including big brown bat *(Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), northern yellow bat (*Lasiurus intermedius*), Seminole bat (*Lasiurus seminolus*), little brown bat (*Myotis lucifugus*), tri-colored bat (*Perimyotis subflavus*), evening bat (*Nycticeius humeralis*), and Brazilian free-tailed bat (*Tadarida brasiliensis*).

Wood storks make use of a variety of freshwater and estuarine wetlands for breeding, roosting, and feeding. They nest primarily in the upper branches of small to large cypress trees, mangroves, or dead hardwoods. Preferred nesting sites are trees in standing water or on small islands surrounded by broad expanses of open water. Nesting colony sites in water must remain inundated throughout the nesting cycle to prevent predation and nest abandonment. Several hundred nests may comprise a single wood stork colony, and these nests may be used for many years. Wood storks roost at sites that are structurally similar to their nesting sites, but a slightly wider variety of habitats are used to roost. These roosts may be used for brief or long periods of time and may be used repeatedly over a period of years (depending on hydrology of the area). Wood storks forage in a variety of wetlands where prey (mostly small fish) densities are high and there is shallow, open water that allows the storks to feed effectively by tacto-location. Ideal conditions would include calm water that is 2 to 15 inches deep and is uncluttered by aquatic vegetation (Ogden 1990). Foraging sites include swamps, freshwater marshes, stock ponds, and managed impoundments. Wood storks regularly occur in western Mississippi in counties bordering the Mississippi River as post-breeding birds dispersing from their nesting colonies in Mexico or the other southeastern U.S. states (NatureServe 2022); however, there are no known/confirmed breeding colonies of wood storks in Mississippi. Wood storks have been observed with increasing frequency in some counties along the eastern edge of the state, although they may occur almost anywhere there are sloughs or swamps to provide feeding habitat (MMNS 2014). Some of the small ponds, shallows of larger ponds, and open wetlands on the Project Site (approximately 12.3 acres) appear to provide marginally suitable foraging habitat for wood storks, to the extent that water levels are acceptable and aquatic vegetation is not so dense as to interfere with stork foraging (Figure 3-6).

As previously noted, the Project lies within the Tombigbee River drainage, which encompasses approximately 6,025 square miles in northeast and eastern Mississippi. Major rivers of this system are the Buttahatchee River, Noxubee River, Sucarnoochee River, Town Creek (West Fork Tombigbee River, not the Town Creek that flows through Project area), Bull Mountain Creek, Tibbee Creek (the Project is located within this watershed), and Luxapallila Creek. The Tombigbee River drainage once supported the largest number of mussel species (51) in Mississippi, including the federally listed stirrupshell; southern combshell; orangenacre mucket; inflated heelsplitter; Alabama moccasinshell; black clubshell; southern clubshell; flat pigtoe; ovat clubshell; and heavy pigtoe. Of these, stirrupshell, black clubshell, flat pigtoe, and heavy pigtoe are no longer found within the state (Jones et al. 2019). The other six federally listed mussel species (Table 3-4) are found in less-disturbed stream segments within the Tombigee River basin.

The southern combshell now is only known to occur in parts of the Buttahatchee River in Mississippi and Alabama. The orangenacre mucket is known from the Buttahatchee River, Yellow Creek (Lowndes County), and a small segment of the East Fork Tombigbee River in Mississippi and in the Sipsey and Little Cahaba rivers in Alabama. The Alabama moccasinshell is known from three streams in Mississippi: the Buttahatchee River, Luxapallila Creek, and a tributary of Luxapallila Creek. The inflated heelsplitter was found in the Pearl River at Jackson, Mississippi, in the past but no longer occurs there; it is likely

that this species occurs in the lower Pearl River in Mississippi. The few recent records in Mississippi are primarily from the East Fork Tombigbee River in Itawamba, Lowndes, and Monroe counties. The southern clubshell still survives in a few locations on the Buttahatchee River and the East Fork of the Tombigbee River. The flat pigtoe once occurred in the Tombigbee River in Mississippi and Alabama but is now believed to be extinct. In Mississippi, the ovate clubshell occurs in the Buttahatchee River and Yellow Creek (Lowndes County). The heavy pigtoe was last seen in Mississippi at one locality in the Buttahatchee River in 1987. The stirrupshell once occurred in the Tombigbee River in Mississippi and Alabama, and the Black Warrior and Alabama Rivers in Alabama; it is now presumed to be extinct (MMNS 2014; Jones et al. 2019).

None of the federally listed mussels in Table 3-4 is believed to occur on or near the Project Site. Most pearly mussels prefer riffle or shoal habitat with stable bottoms composed of sandy gravel or gravel and cobble. Project Site streams have been degraded by agricultural operations (e.g., erosion and sedimentation from tilling adjacent fields, cattle damaging stream banks) and most stream substrates are unstable and/or silty; therefore, they do not provide suitable habitat for these mussel species.

The Alabama sturgeon appears to prefer habitat in the main channels of large Coastal Plain rivers with moderate-to-swift currents and stable gravel and sand substrates. It was once found below the Fall Line in all the major rivers in the Mobile Basin, including the Alabama, Tombigbee, and Cahaba River systems. The species declined after 1970, but is believed to survive in small number in Alabama (MMNS 2014).

Price’s potato bean is federally threatened in Mississippi. Habitat for this species includes woodland edges in limestone areas, river bottoms, and roadside or powerline ROWs. Price’s potato bean typically occurs in association with chinkapin oak, white ash, basswood, sugar maple, slippery elm, redbud, spicebush, and switchcane. Price's potato bean flowers from late June through July and produces fruit in August (MMNS 2014). Price’s potato bean is endemic to Alabama, Mississippi, Kentucky, Tennessee, and Illinois. The single known Illinois population was destroyed, and this species is believed extirpated from that state (MMNS 2014). Currently, there are about 50 to 100 known total occurrences (NatureServe 2022). In Mississippi, there are four sites in three counties (Oktibbeha, Clay, and Lee). The Clay County site contains a declining population of 15 to 20 individuals and is located on private land as a Registered Natural Area (USFWS 1993; NatureServe 2022). No suitable habitat was found within the Project Site for Price’s potato bean. There were no chalk outcrops or limestone areas on ravine slopes that grade into creeks or streams, and the forested areas in the Project Site were small, dense, and surrounded by agricultural areas; therefore, no suitable habitat was present.

No designated critical habitat for federally listed threatened and endangered species was identified within the Project Site (USFWS 2021a). As discussed earlier, there is designated critical habitat for the ovate clubshell, southern clubshell, orangenacre mucket, and the Alabama moccasinshell along the Buttahatchee River (approximately five miles northeast of the Site) and Yellow Creek (approximately 12 miles southeast of the Project Site).

Bald Eagles and Migratory Birds

In Mississippi, the bald eagle is protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Protection Act (MBTA). No bald eagles or nests were observed during the 2021 environmental field surveys. Additionally, no large bodies of water that would provide an adequate food source for bald eagles were present in or adjacent to the Project Site. According to the TVA’s Regional Natural Heritage Database, bald eagles are known to occur within three miles of the Project Site. None were observed in the field.

In the USFWS IPaC Report for the Project, five Birds of Conservation Concern were identified as having the potential to occur in the "Project Area": the southeastern American kestrel (*Falco sparverius paulus*), lesser yellowlegs (*Tringa flavipes*), prothonotary warbler (*Protonotaria citrea*), swallow-tailed kite (*Elanoides forficatus*), and wood thrush (*Hylocichla mustelina*) (USFWS 2021b).

Southeastern American kestrels are found year-round in Mississippi. They inhabit grasslands, pine savannahs, prairie, pastures, and parks where there are scattered trees for perches (Smallwood and Bird 2020). The falcon is a secondary cavity nester, generally using holes created by woodpeckers. The availability of suitable cavity trees appears to limit populations in some areas of the breeding range. The species is regularly observed in the Project vicinity, generally over the October-March period (Sullivan et al. 2009). There is ample foraging habitat for the kestrel in the Project Site (approximately 1,078 acres of pasture) and nesting habitat to the extent that cavity trees are available.

Lesser yellowlegs move through Mississippi in the spring and fall as they migrate to and from breeding areas in Canada and Alaska (Tibbitts and Moskoff 2020). They forage for aquatic insects and snails in wetlands, marshes, flooded agricultural fields, and along edges of ponds and impoundments. Most sightings of lesser yellowlegs in the Project vicinity have been from wetlands around Columbus Lake, approximately 5 miles southeast of the Project Site (Sullivan et al. 2009).

Prothonotary warblers migrate from Mexico and Central America to breed in areas across the midwestern and southeastern U.S. (Petit 2020). They breed in floodplain forests and swamps, often above slow-moving or standing water. Important habitat features include flat terrain, sparse understory, and suitable cavity trees. The riparian woodlands on the Project Site are associated with deeply incised streams and mostly dense understories. Most recent records of the species in the Project vicinity are from around the Tennessee-Tombigbee Waterway area east of the Project and around Columbus Lake southeast of the Project, and are from the April-June period (Sullivan et al. 2009). Prothonotary warbler presence is negatively correlated with forest tracts less than 250 acres and streams less than 100 feet wide (Petit 2020), which suggests that there is no suitable nesting habitat on the Project Site.

Swallow-tailed kites breed along the South Carolina and Georgia coasts, in Florida, and along the Gulf Coast of Alabama, Mississippi, and Louisiana (Meyer 2020). Swallow-tailed kite nesting has been documented in the lower Pearl and Pascagoula river basins and in an undisclosed location in central Mississippi (MDWFP undated). Swallow-tailed kites are occasionally observed along Cosby Corner Road, which is adjacent to the northern Project boundary (Sullivan et al. 2009). Kites in northeastern Mississippi are presumed to be wanderers or juvenile birds that have dispersed from the Gulf Coast, however, rather than nesting birds.

Wood thrushes migrate from wintering areas in Mexico and Central America to breeding areas across the eastern half of the U.S., including Mississippi (Evans et al. 2020). Ideal breeding habitat is characterized by mature hardwood trees greater than 50 feet tall, a "high variety" of deciduous tree species, moderate subcanopy density, a fairly open forest floor, moist soil, and decaying leaf litter (Evans et al. 2020). There is little, if any, of this habitat on the Project Site. Most recent observations of wood thrushes in the Project vicinity have been from forests around Columbus Lake, approximately five miles southeast of the Project (Sullivan et al. 2009). Based on the apparent absence of suitable breeding habitat, it appears there is minimal wood thrush nesting on the Project Site.

According to the MNHP (2021b), the osprey (state ranked S3B, S1S2N), painted bunting (S3B), and Swainson's warbler (S2S3B) are known to occur within two miles of the Project Site. No large bodies of water that would provide an adequate food source for osprey were present in or adjacent to the Project Site; habitat for the painted bunting was present, as they use abandoned farms, strips of woodland between overgrown fields, brushy roadsides or streamsides, and patches of grasses, weeds, and wildflowers; Swainson's warbler may find marginally suitable habitat in forested wetlands within the Project Site, as they prefer dense understory. None of these species were observed in the field.

State Listed Species

When the MNHP website was queried by county, results indicated that the delicate spike (*Elliptio arctata*), monkeyface (*Theliderma metanevra*), crystal darter (*Crystallaria asprella*), frecklebelly madtom (*Noturus munitus*), and black-knobbed map turtle (*Graptemys nigrinoda*) are known to occur in Clay County (MNHP 2021a). In Mississippi, the delicate spike has been found in the Pearl, Pascagoula, and Tombigbee river drainages. It is known from a very small number of specimens collected from seven sites (MMNS 2014). The monkeyface was known only from the old Tombigbee River channel before the river was destroyed by the Tennessee-Tombigbee Waterway and from the lower part of the Buttahatchee River. The last confirmed specimen in Mississippi was collected in 1980 (MMNS 2014; Jones et al. 2019). Crystal darters inhabit large streams over clean sand and gravel in water deeper than two feet. They have been known to occur over remnant gravel patches (often near tributary confluences) in the altered main channel of the Tennessee-Tombigbee Waterway. In Mississippi, the crystal darter occurs in the Bayou Pierre, Homochitto, Pearl, and Tombigbee watersheds (MMNS 2014). The frecklebelly madtom prefers stable gravel or cobble riffles and rapids in both the main river channels and in their larger tributaries. In Mississippi, this species occurs in major tributaries of the highly altered Tombigbee River, although surveys indicate that it no longer occurs in the main channel. It is relatively common throughout lower portions of the Pearl River drainage in the state (MMNS 2014). The black-knobbed map turtle prefers large streams and rivers with relatively fast current, numerous basking logs, and abundant sandbar areas for nesting. These streams must be wide enough to allow sunlight to reach basking sites for several hours per day. In Mississippi, this species occurs in the Tombigbee River system in Lowndes, Clay, Noxubee, Monroe, and Itawamba counties (MMNS 2014). As noted previously, Project Site streams have been degraded by agricultural operations and do not provide suitable habitat for any of these aquatic species.

Spatial data from the MNHP regarding known occurrences of rare and protected species was obtained to determine the target species for this survey (MNHP 2021b). The query results returned known occurrences of the grasshopper sparrow (*Ammodramus savannarum*) and Bewick's wren (*Thryomanes bewickii*) within the Project Site. The grasshopper sparrow is endangered in Florida, but not in Mississippi (Ruth 2015). Bewick's wren is state-endangered in Mississippi and was once common across the southeast, but it has "vanished" from most of its former range east of the Mississippi River (Audubon 2021). Grasslands and prairie habitat (pastureland) within the Project Site provide suitable foraging habitat for these species. Although these two species were technically not within the scope of the survey, biologists conducting surveys were instructed to record observations of either; none were observed.

Rare Plants

Based on the query from TVA's Regional Natural Heritage Database, there are 15 rare plants (with state ranks S2 – Imperiled, S3 – Vulnerable, and S4 - Apparently Secure)

within five miles of the Project Site (TVA 2021). According to TVA records, all the known occurrences are possibly historical or verified extant. Based on the query from the MNHP, two rare plants are located within two miles of the Project Site: the stemless evening primrose (*Oenothera triloba*), ranked S1 – Critically Imperiled; and the white-flower beardtongue (*Penstemon tenuiflorus*), ranked S2S3B. No rare plants were observed during the field surveys.

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed; therefore, no Project-related impacts to biological resources would be expected. Agriculture would likely continue to be the primary activity within the Project Site. There would be no change in vegetation, wildlife use, or impacts on protected species.

3.4.2.2 Proposed Action Alternative

Natural Areas

The Proposed Action is not anticipated to have any impacts on the biological resources associated with natural areas, given the nature of the activities and distance from the Project Site to the natural areas.

Vegetation

Under the Proposed Action, the solar arrays, BESS, and substation would be constructed and put into service, which would lead to direct adverse impacts to vegetation. Approximately 164 acres of forest could be permanently removed during construction, clearing and grading activities for arrays, substation, BESS, laydown yards, and access roads (Figure 3-7). Additional clearing up to eight acres may be necessary along the gen-tie/collector line route to accommodate the transmission line poles. Riparian areas would remain intact at and around streams with a width of at least 25 feet during construction to the greatest extent practicable.

The Proposed Action would result in the clearing of existing cropland, pastureland, and old field vegetation. During construction, grading and clearing activities would remove invasive species with mechanized clearing or selective herbicides as needed. Upon completion of construction, only native, non-invasive vegetation would be introduced to the Project as part of the revegetation strategy and would be in accordance with EO 13112. Seed selection for re-vegetation strategy would be developed to plant low-growing species to reduce the amount of maintenance required below the PV arrays.

Wildlife

Under the Proposed Action, up to 172 acres of woodland (mostly riparian forest) and 1,376 acres of agricultural land (cropland and pastureland) would be cleared and graded for solar facilities. Construction activities in these areas would displace a variety of forest-dwelling species (e.g., gray squirrel, raccoon, downy woodpecker, pileated woodpecker, sharp-shinned hawk) and “grassland” species (e.g., red fox, eastern cottontail, eastern meadowlark, killdeer, Northern harrier), including many of those observed during field surveys and listed in Table 3-3. Some smaller, less-mobile animals (e.g., common small mammals and reptiles) could be harmed by heavy equipment. Larger, more-mobile species (most large mammals and birds) would be expected to disperse to nearby areas that offer suitable habitat when tree clearing and earth moving begin. In addition to these direct impacts, a variety of potential denning, nesting, roosting, and foraging habitats would be eliminated by facility development. None of the species or habitats that would be affected

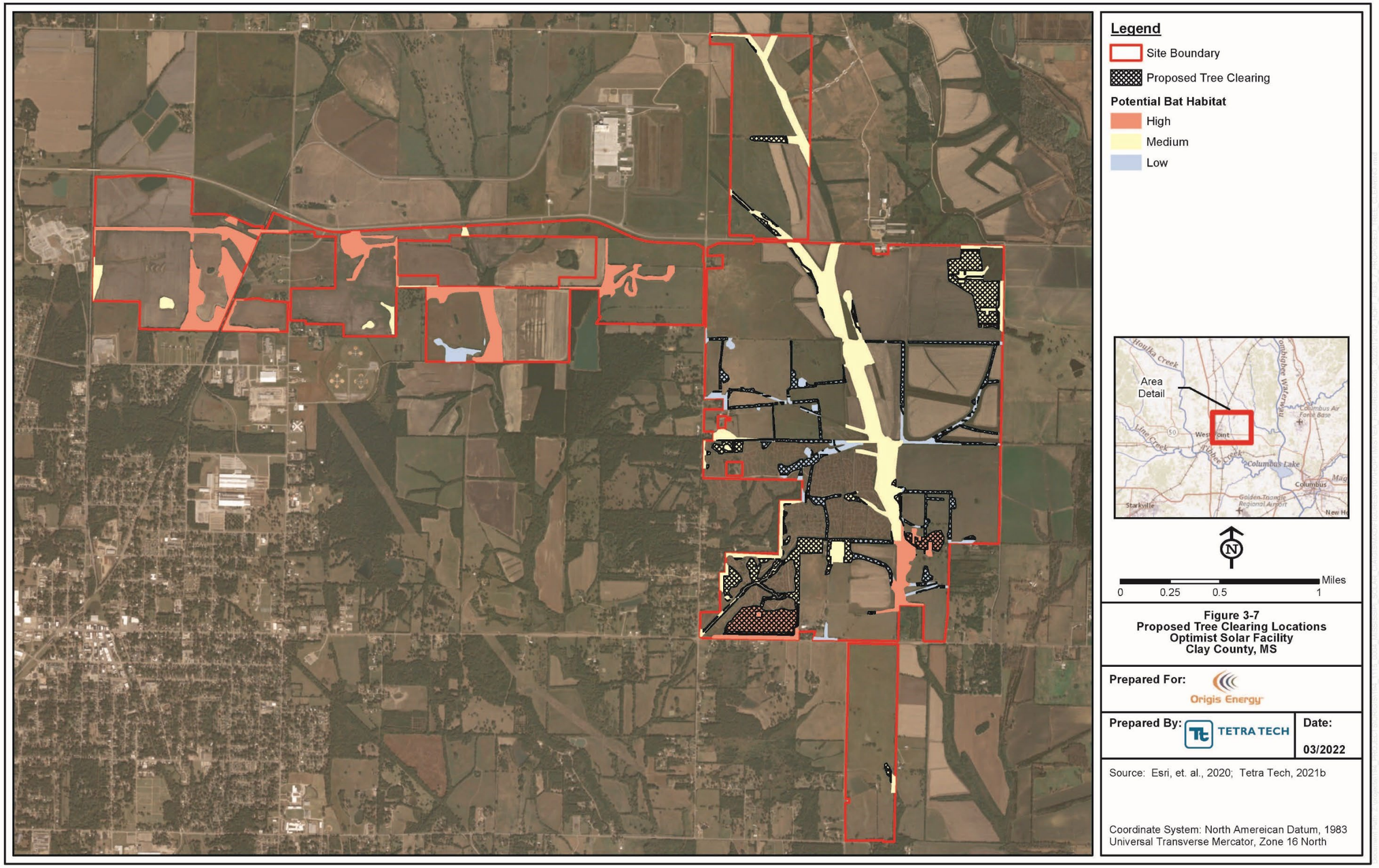


Figure 3-7
Proposed Tree Clearing Locations
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020; Tetra Tech, 2021b

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

Not for Construction

by facility construction is unique or rare; none is state or federally listed. Impacts to protected migratory birds are discussed in the section that follows.

Siting solar facilities in agricultural areas is a common practice. Although agricultural land can, when appropriately managed, provide habitat for disturbance-tolerant wildlife (e.g., white-tailed deer, small mammals, some "grassland" birds), this habitat is generally not of high quality and does not promote biodiversity. Conversely, the land around and within solar facilities can be managed to benefit wildlife. For example, solar developers have planted "wildlife meadows" and pollinator gardens in and around solar arrays, planted low-growing shrubs between rows of solar panels to provide escape cover and nesting sites for songbirds, and erected bluebird and kestrel nest boxes along perimeter fence lines. MS Solar 7 will evaluate the practicality and cost-effectiveness of these and other wildlife enhancement measures.

Potential benefits to wildlife of facility development and operation would stem from discontinuation of agricultural operations. For example, a variety of invertebrates and pollinators, including bees and butterflies, would be much less exposed to pesticides and herbicides routinely applied to row crops. Improved water quality (due to reduction in fertilizer application and removal of cattle) may benefit the limited aquatic biota that is present.

Federally Listed Species

Based on preliminary site design, approximately 54 acres of low quality potential summer roosting habitat, 64 acres of medium quality potential summer roosting habitat, and 46 acres of high quality potential summer roosting habitat for NLEBs will be cleared within the Project Site (Figure 3-7). Additional clearing up to eight acres may be necessary along the gen-tie/collector line route to accommodate the transmission line poles.

Bat acoustic surveys recorded three call sequences that were classified as NLEB by Kaleidoscope Pro software. However, manual inspection of these calls determined they could not confidently be confirmed as NLEB calls. Maximum Likelihood Estimator values generated by the software indicate that presence of NLEB was unlikely for any site night over the duration of the survey period. Given that no NLEBs were manually confirmed while following the USFWS Range-Wide Indiana Bat Survey Guidelines, it is unlikely that the Project will negatively impact the NLEB. Incidental take from tree removal activities is not prohibited with respect to this species, so long as tree removal activities do not: (1) take place within a hibernaculum, (2) occur within a quarter mile of a known, occupied hibernaculum at any time of year, or (3) occur within 150 feet of a known, occupied maternity roost tree from June 1 through July 31 (pup season). Construction activities that include tree clearing will occur outside of the NLEB pup season as a precautionary measure for bats, as well as birds. Most of the bat passes (93 percent of the total recorded) were made at stations adjacent to ponds and streams, suggesting concentrated areas of bat use and highlighting the importance of these resources within the Project Site. Avoiding impacts to wetland and open water sources that serve as foraging areas will further minimize overall impacts to all bats within the Project Site.

No breeding colonies of wood storks are known from the area. Marginally suitable foraging habitat for this species does occur in the Project Site, but all wetlands will be avoided during construction and operation of the Project. Therefore, no impacts to wood stork or their habitats are anticipated.

No suitable habitat is present for sensitive aquatic species (southern combshell; orangenacre mucket; Alabama moccasinshell; inflated heelsplitter; black clubshell; southern

clubshell; ovate clubshell; heavy pigtoe; flat pigtoe, stirrupshell, Alabama sturgeon) or Price's potato bean; therefore, no impacts to these species or their habitats are anticipated.

Bald Eagles and Migratory Birds

As noted previously, bald eagles have not been observed in the Project Site and are not expected to be affected by Project activities. Lesser yellowlegs and swallow-tailed kites are occasionally observed in the Project vicinity, but neither species nests in northern Mississippi. Individuals of both species could be disturbed by construction activity while resting or foraging in the area, but would be expected to simply move to a neighboring property that offers suitable habitat in response to the disturbance. There would be minor energetic expenses associated with dispersing to another area, but any impacts would be minor. Wood thrushes and prothonotary warblers nest in forested areas around the Tennessee-Tombigbee Waterway and Columbus Lake, four-to-five miles east and southeast of the Project Site, but the narrow strips of woodland associated with Project Site streams do not appear to provide suitable nesting habitat for either species. Individuals of either species could be disturbed by construction activity while resting or foraging in the area, but would be expected to simply move to a neighboring property in response to the disturbance. Southeastern American kestrels are known to forage on the Project Site and likely nest there. Small numbers of nesting kestrels could be directly impacted by construction activity, and in particular tree clearing, during the March-July breeding period. Impacts to nesting falcons would be mitigated to an extent by the proposed restrictions on tree clearing during the June-July NLEB pupping period.

State Listed Species

Project Site streams have been degraded by agricultural operations (e.g., erosion and sedimentation from tilling adjacent fields, cattle damaging stream banks) and most stream substrates are unstable and/or silty; therefore, they do not provide suitable habitat for the state-listed aquatic species discussed above; therefore, no impacts to these species or their habitats are anticipated.

Although not observed by biologists on the Project Site in 2021, grasshopper sparrows have been documented there in the past (eBird 2009). The species is a fairly common year-round resident of Mississippi, foraging and nesting in grasslands, prairie, and even grazed pastures (Vickery 2020). Conversion of Project Site pastureland to industrial use will eliminate several hundred acres of potential grasshopper sparrow habitat. Impacts would be similar to those discussed above where foraging and nesting could occur in the action areas. There is no shortage of pastureland in the immediate vicinity of the Project Site, however, or in this part of Clay County. Impacts of facility development on the species are therefore expected to be minor. Bewick's wren was once common across the southeast, but it no longer has range east of the Mississippi River (Audubon 2021); therefore, presence of this species on site is unlikely and no impacts to the species are anticipated.

3.5 VISUAL RESOURCES

This section describes the visual resources of the Project Site and environs and considers the potential impacts on these resources from implementing the No Action Alternative and Proposed Action Alternative.

3.5.1 Affected Environment

Most of the Project Site is comprised of cropland and pastureland, with some grassland areas that are managed as a quail (northern bobwhite) hunting preserve. Croplands are used to grow corn and soybeans. Beef cattle graze in the pastureland. There are several

fencerows (deciduous and evergreen) and mature stands of hardwoods around the Project Site, as visible in Figure 2-2. These fencerows and stands fully-to-partially shield the view of the Project Site for many of the residences in the Project vicinity. TVA's West Point Substation lies west of the site. A railroad separates the substation from the Project Site. A second rail line crosses the Project Site to the west of Eshman Avenue/Old Aberdeen Road. There are isolated single-family residences and several small clusters of homes along Barton Ferry Road, Mississippi Highway 50, and Judge Thomas Road on the west, south, and east sides of the portion of the Project Site where the PV arrays would be located (Figure 3-8).

The Project area is characterized by flat to gently rolling terrain interspersed with stream drainages, with streams generally flowing in a southeasterly direction toward Tibbee Creek. It is a rural agricultural area with scattered single-family homes, clusters of homes (often around crossroads), and some commercial and industrial development. The Yokohama Tire plant, which occupies a 500-acre tract a short distance from the Project Site, is the most significant industrial facility from a visual resources perspective. The Yokohama plant (the actual building) is approximately 0.5 mile west of a proposed solar array and 0.75 mile northwest of the proposed BESS.

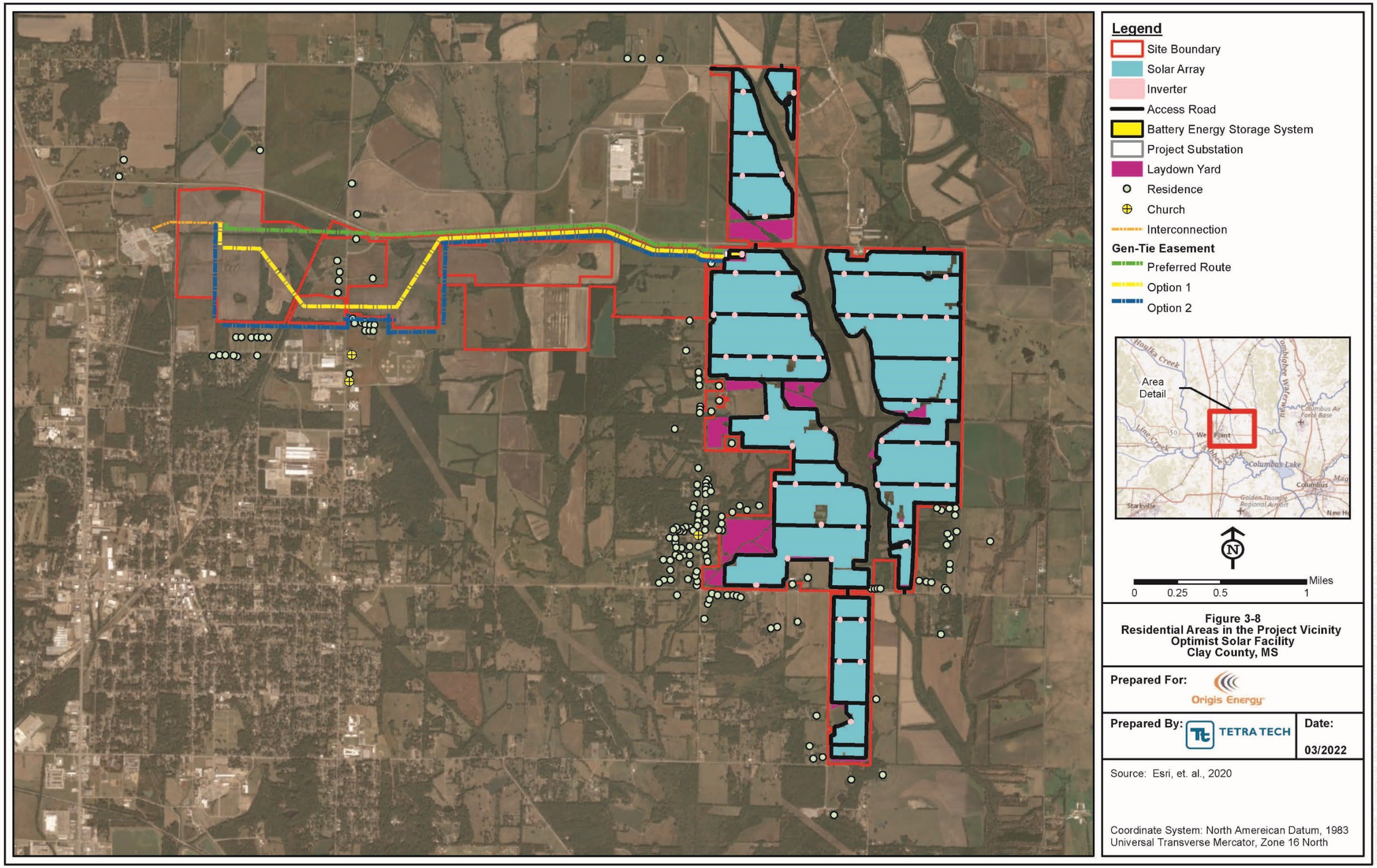


Figure 3-8
Residential Areas in the Project Vicinity
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH **Date:** 03/2022

Source: Esri, et. al., 2020

Coordinate System: North Amereican Datum, 1983 Universal Transverse Mercator, Zone 16 North

Not for Construction

The photographs below show general views of the Project Site.

Figure 3-9. Overview of the northern solar array portion of the Project Site, looking northwest from Barton Ferry Road (October 2020).

Figure 3-10. Overview of the central solar array portion of the Project Site, looking northwest from internal access roads (October 2020).

Figure 3-11. Overview of the southern solar array portion of the Project Site, looking northeast from Pinkerton Road (October 2020).

3.5.2 Environmental Consequences

This section describes the potential impacts on visual resources from implementing the No Action and Proposed Action Alternatives.

3.5.2.1 No Action Alternative

Under the No Action Alternative, MS Solar 7 would not develop a solar PV facility at this location; therefore, there would be no Project-related impacts on visual resources. The rural setting would be largely unchanged, and continue to be characterized by gently rolling farmland, grazing livestock, and small woodlots, with modest homes and farmhouses standing along two-land county roads.

3.5.2.2 Proposed Action Alternative

Construction of solar facilities and supporting infrastructure is expected to take about 16 months. Particulars on facility design and construction are provided in Section 2.2.2. Construction of the proposed Project would substantially alter the visual character of the Project Site. During construction, a relatively large number of workers (up to 250, workers' personal vehicles, heavy trucks, and construction equipment (e.g., dozers, graders, excavators, cranes) would be on site, changing the local visual setting and views from nearby homes and area roads. The part of the Site proposed for the solar arrays is predominantly fields and pastures, with trees found mostly along natural drainages and fencerows. Within the approximately 1,540 acres slated to be developed or temporarily affected for the Project, trees and other tall vegetation would be removed, and portions of the area would be graded, fundamentally changing the property's appearance. In addition to these direct impacts from site preparation and facility construction, indirect impacts from increased traffic and movement of heavy machinery on local roads would be expected. However, these impacts would be temporary (lasting approximately 16 months) and be most noticeable during daytime hours. Overall, there would be minor temporary direct and

indirect impacts during the construction phase, should the Proposed Action Alternative be implemented.

With regard to operational solar facilities, visual concerns are generally associated with the solar arrays and their electrical infrastructure. The Project would transform what is now a mix of agricultural, rural-residential, and forested lands into a light industrial facility consisting of hundreds of acres of low-profile PV arrays and supporting infrastructure. Figures 2-2 and 2-3 show the proposed Project elements.

Once the Solar Facility is operational, the central array of solar modules will extend from Mississippi Highway 50 to Yokohama Boulevard, a distance of two miles, as shown in Figure 3-8. Smaller arrays will extend north to Hazelwood Road and south to Church Hill Road. The solar panels will be ground mounted, standing five to eight feet tall, depending on time of day. Laydown areas have been placed in strategic locations around the solar arrays, to support construction of the facility. Once the Solar Facility is operational, unused construction materials (e.g., lumber, rebar, concrete block, sheet metal) will be removed for recycling or placed in a single, consolidated laydown area for future use. Abandoned laydown areas will be stabilized and revegetated with native grasses and shrubs, as appropriate.

As noted earlier, homes in the Project area are for the most part isolated and strung along roadways. There are several concentrations of homes, however, loosely arranged around crossroads. The largest concentration is around the Mississippi Highway 50-Barton Ferry Road intersection. The next largest is around the Mississippi Highway 50-Judge Thomas Road intersection. These clusters of homes are shown in Figure 3-8.

A large construction laydown area will be established north and east of the homes in the Mississippi Highway 50-Barton Ferry Road crossroads area. Patches and strips of woodland lie between most of these homes and the proposed laydown area and would screen them from views of construction materials and heavy equipment. As the trees are primarily hardwoods, the laydown area will be more visible in winter and less visible in spring and summer.

Homes of residents in the Mississippi Highway 50-Judge Thomas Road crossroads area are south and east of the proposed Solar Facility. They will be screened, to a large extent, by patches of woodland and by a north-south line of trees/hedgerow that becomes less dense as it nears Mississippi Highway 50. Homes closest to Judge Thomas Road would be completely screened; homes closest to the solar arrays would be less screened.

Homes scattered along Mississippi Highway 50 would be most subject to visual impacts. There are fewer patches of woodland here, and the ground is level (agricultural fields), so solar arrays may be visible from these homes in one or two directions (see Figure 3-8).

Although the Solar Facility represents a dramatic change in land use, the visual impact would be softened by the patches of woods that stand between many residences and the solar arrays. The degree to which the trees will conceal or obscure views of the solar panels will depend on the location of the home. Some will be completely screened; others will be partially screened; others (particularly along Mississippi Highway 50) will not be screened at al. But for the most part, the visual impact will be mitigated by the presence of woodland.

Because of the relative openness of the surrounding land and proximity to the Project Site, the residential and agricultural properties along or near Barton Ferry Road, Mississippi Highway 50, Judge Thomas Road, and Pinkerton Road are expected to be more impacted than other properties near the Project Site. Lighting associated with the proposed Project

substation, near the intersection of Cosby Corner Road and Barton Ferry Road, would be downward-facing and timer- and/or motion-activated to minimize impacts to surrounding areas.

Travelers along Mississippi Highway 50, Barton Ferry Road, Cosby Corner Road, and Judge Thomas Road would pass portions of the Project where there are few trees to buffer views of the Solar Facility. The proposed solar panels would be set back between 50 feet to 100 feet from these roadways. Due to the east-west orientation of Mississippi Highway 50 and part of Barton Ferry Road, views during most of the travel time passing the PV panels would be at an oblique angle, which would reduce the visual effects to travelers on the roadways.

The Project would likely be more visually intrusive in the morning, when the panels would be upright, approximately 8 feet from the ground at full tilt, facing east. This effect would be least at mid-day when the panel profile would be lower (approximately 5-feet-tall when lying flat). Figure 3-12 presents a representative view of the type of solar panels proposed for the Project. In the evening, when the panels would be upright facing west, the visual effects would largely occur from Project Area vantage points along and near Barton Ferry Road (the north-south portion), Pinkerton Road, and Mississippi Highway 50. Mature tree buffers along property lines around the perimeter of the Project Site would reduce these effects.

Figure 3-12. Single-axis, tracking photovoltaic system with panels showing some tilt as viewed from the east or west.

Outside of the large solar field with hundreds of thousands of solar panels, the most notable visual impacts would be those associated with the three-mile-long gen-tie (161 kV dedicated transmission line) that would connect the Project Substation to the TVA substation. Although a final design has not been determined, the visual analysis assumed steel transmission towers, with heights ranging from 70 to 80 feet above ground, depending on terrain. The gen-tie will take advantage of existing easements and will parallel Yokohama Boulevard and an existing transmission line. For most of its length, the gen-tie will move through agricultural fields; minimal clearing and tree cutting will be required. Routing a transmission line near existing transmission lines and busy road ensures that it is compatible with the existing setting and reduces visual impacts. The gen-tie could also be

routed south, away from Yokohama Boulevard, move west, then north, as shown in Figure 3-8 (Options 1 and 2). This would entail crossing open farm fields (plowed fields in aerial photographs) and a few strips of woods. Based on aerial photographs, these fields are already crossed by co-located transmission lines and a distribution line. Because these fields are already crossed by several power lines with prominent steel transmission towers, and the viewshed has been altered, the visual impact of the new transmission towers/poles would be substantially reduced.

Visual impacts during the operational phase of the Project would be minor in the immediate vicinity due to tree buffers around property boundaries along the Project Site. Visual impacts would be negligible on a larger (landscape or regional) scale. Visual impacts from the short transmission line (gen-tie) that would connect the Project Substation to the TVA substation would also be minor because existing infrastructure has already altered the viewscape.

3.6 NOISE

The noise generated from Project construction and operation has the potential to increase sound levels offsite, thus impacting offsite human receptors. The impact to these receptors is strongly influenced by the time of day, the duration of the onsite noise, topography, the distance from the noise source to sensitive offsite receptors, and the density of vegetation between the noise source and the sensitive receptors.

Environmental noise experienced by humans is measured in decibels (dBA) on the A-weighted scale. Ambient sound level measurements also account for levels through the 24-hour day and the greater sensitivity to sound during nighttime hours. Two measures that relate the time-varying quality of environmental noise to its known effect to people are the 24-hour equivalent sound level (L_{EQ}) and day-night sound level (L_{DN}). The L_{EQ} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{DN} is the L_{EQ} plus 10 dBA added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The human ear's threshold of perception for noise change is 3 dBA with a 6-dBA change being clearly noticeable to the human ear, and a 10-dBA change is perceived as a doubling of noise (or halving, if the noise is decreasing).

Clay County has no noise ordinance (Clay County 2022a). The City of West Point has a noise ordinance (Chapter 16) but the provisions only concern noise from outdoor amplifiers and vehicle audio systems (West Point 2022). U.S. Environmental Protection Agency (USEPA) developed protective noise guidelines (USEPA 1974) that recommend an average annual equivalent L_{DN} of 55 dBA to protect the health and well-being of the public with an adequate margin of safety. Because most environmental noise is intermittent (not at a steady level, but below 65 dBA more than 10 percent of any one-hour period) and intermittent noise is less damaging than continuous noise of the same L_{EQ}, USEPA applied a correction factor for intermittent noise and developed a protective level of 75 dBA for the 8-hour workday ($L_{EQ(8)}$) and 70 dBA L_{EQ} for the 24-hour day (USEPA 1974).

3.6.1 Affected Environment

The Project Site is a rural area with current land uses of cultivated fields, pasture, and hunting. The solar array locations are bordered by local roads and Mississippi Highway 50 (see Figures 2-1 and 2-2). In addition, there are low-density residential areas nearby with several residences bordering the Project Site (Figure 3-8). North of the gen-tie/collector line route through the easement parcels portion of the Project Site is a designated industrial development area, the Prairie Belt Powersite, currently hosting the Yokohama Tire plant.

Potential substation locations are within or adjacent to the West Point city limits and in close proximity to TVA's West Point Substation (see Figure 2-3). The Project Site's topography is characterized by gently rolling hills, with elevation ranging from approximately 215 feet above mean sea level (amsl) to approximately 270 feet amsl.

USEPA (1974) characterized the sound level of a small town or quiet suburban area as 46 to 53 dBA. Rural areas without traffic and businesses could have lower sound levels. However, as mentioned above, the solar array portions of the Project Site are bordered by roadways and the Prairie Belt Powersite is nearby. Furthermore, the land is farmed, and farm machinery would be used intermittently throughout the year for tilling, planting, and harvesting. Agricultural sounds can raise the noise levels with the use of machinery such as a tractor, combine, and grain grinder with sound levels from 74 to 112 dBA (PennState Extension 2012). With a portion of the Project Site currently used for hunting, nearby residents are also exposed to loud gunfire in fall and winter.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, the Solar Facility and associated structures would not be constructed; therefore, no project-related noise impacts would result. Current noise impacts related to agricultural land use, hunting, and traffic would persist.

3.6.2.2 Proposed Action Alternative

Construction activities would involve operation of pile drivers, excavators, bulldozers, backhoes, graders, front-end loaders, dump trucks, compressor, generators, and similar equipment and machinery over the construction phase of the project. Table 3-5 lists common types of construction equipment and typical sound levels at a distance of 50 feet as estimated by the Federal Highway Administration for roadway construction modeling.

Table 3-5. Construction Equipment Sound Levels

Equipment	dBA at 50 ft
Auger Drill Rig	84
Backhoe	78
Boring Jack Power Unit	83
Chainsaw	84
Compactor (ground)	83
Compressor (air)	78
Dozer	82
Dump Truck	76
Excavator	81
Front End Loader	79
Generator	81
Grader	85
Mounted Impact Hammer ("hoe ram")	90
Roller	80
Welder/Torch	74

Source: FHWA 2006

The noise levels from construction activities would be temporary and fluctuate depending on the number and type of vehicles and equipment in use at a given period. Among the loudest construction activity would be driving the posts for mounting the solar panels. The pile drivers used in roadway construction are larger equipment that those used for setting the shorter posts of solar arrays. The sound level of smaller post drivers used for solar panel installation is approximately 84 dBA at 50 feet (Dudek 2018, Mohawk Solar 2019, and Tetra Tech 2020).

Construction-related sound levels experienced by a noise-sensitive receptor near construction activity would be a function of distance, other noise sources, and the presence and extent of vegetation, structures, and intervening topography between the noise source and receptor. Figure 3-8 shows locations of homes surrounding the Project Site indicating that the greatest concentration is along Barton Ferry Road. Most of the construction activity will be for preparing the land for the solar arrays and their installation. Temporary construction laydown areas would also be noise sources during construction. The solar array and laydown area locations are shown on Figure 3-8. The planned layout for the solar arrays includes typical property boundary setbacks of 100 feet from residential properties; however, Clay County does not have a zoning ordinance or otherwise have established property setback requirements.

Nearby residents would experience elevated noise levels from the operation of construction equipment during daytime hours (typically 8am to 7pm) as well as an increase in traffic during peak morning and evening commutes. Sound levels from construction activities would attenuate with distance as the sound waves spread from the source. Generally, there is a 6 dB drop in sound level with a doubling of distance. Noisy construction equipment will not remain concentrated at one location in the Project Site but would move as construction activities shift from one area to the next. Thus, the distance between a residence and construction activity would frequently change over the 16-month duration of construction activities. The noise levels experienced by local residents are not expected to exceed the 75 dBA recommendation for intermittent noise for prolonged periods.

During operations, the Solar Facility's inverters will emit continuous sound while operating. The inverters would operate only during daylight hours when the PV panels are producing electricity. The sound level immediately adjacent (3 to 5 feet away) to an inverter is expected to be up to 75 dBA. Inverters will be placed throughout the solar arrays but would be located away from the property lines. The sound emitted from the inverters would be attenuated by the surrounding solar array structures and the distance to offsite noise receptors. Field surveys of inverter noise from three solar array locations demonstrated that at a distance of 150 feet all inverter sounds along with sound from other equipment approached background sound levels (MCEC 2012). Intermittent sound emissions from the facility would include maintenance activities at the solar arrays and electrical infrastructure including worker vehicles. In addition, there would be periodic mowing and possibly panel washing. The Project's operations and maintenance offices, storage, and parking would be sources of intermittent noise during daylight hours and would be located along the east-west segment of Barton Ferry Road away from the concentration of residences. The Project's substation and BESS whether located at their preferred site along Barton Ferry Road or at one of the locations near the TVA West Point Substation (see Figure 2-3) would not be noise sources other than occasional operations and maintenance activities during daylight hours. The sound levels experienced offsite would be consistent with existing conditions of agricultural operations and road noise and noise impacts from operations would be minor.

3.7 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This section describes existing air quality and GHG emissions in the Project Area and the potential impacts on air quality and GHG emissions that would be associated with the No Action and Proposed Action Alternatives.

3.7.1 Affected Environment

Ambient air quality is determined by the type and concentration of pollutants emitted into the atmosphere, the size and topography of the air shed in question, and the prevailing meteorological conditions in that air shed. As previously noted, the Project Site is located in Clay County, a rural area of northeastern Mississippi where the land use is mostly agricultural. Urban areas are West Point and Columbus. Pollutants emitted in the area would be reflective of an agricultural setting, traffic between the urban areas, and a nearby industrial site. The topography is gently rolling hills. Northern Mississippi has a normal mean annual temperature of approximately 62°F with rainfall fairly evenly distributed through the year (MSU 2022). At the nearest weather station to the Project Site, West Point 1.0 SSE, the 30-year annual average precipitation is 56 inches with monthly averages ranging from 3. 5 to 5.6 inches (CoCoRaHS 2022).

USEPA monitors ambient air quality and determines attainment with ambient air quality standards for the following criteria pollutants: sulfur dioxide (SO_2), ozone (O_3), nitrogen dioxide (NO_2), particulate matter whose particles are less than or equal to 10 micrometers (PM_{10}), particulate matter whose particles are less than or equal to 2.5 micrometers ($PM_{2.5}$), carbon monoxide (CO), and lead (Pb). Mississippi as a whole is in attainment (USEPA 2021a, 2022). Thus, Clay County, located in the Northeast Mississippi Air Quality Control Region, is in attainment for all criteria pollutants (USEPA 2021a, 2022).

Other air pollutants of concern are GHGs. GHGs are those that trap heat in the atmosphere and increasing levels of GHGs in the atmosphere can result in an increase in warmer temperatures and changes in the hydrologic cycle (e.g., heavy rainfall, drought). The main GHGs and those monitored by USEPA are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. Of these, carbon dioxide is the dominate GHG, making up 80 percent of the U.S. GHG emissions in 2019, a reduction of 2.2% from 2018 levels. The primary sources of the carbon dioxide emissions are from the combustion of fossil fuels (e.g., gasoline, diesel, oil, natural gas) in the transportation (29%) and electricity generation (25%) sectors of the US economy. (USEPA 2021b) GHG emissions from the TVA power system are described in TVA's EIS for its 2019 IRP (TVA 2019b).

The temperatures from 1900 to 2020 in Mississippi rose by 0.1°F with the warmest 5-year period being 2016-2020 (NOAA 2022). The US Global Change Research Program (USGCRP) reviewed historic temperatures and projected impacts to temperature and precipitation for the US Southeast. The warm nights (days with minimum temperatures above 75°F) currently occur only a few times per year across most of the region. For years 2036–2065 under USGCRP's lower scenario of climate change northeast Mississippi would experience an increase of annual warm days of 5 to 20 days (USGCRP 2018). The National Oceanic and Atmospheric Administration (NOAA) published predictions by state and indicated the USGCRP's predicted the change in precipitation for 2036–2065 under a higher scenario of climate change with the predicted change for Mississippi to be 0 to 10% increase for all seasons except summer where the prediction was a 0 to 10% decrease (USGCRP 2017). NOAA published a Mississippi-specific projection of 0 to 5% decrease for northeast Mississippi (NOAA 2022).

The level of carbon dioxide in the atmosphere is also influenced by sequestration of the gas by vegetation. Section 3.4 discusses the vegetative types and acreage of the Project Site.

3.7.2 Environmental Consequences

3.7.2.1 No Action Alternative

Under the No Action Alternative, the Solar Facility would not be constructed. Therefore, no air emissions or GHGs would be generated by equipment or vehicles from construction or operation of the Solar Facility. Existing land use and ongoing emissions would be expected to remain.

3.7.2.2 Proposed Action Alternative

Land clearing and grading for solar arrays will result in exposed soils and generate fugitive dust. Control measures such as wetting of soil piles, covering loads and staging areas, and seeding of bare areas would be implemented to minimize fugitive dust. Land clearing could also involve open burning. Any such burning of vegetative debris would be done in accordance with Mississippi Department of Environmental Quality air regulations (Mississippi Administrative Code Title 11, Part 2, Rule 1.3(2)) which also prohibits burning during high fire danger conditions. The appropriate open burning permits would be obtained from the MFC. Weather conditions would be monitored and considered to ensure safety and minimize degradation to air quality. Chipping and grinding operations during land clearing would produce particulate emissions. Operation of diesel or gasoline-powered construction equipment and vehicles at the Project Site as well as vehicles hauling supplies and debris and workers personal vehicles would generate local emissions of PM, NOx, CO, volatile organic compounds (VOCs), and SO_2. The air emissions from these activities could have temporary localized air quality impacts. Operation of construction equipment and vehicles supporting construction would also cause a minor temporary increase in GHG emissions. Construction activities would be conducted primarily during daylight hours and are expected to last approximately 16 months. With implementation of fugitive dust control measures, proper maintenance of construction equipment, and adherence to open burning regulations, the temporary air quality impacts would be minimized. Impacts to air quality associated with construction activities would be temporary and minor.

The removal of vegetative cover would have a negligible impact on carbon sequestration and atmospheric carbon dioxide levels regionally or at larger scale. As mentioned in previous sections, approximately 1,540 acres of the Project Site would be cleared of vegetation during construction. Upon completion of construction, many of the cleared areas would be revegetated with non-invasive plants and shrubs. The revegetation strategy would involve planting native grasses and low-growing shrubs rather than trees to minimize shading of solar arrays. In addition, some of the acreage would be left unvegetated to accommodate the operations and maintenance building, parking, and access roads.

As mentioned above, operation of construction equipment and vehicles supporting construction would also cause a minor temporary increase in GHG emissions. The GHG emissions would be small, having only negligible impacts on the region and no noticeable effect on the regional climate.

GHGs would also be emitted elsewhere in the US or outside the US for production and transportation of the materials and equipment used for construction. The dispersion of any GHG emissions or their effects over this larger area would not be noticeable at regional or larger scales.

The construction and operation of the Solar Facility is not anticipated to have any long-term adverse impacts on air quality or GHG emissions. The operation of the Solar Facility would generate electricity without GHG emissions in contrast to electricity generation from fossil fuel-fired power plants. This offset would have little noticeable effect at regional or larger scales. It would, however, be a component of the larger planned system-wide reduction in GHG emissions by the TVA power system through reducing the need for some fossil-fuel-based electricity generation.

No noticeable direct or indirect impacts to the local or regional climate would be associated with the construction and operation of the proposed Project. Local or regional climate effects can occur, for example, with major changes in land use that affect the hydrological cycle, or that create large impervious surfaces, thus changing the radiative heat balance over a large area. As described in Sections 3.2 and 3.4, the Project would change the surface characteristics somewhat, but it would have little effect on soil permeability and hydrologic characteristics of the developed area. Vegetation would still grow under and around the solar panels, tending to maintain a landscape with significant evapotranspiration of precipitation, as opposed to creating significant runoff of precipitation, as happens with urban development, which can create a “heat island” effect. Therefore, average temperatures of the Project Site are not expected to change significantly due to the proposed Solar Facility.

3.8 CULTURAL RESOURCES

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

3.8.1 Affected Environment

Federal agencies are required by the National Historic Preservation Act (NHPA) and NEPA to consider the possible effects of their undertakings on historic properties (i.e., cultural resources that are listed in the National Register of Historic NRHP or that meet the criteria to be eligible to the NRHP). The term “undertaking” means any project, activity, or program that is funded under the direct or indirect jurisdiction of a federal agency, or requires a federal license, permit, or federal approval.

An agency may fulfill its statutory obligations under NHPA by following the process outlined in the implementing regulations, Section 106 of NHPA, at 36 CFR Part 800. Under these regulations, considering an undertaking’s possible effects on historic properties is accomplished through a four-step review process:

1) Initiation (defining the undertaking and the area of potential effects [APE], and identifying the consulting parties);
2) Identification (studies to determine whether cultural resources are present in the APE and whether they qualify as historic properties);
3) Assessment of adverse effects (determining whether the undertaking would damage the qualities that make the property eligible for the NRHP; and
4) Resolution of adverse effects (by avoidance, minimization, or mitigation).

Throughout the process, the agency must consult with the appropriate State Historic Preservation Officer (SHPO) and federally recognized Indian tribes that have an interest in the undertaking, and should provide public notice of the undertaking.

Cultural resources include prehistoric and historic archaeological sites, districts, buildings, structures, and objects, and locations of important historic events that lack material evidence of those events. Cultural resources that are included or considered eligible for inclusion in the NRHP and maintained by the Secretary of the Interior are called historic properties. To be included or considered eligible for inclusion in the NRHP, a cultural resource must possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, it must also meet one of four criteria: (a) association with important historical events; (b) association with the lives of significant historic persons; (c) having distinctive characteristics of a type, period, or method of construction, or representing the work of a master, or having high artistic value; or (d) having yielded or having the potential to yield information important in history or prehistory.

When a TVA action would adversely affect a historic property, TVA must, in consultation with SHPOs, tribes, and others throughout the Section 106 process, consider ways to avoid or minimize the adverse effect. If avoidance or minimization are not feasible, measures to mitigate the adverse effect must be taken.

As part of the evaluation process, New South Associates (NSA) performed background research and archaeological and historic architectural field surveys (NSA 2022a, 2022b). The Project Site vicinity contains archaeological resources dating from the Early Archaic period through the Historic period, a span of some 10,000 years. There is potential for resources within the archaeology APE representing any of these time periods.

3.8.1.1 Background Research Results

The background research included a review of recorded cultural resource files maintained by the Mississippi Department of Archives and History (MDAH) plus a literature review of topics pertinent to the Project Site, including soils, environmental setting, prehistoric settlement patterns, and historic period development. The file review identified 15 recorded archaeological sites and 20 recorded historic architectural resources within the respective archaeological and architectural APEs. Ten of the archaeological sites have been determined not eligible for listing in the NRHP by MDAH, and five sites are either unknown or unevaluated regarding their NRHP status. One of the recorded architectural resources (Mobile and Ohio Railroad) has not been evaluated by MDAH for potential to be eligible to the NRHP; the remaining 19 resources have been determined not eligible for listing in the NRHP by MDAH.

3.8.1.2 Identification Survey, and Field Findings

NSA conducted a Phase I cultural resources field survey within the Project APEs during August to October 2021 and March 2022 to determine the presence of archaeological and historic architectural resources that qualify as historic properties or are eligible within the Mississippi Landmark Program (NSA 2022a, 2022b). The Phase I archaeological survey identified 15 newly recorded sites and 9 newly recorded isolated finds. Three previously recorded sites (22CL0102, 22CL1057, and 22CL1058) were revisited and re-surveyed to confirm their prior ‘not eligible’ NRHP recommendations. No cultural material was recovered from the three sites and NSA recommended no change to their eligibility status. All the isolated finds and all of the 15 newly recorded sites were recommended by NSA as not eligible for listing in the NRHP. Fourteen of the newly recorded sites are attributed to nineteenth and twentieth century domestic deposits; one site is associated with the Illinois Central Railroad.

The historic architectural survey identified 64 newly recorded resources and revisited 18 previously-recorded historic resources. Of the 18 previously recorded resources, NSA

found 13 of them were no longer extant and did not recommend changes in NRHP eligibility status for the remaining five. NSA's survey also re-evaluated three previously recorded resources needing additional research. NSA assessed three properties within the APE to possess historical and/or architectural significance and retain enough integrity to be recommended eligible for listing in the NRHP. The Old Aberdeen Road Church of Christ (HS-21) and the West Point Church of God (HS-23) are recommended as currently not eligible, but potentially locally eligible under Criterion C for their distinctive modernist architectural form when they reach the 50-year age threshold, in 2023 and 2032, respectively. The Strong Hill Cemetery (HS-33) is recommended NRHP eligible under Criterion A for its association with local Black heritage through the twentieth century.

3.8.2 Environmental Consequences

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

3.8.2.1 No Action Alternative

The No Action Alternative will produce no Project-related impacts to recorded cultural resources in the archaeological and architectural APEs.

3.8.2.2 Proposed Action Alternative

Following the Phase I archaeological survey of the Project Site and upon completion of the artifact analysis, NSA recommended all of the 24 newly identified archaeological resources and the 3 revisited archaeological resources as not eligible for listing in the NRHP. These sites and isolated finds were concluded to lack research value, and NSA recommended no further archaeological investigation in support of the Proposed Action.

Following the Phase I historic architectural survey of the APE, NSA recommended that three of the 64 newly recorded historic architectural properties possessed historical and/or architectural significance and retained sufficient integrity to be recommended NRHP-eligible. The remaining 63 newly recorded architectural resources and the three revisited architectural resources are recommended not eligible for inclusion in the NRHP. Two of these resources are railroads: the Gulf, Mobile, and Ohio Railroad (025-WPT-5470) and the Illinois Central Railroad (HS-7). NSA recommends both these resources ineligible for the NRHP based on lack of integrity of design, materials, and workmanship. while TVA agrees with NSA's recommendation for (025-WPT-5470 and HS-7, should the SHPO disagree and find the railroads eligible, it is the opinion of TVA that the viewshed has already been affected by surrounding modern infrastructure and that the undertaking would not diminish the significance of the character-defining elements for which the property could contribute to their eligibility and would not result in adverse effects.

The one architectural property (HS-33) recommended NRHP-eligible, and the two architectural properties (HS-21 and HS-23) that would be potentially NRHP-eligible when they meet the 50-year age threshold for listing, are described below.

Old Aberdeen Road Church of Christ (HS-21)

The Old Aberdeen Road Church of Christ is located at 2346 North Eshman Avenue. Constructed in 1973, the church is an A-frame form and has undergone minimal exterior alterations in its fabric or footprint. NSA evaluated Old Aberdeen Road Church of Christ for NRHP eligibility under Criteria A and C. The property was recommended not eligible for listing under Criterion A due to a lack of corroborating evidence that the church has played a vital role in local community development. Under Criterion C, NSA found that the church represented a distinctive modernist style of religious buildings in rural Mississippi and

retained its aspects of integrity, including location, design, setting, materials, and feeling. NSA recommended that the property should be reevaluated for NRHP eligibility under Criterion C when it reached the age threshold in 2023.

Old Aberdeen Road Church of Christ is located approximately two miles west of the proposed solar arrays fronting Barton Ferry Road, and approximately 0.25 to 0.3 mile. south of the proposed gen-tie lines. The property appears to be screened from Project views by vegetation along McGee Creek and woodlots situated between McGee Creek and the arrays. There would be probable views of the gen-tie lines from the property. It is concluded that Project-related visual effects would not diminish the significance of the character-defining elements for which the property has been recommended NRHP-eligible, and thus the introduction of the Project into the landscape would not result in adverse impacts to the Old Aberdeen Road Church of Christ.

West Point Church of God (HS-23)

Construction on the West Point Church of God, located at 2208 North Eshman Avenue, began in 1974 and was completed in 1982. NSA evaluated West Point Church of God for NRHP eligibility under Criteria A and C. The property was recommended not eligible for listing under Criterion A due to a lack of corroborating evidence that the church has play a vital role in local community development. Under Criterion C, NSA found that the church represented a distinctive modernist style of religious buildings in rural Mississippi and retained its aspects of integrity, including location, design, setting, materials, and feeling. NSA recommended the property should be reevaluated for NRHP eligibility under Criterion C when it reaches the 50-year age threshold.

West Point Church of God is located approximately two miles west of the proposed solar arrays fronting Barton Ferry Road, and approximately 0.4 to 0.45 mile south of the proposed gen-tie lines. The property appears to be screened from Project views by vegetation along McGee Creek and woodlots situated between McGee Creek and the arrays. There would be probable views of the gen-tie lines from the property. It is concluded that Project-related visual effects would not diminish the significance of the character-defining elements for which the property has been recommended NRHP-eligible, and thus the introduction of the Project into the landscape would not result in adverse impacts to the West Point Church of God.

Strong Hill Cemetery (HS-33)

Strong Hill Cemetery is associated with the Strong Hill Missionary Baptist Church, an African American church community located on Strong Hill Road. The church and cemetery are associated with the Strong and Davis families. The Strongs descended from Frank and Silvia Strong, an enslaved couple who, during the Reconstruction period, were able to purchase the land that would become the cemetery and church. The earliest recorded burial in the cemetery dates to 1926. The original wood church was replaced in 1955 by a brick structure, which in turn was replaced by the current church building in 2005. The cemetery contains the graves of several members of the Davis family, who operated one of the largest Black-owned chicken processing plants in the South during the mid-twentieth century. The cemetery contains approximately 150 burials. Evaluated for NRHP-eligibility under Criterion A, the Strong Hill Cemetery exhibits an important association with local Black heritage dating from the early twentieth century. NSA recommended Strong Hill Cemetery eligible to the NRHP.

Strong Hill Cemetery is located approximately 0.3-mile northwest of the proposed solar arrays on Mississippi Highway 50 near Barton Ferry Road. The cemetery is screened from

the Project by vegetation along an unnamed tributary to McGee Creek and scattered trees within residential lots. It is concluded that Project-related visual effects would not diminish the significance of the character-defining elements for which the property has been recommended NRHP-eligible, and thus the introduction of the Project into the landscape would not result in adverse impacts to the Strong Hill Cemetery.

Through the Section 106 consultation process, if it is determined that the Project would result in an adverse effect on cultural resources, the Project would be redesigned to avoid affected sites so that MS Solar 7 would not need to mitigate for impacts through a Memorandum of Agreement process. Therefore, there would be no direct or indirect impacts to archaeological or historic resources listed eligible, potentially eligible, or undetermined for the NRHP. TVA is consulting with the SHPO and federally recognized Indian tribes with an interest in the area with respect to TVA's findings of both the archaeological and architectural surveys.

Should previously undiscovered cultural resources be identified during construction or operations, 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 the SHPO would be consulted before any further action is taken.

3.9 UTILITIES

This section provides an overview of existing utilities in the Project Area and the potential impacts on these utilities that would be associated with the No Action and the Proposed Action Alternatives. The utilities analyzed include telecommunications, electric, natural gas, water, and sewer.

3.9.1 Affected Environment

The Project Site is located in a rural area of Clay County. A portion of the Site is within the City of West Point.

3.9.1.1 Telecommunications

Telecommunication services in the area are provided by BellSouth Telecommunications (GTR LINK Undated a, MPUS 2022) as well as mobile carriers (FCC 2021).

3.9.1.2 Electric

The local electricity provider for the area is Four County Electric Power Association (4CEPA), a not-for-profit electric cooperative that purchases power generated by TVA (GTR LINK Undated a). There are eight TVA-owned transmission lines in four ROWs that cross the Project Site (Figure 2-1). Distribution lines are present throughout the Project area, including along portions of Yokohama Boulevard, Barton Ferry Road, Mississippi Highway 50, and other major and minor roads in the vicinity.

3.9.1.3 Natural Gas

Atmos Energy provides natural gas to Clay County, including the Project Site (GTR LINK Undated a). One natural gas pipeline traverses the Project Site running parallel to Eshman Avenue/Old Aberdeen Road. A second natural gas pipeline crosses Eshman Avenue and traverses diagonally from southeast to northwest through the Project Site (Figure 2-1) (PHMSA 2022).

3.9.1.4 Water and Sewer

Water services in the area are provided by the City of West Point Water and Light (GTR LINK Undated a). Because the Project Site is predominantly outside of the city limits, water service is also provided by private wells, and sewer service is provided through private septic systems. There are two water towers adjacent to the Project Site.

3.9.2 Environmental Consequences

This section describes the potential impacts that the No Action or Proposed Action Alternative could have.

3.9.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility would not be constructed; therefore, no Project-related impacts to utilities would be expected. Agriculture would likely continue to be the primary activity within the Project Site.

3.9.2.2 Proposed Action Alternative

Implementation of the Proposed Action would include installation of approximately three miles of gen-tie/collector lines connecting the Project to the TVA's West Point Substation. The Project would not require local electric service by 4CEPA. Portable generators would be used during construction. Once the Project enters the operations phase, power generated by the Solar Facility would be used to meet the low level of facility demand. No long-term adverse impacts are expected to be associated with the Project. Implementation of the Proposed Action would result in additional renewable energy resources in the region and would, thus, constitute a beneficial impact to electrical services across the region.

Natural gas service would not be required. The existing natural gas infrastructure present on the Project Site would not be disturbed or otherwise impacted during the construction or operation of the Solar Facility.

Water would be needed for soil compaction and dust control during construction, and to a lesser extent for domestic use during operations (i.e., cleaning solar panels). Portable toilet facilities would be available onsite for the duration of the construction period. Water in sufficient quantity and quality would be made available through use of on-site groundwater wells, or delivery via water trucks during construction. During operation, a new water well and septic system may be needed for the operations and maintenance building. MS Solar 7 would obtain a permit for a septic system in accordance with Mississippi State Department of Health requirements.

No telecommunication services are anticipated to be acquired through the local providers. MS Solar 7 would have a dedicated communications system to remotely monitor Solar Facility operations.

There would be no anticipated long-term adverse impacts associated with the Project. Implementation of the Proposed Action would result in additional renewable energy resources in the region.

3.10 WASTE MANAGEMENT

This section provides an overview of existing waste management within the Project Site and surrounding areas and the potential impacts to waste management that would be associated with the No Action or Proposed Action Alternatives. Solid and hazardous waste materials were analyzed for this discussion.

3.10.1 Affected Environment

"Hazardous materials" and "hazardous waste" are substances which, because of their quantity, concentration, or characteristics (physical, chemical, or infectious), may present a significant danger to public health and/or the environment if released. These substances are defined by the Comprehensive Environmental Response, Compensation, and Liability Act ([CERCLA]; 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 Part 261. Storage and use of hazardous materials and wastes are regulated by local, state, and federal guidance including the Emergency Planning and Community Right-To-Know Act (42 U.S.C. § 116 *et seq.*) and RCRA. In Mississippi, the MDEQ operates under the authority of the Mississippi Solid Waste Disposal Law (Miss. Code Ann. § 17-17-1 et seq.) and implements RCRA Subtitle C at the state level.

An American Society for Testing and Materials (ASTM) standard E 2247-16 Phase I Environmental Site Assessment was conducted by Tetra Tech in November 2021, to evaluate the Project Site for the presence, former use, or spillage of hazardous substances or petroleum products, referred to as recognized environmental condition (Tetra Tech 2022b). As part of the Assessment, a search of readily available federal, state, regional, and local agency databases was conducted by Environmental Data Resources, Inc. (EDR), a subcontracted regulatory research service. Since 1952, historical use of the Project Site has primarily consisted of cropland and pastureland with forested areas, rural roads, and a scattering of agricultural structures. Based on the EDR report and field reconnaissance, one recognized environmental condition was identified, a hog manure lagoon. The lagoon is in an area of the Project Site where there will be no activity associated with the construction or operation of the solar facility.

Collection and disposal of solid waste in Clay County is conducted by the Golden Triangle Regional Solid Waste Management Authority (Clay County 2022b). Nonhazardous wastes, including construction and demolition debris and yard waste, can be hauled to a Class I operating facility.

3.10.2 Environmental Consequences

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

3.10.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed; therefore, no Project-related impacts to waste management resources would be expected. Agriculture would likely continue to be the primary land use within the Project Site, and existing waste management conditions would likely remain the same.

3.10.2.2 Proposed Action Alternative

Under the Proposed Action, construction activities would result in the generation of both hazardous and nonhazardous solid wastes. These wastes would include construction debris, grading spoils, packaging materials, and general construction solid waste. Every effort would be made to minimize the amount of waste generated during and after Project construction.

Materials for soil compaction activities may be procured from the Project Site or materials may need to be brought to the site, as needed. These materials would be off-loaded at the designated area for immediate dispersion. Any materials not suitable for compaction would be removed and loaded for disposal at an acceptable off-site location. Contaminated grading materials are not anticipated; however, if any materials are encountered, they would be disposed of at the nearest appropriate facility in accordance with applicable laws, ordinances, regulations, and standards.

Construction of the Project is estimated to result in generation of not more than 40 cubic yards of construction debris and material waste each week (during heavier periods of construction), which would be accumulated in a construction debris container and hauled off monthly. A list of acceptable waste facilities is provided in Table 3-6.

Table 3-6. Waste Facilities Near the Project Site

Waste Facility	Address	Accepted Materials
Golden Triangle Regional Solid Waste Authority	9778 Old West Point Road Starkville, MS 39759	Household garbage, vegetative debris, mixed building debris, commercial wastes, office wastes, packaging wastes, and other non-hazardous solid wastes.
West Point Class I Landfill	1400 Landfill Road West Point, MS 39773	Construction and demolition debris and yard waste.

Hazardous Waste

Small quantities of hazardous waste may be generated during construction, operation and maintenance, and decommissioning of the Solar Facility. Possible hazardous wastes generated during construction would be paint, primer, thinners, and solvents. During operation and maintenance, the Project has potential to produce hazardous solid and liquid wastes, such as hydraulic fluids, greases, used oils, fluorescent bulbs, air conditioning fluids (chlorofluorocarbons), used cleaning solutions, and used batteries. During decommissioning of the Project, potentially hazardous wastes would be diesel fuel, hydraulic fluids, lubricant oil, the solar panels, and batteries used in the BESS. Efforts would be made, to the extent practicable, to recycle hazardous wastes in accordance with applicable regulations.

During construction, minimal amounts of petroleum fuel, diesel, oil, and lubricants would be kept on site for equipment. Fueling of construction vehicles and other mobile equipment would occur primarily in the construction laydown areas. Special procedures would be identified to minimize the potential for fuel spills, and spill control kits would be carried on refueling vehicles. Fuel for construction equipment could be provided by a fuel truck or could be stored in aboveground double-walled storage tanks with built-in containment. The volume of each individual tank would not exceed 1,320 gallons, the threshold above which a SPCC Plan would be required (40 CFR 112). However, because there would be fuel in reserve for diesel generators, in addition to the volume of oil contained in the main electrical transformers, the total volume of regulated materials may exceed the threshold. In that case, an SPCC Plan would be prepared. 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 2006, 2011). The SPCC Plan would detail the

procedures, methods, and equipment necessary to prevent spills or discharges from reaching navigable waters. The SPCC Plan would need to be maintained on-site and updated, as needed. All spills would be reported to MDEQ's Emergency Response Division. A cleanup report would be prepared and sent to MDEQ to document each spill and clean up response.

Hazardous materials may also be stored on-site during construction and would be stored in appropriate containers. Storage areas would have secondary containment, as necessary, in case of vessel failure. BMPs would be installed and maintained to contain potential spills. Safety Data Sheets would be kept on-site and be readily available to personnel. A security fence would be installed and maintained during construction and operation of the facility to keep unauthorized personnel from accessing the Project Site.

Typically, at the end of a solar facility's life, the entire facility is decommissioned, and the land is returned to its previous condition. Decommissioning would include the removal of aboveground and below-ground equipment, electrical wiring, concrete pads, storage areas, and additional appurtenances. Most of the materials and equipment would be recycled; however, some hazardous materials would need to be disposed of according to applicable regulations. Solar panels can contain metals, such as cadmium and lead, that are harmful to human health and the environment at high levels (USEPA 2021c). The solar panels could be considered hazardous waste under RCRA when discarded if they exhibit the characteristic of toxicity (USEPA 2021c). Regulatory exclusions may apply to solar panels that are recycled. MS Solar 7 would work to locate a facility to recycle the solar panels. Materials that cannot be recycled would be disposed of at appropriate facilities in accordance with federal, state, and local laws and regulations.

Some batteries exhibit hazardous characteristics and would be considered hazardous waste when disposed. RCRA regulations for managing batteries characterized as hazardous waste would apply to energy storage system batteries. MS Solar 7 has not selected the type of BESS for the Project. Most energy storage systems throughout the U.S. that are 1 MW or greater in capacity use Li-ion batteries (EIA 2021). Li-ion batteries have a typical lifespan of 7-10 years (NREL 2017), at which point they will only hold approximately 70 percent of their initial amount of energy. MS Solar 7 would decide if replacing batteries to maintain the storage capacity would be beneficial over the operating life of the Project. When discarded, energy storage system batteries (other than lead acid batteries) that exhibit hazardous characteristics could be managed under Mississippi Universal Waste requirements (40 CFR 273, Mississippi Administrative Code Rule 11-3-1.21).

As discussed above, MS Solar 7 would develop and implement a variety of plans and programs to ensure safe handling, storage, and use of hazardous materials. Personnel would be supplied with the appropriate personal protective equipment (PPE) and be properly trained in the use of PPE and the handling, use, and cleanup of hazardous materials.

Non-hazardous Waste Management

In addition to hazardous waste, the facility would also produce non-hazardous waste during the construction, operation and maintenance, and decommissioning phases of the Project. Wastes generated throughout the Project's life would include soiled rags, scrap metal, plastic, insulation, empty containers, cardboard, glass, wood, pallets, broken machine parts, broken electrical materials, and other miscellaneous waste. This material would be disposed of by the appropriate refuse and/or recycling services. Applicable regulatory requirements would be followed in the disposal of these materials. Designated site

personnel would conduct daily, weekly, and monthly inspections, cleanup, proper labeling of containers, proper storage and disposal of debris and refuse. MS Solar 7 would record the amounts of waste generated and removed from the Project Site. Information on wastes streams anticipated to be generated during Project construction is provided in Table 3-7.

Table 3-7. Summary of Construction Waste Streams and Management Methods

Waste Stream	Origin and Composition	Estimated Frequency of Generation	On-site Treatment	Waste Management Method / Offsite Treatment
Construction waste	Empty material containers	Intermittent	None	Return to vendor when possible, recycle where practicable, remove to appropriate off-site disposal location
Construction waste	Used oil, hydraulicfluid, oily rags	Intermittent	None	Recycle wherever practicable, remove to appropriate off-site disposal location
Construction waste	Steel, glass, plastic, wood/pallets, cardboard, paper	Intermittent	None	Recycle wherever practicable, otherwise dispose of at a Class I landfill
Sanitary waste	Portable chemical toilets – sanitary waste	Periodically pumped to tanker truck by licensed contractors	None	Ship to sanitary wastewater treatment facility.

The anticipated quantities of waste produced during Project operation are shown in Table 3-8. Waste collection and disposal activities would be conducted in accordance with applicable regulatory standards to minimize health and safety effects. To the extent practicable, waste materials would be recycled. Materials that could not be recycled would be disposed of at an approved facility to be determined by the designated contractor. Waste oil will not be disposed of on the Project Site.

Additional materials that would be present in small quantities would be janitorial supplies, paint, office supplies, laboratory supplies, degreaser, herbicides, residential grade pesticides, gasoline, hydraulic fluid, propane, air-conditioning fluids. Flammable materials would be kept in a flammable material cabinet(s). Spill kits would be located near these storage areas, as spills of small quantities would not be considered to have a significant environmental impact.

Table 3-8. Summary of Operational Waste Streams and Management Methods

Waste Stream	Origin and Composition	Estimated Volume	Estimated Frequency of Generation	Waste Management Method	
				Onsite	Offsite
Used hydraulic fluid, oils, and grease-petroleum-related wastes	Tracker drives, hydraulic equipment	1,000 gallons/year	Intermittent	Accumulate for <90 days	Recycle
Oily rags, oil absorbent,and oil filters – petroleum-related wastes	Various	One 55-gallon drum/month	Intermittent	Accumulate for <90 days	Send offsite for recovery or disposed at Class I landfill

If necessary, a State of Mississippi hazardous waste generator identification number would be obtained by MS Solar 7 or its designated contractor, prior to generating any hazardous waste. Any spills that occurred on the Project Site would be reported to MDEQ's Emergency Response Division along with a sampling and clean up report for each spill. Regardless of amount, each spill would be cleaned up and a cleanup report completed within 48 hours. Copies of any spill and cleanup reports would be kept on site.

A designated contractor or subcontractor would be responsible for daily inspection, cleanup, labeling, storage, and disposal of all refuse and debris produced on the Project Site. Disposal containers, such as dumpsters or roll-off containers, would be obtained from an appropriate waste disposal contractor. Records of the amounts of generated wastes would be provided to the designated MS Solar 7 environmental specialist.

With implementation of appropriate BMPs, no adverse effects are anticipated from waste management activities associated with construction and operation of the solar facility.

3.11 PUBLIC AND OCCUPATIONAL HEALTH AND SAFETY

This section provides an overview of existing public health and safety concerns at the Project Site and the potential impacts to public health and safety associated with the No Action and Proposed Action Alternatives. Analyzed issues include emergency response and preparedness and occupational safety in compliance with the Occupational Safety and Health Administration (OSHA) standards.

3.11.1 Affected Environment

The Project Site is currently owned by the Clay County Economic Development District and private landowners and is being used for agriculture.

Local emergency services in Clay County include fire protection, law enforcement, emergency medical, and emergency management response. Most Project activities would occur at the PV array area and emergency response times were calculated from West Point to the array location. Fire protection services would be provided by the West Point Fire Department, located approximately 5 miles (8 minutes) southwest from the Project Site and the Clay County Volunteer Fire Department, located approximately 6.4 miles (11 minutes) southwest from the Project Site. Law enforcement services would be provided by the West Point Police Department and the Clay County Sheriff's Department, located approximately 6 miles (11 minutes) and 6.5 miles (11 minutes), respectively, from the Project Site. The North Mississippi Medical Center is the closest hospital, located approximately 6.5 miles

southwest (10 minutes) of the Project Site. The closest urgent care facility is the West Point Medical Clinic & Urgent Care, located approximately 6 miles (9 minutes) from the Project Site. The Mississippi Emergency Management Agency would coordinate with state and local (Clay County Emergency Management) agencies in the event of a hazardous materials release.

3.11.2 Environmental Consequences

3.11.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed; therefore, no Project related impacts on public and occupational health and safety would be expected. Agriculture would likely continue to be the primary land use within the Project Site, and existing health and safety issues would likely remain the same.

3.11.2.2 Proposed Action Alternative

During construction, the workers on the Project Site would have an increased safety risk. However, because construction work has known hazards, standard practice is for contractors to establish and maintain health and safety plans in compliance with OSHA regulations. OSHA standards would be implemented to maintain health and safety on all construction sites. BMPs would also be instituted for site safety management to minimize potential risks to construction workers. All personnel would be required to complete health and safety training prior to work commencing on the Project. Training topics may include lockout and tag out procedures, site housekeeping, personal protective equipment, safety inspections, use of specific equipment, stop-work procedures, and plans to identify and resolve potential safety hazards.

During construction and operation of the solar facility, fuel would be stored onsite. An SPCC plan would be developed, implemented, and a copy kept on-site to provide detailed instructions for potential spills. Hazardous materials would be stored and secured properly on site. Any spills would be contained within the Project Site and would not pose a threat to the general public. Emergency response for potential incidents at the Project Site would be provided by local and state emergency services (Section 3.11.1).

Potential public health and safety hazards could result from increased traffic on local roadways due to construction of the Project. Residential areas along roadways used by construction traffic to access the Project Site would experience increased 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).

No public health or safety hazards would be anticipated as a result of operations. Public health and safety hazards could result from a fire during the construction or operation of the BESS. If a fire were to occur, flammable and toxic gases could be released. The BESS building would be furnished with a fire suppression system. Design of the BESS in order to minimize the potential for thermal runaway (i.e., overheating of the batteries) along with proper storage, handling and ventilation would be employed to reduce the risk of potential hazards.

Overall, impacts to public health and safety in association with implementation of the Proposed Action would be considered temporary and minor.

3.12 TRANSPORTATION

This section describes roadways and other transportation infrastructure serving the Project Site and surrounding area, and the potential impacts on transportation resources that would be associated with the No Action and Proposed Action Alternatives.

3.12.1 Affected Environment

The area considered for transportation is from city of West Point in Clay County where the Project Site is located to eastward approaching the city of Columbus in Lowndes County approximately 9 miles southeast of the Project Site (see Figure 2-1). Major north-south highways in this area are US Highway 45 Alternate which passes through West Point and US Highway 45 that passes through Columbus. Mississippi Highway 50 traverses the area east to west and has intersections with US Highway 45 Alternate and US Highway 45. As shown on Figure 2-1, Mississippi Highway 50 traverses the Project Site and would provide access from West Point and Columbus. Mississippi Highway 50 intersects with local north-south roadways in this area. Barton Ferry Road intersects Mississippi Highway 50 and provides access on the west and north sides of the Project Site. On the northern end of the Project Site, Barton Ferry Road intersects with Yokohama Boulevard and continues east, so Barton Ferry Road traverses both north-south and east-west. Yokohama Boulevard originates in West Point and terminates at Barton Ferry Road. Also, at the Yokohama terminus at Barton Ferry Road, a third road, unpaved Cosby Corner Road, travels north and provides access to the northernmost solar array parcel that lies north of Barton Ferry Road's east-west segment. Cosby Corner Road also intersects with unpaved east-west Hazelwood Road which will also provide access to this northernmost parcel. A partially paved local road, Judge Thomas Road, borders the east side of the Project Site and intersects with Mississippi Highway 50 and the east-west segment of Barton Ferry Road. Unpaved Pinkerton Road also intersects with Mississippi Highway 50 and provides access to the portion of the Project Site that lies south of Mississippi Highway 50. The Mississippi Department of Transportation (MDOT) regulates construction in state highway ROWs. A permit would be obtained from the MDOT for overhead or below ground electrical line crossings or access roads along Mississippi Highway 50.

The MDOT conducts traffic counts along Mississippi Highway 50 with the nearest counting station to the Project Site being just west of its intersection with Barton Ferry Road. The most current count at this station was in 2019 and the Average Annual Daily Traffic (AADT) was reported as 5100. A second traffic count station on Mississippi Highway 50 west of the Clay-Lowndes County line approximately 5 miles from the Project Site had an AADT of 4600 for 2019. Mississippi Highway 50 is a two-lane highway in the vicinity of these stations. A third traffic counting station is located on for Barton Ferry Road east of its intersection with Yokohama Boulevard. The AADT for this station was 670 for 2019. Yokohama Boulevard and Barton Ferry Road are both paved two-lane local roadways (MDOT 2022a).

Canadian Pacific-Kansas City (formerly Kansas City Southern) rail lines lie north and northeast of West Point and converge in West Point before continuing southwest. The rail line from the north passes along the east side of TVA's West Point Substation and crosses the Project's interconnection route. The rail line that approaches West Point from the northeast crosses the gen-tie easement (see Figure 2-2). A Burlington Northern Santa Fe rail line is east of the Project Site and provides service to Columbus from the north. Short line railroads also serve areas outside of Columbus, but do not service the Project Site (MDOT 2015).

The nearest airport is McCharen Field, an unattended general aviation airport open to the public on the south side of West Point (AirNav 2021). Approximately 7 miles east of the project is a military airfield at Columbus Air Force Base. The Golden Triangle Regional Airport is located south of the Project Site approximately 10 miles (Figure 2-2). This airport provides commercial flights to regional and major airports.

A port for barge traffic for agricultural products and general cargo is approximately 5 miles southeast of the Project Site on the Tennessee-Tombigbee Waterway. The port, Clay County Port (also known as the Raymond D. Lucas Memorial Port) is on Old Highway 50 which intersects with Mississippi Highway 50 (MDOT 2022b and MWRA 2022).

3.12.2 Environmental Consequences

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed Solar Facility and associated structures would not be constructed; therefore, no Project-related transportation impacts would result. Current levels of traffic and conditions use would continue.

3.12.2.2 Proposed Action Alternative

The Project is projected to be constructed in approximately 16 months and have up to 250 workers onsite during construction. Construction activities would generally be conducted during typical workdays and daylight hours. Commuting traffic would peak at the beginning and end of the construction day. MS Solar 7 anticipates that shipments to/from the Project Site would be by truck and would occur throughout the workday. Construction materials and waste hauling vehicles during peak construction would be 30-40 semi-trailers per day.

Onsite access roads would be maintained within the Project Site. Access points during construction include Barton Ferry Road, Judge Thomas Road, Pinkerton Road, Crosby Corner Road, Hazelwood Road, and Mississippi Highway 50. Permanent access to the preferred location for the Optimist Substation and BESS would be from Barton Ferry Road's east-west segment. Access to the substation and BESS locations near the TVA's West Point Substation (Figure 2-3) would be from Yokohama Boulevard Option C which would have a second access point from Eshman Avenue.

Construction materials and workers would be expected to primarily arrive at the Project Site by Mississippi Highway 50 or Yokohama Boulevard to Barton Ferry Road. The AADT counts for Mississippi Highway 50 east and west of the Project Site were 4600 and 5100, respectively, indicating that the additional project-related traffic on Mississippi Highway 50 would generally be expected to be 50 percent in each direction. Vehicles traveling to the Project Site from West Point could also access the Project Site via Yokohama Boulevard which intersects US Highway 42 Alternate north of West Point. Use of Yokohama Boulevard would allow workers and shipments to avoid traveling through the city of West Point. Use of Yokohama Boulevard to access Barton Ferry Road would also reduce project construction-related vehicles on Mississippi Highway 50 west of the Project Site.

Assuming the maximum worker number of 250 and with 50 percent of the traffic originating east of the Project Site, there would be 125 additional vehicles during the peak hours during peak construction activities traveling on Mississippi Highway 50 east of the Project Site. These peak conditions would exist for short periods and the additional vehicles should be easily accommodated by Mississippi Highway 50. Should substantial traffic congestion occur, Optimist would implement staggered work shifts during daylight hours to assist traffic flow near Project Site access locations. Implementation of such mitigation measures would minimize potential adverse impacts to traffic and transportation to negligible levels.

In addition to traffic impacts, heavy shipping loads can impact roadway infrastructure. Clay County has a heavy haul ordinance enacted to protect secondary county roads from damage from the hauling of multiple heavy loads as a result of specific and limited duration contract jobs (Clay County 2012 and 2014). The ordinance requires a permit for use of county roads for loads exceeding 50,000 pounds. In addition, the permit applicant may be required to install culverts and other roadway infrastructure and the applicant assumes liability for damage to public roads. Abiding by federal, state, and local heavy loads limits and the Clay County heavy loads ordinance would minimize the impacts to transportation infrastructure. Further, under the Clay County heavy loads ordinance, MS Solar 7 would be responsible for repairing damage to local roads. Given compliance with heavy haul limits and repair to local roads in accordance with the Clay County ordinance, impacts to transportation infrastructure would be minimal.

The Project's transmission infrastructure would cross the existing Canadian Pacific-Kansas City rail lines in two locations, one for the gen-tie/collector lines by MS Solar 7, and one crossing by TVA's interconnection line into the West Point Substation. The rail line crossing would either be overhead on new poles or via horizontal directional drilling. Neither installation mode is likely to disturb the rail bed and the installation would be coordinated with the railroad as necessary to the minimize any disruption to freight operations along the rail route. The existing access road from Eshman Avenue crosses the rail line. If necessary, this existing crossing would be upgraded to allow passage of construction vehicles which would involve disturbing the rail bed. The crossing would be designed per Canadian Pacific-Kansas City specifications and its construction would be coordinated with the railroad to minimize disruption to freight operations along the rail route. Given coordination with Canadian Pacific-Kansas City and the short duration of the construction at rail crossings, impacts to rail transportation would be minor. Once in operation, the Solar Facility would have only a few full-time workers and have no impact on traffic conditions or transportation infrastructure.

MS Solar 7 anticipates that construction materials and equipment would be transported by truck. The Project Site is not serviced by rail but as presented in Section 3.12.1 mainline railroads service West Point and Columbus. So, potentially, some construction materials and equipment could be shipped by rail to West Point or Columbus and then be transferred to trucks for delivery to the Project Site. Use of rail, if any, could result in additional railcars to added to existing freight trains but would not be expected to impact rail freight operations.

The general aviation airfield at West Point, McCharen Field Airport, does support transient air traffic and could be used by workers and visitors during construction or operations. However, use of private air carriers rather than common carriers would be infrequent if at all. There would be no transportation-related impacts to McCharen Field. The Golden Triangle Regional Airport provides common carrier commercial flights and could be used by workers and visitors during construction or operations. Any increase in the airport's passenger traffic attributable to the Project would be minor and beneficial to the regional airport.

The Clay County port could potentially be used for receiving barge shipments of construction materials and equipment and which are subsequently transferred to trucks for delivery to the Project Site. Barge shipments to support construction of MS Solar 7, if any, are not expected to have an effect on barge freight operations at the Port of Clay County or the Tennessee-Tombigbee Waterway.

3.13 SOCIOECONOMICS AND COMMUNITY RESOURCES

This section provides an overview of existing socioeconomic conditions near the Project Site, and the potential impacts to socioeconomic conditions that would be associated with the No Action and Proposed Action Alternatives.

3.13.1 Affected Environment

The Project Site is located on the northeast side of the city of West Point in Clay County, Mississippi. Some site parcels are located within West Point city limits. West Point is Clay County's seat and only incorporated city (Clay County 2022c).

Clay County is part of a three-county economic development region called the Golden Triangle (GTR LINK Undated b). The Golden Triangle encompasses the three largest cities in the region, West Point (Clay County), Starkville (Oktibbeha County), and Columbus (Lowndes County). Clay County is identified as the primary area of impact for this analysis, however, data for Lowndes and Oktibbeha Counties are included for reference. Table 3-9 presents socioeconomic data for all three counties.

The total population of Clay County, as reported by the U.S. Census Bureau (USCB), was the smallest of the three counties, at 18,636 in 2020. In 2019, the top employment sectors in Clay County were: manufacturing (28 percent); education, healthcare, and social assistance (18.2 percent); and retail trade (12 percent) (USCB 2019). Top manufacturing employers in the Golden Triangle region are led by Steel Dynamics and Paccar Incorporated (GTR LINK Undated c). Top manufacturing employers in Clay County include

Table 3-9. Regional Socioeconomic Data

Geography	2020 Population[a]	Top Employment Industries[b] (in order of impact)	Civilian Labor Force[b]	Unemployment Rate[b] %	Median Household Income[b] $
Mississippi	2,961,279	E, M, R	1,334,957	7.5	45,081
Clay County	18,636	M, E, R	7,848	10.3	31,833
Lowndes County	58,879	E, M, R	26,534	8.1	50,441
Oktibbeha County	51,788	E, A, P	22,603	8.4	40,453
West Point City	10,105	M, E, R	4,175	11.1	30,664

a. USCB 2021
b. USCB 2019
M - Manufacturing
R - Retail trade
E - Education services, healthcare and social assistance
P - Professional, scientific, and management, and administrative and waste management services
A - Arts, entertainment, and recreation, and accommodation and food services

Southern Ionics, Yokohama Tire, Navistar Defense, and Ellis Steel (GTR LINK Undated c). The Golden Triangle region offers cultural and recreational activities as well as economic opportunities for residents and businesses. Clay County, itself, hosts a variety of events, including an annual rodeo, and provides public access to waterways, parks, and attractions (WPCCCGA 2022).

In 2019, Clay County had a labor force of approximately 7,848, with 7,037 employed and 811 unemployed civilians. The unemployment rate for 2019 was an estimated 10.3 percent. Of the three counties, Clay County had the smallest labor force and the highest unemployment rate. By comparison, the unemployment rate for the state of Mississippi in 2019 was an estimated 7.5 percent. The median household income in Clay was $31,833, the lowest of the three counties. By comparison, the median household income in Mississippi was $45,081 (USCB 2019).

3.13.2 Environmental Consequences

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

3.13.2.1 No Action Alternative

Under the No Action Alternative, the proposed Project would not be constructed. Therefore, there would be no project-related socioeconomic impacts within Clay County, including the beneficial impacts to local population, employment, and land value associated with the Project.

3.13.2.2 Proposed Action Alternative

Under the Proposed Action, a new Solar Facility would be built at the Project Site. Construction activities at the Project Site would take approximately 16 months to complete with a maximum crew of approximately 250 workers, depending on scheduling. Workers would include general laborers, heavy equipment operators, specialized tradespeople, and electrical technicians. Work would generally occur seven days a week during daylight hours; although in certain limited circumstances, construction activities may also be required during evenings. 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 Clay County and its adjacent counties. Most of the other components of the solar and transmission facilities would be acquired from outside of the local area. Most of the construction workforce would be sought locally or within the region, to the degree available, while the remainder of the construction workforce would come from out of the region. The direct impact on the economy associated with construction of the Project would be short-term and beneficial.

Most of the indirect employment and income impacts would be from expenditure of the wages earned by the workforce involved in construction activities, as well as the local workforce used to provide materials and services. Construction of the Project could have minor beneficial indirect impacts to population and short-term employment and income levels in the surrounding region.

Minor adverse indirect impacts could be experienced by the agricultural economy of the region. MS Solar 7 would be purchasing up to 2,952 acres of farmland for the Solar Facility, resulting in the loss of agricultural land. Payments to landowners would offset losses from agricultural production. This conversion would adversely impact any farmers leasing land from landowners as well as the service providers that support agricultural production. These impacts would be minimal, however, and the economic benefit of the Project would outweigh the adverse impacts.

During operation of the Solar Facility, a full-time workforce of up to 3 to 4 people would be on site. This workforce would manage and maintain the Solar Facility and conduct regular inspections. Grounds maintenance and some other operation and maintenance activities may be conducted by local contractors. Therefore, operation of the solar facility would have a small positive impact on employment and population in Clay County.

The local tax base would expand, with the presence of the new Solar Facility, and be most beneficial to Clay County and the vicinity. Additionally, local governments would not have to provide any of the traditional government services typically associated with a large capital investment, such as water, sewer, or schools. Overall, socioeconomic impacts of the operation of the proposed Project would be positive and long-term, but negligible relative to the total economy of the region.

3.14 ENVIRONMENTAL JUSTICE

This section provides an overview of environmental justice considerations within the Project area and the potential impacts to environmental justice populations that would be associated with the No Action and Proposed Action Alternatives. Components of environmental justice that are presented include the proportions of the local population that are minority and low-income and the potential for disproportionate effects on these populations.

3.14.1 Affected Environment

EO 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) was issued in 1994 with the purpose of focusing federal attention on the environmental and human health effects of federal actions on minority and low-income populations (USNARA Undated). The EO's goal is to achieve environmental protection for all communities. Per the EO, federal agencies are directed to identify and address minority and low-income populations that are disproportionately affected by adverse human health and environmental effects to the greatest extent practicable and permitted by law (CEQ 1997, pg. 1). While not subject to this EO, TVA routinely considers environmental justice in its NEPA review process.

The CEQ has oversight of the Federal government's compliance with EO 12898 and NEPA (CEQ 1997, pg. 1). CEQ defines minority populations as readily identifiable groups of people residing in geographic proximity, with (a) concentrations comprising 50 percent of the general population or greater, or (b) concentrations that are meaningfully greater than those of a surrounding geographic comparison area (CEQ 1997, pg. 25). Minority populations may also be geographically dispersed sets of individuals, such as Native Americans or migrant workers, who experience common conditions of environmental exposure or effect (CEQ 1997, pg. 25). CEQ defines a low-income population as a community or group of individuals that live in geographic proximity to one another, or a set of individuals such as American Indians or migrant workers who meet the standards for low income and experience common conditions of environmental exposure or effect (CEQ 1997, pg. 25).

In this analysis, the geographic area of comparison for block group-level data is Clay County, Mississippi. For Clay County, the geographic area of comparison is the state of Mississippi.

CEQ defines minority individuals as those who are members of the following demographic groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black (not of Hispanic origin), or Hispanic (CEQ 1997, pg. 25). For this analysis, minorities are examined, collectively, and are those individuals that list their racial status as a race other than white

alone and/or list their ethnicity as Hispanic or Latino. In effect, they are people other than non-Hispanic white-alone individuals (USEPA 2019, pg. 20). Minority populations are identified in this analysis when the percentages in the affected areas are greater than 50 percent or are meaningfully greater (e.g., 10 or 20 percent) than those of the county or state.

Using the USEPA's Environmental Justice Screening and Mapping Tool (EJSCREEN), minority population percentages are determined for the following project-related geographies (see Table 3-10). Based on the results presented in Table 3-10, Block Group 280259505001 meets the criteria for containing minority populations because it exceeds the minority population percentage in Clay County. Block Group 280259505001 contains most of the site facilities. Clay County also meets the criteria for containing minority populations because it exceeds the minority percentage of the state. Figure 3-13 illustrates the locations of the block groups containing Project facilities (USCB 2020).

Table 3-10. Minority Population Percentages

	USCB Block Group 280259501004	USCB Block Group 280259505001	USCB Block Group 280259505003	Clay County	Mississippi
Minority Population Percentage	31	68	47	61	43

Source: USEPA 2020b

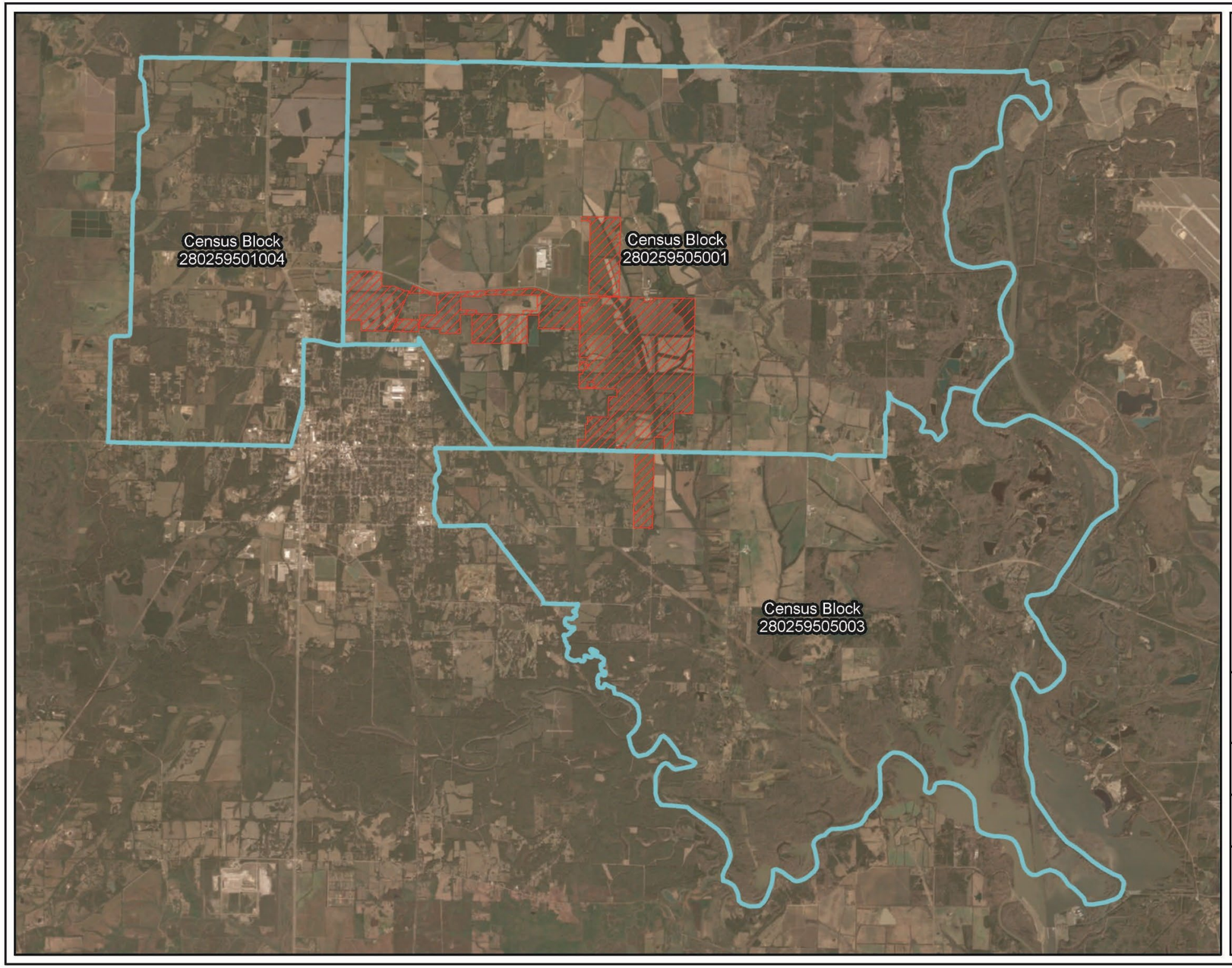
Low-income populations located in an affected area are identified using the annual statistical poverty thresholds provided by the USCB's annual current population reports (Series P-60) on poverty and income (CEQ 1997, pg. 25). For this analysis, low-income is defined as the number or percent of a population in households where the household income is less than or equal to twice the federal poverty threshold (USEPA 2019, pg. 20). Low- income populations are identified in this analysis when their percentages in the affected areas are greater than or equal to those of the county or state.

Using the EJSCREEN, low-income population percentages are determined for the following Project-related geographies (see Table 3-11). Results indicate that Block Group 280259505001 meets the criteria for containing a low-income population because it exceeds the low-income population percentage in Clay County. Clay County also meets the criteria for containing a low-income population as it exceeds the low-income percentage of the state.

Table 3-11. Low-income Population Percentages

	USCB Block Group 280259501004	USCB Block Group 280259505001	USCB Block Group 280259505003	Clay County	Mississippi
Low-income Population Percentage	47	53	44	49	43

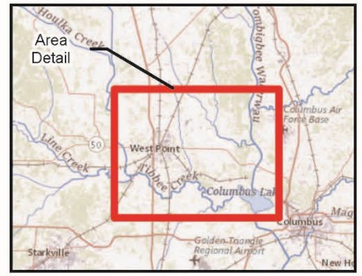
Source: USEPA 2020b



Legend

Site Boundary

Census Block Group



N

0 0.5 1 2 Miles

Figure 3-13
Census Block Groups in the Project Vicinity
Optimist Solar Facility
Clay County, MS

Prepared For: Origis Energy

Prepared By: TETRA TECH

Date: 03/2022

Source: Esri, et. al., 2020; USCB, 2020

Coordinate System: North Amereican Datum, 1983
Universal Transverse Mercator, Zone 16 North

Not for Construction

3.14.2 Environmental Consequences

This section describes the potential impacts on environmental justice populations should the Proposed Action or No Action Alternatives be implemented. According to the CEQ, adverse health effects to be evaluated within the context of environmental justice impacts may include bodily impairment, infirmity, illness, or death. Environmental effects may include ecological, cultural, human health, economic, or social impacts. Disproportionately high and adverse human health or environmental effects occur when the risk or rate of exposure to an environmental hazard or an impact or risk of an impact on the natural or physical environment for a minority or low-income population is high and appreciably exceeds the impact level for the general population or for another appropriate comparison group (CEQ 1997, pp. 26-27).

3.14.2.1 No Action Alternative

Under the No Action Alternative, there would be no changes attributable to the proposed solar project within Clay County that would create disproportionately high and adverse direct or indirect impacts on minority or low-income populations.

3.14.2.2 Proposed Action Alternative

Clay County and Block Group 280259505001 both meet the criteria for containing minority populations. Clay County and Block Group 280259505001 also meet the criteria for containing low-income populations. It should be noted that Block Group 280259505001 contains most site facilities. Based on the analysis of impacts for all resource areas presented in this EA, especially those associated with the 16-month construction period, it is determined that there would be no significant adverse health impacts on members of the public or significant adverse environmental impacts on the physical environment (water, air, aquatic, and terrestrial resources) and socioeconomic conditions. As there are no identified high and adverse human health or environmental effects resulting from the Proposed Action, there would be no disproportionately high and adverse direct or indirect impacts on minority or low-income populations. The Project is expected to have beneficial effects to the local economy that would potentially benefit low-income populations.

3.15 CUMULATIVE IMPACTS

A cumulative impact, as defined by the CEQ, is described as an impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but aggregately significant actions taking place over a period of time (40 CFR 1508.7). A cumulative impacts analysis looks at the potential for the effects of the proposed action on the various environmental resources to overlap spatially and temporally with the effects of other past, present, and reasonably foreseeable future actions.

Cumulative impacts associated with the Proposed Action are described below. This section addresses the cumulative impacts of the Project when combined with any reasonably foreseeable future action in the vicinity.

Desktop research of potential past, present, and future actions in the western Clay County and eastern Lowndes County, Mississippi area was conducted. Resources examined included:

- Local and regional news sources
- City of West Point and Clay County website records, including planning commission meetings, city meeting minutes, and public notices
- Columbus Air Force Base website
- Golden Triangle Development LINK website records and discussions
- MDOT website

The proposed Project would result in minor direct impacts to land use, geological resources and farmlands, water resources, biological resources, visual resources, noise, air quality, public health and safety, and transportation.

3.15.1 Federal Projects

Based on a review of the above listed resources, three federal projects and several MDOT projects that have at least partial federal funding were identified. The four federal projects are the Columbus Air Force Base (AFB) and the proposed Golden Triangle Solar Facilities I and II, which like the Proposed Action will provide power to the TVA network, and a TVA project to install a new transmission line near Artesia and improvements on existing transmission infrastructure in the Golden Triangle area.

Columbus AFB is located approximately seven miles from the Project Site. Glint and glare are potential safety concerns of building solar PV systems on and near airports (14 CFR Part 77). Glint and glare from these systems also have potential to impact airport traffic control tower personnel. A glare analysis is not required for the Project as the Solar Facility would not be located on airport property and implementation of the Proposed Action would not require notifying the Federal Aviation Administration. MS Solar 7 has informally consulted with the Department of Defense to identify any concerns related to Columbus AFB. Impacts from existing operations of the AFB that have the potential for cumulative impacts with the Proposed Action are noise and transportation. The noise from aircraft overhead of the Project Site could combine with construction noise for several seconds at a time but would not significantly elevate L_{DN} or L_{EQ} environmental noise levels. Traffic commuting to Columbus AFB through the Project area would be accounted for in the traffic counts presented in Section 3.12. Access to the AFB is from US Highway 45 north of Columbus. Additional traffic on this multilane US highway attributable to the Proposed Action would not be noticeable and no cumulative impacts would be expected.

The Golden Triangle Solar Facilities I and II are proposed for locations near the Golden Triangle Regional Airport approximately 8 miles southeast of the Project Site (GTR LINK 2021, Origis 2021, and TVA 2020a). The two solar projects would not use the same local roadways for access as the Proposed Action. Given the localized nature of the Proposed Action's minor impacts to visual resources, noise, and air quality, no cumulative impacts to these resource areas are expected. The distance between the projects and implementation of project-level mitigation measures would also minimize the potential for cumulative impacts to water and biological resources. However, the solar projects along with the Prairie Belt Powersite development discussed in Section 3.15.2 would add to the conversion of agricultural land to non-agricultural use. However, once the solar facilities are decommissioned, the sites could be returned to their pre-construction/pre-operation uses. Therefore, the Proposed Action's contribution towards a long-term cumulative impact on agricultural land, when combined with impacts from the other solar facilities and megasite, would be minor.

TVA has proposed to construct, operate, and maintain a new approximately 12-mile 161-kV transmission line from the existing 161 kV West Columbus Switching Station to the Artesia 161-kV Switching Station (TVA 2020b). This new transmission line would be south of US

Highway 82 and like discussed above for the Golden Triangle Solar Facility I provide a great enough distance that cumulative impacts are not expected. The proposed transmission infrastructure improvements include the replacement and update of conductors for approximately 14 miles on the existing Starkville-West Point 161-kV transmission line (TVA 2020b). Given the improvements are replacement of existing infrastructure and only the work at the West Point Substation would be in close proximity to the Proposed Action, no cumulative impacts are expected.

MDOT's proposed roadway projects will receive federal funding. The Clay and Lowndes counties projects proposed for 2022 to 2026 are mill and overlay, bridge replacement, and safety projects at existing roadways. Projects for 2022 and 2023 involve Mississippi Highway 50 (west of West Point and west of Columbus in Lowndes County), US 45 Alternate (north of West Point), and US Highway 45 (north of Columbus) (MDOT 2022c). Any of the projects could result in traffic congestion and delays; but highway projects are planned to mitigate traffic disruptions and the location of the US Highway 45 and US Highway 45 Alternate projects as well as the Mississippi Highway 50 project west of West Point would not be expected to combine with the minor transportation impacts of the Proposed Action for noticeable cumulative impacts. The bridge replacement on Mississippi Highway 50 is on a two-lane portion of the highway east of its intersection with US Highway 45 and additional vehicles commuting to the Project Site could contribute to traffic congestion during peak commuting hours if the two project overlap temporally. However, any noticeable increased traffic congestion would be limited to peak hours for the short duration of the Proposed Action's construction. Given the distance to the MDOT projects from the Project Site adverse cumulative effects to other resources (e.g., air quality and noise) are not expected.

3.15.2 State and Local Projects

The Project Site is within both the city of West Point and unincorporated Clay County. The Project Site is largely agricultural. Adjacent properties are low-density residential, the Prairie Belt Powersite, and agricultural fields. Construction noise and fugitive dust from construction of the Proposed Action could combine with elevated noise and fugitive dust from seasonal planting and harvesting at the surrounding agricultural fields. Should the agricultural activities overlap temporally and spatially with the Proposed Action's construction activities, the cumulative impacts would be minor and very short term.

The Prairie Belt Powersite is an industrial development site adjacent to the Project Site. The Prairie Belt Powersite is one of four "megasites" in the Golden Triangle (West Point, Starkville, and Columbus) region. The other three megasites are the Lowndes County Megasite, the Crossroads Megasite, and the Infinity Megasite, all located in Lowndes County (GTR LINK Undated d). The Infinity Megasite is adjacent to the Golden Triangle Solar Projects I and II mentioned above. The Proposed Action would combine with the Prairie Belt Powersite and the other megasites for cumulative beneficial economic impacts.

The Prairie Belt Powersite is the only megasite that could contribute to adverse cumulative impacts. The megasite includes two parcels proposed for development as part of the Optimist Solar Project as well as land adjacent to Yokohama Boulevard to the west of the Yokohama Tire manufacturing plant. The megasite is being actively marketed by the local economic development organization, the Golden Triangle Development LINK (GTR LINK Undated d). If additional megasite parcels are developed at the same time as the Proposed Action, adverse cumulative impacts on air quality (from construction equipment emissions and fugitive dusts), noise (from construction equipment operation), and increased traffic would be expected and the severity of the impacts would depend on the distance between

the construction activities and the timing and level of construction activities. Cumulative impacts from construction activities would be short-term, most obvious during normal daytime working hours, and would subside once construction was complete.

As discussed in Section 3.5, the Proposed Action would have a visual impact on adjacent residential properties. The locations of residences surrounding the Project Site are shown in Figure 3-8 and are concentrated on the southern portion of the solar arrays. The Prairie Belt Powersite lies on the northern end of the Project Site. Development in the megasite would not be visible from the residences. Overhead transmission lines are part of the existing viewscape and additional electrical lines would largely not be noticeable. Cumulative visual impacts would be minor.

As mentioned in Section 3.15.1, the MS Solar 7 Project combined with the Prairie Belt Powersite would result in an adverse cumulative impact on land use (conversion of agricultural land to non-agricultural use). However, once the MS Solar 7 Project is decommissioned, the Project Site could be returned to its pre-construction/pre-operation use. Therefore, the Project's contribution towards a long-term cumulative impact on agricultural land, when combined with impacts from the megasite, would be minor.

Based on the low level of anticipated impacts to the resources described above, and the lack of cumulative impacts from proposed local projects near the Project Site, the Proposed Action Alternative would not result in any adverse cumulative impacts.

Chapter 4 – 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.

Table 4-1. Optimist Solar Environmental Assessment Team

Name/Education	Experience	Project Role
TVA		
Brooke Davis BS, Forestry/Wildlife Biology BS Environmental Science	22 years of professional experience in NEPA and environmental compliance	NEPA PM and NEPA Compliance
Adam Dattilo M.S., Forestry; B.S., Natural Resource Conservation Management	21 years in ecological restoration and plant ecology, 16 years in botany	Botany, Threatened and Endangered Species QA/QC
Elizabeth Burton Hamrick MS, Wildlife and Fisheries Science, BA, Biology, BA, Anthropology	22 years in biological field studies, 9 years in biological compliance, NEPA compliance, and ESA consultation for T&E terrestrial animals	Terrestrial zoology, threatened and endangered species
Tetra Tech		
Megan Buckalew MS, Environmental Science, BS, Biology	12 years as a biologist, natural resource studies, environmental permitting, NEPA documentation	Document Preparation
Lindy Chovanec AS, Chemistry	More than 20 years in compliance, permitting, inspections, and environmental analysis	Document Preparation
Chandler Dangle MS, Forestry BS, Forest Resources	4 years of environmental assessment, NEPA documentation, hydrology, soils, wetlands, and permitting	Deputy Project Manager, Field Survey Coordination, Document Preparation
Nicole Hill MS, Earth and Environmental Resources Management, MBA, Business Administration, BA, Social Science	More than 20 years in NEPA documentation, socioeconomic, environmental justice, and land use impacts analysis	Document Preparation
Mary Hoganson MS, Biology, BS; Biology	More than 20 years in NEPA documentation, environmental analysis areas include cumulative impacts, alternatives, waste management, transportation, noise, and air	Document Preparation

Name/Education	Experience	Project Role
Robert Jacoby, RAP MA, Historic Preservation BA, Anthropology,	More than 30 years of experience in historic preservation, archeological research projects and cultural resources sensitivity assessments	Document Preparation
Giles Kingsley BA, Geography/ Anthropology	7 years in GIS analysis	Mapping and Analysis
Lisa Matis MS, Mechanical Engineering, BS, Chemical Engineering	More than 30 years in NEPA documentation, regulatory compliance, and permitting	Project Manager, Senior Technical Reviewer
Hal Mitchell BS, Wildlife Biology	15 years of experience conducting habitat evaluations, wildlife surveys, and studies of special-status species	Field surveys, Technical Reviewer
Philip Moore MS, Wildlife and Fisheries Biology, Post Graduate Study, Zoology, BA, English	More than 30 years in NEPA documentation, project management, technical writing, protected species evaluations and surveys, and field assessments	Senior Technical Reviewer

Chapter 5 – Literature Cited

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