Document Type: EA-Administrative Record
Index Field: Supplemental Environmental Assessment & Finding of No Significant Impact
Project Name: KUB Solar Project – Knox County, TN
Project Number: 2020-28

KNOXVILLE UTILITIES BOARD SOLAR PROJECT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

Knox County, Tennessee

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October 2020

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Proposed Action/Purpose and Need for Action

The Tennessee Valley Authority (TVA) is negotiating a Power Purchase Agreement (PPA) with the Knoxville Utilities Board (KUB) under which TVA would purchase the power generated by the proposed KUB Solar Facility. The proposed photovoltaic (PV) Project would be located in Knox County, Tennessee. The proposed facility would be constructed and operated by KUB and would have a generating capacity of up to 1 megawatt (MWac). This Project falls under the Flexibility Research Project, which is a TVA board-approved program that allows local power companies (LPC) to build generation and sell power back to TVA through a PPA. This Project is part of KUB's commitment to renewable energy. The proposed Project would connect to the existing Lonsdale 161-kV delivery point at 12.2-kV voltage. Under the terms of the proposed PPA between TVA and KUB, TVA would purchase the electric output generated by the proposed solar facility for an initial term of 20 years, subject to satisfactory completion of all applicable environmental reviews. Together, the proposed solar facility, the interconnection facilities, and the PPA between KUB and TVA are herein referred to as the "Project" or the "Proposed Action."

This environmental assessment (EA) is a supplement to TVA's Solar Photovoltaic Programmatic Environmental Assessment (PEA) issued September 2014. The PEA encompasses solar projects in Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia. The PEA was prepared to identify and document, at a programmatic level, the potential environmental effects of third parties developing and operating qualifying solar facilities and TVA's purchase of power from these facilities. The types of environmental safeguards that would be routinely implemented during the construction and operation of the facilities to avoid or reduce environmental effects were identified during the development of the PEA. The PEA assessed the potential impacts associated with cultural resources, threatened and endangered species, wetlands, unique natural features, floodplains, prime farmlands and waste materials or contamination. Solar facilities within the scope of the PEA include ground-mounted solar facilities that occupy 20 acres or less on a brownfield site.

Decision to be Made

The decision before TVA is whether to enter into a PPA with KUB related to the proposed Project, which is located on 2.03 acres of property owned by the City of Knoxville. The proposed Project would provide up to 1 MW of generating capacity. Entering into this PPA would meet TVA's objectives to create additional renewable energy under the Flexibility Research Project, which allows LPCs to build, own, and operate generation.

Site Description

The Project is located on an approximately 2.03 acre parcel owned by the City of Knoxville (COK) adjacent to the Knoxville Public Works Facility on Lorraine Street, approximately two miles west of downtown Knoxville, Tennessee in Knox County (35.96001, -83.96112). Interstate 40 runs east to west along the southern portion of the Project. As depicted in Figure 1, the area consists of commercially developed property including interstate, parking lots, and various commercial properties. There are no structures or roads within the Project Area. The Project will be located on a relatively flat brownfield; thus, a ballasted system would be utilized such that ground penetrations are not required. The site is located under a TVA right-of-way; a ROW permit was filed with TVA on September 16, 2019. The property will be leased by KUB from the COK for a 20-year term as proposed under the PPA.

Figure 1. Proposed Project Area

Figure 2. Proposed Solar Layout

Environmental Impacts

TVA has reviewed the proposed Project and has documented potential environmental impacts related to the Project. This EA identifies the resources present in the Project Area and documents TVA's determination that the proposal would not significantly affect these resources. TVA also reviewed the potential environmental impacts of taking no action. If TVA does not enter into a PPA to KUB, the property would remain in its current condition, and no project related impacts would occur to the resources identified herein.

The proposed Project would not involve activities within the 100-year floodplain, and therefore is consistent with Executive Order 11988 (Protection of Floodplains). There would also be no impacts to prime farmland or natural areas, as the proposed activities would occur at a current brownfield site located within an urban area.

A Phase II Environmental Site Assessment was conducted on behalf of the Public Building Authority of Knox County to determine the nature and extent of surface and subsurface contamination resulting from past use of the property where the Project would be located. The Phase II findings are consistent with the current and historical use of the property, and no major onsite issues were identified. This Phase II assessment was performed as part of the Brownfield Agreement between Knox County and the Tennessee Department of Environment and Conservation (TDEC). Construction best management practices (BMPs), such as erosion control measures, would be implemented during construction activities for the Project to help reduce onsite and offsite surface impacts to water quality and aquatic resource impacts. Since construction activities would disturb more than one acre, a construction stormwater permit would be required from TDEC. Temporary impacts associated with construction and erosion would be eventually eliminated as impacted areas will be revegetated or otherwise stabilized. All construction debris would be managed in accordance with all local, state, and federal requirements.

Site construction would generate some temporary, short-term noise. The property is located in a commercial area; therefore, no significant impacts from noise are likely under the implementation of the proposed Project. Construction activities may also generate solid waste materials that would be properly disposed of per state and federal guidelines. Air pollution management is required if open burning is used for disposal of wood wastes, which would require a burn permit.

The Proposed Action could potentially impact air quality, terrestrial ecology (wildlife, threatened and endangered species), botany, archaeological and historical resources, wetlands, aquatics, and surface water. Impacts to these resources were evaluated in further detail. The results of those additional analyses, and TVA's determination that the Proposed Action would not significantly affect these resources, are summarized in this Environmental Assessment and Finding of No Significant Impact.

Air Quality

Through its passage of the Clean Air Act (CAA), Congress has mandated the protection and enhancement of our nation's air quality resources. National Ambient Air Quality Standards (NAAQS) (USEPA 2015) have been established for the following criteria pollutants to protect the public health and welfare:

- sulfur dioxide (SO_2),
- ozone (O_3),
- nitrogen dioxide (NO_2),
- particulate matter whose particles are ≤ 10 micrometers (PM_{10}),
- particulate matter whose particles are ≤ 2.5 micrometers ($PM_{2.5}$),
- carbon monoxide (CO), and
- lead (Pb).

The primary NAAQS were promulgated to protect the public health, and the secondary NAAQS were

promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air (e.g., visibility, crops, forests, soils and materials). A listing of the NAAQS is presented in Table 1.

Ambient air monitors measure concentrations of these pollutants to determine attainment with these standards. Areas in violation of the NAAQS are designated as nonattainment areas and must develop plans to improve air quality and achieve compliance with the NAAQS. Knox County, Tennessee is currently in attainment with the NAAQS for all criteria air pollutants (USEPA 2017).

Table 1. National Ambient Air Quality Standards

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

Source: USEPA 2015Notes:

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

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

3 Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

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

Transient air pollutant emissions would occur during construction activities within the Project Area. Air quality impacts from construction activities would be temporary and dependent on both man-made factors (e.g., intensity of activity, control measures) and natural factors (e.g., wind speed, wind direction, soil

moisture). Even under unusually adverse conditions, these emissions would have, at most, minor, temporary direct, indirect, and cumulative onsite and offsite air quality impacts and would not cause exceedance of the applicable NAAQS.

Terrestrial Ecology

Habitat for terrestrial animal wildlife in the Project Area is comprised of mowed grass, several saplings, two mature hardwood trees, and some small manicured shrubs. Wildlife communities that may utilize urban landscapes would be found in this area.

Review of the TVA Regional Natural Heritage database in August 2020 indicated that fourteen caves were identified within three miles of the Project Area. The closest of these caves is approximately 1.5 miles away.

Review of the US Fish and Wildlife Information for Planning and Consultation (USFWS IPaC https://ecos.fws.gov/ipac/; August 2020) identified 12 birds of conservation concern that have the potential to occur in the Project Area: bald eagle, black-billed cuckoo, bobolink, Canada warbler, cerulean warbler, eastern whip-poor-will, golden-winged warbler, Kentucky warbler, prairie warbler, red-headed woodpecker, wood thrush, and yellow-bellied sapsucker. Quality habitat for these birds of conservation concern does not exist in the Project Area as it is devoid of most natural vegetation and set amongst a highly urbanized landscape.

Terrestrial Ecology – Threatened and Endangered Species

A review of the terrestrial animal species in the TVA Regional Heritage database in August 2020 resulted in records of three state-listed species (hellbender, peregrine falcon, and eastern slender glass lizard) and two federally listed species (gray bat and rusty-patched bumble bee) within three miles of the Project footprint. One additional federally listed species (northern long-eared bat) and one federally protected species (bald eagle) are known within Knox County, Tennessee. The federally listed Indiana bat has not yet been recorded in Knox County; however, the United States Fish and Wildlife Service (USFWS) has determined that it could occur in this county. Therefore, it has been included in this species impact analyses.

Table 2. Federally listed terrestrial animal species within Knox County, Tennessee, and species of conservation concern recorded within three miles of the KUB Solar Project[1]

	Scientific Name	Status[2]	
		Federal	State(Rank[3])
Amphibians			
Hellbender[4]	*Cryptobranchus alleganiensis*	PS	E(S3)
Birds			
Bald eagle[5]	*Haliaeetus leucocephalus*	DM	D(S3)
Peregrine falcon	*Falco peregrinus*	--	--(S1B)
Invertebrates			
Rusty-patched bumblebee[5]	*Bombus affinis*	LE	-(S1)
Mammals			
Gray bat	*Myotis grisescens*	LE	E(S2)
Indiana bat[6]	*Myotis sodalis*	LE	E(S1)
Northern long-eared bat[5]	*Myotis septentrionalis*	LT	T(S1S2)
Reptiles			
Eastern slender glass lizard	*Ophisaurus attenuatus longicaudus*	--	D(S3)

[1]Source:TVA Regional Natural Heritage Database, extracted 08/05/2020; USFWS Information for Planning and Conservation (IPaC) resource list (https://ecos.fws.gov/ipac/), accessed 08/05/2020.
[2] Status Codes: D = Deemed in Need of Management; DM = Delisted but still being Monitored; E = Endangered; LE = Listed Endangered; LT = Listed Threatened; PS = Partial Status; T = Listed Threatened.
[3] State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Rare; S1B = Status of Breeding population.
[4] Subspecies of hellbender found in the Ozarks of Missouri and Arkansas are federally listed. Species of hellbender found in Knox County, Tennessee, are not federally listed.
[5] Federally listed or protected species recorded in Knox County, Tennessee, but not within three miles of the Project footprint.
[6] Federally listed species not yet recorded in Knox County, Tennessee, but whose range overlaps the Project Area and thus has the potential to occur there.

Hellbenders are found in medium and large, fast-flowing streams that have an abundance of large rocks. Crevices under these rocks provide shelter for the hellbenders as well as nesting habitat where they lay their eggs in late summer and early fall (Petranka 1998). The closest record of this species is 2.23 miles away from the Project site in the Tennessee River. No suitable habitat for hellbenders exists in the Project Area.

Eastern slender glass lizards can be found in dry grasslands as well as open woodlands (Powell et al. 2016). The closest record of this species is approximately 0.7 miles away from the Project site. No suitable habitat for this species exists in the Project Area.

Peregrine falcons perch and nest on tall city buildings, cliffs, and river bluffs (Nicholson 1997). A historic nesting record of this species exists on bluffs overlooking the Tennessee River. However, the closest extant record of this species is a single bird that has a territory over downtown Knoxville, Tennessee, approximately 2.3 miles from the Proposed Action. No suitable habitat for this species exists in the Project Area.

Bald eagles are protected under the Bald and Golden Eagle Protection Act (USFWS 2013). This species is associated with larger mature trees capable of supporting its massive nests. These are usually found near larger waterways where the eagles forage (USFWS 2007). Five bald eagle nests are known from Knox County, Tennessee. The closest of these is approximately 6.0 miles away from the Proposed Action. No suitable habitat for bald eagle exists in the Project Area.

Rusty-patched bumblebee inhabits grasslands, prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. They require both diverse, abundant flowers from April to September and undisturbed nesting sites nearby in order have sufficient food and overwintering sites for queens. One record of rusty-patched bumblebee is present in Knox County. The exact location of this record is unknown, and this record is listed as possibly extirpated due to the age of the record (1966). Potential habitat for this species is not present in the Proposed Action area.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (Brady et al. 1982, Tuttle 1976a). Gray bats disperse over bodies of water at dusk where they forage for insects emerging from the surface of the water (Tuttle 1976b). Although they to prefer caves, gray bats have been documented roosting in large numbers in buildings (Gunier and Elder 1971). Gray bats have been documented roosting in garages and parking structures in downtown Knoxville, Tennessee, approximately 2.23 miles away from the Proposed Action.

Indiana bats hibernate in caves in winter and use areas around them for swarming (mating) in the fall and staging in the spring, prior to migration back to summer habitat. During the summer, Indiana bats roost under the exfoliating bark of dead snags and living trees in mature forests with an open understory and a nearby source of water (Pruitt and TeWinkel 2007, Kurta et al. 2002). Although less common, Indiana bats have also been documented roosting in buildings (Butchkoski and Hassinger 2002). Indiana bats are known to change roost trees frequently throughout the season, while still maintaining site fidelity, returning to the same summer roosting areas in subsequent years (Pruitt and TeWinkel 2007). One acoustic recording, presumably from an Indiana bat, was documented approximately 4.96 miles from the Project Area in Muhlenberg County. No Indiana bats are known from Knox County, Tennessee. The closest known record of this species is from a mist net capture in Anderson County, approximately 14.7 miles away.

The northern long-eared bat (NLEB) predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees (typically greater than 3 inches in diameter). Roost selection by northern long-eared bat is similar to that of the Indiana bat; however, northern long-eared bats are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014). The closet record of NLEB is from a mist net survey approximately 13.35 miles away from the Project Area.

No caves are known within the Project footprint, and the nearest recorded cave is approximately 1.5 miles away. One ephemeral stream exists in the Project Area. This stream provides a small amount of suitable foraging habitat for all three bat species. The two mature trees on site also provide a small amount of foraging habitat and suitable summer roosting habitat for the Indiana bat and northern long-eared bat.

Potential impacts of the Proposed Action were assessed for three state-listed species (hellbender, peregrine falcon, and eastern slender glass lizard) and five federally listed or protected species (bald eagle, gray bat, Indiana bat, northern long-eared bat, and rusty-patched bumble bee). No suitable habitat exists in the Project Area for hellbender, peregrine falcon, eastern slender glass lizard, bald eagle, or rusty-patched bumble bee. The Proposed Action is in compliance with the National Bald Eagle Management

Guidelines. Based on guidance provided by the US Fish and Wildlife Service (https://www.fws.gov/midwest/endangered/insects/rpbb/ProjectProponent.html), the Proposed Action is located in the Historical Range of the rusty-patched bumble bee, but is not likely to occur on site. Therefore, Section 7 consultation is not needed. Rusty-patched bumblebee is not present in the Project Area. The Proposed Action would not significantly impact the hellbender, peregrine falcon, eastern slender glass lizard, bald eagle, and rusty-patched bumble bee.

A small amount of foraging habitat for gray bat, Indiana bat, and northern long-eared bat would be impacted by the Proposed Action. Using the US Fish and Wildlife Service's 2020 Indiana Bat Survey Guidance, TVA has determined that approximately 0.18 acres of suitable summer roosting habitat for Indiana bat and northern long-eared bat would also be removed (USFWS 2020). The Project would remove trees in winter when bats are not present on the landscape.

A number of activities associated with the proposed Project are addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) which was completed in April 2018. For those activities with the potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on pages 5 and 6 of the TVA Bat Strategy Project Screening Form (attached) and need to be reviewed/implemented as part of the proposed Project. With the implementation of the identified conservation measures, the Proposed Action would not significantly impact gray bat, Indiana bat, or northern long-eared bat.

Vegetation

The KUB Solar Project would be located in an urban area that has been heavily disturbed by commercial development. As a result of this wholesale alteration of the physical landscape, no portion of the potential affected area supports a natural plant community. The entirety of the proposed Project site is vegetated with lawn grasses and other non-native weeds indicative of early successional habitats.

The Proposed Action would not result in impacts to the terrestrial ecology of the region. Property within the potential affected area has no conservation value, and the Proposed Action would not change that situation. The parcel would continue to be dominated by non-native and early successional species indicative of disturbed habitats. Any changes occurring in the vegetation on-site would be the result of other natural or anthropogenic factors and would not be the result of the Project.

T&E Plants

A September 2020 query of the TVA Heritage Database indicated that four state-listed plant species have been previously reported from within five miles of the proposed Project Area. No federally listed plants are known for Knox County, Tennessee, where the Project would be located (Table 3). A desktop review of the proposed solar site indicated that no habitat for federally or state-listed plant species occurs in the potential affected area. The habitat on the proposed Project site has been severely degraded and is populated primarily with non-native species. No designated critical habitat for plants occurs in the proposed Project Area.

Previous commercial development on the proposed solar site has resulted in significant disturbance that makes the parcel incapable of supporting threatened or endangered plant species. Accordingly, the Proposed Action would have no impact on federal or state-listed plants because those species are not present.

Table 3. All plant species of conservation concern known from within five miles of the Project Area.[1]

Common Name	Scientific Name	Federal Status[2]	State Status[2]	State Rank[3]
PLANTS				
Spreading Rockcress	*Arabis patens*	-	E	S1
Bitter Cress	*Cardamine flagellifera*	-	T	S2
Prairie Ragwort	*Packera plattensis*	-	S	S1
American ginseng	*Panax quinquefolius*	-	S-CE	S3S4

[1] Source: TVA Natural Heritage Database, queried September 2020.
[2] Status Codes: E = Listed Endangered; S = Listed Special Concern; S-CE = Special Concern/ Commercially Exploited; T = Listed Threatened.
[3] State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; S#S# = Denotes a range of ranks because the exact rarity of the element is uncertain (e.g., S1S2).

Cultural Resources

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

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (54 U.S.C. § 300101 et seq.), is specifically designed to address the effects of federal and/or federally funded projects on tangible cultural resources—that is, physically concrete properties—of historic value. The NHPA provides for a national program to support both public and private efforts to identify, evaluate, and protect the nation's important cultural resources. Once identified, these resources are evaluated for inclusion in the National Register of Historic Places (NRHP) maintained by the National Park Service. Tangible cultural resources may qualify for inclusion in the NRHP if they are 50 years of age or older (unless in exceptional cases) and if found to embody one or more of four different types of values, or criteria, in accordance with 36 CFR § 60.4:

- **Criterion A**: association with events that have made a significant contribution to the broad patterns of our history. Such events may include a specific occurrence or pattern of occurrences, cultural traditions, or historic trends important at a local, regional, or national level. To be considered in association with a cultural resource, events must be important within the particular context being assessed.
- **Criterion B**: association with the lives of persons significant in our past. People considered may be important locally, regionally, or nationally, and the cultural resources considered are limited to properties illustrating a person's achievements rather than commemorating them.
- **Criterion C**: embodiment of the distinctive characteristics of a type, period, or method of construction; representative of the work of a master; possessing high artistic values; or representative of a significant and distinguishable entity whose components may lack individual distinction. Cultural resources considered generally include architectural resources such as buildings, objects, districts, and designed landscapes.

- **Criterion D**: cultural resources that have yielded, or may be likely to yield, information important in prehistory or history. Considered cultural resources typically include archaeological sites but may also include buildings, structures, and objects if they are the principal source of important information not contained elsewhere.

Cultural resources that are listed or considered eligible for listing in the NRHP are called “historic properties.” Federal agencies are required by the NHPA to consider the possible effects of their undertakings on historic properties and take measures to avoid, minimize, or mitigate any adverse effects. NEPA requires federal agencies to consider how their undertakings may affect the quality of the human environment, including both cultural resources and those defined as historic properties, so that the nation may “preserve important historic, cultural, and natural aspects of our national heritage.” An “undertaking” includes any project, activity, or program that has the potential to have an effect on a historic property and that is under the direct or indirect jurisdiction of a federal agency or is licensed or assisted by a federal agency.

Considering an undertaking’s possible effects on historic properties is accomplished through a four-step review process outlined in Section 106 of the NHPA (36 CFR § 800). These steps are:

- Initiation (defining the undertaking and the area of potential effect [APE] and identifying the parties to be consulted in the process);
- Identification (studies to determine whether cultural resources are present in the APE and whether they qualify as historic properties);
- Assessment of adverse effects (determining whether the undertaking would affect the qualities that make the property eligible for the NRHP); and
- Resolution of any adverse effects (by avoidance, minimization, or mitigation).

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

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

TVA conducted a desktop review for the proposed Project using National Register of Historic Places (NRHP) data, the Tennessee Historical Commission (THC) Viewer, USGS historical topographic maps (Knoxville, TN 1886, 1892, 1894, 1895, 1901, 1935, 1936, 1942, 1953, 1955, 1957, 1960, 1964, and 1966

7.5-minute quadrangles), cultural resource survey reports, current and historic satellite imagery, and the US Department of Agriculture, Soil Conservation Service Web Soil Survey (WSS). The desktop review of the historic topographic maps of Knoxville showed no historic structures within the Project footprint. No historic properties listed on the NRHP are located within the Project footprint or within the 0.5 mile radius of the Project. The THC Viewer shows 10 NRHP-eligible structures (KN-5615, 5644, 5647, 5653, 8447-8452) within the half-mile radius of the Project Area. However, a review of current aerial imagery and topographic maps of the Project Area show the view to the proposed Project is obstructed by the modern built environment, undulating topography, and vegetation. The Project footprint is bounded by Interstate 40 to the south, and by modern development to the north, east, and west. There are no previously recorded archaeological sites within the Project footprint.

TVA staff archaeologists conducted the field review for this Project on August 7, 2020. Surface visibility within the archaeological survey area was generally limited (<25%) due to vegetation. Opportunistic shovel testing and pedestrian survey were conducted within the Project footprint. No archaeological sites were identified. No additional historic structures were identified during the field survey.

A cultural resources survey was conducted in August 2020, and no archaeological sites or historic structures were identified within the area of impact. TVA finds that based on the results of the survey, no historic properties would be affected by the Project. On September 3, 2020, TVA sent a letter to the Tennessee State Historic Preservation Office (SHPO) and the federally recognized Indian tribes that have an interest in the region regarding TVA's "no historic properties effect" finding. In a letter dated September 3, 2020, TVA received concurrence from the TN SHPO. TVA did not receive comments from the federally recognized Indian tribes.

Wetlands

Wetlands are areas inundated by surface or groundwater often enough to support vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, mud flats, and natural ponds.

Activities in wetlands are regulated under Section 404 of the Clean Water Act, as well as Executive Order 11990. Under Section 404, the U. S. Army Corps of Engineers (Corps) established a permit system to regulate activities in Waters of the United States, including wetlands. In order to conduct specific activities in wetlands, authorization under either a Nationwide General Permit or an Individual Permit from the Corps is required. Section 401 water quality certification issued by the Tennessee Department of Environment and Conservation is also required. Executive Order 11990 requires all federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.

A field survey conducted in September 2020 determined the proposed Project Area is an upland area; there are no wetlands present on the parcel. Therefore, no wetland impacts associated with the Proposed Action would occur.

Aquatic Ecology

The KUB Solar Project area is located in an urban area and has been heavily disturbed by commercial development. As a result of this wholesale alteration of the physical landscape, the entirety of the site is vegetated with lawn grasses and other non-native weeds. An August 2020 field survey by a Tennessee Qualified Hydrologic Professional documented two wet-weather conveyances within the Project Area (Table 5).

No perennial or intermittent streams were documented within the Project Area. Two wet-weather conveyance do occur and would potentially be impacted from the Proposed Action. However, these

features do not support aquatic communities. Ground disturbance would be minimized, and all work would be performed in accordance with best management practices. Therefore, no impacts to aquatic ecology would occur from the Proposed Action.

Aquatic T&E

A September 2020 query of the TVA Heritage Database indicates that one federally listed mussel (orange-foot pimpleback) and five state-listed aquatic species have been previously reported from within the Tennessee (0601020102) 10-digit HUC watershed (Table 4). A field survey of the Project Area did not document any suitable habitat for species listed in Table 4.

A field survey of the proposed Project Area documented two wet-weather conveyances (WWC). These features only flow in response to large precipitation events and do not support aquatic communities. Therefore, the Proposed Action would not result in impacts to species listed in Table 4.

Table 4. Records of federal and state-listed aquatic animal species within the Tennessee 10-digit HUC watershed.[1]

Common Name	Scientific Name	Element Rank[2]	Federal Status[3]	State Status[3]	State Rank[4]
FISH					
Blue Sucker	*Cycleptus elongatus*	H?		T	S2
Flame Chub	*Hemitremia flammea*	E		D	S3
Lake Sturgeon	*Acipenser fulvescens*	E		E	S1
MUSSELS					
Orange-foot Pimpleback	*Plethobasus cooperianus*	H	LE	E	S1
SNAILS					
Ornate Rocksnail	*Lithasia geniculata*	H			S2
Spiny Riversnail	*Io fluvialis*	H			S2

[1] Source: TVA Natural Heritage Database, queried on 10/01/2020
[2] Heritage Element Occurrence Rank; E = extant record ≤25 years old; H = historical record ≥25 years old; ? = uncertain
[3] Status Codes: LE or END = Listed Endangered; T = Listed Threatened; D = Deemed in Need of Management.
[4] State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable

Table 5. Aquatic Features Documented within the Project Area.

Field ID	Sequence ID	Field Notes	PHOTOS	Latitude	Longitude
asc01	E001	Small swale/drain coming from culvert.	148, 149	35.96044	-83.96078
asc02	E002	Small drain with fescue in field.	150-153	35.96037	-83.96079

Surface Water

The proposed Project is located in Knox County, Tennessee, in the Ridge and Valley ecoregion. This Project Area drains to streams within the Tennessee (0601020102) 10-digit HUC watershed. The surface water streams in the vicinity of this Project are The Tennessee River, Third Creek, West Fork of Third Creek, and East Fork of Third Creek. An August 2020 Tennessee Hydrologic Determination survey of the property noted two WWC/ephemeral streams which could be impact by the proposed Project.

Precipitation in the general area of the proposed Project averages about 48 inches per year. The wettest month is March, with approximately 5 inches of precipitation, and the driest month is October with 3 inches. The average annual air temperature is 58 degrees Fahrenheit, ranging from an annual average of 50 degrees Fahrenheit to 69 degrees Fahrenheit (US Climate Data, 2020). Stream flow varies with rainfall and averages about 27.2 inches of runoff per year, i.e., approximately 2.00 cubic feet per second, per square mile of drainage area (USGS 2008).

The federal Clean Water Act (CWA) requires all states to identify all waters where required pollution controls are not sufficient to attain or maintain applicable water quality standards. The CWA also requires states to establish priorities for the development of limits based on the severity of the pollution and the sensitivity of the established uses of those waters. States are required to submit reports to the USEPA. The term "303(d) list" refers to the list of impaired and threatened streams and water bodies identified by the state. Third Creek is currently listed as impaired for sedimentation/siltation, E.Coli, other anthropogenic substrate alterations, and nitrate/nitrite due to municipal high density area, site clearance activities, and sewer overflows. The East Fork of Third Creek is also listed as impaired for sedimentation/siltation, E.Coli, and other anthropogenic substrate alterations, due to municipal high density area, site clearance activities, and sewer overflows. Table 6 provides a listing of local streams with their state (TDEC 2013) designated uses.

Table 6. Designations for Streams in the Vicinity of the KUB Solar EA

Streams	Use Classification[1]						
	NAV	DOM	IWS	FAL	REC	LWW	IRR
Tennessee River/Ft. Loudoun Reservoir[2]	X	X	X	X	X	X	X
Third Creek[2]		X	X	X	X	X	X
West Fork Third Creek				X	X	X	X
East Fork Third Creek				X	X	X	X

[1] Codes: DOM = Domestic Water Supply; IWS = Industrial Water Supply; FAL = Fish and Aquatic Life; REC = Recreation; LWW = Livestock Watering and Wildlife; IRR = Irrigation, NAV = Navigation
[2] Not in Project Area, shown for flow network.

Under the Proposed Action, construction activities have the potential to temporarily affect surface water via storm water runoff. Soil erosion and sedimentation can clog small streams and threaten aquatic life. TVA would comply with all appropriate federal, state and local permit requirements. Appropriate best management practices (BMPs) would be followed, and all proposed Project activities would be conducted in a manner to ensure that waste materials are contained, and the introduction of pollution materials to the receiving waters would be minimized. A general construction stormwater permit would be needed since more than one acre would be disturbed. This permit also requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). Additionally, an aquatic resource alteration permit (ARAP) /401 Water Quality Certifications and Corp of Engineer would be required for stream crossings and stream alterations. The SWPPP would identify specific BMPs to address construction-related activities that would be adopted to minimize storm water impacts. Additionally, BMPs, as described in *Tennessee Erosion and Sediment Control Handbook* (TDEC. 2012), would be used to avoid contamination of surface water in the Project Area. Due to the proximity of the Project to impaired streams, Totoal Maximum Daily Loads and other more stringent BMPs and reporting requirements may apply.

Additionally, impervious buildings and infrastructure prevent rain from percolating through the soil and result in additional runoff of water and pollutants into storm drains, ditches, and streams. Because of the small footprint of this Project, construction would not significantly impact impervious surface area, but it would increase it slightly. Under the Proposed Action, the concentrated stormwater flow from the Project Area would come primarily from the proposed constructed ready-pad. This flow would need to be properly treated by either implementing the proper BMPs or engineering a discharge drainage system that could handle any increased flows prior to discharge into the outfall(s).

Domestic Sewage - Portable toilets would be provided for the construction workforce as needed. These toilets would be pumped out regularly, and the sewage would be transported by tanker truck to a publicly-owned wastewater treatment works that accepts pump out. Due to the size of the Project no permanent restroom facilities would be included in the design.

Equipment Washing and Dust Control – Equipment washing and dust control discharges would be handled in accordance with BMPs described in the Storm Water Pollution Prevention Plan for water-only cleaning.

Maintenance activities associated with the PV panels would possibly include, but would not be limited to, periodic inspections, repairs, herbicide/pesticide use, lawn maintenance, and panel cleanings. Cleaning operations should utilize pure water, but if an additive is required to help facilitate the cleaning process, then the waste product would need to be evaluated to ensure proper disposal of the waste stream according to federal, state, and local regulations. Herbicide/pesticide use should not be applied within 50 feet of a water body and all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements should be followed.

If the removal of the PV panels is required due to damage or decommissioning activities, all debris should be disposed of properly. With proper implementation of controls, only minor temporary impacts to local surface waters would be expected.

Proper implementation of these controls is expected to result in only minor temporary impacts to surface waters.

Mitigation Measures

The Knoxville Utilities Board would be required to obtain a construction stormwater permit from TDEC. The Proposed Action would also require the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). An aquatic resources alteration permit (ARAP)/401 Water Quality Certifications and Corp of Engineers would be required for stream crossings and stream alterations should those occur. A burn permit may be required if on-site burning is conducted. All best management practices are required during construction. BMPs described in the Tennessee Erosion and Sediment Control Handbook should be used. Herbicide/pesticide use is not permitted within 40 feet of water bodies.

Due to several roost trees identified on the property, KUB would limit tree clearing activities to between October 15 and March 31 when bats are not present on the landscape. Completion of tree removal must be communicated to TVA.

Conclusion and Findings

Based on the findings in this Supplemental Environmental Assessment, TVA concludes that the Proposed Action to enter into a Power Purchase Agreement with Knoxville Utilities Board would not be a major federal action significantly affecting the environment. Accordingly, an environmental impact statement is not required.

10/19/2020

Dawn Booker, Manager
NEPA Program
Environmental Compliance and Operations
Tennessee Valley Authority

Date Signed

Preparers

NEPA Project Management

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Other Contributors

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Craig Phillips – Aquatic Ecology and Aquatic Threatened and Endangered

Adam Dattilo – Terrestrial Ecology and Threatened and Endangered Plants

Chevales Williams – Surface Water

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Attachments

Attachment A – Tennessee State Historic Preservation Officer and Federally Recognized Tribes Correspondence

Attachment A – Tennessee State Historic Preservation Officer and Federally Recognized Tribe Correspondence

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
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September 3, 2020

Mr. Clinton E. Jones
Tennessee Valley Authority
Biological and Cultural Compliance
400 West Summit Hill Drive
Knoxville, TN 37902

RE: TVA / Tennessee Valley Authority, Knoxville Utilities Board (KUB) Community Solar Project, Lorraine Street, (35.96001, -83.96112), Knoxville, Knox County, TN

Dear Mr. Jones:

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

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

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. You may direct questions or comments to ((615) 687-4780, Jennifer.Barnett@tn.gov). This office appreciates your cooperation.

Sincerely,

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

EPM/jmb

Dear Sir/Madam:

TENNESSEE VALLEY AUTHORITY (TVA), KNOXVILLE UTILITIES BOARD (KUB)
COMMUNITY SOLAR PROJECT, KNOX COUNTY, TENNESSEE

KUB is proposing to construct an up to 1 megawatt (MW) solar facility on approximately 3.22 acres of land owned by the City of Knoxville. The KUB Solar Project is funded under the TVA Flexibility Research Project (FRP), which is a board-approved program that allows local power companies (LPC) to build generation and sell power back to TVA through a Power Purchase Agreement. The proposed solar project is located at the Knoxville Public Works Facility on Lorraine Street west of downtown Knoxville, Tennessee in Knox County (35.96001, -83.96112). The height of the proposed solar panels will be 15 feet or less. TVA finds that the proposed project constitutes an undertaking (as defined at 36 CFR § 800.16 (y)) that has the potential to cause effects to historic properties. TVA has determined the area of potential effects (APE) for this project to be all areas where ground disturbing activities would take place, in this case the entire 3.22 acre parcel, as well as all areas within a 0.5-mile radius of the undertaking from which the project would be visible.

TVA staff archaeologists conducted the field review for this project on August 7, 2020. A detailed discussion of the methods used and the results of the field review are provided in the attached report entitled *Cultural Resources Survey for Knoxville Utilities Board (KUB) Community Solar Project, Knox County, Tennessee*. No cultural resources or historic properties were identified during the course of this field review. No further cultural resource work is recommended, and TVA finds that the proposed undertaking will have no effect on historic properties.

Based on the background research and the results of the field review, TVA finds that the proposed undertaking would result in no effect to historic properties. Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the National Register of Historic Places (NRHP): Absentee Shawnee Tribe of Indians of Oklahoma, Alabama-Coushatta Tribe of Texas, Cherokee Nation, Coushatta Tribe of Louisiana, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, Kialegee Tribal Town, The Muscogee (Creek) Nation, Shawnee Tribe, Thlopthlocco Tribal Town, and the United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR § 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4 (a)(4)(b).

Please respond by October 4, 2020 if you have any comments on the proposed undertaking. If you have any questions, please contact me by phone, (865) 632-2464, or by email, mmshuler@tva.gov.

Sincerely,

Marianne Shuler
Senior Specialist, Archaeologist and Tribal Liaison
Cultural Compliance