

**Natural Resources Assessment for:
150 kW Photovoltaic Electric Generation Facility
Norwich Turnpike Solar Project**

Norwich, Vermont

*Prepared by:
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June 19, 2020



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I. Summary Findings

Arrowwood Environmental, LLC (AE) conducted a natural resources assessment for the proposed Norwich Turnpike Solar Project (“Project”) located at 645 Turnpike Road in Norwich, Vermont. The field assessment was conducted in the summer and fall of 2019 and summer 2020. The Project site is located within an open field. AE assessed natural resources criteria incorporated by the Public Utility Commission into the review of solar projects, including streams and headwaters, floodways, outstanding resource waters, shorelines, wetlands, rare and irreplaceable natural areas, necessary wildlife habitat, and rare, threatened, and endangered species.

There are no streams, shorelines, floodways, outstanding resource waters, necessary wildlife habitat, rare and irreplaceable natural areas, or rare, threatened, and endangered species at the Project site.

The Project is located in a headwater. The Project will be performed in accordance with the Vermont Standards & Specifications for Erosion and Prevention and Sediment Control, 2019.

The Project site contains Class 2 wetlands. The Agency of Natural Resources Wetland Program visited the site on October 31, 2019 to review and approve wetland classifications and delineations. The Project has been designed to avoid all Class 2 wetlands and 50’ buffer areas.

The Project area contains two additional wetland resources. AE agrees with the Wetland Program that due to size and lack of significant functions and values that these wetlands are Class 3. The Project will result in no tree clearing in these small wetland areas. The Project access road will result in less than 3,000 sf of impact to Class 3 wetland resources and therefore does not trigger the need for a reporting Army Corps of Engineers permit.

In summary, AE concludes that the Project has been sited and designed to avoid undue adverse impacts to natural resources including shorelines, streams and headwaters, floodways, outstanding resource waters, wetlands, rare and irreplaceable natural areas, necessary wildlife habitat, and rare, threatened, and endangered species.

II. Introduction and Project Description

Arrowwood Environmental, LLC (AE) was retained by Norwich Solar Technologies to perform a natural resources assessment for a proposed 150 kW photovoltaic electric generation facility located at 645 Turnpike Road in Norwich, Vermont (“Project”). The Project site is located within an open field.

Access to the Project will be off of Turnpike Road. The Project will interconnect to Green Mountain Power Corporation’s (GMP) distribution circuit, with a line extension to a new GMP 150 kVA pole-mounted transformer.



Project Area (7/30/19)

This report outlines AE’s findings related to natural resources criteria incorporated by the Public Utility Commission into the review of solar projects, including streams and headwaters, floodways,

outstanding resource waters, shorelines, wetlands, rare and irreplaceable natural areas, necessary wildlife habitat, and rare, threatened, and endangered species.

The natural resources assessment involved both a remote review of available digital databases as well as field investigations at the Project site on July 30, 2019, October 10, 2019, and June 18, 2020.

III. Site Characterization

Ecologically the site is within the Southern Vermont Piedmont biophysical region of the state (Thompson and Sorenson, 2019). The Project is located at approximately 800 feet above mean sea level according to U.S. Geologic Survey (“USGS”) topographic data. The mapped bedrock that is underlying the site is of the metasedimentary rock class with quartzite and phyllite rock types from the Gile Mountain Formation. (Ratcliffe et al. 2011). The soils are mapped as Cabot and Buckland loam soils in the Project area (NRCS Soil Survey). The Project site is located within an open field.

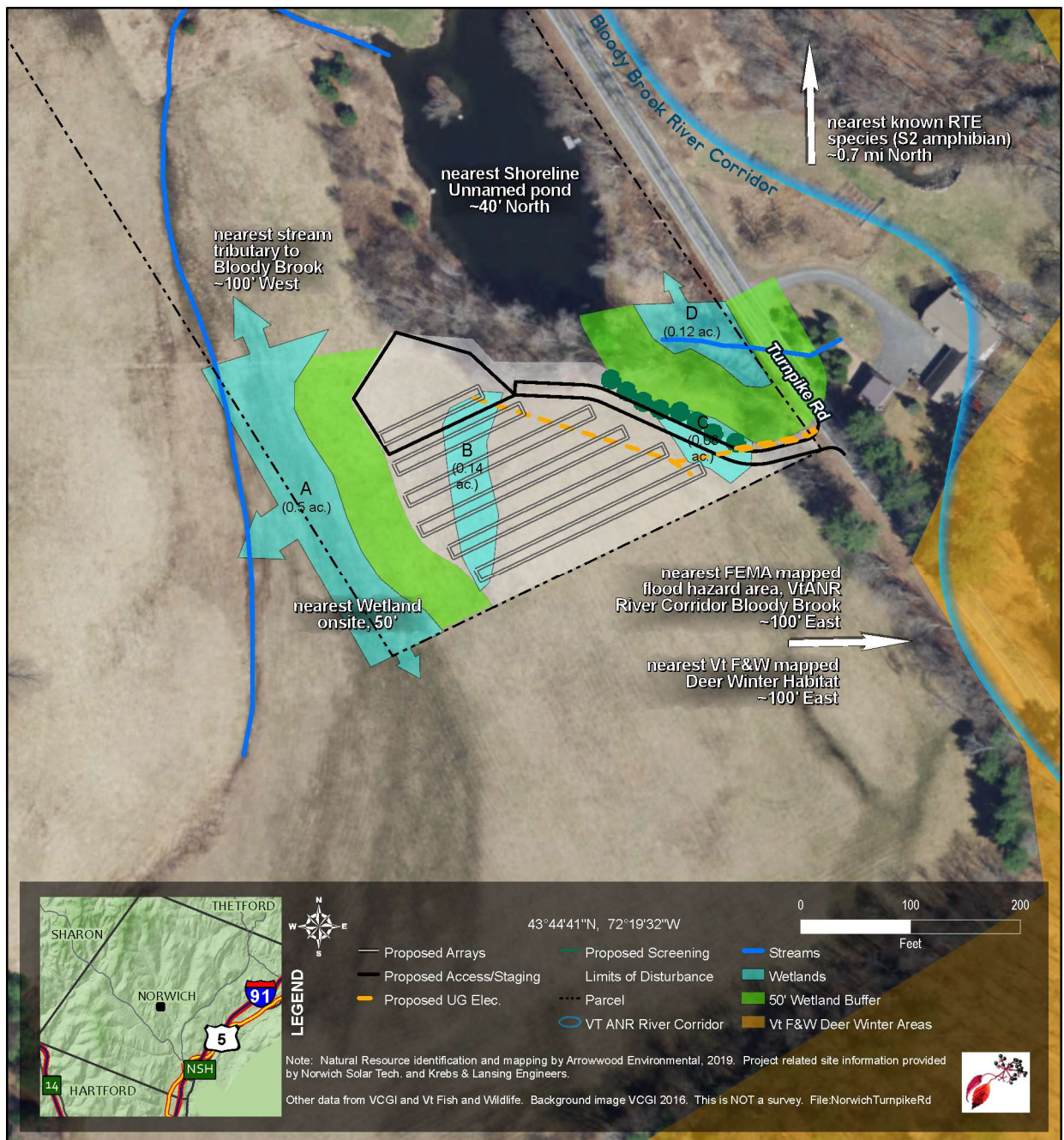


Figure 1. Project Site and Nearby Natural Resources.

IV. Criterion 1(A) Headwaters

The headwaters assessment involved both a remote review of the USGS topographic map and Vermont Hydrography Dataset (streams, rivers, and waterbodies) and field investigation in July 2019. The Project is located in a headwater as its watershed area is less than 20 square miles. The

Project area is however below 1,500 ft. in elevation and the Project site is not for public water supplies and does not provide significant recharge to aquifers (ANR Natural Resources Atlas).

The Project will be constructed in accordance with the Vermont Standards & Specifications for Erosion and Prevention and Sediment Control, 2019. The Project site, including space between the solar panels, will remain vegetated and maintained with mowing or brush hogging conducted without the use of chemical herbicides. The proposed Project will not result in a reduction of the quality of ground or surface waters in the area. For these reasons, we conclude that the Project will have no adverse impact on headwater areas.

V. Criterion 1(D) Floodways

AE reviewed the FEMA DFIRM (Digital Flood Insurance Rate Map Database) for Windsor County, Vermont. The site of the proposed Project is not located within a 100-year flood hazard area (zone A). The proposed Project is not located within a floodway or a floodway fringe and will not restrict or divert the flow of floodwaters or significantly increase the peak discharge of a river or stream within or downstream from the Project, or endanger health, safety, or welfare of the public or of riparian owners during flooding. The closest mapped floodway and river corridor is approximately ~100' to the east of the Project. The Project will have no impact on floodways or river corridors.

VI. Criteria 1(E) Streams and Section 248(b)(8) Outstanding Resource Waters

The stream assessment involved both a remote review of the USGS topographic map and Vermont Hydrography Dataset (streams, rivers, and waterbodies) and field investigation in July 2019.

There are no surface waters within the Project footprint. The closest stream is a tributary to Bloody Brook approximately 100' to the west of the Project area. The Project will not result in any clearing of forest vegetation within the riparian buffer zone (measured 50' from the boundary of the Class 2 wetland). Accordingly, the Project will maintain the condition for the streams identified, and will not endanger the health, safety, or welfare of the public or adjoining landowners. For these reasons, we conclude that the Project will have no adverse impact on streams.

The Agency of Natural Resources has listed four waterways as Outstanding Resource Waters (ORW): Batten Kill River in towns of East Dorset and Arlington; Pike's Falls/Ball Mountain in the town of Jamaica; Poultney River in the towns of Poultney and Fair Haven; and Great Falls, Ompompanoosuc in the town of Thetford. There are no waters which intersect the Project or are near the Project that have been designated as an ORW. Therefore, the Project will not result in any impact to ORWs.

VII. Criterion 1(F) Shorelines

AE reviewed USGS topographic maps, the Vermont Hydrography Dataset (streams, rivers, and waterbodies), and digital orthophotography. The site of the proposed Project is not located on a shoreline of a river, lake, pond, or reservoir. The closest shoreline to the Project is that of an unnamed pond ~40' to the north of the Project area. The Project will not result in any clearing of forest vegetation along the shores of this pond. The proposed Project will result in no adverse impact to shorelines.

VIII. Criterion 1(G) Wetlands

The wetland assessment involved both a remote review of available maps (including Vermont Significant Wetland Inventory Maps and the NRCS Soil Survey) and a field inventory component conducted in July 2019. The protocols put forth in the USACE's *Corp of Engineers Wetlands Delineation Manual* (2009 Regional Supplement for the Northcentral and Northeast Region) were employed for delineating wetlands as is the standard practice in Vermont.

AE identified and mapped Class 2 wetlands in the Project area. Ms. Rebecca Chalmers from the ANR Wetland Program visited the site to review and approve the wetland delineations and wetland classifications. The Project has been designed to avoid impacts to the Class 2 wetlands and associated 50' buffer zones in the vicinity of the Project. The Project does not require a Vermont Wetlands Permit, and we conclude that the proposed Project will have no undue adverse impact on Class 2 wetland resources.

The Project area contains two additional wetland resources. AE agrees with the Wetland Program that due to size and lack of significant functions and values that these wetlands are Class 3. The

Project will result in no tree clearing in these small wetland areas. The Project access road will result in less than 3,000 sf of impact to Class 3 wetland resources and therefore does not trigger the need for a reporting Army Corps of Engineers permit.

IX. Criterion 8 Rare and Irreplaceable Natural Areas

The Rare and Irreplaceable Natural Areas assessment involved both a remote review of available digital maps for the Project area and a field review. AE reviewed digital orthophotography, the NRCS Soil Survey, the 2011 Bedrock Geologic Map of Vermont, and the Wildlife Natural Heritage Inventory (NHI) Rare, Threatened and Endangered Species digital database.

The Project area is characterized as open field that has been infrequently mowed. These areas do not constitute a significant natural community or a Rare and Irreplaceable Natural Area (RINA). No RINAs are present within the Project area. Since there are not Rare and Irreplaceable Natural Areas in the Project area, there will be no adverse impacts on any Rare and Irreplaceable Natural Areas.

X. Criterion 8(A) Necessary Wildlife Habitat and Rare, Threatened and Endangered Species

The wildlife habitat assessment involved both a remote review of available digital maps for the Project area and a field inventory component. A remote review of available digital databases was conducted to identify and map necessary wildlife habitat (including State of Vermont Deeryard data layer, Vermont Dept. of Fish, USGS Topographic map, “VT HYDRODEM” elevation data) within the Project area and within the vicinity of the Project area.

Site assessments were conducted in the summers of 2019 and 2020 to assess wildlife, wildlife habitats, and threatened and endangered species.

A. Necessary Wildlife Habitats

1. White-tailed Deer Wintering Habitats

There are no mapped VT Fish and Wildlife Department white-tailed deer (*Odocoileus virginianus*) winter habitats (DWA) in the Project area. The closest mapped DWA is located approximately 100' to the east of the Project area. The Project will result in no clearing of trees. AE confirmed the absence of historic or recent deer wintering activity as well as lack of forested areas containing significant enough soft wood canopy closure to be considered DWA habitat in the Project area. The proposed Project will have no adverse impact on DWA resources.

2. Black Bear Habitat

Project site does not consist of American beech (*Fagus grandifolia*) or Oak (*Quercus spp*) stands. No sign of use by black bear was documented. No potential black bear spring feeding wetlands were identified. The Project will therefore have no adverse impact on black bear habitat.

3. Grassland Bird Habitat

The Project site area is located within an ~16 acre open field. The Project area does not provide suitable habitat for grassland bird species. The Project will have no adverse impact on grassland bird habitat.

B. Rare, Threatened and Endangered (RTE) Species

The RTE species review involved both a remote review of available digital maps for the Project area as well as a field survey. AE reviewed digital orthophotography, the NRCS Soil Survey, the 2011 Bedrock Geologic Map of Vermont and the Wildlife Natural Heritage Inventory (NHI) Rare, Threatened and Endangered Species digital database.

In reviewing the NHI digital database, there are no records or occurrences of RTE plant or animal species in or directly adjacent to the Project site.

1. RTE Animal Species

The Northern Long Eared Bat (LEB) became a federally listed endangered species in May of 2015. Vermont Fish and Wildlife Department has issued guidance that project clearing constituting greater than 1% of the total forested area within a 1 square mile radius of a project triggers review for habitat loss of this endangered species. The Project will result in no clearing of trees.

The Project is not in an area that potentially provides summer roosting habitat for Indiana bat, there are no old or abandoned buildings potentially providing roosting habitat for little brown bat proposed for demolition, and there are no known bat hibernacula or maternity roosts within 1 mile of the Project site. The Project will have no adverse impact on RTE animal species.

2. RTE Plant Species

There are no known records or occurrences of RTE plant species at the site. Michael Lew-Smith conducted a plant survey of the Project area on June 18, 2020. No RTE plant species were identified during this survey. The proposed Project will have no adverse impact on RTE plant species.

XI. References

Argentine, Cindy Corlett. Vermont Act 250 Handbook. Putney Press. 2008.

Natural Resources Board. Vermont Wetland Rules. Effective January 21, 2020.

Natural Resources Conservation Service. Soil Survey Maps.

Ratcliffe, N.M., Stanley, R.S., Gale, M.H., Thompson, P.J., and Walsh, G.J., 2011, Bedrock geologic map of the Vermont: U. S. Geological Survey Scientific Investigations Map 3184, scale 1:100,000.

Thompson, Elizabeth H. and Eric R. Sorenson, and Robert J. Zaino. Wetland, Woodland, and Wildland: A Guide to the Natural Communities of Vermont. The Nature Conservancy of Vermont, 2019.

Vermont Center for Geographic Information (VCGI). EcologicHabitat_DEERWN GIS data layer. Provided by Vt. Dept. of Fish and Wildlife, release date April 1, 2011.

Vermont Fish and Wildlife Department Regulatory Review Guidance for Protecting Northern Long-eared Bats and Their Habitats. February 2017.

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