Solar Energy Facility
Construction and Operation Recommendations

Wildlife Information and Environmental Services
February 13, 2025

I. Scoping for Wildlife Impact Assessment:

A. DWR data and resources

Step 1: Access the VA Fish and Wildlife Information Service (VAFWIS) from the DWR website at: https://services.dwr.virginia.gov/fwis/index.asp . Send an email to Support_VAFWIS@dwr.virginia.gov if you need to set up an account or need other assistance.

Step 2: Using the geographic search function, generate an Initial Project Assessment (IPA) report for the site using an at least 2 – mile buffer around project boundaries (action area), OR use the PBR (permit by rule) reporting feature. See the "help" section for instructions.

Step 3: Review the below information regarding data returned by VAFWIS and apply, as appropriate. Please see the end of the document for contacts regarding common wildlife species, the location of which may not be accurately depicted by VAFWIS which is most heavily populated by imperiled species and designated resource data.

Any project with a federal nexus (e.g., the project entails any federal funding, permits, or federal agency action) must comport with consultation requirements pursuant to Section 7 of the Endangered Species Act. To ensure such compliance, the project applicant or proponent should access the USFWS Virginia Field Office Project Review (IPaC) website at: https://www.fws.gov/office/virginia-ecological-services/virginia-field-office-online-review-process. Since listing of Atlantic Sturgeon, all hydraulic hopper dredging activities in the Chesapeake Bay, Atlantic Ocean, and major tributaries, regardless of time of year must be coordinated with NOAA Fisheries Service.

Data Returned by VAFWIS:

Species Observations (SppObs) – The Species Observation dataset includes all verified species documentations maintained by DWR. If the IPA results indicate that a *listed species* has been documented from the project area, it is possible that the species is present on the project site, if suitable habitat exists. Coordinate with DWR Environmental Services Staff, per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/, as we may recommend conservation measures necessary to ensure compliance with the Endangered Species Act.

Threatened and Endangered Species Waters (TEWaters) – The Threatened and Endangered Species Waters (TEWaters) dataset includes the locations of waters from which *listed species* have been documented and which agency biologists have determined are currently occupied by such species. If work in the TEWater or its tributaries is proposed (ex: installation of crossings, soil borings, stream restoration, utility installation, etc.), we recommend coordination with DWR's Environmental Services (ES) staff , per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/, as we may

recommend conservation measures necessary to ensure compliance with the Endangered Species Act.

Otherwise, we offer the below general guidance regarding protection of TEWaters:

a) If a waterbody is designated a TEWater due to the presence of listed fishes, mussels, snails, or crayfish, we recommend the following to best protect such listed aquatic species (and the resources upon which they depend) from harm that may result from nearby agriculture, silviculture, habitat management or restoration, and/or land development:

- We recommend protecting from impacts a natively vegetated riparian buffer of at least 100 ft on both sides of all intermittent tributaries to the designated water;
- We recommend protecting from impacts a natively vegetated riparian buffer of at least 200 ft on both sides of all perennial tributaries to designated waters; and/or
- We recommend protecting from impacts a natively vegetated riparian buffer of at least 300 ft on both sides of designated waters.

b) If a waterbody is designated a TE Water due to the presence of wood turtles, we recommend the following (in addition to the above), to best protect this listed semi-aquatic species (and the resources upon which it depends) from harm that may result from nearby silviculture, habitat management or restoration, and/or land development:

- Because wood turtles must have access to freshwater streams during hibernation as well as access to adjacent uplands, where they forage, mate, and nest, we recommend coordination with us not only for instream work, but also for any work in uplands adjacent to (within 900 feet of) the designated water.

Anadromous Fish Use Areas – The Anadromous Fish Use Areas (AnadFish Waters) dataset includes the locations of streams known to provide migratory and/or spawning habitats for anadromous fishes. We recommend coordination with DWR ES per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/ anytime work in designated AnadFish Waters and/or their tributaries is proposed. Otherwise, we offer the below general guidance regarding protection of AnadFish Waters:

- We recommend protecting from impacts a natively vegetated riparian buffer of at least 100 ft on both sides of all perennial tributaries to the designated water; and/or
- We recommend protecting from impacts a natively vegetated riparian buffer of at least 200 ft on both sides of the designated water.

Anadromous Fishes/Fish Passage Expert: Alan Weaver
804-367-6795 or Alan.Weaver@DWR.virginia.gov

Bat Occurrence Data Applications – These datasets depict regulatory buffers around those documented occurrences and landscape features that support listed bats. Any land development or forestry activities (habitat modifications) within a regulatory buffer should be coordinated with DWR ES, per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/. For the species below, use the indicated applications to determine the location of hibernacula and roosts.

- Northern Long-eared Bat Regulatory Buffer Map:
  https://dwr.virginia.gov/wildlife/bats/northern-long-eared-bat-application/
- Little Brown and Tricolor Bat Hibernacula and Roosts:
  https://www.DWR.virginia.gov/wildlife/bats/little-brown-bat-tri-colored-bat-winter-habitat-roosts-application/

Sea Turtle Nesting Beaches* – This dataset includes stretches of beach/shoreline in Virginia known to support nesting of sea turtles, all of which are federally- and state-listed. We recommend coordination with DWR ES, the USFWS and NOAA/National Marine Fisheries Service regarding any activities proposed on these designated beaches/shorelines. Otherwise, we support protection of these areas and adjacent shorelines from incompatible activities.

Wild Trout Waters – The Cold Water Streams dataset includes the locations of waters designated as cold water habitat. Many of these streams support wild trout populations. To best protect these waters and the species they are known to support, we recommend coordination with DWR ESS per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/ anytime work in designated Trout Waters and/or their tributaries is proposed. Otherwise, we offer the below general guidance regarding protection of Trout Waters:

- We recommend protecting from impacts a natively vegetated buffer of at least 100 ft on both sides of all perennial tributaries to the designated water; and/or
- We recommend protecting from impacts a natively vegetated buffer of at least 200 ft on both sides of the designated water.

Stockable Trout Waters – The Cold Water Streams dataset also includes the locations of waters currently stocked with trout by DWR as well as those suitable for stocking, but perhaps not currently stocked. To best protect these waters and the species they are known to or capable of supporting, we recommend coordination with DWR ESS per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/ anytime work in Stocked Trout Waters is proposed. Otherwise, we offer the below general guidance regarding protection of Trout Waters:

- We recommend protecting from impacts a natively vegetated buffer of at least 100 ft on both sides of all perennial tributaries to the designated water; and/or
- We recommend protecting from impacts a natively vegetated buffer of at least 200 ft on both sides of the designated water.

Trout/Trout Stream Expert: Steve Reeser
540-248-9360 or Steve.Reeser@DWR.virginia.gov

Colonial Waterbird (CWB) colonies – This DWR-maintained dataset includes documented locations of colonial waterbird colonies. To ensure protection of the colony and the species known to nest within it, we recommend coordination with DWR's ES per the protocols provided here: https://dwr.virginia.gov/wies/environmental-services/ for any land development or timbering activities proposed to occur within 0.5 miles of a documented colony. Otherwise, we offer the below general guidance regarding protection of colonial waterbird colonies:

- We recommend preserving, planting and/or enhancing an undisturbed natively vegetated buffer of at least 500 ft around the waterbird colony. This provides the colony with a line of sight and habitat buffer, providing nesting activity protection as well as habitat protection to ensure suitability for future nesting seasons.

Bald Eagle Nests – This dataset includes the location of bald eagle nests, and their associated buffers, within Virginia. While we periodically update nest status or add new nests based on curated observations from citizens and/or our staff, we no longer update bald eagle nest data annually per flyover survey data. To ensure protection of bald eagles in compliance with the Bald and Golden Eagle Act, we recommend using the Center for Conservation Biology (CCB) Eagle Nest Locator to determine if any active eagle nests are known from the project area. If active bald eagle nests have been documented from the project area, we recommend that the project move forward in a manner consistent with state and federal guidelines for protection of bald eagles; and coordination, as indicated, with the U.S. Fish and Wildlife Service regarding possible impacts upon bald eagles or the need for a federal bald eagle take permit.

Bald Eagle Concentration Area and Roosts (BECAR) - This dataset includes bald eagle concentration areas (defined as 660 feet landward or channelward of the shoreline) and documented roosting sites documented by VDWR and/or our partners. Significant habitat alteration, location of water-dependent facilities or other recreational and commercial activities within certain distances of eagle nests, concentration zones, or roosts may result in adverse impacts upon eagles. Therefore, we recommend that land owners comply with the Virginia management guidelines for landowners; and that he or she coordinate with the U.S. Fish and Wildlife Service regarding possible impacts upon bald eagles or the need for a federal bald eagle take permit associated with activities on his or her property.

DWR Lands (boat ramps, WMA's, Fish Hatcheries, lakes)* – The DWR Lands dataset includes locations of all DWR facilities. We support development of easement restrictions protective of our facilities and access to them by the public and our staff; and the watersheds/drainages upstream of our hatcheries and fishing lakes.

****coming to VAFWIS very soon!*

B. DEQ Data and Resources

Coastal Avian Protection Zones: Permit-By-Rule (PBR) applicants need to identify whether the proposed site is located within a Coastal Avian Protection Zone (CAPZ; 9VAC15-60-60 *et seq*.). See https://www.deq.virginia.gov/our-programs/coastal-zone-management/coastal-mapping/coastal-gems to access DEQ's Coastal GEMS Online Application at: https://gaia.vcu.edu/GemsMap/.

II. Additional Wildlife Considerations

Wildlife passage and fencing:
Solar facilities typically incorporate perimeter fencing that may act as a barrier to ground-based wildlife movement. We recommend documenting wildlife travel corridors and observed passage prior to construction activities and encourage the consultant/applicant to coordinate with DWR regarding wildlife fencing that would allow ingress and egress through the enclosure, as well as the development of wildlife corridors. Adaptive strategies may include lower fence height in wildlife corridors; dividing large sites into smaller fenced sub-parcels (approximately 40 acres maximum) to establish unfenced wildlife corridors; use of larger mesh fence at ground level (*i.e.*, "wildlife-permeable fencing"); and facilitating wildlife passage via

ground-level openings or pipes (approximately 8-inch diameter) through the fence.

General fencing recommendations**:** We recommend that the fences enclosing solar facilities either be 61 inches or less in height, so that deer will have easy ingress and egress to/from the enclosure; or that the fences (including barbed wire if desired) be at least 96 inches in height, so that deer would not normally enter the site.

Fence design recommendations for deer management**:** Under certain conditions deer may seek refuge or become entrapped within fenced enclosures. To address this concern, perimeter fences around solar facilities should either be no more than 61" high OR greater than or equal to 96" (8') high. Fences lower than 61" should provide free ingress and egress of deer. Fences of heights between 61" and 8' are likely to entrap deer that are motivated to enter but not leave the enclosure. Fences over 8', if properly maintained, should exclude deer so that they do not become entrapped. Maintenance along the bottom of an exclusionary fence is critical to prevent deer incursions; fences should be erected tight to the ground and any gaps should be filled with rip rap or other barriers (except at purposeful wildlife crossings).

Hunting prohibition: Hunting deer is prohibited within any enclosure having fences higher than 61" (with certain exceptions not applicable to solar facilities). This prohibition is documented and explained in the Code of Virginia (29.1-525.1) and DWR regulations (4VAC15-90-291). Other than this prohibition, DWR does not regulate fencing of projects such as solar energy facilities

Lake effect: It has been reported that contiguous aggregates of panels could result in an avian impact known as "lake effect," in which birds may mistake the reflective solar panels for a waterbody and attempt to land on or near the panel array. Waterbirds are especially at risk because some species require a running start on the water surface and cannot take off from the ground. Further research and study of available scientific literature is recommended. Post-construction monitoring may be recommended, if warranted by site- specific conditions.

Thermal-island effect: It has been reported that "thermal island" impacts may result from large solar facilities, similar to thermal islands resulting from large, paved parking areas. To date, there has been little scientific investigation of this potential effect. Further research and study of available scientific literature is recommended. Post-construction monitoring may be recommended, if warranted by site-specific conditions.

Wetland and stream impacts: If the project entails instream work or wetland impacts, we anticipate that a Joint Permit Application (JPA) will be distributed for interagency review. We will review and provide additional comments on that application, as appropriate.

III. Vegetation Management:

Native species: We recommend that the applicant utilize native plants and seed mixes for vegetative

ground cover, to the greatest extent possible. We recommend the consultant or applicant contact DWR and DCR-DNH for guidance regarding native plantings and pollinator seed mixes.

Invasive species: We recommend that invasive species control be incorporated into the facility operation and mitigation plan(s). Post-construction monitoring for invasive species is recommended as warranted by site-specific conditions.

IV. Standard Site Development Recommendations:

To minimize overall impacts to wildlife and our natural resources, we offer the following comments about development activities:

We recommend that the applicant avoid and minimize impacts to undisturbed forest, wetlands, and streams to the fullest extent practicable. Avoidance and minimization of impacts may include relocating stream channels as opposed to filling or channelizing as well as using, and incorporating into the development plan, a natural stream channel design and forested riparian buffers. We recommend maintaining undisturbed naturally vegetated buffers of at least 100 feet in width around all on-site wetlands and on both sides of all perennial and intermittent streams. We recommend maintaining wooded lots to the fullest extent possible. We generally do not support proposals to mitigate wetland impacts through the construction of stormwater management ponds, nor do we support the creation of in- stream stormwater management ponds.

We recommend conducting any in-stream activities during low or no-flow conditions, using non-erodible cofferdams or turbidity curtains to isolate the construction area, blocking no more than 50% of the streamflow at any given time (minimal overlap of construction footprint notwithstanding), stockpiling excavated material in a manner that prevents reentry into the stream, restoring original streambed and streambank contours, revegetating barren areas with native vegetation, and implementing strict erosion and sediment control measures. We recommend that instream work be designed and performed in a manner that minimizes impacts upon natural streamflow and movement of resident aquatic species. If a dam and pump-around must be used, we recommend it be used for as limited a time as possible and that water returned to the stream be free of sediment and excess turbidity. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap. To minimize harm to the aquatic environment and its residents resulting from use of the Tremie method to install concrete, installation of grout bags, and traditional pouring of concrete, we recommend that such activities occur only in the dry, allowing all concrete to harden prior to contact with open water. Due to future maintenance costs associated with culverts, and the loss of riparian and aquatic habitat, we prefer stream crossings to be constructed via clear-span bridges. However, if this is not possible, we recommend countersinking any culverts below the streambed at least 6 inches, or the use of bottomless culverts, to allow passage of aquatic organisms. We also recommend the installation of floodplain culverts to carry bankfull discharges.

We recommend that the stormwater controls for this project be designed to replicate and maintain the hydrographic condition of the site prior to the change in landscape. This should include, but not be limited to, utilizing bioretention areas, and minimizing the use of curb and gutter in favor of grassed swales. Bioretention areas (also called rain gardens) and grass swales are components of Low Impact Development (LID). They are designed to capture stormwater runoff as close to the source as possible and allow it to slowly infiltrate into the surrounding soil. They benefit natural resources by filtering pollutants and

decreasing downstream runoff volumes.

We recommend that all tree removal and ground clearing adhere to a time of year restriction (TOYR) protective of resident and migratory songbird nesting from March 15 through August 15 of any year.

We recommend adherence to erosion and sediment controls during ground disturbance. To minimize potential wildlife entanglements resulting from use of synthetic/plastic erosion and sediment control matting, we recommend use of matting made from natural/organic materials such as coir fiber, jute, and/or burlap.

V. Additional Agency Coordination:

VDCR-DNH: The applicant should conduct a preconstruction desktop survey of natural heritage resources within the disturbance zone, and coordinate with VDCR-DNH regarding protection of these resources, as needed.

USFWS: If a proposed facility may involve impacts to federally-listed Threatened or Endangered species; or to other federally protected wildlife resources, the applicant should contact Troy Andersen, USFWS – Virginia Field Office, at troy.andersen@fws.gov or (804) 693-6694 ext. 2428 for guidance regarding completion of an online IPaC (Information Planning and Consultation) project assessment.

VI. Contacts:

DWR Environmental Services	DEQ Renewable Energy Program
Hannah Schul Environmental Services Program Manager Hannah.Schul@dwr.virginia.gov (804) 968-8546	Susan Tripp Renewable Energy PBR Coordinator Susan.Tripp@deq.virginia.gov (804) 664-3470