263 Blue Ridge Drive
Manchester, CT 06040

May 7, 2024

Melanie Bachman, Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **PETITION NO. 1609** – TRITEC Americas, LLC notice of election to waive exclusion from Connecticut Siting Council jurisdiction, pursuant to Connecticut General Statutes §16-50k(e), and petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 0.999-megawatt AC solar photovoltaic electric generating facility located at 250 Carter Street, Manchester, Connecticut, and associated electrical interconnection.
Pre-filed Testimony and Evidence

Dear Executive Director Bachman and Members of the Siting Council:

Provided herein is our joint written testimony and evidence demonstrating that the numerous negative impacts to the environment, ecology, and assets of scenic, historic, and recreational importance that would result from the proposed solar photovoltaic electric generating facility at 250 Carter Street in Manchester, Connecticut ("proposed Project") would not outweigh the benefits of said proposed Project.

Sincerely,

Rachel & Dana Schnabel

Rachel Schnabel

Rachel Schnabel, PE

Dana Schnabel

c: Service List dated April 25, 2024

Petition No. 1609
TRITEC Americas, LLC
250 Carter Street, Manchester, Connecticut

Pre-filed Testimony and Evidence by Rachel and Dana Schnabel
May 7, 2024

We, Rachel and Dana Schnabel, attest to have fully reviewed Petition No. 1609, which has been filed by TRITEC Americas, LLC (hereinafter "Petitioner"). The testimony provided herein was prepared jointly, with the exception of sections directly pertaining to our respective areas of expertise. Such sections are denoted within the section header.

I. Relevant Credentials

A. Rachel Schnabel, PE

- Technical Education & Experience
  - Bachelor's Degree in Environmental Engineering, Minor in Geology
    - Rensselaer Polytechnic Institute (RPI), Troy, NY
  - 10+ years of experience working as a Civil/Environmental Engineer for consulting firms within the Architectural, Engineering and Construction (A/E/C) industry
- Licenses & Certifications
  - Professional Engineering, CT License No. 32562
  - Soil Evaluator, MA License No. 13897
  - 10-Hour OSHA Construction Certified
- Professional Memberships
  - New England Water Environment Association (NEWEA) since 2015
    - Contaminants of Emerging Concern Committee Member
    - PFAS Task Force Member
- Relevant areas of knowledge and experience: stormwater quality and management, soils, groundwater quality and modeling, environmental remediation, and construction oversight

B. Dana Schnabel

- Technical Education & Experience
  - Bachelor's Degree, Dual Major in Aeronautical Engineering and Mechanical Engineering
    - Rensselaer Polytechnic Institute (RPI), Troy, NY
  - 12+ years of experience in manufacturing including aerospace, defense, energy, and telecommunications industries
- Emergency Response Certifications, Training, & Experience
  - Connecticut Certified Firefighter II (NFPA 1001), Hazmat operations (NFPA 472), EMT
  - Completed multiple courses through the FEMA Emergency Management Institute
  - Apparatus driver, pump operator
  - 8+ years of experience as a volunteer firefighter, 3 years as a Lieutenant

- Formerly Manchester Fire Department Eighth Utilities District, currently Bolton Volunteer Fire Department

- Relevant areas of knowledge and experience: Materials testing, regulatory compliance, industry specifications, Underwriters Laboratory-approved electrical insulation systems, transformer manufacturing; fireground operations & tactics

II. Proposed Site & Surrounding Area

A. Setting of the Proposed Project

For the sake of providing context to the Siting Council, photographs and video footage of the area surrounding 250 Carter Street has been provided as **Exhibit A-1**. While Google Maps does not provide a street view of the roadways in the area surrounding, Bing Maps does. Here is a link to the 250 Carter Street property in Bing Maps: https://www.bing.com/maps?osid=bfdf2acd-9e60-4b54-9283-74aea5995b37&cp=41.76284~-72.475266&lvl=16.4&pi=0&imgid=c7228a5e-7522-4347-b42a-24a9e95f9a10&v=2&sV=2&form=S00027. To observe any of the surrounding roadways in street-view mode, simply zoom into the desired location until the roadway turns blue, then click on the section of roadway where you would like to start the street-view mode.

We looked at over 40 houses before we found our current home at 263 Blue Ridge Drive. What is unique about the location of this property compared to the many others we considered is that it has the qualities of being in a rural, natural setting, without being too far from our offices and the local businesses that we support. Since we moved to Blue Ridge Drive in 2019, we have taken many photos, videos, and even audio recordings of the wildlife that we encounter here. Provided in **Exhibit A-2** are photos of woodpeckers, hawks, a toad, and a butterfly, as well as audio and/or video footage of bats, owls, coyotes, and spring peepers. In addition to this evidence that we are able to provide, we can also attest to seeing foxes, deer, rabbits, opossums, skunks, squirrels, chipmunks, mice, other butterflies, and many other species of bids.

B. Visual Impacts

We agree with the concerns raised by Mega Pilla, Town of Manchester Principal Development Planner, in her written testimony, dated April 30, 2024, regarding visual impacts to neighboring properties (A.17, Item 5). We appreciate the Siting Council's direction to the Petitioner for a revision of the visual impact study.

C. Historic Value

The Blue Ridge Drive community was developed by U&R Housing Corp. in the late 1960's into the early 1970's, as shown on the Highland Estates Development Plan (**Exhibit B-1**). U&R, Housing Corp. was run by Ludis Upenieks and Ilmar Rupner, who had migrated to the United States from Latvia and Russia, respectively. Per Rupner's obituary: "Together, Ilmar and Ludis built custom homes with a broad appeal. Their unique designs were innovative and their quality craftsmanship became their signature trademark." (**Exhibit B-2**). Just last year, our home at 263 Blue Ridge Drive was recognized with a Preservation Award by the Cheney Brothers National Historic Landmark District Commission (**Exhibit B-3**).

On the Highland Estates Development Plan, the owner of what is now known as 250 Carter Street is listed as Case Brothers Inc. The Case Brothers, who ran a paper mill using water from Birch Mountain Brook, owned much of the land in the area. The Case Brothers-Highland Park Historic District is approximately 0.2 miles away from the 250 Carter Street property. A map of the Case Brothers-Highland Park Historic District is provided as **Exhibit B-4**.

D. Shenipsit Blue Blaze Hiking Trail

The Shenipsit Blue Blaze Trail connects 250 Carter Street with the Case Mountain trails, located within the Case Brothers-Highland Park Historic District. (Maps of the Shenipsit trail are provided as **Exhibit C-1**.) The *Connecticut Woodlands* magazine of the Connecticut Forest and Parks Association (CFPA) included an article titled "A Pioneer in Manchester: Lewis Morgan Porter (1903-1967) and the Shenipsit Trail" in their Spring 2008 edition (**Exhibit C-2**). Per the article, Porter had written letters in June 1947 regarding his progress with landowners on siting the Shenipsit Trail. "Porter had obtained permission to cross Case Brothers property '*from the heirs, Mrs. Robert Dennison and her sons, Wells and Robert… and have walked over the trails with Mr. Wells Dennison. They are very much interested in this work*'" (**Exhibit C-2**).

The Shenipsit Trail is part of a public trust that is enjoyed by people from across Connecticut, and beyond. Some of those individuals are participants of the Shenipsit Trail End-to-End Run that is hosted annually by the Shenipsit Striders. (Provided as **Exhibit C-3** are relevant pages from the Shenipsit Striders' website.) When it comes to walking our dog, Daisy, we enjoy taking her down the nearby portions of the Shenipsit trail. She especially likes the many smells of wildlife along the trail during our excursions.

III. Proposed Facility and Associated Equipment

A. Glare

Petition Narrative Section C: "The solar modules are designed to absorb incoming solar radiation and minimize reflectivity, so only a tiny percentage of incidental light will be reflected off the panels. This incidental light is significantly less reflective than standard building materials such as steel or a smooth water surface such as a pond or lake."

This comparison is disingenuous for several reasons. First, glare off water has been identified by the National Transportation Safety Board (NTSB) as a contributing factor to multiple aircraft crashes (**Exhibit D-1**). Secondly, the United States Federal Aviation Administration recognizes that light reflected off solar panels can be significant enough to impact air traffic control personnel, as noted in Administrative Notice List Item #18 *Review of Solar Energy System Projects on Federally-Obligated Airports, May 11, 2021:*

> "While solar PV or SHW systems (henceforth referred to as solar energy systems) are designed to absorb solar energy to maximize electrical energy production or the heating of water, in certain situations the glass surfaces of the solar energy systems can reflect sunlight and produce glint (a momentary flash of bright light) and glare (a continuous source of bright light). ***FAA has learned that glint and glare from solar energy systems could result in an ocular impact to airport traffic***

control tower (ATCT) personnel working in the tower cab, and compromise the safety of the air transportation system." (emphasis added).

B. Transformer Oil

Petitioner responses to Interrogatories from Council dated 4/23/2024, response 42, purports that "Mineral oil presents no danger to the environment and is biodegradable." On the contrary, the Safety Data Sheets (SDS) of several industry-standard transformer mineral oils include a variety of warnings about risks to wildlife and to the environment. These are summarized below. See **Exhibit E-1** for full SDS documents.

1. LC50 Toxicity Data for Sunoco Type II Transformer Oil indicates that a **0.5% concentration of the transformer oil in water will kill half of the fish exposed at that concentration. This test was conducted on oncorhynchus, a genus of fish including species of trout and salmon.**
2. Castrol 467552-BE02 Uninhibited Transformer Oil Safety Data Sheet, issued 04/07/2017, includes the following statements:
    - Mobility in soil: Spillages may penetrate the soil causing ground water contamination
    - Spills may form a film on water surfaces causing physical damage to organisms
    - Oxygen transfer could also be impaired
    - Persistence and degradability: Not expected to be rapidly degradable
3. D-A Cross Transformer Oil Safety Data Sheet, 09/09/2016, includes the following statements:
    - Acute and chronic aquatic toxicity
    - This product is not toxic to fish but may coat gill structures resulting in suffocation if spilled in shallow, running water
    - Product may be moderately toxic to amphibians by preventing dermal respiration
    - If applied to leaves, this product may kill grasses and small plants by interfering with transpiration and respiration
    - This product may cause gastrointestinal distress in birds and mammals through ingestion

IV. Public Safety

B. Local Traffic

We agree with the concerns raised by the written testimony of Rose Carroll, Vice Present and Secretary of Manchester Advocates for Responsible Solar Development (MARSD), dated April 25, 2024 (the eleventh concern raised, page 3) regarding traffic concerns on Carter Street. When walking along Carter Street to and from the Shenipsit Trail, we have to be on the lookout for cars so that we can quickly move off of the road. Visibility of oncoming traffic is low, due to the steep and winding qualities of the road. Carter Street is also curbed with no breakdown lane, and the areas bordering the roadway are vegetated, so it can be difficult to walk off the road for the entire stretch.

We face these same safety concerns related to visibility when biking down the hill or walking our bicycles back up the hill, as well as when we pull out of Blue Ridge Drive in one of our cars or on one of our bicycles or motorcycles. Knowing this, we have concerns that it would be difficult to see oncoming traffic when pulling out of the proposed access drive for 250 Carter Street. We have asked the Petitioner in our Interrogatories, dated April 18, 2024, if a sight distance analysis has been performed (Question No.

5). If the answer is no, then I urge the Siting Council to require the Petitioner to conduct a site distance analysis. If it is determined by the Petitioner that additional forest must be cleared for the sake an adequate site line out of the access drive, then that needs to be documented as part of the Petition.

Additionally, we have concerns regarding the use of large trucks in relation to the site that may need to pull up next to the site along Carter Street, but have no means to, thus blocking the roadway and presenting a dangerous situation.

A. Fire – Dana Schnabel

While the likelihood of a fire occurring at a photovoltaic energy generating facility is relatively low, the severity can be quite high. This site in particular exhibits a number of especially hazardous aspects. The close proximity of the proposed Site to a number of residences to the East increases the risk of fire extension to homes therefore threatening life and personal property. The nearby natural gas distribution pipeline to the West on the parcel would be another high risk in event of uncontrolled brush/forest fire. Locating the site in the middle of a forest creates a high risk of fire extension to forest, and would also cause significant access difficulties for firefighters.

A1. Access Difficulties

For an aerial (ladder) truck to set up on Carter Street for fire suppression activity, it would completely block any other fire apparatus from traveling between Amanda Drive and Blue Ridge Drive due to the narrow width of the road and the stabilizers (outriggers) required to operate the aerial. Additionally, the mximum water stream distance from a master stream on the end of a 105-foot aerial is 455 feet. The minimum distances from existing roadways to proposed solar panel array are as follows:

- 300ft from Carter st to Northeast corner,
- 400ft from Blue Ridge Dr to East side,
- 550ft from Blue Ridge Dr to Southeast corner,
- 600ft from Carter to Northwest corner,
- 880ft from Blue Ridge Dr to Southwest corner
- 950ft from Amanda Dr to Southwest corner

A2. Major Hazards

Per NFPA 850, Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Stations (2020 Edition), Subsection 14.4.1 Photovoltaic (PC) Power: "Major hazards associated with photovoltaic generating plants are as follows:

- Electrical fire associated with failed PV module connections or string cabling
- Hydraulic oil fires associated with the hydraulic oil systems used for multi-plane tracker positioning of the PV modules *(not applicable here)*
- Inverter, switchgear, and cable fires
- Transformer failure fires
- Wildland fire around arrays of PV module and strings."

While hydraulic oil fires are not a concern for the proposed Project, the remaining four items are.

A3. Wildland Fires

Per NFPA 840, Subsection 6.1.1.6: "Particular care should be practiced with respect to adequate spatial separation and protection from wildland fires as well as the control of vegetation." In my experience with managing brushfires in forested areas as a firefighter, they are incredibly labor-intensive to fight. This is due to both the lack of accessibility to most fire apparatus and to the limited water supply available in forested locations. Without an adequate, constant source of water, the response tends to be more-so defensive, where attention has to be focused on preventing the fire's spread.

A4. Water Supply

Per NFPA 840, Subsection 7.4.1.1: "Supply Mains, Yard mains, and outdoor fire hydrants should be installed on the plant site. Hydrant spacing in main plant areas should be a maximum of 300ft." The proposed Project does not include the construction of a fire hydrant at the site. The nearest fire hydrant is at the corner of Amanda Drive at elevation 514'. The proposed access road is approximately 2,000 feet from this hydrant. The Site elevation is approximately 644' at the corner nearest to the access road. Therefore, the hydrant water will need to be pumped up 130' of elevation through 2,000ft of large-diameter supply hose to get to the access road, then an additional ±350ft to a fire engine or portable master-stream device on the access road a safe distance from the fire. Given the calculations provided below, firefighters responding to a fire at 250 Carter Street would need pumpers that can compensate for the 244 psi of pressure loss just to get 1000 gallons per minute of water flowing uphill to the scene. By comparison, most fire hose nozzles are pumped at between 50psi-100psi depending on the type. The combined total amount of water carried by the staffed fire apparatus in Manchester is approximately 3500-4000 gallons. For comparison, the majority of fire tankers in Tolland County carry 3000 gallons each.

- $P_{loss}Elevation = H * 0.434 = 130 * 0.434 = 56.42psi$
- $P_{loss}Friction = CQ^2L = C * \left(\frac{Gpm}{100}\right)^2 * \frac{Length}{100} = 0.08 * \left(\frac{1000gpm}{100}\right)^2 * \left(\frac{2350ft}{100}\right)$
- $P_{loss}Friction = 188psi$
- $P_{loss}Total = 56psi + 188psi = 244psi$

A5. Air Pollution

In the event of a fire affecting the photovoltaic panels, the smoke generated by pyrolosis of the photovoltaic panels would be hazardous to nearby wildlife, residents, and emergency responders. Based on laboratory smoke gas analysis tests of similar solar panels, chemicals released in the smoke include arsenic, lead, cadmium, selenium, formaldehyde, carbon monoxide, and a significant amount of carbon dioxide (*Assessing Fire Risks in Photovoltaic Systems and Developing Safety Concepts*, June 2018). Three of the aforementioned chemicals are listed by NIOSH as Potential Carcinogens.

In under a 20-minute period, at the residences nearest to the proposed Project, the concentration of four of the aforementioned chemicals would likely exceed the Immediately Dangerous to Life or Health Concentrations (IDLH) recognized by NIOSH. Only trained personnel (i.e. structural firefighters) using self-contained breathing apparatus should be in such an IDLH environment. All of the approximately 100 residences within a one-quarter mile radius of the proposed Project Site would need to be evacuated

quickly. Spread of smoke is significantly dependent on weather conditions, and approximate modeling of smoke spread is far beyond the scope of this assessment. See **Exhibit F** for details on assumptions and estimations.

A6. Connecticut State Fire Safety Code

In order for the project plans to be reasonably complete, emergency access provisions must be ensured. It appears that several aspects of the current design may deviate from the 2022 Connecticut State Fire Safety Code.

1. Current plans for this project are based on a 12 ft wide gravel access drive.
    - CT Fire Safety Code D1.2.3.1.1: "Approved fire apparatus access roads shall be provided for every facility, building, or portion of a building hereafter constructed or relocated."
    - CT Fire Safety Code D1.2.3.5.1.1: "Fire apparatus access roads shall have an unobstructed width of not less than 20 ft (6.1 m)."
2. The proposed access road appears to be in excess of 500', yet there does not appear to be adequate provisions for fire apparatus to turn around.
    - CT Fire Safety Code D1.2.3.5.4 Dead: "Dead-end fire apparatus access roads in excess of 150 ft (46 m) in length shall be provided with approved provisions for the fire apparatus to turn around."
3. Based on the Property & Topographic Survey Map, the slope of Carter Street in the area of the planned access road has a slope of approximately 1 ft drop in less than 15 ft, which exceeds the specification:
    - CT Fire Safety Code D1.2.3.5.6.2: "The angle of approach and departure for any means of fire apparatus access road shall not exceed 1 ft drop in 20 ft (0.3 m drop in 6 m) or the design limitations of the fire apparatus of the fire department and shall be subject to approval by the AHJ."

While the Authority Having Jurisdiction (AHJ) has the ability to allow deviations to each of the aforementioned requirements, the Petitioner has requested to wait until after Siting Council approval before speaking with the Fire Marshall. Changes to the plan to accommodate any of these requirements would have the potential to increase the destruction of forest, the destruction/permanent disturbance of wetlands, or decrease the wetland setbacks. Therefore, it appears prudent for these items to be addressed prior to a decision by the Siting Council.

A7. Safety Certifications

Considering that inverter product defects are cited as one of the main causes of fires in photovoltaic energy generating systems (reference Exhibit F-2), it would seem prudent to select a product **certified** to meet relevant safety standards. Upon review of Petitioner's equipment list, manufacturer websites, and searches in the internet-based approval directories for each common certifying body, Solar Flexrack TDP

2.0 Turnkey Solar Tracker does not appear to have an active UL Listing, TUV Rheinland certification, nor Intertek ETL listing. In fact, no Solar Flexrack products, Qcells products, nor Northern States Metals appear in any of these directories. Perhaps they are purchasing electrical *components* that are certified, then integrating them into the structural assemblies, but even that would not be in the spirit of what the manufacturer portrays on their specification sheets and website.

Additionally, the Sungrow Power Inverter SG125HV does not appear to have a certificate issued by TÜV SÜD. No Sungrow inverters are ETL-listed. No Sungrow products appear to be UL-listed. The specification sheet for the SG125HV only denotes "compliance" with a variety of UL, CSA, IEC and other regulatory specifications (i.e. internally deemed compliant, not certified by an outside entity).

V. Environmental Effects and Mitigation Measures

A. Core Forest

We agree with the concerns raised by the following entities regarding the destruction of core forest:

1. Connecticut Council on Environmental Quality
    - Comments dated February 29, 2024 (Item 1)
2. Town of Manchester
    - Testimony of David Laiuppa, Environmental Planner, dated April 30, 2024 (A.12, Item 1)
    - Testimony of Megan Pilla, Principal Development Planner, dated April 30, 2024 (A.17, Item 1)
3. Manchester Advocates for Responsible Solar Development (MARSD)
    - Testimony of Rose Carroll, Vice President and Secretary, dated April 25, 2024 (first listed concern, page 1)

In addition to the proposed destruction of core forest, there is the potential for further destruction. As stated in **Section IV.B**, the Petitioner may determined that additional forest must be cleared for the sake an adequate site line out of the access drive. Additionally, during the cross examination of the Petition by the Siting Council on May 2, 2024, Solli Engineering stated: "Property owner has ability to further develop the rest of the property."

B. Protected Species

Petition Appendix B includes a letter from the United Station Department of the Interior Fish and Wildlife Service identifying the Northern Long-eared Bat as an endangered species that may occur within the boundary of the proposed project and/or may be affected by the proposed project. We have seen bats on our property many times. (Refer to **Exhibit A-2** for video evidence.) Given the local presence of bats, I agree with the recommendation made by David Laiuppa, Town of Manchester Environmental Planner, in his written testimony regarding the Northern Long-Eared Bat (A12, Item 2.b), dated April 30, 2024: "It is recommended that, in the absence of existing and current scientific data, there should, at a minimum, be acoustic detection surveys done on the site when there are identified suitable habitat elements."

Petition Appendix C includes a letter from CT DEEP identifying the Eastern Box Turtle as a species of special concern that has been documented in the vicinity of the proposed project area. Per the written

testimony and associated evidence of Rose Carroll, the Vice President and Secretary of MARSD, dated April 25, 2024, a turtle was found adjacent to the project site that appears to be the Eastern Box Turtle. (We do not have the credentials to make an official determination.) This evidence raises the concerns provided in the written testimony of David Laiuppa, Town of Manchester Environmental Planner, dated April 30, 2024 (A.12, Item 2.a) regarding the Eastern Box Turtle. Testimony regarding impact mitigation to the Eastern Box Turtle during construction is provided under **Section IV**, Facility Construction.

C. Cold Water Habitat – Rachel Schnabel, PE

Petition Exhibit G, Section 3.4.3 Wildlife, page 12 reads: "The offsite Birch Mountain Brook watercourse does contain a wild trout population; however, according to the CT DEEP Connecticut Trout Stocking Map, the watercourse is not stocked." This statement implies that Birch Mountain Brook is a cold-water habitat with native brook trout. The following sentence in the same paragraph reads: "The on-site watercourses are considered cold-water watercourses. Likewise, the nearby Birch Mountain Brook is also within the same cold-water drainage basin…" The cold-water drainage basin referenced in this statement is depicted in CT DEEP's Cold Water Stream Habitat Map, which is an interactive map. I generated a map of 250 Carter Street through this interactive map, which is included as **Exhibit G-1**. This cold-water drainage basin includes Birch Mountain Brook and its tributaries. The presence of brook trout in Birch Mountain Brook is documented in CT DEEP's Stream Flow Classifications interactive map. I generated a map of 250 Carter Street through this interactive map, which is provided as **Exhibit G-2**.

CT DEEP's General Permit for the Discharge of Stormwater and Dewater Wastewater from Construction Activities (Administration Notice Item No. 40), Section 3(15) Cold Water Stream Habitat states: "Unless otherwise authorized in writing by the Commissioner, ***a Permittee shall maintain a one-hundred (100) foot buffer of undisturbed soil and well-established vegetation between any construction activity and any stream, river, or tributary that is included within a Cold Water Stream Habitat*** as defined at: https://portal.ct.gov/DEEP/Water/Inland-Water-Monitoring/ColdWater-Stream-Habitat-Map." (emphasis added). It is important to note that, while the link provided in this quote is no longer valid, the referenced map is currently provided through the web link included in the Administrative Notice List, dated April 11, 2024, Item No. 50: https://ctdeepwatermonitoring.github.io/ColdWaterHab/. Additionally, a map generated from this website for 250 Carter Street is provided as **Exhibit G-1**, as previously stated.

CT DEEP's Modifications Regarding Activities within Cold Water Stream Habitats Fact Sheet (**Exhibit G-3**) regarding the General Permit for the Discharge of Stormwater and Dewater Wastewater from Construction Activities states:

> "Under the general permit effective December 31, 2020, construction projects within a Cold Water Stream Habitat as defined in the general permit, must maintain a one-hundred (100) foot undisturbed buffer between any construction activity and any stream, river, or tributary included within the habitat. This buffer must consist of undisturbed soil and well-established existing vegetation and must be verified post-construction. ***Permittees that are unable to comply with these conditions may not utilize the general permit but must instead obtain coverage under an individual NPDES discharge permit.***" (emphasis added).

Given that the proposed Project is located within the Cold Water Stream Habitat of the Birch Mountain Brook watershed, and given that the proposed Project includes both direct disturbance to site wetlands

and the 100-foot wetland buffer, the proposed Project is not eligible for coverage under the General Permit for the Discharge of Stormwater and Dewater Wastewater from Construction Activities and, therefore, cannot claim exemptions from said permit for the proposed disturbances.

D. Hydrological Impacts – Rachel Schnabel, PE

I have a number of concerns related to the proposed changes to site hydrology. I have asked the Petitioner in our Interrogatories, dated April 18, 2024, for all soil and groundwater records from site field investigations (Question No. 24). Having not received a response, I can only testify on the information that is available to me.

The slow infiltration rate of the site soils, as well the presence of wetlands, indicate of a lack of available storage in the soils to support the infiltration of a greater volume of stormwater runoff than existing conditions. Under existing conditions, there are drainage issues at the properties directly down-gradient of the proposed Project, as is referenced in the following testimony and associated exhibits of local residents:

1. Manchester Advocates for Responsible Solar Development (MARSD)
    - Testimony of Rose Carroll, Vice President and Secretary, dated April 25, 2024 (seventh listed concern, page 1)
2. Raymond Welnicki
    - Testimony – Stormwater and Groundwater, dated April 25, 2024 (Existing Conditions Section)

I agree within the concerns raised by the following entities regarding the concern of hydrological impacts that could result from the proposed Project:

1. Written testimony of David Lauippa, Town of Manchester Environmental Planner (A.12, Items 3.a and 3.b)
2. Written testimony of Megan Pilla, Town of Manchester Principal Development Planner (A.17, Item 7), dated April 30, 2024.

The Petitioner has focused on the change in stormwater runoff produced purely based on runoff curve numbers. This is concerning for two reasons. My first concern is that these values are based on land cover type, which is only relevant to the site ***after vegetation has been established***. It could take over a year or more for that to occur. My second concern is that the Petitioner has overlooked the effects on how a change in land use type will alter the vegetative uptake of water from the site, which is thoroughly discussed in the written testimony of Megan Pilla (dated April 30, 2024).

Another hydrological concern of mine is that the proposed Project would redirect the site stormwater runoff into one point of discharge. The natural movement of stormwater runoff is by sheet flow, perpendicular to the ground surface contours, until it either infiltrates into the ground or discharges into a wetland or water body. The proposed Project would intercept all of the stormwater runoff from the developed portion of the site via swales and discharge the stormwater into the stormwater pond. The stormwater would then exit the stormwater pond through the outlet control structure and potentially the emergency spillway, as well. The discharge is directed into one of the site wetlands. ***This would increase***

the volume of stormwater runoff entering that wetland when compared to existing conditions. Such changes in volume of water received by the wetland could change its hydrology and may impact the down-gradient properties, which is further discussed in the written testimony of David Laiuppa (dated April 25, 2024). The property of Raymond Welnicki, 121 Amanda Drive, is directly down-gradient of the wetland, as is his neighbor to the south, 141 Amanda Drive.

E. Noise Pollution

Per CT DEEP's "Noise Pollution Control" webpage (https://portal.ct.gov/deep/air/planning/noise-control): "The policy of the state is to promote an environment free from noise to the extent that it jeopardizes the health and welfare ***of the citizens*** of the State of Connecticut." (emphasis added). Even if the proposed Project meets state and local noise requirements, we are concerned that such requirements do not account for the potential affects to wildlife and domestic animals. Additionally, we are concerned that such requirements do not account for people with auditory sensitivities, as pointed out by the Testimony of Megan Pilla, Town of Manchester Principal Development Planner (April 30, 2024 – A.17, Item 5).

"Neurobehavioral Alternations from Noise Exposure in Animals: A Systematic Review" was published on December 29, 2022 in the International Journal of Environmental Research and Public Health (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9819367/). Provided, below, are quotes that highlight some of the many reported effects of noise pollution on animals that were uncovered by this systematic review:

- "Laboratory studies and field research have identified four main ways in which animals are adversely affected by noise pollution: (i) hearing loss, with noise levels of 85 Decibel or higher; (ii) masking, such as the inability to hear important environmental and animal signals; (iii) increased heart rate and breathing; and (iv) behavioral effects… This may lead to territory abandonment and loss of reproduction." (pg. 2)
- "In particular, within the behavioral sphere, substantially, there were three aspects that came to light, namely, alterations in movements, in foraging and in reproduction." (pg. 15)
- "In mammals, hearing loss can lead to a reorganization of the auditory cortex (AI) tonotopic map. Some researchers have highlighted a profound reorganization of this map in AI caused by acoustic trauma of about 30 dB and frequencies above 10 kHz in young cats." (pg. 16)

Given the findings of this systematic review, we are concerned that siting the proposed Project in a core forest and so close to residences could harm the local ecosystem and neighboring community.

VI. Facility Construction – Rachel Schnabel, PE

A. Eastern Box Turtles

As discussed in **Section V.B**, there is reason to believe that the Eastern Box Turtle could be present on the project site. In my professional experience of providing training to field staff, just because training is provided does not mean that the staff are (1) paying attention, (2) comprehending the information, and (3) going to remember or care enough to execute what was learned. The primary responsibility of the general

contractor is to construct the facility. Being vigilant of the presence and/or potential presence of the Eastern Box Turtle at the project site is a secondary responsibility. The level of seriousness to which such a responsibility is taken will differ from person to person. There is no way to ensure that the general contractor perfectly executes the training provided, which increases the risk of harm to the Eastern Box Turtle during construction activities.

VII. Environmental Effects and Mitigation Measures

Petition Exhibit A – Notices filed by the Petitioner: The list of abutters contacted by the Petitioner included the previous owners of 78 Blue Ridge Drive and excluded the "new" owners, despite the sale of the property occurring more than one year prior to the date of the mailing.

E&N Maderazo	78 Blue Ridge Drive Manchester, CT 06040	155/ 560/ 78	23 Perennial Border Ct Las Vegas, NV 89148
Anthony Addesso	61 Amanda Drive Manchester, CT 06040	154/ 105/ 61	61 Amanda Drive Manchester, CT 06040
Richard & Anna McNamara	180 Blue Ridge Drive Manchester, CT 06040	154/ 560/ 180	118 Dunes Edge Road Jupiter, FL 33477

CERTIFICATION

I hereby certify that Notices of the Siting Council Petition were mailed via certified U.S. mail, return receipt requested, to the abutters listed above on November 5, 2023.

Town of Manchester Property Card:

Owner of Record

Owner	BIRD JORDAN M BIRD GABRIELLE	**Sale Price**	$550,000
		Certificate	
Address	78 BLUE RIDGE DRIVE MANCHESTER, CT 06040	**Book & Page**	4699/844
		Sale Date	09/22/2022
		Instrument	25

VIII. Certification of Testimony

We hereby verify that this testimony was prepared by us and is believed to be true and accurate to the best of our knowledge.

Rachel Schnabel, PE

Dana Schnabel

CERTIFICATE OF SERVICE

I hereby certify that on May 7, 2024, a copy of the foregoing document was electronically mailed to the Service List dated April 25, 2024.

Rachel Schnabel, P.E.

Dana Schnabel