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May 7, 2024

VIA ELECTRONIC MAIL

Attorney 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. **Additional Pre-Filed Testimony – Part Three**

Dear Executive Director Bachman:

I hereby electronically submit Additional Pre-Filed Testimony – Part Three regarding Petion No. 1609. This testimony relates to the revised Stormwater Management Report submitted by the Petitioner to the CSC dated April 23, 2024. I am delivering 15 paper copies today.

I certify that I am including on the distribution of this emailed submission all the parties on the Service List shown on the Siting Council's website as of today.

Respectfully,

Raymond Welnicki

cc: cc John F. Sullivan, Attorney for Town of Manchester, Raymond Welnicki, Rachel and Dana Schnabel, Rosemary Carroll (on behalf of MARSD), Attorneys for the Petitioner: Paul R. Michaud, Bernadette Antaki, Dylan J. Gillis

PRE-FILED TESTIMONY, PART THREE

STORMWATER AND GROUNDWATER ISSUES BASED ON PETITIONER'S REVISED STORMWATER MANAGEMENT REPORT FILED 4/23/2024.

SUBMITTED BY PARTY RAYMOND WELNICKI, May 7, 2024

INTRODUCTION

Q. Please state your name, residence address and length of time residing there.

A. My name is Raymond Welnicki and I reside with my wife Elaine at 121 Amanda Drive, Manchester, CT. We have lived there since 2012.

Q. What is your connection to this Petition?

A. My property abuts 250 Carter St. in Manchester and I have been approved as a Party to this Petition.

Q. What is your professional background?

A. I am a Member of the American Academy of Actuaries and a past Fellow of the Society of Actuaries. While I am not testifying in my professional role as an actuary, I represent that my actuarial training and experience provides me with substantial and credible proficiency in evaluating risk in a wide variety of applications. This includes assessing factors that lead to reasonable conclusions regarding the potential for certain situations, events and conditions to occur or arise and the potential for them to produce significant adverse consequences.

Q. What is the purpose of your pre-filed testimony?

A. The purpose of this testimony is to provide additional information as to why the Petion No. 1609 should not be approved.

PROJECT SPECIFIC TESTIMONY

Q. What concerns do you have about stormwater and groundwater resulting from the proposed development?

A. I think it is clear that the proposed development will exacerbate existing stormwater and groundwater issues experienced along Amanda Drive which lies downslope of the proposed development.

Q. Are there any groundwater issues that should be considered with respect to this Petition?

A. Yes. In my filing with the CSC of "Additional Pre-Filed Testimony, Part Two, 04/25/24", I described the existing groundwater issues at properties along Amanda Drive, including my property. That testimony was based on the Petition filed on January 24, 2024 and did not specifically reflect changes made by the Petitioner in its filing on April 23, 2024. The original Petition proposed an infiltration basin rather than the currently proposed stormwater basin. While the current proposal may result in less concentrated stormwater infiltration than the original proposal, the concerns I expressed remain. By concentrating stormwater across a large drainage field (now 10.488 acres rather than 7.547 acres), any infiltration of concentrated stormwater within the currently proposed stormwater basin into the groundwater below the basin will exfiltrate downslope including on the properties directly below that basin. My property at 121 Amanda Drive is one of those properties. As such, I would expect an increase in groundwater exfiltrating at the bottom of the hill very close to my house which may overwhelm the installed French drain and lead to ponding on my lawn and water entering into my basement.

Q. Please describe the existing stormwater issues experienced along Amanda Drive.

A. Each time it rains more than a threshold amount, flooding begins to occur at several points along Amanda Drive. Based on my observed experiences over the last 10+ years, I would estimate that this threshold amount to begin a flooding process is a rain event of more than one inch in a 12-hour period or more than 1.5 inches in a 24-hour period.

Q. What do you mean by a "flooding process"?

A. When this flooding threshold is reached, stormwater runoff begins to pond on certain surfaces on some of the properties along the east side of Amanda Drive, downslope of the proposed development. These properties include 101 Amanda Drive, 121 Amanda Drive,

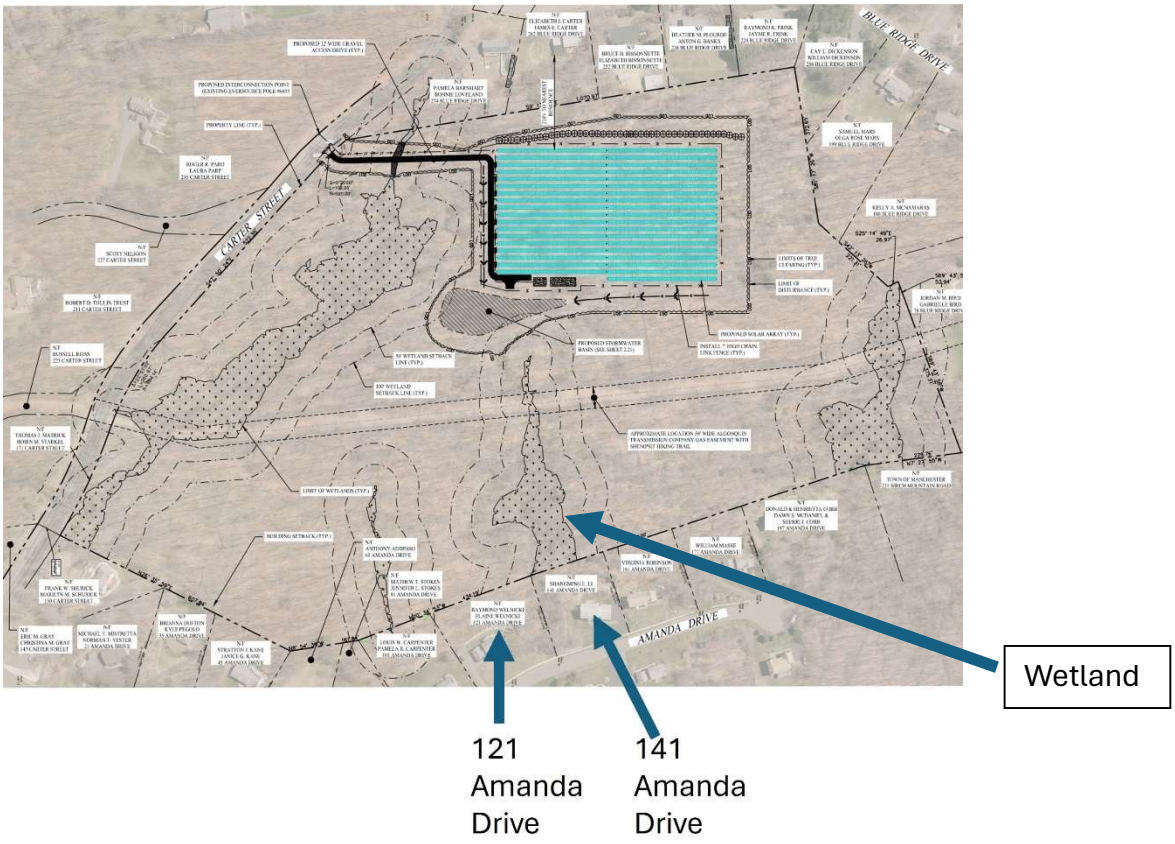
141 Amanda Drive and 161 Amanda Drive. As the intensity and duration of the rain event and the amount of precipitation increases, the flooding progresses to a larger area of ponding. At some locations (e.g., 121 Amanda Drive and 161 Amanda Drive), larger storms cause the ponding to spill over onto the sidewalk and then over the curb and onto Amanda Drive itself.

Q. Do you know where this stormwater runoff comes from?

A. I will restrict my answer to the properties that I have been able to observe directly during rainstorms: 121 Amanda Drive and 141 Amanda Drive. Based on these direct observations, it is apparent to me that the stormwater runoff onto these two properties is sourced primarily from the wetlands directly upslope of those properties. This wetland is shown on the map below which is taken from the Stormwater Management Report filed with the Petion on January 24, 2024 (my notations added).

During a rainstorm in December 2023, I followed two courses of runoff on the south side of my property and followed them uphill a short way. I could see several courses of runoff water flowing from the southeastern border area of my property and running downslope. As I looked south, I could also see one flow of runoff flowing from upslope onto the northerly portion of 141 Amanda Drive. This appeared to be the same areas of stormwater runoff that I observed during a rainstorm about 5 years ago.

From those observations and the map below, I conclude that the stormwater runoff is sourced primarily from the wetlands.



Q. Do you have any photographs of the stormwater runoff flow on your property?

A. Yes. Here is a picture of stormwater runoff on the south side of my property taken on December 18, 2023:

Q. With respect to the above picture, how much rain fell in Manchester on December 18, 2023?

A. I don't know how much rain fell at Manchester but 2.86 inches of rain fell in Hartford according to How Much? New England Rain Totals and Highest Winds December 18, 2023 (newenglandstormcenter.com). This is less than the 2-year storm event of 3.16 inches.

Q. Why do you think the proposed development will exacerbate the flooding on the Amanda Drive properties?

A. The Revised Stormwater Management Report submitted by the Petitioner on April 23 would divert stormwater runoff from a 10.448-acre drainage area to a stormwater basin and from there in the direction of the wetland immediately downslope of the proposed development. This is the wetland depicted earlier that lies upslope of 121 Amanda Drive and 141 Amanda Drive. I believe that the amount of stormwater runoff directed into that wetland under this proposal would be a multiple of the amount of stormwater runoff that currently reaches that wetland. This will send a much greater flow of stormwater than under existing conditions downslope and onto 121 Amanda Drive and 141 Amanda Drive.

Q. What is the basis for this contention?

A. Very simply put, the proposed stormwater management plan would increase the effective size of the drainage field flowing into the wetlands compared to existing conditions. Consider:

1. The drainage area for the proposed stormwater basin is labeled PDA-1A in the stormwater management plan.

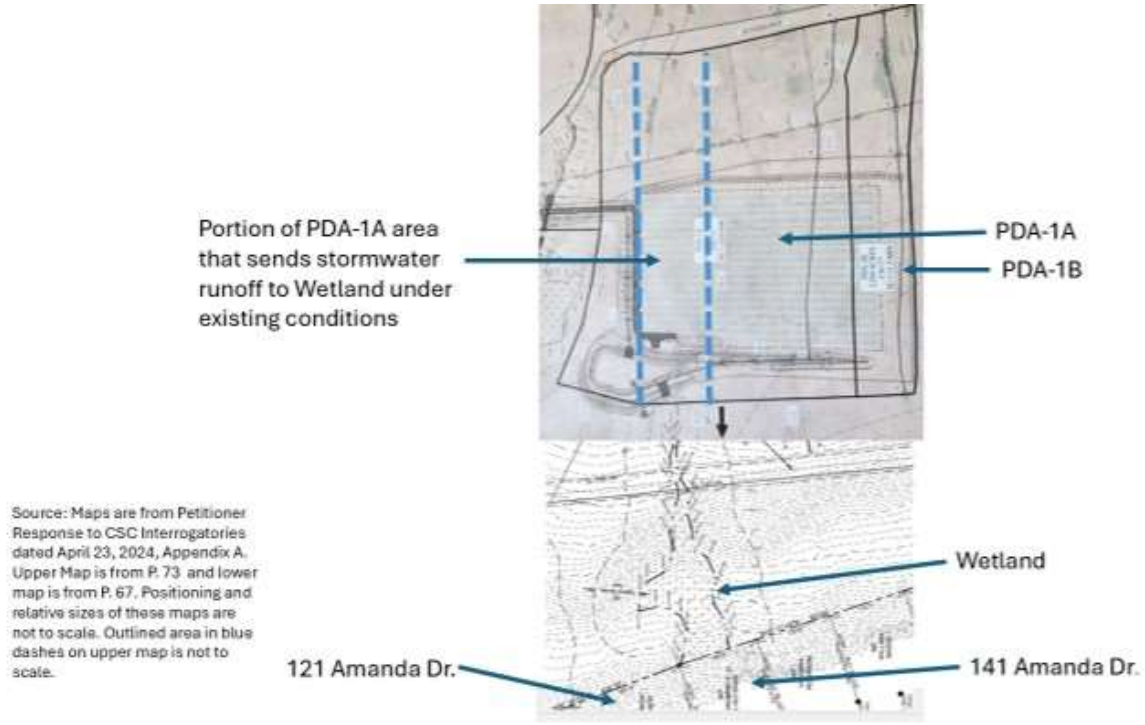
2. That drainage area is 10.448 acres. While not a perfect rectangle, scale measurements that I took from the mapped site exhibits suggest that the drainage area PDA-1A is approximately 588 feet from north to south and approximately 773 feet from east to west. (Note that a rectangle of 588 feet by 773 feet would equal 10.434 acres which is almost identical to the actual PDA-1A area of 10.448 acres.)

3. The widest north-south width of the wetlands in question appears to be between 170 and 190 feet. For conservatism, let's use 190 feet.

4. Under existing conditions, the portion of the area PDA-1A that could be said to send stormwater runoff to the wetland is a rectangle running the same east-west distance as

PDA-1A and running approximately 190 feet north to south – i.e., the approximate north south width of the wetland in question.

5. So one could reasonably assume that the existing conditions "drainage area" within the PDA-1A area for the wetland is approximately a 190-feet-wide slice (running north-south) of the PDA-1A area. This is represented on the following diagram (NOTE: this is a representation and is not drawn precisely to scale):



6. Since the approximate north-south width of PDA -1A is 588 feet, the existing conditions stormwater runoff area for the wetland is approximately 190 ÷ 588 or 32% of the drainage area PDA-1A. This means that the existing conditions drainage area within PDA-1A for the wetland in question is approximately 32% of 10.448 acres, or approximately 3.34 acres.

7. Accordingly, it appears that the PDA-1A drainage area is approximately 3.13 times larger than the wetland's existing conditions drainage area within the PDA-1A area. Thus, unless there are other factors to consider, one could assume that the proposed development

would discharge approximately 3 times the amount of stormwater runoff to the wetland in question than under existing conditions.

8. One factor that could slightly reduce the 3 to 1 ratio is that the stormwater management plan calculations appear to assume that less than 100% of the inflow to the stormwater basin winds up as outflow towards the wetlands. But this is only significant for a 2-year storm event where the assumption appears to be that the basin outflow is about 90% of the inflow. For other storm events the assumption appears to be that the basin outflow is 95% or more of the inflow volume.

9. Another factor to consider is whether the amount of runoff across PDA-1A under existing conditions is less than post-development conditions because of the loss of trees, compaction of soil from construction activities and the introduction of some impervious surfaces. While I believe these factors would serve to increase the 3 to 1 ratio, for simplicity I will assume that these factors would offset any differences discussed in (8) above. I believe this is a conservative tradeoff.

10. Therefore, I believe it is likely that the proposed development will generally triple the amount of stormwater runoff to the wetland in question during and shortly after large storms. That runoff would then flow towards and onto the properties at 121 and 141 Amanda Drive.

Q. What would be the likely effect of increasing the amount of stormwater runoff entering the wetland below the proposed stormwater basin?

A. Most of the stormwater runoff entering the wetland when it is fully saturated (such as after a previous rain event or in seasonal wet periods) will flow downslope onto the properties at 121 Amanda Drive and 141 Amanda Drive. These properties already experience flooding after even moderate rainstorms let alone large rain events. By discharging potentially 3 or more times the existing volumes of runoff into the wetlands after a storm event, the proposed development would significantly exacerbate existing flooding conditions and adversely effect those properties.

Q. Do you have any idea how much additional volume of stormwater runoff could be involved?

A. I can only estimate this based on the stormwater basin outflows modeled by Solli Engineering and provided in the Revised Stormwater Management Report. Those outflows are as follows:

		Outflow from PDA-1A Basin		
	Inches of Rain	Acre-Feet	Cu. Feet	Gallons
Relativity to 1 Acre Foot			43,560	325,851
2-Year Storm Event	3.16	0.923	40,206	300,760
10-Year Storm Event	4.91	2.111	91,955	687,871
25-Year Storm Event	6	2.922	127,282	952,137
50-Year Storm Event	6.81	3.545	154,420	1,155,142
100 Year Storm Event	7.69	4.238	184,607	1,380,957

Those outflow volumes are discharged downslope towards the wetland. Let's assume that a percentage of those volumes reach the wetlands, with the balance infiltrating into the soil prior to reaching the wetland. Let's assume that percentage increases from 60% in a 2-year storm event and rises linearly to 80% in a 100-year storm event. Let's also assume that the additional discharge towards the wetland is 2/3 of the total outflow given the 3 to 1 ratio we estimated earlier. From this we can estimate the approximate additional volume of water that will flow into the wetland as a result of the proposed development. Those results are as follows:

	Outflow from Basin			Additional Discharge into Wetland	
	(cubic feet)	(gallons)	% Reaching Wetland	(cubic feet)	(gallons)
	A	B	C	D = A x C x 2/3	E = B x C x 2/3
2-Year Storm Event	40,206	300,760	60%	16,082	120,304
10-Year Storm Event	91,955	687,871	65%	39,487	298,078
25-Year Storm Event	127,282	952,137	70%	59,398	444,330
50-Year Storm Event	154,420	1,155,142	75%	77,210	577,571
100 Year Storm Event	184,607	1,380,957	80%	98,457	736,510

Thus, the additional volume of stormwater runoff flowing into the wetland is quite substantial as shown in the last two columns of the above table.

Q. What would be the likely consequences to the properties at 121 and 141 Amanda Drive of those volumes of additional runoff flowing into the wetland?

A. Much of those volumes of runoff will flow onto the properties at 121 and 141 Amanda Drive and would likely have these adverse consequences:

- Erosion of soil on those properties given the significant slope that exists below the wetland (estimated average of 20%).
- Creation of gullies that will channel stormwater more rapidly and forcefully with each succeeding large storm.
- Damage to landscaping and plantings that homeowners at 121 and 141 Amanda Drive have invested in.

- Significant expansion of flooding at the base of the hill behind the houses at 121 and 141 Amanda Drive.
- Potential for stormwater to directly or through infiltration to enter the basements of the properties at 121 and 141 Amanda Drive.
- Ponding of water lasting for days or weeks, particularly with repeat rainstorms, creating a breeding ground for mosquitos that could potentially carry West Nile virus, Eastern Equine Encephalitis virus and other mosquito borne diseases.
- Property owner diminution of enjoyment of their properties.
- Imposition of mental stress and anxiety on the property owners when large rainstorms are forecast. At times, this may also cause the homeowners to not take trips or vacations or to cut those journeys short when large storms are forecast in order to be present to protect their properties from damage or to mitigate those damages.
- The need for property owners to secure flood insurance which they currently do not need to carry.
- As a measure of the substantial nature of these effects and not as an adverse effect in itself, the above effects will undoubtedly result in a significant loss in home value. (My understanding is that the loss of home value may not be considered as an adverse environmental effect but may be used as a measure of the substantial consequences of other adverse environmental effects.)

Q. Would there be any adverse effects to the wetland itself?

A. I am not an ecologist and cannot answer this from personal expertise. However, in a report contrasting constructed wetlands vs. natural wetlands, the EPA has stated: "Planners should distinguish between using a constructed wetland for stormwater management and diverting stormwater into a natural wetland. They should avoid the latter: altering the hydrology of a natural wetland can in turn alter and, in many cases, degrade the existing system. In most cases, local regulations also prohibit this practice. In all circumstances, communities should protect natural wetlands from the adverse effects of development, including impacts from increased stormwater discharge. This is especially important because natural wetlands provide stormwater and flood control benefits on a regional scale." (source: https://www.epa.gov/system/files/documents/2021-11/bmp-stormwater-wetland.pdf, excerpt attached as Exhibit A.)

Q. Based on the above, do you believe that the Petitioner has met its burden of proof that the proposed project will not cause substantial adverse environmental effects?

A. The Petitioner has failed to meet its burden of proof. To the contrary, the proposed development is likely to cause substantial adverse environmental effects to the proximate wetland and to abutting downslope properties. The probability that this is the case if the designed stormwater management plan works as intended is high. The risk is increased when one considers the potential for design errors (especially in light of no field verification of the modeled results), construction errors and unpredictable events including those that are made more likely as a result of climate change. An example of the latter is Connecticut having experienced two hurricanes within a week in August 1955.

It is clear that the proposed development creates an environmental hazard in a residential area that creates substantial risk of adverse consequences to a proximate wetland and to properties abutting the development.

May 7, 2024

Stormwater Best Management Practice

Stormwater Wetland

Minimum Measure: Post Construction Stormwater Management in New Development and Redevelopment
Subcategory: Retention/Detention

EXHIBIT A

Description

Stormwater wetlands (or constructed wetlands) are structural post-construction stormwater controls similar to wet ponds (see the Wet Ponds fact sheet) whose design incorporates shallow zones and vegetation. As stormwater flows through the wetland, it removes pollutants through settling and biological uptake. Wetlands are among the most effective post-construction stormwater controls in terms of pollutant removal and also offer aesthetic and habitat value. Stormwater wetlands are fundamentally different from natural wetland systems. Engineers design them specifically to treat stormwater, and they typically have less biodiversity than natural wetlands in terms of both plant and animal life. Several variations of stormwater wetlands exist, differing in relative amounts of dry, shallow and deep water zones.

Planners should distinguish between using a constructed wetland for stormwater management and diverting stormwater into a natural wetland. They should avoid the latter: altering the hydrology of a natural wetland can in turn alter and, in many cases, degrade the existing system. In most cases, local regulations also prohibit this practice. In all circumstances, communities should protect natural wetlands from the adverse effects of development, including impacts from increased stormwater discharge. This is especially important because natural wetlands provide stormwater and flood control benefits on a regional scale.

Applicability

Constructed wetlands are widely applicable. They can have limited applicability in highly urbanized settings and arid climates, but they have few other restrictions.

Regional Applicability

Most regions of the United States can apply stormwater wetlands, except those with arid climates. In arid and semiarid climates, it is difficult to design stormwater controls with permanent pools. Stormwater wetlands are shallow, so large portions of them are subject to evaporation. This makes maintaining the permanent pool in wetlands more challenging than maintaining the pool of a wet pond (see the Wet Ponds fact sheet).

Stormwater wetlands provide a reduction in stormwater pollutants as well as provide wildlife habitat.

Urban Areas

It is difficult to use stormwater wetlands in urban environments because of the large continuous land area they require. However, they can work in an urban environment if a relatively large area is available downstream of a site.

Stormwater Hot Spots

Stormwater hot spots are areas where certain land uses or related activities generate highly contaminated stormwater, with higher-than-usual pollutant concentrations. Typical examples include gas stations and industrial areas. Wetlands can accept stormwater discharge from hot spots—but, if they do, they need significant separation from groundwater. If designers use these practices to develop wildlife habitat, they should be careful to ensure that pollutants in stormwater discharge do not enter the food chain for organisms living in or near the wetland.

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