Petition No. 1222 Interrogatories Set Three May 25, 2016 Windham Solar LLC (WS) Responses June 24, 2016

43. Is the Overall Site Plan provided in the responses to set one and two interrogatories dated April 28, 2016 the most up to date? If no, please provide an updated Overall Site Plan. If approved, does Windham Solar LLC (WS) plan to construct all of the project initially, or would portions of the solar farm and access drives be reserved for the future? In other words, if approved, would WS submit one Development and Management Plan (D&M Plan) for the entire project as proposed on the Overall Site Plan? Explain. The most recent site plan is attached, it includes an updated site plan which responds to Town and Interconnection related comments and design elements. The site plan also incorporates

and Interconnection related comments and design elements. The site plan also incorpora additional filed survey of rocks, walls and abutting property fencing. - Exhibit A

- 44. The letter from the Connecticut Department of Energy and Environmental Protection (DEEP) dated January 26, 2016 stated that no impacts to State-listed species are expected. This letter expires on January 26, 2017. If approved, in the event that construction does not commence prior to January 26, 2017, would WS apply for an updated DEEP determination? Yes, a DEEP determination will be updated if construction does not commence by the expiration date.
- 45. Referencing the response to question 20 of the first set of interrogatories, provide the status of the biologist review of the site with respect to federally-listed species, including but not limited to the northern long-eared bat, piping plover, sandplain gerardia, and small whorled pogonia. Provide a copy of the biologist's report including the presence and/or suitable habitat at the site for federally-listed species, and any recommended protective measures for such species.

See attached documentation from E3 Environmental, LLC – Exhibit B

- 46. What is the status of the Eversource System Impact Study? To WS' knowledge, can the local electrical distribution system support the 8 MW AC solar output of the project? Would utilities be run underground from the interver/transformer area until close to Fisk Road and then run overhead on three new poles to connect to new service on Fisk Road? WS made an initial interconnection request of 3MW which has been approved, and an additional request to a total of 8.5MW (5.5MW additional) is still be investigated for total interconnection upgrade capacity and associated costs. At this time projects 1-5 are the current intent of site construction unless interconnection capacity requires a smaller sized system.
- 47. Provide a final stormwater management report for the most up to date Overall Site Plan, consistent with the 2004 Connecticut Stormwater Quality Manual and stamped by a Professional Engineer duly licensed in the State of Connecticut.
 A final stormwater management report will be prepared for the first phase of construction and

A final stormwater management report will be prepared for the first phase of construction and the associated footprint. It will be issued within the construction documents which have yet to be prepared.

- 48. Provide the determination letter from the State Historic Preservation Office (SHPO) and indicate how SHPO's recommendations, if applicable, could be implemented. SHPO Letter is attached Exhibit C. WS is soliciting proposals for an archaeological Phase 1 survey and will forward the initial report when completed.
- 49. Provide the final erosion and sedimentation control (E&S controls) plan for the most up to date Overall Site Plan consistent with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

A final erosion and sediment control document, stormwater pollution prevention plan ("SWPPP") and an application to CTDEEP for a construction general permit will be made for the project prior to groundbreaking. A preliminary grading, erosion and sediment control plan has been prepared for the first phase of construction and the revised footprint and is attached - Exhibit D.

- 50. While an approximately 100-foot wetland buffer was provided in most areas, what is the closest (i.e. shortest) wetland buffer distance on the Overall Site Plan? In other words, what is the closest distance from a solar panel to a wetland boundary and where is it located? All major wetland buffer encroachment dimensions are identified on the site plan Exhibit A.
- 51. Provide a diagram to scale with the vernal pool analysis showing the shape and locations of the vernal pools and the 100-foot vernal pool envelopes (VPE) and the 100-foot to 750-foot critical terrestrial habitat (CTH) along with the proposed project. Compare the existing percent development areas of the VPEs and CTHs to the post-construction percent development areas of the VPEs and CTHs. Attached please find Docket No. 455 sample diagram.

A vernal pool diagram has been prepared. – Exhibit E.

52. Page 5 of the Wetland Report dated April 27, 2016 notes that the first breeding area in the vernal pool habitat assessment is rated as Tier I. However, the Vernal Pool Assessment Sheet refers to it as Tier III in the Cumulative Assessment. Please clarify whether it is Tier I or Tier III.

An updated wetland report is attached. – Exhibit F.

- 53. Has WS evaluated the cost differential between 2-inch chain link mesh and a smaller size (e.g. less than two-inch mesh)? What size mesh would be used for the 7-foot tall chain link fence? At the field review, WS indicated that it might reduce or possibly eliminate the fencing. If no fencing or less fencing is proposed, indicate as such and update the Site Plan accordingly. WS would prefer to install a 2-inch chain link mesh fence. A 1" mesh nearly doubles the cost of material fencing and there is little added value given our other on site security measures.
- 54. Provide WS' response to the Town of Hampton Planning and Zoning Commission (Town) comments dated April 28, 2016 including but not limited to the following:
 - a) Would WS coordinate with the Town to minimize impact to stonewalls and major trees along the affected segment of Fisk Road?

The revised site plan identifies exposed rock areas and stone walls. Also additional survey data was gathered at Fisk Road, to identify additional fencing to the north. The revised site plan minimizes impacts to the stone wall and the entrance alignment off of Fisk Road has been revised for minimal impacts. – Exhibit A.

- b) Would WS preserve stonewalls, whether boundary walls or interior walls, to the greatest extent possible? Yes. Both boundary and interior walls are minimally impacted. – Exhibit A.
- c) If approved, would WS also provide a copy of the D&M Plan to the Town? Yes. WS will work with the Town on finalizing the D&M Plan.
- d) Has WS evaluated the need to surround the entire perimeter of the site with fencing and would it utilize the minimum fencing needed for safety and security? Could the fencing be raised approximately six inches above grade to accommodate the passage of wildlife?
 Raising the fence 6" is acceptable. A 2" chain link is still proposed, however WS is open to installing 6x6 or 4x4 square knotted fence, as we have installed this type of fencing on other projects in the Northeast.
- e) Could a copy of these interrogatory responses be provided to the Town including the stormwater management and erosion and sedimentation control plans?
 Yes.
- f) Provide an invasive species management plan.
 An invasive species management plan can be prepared as part of the projects O&M document, and will be provided to the Town for review.
- g) Could A horizon soil remain at the site? No soil export from the site is expected, regardless of the type.
- h) Could spruce or other appropriate evergreen species be added to the buffer along Fisk Road on its west side, on the subject property? If yes, note such plantings on the Overall Site Plan and provide the approximate height of such plantings.
 Approximately 200 American Arbovitae are proposed along the north site of project and are illustrated in the updated site plan.
- 55. Provide WS' response to the Town of Hampton Inland Wetlands and Watercourses Agency written comments received on May 5, 2016 including but limited to the following:
 - a) Address the disturbance of soil beginning with the removal and grubbing of all vegetation five inches and less in diameter in the context of the DEEP General Permit for the Discharge and Dewatering Wastewaters Associated with Construction Activities. Would all detention basins and erosion and sedimentation control measures be in place prior to the grubbing and tree removal phase? Explain and provide such plans.

Project phasing will be identified in the projects final construction documents and will be addressed in detail in the project's stormwater pollution prevention plan ("SWPPP") and the submission to CTDEEP for the Construction General Permit. The town of Hampton will be able to review this document.

- b) With the tree removal creating exposed "open soil" and channelization of the site, would intermediary erosion and sedimentation control measures be implemented as logging occurs? Provide such plans. Has WS considered the use of a log forwarder machine to reduce the open soil and channelization impacts? How would WS protect water resources down gradient of the entire development (including wetlands) during the grubbing and tree removal phase? Provide such plans.
 Erosion control phasing will be identified in the projects final construction documents. At this time, WS has not explored the construction methodology for the projects tree clearing. Erosion control methods will be adjusted to
- c) Would the project have a third party certified/qualified inspector at the site during construction? Provide the name and resume of such individual. Yes. WS will outline the inspection requirements in the projects final SWPPP.
- d) Explain how the environmental impacts associated with the disturbance of 35 acres of soils on steep slopes above wetlands would be mitigated. Mitigation will consist of project phasing, stormwater detention/retention and overall proper site design and will be outlined in the projects civil construction documents and SWPPP.
- 56. Does the proposed host property contain any Connecticut Prime and Important Farmland Soils? If so, what acreage of Prime and Important Farmland Soils would the solar panels and associated equipment be located on? Attached is an exhibit illustrating the soil types and their associated farmland designations, and % impacts. – Exhibit G.

adhere to the requirements.

57. Has the State of Connecticut Department of Agriculture purchased any development rights for the proposed site as part of the State Program for the Preservation of Agricultural Land? WS owns all development rights on the parcel.





EXHIBIT B

Endangered Species Review and Analysis

ECOS Energy, LLC Fisk Solar Garden Windham County, Connecticut

ECOS Energy, LLC (ECOS) has proposed the development of a renewable energy facility designed to gather solar energy to be located at 1-72 Fisk Street, Windham County, Connecticut. The proposed facility would install photovoltaic panels to collect solar energy for distribution. ECOS has contracted E3 Environmental, LLC (E3) to conduct a review of the project and assess the potential impacts to species that are afforded protection under the Endangered Species Act of 1973 (ESA; 16 U.S.C. § 1531 et seq.) which is administered by the US Fish and Wildlife Service (FWS).

The FWS maintains various databases with entries for every species listed under the ESA. This information is accessible to the general public and provides detailed species information such as species specific life cycles, habitat requirements, current and historical recorded occurrences. This information is provided by the FWS as a service to the general public for informational purposes and to professionals for project planning. The Environmental Conservation Online System provided by the FWS offers the Information for Planning and Conservation (IPaC) web based service which is a project planning tool designed to streamline the FWS environmental review process. On June 23, 2016, E3 accessed the IPaC system to evaluate potential occurrences of ESA listed species within the proposed project area; the results were analyzed with respect to potential impacts to ESA listed species with the potential to occur within the project area.

IPaC Results – ESA Listed Species:

- Northern long-eared bat (Myotis septentrionalis)
 - o ESA Status: Threatened

The northern long-eared bat (NLEB) was the only species identified by the IPaC consultation conducted for this project. This species has an expansive range which encompasses all of New England. Scientist have observed a measurable decline in this species' population throughout its range and have attributed the loss in population primarily due to the white-nose syndrome. The FWS has determined that the most effective conservation measure to protect this species throughout its range will be through restrictions of tree clearing activities. As of February 16, 2016 the Final 4(d) Rule for the northern long-Eared bat went into effect which states the following management measures:

- Tree clearing at any time of the year within a 0.25 mile radius of known NLEB is prohibited; and
- Tree clearing within 150-foot radius of known occupied maternity roost trees during the pup season (June 1 through July 31) is prohibited.



E3 has reviewed FWS published data with respect to the locations of known NLEB hibernacula in Connecticut and confirmed that there is no known NLEB hibernacula recorded in Windham or surrounding counties. Provided tree clearing is suspended during the pup rearing season (June 1 through July 31) the proposed project would not result in adverse impacts to this species.

Other ESA Species Reported to Occur in Windham County:

- Sandplain gerardia (Agalinis acuta)
 - o ESA Status: Endangered

The sandplain gerardia is a plant species that is known to favor the coastal plains. The project, due to its distance from the coast, will not result in a negative impact to this species. ESA protection is not granted to plants for activities on private land that are not federally funded.

- Small whorled pogonia (Isotria medeoloides)
 - o ESA Status: Threatened

The small whorled pogonia is an extremely rare forest orchid. This plant species favors acidic soils under the canopy of deciduous or mixed deciduous – coniferous forests. Due to the lack of preferred habitat and based upon previous consultation with state agency, the proposed project will not have adverse impacts on this species. ESA protection is not granted to plants for activities on private land that are not federally funded.



Department of Economic and Community Development



EXHIBIT C

June 23, 2016

Mr. Christopher Little Ecos Energy 222 South Ninth Street, Suite 1600 Minneapolis, MN 55402

> Subject: Solar Farm Development 0 Fisk Road Hampton, Connecticut

Dear Mr. Little:

The State Historic Preservation Office (SHPO) has reviewed your request for information concerning the potential effects to historic properties associated with the referenced project. SHPO understands that the proposed solar voltaic facility will entail the construction of ground mounted solar arrays and ancillary facilities (e.g. access road) within an area encompassing approximately 65 acres. The proposed activities are under the jurisdiction of the Connecticut Siting Council and are subject to review by this office pursuant to the Connecticut Environmental Policy Act (CEPA).

Although no properties listed on the National Register of Historic Places have been documented within or immediately adjacent to the project parcels, numerous archeological sites have been recorded in the region surrounding the project site. The project area is situated on well-drained soils surrounded by unnamed wetlands. This type of environmental setting tends to be associated with pre-contact Native American settlement. We are therefore requesting that a professional cultural resources assessment and reconnaissance survey be completed prior to construction. SHPO acknowledges that portions of the property have been subjected to substantial prior ground disturbances. Not all areas of the proposed solar field are archeologically sensitive, but it is SHPO's opinion that intact and relatively well-drained soils within portions of the Area of Potential Effect have an elevated potential to contain significant archeological resources. Subsurface testing should assess all areas of anticipated ground disturbance that are considered to have a moderate/high sensitivity for containing significant archeological deposits, unless sufficient research or fieldwork documents that this level of effort is unwarranted. All work should be in compliance with our Environmental Review Primer for Connecticut's Archaeological Resources and no construction or other project-related ground disturbance should be initiated until SHPO has had an opportunity to review and comment upon the requested survey. A list of qualified consultants is attached for your convenience.

This office appreciates the opportunity to review and comment upon this project. These comments are provided in accordance with the Connecticut Environmental Policy Act. For additional information, please contact me at (860) 256-2764 or catherine.labadia@ct.gov.

Sincerely,

Catherine Labadia Deputy State Historic Preservation Officer

State Historic Preservation Office One Constitution Plaza | Hartford, CT 06103 | P: 860.256.2800 | Cultureandtourism.org An Affirmative Action/Equal Opportunity Employer An Equal Opportunity Lender



Designed:	ADC		
Checked:	SAW		
Drawn: S			
Record Drawing by/date:			
Revisions: # DATE	DESCRIPTION		
- 3/15/2016	CT SITING BOARD SUBMISSION		
- 4/21/2016	CT SITING BOARD SITE VISIT REVISIONS		
- 6/21/2016	CT SITING BOARD IR3 REVISIONS		

EROSION CONTROL

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Revi #	sions: DATE	DESCRIPTION	
-	3/15/2016	CT SITING BOARD SUBMISSION	
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-	6/21/2016	CT SITING BOARD IR3 REVISIONS	

EROSION CONTROL

EXHIBIT F

HIGHLAND SOILS LLC

WETLAND REPORT

FISK ROAD SOLAR HARTFORD TURNPIKE & FISK ROAD HAMPTON, CONNECTICUT

PREPARED FOR ECOS ENERGY, LLC

BY JOHN P. IANNI PROFESSIONAL SOIL SCIENTIST

APRIL 27, 2016

REVISED JUNE 10, 2016

P.O Box 337, Storrs, CT 06268 · 860-742-5868 · Highlandsoils@aol.com

INTRODUCTION

The subject property is located on the south side of Hartford Turnpike, CT Route 6, and west of Fisk Road in Hampton, CT. The property is currently wooded and lies within two watersheds. The majority of the property is within the watershed of Merrick Brook which lies to the east of the site. The remainder of the site drains to the northeast toward the Cedar Swamp Brook. Both brook systems are within the Shetucket River regional drainage basin.

The inland wetland delineation on the subject property was completed on September 2, 2015. The wetlands were field delineated in accordance with the standards of the National Cooperative Soil Survey and the definition of wetlands as found in the Connecticut General Statutes, Chapter 440, Section 22A-38. I have reviewed the prepared plans have found the representation of the field delineated wetlands to be substantially correct.

Additionally, the wetland boundaries also conform to the jurisdictional wetlands definition (Federal or Army Corps wetlands) as based on:

Environmental Laboratory. 1987. "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Additional field data was collected on March 23 and April 13, 2016.

EXISTING CONDITIONS

The site contains just less than one hundred acres and is currently wooded. Three wetland areas were mapped on the site with the largest wetland area located in the southern and southwestern portion of the site. A small area of wetland extends onto the property in the southeastern corner of the site. Both of these systems drain toward Merrick Brook.

The third wetland system is located in the northeastern portion of the site and this system is in the Cedar Swamp Brook watershed. As stated earlier, all of the land is within the Shetucket River Region Basin.

The upland areas on the site extend from a high point along Fisk Road. The land slopes to the east, south and west toward the wetlands. The uplands are wooded with mixed hardwood species. The eastern half of the site was logged recently, and most of the mature species of oak were removed. The previous timber removal operation did not remove or reduce the slash, and tree tops and the material is scattered throughout the site.

The upland areas are fairly typical of the area with an even-age mature forest consisting of mainly Oak, Hickory and Maple. The understory in the unlogged areas is open and contains saplings of the fore mentioned species. The composition of the forest changes as the soils transition from well-drained and moderately well-drained soils over a friable glacial till to the wetlands. The dominant soil types in the uplands are the well-drained Charlton and Chatfield Series, with smaller areas of the shallow to bedrock Hollis Series and the moderately welldrained Sudbury Series also present.

WETLAND RESOURCES

Three wetland areas were noted on the property and are identified based on the relative location on the property.

SOUTHEASTERN WETLAND

This is the smallest area of on-site wetlands and is in the southeastern corner of the property. The wetland continues off-site and drains into Merrick Brook. The wetland contains poorly drained soils of the Leicester series that grade to very poorly drained soils of the Whitman Series. The wetland is wooded with Red maple and Grey birch in the canopy. The understory is strikingly thick with Highbush blueberry, Sweet pepperbush and Winterberry as the dominant shrub species. The shrub layer is extremely dense and Cinnamon fern, Skunk cabbage and Sphagnum moss comprise the dominant species in the herbaceous layer.

In the interior of the on-site wetland, the soils are saturated to the ground surface but little to no surface water was present. Surface flow is very diffuse and no defined surface water flow patterns were discernible.

NORTHEASTERN WETLAND

This wetland system is larger and lies along the northeastern property line. At the time the wetland delineation was conducted the property line was not apparent. Upon completion of the boundary survey the property line was identified and areas of upland soils were noted, but not delineated. The area of upland is approximately one to two acres in size, is irregularly shaped, and appears to be within one hundred feet of the wetlands.

This system is also wooded with Red maple, and Grey birch is the dominant species in the canopy. Highbush blueberry and Sweet pepperbush are the dominant shrub species. The wetland contains poorly drained soils of the Leicester Series and very poorly drained soils of the Whitman Series. Both soils overlay a friable and coarse glacial till.

The interior of the wetland is saturated to the ground surface and the surface flow within the wetland is diffuse until nearer the property lines where more defined flow occurs. The wetland outlets in two locations, one outlet is to the north near Fisk Road and the other outlet is along the southern limits of the wetland. The southern outlet shows signs of channelization of the surface flow from human activity. This wetland drains to the north and east across Fisk Road and into the Cedar Swamp Brook watershed.

SOUTH-SOUTHWESTERN WETLAND

This is the largest of the three on-site wetland systems and contains the most diversity in vegetation and functions and values. The system contains three fingers that extend westerly,

northerly and easterly from the main body of the wetlands. The main body of the wetland consists of an area of very poorly drained organic soils located at the deflection point in the southerly boundary line and where the three fingers of wetlands converge. This area of wetlands is permanently saturated and contains organic soils to a depth of over four feet. The canopy is open and the shrub layer is very thick. Red maple is the dominant tree species, but forms a very open canopy. Red elm saplings were noted and the shrub layer is dominated by Highbush blueberry and Sweet pepperbush. The ground surface contains many hummocks, which the trees and shrubs have colonized, and Cinnamon fern and Skunk cabbage were also present. Sphagnum moss dominates the ground cover in this portion of the wetland system.

Defined water course channels enter the main body of the wetland from the three fingers; however, the flow in the main body of the wetlands is diffuse and poorly defined. Small areas of shallow surface water are located throughout this portion of the wetland, and well defined surface flow paths could be distinguished.

The westerly finger of this wetland system extends towards Route 6. Nearest Route 6 the area is dominated by pole-sized Red maples with Highbush blueberry in the understory. This area appears to have been cleared in the not too distant past. A stone wall separates the upper part of the wetland finger from the remaining system and the soils get increasingly wetter as the finger transitions to the main body of the wetland. The vegetative community also changes with the canopy becoming sparser as the soils get wetter and the understory gets increasingly thicker with Sweet pepperbush being more dominant. Surface flow becomes less well defined and the soils start to transition from mineral to organic. Winterberry and Highbush blueberry become the dominant shrub species in the wetter areas where the organic soils are more prevalent.

The northerly finger of this wetland complex also extends out from the main wetland body. This finger of wetlands extends uphill toward the intersection of Fisk Road and Route 6 in a more northerly direction. This wooded wetland is dominated by Red maple and Grey birch and transitions to a pole-sized stand of young Red maple at its terminus. The surface flow is diffuse in the upper reaches of the wetland and becomes better defined as the topographic gradient increases. A defined water course channel flows through the wetland until the transition into the organic soils in the main wetland body. The vegetation also transitions and the transitions coincide with changes in hydrology.

The largest finger extends southerly from the main wetland body and parallels the property line. This wooded wetland contains a Red maple, Grey birch canopy and the understory contains Japanese barberry, which was noticeably absent in most of the other wetlands. Most of this portion of the wetland has been impacted by the previous logging operation, with some removal of trees along the perimeter and quite a bit of slash left within the wetlands. There is enough of a topographic gradient in the wetland finger to produce minor channelized flow, however, the soils are seasonally saturated and a fluctuating water table does not support long duration saturation of the soil surface. The accumulated slash from the logging operation has resulted in the formation of micro pools of shallow standing water where surface flows have been temporarily blocked.

The surface of the wetland is stony and there are areas where diffuse surface flows dominate. The poorly drained soils of the Leicester Series dominate the finger until the transition to the organic soils.

VERNAL POOL HABITAT

A field survey was conducted on March 23, 2016. The temperatures ranged from 45 degrees F. to 60 degrees F. Mostly cloudy skies gave way to mostly sunny by late afternoon. All wetland and upland areas were surveyed for breeding amphibians.

A second field survey was conducted on April 13, 2016. Temperatures ranged from 50 degrees F. to 60 degrees F. and skies were sunny.

No isolated Vernal Pools were noted on the property. However, breeding amphibians were noted within two areas of the wetlands and the likelihood of an additional breeding area occurs just off-site.

It should be noted that Vernal Pool Assessments (Assessment Sheets attached) were conducted in accordance with the methodology contained in the following publication, hereafter referred to as the BDP (Best Development Practices):

> Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

The first breeding area was encountered in the northern finger of wetlands that are part of the large wetland complex described in the South-Southwestern Wetland section of this report. Ten Spotted Salamander egg masses were noted thirty feet east of wetland flag #151. A large tree was blown down and a small pool of standing water has accumulated where the root ball of the downed tree has created a small depression. The water was one foot or less in depth and the total area of standing water was within a ten-foot circle. This breeding area is rated as Tier III according to the methodology. The hydrology of the breeding site appears to be marginal for life cycle completion and further study will be conducted.

The second breeding area was noted in the eastern finger of this same wetland complex. At wetland flag #75 a small pool of surface water has formed due to the blockage of surface water from slash that was left in the wetland from a previous logging operation. The surface flow has been partially blocked and a small area of surface water approximately 20 feet by 50 feet and up to twelve inches deep has formed. In this area three Wood Frog and one Spotted Salamander egg masses were found. Again, the hydrology appears marginal, as this may be a temporary condition due to the accumulated slash. Surface flow through the breeding area was noticed, so the location of the egg masses was a bit of a surprise. The area will be monitored further into the season. This breeding area is ranked as Tier I according to the methodology.

The main body of the South-Southwestern wetland contains numerous pools of shallow standing water. Due to the thickness and complexity of the wetland it was not possible to visually search the entire area. Breeding activity cannot be ruled out in this portion of the wetland.

WETLAND FUNCTIONS

The functions and values of the wetlands will be described in a qualitative manner modeled after the method used by the US Army Corps of Engineers. The information is from *The Highway Methodology Workbook Supplement*. This publication uses a descriptive approach to assessing functional values, versus the CT D.E.P. approach, which uses a quantitative or numerical approach to ranking wetland functions and values.

<u>Ground Water Recharge/Discharge</u> - This function considers the potential for a wetland to serve as a ground water recharge and/or discharge area. It refers to the fundamental interaction between wetlands and aquifers, regardless of the size or importance of either.

The wetland systems are underlain by glacial till, although not hardpan, the wetlands are not associated with stratified drift (sand and gravel). Seepage zones were apparent adjacent to all of the wetland systems and shallow ground water flows appear to be the main source of water for the wetlands. The on-site wetlands are discharge wetlands with recharge of shallow ground water and the maintenance of base flows also being present. This is a principle function of the on-site wetlands.

<u>Floodflow Alteration</u> - This function considers the effectiveness of the wetland in reducing flood damage by water retention for prolonged periods following precipitation events and the gradual release of flood waters. It adds to the stability of the wetland ecological system or its buffering characteristics and provides social or economic value relative to erosion and/or flood prone areas.

The on-site wetlands are at the upper portion of the individual watersheds and generally have diffuse surface flows except where topographic gradients allow for concentrated surface flows. Although not associated with constricted outlets, the presence of very poorly drained and/or organic soils within the wetlands allows for the accumulation of surface water for short periods. The wetlands are not associated with floodplains but the well-drained soils in the adjacent uplands contribute steady ground water flows to the wetlands. The most active area for this function occurs in areas where the topography is flat and the organic soils have developed. This function is well represented in the wetlands, but is not a principal function.

<u>Fish and Shellfish Habitat</u> - This function considers the effectiveness of seasonal or permanent watercourses associated with wetland in question for fish and shellfish habitat.

The on-site wetlands are not associated with a water course that is capable of supporting fish or shellfish habitat. This function is not present on-site.

<u>Sediment/Toxicant/Pathogen Retention</u> - This function reduces or prevents degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants or pathogens in runoff water from surrounding uplands, or upstream eroding wetland areas.

The watershed of the on-site wetlands is mainly wooded and no signs of significant erosion were present. Route 6 is a potential sediment source and accumulations of road sand were noted near the headwaters for the wetland. The presence of deep organic soils in the South-Southwestern wetland produce diffuse flows capable of sediment retention. Flat topography and diffuse surface flows indicate this function is present in the wetlands, but with the lack of sediment and/or toxicant sources this function is underutilized. This function is present and is a principle function for the on-site wetlands.

<u>Nutrient Removal/Retention/Transformation</u> - This function considers the effectiveness of the wetland as a trap for nutrients in runoff water from surrounding uplands or contiguous wetlands, and the ability of the wetlands to process these nutrients into other forms or trophic levels. One aspect of this function is to prevent ill effects of nutrients entering aquifers or surface waters such as ponds, lakes, streams, rivers or estuaries.

The presence of sediment trapping functions and fine grained and organic soils are positive indicators for this function. Diffuse flows in much of wetlands also add to the ability of the wetlands to perform this function. The lack of deep water habitat limits the ability of the wetlands to perform the function and the lack of sources of excess nutrients also limit the ability of the wetlands to perform this function. The presence of thick woody vegetation and organic soils are positive qualifiers. Overall, this function is present in the on-site wetlands and is a principle function.

<u>Production Export</u> - This function relates to the effectiveness of the wetland to produce food or usable products for human, or other living organisms.

Portions of the wetlands are capable of producing large quantities of organic matter, however, flushing of the wetlands generally does not occur and the diffuse flows and presence of high organic matter soils indicates attenuation of organic matter. The wetlands lack diversity of cover but the density of cover is good. Overall this function is present but is not a principle function.

<u>Sediment/Shoreline Stabilization</u> - This function evaluates the effectiveness of a wetland to stabilize stream banks and shorelines against erosion.

The on-site wetlands are not associated with a shoreline or stretch of open water. The wetlands are all wooded with seasonal or intermittent water courses, or flat topography and organic soils, which promote sheet flow. This function is not present in the wetlands.

<u>Wildlife Habitat</u> - This function considers the effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and wetland edges. Both resident and/or migrating species are considered.

The wetlands have many positive indicators for this function including the dominant wetland type (wooded swamp), the lack of development near the wetlands, good water quality, high abundance of vegetation and connectivity to other wetlands. They generally lack: species diversity and the presence of marsh habitat, flowering plants and open water habitat. The subject property is contiguous with large tracts of undeveloped land and wildlife utilization of the property is typical for wooded habitat. For this to be a principle function the methodology indicates that greater diversity in plant species and cover types, along with deeper water habitats should be available. This function is present but it is not a principle function.

<u>Recreation</u> – (Consumptive and Non-Consumptive) This value considers the suitability of the wetland and associated watercourses to provide recreational opportunities such as hiking, canoeing, boating, fishing, hunting and other active or passive recreational activities.

This function is centered on water-based recreation such as fishing, canoeing and other activities. The property is not suitable for water-based recreation and consumptive values such as hunting are limited by private property rights. The lack of water-based recreational opportunities limits this value to passive recreation. This is not a primary value.

<u>Educational/Scientific Value</u> - This function considers the suitability of the wetland as an "outdoor classroom" or for scientific research.

The wetlands generally are a single cover class (wooded) that limits the potential for educational study. There are no good access points near the wetlands and there are no ponds or perennial water courses. The access to the property is controlled and the wetlands are typical for the area. The wetlands are not high quality wildlife habitat and viewing locations into the wetlands are limited. Overall, few positive qualifiers are present for this value.

<u>Uniqueness/Heritage</u> - This value considers the effectiveness of the wetland for special values such as archeological sites, rare and endangered species habitat or uniqueness for its location.

The on-site wetlands exhibit few of the qualifiers for this value. The wooded wetlands are very typical for the area and lack a perennial water course, open water or low growing vegetation. The absence of large flowering plants and wildlife habitat reduce the potential for this value. This value is not present on the site. <u>Visual Qualities/Aesthetics</u> - This value relates to the visual qualities of the wetlands.

The wetlands are within a large tract of relatively undisturbed land and do not show signs of pollution. However, the fact that the wetlands are a single cover class reduces the importance for this value. There are multiple viewing locations that afford relatively unobstructed views to the wetlands; however, the views are not present into the wetlands due to thick vegetation along the edges.

<u>Endangered Species Habitat</u> – This value considers the suitability of the wetland to support threatened or endangered species.

A letter has been issued for the project from the Connecticut Department of Energy and Environmental Protection. The letter indicated no adverse impacts from the project.

WETLAND IMPACTS

The project has been designed to avoid all direct wetland impacts. The 100-foot upland review area is to remain mostly intact with only minor clearing and no grading occurring. The perimeter fencing generally follows the URA and in many areas is well away from the wetlands and review area.

The two areas where breeding amphibians were found are well protected with no activity proposed near the Spotted Salamander breeding area near wetland flag #151 and no activity within the 100-foot envelope of the second breeding area near flag #75.

Additionally, all of the access roads are well away from the wetlands and upland review areas and no indirect wetland impacts are anticipated.

