

**STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL**

**Petition of BNE Energy Inc. for a
Declaratory Ruling for the Location,
Construction and Operation of a 4.8 MW
Wind Renewable Generating Project on
Winsted-Norfolk Road in Colebrook,
Connecticut (“Wind Colebrook North”)**

Petition No. 984

November 28, 2011

**REPORT OF WILLIAM F. CARBONI
REGARDING BNE’S D&M PLAN**

I. Background and Summary

1. My name is William Carboni. I work at Spath-Bjorklund Associates. I was retained by Reid and Riege, PC on behalf of on behalf of FairwindCT, Inc., Susan Wagner and Michael and Stella Somers to assess the plans and reports submitted by BNE Energy Inc. (“BNE”) regarding stormwater discharge, erosion and sediment control and provide testimony on those subjects. I earned a B.S. in civil engineering from Worcester Polytechnic Institute in 1967 and have worked as a civil engineer with several firms and state agencies since 1967. I am a licensed professional engineer in Connecticut and California. My qualifications and experience are outlined in more detail in my pre-filed testimony contained in the record of this docket.

2. During the hearings held in this matter, I submitted pre-filed testimony about BNE’s failure to submit plans that complied with Connecticut state guidelines with regards to erosion and sedimentation, the Connecticut General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities, site engineering with regards to drainage and grading, and Standards of Good Practice for this type of site development.

3. I have now reviewed the plans submitted by BNE during the “D&M” phase. This report discusses my conclusions, but in sum, the new plans still do not comply with State of Connecticut water quality and erosion guidelines.

4. In my opinion, the D&M plans are not ready for approval. My most significant finding is that BNE has not provided sufficient information regarding its planned infrastructure improvements, which involve reconstructing a portion of Rock Hall Road, including a portion that crosses Mill Brook. The wetlands impact of rebuilding the road and likely replacing the culvert that is located at the crossing will be significant, and BNE has provided no analysis of that work.

II. The Infrastructure Improvement Report Is Insufficient

5. BNE submitted a one and half page “Report on Need for Town Infrastructure Improvements” that states that “[s]ome temporary widening at this intersection [of Rock Hall Road and Route 44] will be required . . .” and that a 1500 linear foot section of Rock Hall Road “will need to be rebuilt in order to accommodate the anticipated construction traffic.” (Infrastructure Report, Sept. 2011, at 1.) The anticipated rebuilding of Rock Hall Road may have significant impacts on the wetlands calculations submitted by BNE.

6. The Infrastructure Improvements Report does not address the culvert or bridge that carries Mill Brook under Rock Hall Road. The report does not identify the type of structure that conveys Mill Brook, or the condition of that structure. A structural evaluation of the culvert/bridge needs to be conducted.

7. The Infrastructure Improvements Report acknowledges that “[t]he physical condition of Rock Hall Road is in poor condition with severe cracking and pavement failure” It is logical to assume that the culvert or bridge is in the same poor condition.

8. The report states that “[t]he horizontal and vertical geometry of Rock Hall Road itself is relatively gentle in nature and will not require any modifications in order to accept the transport vehicles.” (Infrastructure Report, Sept. 2011, at 1.) However, the report does not provide a profile of the road. Therefore, BNE has not provided information demonstrating that there is sufficient cover to provide the 2.83-foot road structural section without modifying the vertical geometry. As shown on Sheet A-2 of the report, the road will be rebuilt with 24" compacted gravel base, 6" processed gravel and 4" of asphalt. This is the depth of the road necessary to carry the loads that will be applied by the transportation vehicles. If the existing road grade over the culvert/bridge structure does not allow the installation of the structural section, then the road grade will have to be increased. This will result in extending the road banks into the wetlands surrounding Mill Brook.

9. If the culvert/bridge does not have the structural integrity to carry the anticipated truck loads, the culvert/bridge may have to be replaced or reinforced. This will require a significant amount of work to be done in the stream channel of Mill Brook.

10. The area tributary to this road crossing is more than 1,100 acres. A detailed hydraulic analysis is necessary to evaluate the existing flow through the culvert/bridge. If any improvements are required for the culvert/bridge, the study should insure that the hydraulic grades of the stream are not modified. A modification of the hydraulic grade of Mill Brook will require additional DEEP permits. BNE should be required to conduct a more thorough investigation of the crossing structure before being permitted to begin construction.

III. BNE's Plans and Reports Are Still Inadequate

11. The new plans and reports submitted by BNE still contain some of the same inadequacies that were present in the earlier versions of the plans and discussed in my pre-filed testimony.

12. For example, BNE has not provided a certification for the basis of the mapping used to prepare the plans. Since BNE is asking that the plans be considered as construction documents, a Licensed Surveyor should certify that the base mapping meets A-2 and T-2 standards.

13. The GZA GeoEnvironmental plans for the foundation design are marked "Not for Construction" – yet BNE is asking that they be approved for construction. These "Not for Construction" plans are also the basis for BNE's proposed grading around the towers. They will also be used to design any necessary dewatering facilities for construction. If these plans are to be considered the structural plans for the towers, they should show the reinforcing bars in the concrete, how the tower will be attached to the foundation and other structural details. BNE should provide a report showing the adequacy of the design for bearing capacity, structural strength, overturning calculations, wind resistance analysis and other design criteria.

14. There are several errors in the Detention Study. The watershed boundaries are not accurately depicted in the studies. In particular, the area tributary to Temporary Sediment Trap ("TST") 3 and Stormwater Pond 1 is underestimated. These facilities are in the same location and should have the same tributary area. The only boundary map provided is for the Detention Study. (See Drainage Area Map D-100, included in Appendix D of the Stormwater Management Plan.) In Appendix K of the Stormwater Management Plan, the Detention Study shows the area

tributary to Pond 1 as 5.70 acres. In Appendix C of the Erosion and Sediment Control Plan, the area tributary to Temporary Sediment Trap 3 is 4.85 acres. A tributary area of 5.70 acres requires use of a Temporary Sediment Basin instead of a Temporary Sediment Trap. The criteria for sediment basins are more rigorous than those for a sediment trap.

15. Attached to this report is Figure 1, which shows the area tributary to TST 3 and Pond 1. According to my analysis, the tributary area is approximately 10.9 acres. The underestimation of the tributary areas also has significant consequences for the design of the detention pond. As currently calculated in the study, the maximum elevation in the pond is 1269.40 during a 100-year storm. The spillway elevation is 1269.25. The top of the berm is 1270.0. As currently configured, the spillway will be carrying about 1 cfs during a 100-year storm and the pond does not provide one-foot of freeboard. Section 5-9 of the 2002 Guidelines requires a minimum of one foot of freeboard between the 100-year routed water surface and the top of the embankment. If the actual tributary area to the pond is about 11 acres, rather than the 5.7 acres used in the study, the pond will fail.

16. On Sheet C-501 of the construction plans, the elevation of the spillway for Pond 2 is called out as 1242.54. However, the Detention Study included in Appendix K of the Stormwater Management Plan uses an elevation of 1243.0 in the calculations. If the spillway is constructed according to the plans, Pond 2 will allow more flow from the pond. This will result in the peak flow during the proposed conditions exceeding the pre-construction conditions.

17. Another error in the Detention Study is in the outlet calculations for Detention Pond 2. The Detention Study included in Appendix K of the Stormwater Management Plan shows that there are four outlets from the pond. There are two orifices and an overflow inlet in

the outlet control structure. There are a five-inch and a six-inch orifice and the top of the structure will act as a weir. The fourth outlet from the pond is the spillway, which is not part of the outlet control structure. There is also a 15-inch RCP outlet from the structure that takes the flow from the structure to a riprap pad. The calculations of the outflow from the basin are based on free outfall from the orifices. However, this is not the case. The 15-inch pipe will cause a backwater in the structure and the lowest orifice will not have a free outfall. For example, the computer model shows that the lowest orifice will allow 0.97 cfs to exit the pond when the elevation is 1242.4. However, the 15-inch pipe will cause a backwater that will entirely submerge the orifice. By time the water elevation is 1244.0, the 15-inch outlet pipe does not have the capacity to carry the entire flow used in the computer model. This results in the pond being undersized. Since the water will not flow from the pond at the rate assumed in the study, the water will be stored to a greater depth. This may cause the pond to overtop in larger storms or, at a minimum, more water will be released through the spillway than indicated in the Stormwater Management Plan. This may result in the peak flow during the proposed conditions exceeding the pre-construction conditions.

18. There are no details for the construction of the detention ponds. It appears from Sheets C-501 and C-502 that the embankments that create the ponds have 2:1 side slopes with a 5-foot top width. This does not conform to the 2002 Guidelines. Section 5-9 of the Guidelines requires that the combined side slopes of the embankment shall not be less than 5:1 and also requires that the top width be 8 feet. For Stormwater Pond 2, this would increase the base width to the embankment by 9.5 feet, which means that the top of the slope would encroach into the wetlands.

19. BNE has testified that the Wind Colebrook North project will utilize the office and education center of the Wind Colebrook South project. However, BNE has not provided a design of the septic system to serve that building. The depth to ledge rock in the area of the septic system proposed for Wind Colebrook South is only 6 feet. The soils contain silt, which inhibits the percolation. BNE should be required to submit a septic design report that provides the design flows, percolation rates and MLSS calculations to insure compliance with the Connecticut Health Code.

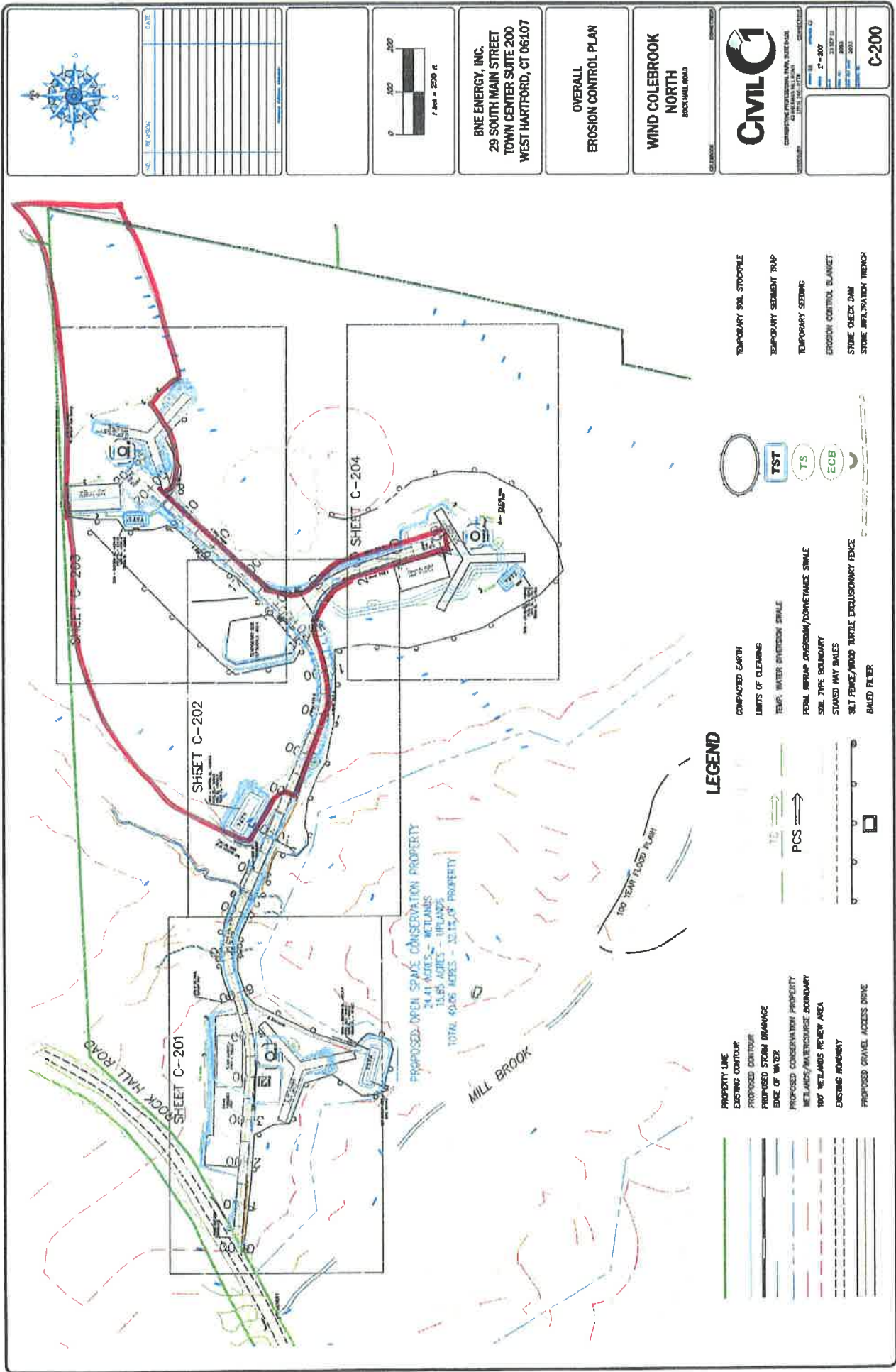
20. Finally, I note that during the hearing in this matter, Dr. Klemens, BNE's consultant, recommended that the access road be moved 40 feet north and that the stormwater basin be minimized or eliminated. He made those recommendations regarding the two stream crossings and previous Temporary Sediment Trap 4. My understanding is that this recommendation was to separate the impacts of the project from the resources of the wetlands to protect habitat for state-listed salamanders. The current project moved the first crossing (Station 7+00) about 25 feet and did not move the second crossing. The previous sediment trap was located within 15 feet of the wetlands and had about 120 feet of frontage along the wetlands. The new Temporary Sediment Trap 4 has been moved about 200 feet southerly. It is now less than 5 feet from the wetlands and has more than 250 feet of frontage along the wetlands. It would seem that BNE has deviated from their own consultant's earlier recommendations.

The statements above are true and accurate to the best of my knowledge.

November 28, 2011
Date

/s/ William F. Carboni
William F. Carboni, P.E., No. 22722

FIGURE 1
 Area tributary to Temporary Sediment Trap 3 and Stormwater Pond 1



CERTIFICATION

I hereby certify that a copy of the foregoing document was delivered by first-class mail and e-mail to the following service list on the 28th day of November, 2011:

Lee D. Hoffman
Paul Corey
Thomas D. McKeon
David M. Cusick
Richard T. Roznoy
David R. Lawrence and Jeannie Lemelin
Walter Zima and Brandy L. Grant
Eva Villanova

and sent via e-mail only to:

John R. Morissette
Christopher R. Bernard
Joaquina Borges King



Emily A. Gianquinto