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FOOD AND RURAL RESOURCES
OFFICE OF THE STATE SOIL SCIENTIST
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MEMO

To: Donald Murphy, LURC Project Analyst
From: David P. Rocque, State Soil Scientist
Re: Proposed Bull Hill Wind Farm Project
Date: February 16, 2011

After reviewing the subject application, I offer the following comments. Most of these comments have been communicated to the James W. Sewall design engineers by phone. I called them to discuss a few questions and our conversation shifted to review comments.

1. **Erosion and Sediment Control Plan Narrative** – Volume I of the application includes a single paragraph discussing erosion and sediment control. Included in this paragraph is the statement **"The erosion and sediment control plan and attendant drawings are not intended to provide the exact location for placement of the erosion control measures, but rather provide the basis for their use as a "tool box" of control measures".** It is my opinion that the "tool box" approach is appropriate for hydrology measures in the mountains because the mountains have unique hydrology features that can not always be located in the field before construction begins. It is therefore, necessary to create a "tool box" of measures to be used when a particular, unexpected, hydrology feature is encountered. The same is not true however, for erosion and sediment control measures, and, in addition, the Bull Hill site is not a mountain and therefore does not include the unique hydrology features that require the use of a "tool box" of measures.

   The application does include drawings that have erosion and sediment control standard details and "general notes and construction specifications" as well as plans showing the location of a number erosion and sediment control measures. I recommend that the erosion and sediment control narrative strike the statement on using the "tool box" approach and it should be expanded to discuss the drawings and plans where erosion and sediment control measures can be found.

2. **Standard Details** – Following are comments on the standard details sheets:

    a. **Erosion Control Mulch Berms** – According to the project engineer, the reason for the "tool box" approach for erosion control measures was to inform the reader that the erosion control mulch berms are not simply installed perpendicular to the slope, parallel to the road, but turn out occasionally. It was not intended to mean that the contractor could choose to replace any measure he/she wanted to with another one in any location. I suggest striking the "tool box" approach and include a standard detail showing the correct installation of erosion control mulch berms installed beside roads that are perpendicular to the contour and then put a note on the erosion control plans referring to the standard detail.
    b. **Dewatering** – The detail plans include construction notes indicating that **"a high water table exists at several turbine pad locations. Contractor shall be responsible for properly dewatering excavations during construction".** The notes also state that **"contractor shall dispose of pumped water in appropriate manner to avoid concentrated flows from the site" and "methods of dewatering and sediment control devices shall be approved by Engineer and third party inspector at each location".** It is my opinion that the locations and designs for dewatering should be shown on the erosion control plans. They should be located on soils that have the ability to absorb the pumped water (not soils with a high groundwater table or that are shallow to bedrock) and away from any protected natural resource.

    Another note on dewatering, located beneath the standard detail for "dirtbag pumped silt control system" states **"Contractor shall provide appropriate sized dewatering control devices to accommodate dewatering activities"**. I would like to see more specific guidance provided to the contractor and third party inspector in the proper sizing of these devices.

    The standard detail for "dirtbag pumped silt control system" does not indicate if or how the infiltrative surface should be prepared before being used. That should be included in the detail. I believe using the natural ground surface, organic duff and roots, is superior to a graded surface. The graded surface destroys soil structure and greatly limits infiltrative capacity.

c. **Typical Road Details** – The typical road details show a deep cut on the upslope side and a fill on the downhill side. That detail is not very representative of the project site roads. Most of the roads are to be built on top of the existing ground surface with a few sections being a cut on both sides (perpendicular to the contour). If they were representative of the roads on the project site, they would need to be amended to show a rock sandwich because most of the soils on this site have a high seasonal ground water table. It would be more appropriate to show the typical condition road detail or to show several with all of the representative conditions expected to be encountered.
d. **Typical Stone Ditch Protection Detail** – This detail indicates that rip-rap will be used to line all ditches exceeding 8% slope, which is appropriate. It is also appropriate to line ditches with rip-rap on lesser slopes if the ditches are to be constructed below the groundwater table. This is typical of road cuts that are perpendicular to the slope. These ditches must carry water until they can outlet, which may be a considerable distance. Also, they will be hard to stabilize vegetatively due to prolonged wetness by groundwater. Rip-rap stabilization should go up the cut slope to the height of the seasonal groundwater table.
e. **Stone Bermed Level Lip Spreader** – the title of this detail seems to indicate that this detail may be for a soil core berm that is covered with stone (though that is not shown on the detail). I suggest just calling it a stone level spreader. The detail should also specify stone size since that is important in determining how well water is spread out after passing through the stone.
f. **Typical Ditch Cross Section** – This detail states “provide loam, seed and mulch or erosion control mix (mulch) on all disturbed soil areas”. Loam and seed with mulch and/or erosion control blankets is appropriate for all areas not needing rip-rap but erosion control mulch is not appropriate for the bottom of the ditch. Concentrated flow there will wash the mulch away. Erosion control mesh should be included as an alternative for hay mulch and should be required for steeper cut slopes and those that are long.
g. **Organic /Duff Waste Disposal Detail** – This detail indicates that all organic waste/duff will be disposed on along the downslope side of road fill extensions. That may be ok in some locations but may be a problem in others such as where there is a rock sandwich and where significant amounts of runoff water flow over the side of the road. I suggest the material simply be spread over the ground surface where it can decompose slowly. Even better, it could also be saved and mixed with soil from excavations to form topsoil equivalent, if allowed to age and decompose somewhat.

h. **Rock Sandwich Detail** – This detail needs to be revised as follows: The rock layer should extend upslope to cover all exposed soils that are below the seasonal groundwater table. Otherwise, these soils will seep and slump down over the sandwich material at the edge of the road. No filter fabric material should be used under the rock on the upslope side of the road. It is not needed because there will be no weight forcing the stone into the soil. Instead, I suggest a coarse gravel that is permeable enough to allow the seeping water into the rock layer. Filter fabric may not be permeable enough to accommodate the seep so it will be circumvented and cause a problem with the structure. On the downslope side of the road, the rock sandwich should be placed on the ground surface so that it out lets on top of the ground at the toe of fill, not subsurface as the detail indicates. It is impossible to reconnect the subsurface layers as they originally were. Therefore, it is best to let the rock sandwich outlet onto the ground surface where it can eventually seep into the ground.

3. **Erosion and Sediment Control Plans** –
    a. **Cross Culverts** – Cross culverts shown on the erosion and sediment control plans do not indicate (by the after built contours) that upslope ditches on either side are supposed to drain into the culverts or where they outlet. Proposed contours of the ditches should be revised to indicate this. On the upslope side of the road, there should be a soil berm to prevent the ditch water from flowing past the culvert inlet. On the downslope side, there should be a ditch turnout, directing upslope water to the buffer/filter strip.
    b. **Road Cut Cross Culvert Buffers** – Most of the road cuts, at least the most lengthy and significant cuts, are perpendicular to the contour. That means that ditches are needed on both sides of the road. Much of the time, those ditches are well below the seasonal groundwater table meaning that they will carry significant amounts of groundwater as well as runoff water. The buffers that cross culverts in these cut areas outlet to should be designed to accommodate both expected runoff flows as well as groundwater flows. Otherwise, the buffers may be overwhelmed and not be effective.
    c. **Road Cut Cross Culverts** – Most of the road cuts that are perpendicular to the slope indicate cross culvert spacing to be several hundred feet apart. Due to the fact that these ditches are generally cut well below the seasonal groundwater table, there is likely to be a considerable amount of flowing water in them, particularly when the groundwater table is high during a precipitation event or snow melt. It is therefore recommended that every effort be made to provide additional cross drainage devices to reduce the volume of water discharged. These can be either cross culverts or “rock burritos” which are trenches with fabric wrapped rock that act similar to cross culverts.

Rock burritos have an advantage in that they do not collapse, rust or heave but they can not accommodate the volume of water that a culvert does.

d. **Turbine Pads** – In many cases, turbine pads are to be installed in soils with a seasonal high groundwater table. A number of the pads require cuts in the upslope side of the hill and fill on the downhill side. The erosion and sediment control plan shows intercepted groundwater from the uphill cuts flowing around the pad site in constructed ditches before being outlet to buffer/filter strips. If possible, I would like to have a couple of rock burritos installed beneath the turbine pad sites, to carry intercepted groundwater where it will be discharged in a manner that will better reconnect the natural hydrology. The manmade ditches can still be constructed but the rock burritos inlets should be installed at a slightly lower elevation so they take all of the groundwater they can. If the flow exceeds the capacity of the rock burritos, the excess will simply flow to the cross culvert and then to the buffer/filter field. This was done for the Kibby substation and has worked very well. The fill extension around the rock burrito outlets should be rip-rap so that it will act as a stone level spreader. The rock burrito should end where it encounters the rip-rap.

e. **SubStation** – I would like to see a couple of rock burritos installed below the substation site, similar to what was described above for the turbine pads and what was done at Kibby. The soils at this site are not mapped as being wet but shallow to bedrock soils typically have groundwater flow across the rock face in the spring, fall and after significant precipitation events. Over blasting the bedrock when preparing the site for installation is also an alternative. The resulting fractured rock/rubble will act in a similar manner to a rock sandwich, allowing groundwater to pass below the substation.

REVIEW MEMORANDUM

March 21, 2011

To: Donald Murphy, Project Manager, Land Use Regulation Commission
From: John Hopeck, Ph.D., Division of Environmental Assessment

Re: Bull Hill Wind Project

1) It appears from the blast overpressure limit cited that the applicant does not intend to blast more than once per day. If the applicant intends to blast more often than once per day, or would like to have the option, I recommend that the applicant apply the standards for airblast levels found at 38 MRSA §490-Z)(14)(H). Records of individual blasts should generally include the information listed at 38 MRSA §490-Z)(14)(L), although blast records are not considered incomplete if missing only a social security number.

2) The Spill Prevention, Control, and Countermeasures Plan submitted appears to address only construction; a full plan must be submitted to address storage and potential spills of petroleum and hazardous materials and other potential contaminants (including herbicides, paints, solvents, and similar products, excepting any used for purely custodial purposes) during operation. This plan must inventory all petroleum products and hazardous material stored and used on the site, describe storage locations and volumes, and must specifically address fuel storage and containment at the Operations and Maintenance building and procedures for changing oil in the turbines and related facilities, including the volumes and storage methods for any oil to be stored on the site during such oil changes. This operational plan should also describe vehicle maintenance, if any, planed to occur at the site. The plan or another document related to long-term operation should discuss planned use, if any, of herbicides at the site, and provide for no-herbicide setbacks from protected resources comparable to those for refueling and fuel storage. This project does not appear to include a separate powerline, so that use of herbicides and other potential contaminants for right-of-way maintenance is not an issue.

   In addition to the other measures described in the construction SPCC plan, no overnight vehicle storage or parking, or any vehicle maintenance, should take place within 100 feet of a protected resource. The construction plan should also inventory potential contaminants other than fuel, and fuel storage procedures during construction, including estimated volumes and storage methods, should be described.

3) The information submitted includes the location and design of a wastewater disposal system for the operation and maintenance building. There are no calculations for the design flow proposed, but the volume appears generally consistent with facilities of this type. The soil types are acceptable and sufficient

exploration was done in the area of the proposed system to demonstrate that separation from bedrock will be consistent with code requirements throughout the area. It is not clear if the location of the proposed disposal field would meet requirements under the Site Location Law for setbacks from downgradient property boundaries, but those are not applicable in this case.

4) It is noted in the archaeological survey that buildings may be removed from their present sites, whether as part of this project or at the same general time as this project; it is not clear if this removal is to occur as part of the proposed project. Any buildings moved or demolished as part of the project should be inspected carefully for hazardous materials, petroleum products, and other wastes such as asbestos-containing materials and mercury-containing materials. Any such materials should be disposed of properly, or handled in a manner to minimize risk to human health and the environment, if the structure is not to be demolished. Any stained soils or other evidence of petroleum contamination should be reported immediately.

5) As noted in the application, the area of proposed construction is largely underlain by granite and other rocks of similar composition, so that the risk of encountering acid-generating rock is minimal. While no additional testing or other measures for assessment of this potential risk is required at this time, the applicant should be aware that unexpected rock types may be encountered, and the applicant should be able to recognize rocks with the potential for acid generation and respond properly in that event.

Site Location of Development
TECHNICAL REVIEW MEMORANDUM
Bureau of Land and Water Quality

TO: **Donald Murphy, Project Manager, LURC**
FROM: **David A. Waddell -- Division of Watershed Management i**
DATE: **March 9, 2011**
RE: **T16MD – Bull Hill Wind Project**

As per our phone conversation today, I have looked into the additional issues you have brought up and clarified some of my initial comments. I have addressed these below, and have revised and copied my adjusted original memo comments.

- Comment No. 1 - expanded.
- Comment No. 8 - has been corrected from an incomplete statement.
- Comment No. 14 - clarified and expanded.

New topics not in original memorandum:

- Provide a detail for the appropriate discharge of foundation and pit dewatering discharge.
- Please provide or direct me to a maintenance plan that addresses the site specific long term maintenance measures for the stormwater structures constructed on site. Be sure to include ditches, buffers, level spreaders, culverts, rock sandwiches, and all other stormwater improvements.
- Laydown areas are proposed for the project. These areas my be necessary during decommissioning or upgrades at a later date. After construction use these areas could be covered in a layer of erosion control mix with a minimum of 4 inches in thickness.
- This review provided relies heavily on the contour information provided with the application. It is understood due to the nature of the project that during construction changes may be necessary to accommodate inaccuracies in the contour information, soils, or to accommodate infrastructure needs. Small changes in the locations of drainage / treatment structures to improve the treatment provided can be approved through the third party inspector. A cover letter outlining the changes should be submitted to the Commission for the project file at the end of construction. For changes that go beyond the scope above consider the following condition.

Proposed Condition: The applicant will retain the services of a professional engineer to provide "as-built" plans that detail any portions of the project that significantly deviate form the approved plans. Any changes in layout, grading, stormwater system, impervious area, or other changes that affect the stormwater quality need to be located and addressed as to how these changes have been treated and meet the general standard. Significant changes in the proposed project may trigger the need for an amendment of the approved department order. This requirement is for the portion of the project constructed as common property. The applicant's agent will notify the department in writing within 14 days of final acceptance of the project to state that the project has been completed. Accompanying the engineer's notification must be updated project plan sheets (if necessary), a report on the changes in treatment and how they meet standard (if necessary), and a copy of the Notice of Termination (NOT) for the project.

Other typical Condions:

Proposed Condition: Due to the level of disturbance, steep slopes, and its close proximity to on site water resources, an independent third party site inspector reviewing erosion and sedimentation control is suggested for this project. The applicant will retain the services of an approved site inspector to inspect the erosion and sedimentation controls on the site. Inspections shall consist of weekly visits to the site to inspect erosion and sedimentation controls from initial ground disturbance to final stabilization. If necessary, the inspecting engineer will interpret the erosion and sedimentation control plans and notes

for the contractor. Once the site has reached final stabilization, the inspector will notify the department in writing within 14 days to state that the construction has been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, and the items inspected on each visit.

Proposed Condition: The applicant will retain the services of a professional engineer to inspect the construction and stabilization of the stone bermed level spreaders and ditch turnouts to be built on the site. Inspections shall consist of weekly visits to the site to inspect each level spreaders /turnout construction, stone berm material and placement, settling basin from initial ground disturbance to final stabilization of the level spreader. If necessary, the inspecting engineer will interpret the stone bermed level lip spreader's location and construction plan for the contractor. Once the stone bermed level lip spreaders are constructed and stabilized, the inspecting engineer will notify the department in writing within 14 days to state that the level lips have been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, the items inspected on each visit, and include any testing data or sieve analysis data of the berm media.

APPLICANT: First Wind – Blue Sky East
Application #: DP-4886
Town: T16MD
Engineer who prepared application: Stantec / Sewall Corp
Parcel Size:
Site Description:
Project description: 19 Wind Power turbines, Substation, O+M Building, Access Roads
Size of new impervious area: 24.24 acres
Size of new developed area: 25.44 acres
Watershed (waterbody): Narraguagus River, Narraguagus Lake, Spectacle Pond and Graham Lake
Watershed type: sensitive / threatened, most-at-risk lake, other

PLANS USED FOR REVIEW:

Pre-development: Plan Sheet C-701, "Pre Development Drainage Plan," dated 11/12/2010, revised 1/25/2011.
Post-development: Plan Sheet C-702, "Post Development Drainage Plan," dated 11/12/2010, revised 1/25/2011.
Erosion and Sediment Control Plans: Plan Sheets C-601 thru C-608, "Erosion Sedimentation Control Plan," dated 11/12/2010, revised 1/25/2011.
Note: Other plans may have been reviewed that are not noted here.

STORMWATER MANAGEMENT

The applicant is proposing a 19 turbine windfarm on Bull Hill and Heifer Hill in T16MD and called Bull Hill Wind Project. This project lies within the watersheds of Narraguagus River, Narraguagus Lake, Spectacle Pond and Graham Lake. This proposed project will create 25.44 acres of developed area and 24.24 acres of impervious area. This project has been required to meet the "Stormwater Law" rules and as such must meet the Basic, General, and Flooding Standards. Under the General Standards the applicant is applying the phosphorus methodology to address impacts to Narraguagus Lake and Spectacle Pond. As such, the applicant is required to use the Phosphorous Methodology outlined in "Phosphorous Control in Lake Watersheds: A Technical Guide to Evaluating New Development" to assess the development.
This project is being reviewed under the 2006 Stormwater Management rules and the design and sizing of the proposed BMPs for this project are based on the "Stormwater Management for Maine" January 2006.
Stormwater quality treatment will be achieved with numerous buffers.
Stormwater flooding mitigation will be achieved with disconnected impervious area and lengthening of flow paths.

The following comments need to be addressed:

ENGINEERING

1. In exhibit 11B the applicant has supplied a SPCC plan to address "house keeping" BMPs onsite. The plan appears to address only the conditions of construction. It is my understanding that a separate SPCC plan for Operations + Maintenance is required also. Please submit this plan for review. Be sure this plan addresses any oil changes on the generator or "bus", and spills on the mostly porous foundation pads. For the construction SPCC plan, please address the storage and containment of materials related to construction (such as paint, solvents, grease, etc.) and disposal of construction debris. Consider including other housekeeping measures like dust suppression that are not typical for other sections of the application.
2. Please reconcile the typical road cross section and the underground electric road cross section. It appears that the underground electric will be into the rock sandwich and other drainage details related to roads.

BASIC STANDARDS:

Note: *As always the applicant's erosion control plan is a good starting point for providing protection during construction. However, based on site and weather conditions during construction, additional erosion and sediment control measures may necessary to stop soil from leaving the site. In addition, other measures may be necessary for winter construction. All areas of instability and erosion must be repaired immediately during construction and need to be maintained until the site is fully stabilized or vegetation is established. Approval of this plan does not authorize discharges from the site.*

3. Erosion control notes call for top soil stock piles on site. Please provide locations of the stockpiles on the E+S location plan.
4. Plan Sheet C-4 Silt Fence Detail: Notes do not limit silt fencing to ¼ acre of drainage for each 100 feet of fencing. The detail also does not require fencing be installed along the contour. Please correct.
5. Lay down areas appear to need grading for this project. Though not included in the long term project impacts (as long as they are revegetated with in one year) these areas do need to be restored to their original contours. Please provide information on the protection of the natural area and removal of the lay down area fill as part of the E+S narrative.
6. It appears that all of the ditches for the project are stone lined. I was unable to find any detail for vegetated ditches or locations on the plans sheets. Stone check dams are intended to reduce scour of soil in the ditch line. This would only be necessary if the ditch lines were to be vegetated. Where check dams are indicated on the plans the spacing is not correctly shown if the construction detail was applied.
7. It is typical for filter barriers such as silt fencing, hay bale barriers, and erosion control mix barriers to be installed along the contour. Without doing so, flow is directed to the lowest elevation in the line of barrier and may result in a blow out or overtopping of the barrier. On the E+S location plans the barriers are shown crossing contours through out. Please correct.

GENERAL STANDARDS

General Comments:

8. The major watershed boundaries do not appear to actually reflect the actual contour information provided. Though not imperative for the portions of the project meeting the general standard, it is important for those areas draining to a great pond and using the phosphorous standard. These areas base their treatment threshold on the amount of acreage encumbered by the project. As such, a more accurate depiction of the drainage is important.
9. The ditch lines does not show any diversions that divert flow into cross culverts. This could be done in a standard culvert crossing detail without showing it on the proposed contour plans. However without a detail it is assumed that flow in the ditchlines is not being directed into the cross culvert and continues down the fall line of the ditch.
10. No culvert sizing schedule was found, nor was there any individual ID for culverts on the project except for road stationing. There were no inlet or outlet elevations shown.
11. The road profiles did not include improvements like culverts or rock sandwiches. Also no information on culvert invert and outlet elevations was provided.

12. Roadside buffers are shown as 35 feet (wooded) in width for a single lane of standard road way drainage and 55 feet (wooded) for two lanes of standard road way drainage. For this project the crane path is much greater in width than a standard road and as such to use the roadside buffers for a wider crane path will need to increase. For crane path road side buffers, the buffer width would need to be increased from 35 feet (wooded) to 55 feet (wooded) for a single lane buffer width, and from 55 feet (wooded) to 80 feet (wooded) for a two lane buffer width.
13. In general the level spreader buffers are shown with straight sides and do not follow the fall line of the contours or cross them perpendicularly. This results in the treatment areas not being the areas protected by the buffer plan. In some cases, like BL32 (Plan sheet C-604), the orientation does not result in acceptable treatment.
14. Buffer areas to meet water quality purposed are restricted to either limited disturbance or no disturbance. These areas are typically protected by deed restrictions or agreements / easements and located in the field with signage to protect their integrity. Please address. It is assumed that the areas set aside as “phosphorous development area limits” are being used for their allocation. These areas will need to be restricted to General Forest Use due to the nature of the project. General forest use means that the land must be maintained in essentially forest cover with undisturbed soil, duff layer and ground cover vegetation, and understory vegetation. Timber may be harvested on a selective basis provided that no more than 40% of the volume is harvested within any 10 year period. If preferred, the standards for either limited disturbance or no disturbance buffers may be used as an alternative definition of general forest use. To limit disturbance of the duff layer winter harvesting in frozen conditions is considered more appropriate.
15. The calculations do not appear to take into consideration the existing impervious area that is being reused for this project.

Details:

16. Plan Sheet C4: Add the level spreader berm material gradation specification to the detail

Road Specific:

17. Turbine T4 is noted as “re-vegetation non-typical”. Please address.
18. Plan sheet C-601: The treatment proposed at BL27 is diverted by the cross culvert at 1038+50. Flow is diverted to BL20. Please review treatment in this area.
19. Turbine T2: an existing road crosses the turbine site in areas that are to be revegetated and through the buffer. Please account for the impact or remove.
20. Plan sheet C-601, Buffer BL19: the level spreader is shown at contour elevation 560’ and the inlet of the culvert is at elevation 556’. Please address.
21. Plan sheet C-601, Buffer BL20 / Buffer B1: Buffer BL20 is shown draining over B1. Buffer BL20 is called meadow but buffer B1 is forested. Please address.
22. Plan sheet C-100, Turbine T3: T3 is shown as being graded away from the proposed treatment buffer and into a diversion ditch that drains to an E+S level spreader. Please address.
23. Plan sheet C-603: Road stationing is missing.
24. Plan sheet C-604, Buffer BL21 / BL2: Is buffer BL21 necessary? Would moving the culvert at Station 8+30 to station 6+50 allow for collection of the same area and treatment in BL2??
25. Plan sheet C-604, Road stationing NS19+20 to 22+10: This portion of road appears to drain to Spectacle Pond. Please review contour information and adjust treatment plans as necessary.
26. Plan Sheet C-604, Road Stationing NS 33+00 to 36+00: Treatment appears to be changed by the inclusion of the “rock sandwich” diverting flow away from Buffer BL32. Please adjust.
27. Plan Sheet C-601, Turbine T3 and T4: Both of these pads appear to drain to the Graham Lake Watershed. Please correct.
28. Spectacle Pond Water Quality Calculations for Linear Portion, page 1: NS Crane station starts at 15+75 and appears from Plan sheet C-604 to start at station 14+75. Please check impervious area calculation and treatment.
29. Plan Sheet C-601: Crane Path T1-4 Station 1002+00 TO 1005+00: Proposed layout conflict with existing road, consider removing and rehabilitation of existing road.

O+M Building / Substation:

30. Plan sheet C2: A diversion ditch to the south of the substation pad that appears to need more work defining the ditches, outlets, and contours.

FLOODING STANDARDS

The applicant has provided a Hydro-cad model that shows the project's impact on the weighted curve number of each watershed and the subsequent impact to peak flows for these watersheds for the 2,10, and 25 year, 24 hour storm. The evidence shows that the weighted curve number for each sub watershed changes little. The model also indicates that there is a minor / "insignificant" increase in the peak flow for Spectacle Pond Watershed. In reviewing this portion of the model the assumptions of the sub-watershed boundaries to flow path length are inaccurate and result in an implied increase where one does not appear to exist when looking at the weighted curve number of the program. This change is well within model tolerances and does not take into consideration the redistribution of flows into the buffer areas that will lengthen the time of concentration for all of the watersheds. For this project the model indicates that the project meets the flooding standard requirement of maintaining the preconstruction peak flows for the 2, 10, and 25 year, 24 hour storm at the property boundary.

MAINTENANCE:

NOTE: The applicant and contractor will be responsible for the maintenance of all proposed stormwater management structures, i.e. ponds, swales, culverts and discharge outlets during construction. Thereafter, each stormwater management structure should be cleaned and cleared of debris yearly at a minimum. Sweeping of all pavements is recommended on an annual basis. The DEP may request to inspect the site at a future date.

DESIGN REVIEW RESPONSIBILITY

This review only ensures that the proposed plan is meeting the minimum standards set by the department for erosion control management and for stormwater management. It does not guarantee that the design is appropriate for the level of work suggested and for the functionality of the facility.