



July 30, 2020

Ref: 12970.00/14424.00

Sudbury Conservation Commission  
275 Old Lancaster Road  
Sudbury, MA 01776

Re: BETA Peer Review Comment Letter—Applicants' Response to Stormwater Comments  
DEP File No. 301-1287  
Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project

Sudbury Conservation Commission Members,

The Applicants, the Massachusetts Department of Conservation and Recreation (“DCR”) and NSTAR Electric Company d/b/a Eversource Energy (“Eversource”), are providing this additional response to the peer review letter provided by BETA, dated May 11, 2020. These responses address specific comments related to stormwater from the letter as numbered by BETA (e.g., SW1, SW2, etc.). Each comment is presented in italicized text, and the Applicants’ response is provided in plain text.

## Stormwater Management

*SW1. Clarify justification for abandonment of existing culvert pipes such that local drainage patterns will not be impaired.*

On the previous version of the plans, pipe #126D was identified to be abandoned. After further review, Pipe #126D will be replaced to maintain local drainage patterns and the plans were updated to reflect this change. In the profile of the previous version of the plans, Pipe #125B was mistakenly labeled to be abandoned; this label was removed and, as noted on the construction plans, the pipe will be retained and extended.

*SW2. Field visit noted the presence of an outfall near the Landham Road bridge which will discharge into Watershed 10.14. Determine approximate runoff anticipated from this outfall and include in HydroCAD model.*

Based on MassDOT plans for intersection upgrades to Route 20 and Landham Road there is an existing 12” outfall running from Landham Road to the northeast of the Landham Road bridge over the MBTA right-of-way (“ROW”). Watershed areas for existing and proposed conditions were updated to include the tributary area of this outfall.

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## Massachusetts Stormwater Management Standards

*SW3. See WPA1. BETA recommends the commission determine if this combined project qualifies as a Limited Project 310 CMR 10.53(3)(d).*

See the responses to BETA comments C2, C3, and WPA1.

## LID Measures

*SW4. Water quality swales require specific design requirements. Provide details and supporting calculations in accordance with the MassDEP Stormwater Handbook.*

The features called out as "Water Quality Swales" in the previously submitted Stormwater Management Plan were revised to match the plans, which label these areas as "Swales". In practice, these swales are BMPs that will provide stormwater detention, infiltration, and treatment. However, in the revised Stormwater Management Report and calculations these swales are not included to document compliance with Stormwater Standards 2, 3, 4 or 6 because they are not considered recharge and treatment BMPs by MassDEP's current Stormwater Management Handbook.

*SW5. Some swales are located above "fluidized thermal backfill". Provide information on infiltrative capacity of this material.*

Fluidized thermal backfill is a permeable material with an estimated permeability of 1.4 inches per hour.

*SW6. Most swales and enhanced infiltration areas are not level and check dams are 6 inches high, update HydroCAD model and treatment volume calculations to reflect design.*

The proposed conditions' hydrologic model assumes stormwater detention only in the areas of increased infiltration (not in conveyance swales) for calculation of the proposed conditions' peak rate of runoff and volume. Storage areas and water quality volumes were refined in the updated Stormwater Management Plan.

*SW7. In several locations the proposed swales are on the north side of the path where the path cross slope pitches down to the south sites. Recommend relocating swales to side the future path will shed runoff.*

The majority of swales and areas of increased infiltration receive bike path runoff; in a few locations, the swales are intended to address off-site stormwater that drains toward the path. The plans were updated to revise the cross slope at stations 736+50 to 738+25 to provide treatment and detention of the bike path runoff.



- SW8. Consider installing infiltration (trench) swale the entire length on the downslope side of the path to facilitate meeting the standards 2,3,4 and 6 more fully.*

See the response to BETA comment C3.

Unlike a typical development project with extensive impervious surfaces that uses structural BMPs to re-route stormwater to other areas entirely, the Project design provides for stormwater recharge and treatment within the immediate vicinity of the bike path footprint. The stormwater design provides structural stormwater infiltration BMPs and semi-structural/non-structural “impervious area disconnection” BMPs (redirecting stormwater from areas of impervious cover to areas of pervious cover). The impervious area disconnection BMPs will allow stormwater to discharge in adjacent vegetated areas where it will naturally infiltrate. Although DEP’s stormwater management regulations do not provide recharge credit for this non-structural stormwater BMP, EPA guidance recognizes volume and pollutant reductions for the impervious area disconnection BMP (with an impervious area to pervious area ratio as low as 8:1 and no restrictions on slope). The stormwater management design also reflects the fact that stormwater runoff from bike paths is a limited source of pollutants such as total suspended solids and phosphorus. The cost of installation and maintenance of an infiltration trench is not justified by the nominal water quality and recharge benefit that would be provided by an infiltration trench. Based upon these factors, the Applicants do not plan to install an infiltration trench along the entire length of the downslope side of the path.

#### **No Untreated Stormwater (Standard Number 1)**

- SW9. Provide outlet control/overflow devices such that erosion and sedimentation will be controlled.*

The plans were updated to include outlet protection at an area of increased infiltration at station 501+00 and a proposed deep surface basin at station 533+50.

- SW10. Identify where swales will outlet to slopes and flow down slope. Proposed grading will result in the creation of swales alongside the trail for significant portions of its length. Provide calculations showing that these swales can convey proposed flows. Provide outlet aprons for these swales to control sedimentation. For all swales, show that swale lining is capable of managing these flows without losing stability or eroding.*

The Stormwater Management Plan and plan set were refined to include additional information regarding swale lining and outlet protection specifications and calculations. Calculations analyzed both swales and areas of increased infiltration and have shown that in all but one location, flow does not build up erosive velocities greater than the erosion-resisting capacity of the vegetation restored with the proposed seed mix; therefore, outlet aprons are not necessary.



At stations 753+50 to 757+50 sod seed mix was added to account for higher velocities, and an outlet apron was added at station 753+50.

*SW11. Provide sizing calculations for riprap aprons.*

Sizing calculations for riprap aprons are included in the revised Stormwater Management Plan.

**Post-Development Peak Discharge Rates (Standard Number 2)**

*SW12. Revise and limit pre and post development areas to include the Applicant's property and any upgradient area that sheds stormwater runoff to the Applicant's property.*

The Project is a long linear project that discharges to areas near multiple waterbodies, wetlands, and low-points and qualitatively differs from other forms of development. Therefore, design points were chosen that represented these macro-scale low points, wetlands, or waterbodies. Drainage areas were extended past the MBTA ROW to capture both stormwater coming onto the ROW and stormwater that travels to those design points. This was done to provide a comparison of the overall hydrologic conditions of these design points and potential changes from pre- to post-development conditions.

The stormwater analysis did consider limiting the watershed areas to the upgradient areas that shed onto the ROW. However, a high-level modeling analysis that limited the watershed areas in this way along a representative 1,000-foot length within an 80-foot-wide corridor similar to the Project's corridor showed that during a 100-year storm the runoff would only increase by 0.7 cubic feet per second. The existing conditions portion of the analysis assumed cover types of "gravel roads" (to represent the rail bed) and "woods-good" (a cover type that includes forest canopy and groundcover), and the proposed conditions portion assumed "pavement" (to represent the bike path) and "meadow" for varying hydrologic soil groups. This analysis indicated that that updating the watersheds is not necessary; the project would continue to have no detrimental downstream impacts and the update would not result in changes to the stormwater management design.

*SW13. In the HydroCAD model the current railroad bed are identified as gravel roads. Much of the bed has developed a forest matting and is overgrown with trees and brush. In limited areas where there are narrow paths these could be model as dirt, revise calculations accordingly*

The existing gravel bed remains throughout the existing railroad bed including in overgrown areas. The gravel bed has had a reduction in void space as a result of years of sediment deposition especially in overgrown areas, which reduces the infiltration capacity of this material. The gravel road curve number most accurately represents the runoff conditions, including in overgrown areas, throughout the current railroad bed due to these conditions.



*SW14. Clarify how soil groups have been determined for areas listed as HSG Unknown.*

Soil groups for HSG unknown soils were determined by evaluating nearby known HSG and applying those to the unknown soils, which is consistent with standard engineering practice.

*SW15. Use known surface type instead of "unpaved" to better calculate Tc for shallow concentrated flow.*

The HydroCAD calculations were revised based on the known surface type.

*SW16. Verify watershed area used for EX-5.11, PR-7.2, PR-8.4, PR-8.10, EX-9.1, EX-10.11, EX-10.12, EX-10.6; The area in HydroCAD varies significantly from that shown on the plans.*

The specified watershed areas were verified. Watershed areas for EX-9.1 and EX-10.6 were updated based on this review.

*SW17. Verify watershed area used for 5.8, 5.13, 5.14, 5.16, 5.17, 5.18, 6.14, 7.1, 7.3, 7.4, 8.3B, 8.4, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 10.2, 10.8, 10.9 (existing and proposed). The areas attributed to each soil group vary significantly from that shown on the plans.*

The specified watershed areas, soil groups, and land use were verified. No figure or calculation changes are necessary.

*SW18. Provide location of Watershed PR-6.15.*

The location of Watershed PR-6.15 was added to the watershed figures.

*SW19. Review routing of watersheds into basins. In many cases, only a portion of each watershed will drain into the Basins, rather than the entire area as modeled in HydroCAD. Sub-watersheds should be created as necessary to reflect this.*

Watershed areas were refined and are included in the figures and in the HydroCAD reports in Appendix B.

*SW20. Provide means of controlling runoff that will be directed/discharged onto Town streets.*

There are currently no direct connections from the MBTA ROW to the Town of Sudbury drainage system and the Project does not propose any such connections. There is currently overland runoff from the MBTA ROW that discharges onto Town streets under existing conditions at Dutton Road, Peakham Road, Horse Pond Road, and Union Avenue. These four roads have a total of 11 design points that discharge to the roads:

- Dutton Road: Design Points 6.1, 6.2, and 6.3
- Peakham Road: Design Points 6.15 and 7.3



- Horse Pond Road: Design Points 7.8, 7.10, 7.11, and 7.12
- Union Avenue: Design Points 8.10 and 8.11

A shown in Tables 3 through 14 of the Stormwater Management Plan, in most instances these discharges have been reduced by the project design or remain the same under proposed conditions. In the locations where the discharge will increase, it is a nominal amount and therefore no additional means of controlling runoff is necessary.

### Recharge to Groundwater (Standard Number 3)

*SW21. Tabulate comparison of runoff volume to each watershed for pre- and post-development conditions. The Site is abutted by low-lying areas and thus risk of flooding must be considered (8.0(A)(3)(i)).*

The Stormwater Report was updated to include a comparison table of runoff volume to each design point for pre- and post-development conditions.

*SW22. To address compliance to the maximum extent practicable provide a complete evaluation of all possible infiltration measures per Standard 3, such as infiltration beneath the footprint of the trail or in areas devoid of vegetation such as the sandy area near northern Hop Brook. As discussed above, proposed grading will create low-lying areas which can potentially be used as infiltration areas dependent on presence of vegetation.*

See responses to BETA Comments C3 and SW8.

*SW23. Provide detail for linear infiltration basins and show required grading on cross sections. Identify design criteria such as outlet weir elevation on the plans/details. Show top elevation of check dams to ensure proper flow between cells.*

A detail for areas of increased infiltration was added to the plans. The top elevation of each check dam within areas of increased infiltration was added to the plan set.

*SW24. Provide location and label of proposed basins on the drain area plans. Clarify location of Basins 5.18, 8.4, 8.5, and 10.13, BETA was not able to see on the site plan set.*

The watershed figures were updated to clarify the location of each proposed BMP.

*SW25. Provide minimum 1' of freeboard for all linear infiltration basins. BETA notes that peak elevation for some basins above the crest height of the proposed trail.*

The Project meets the structural BMP requirements of Standards 2, 3, 4 and 6 to the maximum extent practicable. Please refer to the response to BETA Comment C3. The Project was designed to provide 1 foot of freeboard to the proposed bike path in all locations where it was possible to do so without requiring a significantly larger limit of work.



- SW26. Review HydroCAD model for basins to ensure that surface areas and elevations in model match those depicted in the plans/sections. Basins designed in GydroCAD are larger than those shown on the plans.*

The HydroCAD surface areas were refined in the updated Stormwater Management Plan. Surface areas were summed at each area of increased infiltration to create a composite surface area that conservatively reflects the storage area behind each check dam. This provides a conservative calculation in order to document compliance with Standard 2, 3, and 4.

- SW27. Provide HydroCAD model for the basin near Station 731.*

The HydroCAD results were included in the previous submission of the Stormwater Management Plan for the increased area of infiltration from STA 730+00 LT to 732+00 LT under BMP number 10.7. The body of the Stormwater Management Plan was updated to clarify this.

- SW28. Conduct test pit/borings at the location of each proposed "area of increased infiltration" to verify soil conditions, infiltration rates, and groundwater levels.*

Groundwater and soil data from on-site borings were reviewed to verify soil conditions, groundwater levels, and to estimate Rawls Rates where data is available. The Project's boring data is included in Appendix C of the Stormwater Management Plan.

- SW29. Show that water quality swales will dewater within 72 hours and that seasonal high groundwater is not within 2-4 feet of the swale bottom.*

BMPs called out as "Water Quality Swales" in the previously submitted Stormwater Management Plan were revised to match the plans, which label these areas as "Swales." These conveyance swales were not included in calculations to document compliance with Stormwater Standards 2, 3, 4 or 6.

Structural BMP locations for areas of increased infiltration were chosen to capture water before discharging to critical areas and to minimize disturbance to existing vegetation to the maximum extent practicable. Available groundwater data from the Project's boring locations was reviewed to confirm at least 2 feet of separation from the bottom of the proposed structural BMPs. The Project's boring data and calculated drawdown time for areas of increased infiltration are included in Appendix C and Appendix D of the Stormwater Management Plan, respectively.

- SW30. Provide provisions to protect infiltrative capacity of swales and "area of increased infiltration".*

See response to Comment SW46 regarding the long-term operation and maintenance of stormwater BMPs. See response to Comment SW41 for discussion on construction period maintenance of stormwater BMPs.



*SW31. Not all new impervious areas are directed to recharge BMPs, provide capture area adjustment analysis (MSWH vol.3, ch.1 pgs. 27 – 28).*

Capture area adjustment calculations were previously submitted as Appendix C of the Stormwater Management Plan.

#### **80% TSS Removal (Standard Number 4)**

*SW32. Revise TSS Removal worksheets. 80%/70% TSS removal credit can only be attributed to infiltration basins/water quality swales if combined with adequate pretreatment.*

The TSS removal worksheets were updated to reflect pollutant removal rates published by EPA in order to highlight the Project's compliance to the maximum extent practicable for Standard 4. Although they do provide treatment benefits, swales and vegetated filter strips are not included in the TSS calculations because they are not considered recharge and treatment BMPs by MassDEP's current Stormwater Management Handbook.

*SW33. Identify location of and provide detail for proposed vegetated filter strips.*

Vegetated filter strips were removed from the TSS worksheets.

#### **Critical Areas (Standard Number 6)**

*SW34. Provide required BMPs to treat discharges in these critical areas.*

See response to Comment SW8. The Project design provides structural and non-structural stormwater BMPs to provide treatment, detention, and infiltration for the proposed MCRT and avoid impacts to critical areas. The Stormwater Management Standards requires that BMPs be set back 100 feet from vernal pools and that infiltrating BMPs be located at least 50 feet from any surface water including wetlands, which limits the available space for such stormwater features within this linear corridor. Bike paths are a limited source of pollutants and any additional structural BMPs would provide negligible benefits in comparison to the proposed design which is unlikely to impact critical areas.

#### **Construction Period Erosion and Sediment Controls (Standard Number 8)**

*SW35. Provide draft copy Stormwater Pollution Prevention Plan SWPPP for review.*

Please refer to the draft SWPPP manual attached with the prior response to BETA comments dated June 25, 2020.



*SW36. Provide provisions for management of soils including stockpile areas and assessment of contamination levels.*

See responses to BETA Comments G2 and W23.

*SW37. Provide maintenance/inspection requirements for stabilized construction entrance and turbidity curtain.*

As discussed within Section 5.5 of the NOI, Eversource and DCR will employ a qualified environmental monitor during both phases of construction. The environmental monitor will be responsible for daily inspections of work areas, which includes stabilized construction entrances and turbidity curtains (if used).

*SW38. Provide measures for street sweeping of Dutton Road, Peakham Road, Horse Pond Road, Union Avenue, and Boston Post Road during construction.*

Please refer to the draft SWPPP manual attached with the prior response to BETA comments dated June 25, 2020.

*SW39. Provide perimeter erosion controls along the south side of the Site near stations 391+50, 405, 516, 545 through 555, 557, 565, and 753, and the north side of the Site near stations 565 through 569 and 580 through 585.*

These areas were evaluated during the Project design and it was determined that perimeter erosion controls are not required due to site conditions (i.e., slope) and proximity to wetland resource areas.

*SW40. Provide a construction phasing plan that limits the area of the Site disturbed at any one time to mitigate environmental impacts and risk of erosion.*

The actual work to be performed in each area, as well as accompanying date(s) for when such work will be performed, will be established once a Contractor is engaged to perform the work. However, there is no need to limit the area of the Site disturbed at any one time because appropriate erosion control measures will be employed to minimize potential impacts and environmental monitors will be present throughout to confirm that all activities are being conducted in accordance with applicable permit conditions.

*SW41. Provide measures to protect infiltration systems during construction.*

As described in the draft SWPPP manual, permanent infiltration BMPs shall not be used as temporary construction sedimentation basins without prior approval of the project engineer.



*SW42. Revise inspection frequency to conform to Town of Sudbury requirements (9.0(B)(1)).*

See the draft SWPPP manual. Inspections will be conducted once every 7 days and within 24 hours of a rainfall event 0.25 inches or greater.

*SW43. Provide template for inspection forms (9.0(B)(3)).*

See the SWPPP manual for an inspection form template.

*SW44. Clarify if use of fertilizers is proposed; contradictory information is presented in narratives and plan set.*

The NOI narrative is correct and fertilizers will not be used on the Project Site. Note 2 on Sheet 130 of the Eversource plans was revised to remove the use of fertilizer on the jute mesh erosion control fabric.

*SW45. BETA recommends a condition requiring a final, signed SWPPP be provided to and approved by the Town prior to the start of work.*

See response to BETA Comment W6.

#### **Operations and Maintenance Plan (Standard Number 9)**

*SW46. Provide Operation and Maintenance Plan for stormwater controls meeting the requirements of the MassDEP Stormwater Handbook and Town of Sudbury requirements.*

An updated DCR Operations and Maintenance Plan ("OMP") and Long-Term Pollution Prevention Plan ("LTPPP") is attached.

*SW47. Provide map indicating location of all proposed BMPs.*

The Stormwater Management Plan figures have been updated to clarify the location of each proposed BMP.

*SW48. Provide inspection measures meeting the requirements of 9.0(C).*

Section 9.0C of the Sudbury Stormwater Management Bylaw Regulations addresses Construction Inspections. The draft SWPPP manual provided with the response to BETA comments dated June 25, 2020, addresses inspection measures during construction.



*SW49. Provide inspection and maintenance procedures for culverts.*

Inspection and maintenance of proposed and existing structures will be conducted in accordance with the OMP and LTPPP.

*SW50. Implement a long-term pollution prevention plan to control runoff into Hop Brook, which is an impaired waterbody.*

The OMP and LTPPP discuss the measures that will be implemented, which are consistent with DCR's NPDES Stormwater MS4 Permit and their Stormwater Management Plans. The Mass Central Rail Trail ("MCRT") serves non-polluting vehicles and no wintertime maintenance will be conducted so the operation of the MCRT will not produce any stormwater discharges that will contribute pollutants to Hop Brook.

#### **Illicit Discharges (Standard Number 10)**

*SW51. Provide illicit discharge compliance statement signed by the Owner*

A statement regarding illicit discharge was provided in the Stormwater Management Plan. Once the Project is constructed a finalized and signed illicit discharge statement will be provided.

Should you have any questions concerning this submittal or require additional information, please contact Katie Kinsella at 617-607-2157 or [kkinsella@vhb.com](mailto:kkinsella@vhb.com), or Gene Crouch at 617.607.2783 or [gcrouch@vhb.com](mailto:gcrouch@vhb.com).

Sincerely,

Two handwritten signatures in blue ink. The first signature is on the left and the second is on the right.

Katie Kinsella, PWS / Gene Crouch

CC: Denise Bartone, Eversource  
Paul Jahnige, DCR  
MassDEP Northeast Regional Office

#### **Attachments:**

Revised Stormwater Management Plan  
Updated Plan Sets  
Updated DCR Operation and Maintenance Plan and Long Term Pollution Prevention Plan