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Sustainable Environmental Solutions

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November 23, 2020

Ms. Beth Suedmeyer
Environmental Planner
Planning and Community Development
Town of Sudbury
278 Old Sudbury Road
Sudbury, Massachusetts 01776

Ref: 2nd Peer Review of the Stormwater Management for the
Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project

Dear Ms. Suedmeyer and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Sudbury Planning Board with this follow up technical peer review report associated with the stormwater management for the Mass Central Rail Trail project associated with the Sudbury-Hudson Transmission Reliability project. As noted in our September 18, 2020 initial peer review, HW has reviewed the Stormwater Management Report prepared by VHB dated July 2020 and submitted to the Sudbury Planning Board and compared it to the follow up peer review letter prepared by BETA Group, Inc. (BETA) for the Sudbury Conservation Commission dated August 31, 2020.

The Project Site is a portion of the regional Mass Central Rail Trail (MCRT). Approximately 4.3 miles in length, the 82-foot wide right-of-way runs through a variety of neighborhoods as it crosses Sudbury. The portion of the trail relevant to the review conducted by BETA begins at the intersection of the Marlborough, Hudson, and Sudbury town lines. The trail continues southeast, crossing several roads before reaching a privately owned driveway. While the trail continues east towards the Town of Wayland, BETA reviewed only the portion of the trail between the town line intersection and the private driveway associated with #163 and #183 Boston Post Road.

In response to HW's initial peer review dated September 18, 2020, VHB has provided the following documents to the Sudbury Planning Board:

- Memorandum regarding the Underground Transmission Line Stormwater Management Standards Compliance for Hypothetical Development Scenario, prepared by VHB, dated November 10, 2020 (5 pages).
- Memorandum regarding the HW Peer Review of the Stormwater Management, prepared by VHB, dated November 10, 2020 (10 pages).
- Letter to the Sudbury Planning Board, in response to HW's Comment Letter, prepared by VHB, dated October 21, 2020 (14 pages).

- Sudbury Stormwater Management Plan Narrative, for the Sudbury-Hudson Transmission Reliability and Mass Central Rail Trail Project, Sudbury Massachusetts, prepared by VHB, revised October 21, 2020 (1,349 pages).
- MassCentral Rail Trail (MCRT) – Wayside Section Stormwater Management System Operation and Maintenance (O&M) Plan and Long-Term Pollution Prevention Plan (LTPPP), dated June 2020.
- Stormwater Pollution Prevention Plan (SWPPP) Construction Site Inspection Report - template (5 pages).
- Site plans titled Commonwealth of Massachusetts, Department of Conservation and Recreation, Division of Planning and Engineering, Mass Central Rail Trail, prepared by VHB, dated October 21, 2020, (50 pages).
- Site plans titled Eversource, Sudbury-Hudson Transmission Reliability Project, Sudbury Stormwater Permit Plans, prepared by VHB, dated October 2020, (205 pages).

MEPA - Stormwater Compliance:

It is HW's understanding that in accordance with the Certificate of the Secretary of Energy and Environmental Affairs (EEA) on the Final Environmental Impact Report (FEIR) for the Sudbury-Hudson Transmission Reliability Project, EEA #15703, dated September 14, 2018, the proponent was referred to, "MassDEP's comment letter which identifies additional information and calculations that should be provided with the future NOI applications." The Certificate further noting that, "Additional analysis of the stormwater management system will be required as part of the permitting process."

In accordance with the MassDEP letter to EEA, regarding EEA #15703, dated September 7, 2018, the FEIR did not demonstrate compliance with Stormwater Standard 2 or Stormwater Standard 3.

In accordance with the letter issued to EEA, by KP Law on behalf of the Town of Sudbury, regarding EEA #15703, dated September 7, 2018, "The Supplemental FEIR should demonstrate that it is feasible for the Project to fully comply with the Stormwater Standards as required by the Wetland Regulations, 310 CMR 10.00 and if feasible, qualify and quantify the total environmental impact from such compliance."

Stormwater Review:

BETA reviewed the stormwater management design for compliance with the Sudbury Stormwater Management Bylaw Regulations and the MassDEP Stormwater Management Standards. HW did not review the entire Stormwater Management Report issued by VHB but rather only those areas that BETA had previously commented on. The comments below in *italic font* correlate to the BETA peer review letter (pages 22 through 26) dated May 11, 2020 regarding Stormwater Management.

BETA's review requires that the Applicant comply with the Stormwater Standards to the fullest extent. HW has provided the following comments in **bold font** considering the possibility that the Applicant must demonstrate compliance to the maximum extent practicable with suggestions on how it may do that.

The following comments correlate to HW's September 18, 2020 letter. Follow up comments are provided in bold font.

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

Sept. 18, 2020 (HW): In its response to BETA, VHB has identified two culverts that were previously noted to be abandoned. The pipes have been relabeled to be retained on the July 2020 plan set. BETA referenced a Culvert Structure Assessment Memorandum from 2017, HW was not able to locate this document however agrees that BETA's request appears reasonable to update the assessment and locate any structures mentioned.

November 2020 (HW): HW recommends that the Planning Board consider a condition of approval stating that "a structural engineer is to inspect the culverts as noted in the Culvert Structure Assessment Memorandum from 2017 prior to any land disturbance. The Assessment is to be updated and culverts noted to be retained shall be protected and cleaned. Culverts found that require replacement shall be replaced with a crossing that meets the MA Stream Crossing Standards as accepted by the Conservation Commission."

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.

Sept. 18, 2020 (HW): HW also located the outfall in the field. VHB acknowledged the outfall at Landham Road bridge and stated that the calculations and plans were updated. BETA is satisfied. It appears that the Stormwater Report has been updated however HW was not able to locate the outfall on the plan set. We believe the outfall should be shown on Sheet 67 of 316, and/or on Sheet C-45.

November 2020 (HW): The 12-inch RCP outfall appears on Sheet 67 of 346 and on Sheet C-45. HW has no further comment.

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

Sept. 18, 2020 (HW): BETA and VHB are discussing this issue under the purview of the Conservation Commission. As BETA has noted the applicability of Limited Project provisions for a given project may only be determined by the issuing authority which is the Sudbury Conservation Commission.

For the Planning Board's information, 310 CMR 10.53 General Provisions (3)(d) states, "*The construction, reconstruction, operation and maintenance of underground and overhead public utilities, such as electrical distribution or transmission lines, or communication, sewer, water and natural gas lines, may be permitted, in accordance with the following general conditions and any additional*

conditions deemed necessary by the issuing authority:

- 1. the issuing authority may require a reasonable alternative route with fewer adverse effects for a local distribution or connecting line not reviewed by the Energy Facilities Siting Council;*
- 2. best available measures shall be used to minimize adverse effects during construction;*
- 3. the surface vegetation and contours of the area shall be substantially restored; and*
- 4. all sewer lines shall be constructed to minimize inflow and leakage.”*

Regarding the DCR bike path, the Massachusetts Stormwater Handbook (MSH) Volume 1, Chapter 1, page 3, states that, the Stormwater Management Standards shall apply to the maximum extent practicable to footpaths, bike paths and other paths for pedestrian and/or nonmotorized vehicle access.

Furthermore 310CMR 10.53 General Provisions (6) states *“Notwithstanding the provisions of 310 CMR 10.58 (Riverfront Area), the issuing authority may issue an Order of Conditions for the construction, rehabilitation, and maintenance of footpaths, bikeways, and other pedestrian or nonmotorized vehicle access to or along riverfront areas but outside other resource areas, provided that adverse impacts from the work are minimized and that the design specifications are commensurate with the projected use and are compatible with the character of the riverfront area. Generally, the width of the access shall not exceed ten feet of pavement, except within an area that is already altered (e.g., railroad beds within rights of way). Access shall not be located in vernal pools or fenced in a manner which would impede the movement of wildlife.”*

It is HW's opinion that the Stormwater Management Standards are associated with an increase in impervious area and significant alteration to surface topography. The 10-foot wide bike path will increase impervious area and are required to apply the Massachusetts Stormwater Standards to the maximum extent practicable. The majority of the Eversource transmission line is below the surface and therefore does not significantly impact the stormwater except in areas where the proposed grades create steep slopes and where large areas of vegetation is cleared from woods to grass. To minimize any increase in runoff the cleared landscape should be replanted with hearty vegetation. The Eversource proposal includes replacing the existing 11-foot wide railroad ballast with a 14-foot wide gravel path that will be used to access the transmission line by vehicles. The anticipated frequency of vehicles using this gravel road should be provided to the Town of Sudbury as well as an explanation detailing the need for the 14-foot wide path to replace the 11-foot wide railroad ballast.

November 2020 (HW): The Applicant has stated that Eversource requires a 14-foot wide access way for maintenance purposes. After construction is complete, the 14-foot wide gravel path will be utilized by Eversource once every three years. The gravel base material will stabilize the path and reduce erosion and rutting within the corridor.

The cross sections provided on Sheets 14-17 of the Eversource plan set indicate that 4” of loam and seed will be installed over the entire width of the disturbed area with the exception of a 10 foot wide section of 4” pavement to be installed by DCR for the bike path. Sheets 102-122 illustrate the various plantings to be installed as part of the Eversource project. Sheet 161 lists

the planting schedule for the corridor.

It is HW's understanding that typical multi-use paths in Massachusetts require a minimum width of 10 feet for the comfort of the bike riders and pedestrians using the path at the same time. Furthermore, a typical multi-use path requires 2-3-foot-wide shoulders on both sides of the path. Therefore the 14-foot wide gravel base appears to be reasonable for the bike path.

Volume 3, Chapter 1, page 15 of the 2008 Massachusetts Stormwater Handbook states that *impervious surfaces include roads, rooftops, parking lots, and sidewalks, when they are paved with concrete, asphalt, or brick pavers.*

With the understanding that the Massachusetts Stormwater Handbook does not consider gravel to be impervious, it is HW's opinion that the proposed stormwater management design for the proposed Eversource Transmission phase of the project complies with the Massachusetts Stormwater Standards.

The Town of Sudbury Stormwater Management Bylaw Regulations defines IMPERVIOUS SURFACE: *Any material or structure on, above or below the ground that prevents water from infiltrating through the underlying soil. Impervious surface is defined to include, without limitation: paved surfaces (parking lots, sidewalks, driveways), roof tops, swimming pools, patios, and paved, gravel and compacted dirt surfaced roads.*

With the understanding that the Town of Sudbury Stormwater Management Bylaw Regulations considers gravel to be impervious, it is HW's opinion that the stormwater management for the proposed Eversource Transmission phase of the project with a 14 foot wide gravel road is not in full compliance with the Town of Sudbury Stormwater Management Bylaw Regulations because there is an increase in peak discharge rates at several design points, and the Applicant does not provide the required recharge volume or water quality volume for the total impervious area.

The Planning Board may choose to consider a condition of approval to guarantee that the bike path phase of the project is constructed or in the event it is not that the stormwater management design for the Eversource phase is brought into full compliance with the Town of Sudbury Stormwater Regulations.

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

Sept. 18, 2020 (HW): VHB has eliminated the water quality terminology and has not included the proposed swales in the stormwater calculations. HW has no further comment.

November 2020 (HW): HW has no further comment.

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

Sept. 18, 2020 (HW): VHB has noted that the fluidized thermal backfill has an infiltration rate of 1.4 inches per hour (iph). This product is proposed above the transmission line which in three locations is below an "Area of Increased Infiltration." BETA has

recommended that the exfiltration rate used in the HydroCAD model be adjusted to 1.4 iph. HW notes that the "Area of Increased Infiltration P-10.8" on the plans has been mislabeled and should be P-10.6A. HW also notes that the HydroCAD model for "Areas of Increased Infiltration" called "Linear Infiltration Basin" in HydroCAD for P-8.3B, P10.6A, and P-10.13A have exfiltration rates slower than 1.4 iph which can be considered conservative.

November 2020 (HW): The Applicant has corrected the label for P-10.6A. HW finds the infiltration rate used acceptable. HW has no further comment.

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.

Sept. 18, 2020 (HW): VHB has adjusted the HydroCAD models to incorporate the 6-inch-high check dams within the areas of increased infiltration. BETA has recommended that for any basins that are not level the HydroCAD model should be adjusted to incorporate the slope. HW recommends that for any area of increased infiltration that is within a slope of 3% or steeper the HydroCAD model should be adjusted, reducing the available storage volume.

November 2020 (HW): The Applicant has provided a Table on page 13 of the Stormwater Narrative that illustrates the areas calculated for each area of infiltration at 6" depths. HW has no further comment.

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.

Sept. 18, 2020 (HW): VHB explained that some swales have been designed to capture stormwater coming onto the bike path and adjusted the slope on 175 feet of path. No further comment.

November 2020 (HW): No further comment.

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.

Sept. 18, 2020 (HW): VHB has suggested in its response that the stormwater management system has been designed to the maximum extent practicable. BETA has developed a Summary Table of the Areas without Treatment and provided low, medium, and high priority Recommendations. HW has reviewed BETA's Summary Table provided at the end of BETA's August 31, 2020 peer review letter and Tables 3-8 in VHB's Sudbury Stormwater Management Plan Narrative dated July 2020. It is HW's opinion that out of the 87 proposed watershed areas the following areas should be reevaluated at a minimum for additional treatment because the increase in flow is relatively significant and the practices discharge to cold water fisheries or vernal pools that may be impacted by an increase in flow or volume: Watersheds 5.14, 8.5, 9.1, 10.4, and 10.14. The table below illustrates these 5 watersheds with the peak flows in cubic feet per second (cfs) and peak volumes in acre-feet (af) for a 100-year storm event. Values for the other watershed areas and storm events can be found on pages 37-49 of the VHB Sudbury Stormwater Management Plan Narrative.

Watershed/ Design Point	Ex Peak Flow (cfs)	Prop Peak Flow (cfs)	Ex Volume (af)	Prop Volume (af)
5.14 (14.1 ac)	20.1	25.2	2.555	2.568
8.5 (4.2 ac)	13.6	17.6	1.571	1.803
9.1 (2.2 ac)	8.5	10.3	1.296	1.363
10.4 (4.8 ac)	13.8	18.8	1.628	1.676
10.14 (7.0 ac)	22.9	31.2	3.182	3.150

November 2020 (HW): The Applicant has evaluated 69 design points.

- The peak discharge rate for 33 of the 69 either remains the same or is reduced under proposed conditions.
- The peak discharge rate for 28 of the 69 will increase by less than 1.0 cfs for the 100-year storm event.
- The flow to 6 design points will increase by less than 1.8 cfs.
- Two design points will increase by less than 2.4 cfs.

The Applicant has proposed 16 stormwater practices of approximately 6,900 linear feet along the 4.3-mile corridor.

In our September 2020 review, HW highlighted 5 watersheds/design points which we requested that the Applicant reevaluate. Stormwater practices are proposed for four of the design points originally questioned 5.14, 8.5, 10.4 and 10.14, as well as design point 5.13. HW reached out to the Applicant on November 4 and asked for additional clarification regarding how these watersheds/design points were reevaluated. The Applicant submitted an additional document dated November 10, 2020 as clarification.

During the November 18, 2020 Planning Board hearing the Applicant described the 5 design points and the stormwater management proposed for each. The Board requested that the Applicant revisit watershed 10.14 and the size of the proposed basin. If feasible the Board requested that the proposed basin be increased to further reduce the discharge to the design point. The Board also requested that the Applicant revisit watershed 9.1 and consider sloping the bike path towards Sudbury Lumber and install a stormwater practice to reduce the discharge towards Hop Brook at this location.

It is HW's opinion that once the Applicant has revisited these two locations and

provided its findings, the proposed stormwater management design for the proposed bike path complies with the Massachusetts Stormwater Standards to the maximum extent practicable.

The revised Stormwater Management Report includes the following values:

Watershed/ Design Point	Ex Peak Flow (cfs)	Prop Peak Flow (cfs)	Ex Volume (af)	Prop Volume (af)
5.14 (1.1 ac)	1.1	1.6	0.152	0.184
8.5 (4.2 ac)	13.2	13.3	1.305	1.295
9.1 (2.2 ac)	8.0	9.5	1.207	1.230
10.4 (4.8 ac)	6.3	7.4	0.627	0.627
10.14 (7.0 ac)	9.7	11.7	1.320	1.282

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

Sept. 18, 2020 (HW): VHB has updated the plans to include outlet controls at two stormwater practices. BETA's recommendation is that outlet control devices should be provided at all infiltration areas. HW has reviewed the 100-year peak flows from the 14 areas of increased infiltration and the one detention basin. As designed, only one of these practices has a peak flow greater than 1.5 cubic feet per second. Flow rates less than 2 feet per second are not anticipated to cause excessive erosion depending on the surface material and vegetation at the discharge point and should not require outlet controls. The HydroCAD model for the one area of increased infiltration 10.13A indicates that this practice will discharge at 7.9 cfs during a 100-year storm event. Sheet 67 of 316 (Eversource) indicates that an energy dissipation bowl will be installed at the outlet of 10.13A. HW was not able to locate the sizing calculations for this energy dissipation bowl. HW requests that the sizing calculations be provided. HW further recommends that the surface material/type of vegetation at the low points of each area of increased infiltration be clarified.

November 2020 (HW): The Applicant has provided the sizing calculations as requested. Furthermore, the Applicant has provided a specification for the seed mixture. HW has no further comment.

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.

Sept. 18, 2020 (HW): VHB provided additional documentation regarding potential erosive velocities and included seed mixes to restore vegetation. BETA suggested that outlet control devices be provided at four additional BMPs. HW agrees that the areas of 10.4A, 10.4B, 10.13A, and 10.14 have a higher risk of causing erosion and additional protection should be implemented. BETA further recommended that areas that may create swales because of the proposed grading be identified. HW recommends that the Operation & Maintenance Plan include a requirement to document and repair erosion gullies during and post construction until all slopes are fully stable. The Operation & Maintenance Report should include methods to manage erosion when vegetation is not effective. Furthermore, it may be beneficial if a typical detail of a level spreader or outlet apron be included in the plan set if locations of excessive erosion are identified during construction.

November 2020 (HW): The Applicant has revised the Operation & Maintenance Report as requested.

SW11. Provide sizing calculations for riprap aprons.

Sept. 18, 2020 (HW): BETA agrees that VHB has provided the riprap sizing calculations in Appendix A of the July 2020 Stormwater Management Plan Narrative. No further comment.

November 2020 (HW): No further comment

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.

Sept. 18, 2020 (HW): VHB and BETA are not in agreement on the appropriate way to model watershed areas that flow away from the transmission corridor to a down gradient wetland and includes a large down gradient land area that may dilute the impacts of the proposed bike path. BETA has listed 24 specific watersheds that it has recommended VHB model eliminating the downgradient land area under existing and proposed conditions. The request made by BETA is not difficult, HW recommends that VHB provide the revised model to clearly illustrate that there is no difference.

November 2020 (HW): The Applicant has revised the watersheds as requested. No further comment.

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.

Sept. 18, 2020 (HW): It is VHB's opinion that the existing railroad bed consists of material that should be classified similar to a gravel road. BETA does not agree with VHB's assumption. HW also walked the existing line and it is our opinion that most of the railroad bed between the bridge replacement at 725+00 and the Eversource Driveway at 767+00 is heavily vegetated and should not be considered gravel with a high curve number (CN) value. The gravel and railroad ties may still exist, but the vegetation is very thick which reduces the existing stormwater runoff. In our opinion the portions of the rail bed that are relatively clear of vegetation can be given a CN value

similar to a gravel road.

November 2020 (HW): The Applicant has revised the HydroCAD model as requested. No further comment.

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

Sept. 18, 2020 (HW): VHB noted that the chosen soil groups within areas that do not have a hydrologic soil group (HSG) designation were determined by the soil groups in the surrounding area, which is common practice. BETA suggested that VHB use the higher rate adjacent HSG. HW agrees that the majority of the corridor consist of HSG A soils and that utilizing HSG A unless the area is a delineated wetland would be a reasonable approach.

November 2020 (HW): The Applicant has revised the unknown soil groups to be listed as HSG A as requested. No further comment.

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

Sept. 18, 2020 (HW): VHB has revised the HydroCAD model as requested by BETA. No further comment.

November 2020 (HW): No further comment

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.

Sept. 18, 2020 (HW): VHB revised the watershed areas as requested by BETA. No further comment.

November 2020 (HW): No further comment

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.

Sept. 18, 2020 (HW): VHB has stated that it reviewed the watersheds as requested and did not change any of the watershed areas. BETA has noted three specific areas should be reevaluated 5.8, 5.14, and 6.14. HW has the following comments:

Watershed 5.8 was evaluated under existing and proposed conditions. It appears that the wetland area (wetland 45) is located within Ex 5.8 and Pr 5.8A. The two comparable watersheds are large, over 8 acres and the adjustment for the 1.62-acre wetland to HSG D as suggested by BETA will likely have negligible impact on the comparisons between the existing and proposed conditions.

Watershed 5.14 was evaluated under existing and proposed conditions. Ex 5.14 is comparable to Pr 5.14A, the two watersheds are over 13.5 acres and the areas listed under woods with HSG B @ 3.27 acres, woods with HSG D @ 2.83 acres, and surface water @ 0.028 acres are consistent between the two HydroCAD models. Adjusting the watersheds as suggested by BETA will likely have negligible impact on the comparisons between the existing and proposed conditions.

Watershed 6.14 was evaluated under existing and proposed conditions. Ex 6.14 is

comparable to Pr 6.14, the two watersheds are just over 5 acres and the 0.596 acres listed as C woods is equivalent in both. Adjusting the watersheds as suggested by BETA will likely have negligible impact on the comparisons between the existing and proposed conditions.

November 2020 (HW): The Applicant has revised the watersheds. No further comment.

SW18. Provide location of Watershed PR-6.15.

Sept. 18, 2020 (HW): VHB revised the watershed figure as requested by BETA. No further comment.

November 2020 (HW): No further comment

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.

Sept. 18, 2020 (HW): VHB revised the watershed figures and the HydroCAD model as requested by BETA. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has stated that the increased discharge to the roadways is nominal. BETA has stated that the discharge to Horse Pond Road and the Eversource Driveway should be reevaluated. It is HW's opinion that the proposed discharge to Horse Pond Road is minimal with a proposed slope at approximately 0.57%. However, the proposed discharge to the Eversource Driveway is greater than 5 cfs for the 100-year storm event and the slope of the bike path is between 1.5% and 2.9%. HW recommends that the Applicant verify that there will not be ponding or erosion at the end of the corridor at the Eversource Driveway.

November 2020 (HW): The Applicant has added a riprap apron at the Eversource driveway. The riprap is shown on Sheet 69 of 348.

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)).

Sept. 18, 2020 (HW): VHB provided the runoff volumes in a table as requested. BETA has suggested that there are numerous watersheds with an increase in volume that should be reevaluated. It is HW's opinion that at a minimum the following watershed areas be reevaluated for additional treatment because the increase in flow is relatively significant and the practices discharge to cold water fisheries or vernal pools that may be impacted by an increase in flow or volume. This is a concern for Watersheds 5.14, 8.5, 9.1, 10.4, and 10.14.

November 2020 (HW): The Applicant has reevaluated the watersheds as requested. See response to SW8.

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.

Sept. 18, 2020 (HW): VHB has suggested in its response that the stormwater management system has been designed to the maximum extent practicable. BETA stated that there exist many areas along the bike path where an infiltration basin could be proposed without increasing the area of disturbance. It is HW's opinion that if there are locations where additional areas of infiltration can be accommodated it makes sense to include these areas.

November 2020 (HW): The Applicant has reevaluated the watersheds and added another area of increased infiltration at design point 5.13 as discussed under 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.

Sept. 18, 2020 (HW): VHB has provided the detail as requested by BETA. BETA has recommended that the Applicant include additional information provided in the Massachusetts Stormwater Handbook. Information regarding infiltration basins can be found in Volume 2, Chapter 2, page 86-92. HW agrees that to verify that the areas of increased infiltration are constructed as modelled additional information should be provided on the plans at Sheet 122 of 316 (Eversource).

November 2020 (HW): The Applicant has provided a detail for the infiltration areas as well as elevations at each check dam within an area of increased infiltration. The Applicant has provided a Table on page 13 of the Stormwater Narrative that illustrates the areas calculated for each area of infiltration at 6" depths. HW has no further comment.

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.

Sept. 18, 2020 (HW): VHB has updated the watershed figures to clarify the locations of the various BMPs. BETA has stated that the areas modeled as "low points" should also be labeled on the plans. HW has evaluated the "low points" 5.11, 7.6, 7.8, 8.7, and 8.10. The HydroCAD model is identical for each of these low points under existing and proposed conditions except for "low point 8.7" where the outlet appears to have been raised by 0.2 feet. This may be an error in the HydroCAD model input; however, it should be corrected. HW agrees that the low points should be labeled on the plans specifically to understand if the rise in ponding elevations in these low points due to the proposed development will impact abutters.

November 2020 (HW): The Applicant has added the label within watershed 10.4 in the vicinity of station 720+00. HW has no further comment.

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.

Sept. 18, 2020 (HW): VHB has stated that the design meets the structural BMP requirements to the maximum extent practicable. BETA has noted that several of the basins can be expanded without additional disturbance. HW recommends that the areas

of increased infiltration be as large as feasible without further disturbance. It may be helpful to understand how the various areas of increased infiltration were designed considering the criteria involved such as soil type, depth to groundwater, location along a slope, and watershed being captured.

November 2020 (HW): The Applicant has reevaluated the design points and described how the areas were sized in the Stormwater Report. The Applicant provided a Table on page 13 of the Stormwater Narrative that illustrates the areas calculated for each area of infiltration. HW has no further comment.

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 HydroCAD are larger than those shown on the plans.

Sept. 18, 2020 (HW): VHB has refined the HydroCAD model to be consistent with the plan set. BETA has noted that some of the basins do not appear to be accurately modeled. HW recommends that VHB provide a table on the plan set, that lists each of the areas of increased infiltration, the station each area starts and ends at, the width of the bottom area and the side slopes. The overflow weirs as modeled in HydroCAD should also be included to verify that the infiltration areas are constructed as designed.

November 2020 (HW): The Applicant provided Table 3 on page 13 of the Stormwater Narrative that illustrates the areas calculated for each area of infiltration at 6" depths by station. HW has no further comment.

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

Sept. 18, 2020 (HW): VHB clarified the location of the HydroCAD model for the stormwater practice 10.7 as requested by BETA. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has provided some test borings conducted along the 4.3-mile length of corridor to be developed. BETA has recommended additional testing be conducted to verify the soils for a few of the areas of increased infiltration. Furthermore, BETA has recommended that a condition be included requiring that additional soil testing be conducted during construction and provided to the Town for review. HW agrees that additional soil testing during construction is valuable and requiring the testing as a condition of approval is appropriate.

November 2020 (HW): HW recommends that the Planning Board include a condition of approval requiring additional soil testing be conducted during construction in the vicinity of Station 502+00, Station 511+00, Station 570+00, and Station 579+00.

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.

Sept. 18, 2020 (HW): VHB has provided the drawdown calculations as requested by BETA. BETA has suggested that further adjustment to Basin 10.6A (labeled as 10.8A) is needed. The boring (B-MP-38) located within the area of Basin 10.6A indicates high groundwater. HW reviewed the cross sections provided on Sheets 302 and 303 of the

Eversource Plan set. It appears that Basin 10.6A is in an area of fill and will be constructed 1-2 feet above the existing grade and so will meet groundwater separation requirements. No further comment.

November 2020 (HW): No further comment

SW30. *Provide provisions to protect infiltrative capacity of swales and “area of increased infiltration”.*

Sept. 18, 2020 (HW): VHB and BETA have directed response to this comment to comments SW41 and 46. HW has no further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has stated that it has provided the adjustment calculations. BETA notes that the calculations indicate that only 42% of the total impervious area is being directed to an infiltration BMP. In accordance with the Massachusetts Stormwater Handbook 65% of the total impervious area should be captured for compliance. It is HW's opinion that additional treatment, preferable infiltration practices should be provided for a few of the watersheds which discharge to critical areas, including watershed areas 5.14, 8.5, 9.1, 10.4, and 10.14.

November 2020 (HW): The Applicant has reevaluated the design points and provided additional information in response to SW8.

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.*

Sept. 18, 2020 (HW): VHB has noted that a number of practices including swales and vegetated filter strips are proposed but not included in the TSS removal worksheets. BETA agrees that sediment will be minimal however recommends providing treatment where critical areas have been identified. It is HW's opinion that at a minimum the following watershed areas be reevaluated for additional treatment because the increase in flow is relatively significant and the practices discharge to cold water fisheries or vernal pools that may be impacted by an increase in flow or volume. Watersheds areas 5.14, 8.5, 9.1, 10.4, and 10.14.

November 2020 (HW): The Applicant has reevaluated the design points and provided additional information in response to SW8.

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

Sept. 18, 2020 (HW): VHB has eliminated the vegetated filter strips. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has suggested in its response that the stormwater management system has been designed to the maximum extent practicable to avoid impacts to critical areas. BETA has developed a Summary Table of the areas without treatment and provided recommendations. As noted in comment SW8 above, HW has

reviewed BETA's Summary Table provided at the end of BETA's August 31, 2020 peer review letter and Tables 3-8 in VHB's Sudbury Stormwater Management Plan Narrative dated July 2020. It is HW's opinion that at a minimum the following watershed areas should be reevaluated for additional treatment because the increase in flow is relatively significant and the practices discharge to cold water fisheries or vernal pools that may be impacted by an increase in flow or volume: watersheds 5.14, 8.5, 9.1, 10.4, and 10.14.

November 2020 (HW): The Applicant has reevaluated the design points and provided additional information in response to SW8.

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

Sept. 18, 2020 (HW): VHB has provided a draft copy of the SWPPP as requested. BETA has recommended that the final SWPPP be provided to the Town prior to construction and has listed several items to be included. HW agrees that the final SWPPP should be provided to the Town with all applicable attachments.

November 2020 (HW): HW recommends that the Planning Board include a condition of approval requiring the Applicant to provide a final SWPPP prior to land disturbance.

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

Sept. 18, 2020 (HW): This comment has been relocated to be resolved under the wetland comments. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has listed the inspection requirements in the SWPPP. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB provided the requested information in the SWPPP manual. No further comment.

November 2020 (HW): No further comment

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.

Sept. 18, 2020 (HW): VHB is not in agreement with BETA's need for additional erosion controls. HW recommends that a preconstruction visit be a condition of approval at which time the acceptance of the location of the erosion control barrier along the perimeter can be finalized. However, it should be clear in the bid documents that a representative from the Town of Sudbury may require additional perimeter controls at numerous locations.

November 2020 (HW): HW recommends that the Planning Board include a condition of approval requiring the Applicant to conduct a preconstruction meeting with a Town Representative to confirm the final placement of erosion controls.

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.

Sept. 18, 2020 (HW): VHB stated that the construction schedule will be determined by the Contractor once one is engaged. BETA defers to the Town as to the need for a construction schedule. HW recommends that a preconstruction visit be a condition of approval at which time the construction schedule and acceptance of erosion control barrier can be finalized.

November 2020 (HW): HW recommends that the Planning Board include a condition of approval requiring the Applicant to conduct a preconstruction meeting with a Town Representative to confirm the construction schedule and the final placement of erosion controls.

SW41. Provide measures to protect infiltration systems during construction.

Sept. 18, 2020 (HW): VHB has stated that the infiltration basins will not be used as sediment basins during construction. BETA has requested additional assurance and a construction schedule. To verify that the infiltration basins do not receive excessive sediment during construction, HW recommends that the basins be protected by an erosion control barrier or constructed after the gravel base layer is complete.

November 2020 (HW): HW recommends that the Planning Board include a condition of approval requiring the Applicant to protect the infiltration areas with erosion control barriers during construction.

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

Sept. 18, 2020 (HW): VHB has revised the inspection frequency as requested by BETA. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has provided inspection forms as requested by BETA. BETA has suggested additional information be listed, including recent storm events, and noted failed practices. HW agrees that BETA's suggestion is useful.

November 2020 (HW): The Applicant has provided a template to be utilized during the SWPPP inspections. HW has not further comment.

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

Sept. 18, 2020 (HW): VHB has confirmed that fertilizers will not be used. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): This comment has been redirected by BETA and VHB to the wetland discussion. HW has no further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has provided an Operation & Maintenance (O&M) Plan as requested. BETA has requested additional details be included per the Massachusetts Stormwater Handbook. The information requested is common practice to be included in an O&M Plan. The O&M Plan should be a stand-alone document that can be easily utilized by MA DCR as the responsible party.

November 2020 (HW): The Applicant has revised the O&M Plan. It is a stand-alone document. No further comment.

SW47. Provide map indicating location of all proposed BMPs.

Sept. 18, 2020 (HW): BETA has requested that VHB include all BMPs including the swales and culverts that may require inspections and maintenance in future years. HW agrees that a simple figure will be very beneficial to long term maintenance of the stormwater practices.

November 2020 (HW): The Applicant has provided the simple figure as requested. No further comment.

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

Sept. 18, 2020 (HW): BETA has noted three measures that should be included in the O&M Plan to comply with the requirements outlined in Section 8.0(C) of the Sudbury Stormwater Management Bylaw Regulations dated January 23, 2013. HW agrees that these measures should be included.

November 2020 (HW): The Applicant has adequately addressed this comment. No further comment.

SW49. Provide inspection and maintenance procedures for culverts.

Sept. 18, 2020 (HW): VHB has stated that drainage structures have been included in the O&M Plan. BETA has requested confirmation that culverts are included with drainage structures. HW agrees that the culverts should be included and recommends that the culverts be labeled on a sketch for ongoing maintenance.

November 2020 (HW): The Applicant has labeled the culverts on the O&M Figure and listed the culverts in the O&M Plan. No further comment.

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

Sept. 18, 2020 (HW): VHB provided the long-term pollution prevention plan as requested by BETA. No further comment.

November 2020 (HW): No further comment

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

Sept. 18, 2020 (HW): VHB has agreed to provide a signed illicit discharge statement once construction is complete. The MSH Volume 1, Chapter 1, page 25 states that the illicit discharge statement should be provided prior to the discharge of stormwater runoff to the post-construction stormwater best management practices. HW recommends that the signed statement be provided prior to any land disturbance.

November 2020 (HW): HW recommends that the Planning Board include a condition of approval stating that the Applicant will provide a signed illicit discharge statement prior to land disturbance.

Additional HW comment Sept. 18, 2020:

During the site walk, HW observed the two 36-inch corrugated metal culverts at approximately Station 539 + 50, to allow the passage of Dudley Brook. The metal culverts were showing signs of deterioration. HW recommends that further investigation be conducted to verify the long-term functionality of these culverts and the possibility of repairing them be considered.

November 2020 (HW): HW recommends that the Planning Board consider a condition of approval stating that “a structural engineer is to inspect the culverts as noted in the Culvert Structure Assessment Memorandum from 2017 prior to any land disturbance. The Assessment is to be updated and culverts noted to be retained shall be protected and cleaned. Culverts found that require replacement shall be replaced with a crossing that meets the MA Stream Crossing Standards as accepted by the Conservation Commission.”

Additional HW comment November 2020:

At the request of the Town, the Applicant has included a rotary at the intersection with the future Bruce Freeman Trail. The rotary is to the west of Union Street around Station 600+50. The Applicant has included the increased impervious area in the October 21, 2020 Stormwater Management Report. The rotary appears to fall within four separate watersheds 8.8, 8.9, 8.10 and 8.11. There is minimal increase in the runoff due to the proposed rotary. No further action recommended.

Please do not hesitate to contact me at 857-263-8193 or at jbernardo@horsleywitten.com with any questions regarding these comments.

Sincerely,

Horsley Witten Group, Inc.



Janet Carter Bernardo, P.E.
Senior Project Manager