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May 13, 2022

Ms. Jacki Byerley, Planner
Andover Planning Board
Town Office
36 Bartlett Street
Andover, MA 01810

Re: Initial Stormwater Peer Review
1320 South Street, Andover, MA

Dear Ms. Byerley and Board Members:

The Horsley Witten Group, Inc. (HW) is pleased to provide the Andover Planning Board with this letter report summarizing our initial peer review of the stormwater management for the proposed energy storage facility at 1320 South Street in Andover, Massachusetts. We understand that the project involves the construction of a 12MW, 48MWh battery storage facility on a 9.9-acre parcel. The proposed area of disturbance is currently undeveloped woodlands, and the proposal includes clearing 1.5 acres of trees. The proposed stormwater management includes two infiltration swales with check dams along the access road and an infiltration basin located on the northwest side of the facility.

The existing topography of the project area slopes towards the northern to a large wetland resource area, which then flows to the Shawsheen River. The project will be located outside of the 100-foot wetland buffer as well as the 200-foot riverfront area. There is a NHESP certified vernal pool located off site and the project will be located outside of the 100-foot vernal pool buffer. NHESP has identified four (4) endangered or special concerned species occurring in the vicinity of the site. The Applicant has stated that it is working with NHESP to ensure that the project will have no impacts to these species.

A portion of the project area is located within the Federal Emergency Management Agency (FEMA) 100-year flood zone (Zone AE, Elevation 77), also defined as Bordering Land Subject to Flooding (BLSF) per Section 10.57 of the Wetlands Protection Act. Work within BLSF is within the jurisdiction of the Andover Conservation Commission.

The following documents and plans were received by HW:

- Transmittal, 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., dated April 12, 2022 (1 page);
- Application for a Special Permit under the Major Non-Residential project bylaw, 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., dated April 12, 2022 (49 pages);
- Stormwater Report, 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., dated April 12, 2022 (82 pages); and
- Site Use Permit/Plan Set for 1320 South Street, Andover, MA, prepared by Borrego Solar Systems, Inc., dated April 12, 2021, stamped 4/12/2022, which includes:

o Title Page	T-1
o Existing Conditions Plan	C-1.0
o Tree Clearing Plan	C-2.0
o Layout and Materials Plan	C-3.0
o Grading and Erosion Control Plan	C-4.0
o Civil Details	C-5.0
o Civil Details	C-5.1

Stormwater Review

HW has reviewed the documents listed above and has the following comments concerning the stormwater management design in accordance with the Massachusetts Stormwater Handbook (MSH) dated February 2008, and the Town of Andover Stormwater Management and Erosion Control Regulations amended May 11, 2021 (Stormwater Regulations).

In accordance with Section VI.B. of the Andover Stormwater Regulations the Stormwater Management Permit and Narrative provided by an applicant shall contain sufficient information to verify compliance with the local Stormwater Bylaw and the MassDEP Stormwater Management Standards. Below are comments relating to the standards as presented in the MSH. Where the more stringent requirements of the Andover Stormwater Regulations are applicable, those comments are included.

1. *Standard 1 states that no new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

    a. The proposed development includes land disturbance greater than 100 feet from the wetland resource area. The Applicant has proposed drainage swales and an infiltration basin to capture and recharge the stormwater runoff from the gravel driveway as well as from the battery storage facility. The peak discharge from the swales and the infiltration basins is negligible and as designed the proposed development should not cause erosion in the wetlands or waters of the Commonwealth.

        The Applicant complies with Standard 1.

2. *Standard 2 requires that post-development runoff does not exceed pre-development runoff off-site.*

    a. The Applicant has noted that the proposed impervious area of the site consists of 6,739 square feet (sf) of concrete pads. A 27,585-sf gravel road is also proposed. HW frequently recommends that gravel drives be evaluated as impervious. However, the amount of traffic this drive will have suggests that it will allow stormwater to be retained in the gravel and will not sheet flow off like a hard packed gravel drive might. No action required.

    b. The Applicant has provided four subcatchments under proposed conditions. Subcatchment areas 12 and 13 include the gravel drive as well as the battery storage facility. The HydroCAD model lists brush as a surface condition within subcatchment areas 12 and 13. It is not clear from the Post-Development Watershed Plan where the brush is located within these two catchment areas. HW recommends that the Applicant clarify the use of brush.

c. Section IX.E.4 of the Andover Stormwater Regulations references curve number (CN) values that the Town requires applicants to use for Pre-Construction Runoff and Post-Construction Runoff calculations. HW recommends that the Applicant verify that the CN values utilized in the HydroCAD model are consistent with Table 1 found on page 25 of the Stormwater Regulations, specifically for Newly graded pervious areas and Open space under post-construction.

d. In accordance with Section IX.E.6 of the Andover Stormwater Regulations the depth of precipitations shall be based on data provided by "NOAA Atlas 14." HW recommends that the Applicant revise the precipitation depths used in the HydroCAD model accordingly.

e. Standard engineering practice is to use 6.0 minutes as a minimum time of concentration (Tc). HW recommends that the Applicant consider revising the Tc values used for Subcatchment 12 and 13. As presented the values are considered conservative.

f. As modeled in the HydroCAD calculations the Applicant has not included the overflow structures as an outlet device. The peak elevations for the swales and infiltration basin do not reach the overflow structures. As designed the infiltration basin and infiltration swales discharge through infiltration only. The Applicant may choose to add the additional outflow devices to the model. No further action required.

g. The Proposed Conditions narrative in the Stormwater Report describes an infiltration ditch lined with fabric. HW recommends that the Applicant provide a detail of the infiltration ditch including the size of the ditch, the surface material, and the type of fabric proposed.

h. HW recommends that the Applicant provide a detail of the infiltration basin including the proposed vegetation and the overflow level spreader, noting the elevation and material. Section IX.I. of the Andover Stormwater Regulations lists several design features that the Applicant should verify it complies with.

3. *Standard 3 requires that the annual recharge from post-development shall approximate annual recharge from pre-development conditions.*

a. The Applicant has proposed two infiltration swales and one infiltration basin. The Applicant has noted that a conservative infiltration rate of 7.0 inches per hour (iph) has been used based on the Natural Resources Conservation Service (NRCS) soil map available online. The Applicant has not conducted any test pits within the area of the infiltration practices. HW agrees that based on the NRCS soil map the soils in the area are considered hydrologic soil group (HSG) A. However, we do not agree that an infiltration rate of 7.0 iph is appropriate. In accordance with Volume 3, Chapter 1, page 10 of the MSH an in-situ permeability test is not required but the Rawls 1982 rates found on page 22 shall be used. To be conservative HW recommends that the Applicant use an infiltration rate of 2.41 iph. HW further recommends that the Applicant conduct soil test pits within the footprints of the infiltration practices to confirm the soil texture and the elevation of the Estimated Seasonal High Ground Water (ESHGW).

b. Volume 3, Chapter 1, page 28 of the MSH describes the need to provide a Mounding Analysis when the vertical separation from the bottom of an exfiltration system to ESHGW is less than four (4) feet *and* the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm. HW recommends that the Applicant determine if a mounding analysis is required for the proposed development and provide one in accordance with the MSH.

c. The Applicant describes the provided recharge volume as the volume in the stone surrounding the concrete pads. HW recommends that the Applicant explain how the stormwater flows from the crushed stone into the infiltration basin. It does not appear that the available storage in the crushed stone has been modeled in HydroCAD.

d. Section IX.F of the Andover Stormwater Regulations requires applicants to illustrate that they are providing channel protection by detaining the 1-year 24-hour storm event. The Applicant has not provided the calculations. However, the HydroCAD model indicates that the Applicant is detaining the 2-year storm event. No further action required.

4. *Standard 4 requires that the stormwater system be designed to remove 80% Total Suspended Solids (TSS) and to treat 1.0-inch of volume from the impervious area for water quality.*

   a. Per Section IX.G. of the Andover Stormwater Regulations an Applicant is required to retain 1 inch of stormwater over the impervious area for pollutant removal. It appears that the Applicant has met this requirement.

   b. HW recommends that the Applicant describe how the future development will minimize sediment from entering the infiltration practices which could become clogged over the years.

   c. HW recommends that the Applicant clarify the type of equipment used at the facility and the potential for any spills to occur that could impact the groundwater.

5. *Standard 5 is related to projects with a Land Use of Higher Potential Pollutant Loads (LUHPPL).*

   a. The site is not considered a LUHPPL, therefore Standard 5 is not applicable.

6. *Standard 6 is related to projects with stormwater discharging into a critical area, a Zone II or an Interim Wellhead Protection Area of a public water supply.*

   a. The site is not within a critical area, therefore Standard 6 is not applicable.

7. *Standard 7 is related to projects considered Redevelopment. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.*

   a. The proposed project is considered a new development. Therefore, Standard 7 does not apply.

8. *Standard 8 requires a plan to control construction related impacts including erosion, sedimentation or other pollutant sources.*

    a. The Applicant has included an Erosion and Sediment Control Plan, Sheet C-4.0. It appears that a Mulch Tube has been proposed around the northern side of the infiltration basin. Details for the Mulch Tube and Silt Fence have been included on Sheet C-5.0. HW recommends that the Applicant revise the line type for the erosion control practice as it is difficult to locate and clarify which practice is proposed. HW recommends that the mulch tube and the silt fence are installed on the northern limit of work. HW further recommends that the Applicant extend the erosion control line along the west side of the limit of work to the 83 foot contour.

    b. HW recommends that the Applicant add fencing around the infiltration basin and infiltration swales to prevent heavy vehicles from compacting the soil in these stormwater practices.

    c. HW recommends that the Applicant provide a location for soil stockpiles and provide a detail with appropriate erosion controls.

    d. According to the Tree Clearing Plan, the Applicant is removing 1.5 acres of trees. HW recommends that the Applicant provide a tree protection detail as well as provide construction fencing around the entire Limit of Work.

    e. The proposed project requires land disturbance of greater than 1 acre. Therefore, a Stormwater Pollution Prevention Plan (SWPPP) per the EPA NPDES Construction General Permit will be required. HW recommends that the Applicant provide a copy of the SWPPP to the Town a minimum of 14 days prior to land disturbance.

9. *Standard 9 requires a Long-Term Operation and Maintenance (O & M) Plan be provided.*

    a. The Applicant has provided a Long-Term Pollution Prevention Plan in the Stormwater Report as required. HW recommends that the document become a standalone document to be signed by the property owner prior to land disturbance.

    b. The Applicant has noted in the O&M Plan that the stormwater management system owners, parties responsible for operation & maintenance, and an estimated operations & maintenance budget are to be determined (TBD). HW recommends that the Applicant provide a final O&M Plan with these items included prior to land disturbance.

    c. The Applicant has provided maintenance tasks for the Infiltration Basin. HW recommends that the Applicant add that inspection is required “after every major storm during the first 3 months of operation” per Volume 2, Chapter 2, Page 87 of the MSH.

    d. HW recommends that the Applicant include the maintenance of check dams and infiltration trenches in the stormwater management maintenance section of the O&M Plan.

    e. HW recommends that the Applicant provide a simple plan that is drawn to scale and shows the location of all stormwater practices requiring inspections and long term maintenance.

f. The Applicant includes culverts under the stormwater management maintenance section of the O&M. HW recommends that the Applicant indicate where this practice is being used at this site.

10. Standard 10 requires an Illicit Discharge Compliance Statement to be provided.

a. HW recommends that a signed Illicit Discharge Compliance Statement be provided to the Town of Andover prior to the discharge of any stormwater to post-construction best management practices (BMPs).

11. Compensatory Flood Storage.

a. It appears that the Applicant is filling a small area of the 100-year flood plain along the west corner of the infiltration basin. HW recommends that the Applicant demonstrate that it has provided adequate compensatory storage to mitigate for the volume filled or consider relocating the basin to avoid this filling.

Conclusions

HW recommends that the Planning Board require the Applicant to provide a written response to address these comments as part of the permitting review process. The Applicant is advised that provision of these comments does not relieve him/her of the responsibility to comply with all Town of Andover Codes and By-Laws, Commonwealth of Massachusetts laws, and federal regulations as applicable to this project. Please contact Janet Bernardo at 857-263-8193 or at jbernardo@horsleywitten.com if you have any questions regarding these comments.

Sincerely,

HORSLEY WITTEN GROUP, INC.

Janet Carter Bernardo, P.E.
Associate Principal

Veronica Seward-Aponte, E.I.T.
Environmental Engineer

CC: Andover Conservation Commission