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December 1, 2020

Devens Enterprise Commission
c/o Neil Angus, AICP CEP, LEED AP
Environmental Planner
33 Andrews Parkway
Devens, MA 01434

RE: Nitsch Project #9419
Water Treatment Plant
Patton Well
Stormwater Review Comments
Devens, MA

Dear Mr. Angus:

This letter is regarding the Water Treatment Plant, Patton Well Level 2 Unified Permit. The project site is located on portions of 150 and 168 Patton Road in Devens, Massachusetts. In addition to the documents reviewed at the time of our initial letter issued on October 1, 2020, Nitsch Engineering received and reviewed the following new documents from the Applicant:

1. Site Plans (the Plans) entitled, "Patton Water Treatment Plant, Devens, Massachusetts", revised November 23, 2020, prepared by Wright-Pierce; and
2. MassDevelopment, Stormwater Management Plan, Patton Water Treatment Plant, revised November, 2020;

Documents previously received and reviewed include the following:

1. Level Two Unified Permit – Checklist for Determination of Completeness;
2. Narrative for Reuse Plan and Industrial Performance Standards Shabokin and Patton Water Treatment Plant Projects, dated September 2, 2020;
3. Geotechnical Report, Proposed Water Treatment Building, Patton Well Site, Devens, Massachusetts, dated July 10, 2020;
4. MassDevelopment, Stormwater Management Plan, Patton Water Treatment Plant, dated September 2020;
5. Emergency Action Plan Site Specific Program, Devens; and
6. Convault Brochure.

For clarity, we have provided our initial comments from October 1, 2020 in black font, the Wright-Pierce response in blue font, and our updated response is provided in red font.

DEC REGULATORY CONFORMANCE

Based on Nitsch Engineering's review of the submitted documents and the above-referenced regulations, we offer the following comments for consideration:

DEC Site Plan Review Design Standards

1. **974 CMR 3.04(4)(a)(3)** requires that Low Impact Development (LID) Stormwater Management design shall be incorporated into the site plan to allow for the full utilization of the property while maintaining the pre-development characteristics of the site as though it were a "green field" (volume, frequency, peak runoff rate) to the maximum extent feasible. This project does not take in to account the green field requirement in the drainage analysis; the Applicant should review and address this requirement.

Wright-Pierce Response (11/20/2020): The “green field” requirement has been addressed for this submittal. All existing impervious surfaces have been modeled as woods/grass in the pre- and post-development land cover calculations.

Nitsch Response (12/01/2020): The SWMP and HydroCAD have been updated to incorporate the ‘green field’ requirement. Comment closed.

2. **974 CMR 4.08(2)(a)** requires compliance with the Massachusetts Department of Environmental Protection (MassDEP) Stormwater Management Standards and the submittal of a completed and endorsed Stormwater Management Form (MassDEP Stormwater Checklist). The MassDEP Stormwater Checklist should be signed and stamped by a Registered Professional Engineer.

   Wright-Pierce Response (11/20/2020): The engineer of record’s stamp has been added to the MassDEP Stormwater Checklist.

   Nitsch Response (12/01/2020): Comment closed.

3. **974 CMR 4.08(4)(g)** requires conducting a falling head soil permeability test in retention/infiltration basins before the basin design in all basins and infiltration structures. To use infiltration rates faster than 8.27 inches per hour, use 50% of the infiltration rate obtained from the falling head soil permeability test. The HydroCAD model shows a rate of 15 inches per hour, which is consistent with information in the Geotechnical Report. However, it does not appear a falling head permeability test was performed. The Applicant should review and address this requirement.

   Wright-Pierce Response (11/20/2020): Based on discussions on October 7, 2020, the Rawls rate has been used in the HydroCAD model rather than the saturated hydraulic conductivity provided in the geotechnical report.

   Nitsch Response (12/01/2020): The Applicant has updated the infiltration rate in the HydroCAD model and SWMP. Comment closed.

STORMWATER DESIGN AND CALCULATIONS

4. Most of the eastern driveway appears to bypass the sediment forebays that provide pretreatment for the infiltration basins. Additionally, the sediment forebay located to the north of the building does not appear to capture any runoff. The grading should be reviewed to evaluate alternatives to direct flow from the driveway towards a pretreatment train that achieves 44% TSS removal prior to discharge to the infiltration basins (refer to comments regarding Standard 4 and Standard 6 of the MassDEP Stormwater Standards below).

   Wright-Pierce Response (11/20/2020): The site grading has been revised for this submittal to provide more efficient flow to pre-treatment devices.

   Nitsch Response (12/01/2020): The Applicant has revised the grading. Comment closed.

5. The sediment forebay and infiltration basin located in the northwestern portion of the site along Patton Road should be labeled for clarity.

   Wright-Pierce Response (11/20/2020): All stormwater BMPs have been labeled for clarity.

Nitsch Response (12/01/2020): The Applicant has revised and labeled the plans. Comment closed.

6. The proposed conditions Watershed Map and HydroCAD model do not appear to be consistent with the stormwater system outlined in the plans. For example, the HydroCAD model does not reference the three (3) drywells, three (3) sediment forebays, and two (2) basins shown on the Site Grading Plan. The Watershed Map is missing much of the relevant stormwater information including the proposed grading and drainage piping. All documents should be made consistent. Note that we may have additional comments on the specific elements of the HydroCAD model once is it updated.

   Wright-Pierce Response (11/20/2020): The proposed conditions watershed map has been revised to clearly show the SW treatment strategy.

   Nitsch Response (12/01/2020): When comparing the plans and HydroCAD model, there are some inconsistencies that make it difficult to understand the modeling strategy. The Drywell #1 and #3 names appear to be swapped in the HydroCAD model compared to the Watershed Map but modeling sizes appear to be consistent with the plans. Is Pond 3P representative of Sediment Forebays #3 and #4? If so, why are Sediment Forebays #3 and #4 modeled but not #1 and #2? The Applicant should review and revise the modeling of these strategies for consistency.

7. The HydroCAD model indicates that the drywells provided to infiltrate the roof have a 6-inch overflow pipe; however, this pipe is not indicated in the detail or plan view.

   Wright-Pierce Response (11/20/2020): Please refer to the detail on sheet C-10. Drywell overflows are located at the base of the roof leader.

8. Nitsch Response (12/01/2020): Understood. The drywell overflow is integrated into the roof drain riser pipe such that water will flow overland if the drywells are full. However, the HydroCAD model does not appear to represent this overflow condition accurately. For example, all three drywells appear to fill up past the three (3) feet of intended drywell storage in the 100-year storm. Rather than routing surcharge beyond this volume to the downstream node, the drywells are modeled with an additional 10 square feet above the drywell. It is unclear how the 10 square feet was determined. We recommend this volume be removed so that the model is more reflective of the proposed overflow conditions. Also, the HydroCAD settings for the dry wells seem to impede the model from discarding the infiltrated volume (i.e. the “excluded horizontal area”). This should be reviewed and revised as needed.

9. The detail for the sediment forebay does not indicate that it will be lined. Given the high infiltrative capacity of the underlying soils, the forebay should be lined to prevent infiltration.

   Wright-Pierce Response (11/20/2020): Noted. A liner has been added to the forebay detail.

   Nitsch Response (12/01/2020): The Applicant has revised the forebay detail to include a liner. Comment closed.

10. A detail should be provided for the swales located around the perimeter of the driveway and parking areas. Similar to the sediment forebay, the swale should be lined to prevent infiltration.

    Wright-Pierce Response (11/20/2020): Noted. The swale detail has been updated to show a liner to prevent infiltration.

    Nitsch Response (12/01/2020): The Applicant has provided a swale detail. Comment closed.

11. Please clarify the source of the two (2) “12-inch Overflow” pipes from the building to the sediment forebay. Are these roof drainage pipes or an overflow from the internal system? Is this water being accounted for in the HydroCAD model?

    Wright-Pierce Response (11/20/2020): The (2) 12-inch overflow pipes are used for emergency overflows only. Due to the infrequent nature of overflows from either pipe, they have not been included in the HydroCAD modeling. One pipe is an overflow from the clearwell, which is finished water. The other overflow is from the process water transfer tank. This water has been treated for Fe and Mn, but has not been treated for PFAS.

    Nitsch Response (12/01/2020): We understand that these pipes are only for emergency and not utilized under standard operating procedures or routine maintenance flushing. Therefore, we agree that these do not need to be included in the HydroCAD model. Comment closed.

12. The excess soil area will require the removal of a substantial area of trees in the western portion of the project site. The Applicant should confirm that this removal of trees is included in the land cover calculations and the HydroCAD model.

    Wright-Pierce Response (11/20/2020): The excess soil area has been revised for this submittal and is shown on the proposed watershed map for clarity. The removal of trees is included in the land cover calculations and HydroCAD modeling.

    Nitsch Response (12/01/2020): The revised calculations account for the excess soil area. Comment closed.

CONFORMANCE WITH THE MASSDEP STORMWATER STANDARDS

In accordance with **974 CMR 4.08(2)(a),** Nitsch Engineering reviewed the stormwater design and calculations for general conformance with the MassDEP Stormwater Standards. Based on this review, Nitsch Engineering offers the following comments:

13. **Standard 3** requires the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook. Based on Hydraulic Soil Group A soils a recharge volume of 0.6 inches over the impervious area is required for the site. The drywells are only sized to infiltrate 0.5 inches over the impervious area and should be revised to infiltrate the required recharge volume based on soil type. Also, it is unclear how the impervious area for the Infiltration Basin Required Recharge Volume in Sections 4.3 of the Stormwater Management Plan was obtained. The Applicant should provide an overall summary that includes the recharge volume provided from all infiltrative practices for all impervious areas.

    Wright-Pierce Response (11/20/2020): The drywells have been resized to store and infiltrate the recharge volume based on 0.6-inches of rainfall over the impervious surfaces. Revised sizing calculations can be found in Section 4 of the SWMP. Additionally, a summary of impervious surface and recharge volume has been provided.

    Nitsch Response (12/01/2020): The Applicant has addressed this requirement and updated the SWMP accordingly. There is a small inconsistency between the total impervious areas listed on the plans and in the SWMP, but the storage is sufficient for the larger of the two numbers. Comment closed.

14. **Standard 3** also requires that at least 44% of the TSS must be removed prior to discharge to the infiltration structure if the discharge is within a Zone II or Interim Wellhead Protection Area. The sediment forebay only provides 25% TSS before the infiltration basin. The Applicant should include additional pretreatment to achieve 44% TSS removal before discharging into the infiltration basin.

    Wright-Pierce Response (11/20/2020): A second sediment forebay has been added to the pre-treatment train on the southern edge of the site. In order to provide 44% pre-treatment, deep sump catch basins have been added to the pre-treatment train along the northern edge of the site. This provides 44% TSS removal prior to discharging into the infiltration basin for both treatment trains.

    Nitsch Response (12/01/2020): The Applicant has addressed this requirement and updated the TSS worksheet and plans accordingly. Comment closed.

15. **Standard 3** also requires that infiltration structures must be able to drain fully within 72 hours. Please provide drawdown calculations for the drywells.

    Wright-Pierce Response (11/20/2020): Drawdown calculations for the drywells have been provided in Section 4 of the SWMP.

    Nitsch Response (12/01/2020): The Applicant has addressed this requirement and updated the SWMP accordingly. Comment closed.

16. **Standard 4** requires the required water quality volume equals 1.0 inch of runoff times the total impervious area of the post-development project site for a discharge within a Zone II or Interim Wellhead Protection Area. The Stormwater Management Report indicates that only 0.5 inch of runoff times the total impervious area is being used for the water quality volume. The Applicant should review and address this requirement.

    Wright-Pierce Response (11/20/2020): The SWMP has been revised to reflect a water quality volume (WQV) based on 1.0 inch of runoff times the impervious surfaces. The infiltration basin has been adjusted to address this requirement.

    Nitsch Response (12/01/2020): The Applicant has addressed this requirement and updated the SWMP accordingly. Comment closed.

17. **Standard 4** also requires a Long-Term Pollution Prevention Plan, which was not provided with this submission.

    Wright-Pierce Response (11/20/2020): A Long-Term Pollution Prevention Plan (LTPPP) has been included with this resubmission and is included in Appendix E of the Stormwater Report.

    Nitsch Response (12/01/2020): A Long-Term Pollution Prevention Plan has been included. Comment closed.

18. **Standard 6** requires stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater Best Management Practices (BMPs) determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. As stated in the above requirements, because the project is located within a Zone II the project requires a Water Quality

Volume of 1.0 inch times impervious area, at least 44% TSS must be removed prior to discharge to the infiltration structure, and for discharges within the Zone I, Zone II, or IWPA, proprietary BMPs may be used for pretreatment only. The Applicant should review and address these requirements.

Wright-Pierce Response (11/20/2020): This requirement has been addressed. Additional pre-treatment has been added and the WQV has been recalculated based on 1-inch of rainfall over the impervious surfaces.

Nitsch Response (12/01/2020): The Applicant has addressed this requirement and updated the SWMP accordingly. Comment closed.

19. **Standard 10** prohibits illicit discharges to the stormwater management systems. The Illicit Discharge Statement provided should be signed by the Engineer of Record.

Wright-Pierce Response (11/20/2020): The engineer of record's stamp and signature have been added to this section.

Nitsch Response (12/01/2020): The Applicant has provided a signed and stamped Illicit Discharge Statement. Comment closed.

NEW COMMENTS BASED ON REVISED INFORMATION:

20. **974 CMR 4.08(3)(b)** requires, in addition to compliance with the SMS, the post-development peak rate of stormwater discharge off-site shall not be greater than the pre-development peak rate of stormwater discharge for the 2, 10, 25, 50, and 100-year storm events from any point of discharge on the site. The post-development rates are greater than the pre-development rates for the 2-year storm. The Applicant should review and address this requirement.

If the Commission has any questions, please call.

Very truly yours,

Nitsch Engineering, Inc.

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Approved By:

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