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New Jersey Department of Environmental Protection
Division of Land Resource Protection
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P.O. Box 420
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November 15, 2024

Via email: scarlett.simpson@dep.nj.gov

**RE: Stormwater Management, Freshwater Wetlands, and Flood Hazard Individual Application Review
West Essex Highlands Inc, Inc. Block No. 179, Lot No.32
West Orange Township, Essex County, New Jersey
PB-24-01 West Essex Highlands, Inc.**

Dear Mrs. Simpson,

At the request of attorney Bruce Afran, counsel for objectors and We Care NJ Corp., Princeton Hydro has performed an independent technical review of the aforementioned development located in West Orange Township, NJ. The project is also the subject of a NJDEP Flood Hazard Area permit and Freshwater Wetland Permit, NJDEP File and Activity No. 0722-04-0001.1, LUP230001. The initial Flood Hazard Area permit had been withdrawn, and the new Flood Hazard Area permit application was submitted on July 22, 2024. Princeton Hydro also reviewed the latest (third) submission of the Freshwater Wetlands permit application. A revised submission was provided to the NJDEP on October 2, 2024. Princeton Hydro has updated our review letter based on the latest submission.

It is Princeton Hydro's understanding that the NJDEP has allowed the project to be exempted from the Inland Flood Protection Rule because the Wetlands permit application was originally submitted prior to implementation of the Inland Flood Rule even though the applicant withdrew the Flood Hazard Permit application and has submitted a new permit application. Princeton Hydro maintains that the project should not be exempt from the Inland Flood Protection Rules.

Documents central to the contents of this letter include but are not limited to the following:

- Plan titled, "Preliminary and Final Site Plans West Essex Highlands Block 179 Lot 32, Tax Map #130 Township of West Orange Essex County, New Jersey, Overall Drainage Area Map" prepared by Paul W. Anderson, PE of Anderson Consulting Services LLC., dated September 23, 2022, last revised October 28, 2024.
- Drainage Report, "Stormwater Management Report (formerly Drainage Report) West Essex Highlands Block 179, Lot 32, Township of West Orange, Essex County, New Jersey," prepared for West Essex Highlands Inc., prepared by Anderson Consulting Services LLC., dated March 12, 2023, last revised October 28, 2024.





It is our professional opinion that the application contains critical deficiencies related to stormwater management. For this reason, the permit application should not be approved at this time.

1.0 INTRODUCTION

The application entails the proposed construction of multi-family residential development with recreational facilities and a clubhouse for residents of the facility with a limit of disturbance of 1,233,793 sf (28.32 acres). The 120-acre parcel is currently undeveloped. The project has not received any Municipal or State approval.

The purpose of this letter is to briefly summarize deficiencies that we have observed in the revised application materials related to critical aspects of the application's compliance with the New Jersey Stormwater Management Rules at N.J.A.C. 7:8.

2.0 STORMWATER MANAGEMENT

The site plans and stormwater calculations have been reviewed to determine if the design engineer has demonstrated compliance with N.J.A.C. 7:8, the New Jersey Stormwater BMP Manual, and the local ordinance. We find the application fails to demonstrate it meets the requirements as it relates to the soil testing requirements and the two of the three of the primary stormwater management performance metrics. The following subsections outline our specific concerns as they relate to these three areas with the application submission. It is our professional opinion that the applicant has failed to demonstrate compliance with the requirements of N.J.A.C. 7:8.

2.1 SOIL TESTING REQUIREMENTS

Prior to the discussions of the issues with the compliance with the three primary stormwater management performance metrics, this section will provide a breakdown of the soil testing requirements and its impact to the compliance to the stormwater regulations. As stated in Chapter 12 of the BMP Manual, understanding the character and saturated conductivity of surface and subsurface soils at a proposed land development site is crucial to the design of stormwater best management practices (BMPs) that meet the requirements of the New Jersey Stormwater Management rules at N.J.A.C. 7:8 (the Rules). Section 2 of Chapter 12 further clarifies that saturated soil hydraulic conductivity and depth to Seasonal-High Water Table (SHWT) are of high importance for the design of stormwater BMPs.

The total number of soil tests required within the footprint of a stormwater BMP is based on the area of the infiltration area. Chapter 12 of the BMP Manual states that a minimum of two soil profile pits must be excavated within the infiltration area of any proposed infiltration BMP. Additionally, for BMP infiltration areas larger than ten thousand square feet a minimum of one additional soil profile pit shall be conducted for each additional area of ten thousand square feet.

Table 1 below is the summary of soil testing within each BMP based on our assessment of the plans and reporting. The table states the BMP number, type, Infiltration area, number of soil tests completed, number of soil test required, and a compliance check.



Table 1: BMP Soil Test Summary

BMP ID - BMP Type	Infiltration Area (SF)	Number of Tests Provided	Number of Tests Required	Compliant (yes/no)
1 – Large Scale Infiltration Basin	32,670	3	5	No
2 – Small Scall Infiltration Basin	26,023	2	4	No
3 – Porous Paving	5,227	None	2	No
4 – Porous Paving	12,197	None	3	No
5 – Porous Paving	14,810	1	3	No
6 – Porous Paving	35,719	1	5	No
7 – Small Scall Infiltration Basin	14,375	2	3	No
8 – Porous Paving	10,019	None	3	No
9 – Porous Paving	6,534	1	2	No
10 – Small Scall Infiltration Basin	9,587	2	2	Yes
11 – Porous Paving	45,948	2	6	No
12 – Small Scall Infiltration Basin	4,182	None	2	No

As can be seen in the table above, the design engineer has only provided the minimum required quantity of soil tests within BMP 10. The remaining BMPs do not have sufficient testing to demonstrate the BMPs will function as designed. As a matter of fact, four BMPs have zero soil tests. The purpose of the soil tests is to demonstrate the soil below the proposed stormwater BMPs are suitable for the selected stormwater BMP. Since adequate testing has not been performed, the applicant has failed to demonstrate the stormwater system is compliant with the soil testing requirements. The soil testing is also used to demonstrate compliance with the groundwater hydraulic impact requirements at N.J.A.C. 7:8-5.2(h). While the applicant submitted groundwater mounding calculations, they cannot be considered valid because of the missing soil testing data.

In the latest stormwater report, an Overall Soil Testing Map (Sheet OA) was provided. It notes locations of new soil tests or potential new soil tests, but any associated test results for these locations were not included.

2.2 GROUNDWATER RECHARGE

Based on our review, the application fails to meet the Groundwater Recharge standards set forth in N.J.A.C. 7:8-5.4. In order for the BMPs to be used to satisfy the Groundwater Recharge Requirements, all requirements of Chapter 6 of the BMP Manual must be met. Based on the deficiencies of the soil explorations noted previously, the design does not have the acceptable number of soil tests required to demonstrate groundwater recharge.

While the project is not compliant with the Groundwater Recharge requirements due to sufficient soil testing, it also reroutes a significant portion of the stormwater runoff in a manner that changes the flow

patterns from the existing conditions. Under the existing conditions, the stormwater runoff sheet flows evenly from the site to the existing wetlands. This flow of water helps to hydraulically support the conditions of the wetland. The proposed improvements will collect and convey the stormwater runoff through the stormwater system and the runoff will be discharged much further downstream. The current design does not replicate the existing groundwater hydraulics in either magnitude or pattern, and the recharge that it does offer concentrates the groundwater recharge much further downstream in the watershed. The proposed development will greatly reduce the amount of stormwater that is discharged (via overland flow and through the groundwater) to the upstream portions of the existing onsite wetlands, as demonstrated in Figure 1. This reduction of received stormwater runoff would cause permanent damage to the wetlands.

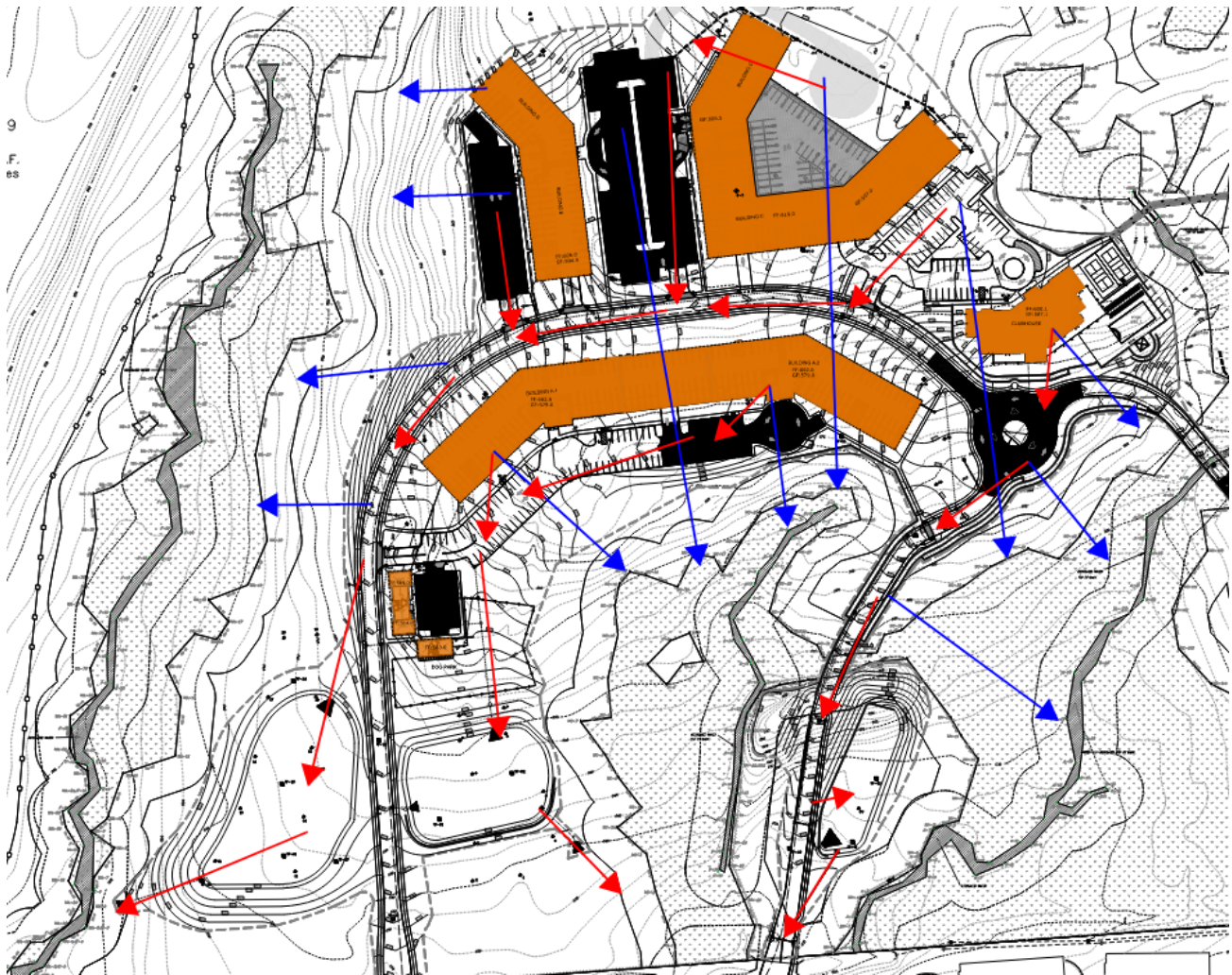


Figure 1: Proposed Grading Plan with Blue Arrows showing the existing drainage path and the red arrows showing the proposed drainage paths and how the runoff is being diverted from the wetlands.

2.3 PEAK FLOW RATE CONTROL (WATER QUANTITY)

Based on our review, the application fails to meet the rules outlined in N.J.A.C. 7:8-5.6 with respect to peak flow rate control. First, the design engineer has designed most of the BMPs using exfiltration during the storm to demonstrate compliance with this standard. Chapter 5 of the BMP Manual explicitly



outlines the conditions that allow the use of exfiltration for routing computations, with the first stating that “all soil testing must be fully compliant with Chapter 12: Soil Testing Criteria of this manual.” As noted in Table 1, none of the proposed BMPs with the exception of BMP 10 have the sufficient number of soil tests to demonstrate the site soils are appropriate for the stormwater design. The erroneous use of exfiltration for routing computations allows the applicant to artificially report reduced peak flow rates in the proposed condition to claim compliance with N.J.A.C. 7:8-5.6.

Furthermore, there is a substantial routing error in the stormwater model. The site is broken down into three points of analysis (POAs). After reviewing the drainage patterns in existing and proposed drainage plans, Princeton Hydro has concluded that there should be four POA's not three. POA2 has two distinct discharge locations on Warner Road and Kuzik Drive. The two roadways are over 500 feet apart. Their flows cannot simply be combined. The drainage area analysis completely ignores any flow in the existing and proposed condition at Kuzik Road. The flows at both points need to be analyzed separately to make sure the stormwater runoff quantity standards as per N.J.A.C. 7:8-5.6 (c). The current design ignores flow at Kuzik Road and risks causing a significant flooding issue unless a separate POA at Kuzik Road is included in the analysis. The current analysis cannot demonstrate that the flow at Kuzik Road meets the peak flow reductions for the 2-, 10- and 100-year storm. The report and modeling give the false appearance that the proposed design meets the required peak flow reduction rates. Only after the fourth POA is developed and analyzed can the model confirm that the design is compliant. It must also be noted that the existing conditions drainage path for POA 2 stops approximately 700 feet short of the actual analysis point which just another error in the analysis that would need to be addressed as shown in Figure 2 below.

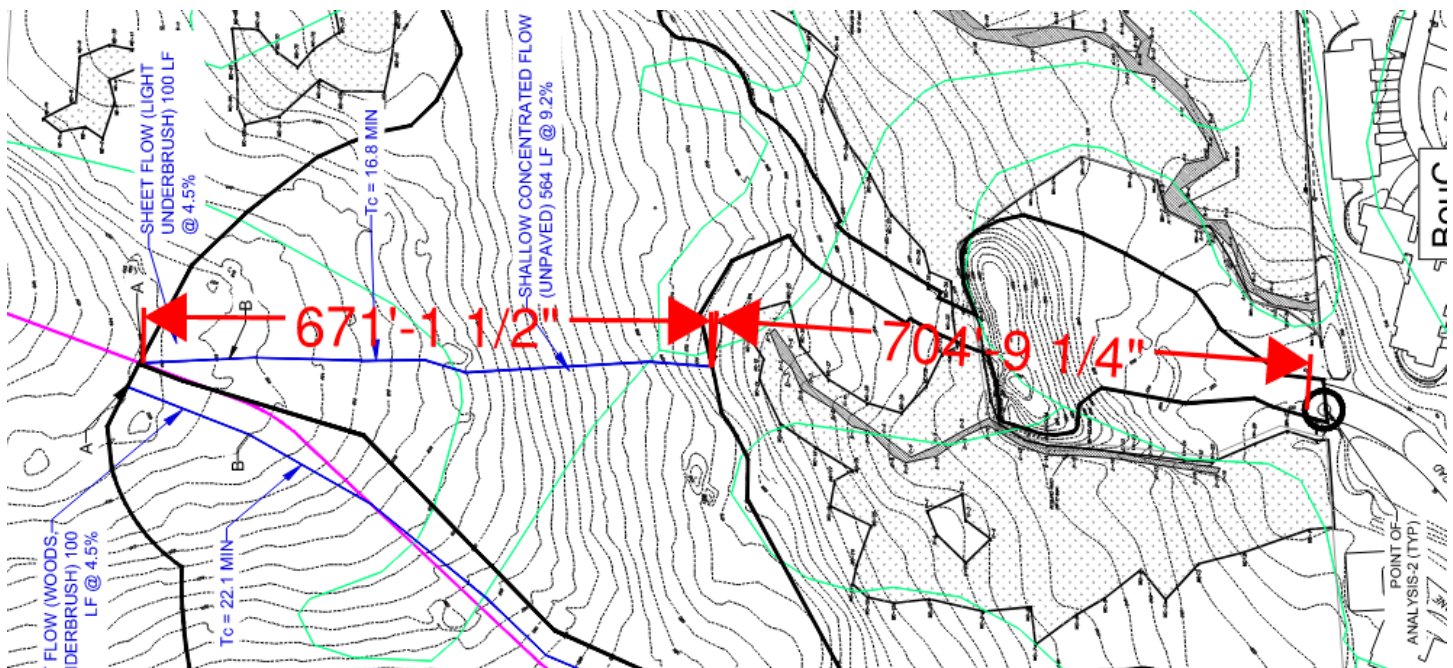


Figure 2: Existing Conditions Drainage Path for POA-2, demonstrating how the analysis stops approximately 700 feet short of the POA location.



The time of concentration (Tc) calculations for the existing conditions model were performed incorrectly, yielding a smaller Tc and resulting in a higher peak flow rate in the existing condition. The designer is required to use the Velocity Versus Slope for Shallow Concentrated Flow graph found on page 26 of Chapter 5 of the BMP Manual (Figure 5-13) to determine the velocity of the runoff traveling through the segment of shallow concentrated flow, but they did not use that graph to determine the velocity. For example, in the existing conditions model at POA 1, the designer assumed the runoff would have a velocity of 16.1 ft/s for 1,625 ft (travel time of 7.2 minutes). Per Figure 5-13, a forested area at a ground slope of 5% would yield a velocity of 0.5 ft/s (travel time of 54.2 minutes). The total time of concentration would thereby be 69.1 minutes as opposed to the 22.1 minutes as used in the applicant's model. A longer time of concentration results in a lower peak flow rate and as stated previously, the proposed design must yield peak flow rates lower than the existing condition. By artificially increasing the pre-development flow rates with erroneous Tc computations, the applicant is able to show the proposed design is in compliance, where in reality, it is not. To demonstrate this, Princeton Hydro remade the model for POA 1 existing conditions using the higher Tc value and found that it lowered the peak flow rate from 19.4 cfs to 10.52 cfs, which is almost a 50% reduction in the peak flow rate. With the reduced existing conditions peak flow rate, POA 1 no longer is compliant with the peak flow rate reduction for the 10-year storm. The proposed condition actually has a higher peak flow rate (15.29 cfs) than the existing conditions (10.52 cfs). This error is present in each drainage area in the existing conditions model, invalidating all reported results.

2.4 GENERAL PLAN COMMENTS

Sanitary sewer and other utilities are proposed below (or within) proposed porous pavement BMPs. Sanitary sewers are required to have 18 inches of vertical separation and 10 feet of horizontal separation from stormwater facilities. Sanitary sewer cannot run through stormwater detention systems.

The analysis provided in this letter is based on the guidance from the NJDEP that this project is exempt from the Inland Flood Protection Rules that became effective on July 17, 2023, and should be evaluated on the NJDEP Green Infrastructure Rules that became effective on March 2, 2021. On the advice of counsel, Objectors reserves the right for further legal action to determine if the Inland Flood Protection Rules are applicable.

3.0 SUMMARY

In conclusion, our detailed review has found that the application is not in compliance with applicable State stormwater requirements. It is my professional opinion that the application does not meet all three central performance requirements of the State stormwater requirements.

Since the project has not demonstrated compliance with all three specific stormwater management requirements of the central goals of stormwater management planning as outlined in NJAC 7:8, in my professional opinion, the application is non-approvable as designed. If the application is approved as designed, the development will increase the frequency and severity of damage expected during a flood in the adjacent and downstream areas.



I appreciate the opportunity to provide you with these engineering services for you. Please do not hesitate to contact me with any questions regarding this review.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Sean Walsh', is written over a faint, light blue circular watermark.

Sean Walsh, PE
Senior Project Manager