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January 14, 2022

Stuart B. Popper, AICP
Director of Planning & Development
Town of Cromwell
41 West St.
Cromwell, CT 06416-0189

RE: Cromwell Inland Wetlands and Watercourses Agency Review
IWWA Application #21-06
Scannell Properties #576, LLC
210 Shunpike Road, Cromwell, CT

Dear Mr. Popper:

LandTech has conducted a review of the application documents pertaining to the proposed site improvements at 210 Shunpike Road and conducted on-site evaluations of the property and surrounding area.

Reviewed application documents include:

- *Town of Cromwell Inland Wetlands and Watercourses Agency Application to Conduct Regulated Activity.*
- *Geotechnical Report, Project Highlands,* 76 Geer Street, Cromwell, CT", by GEI Consulting, Inc., Dated October 18,2021
- *Stormwater Management Report for Project Highlands, 201 Shunpike Road, Cromwell, Connecticut,* prepared by Langan CT, Inc., dated October 2021
- *Wetland Assessment Report Project Highlands 210 Shunpike Road Cromwell, Connecticut.* Prepared for Scannell Properties #576, LLC Prepared by All-Points Technology Corp., P.C. dated October 2021.
- Project Highlands Permitting Drawings 210 Shunpike Road, prepare by Langan CT, Inc. Sheets dated 10/20/2021 and 10/27/2021.
- *Alternative Site Plan #1* Prepared by Langan CT, Inc. Dated 10/22/2021
- *Alternative Site Plan #2* Prepared by Langan CT, Inc. Dated 10/22/2021

Based on the site visits conducted on December 30, 2021 and a review of the above application documents, we offer the following comments for your consideration.

This report was prepared to provide comments during the Inland Wetlands and Watercourses Agency application process. Some of the comments such as those provided for stormwater management may only be applicable for the Planning and Zoning application review process.

Stormwater Report:

Culvert Analysis:

CA 1) The design flows used for the culvert design appear to be taken from StreamStats. Per the ConnDOT drainage manual, these flows may need to be adjusted upward to account for the urbanization of the watershed (See ConnDOT Drainage Manual Section 6.13). The applicant should perform this analysis to verify that they are using the correct design flows for analysis.

CA-2) Although not indicated on the topographic survey, there is an existing culvert downstream of the proposed crossing that crosses Shunpike Road. It is unclear whether an analysis of this culvert was performed to determine what affect that its performance and condition might have with regard to tailwater elevations on the proposed culvert. The FEMA mapping shows much of the area downstream of the proposed culvert within Flood Zone A, meaning that the area likely exhibits some flooding in the 100-year event.

CA-3) With regard to the construction of the culvert and the associated retaining walls, the applicant should consider eliminating the roadway shoulders and guiderails and design the retaining walls to extend above the roadway to act as guiderail protection. This would shorten the culvert length by approximately 8', thereby reducing the area of wetland filling.

CA-4) There is no inlet or outlet protection proposed for the proposed road crossing culvert. The stormwater management report reports velocities of 8+ fps at the inlet and 10+ fps at the outlet. Based on the improved hydraulic characteristics of the culvert, these velocities are likely higher than what the natural stream channel currently experiences, and may result in increased erosion/scour at the inlet and outlet of the proposed culvert. The applicant should justify their decision to omit any stream bed protection in this area.

CA-5) The natural channel bottom is depicted as having a low-flow channel, but no dimensions of this channel are provided. The applicant should provide base flow calculations showing how average daily flows will be contained in the low flow channel, allowing for wildlife passage under the culvert under non-storm conditions. The low flow channel should also be designed to limit flow velocities to allow aquatic wildlife to traverse the culvert in an upstream direction.

Stormwater Analysis & Design:

SA -1) The Cromwell zoning regulations appear to require analysis of the 50-year storm event. The applicant may wish to consider adding the 50-year event to their analysis.

SA-2) The Stormwater Management Report we received provided a summary table of discharges for the 2, 10, 25, and 100-year storm events, but only the detailed HydroCAD output for the 25-year storm was included. Please provide the detailed HydroCAD output for all storm events so that we can complete our review.

SA-3) The drainage system for the entry drive consists of rip rap leak-offs with roadside swales. In general, we support this methodology. We would like the applicant to provide the following information to more fully document their design:

- Gutter flow analysis of the roadway to verify the capacity and spacing of the leak-offs.
- Hydraulic analysis of the roadside swales to verify capacity for the design storm.

SA-4) The applicant may also want to consider incorporating rip rap infiltration trenches at the

bottom of the roadside swales to further promote infiltration and distribute the groundwater recharge more uniformly along the roadway length.

SA-5) We would consider the proposed infiltration basins (D2, F2, F3, F4, G2) to meet the definition of an "Infiltrative Practice" as defined in the 2004 Connecticut Stormwater Quality Manual (CSQM). The applicant also defines them in this way in their SWM Report. As such, we believe that the guidance provided in the CSQM applies to these elements. Our review indicates the following with regards to compliance with the CSQM:

a) Section 11-P3-3 of the CSQM requires a minimum of three field tests and test pits/borings within the footprint of each proposed infiltrative practice. In this case, the applicant has provided a maximum of two tests in the vicinity of proposed basin D-2, and no testing for any of the other proposed Infiltration Basins. We recommend that the applicant perform an additional two soil tests/field infiltration tests within the footprints of the proposed infiltrative practices. In addition, we recommend that the soil tests be performed as test pits, as opposed to borings, so that the soil indicators (redox) of seasonal high ground water can be identified and proper vertical separation distances can be ensured.

b) Section 11-P3-3 of the CSQM specifies that the field-measured infiltration rates in the areas proposed for infiltrative practices should be between 0.3 in./hour and 5.0 in./hour. The infiltration tests provided in the submission materials specify infiltration rates between 8.0 inches/hour and 60.0 inches/hour which are clearly outside of the CTDEEP recommended range. CTDEEP recommends against locating infiltrative practices in these types of soils due to the lack of treatment/renovation and the potential for groundwater impacts. This is especially true when there is a limited vertical separation between the bottom of the basins and the groundwater table. The applicant should justify why the recommendations of the CSQM should not be applied in this case.

SA-6) The large underground detention systems proposed to handle the runoff from the roof of the proposed building are detailed as open bottom structures. The detail calls for these systems to be wrapped with a geotextile fabric/membrane. Based on the outlet structures proposed, it appears that these structures will depend on infiltration to completely drain out after storm events. The same comments that apply to the proposed infiltration basins, as described above, also apply to these underground structures.

SA-7) Please provide drawdown calculations for all stormwater management basins/systems.

SA-8) Please provide computations that demonstrates how the proposed stormwater management facilities meet the CSQM relative to Groundwater Recharge Volume (GRV).

SA-9) Please provide documentation that demonstrates how the proposed stormwater management facilities meet the recommendations of the CSQM relative to Peak Flow Control, more specifically, the recommendations relative to:

a) Stream Channel Protection
b) Conveyance Protection
c) Peak Runoff Attenuation (Complete)
d) Emergency Outlet Sizing

SA-10) The proposed project includes significant areas of roof and pavement. Runoff from these impervious surfaces is often at a much higher temperature than that from lawn/landscaped areas.

The applicant should evaluate and discuss how these potential "thermal effects" are mitigated by the proposed stormwater design.

SA-11) It appears that the large wet basin (B-5) is designed so that the bottom will remain below the water table, based on a single observation of groundwater/mottling at 5.8ft/5.5ft. below the surface (Approximate Elevation 130.5). The maximum static surface water elevation (non-storm event) will be maintained at an elevation of 132.00 by a low-flow orifice in the outlet structure. We have the following comments regarding this basin:

a) The groundwater levels that are being relied on for this design are based on a single, instantaneous observation of the groundwater. We believe that additional testing, as well as groundwater monitoring wells, should be installed and monitored over an extended period of time to more accurately determine the groundwater behavior and variability of the groundwater elevations over time. At a minimum, these observations should extend through the spring "wet" season until late spring.

b) Based on the testing, the seasonal high groundwater elevation is approximately 130.5 (based on observed mottling), and the aquatic bench elevation is set at 131.0. If the pond elevation remains at or below the observed GW elevation for extended periods of time, will the viability of the aquatic bench be affected?

c) The basin does not appear to be equipped with an emergency overflow weir. Clogging of the small outlet orifice and catch basin grate could result in the basin filling to the top of the berm at elevation 137.5, causing the breaching of the earthen berm. We suggest that the applicant consider adding an emergency overflow weir to the basin or demonstrate why it is not advisable to include it.

d) The wet basin will collect runoff from a 67.7-acre area and convey that runoff into a basin with a footprint of approximately 10 acres. The stormwater modelling does not consider the effects of infiltration, which is conservative with respect to runoff rates and volumes. We do feel, however, that the stormwater stored in the basin will infiltrate into the surrounding soils and groundwater, and based on the types of soils in the area, could potentially cause some groundwater mounding in the vicinity of the pond. We suggest that the applicant evaluate this potential groundwater mounding to verify that the effects will not extend past the property limits.

General Site Design:

GSD-1) All proposed grading steeper than 3H:1V should be installed with soil erosion control matting. This shall include both cut and fill slopes.

Soil Erosion & Sediment Control Plans:

ESC-1) The soil erosion and sediment control plans appear to be well thought out and designed: we offer the following observations:

a) The construction sequence lacks sufficient detail for a project of this scope. Additional detail is required, including the approximate duration of each phase, as well as overall project duration.

b) An estimate of earthwork quantities should be included, and should specify the approximate quantities of the various materials (topsoil export, structural fill import, etc.)

c) Due to the large areas being disturbed, the applicant may wish to include additional rows of silt fence/sediment barrier within the project site to limit the transport of sediment across the site and to further limit sedimentation of areas outside of the project area in the event of a failure of the perimeter sediment barrier.

d) We strongly suggest that the applicant construct, stabilize, and provide a temporary or permanent bituminous concrete binder course on the construction access road prior to commencing the main site construction. We believe that the length of the access road, proximity to wetlands, and amount of trucks required for the import/export activities warrant this approach.

ESC-2) If approved, we recommend that the town bond all erosion and sediment control measures and retain an independent third party to provide inspections and reporting by a qualified erosion and sediment control professional on a weekly basis and after each measurable precipitation event of 0.25 inches or greater until the site is permanently stabilized.

Wetland Assessment Report

Wetlands and Vernal Pools

WVP-1)Breeding data from the vernal pools were collected during one breeding season and potential vernal pools 8 and 9 were not evaluated at all as portions of the property had not yet been acquired when the breeding season occurred. There is a lot of variability in vernal pool breeding success from year to year due to a number of factors including rainfall and normal variability in local populations. Therefore, if possible, it is typically better to get more than one year of biological data to confirm if a pool meets the biological component of the definition or not and to identify potential impacts from proposed structures. This appears practical as the next breeding season is expected to start in March of this year.

WVP-2)An approximate 275-foot-long road is proposed to be constructed through wooded areas and near sensitive wetlands. The proposed road will separate the highly functioning Vernal Pool 4 from the high functioning Vernal Pool 2, and Potential Vernal Pools 8 & 9. The path of this road goes through upland habitat critical for amphibian species during the non-breeding season. The expected truck traffic is not appropriate for Geer Street therefore, if this facility is to be constructed, Shunpike Road is the only option. The applicant has proposed best management practices and environmental protections to minimize impacts to vernal pool species. However, there is still a risk of mortal impacts to migrating herpetofauna during both the spring breeding season and during the summer as subadults emerge from the vernal pools.

WMP-3) The road appears to be laid out to skirt the southern boundaries of the 200-foot vernal pool buffers. Data from last year's breeding season show Vernal Pools 2 and 4 to be highly productive. Unless there is geographic or ecological habitat area that is being preserved, the applicant should consider moving the proposed road to the south more to allow for a larger southern buffer for VP 2.

WVP-4)The Wetland Assessment Report states (Pg A-16) that potential vernal pools 8 & 9 are assumed to support breeding by vernal pool species. We assume from this statement that the pools met the physical definition of vernal pools however this was not stated. The applicant should confirm. No physical components were provided for any of the vernal pools or potential vernal pools.

WVP-5)The applicant states that PVP 5 did not show evidence of amphibian breeding last season so they did not consider it a vernal pool. The question we have is does the depression meet the physical components of the vernal pool definition? If so and the pool supports breeding in other years, it may meet the "most years" guideline and may be considered a vernal pool. More information on depth and hydroperiod is needed as this PVP is on the western edge of the proposed development.

WVP-6)Please confirm the spotted salamander egg mass number recorded for VP7, it seems high based on the fact that the vernal pool is surrounded by 300 to 860 feet of agricultural fields which provides little to no escape cover from predators or solar cover in the spring, putting salamanders at risk for desiccation.

WVP-7)We agree with the description of Vernal Pool 7 presented on page A-6 except for the statement that "it is entirely isolated hydraulically from any surrounding wetland or watercourse". We expect there to be a hydrological groundwater connection.

WVP-8)The top of page A-11 states that "Classic" vernal pools are natural depressions in a wooded upland with no hydrologic connection to other wetland systems. Classic vernal pools are not limited to natural depressions, productive vernal pools can also form in manmade basins.

WVP-9)The applicant should provide the response letter of the NDDB request when it is received so that the town can evaluate any special requirements needed by protected or high interest species.

WVP-10) Has a dispersal study been conducted to determine where the breeding herptiles are migrating from and to at each pool? Certain upland habitats are more suitable for amphibians and turtles than others. If the migratory routes are known, one can have a better understanding of potential impacts to migrating animals from structures such as roads. If a study has not been done, estimated habitat usage based on the evaluation of suitable surrounding habitat can provide useful information.

Wetland Impact Mitigation Measures

WIMM -1) How will migrating amphibians and reptiles be kept from entering the stormwater management feature located southwest of the warehouse and the smaller wet and dry basins northwest and west of the building? Basins like these often act like decoy breeding pools. Fencing or other barriers that meet the ground should be installed around these basins to prevent wildlife access.

WIMM-2) Similarly, what exclusion devices are proposed to keep migrating amphibians and reptiles from entering onto the parking lot from Wetland 2/Vernal Pool 6 and the Wetland 12/proposed wetland & vernal pool creation complex?

WIMM-3) The applicant has provided a Wetland and Vernal Pool Protection Program as part of the Wetland Assessment Report. This program discusses how erosion and sedimentation controls will be installed in sensitive herpetofaunal areas. However, it appears to be focused toward migrating animals and not sedentary ones.

It is likely that some of the breeding activity found in Vernal Pool 7 is from mature individuals who live year-round in the wetland buffer and do not migrate over the 300-to-860-foot distance of agricultural field which likely contains little to no vegetation during March and April. This was not discussed in the application. If so, this resident population needs to be protected. What time of year will Wetland 1/Vernal Pool 7 be filled in? Care should be taken to not only avoid disturbance during

the breeding and metamorphosis period, but to also protect any vernal pool species utilizing the narrow upland buffer. Protecting/removing salamanders, frogs etc. living in the narrow buffer around Wetland 1/Vernal Pool 7 will take some detailed work. The applicant should provide some additional procedures for this area.

WIMM-4) A wetland and vernal pool complex is proposed to be created north of the building to compensate for the direct wetland impacts of Wetland 1/Vernal Pool 7 and Wetland 4. The Wetland Assessment Report states that the direct impacts to Wetland 1/ Vernal Pool 7 is 18,007± sf and the impact associated with the road crossing through Wetland 4 is 3,047± sf. The applicant has proposed to create a 25,187± sf wetland of which 12,250± sf will be a created vernal pool. The applicant reports a 1.4:1 ratio.

The wetland creation area appears to be suitable as it is adjacent to a large wetland system and is in the vicinity of Vernal Pool 6 however, we saw no ground water data for this area. During a phone conversation with Dean Gustafson, Senior Wetland Scientist for the applicant on January 13, 2022, Dean stated that the groundwater in this area is being monitored to determine if it is suitable for the wetland and vernal pool creation that is proposed. The applicant should provide details of this monitoring program and present the results to the commission for discussion. The results may require altering the design of the wetland and vernal pool creation.

Current science tells us vernal pool creation should be much larger than the area it is intended to replace (Klemens et. al. 2021[1]). The Army Corps of Engineers New England District Compensatory Mitigation Guidance (Appendix C) (published September 7, 2016) recommends 4:1 creation for forested wetlands. The reason for this is that vernal pools are complex systems and therefore it is difficult to recreate all of the aspects of an existing pool and make it function like the one being replaced. Therefore, current practice is to create a much larger vernal pool habitat to compensate for those areas that will not function as intended. The applicant should consider creating a larger vernal pool or multiple smaller systems in close proximity to each other to provide appropriate compensation.

WIMM-5) The area southeast of Wetland 7 is currently cleared agricultural fields. This area will remain undeveloped and as part of the planting plan should be replanted up to the western edge of the development in order to accelerate the establishment of suitable wetland and vernal pool buffer for Wetland 7/Vernal Pool 4.

Based on our comments, we anticipate that the applicant may need to make some revisions to the current plan set and anticipate that an additional review will be required once revised materials are submitted. If you have any questions or require further assistance, please call us.

Yours truly,

LANDTECH

Thomas Ryder
Certified Ecologist

Robert Pryor, P.E., L.S.

[1] Klemens, M.W., H.J. Gruner, D.P. Quinn & E.R. Davison, 2021. *Conservation of Amphibians and Reptiles in Connecticut.* Department of Energy and Environmental Protection