April 8, 2020

Worcester Conservation Commission
Worcester Division of Planning & Regulatory Services
City Hall
455 Main Street, Room 404
Worcester, MA 01608

Re: Notice of Intent (NOI)
Salisbury Street @ Willowbrook Drive, Worcester
Applicant: Xenos Custom Homes, LLC

Dear Commission Members:

This letter is written to provide responses to the email from Stefanie Covino dated April 7, 2020. For clarity, I have provided the comment from the email (in italics) followed by a detailed response from the applicant, engineer and EcoTec, Inc. as follows:

1. **clarification of plans and break up of plan sheets as previously described.**  
   **Response:** We have considered possible options for breaking up the plan sheets and find that separating the compiled information makes the plan more difficult to understand; i.e., the current plan layout is the most informative. We note that the plans submitted are consistent with plans for similar projects approved by the Commission, and in keeping with industry standards and practice. While we have considered this request, it is our opinion that the plans provide the required information in the most effective manner and separating the plans is not helpful in understanding the site.

2. **request to provide soil boring/testing to determine depth of clay soil and permeability. Is the engineer able to provide this information?**  
   **Response:** Scott Morrison, RPSS of EcoTec conducted an evaluation and confirmed that there is an approximate 6” clay cap over a sandy draining layer. This construction profile is analogous to a bituminous road construction profile, with a draining layer below an impervious layer, to minimize frost heaves and settling. John E Finlay, PE of Finlay Engineering, the project engineer has determined that the clay tennis court should be considered an impervious surface. The K (or hydraulic conductivity) factors for clay, is approximately 0.01 to 0.001 feet per day. Based upon EcoTec’s inspection there is a clay cap over a sandy draining layer. However, given the K factors of the clay water would runoff before ever infiltrating into the clay surface. As previously noted, the project results in a net decrease in impervious cover. Lastly, the proposed project will remove this clay court and install well-draining topsoil to promote infiltration into the soils, which are mapped as class “B” soils. As such, even if one argues that the clay is not
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100% impervious, the removal of this large area of clay court and replacement will well-draining topsoil will unquestionably increase infiltration on the site.

3. whether the brook is perennial or intermittent. While it does not meet the criteria for determining perennial, it does appear to meet the definition of flowing “throughout the year” based on what neighbors have shared and what I’ve seen. It also appears to have been perennial in the past before there was human modification of the stream. I’m not sure how the Commission will interpret this based on the WPA regulations of 310 CMR 10.58(2)a.1.f:

“Rivers and streams that are perennial under natural conditions but are significantly affected by drawdown from withdrawals of water supply wells, direct withdrawals, impoundments, or other human-made flow reductions or diversions shall be considered perennial.”

Response: We concur with Ms. Covino’s statement: “While it does not meet the criteria for determining perennial,” which is based upon the Wetland Regulations and indicates that the stream shall be deemed intermittent. EcoTec agrees with this determination.

There is a detailed procedure within the Wetland Regulations to determine if a stream would qualify as perennial under the Act at 310 CMR 10.58(2) 1 (a through c). Sections a and b require the stream to be mapped as perennial or the watershed to exceed 1 square mile. Neither of these criteria apply to the site. Section c(i) requires a 0.5 to 1 square mile watershed and a flow rate greater than or equal to 0.01 cubic feet per second at the 99% flow duration (using USGS StreamStats). Section c(ii) requires the stream to have a watershed of 0.5 to 1 square miles and 75% or more stratified drift. StreamStats could not be used to generate a flow rate for this site or other sites in the area. Therefore, one must determine if subsection (ii) of the regulations has been met. The StreamStats analysis, which was prepared and submitted within the Wetland Resource Evaluation report, found the stream to have a watershed of 0.91 square miles with 0% stratified drift (sands and gravel). Based upon an evaluation of the stream, neither subsection (c)i nor (c)ii of the regulations has been met. As such, in accordance with the regulations the stream “is intermittent.” I have attached the regulatory citation as an attachment to this letter. EcoTec’s Wetland Resource Evaluation report provides the documentation necessary for this conclusion that the stream shall be found to be intermittent.

In addition, this email indicates that the Agent believes the stream to be perennial “based on what neighbors have shared and what I’ve seen.” It is unclear what has been shared or seen, but the regulations require the stream evaluation to be completed as detailed above. The regulations do not have provisions to allow long-term observations to determine the stream status. Stream observations may only be utilized to present information to overcome a perennial designation, which does not apply to this stream. The Preface to the

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2002 Wetland Regulations (when the subject regulatory provisions became effective) explains the MassDEP’s position in writing the Regulations, and states that:

“Streams that do not fit into these categories must be classified as intermittent. Unfortunately, proving that a stream is perennial by direct observation requires multiple observations made in the late summer and early fall months over many years, and the Department could not craft a workable provision to accommodate those timeframes.”

It is also worth noting that the citation provided in the Covino email referencing 310 CMR 10.58(2)a.1.f provides only a small subsection of the section of the regulations. This is a misleading citation of the regulations because the quoted section of the regulations is intended to prevent someone from overcoming the perennial stream designation for a stream with withdrawals or human-made flow reductions. The applicant is not attempting to overcome a perennial determination. Therefore, this section of the regulations is not applicable to the stream on the site. The Regulations are clear that a watershed of 0.91 square miles and 0% stratified drift always requires an “intermittent” stream designation.

Furthermore, even if the stream were deemed perennial the project is fully compliant because all work within 25-feet of the stream consists of work within the tennis court. The tennis court consists of clay and therefore lacks “top soil.” As such, this area would be deemed “previously degraded,” which would allow for the redevelopment of this area.

4. This area appears to flood and has experienced flooding in the past, to the point where the City took action in the late 90s to install a culvert in attempts to alleviate this. This was brought up at the past 3/2 meeting as well as the recent meeting of the Planning Board when this was heard. To determine whether this land is unmapped BLSF, please provide calculations determining the extent of flooding for both the 100 and 10 year storms as described in 310 CMR 10.57(2)(a)3-4 (7.0” and 4.8” respectively).

Response: The boundary of Bordering Land Subject to Flooding (BLSF) is defined at 310CMR 10.57(2)(a)3 as defined below:

“3. The boundary of Bordering Land Subject to Flooding is the estimated maximum lateral extent of flood water which will theoretically result from the statistical 100-year frequency storm. Said boundary shall be that determined by reference to the most recently available flood profile data prepared for the community within which the work is proposed under the National Flood Insurance Program (NFIP, currently administered by the Federal Emergency Management Agency, successor to the U.S. Department of Housing and Urban Development). Said boundary, so determined, shall be presumed accurate…."

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The Wetland Resource Evaluation report provides a copy of the most recent FEMA data. Based upon a review of the Flood Insurance Rate Map, Worcester County, Massachusetts, Map Number 25027C0612E, Effective Date July 4, 2011, the site is mapped as Other Areas: Zone X, which is defined as areas located outside of the 0.2% annual chance flood (i.e., outside of 500-year floodplain). Therefore, BLSF is presumed to not occur on the site and a drainage analysis is not required. EcoTec is not aware that any credible information has been presented to overcome that presumption.

We hope that this response provides the clarity that the agent was seeking. We look forward to meeting (virtually) with the Commission regarding this project. If you have any questions, please feel free to contact me at any time.

Sincerely,

Scott M. Morrison, PWS
Senior Environmental Scientist

C: John E Finlay, II PE
Xenos Custom Homes
From 310 CMR 10.58(2)(a)

1. A river is any natural flowing body of water that empties to any ocean, lake, pond, or other river and which flows throughout the year. Rivers include streams (see 310 CMR 10.04: Stream) that are perennial because surface water flows within them throughout the year. Intermittent streams are not rivers as defined herein because surface water does not flow within them throughout the year. When surface water is not flowing within an intermittent stream, it may remain in isolated pools or it may be absent. When surface water is present in contiguous and connected pool/riffle systems, it shall be determined to be flowing. Rivers begin at the point an intermittent stream becomes perennial or at the point a perennial stream flows from a spring, pond, or lake. Downstream of the first point of perennial flow, a stream normally remains a river except where interrupted by a lake or pond. Upstream of the first point of perennial flow, a stream is normally intermittent.

   a. A river or stream shown as perennial on the current United States Geological Survey (USGS) or more recent map provided by the Department is perennial.

   b. A river or stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size greater than or equal to one square mile, is perennial.

   c. A stream shown as intermittent or not shown on the current USGS map or more recent map provided by the Department, that has a watershed size less than one square mile, is intermittent unless:

      i. The stream has a watershed size of at least $\frac{1}{2}$ (0.50) square mile and has a predicted flow rate greater than or equal to 0.01 cubic feet per second at the 99% flow duration using the USGS Stream Stats method. The issuing authority shall find such streams to be perennial; or

      ii. When the USGS StreamStats method cannot be used because the stream does not have a mapped and digitized centerline (including but not limited to streams located in the following basins: North Coastal Basin, Taunton Basin, Buzzards Bay Basin, Cape Cod and Islands Basin, and that portion of the South Coastal Basin that is south of the Jones River sub-basin), and the stream has a watershed size of at least $\frac{1}{2}$ (0.50) square mile, and the surficial geology of the contributing drainage area to the stream at the project site contains 75% or more stratified drift, the issuing authority shall find such streams to be perennial. Stratified drift shall mean sand and gravel deposits that have been layered and sorted by glacial meltwater streams. Areal percentages of stratified drift may be determined using USGS surficial geologic maps, USGS Hydrological Atlases, Massachusetts Geographical Information System (MassGIS) surficial geology data layer, or other published or electronic surficial geological information from a credible source.

EcoTec, Inc.