

# EcoTec, Inc.

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## ENVIRONMENTAL CONSULTING SERVICES

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July 5, 2023

Sturbridge Conservation Commission  
Center Office Building  
308 Main St  
Sturbridge, MA 01566

Re: Notice of Intent  
68 Paradise Lane, Sturbridge  
Applicant: Jeffrey Buchanan

Dear Commission Members:

This letter is written to address comments provided by the Commission and agent during the June 22, 2023, Conservation Commission hearing. These comments relate to mitigation suggested by the Commission for the replacement of the existing single-family on the site.

### Adjust the House Configuration and Layout:

The proponent provided an alternative house layout as depicted on the Alternative Concept Plan by McClure Engineering dated June 15, 2023. Based upon discussion with the Commission this alternative is preferred by the Commission, and it was further suggested that this house be rotated clockwise on the lot to provide the most amount of setback from the wetlands as possible. The proponent has subsequently had the architect redesign the house layout using this configuration.

### Treat Road Runoff:

The plan proposes the use of a rain guardian turret to provide treatment from road runoff prior to entering the wetland. Currently there is no treatment.

### Roof Infiltration:

The proposed project includes roof infiltration at two locations. One to the rear of the proposed house and one located between the proposed house and the roadway. This provides an improvement over existing conditions, which provides no infiltration system.

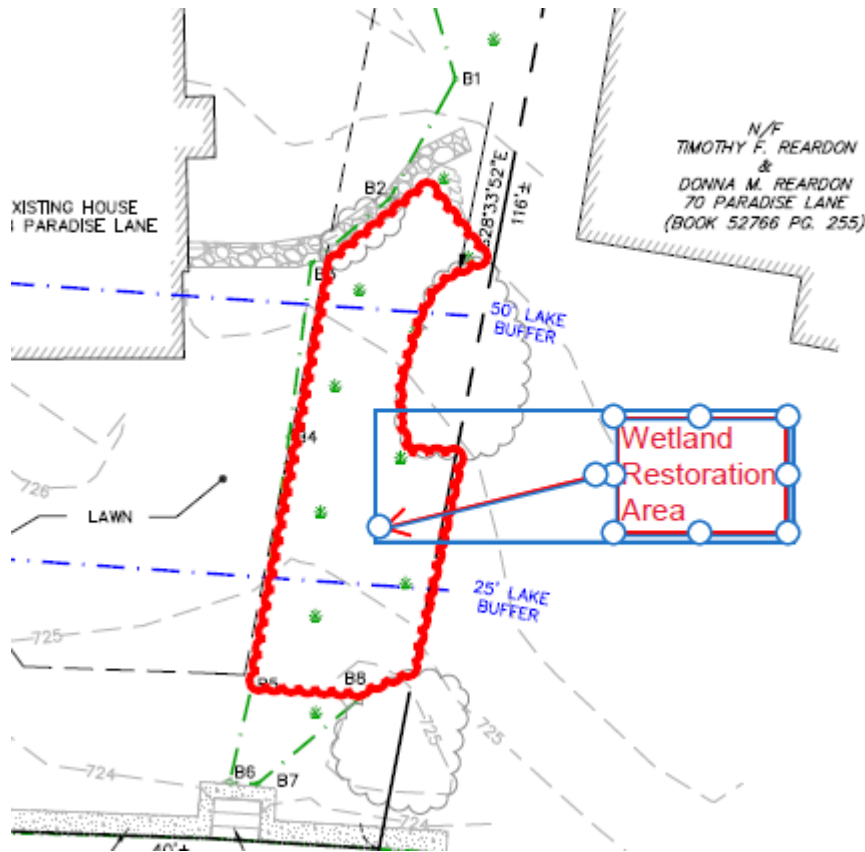
### Restoration of Wetlands:

The following restoration measures are proposed in two areas as follows:

The existing grass will be removed and replaced with an equal thickness of topsoil. Alternatively, the sod may be cut, removed that replaced with the grass facing downward. This prevents the existing grass from competing against the plantings as they are getting established. Once this is completed, the following vegetation will be planted.

**Planting Plan for Wetland Restoration Area East of (B2-B5)**

SPECIES; SIZE; SPACING	NUMBER
Shrubs	4
Meadowsweet ( <i>Spiraea latifolia</i> )	
Steeplebush ( <i>Spiraea tomentosa</i> )	
Highbush blueberry ( <i>Vaccinium corymbosum</i> )	
Winterberry ( <i>Ilex verticillata</i> )	
Serviceberry ( <i>Amelanchier canadensis</i> )	
Witch hazel ( <i>Hamamelis virginiana</i> )	
Herbaceous;	
Cinnamon fern ( <i>Osmunda cinnamomea</i> )	10
Ostrich fern ( <i>Matteuccia struthiopteris</i> )	
Marsh fern ( <i>Thelypteris palustris</i> )	
Boneset ( <i>Eupatorium perfoliatum</i> )	
Soft rush ( <i>Juncus effusus</i> )	
Or similar native plants	



It should be noted that the well is proposed to be abandoned in accordance with MassDEP and Board of Health requirements.

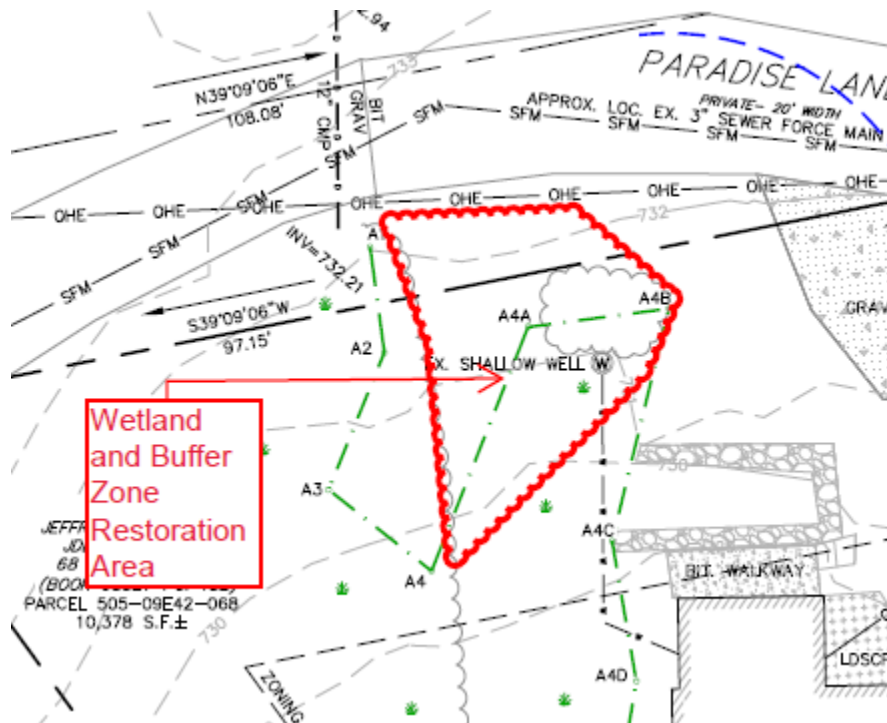
**Planting Plan for Wetland Restoration Area at the Well**

SPECIES; SIZE; SPACING	NUMBER
Saplings	2
Red maple ( <i>Acer rubrum</i> )	
Gray birch ( <i>Betula populifolia</i> )	
Shrubs	5
Sweet Pepperbush ( <i>clethra alnifolia</i> )	
Meadowsweet ( <i>Spiraea latifolia</i> )	
Steeplebush ( <i>Spiraea tomentosa</i> )	
Highbush blueberry ( <i>Vaccinium corymbosum</i> )	
Winterberry ( <i>Ilex verticillata</i> )	
Herbaceous;	
Cinnamon fern ( <i>Osmunda cinnamomea</i> )	10
Ostrich fern ( <i>Matteuccia struthiopteris</i> )	

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Marsh fern (*Thelypteris palustris*)  
Boneset (*Eupatorium perfoliatum*)  
Soft rush (*Juncus effusus*)  
Or similar native plants

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Mark trees to be cut:

Dead, diseased, and/or dying trees proposed to be removed have been marked on the site. These consist of several ash, hemlock and a birch trees. Saplings and shrubs less than 5" will remain.

Alternatives Analysis for Foundation vs. Piers:

The proponent has assessed the alternatives between a concrete foundation and constructing the house on piers. This evaluation assessed three alternatives consisting of a concrete foundation, pier foundation, and a hybrid approach as detailed below.

Concrete Foundation: This alternative would utilize a concrete foundation to provide for the walls and basement crawlspace foundation. Due to groundwater and elevations on the site a full foundation is not feasible. This foundation will require excavation, pouring of foundation footings, walls and concrete slab. The benefits of this type of foundation allow for a permanent base for the new home and will allow for a vapor barrier to be installed beneath the concrete slab to limit moisture into the home. In addition, this type of foundation allows for the home's mechanical system and water and sewer connections to be contained within the structure and provides frost protection. This is the preferred alternative of the applicant.

Pier Foundation: This alternative would utilize a number of piers to be installed to serve as the homes foundation. This would reduce the amount of excavation work required for the construction of the home. The proponent consulted with the project architect and the piers only have a 15-year warranty. Should the piers require replacement, it would result in significant additional disturbance. Pier foundations require excavation of the existing topsoil and replacement with stone beneath the home to provide stabilization. As such, there is only slightly less excavation required under this alternative. It is also worth noting that by eliminating the foundation, frost protection for the water and sewer service lines would rely upon insulation during winter months. Should there be a significant freeze, a rupture of the services could result in a significant impact to the adjacent lake. Given the excavation required, short lifespan of the piers, and the frost protection concerns this alternative has been dismissed.

Hybrid Foundation:

Given the Commission's suggestion that the home be placed on piers, we analyzed a hybrid between both foundation alternatives we assessed the possibility of constructing a foundation in a portion of the structure and utilizing piers in other portions of the structure. This would provide the benefits of both options including providing frost protection for the utilities and permanent stability of a concrete foundation for the home along with the pier foundation preferred by the Conservation Agent for the rear portion of the structure. As such, this hybrid alternative has been selected.

Well Setbacks:

The engineer has reviewed the well setbacks, and this will be addressed through the Board of Health.

Provide a construction narrative-sequence:

The following construction sequence has been prepared to provide the details and sequence of construction to ensure that the project is constructed in the least impactful way possible.

1. Installation of perimeter erosion controls;
2. Install Construction entrance tracking pad;

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3. Excavate foundation from the lake side of the lot toward the roadway;
4. Install the foundation;
5. Install perimeter drain, utility connections;
6. Backfill foundation and regrade the site;
7. Complete construction;
8. Install driveway and walkway;
9. Loam, seed and permanently stabilize the site;
10. Restore wetlands and install mitigation plantings; and
11. Remove erosion control barriers (with approval of the Conservation Commission).

We look forward to meeting 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

17/E/SturbridgeParadise68NOILetter2023.7.5