GODDARD CONSULTING LLC
Wetland Strategies

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Wetland Replication Plan

12 Summer Street – Lot #2

Acton, Massachusetts

Submitted to:

Acton Conservation Commission
472 Main Street
Acton, MA 01720

Prepared for:

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Introduction

In order to mitigate the proposed impacts to wetland resource areas, the following Wetland Replication Plan is proposed. It is proposed to fully restore the wetland function and value incurred by the proposed filling of two areas of Bordering Vegetated Wetland (BVW) resource area totaling 1,538 s.f. Refer to *"Notice of Intent Plan"* prepared by R. Wilson Associates, dated 2/2/15, for proposed alteration and replication locations.

Approximately 2,950 s.f. of BVW will be created as mitigation for the permanent alteration of 1,538 s.f. of BVW, along with approximately 1,762 s.f. of in-place restoration of the existing foot path within wetland along the proposed driveway and any temporary alteration from erosion control. The BVW replication area is located adjacent to wetland flags #A48 to A56, at the 190-foot existing contour line. No net loss of BVW is proposed, rather a total of 1,412 s.f. of additional BVW will be created as a result of this project.

Existing Conditions

The overall wetland system in the vicinity of the replication area consists of forested wetland, with numerous medium-sized red maples forming a dense tree canopy. There are pockets of shallow standing water interspersed among the maples, and numerous hummocks covered with tussock sedge (Photo 1). The proposed wetland replication would be designed to go around existing trees to prevent removal.

Photo 1- Forested wetland habitat in BVW near replication area.

At the wetland edge, the habitat transitions from standing pockets of water to dry land, with tussock sedge becoming more sparse, some skunk cabbage, small arrowwood and glossy buckthorn shrubs, and poison ivy ground cover (Photo 2). Further north, the vegetation at the

wetland edge consists of Canada mayflower, cinnamon fern, and some silky dogwood shrubs.

Photo 2 - Wetland habitat at BVW border, near flag #A49.

The replication area itself consists of small white pine and oak trees near wetland flags #A48-A56 (Photo 3).

Photo 3 - Habitat in southern portion of replication area, facing BVW.

An existing trail runs through the eastern portions of the area (Photo 4).

Photo 4 - Existing foot trail within replication area, facing north.

Planting Plan (see attached plan)

The goal of the replication area is to mimic the existing vegetation, soils, and wetland functions of the adjacent BVW. Therefore, the plan calls for the planting of red maple saplings, silky dogwood and arrowwood shrubs, and clumps of tussock sedge and boneset ground cover. The area is designed to accommodate temporary flooding in early spring, but will remain dry most of the year. The existing trail will be re-routed outside of the area to the east.

General Installation and Monitoring Procedures

- **Supervision**: All work within the replication area and restoration areas shall be supervised by a qualified wetlands scientist/consultant.

- **Timing**: In order to optimize planting conditions, fall construction is preferred. The optimal time of year for plant installation is September to mid-October.

Step 1: Survey. Field stake limits of replication area.

Step 2: Erosion control. Install new erosion control barrier along western boundary of replication area to prevent any alteration to adjacent BVW.

Step 3: Vegetation Removal. Remove trees, shrubs and herbaceous vegetation (including stumps) from within replication area, with care being taken not to allow any debris beyond the erosion control barrier. Some existing red maple trees will remain in the wetland replication area as determined by the supervising wetland scientist. If grading needs to be performed close to

these trees, a field determination will be made during construction to decide what grading is acceptable around these trees. During construction, care will be taken to disturb the roots as little as possible, including techniques such as making clean root cuts, hand grading, and placing mulch over the exposed areas after work has been done to protect the roots from drying out. The edge of the wetland replication plan is designed to prevent removal of as many trees as possible.

Step 4: Excavation. An excavator shall remove all upland soil up to the edge of the erosion control barrier within the replication area to at least 12 inches below finish grade elevation (190' +/-) or where natural muck or wetland soils are observed and the wetland scientist determines that a suitable depth has been reached. The site contractor shall work from the wetland side and move upgradient.

Step 5: Final Grading. Upon removal of all soil, suitable hydric soils shall be graded up from the existing haybale and silt fence edge to the edge of the replication area. The final grade for the replication area shall be 189-190' +/-. A minimum of 12 inches of the translocated topsoil from the BVW fill areas as well as any additional topsoil mixed with leaf compost shall be placed and shall be stabilized by an organic mulch tackifier. The soils are to be inspected and approved by the wetland scientist prior to installation.

Step 6: Planting. The following planting schedule is proposed. The plantings will be placed with the herbaceous closest to the existing wetland line, then the shrubs, then the saplings in order to imitate the existing wetland. Precise citing of plants will be done by wetland scientist in the field prior to installation.

- 5 red maple trees (*Acer rubrum*) – 4-6' tall
- 20 silky dogwood (*Cornus amomum*) – 3-4' tall
- 20 arrowwood (*Viburnum dentatum* or *recognitum*) – 3-4' tall
- 200 tussock sedge (*Carex stricta*) - 2" plugs
- 100 Boneset (*Eupatorium perfoliatum*)- 2" plugs
- 100 Joe-Pye Weed (*Eupatorium maculatum*)- 2" plugs
- New England Wetmix (Wetland Seed Mix), New England Wetland Plants- 2 lbs
- Native mulch shall be spread throughout the replication area upon completion of plantings.

Step 7: Restoration. The in-place restoration of the trail within BVW and the erosion control will be performed after the completion of the stabilization measures for the construction and once the erosion control can be removed. De-compaction of the soils shall be performed prior to the seed mixes. Goddard recommends the use of a seed mix in the erosion control footprint as well as in the existing trail consisting of the New England wetmix seed mix from New England Wetland Plants or the equivalent. The seed mix should be placed in the appropriate ratio, with a layer of hay or mulch placed on top to stabilize. The proposed plantings in the restoration areas are:

- 5 red maple trees, (*Acer rubrum*)- 4-6' tall
- 15 silky dogwood (*Cornus amomum*)- 3-4' tall
- 15 arrowwood (*Viburnum dentatum* or *recognitum*) – 3-4' tall
- New England Wetmix, New England Wetland Plants- 1 lb

Step 8: Bordering Land Subject to Flooding Restoration. Once the BLSF mitigation area is completed, it will need to be restored with native vegetation and monitored for invasive plant species. There is approximately 649 cubic feet of fill proposed within BLSF, and 649 cubic feet of compensatory storage proposed. The topsoil from the excavation area should be put aside and once excavation is completed, the topsoil returned to its location at the appropriate grade. The compensatory storage area will be replanted with native vegetation as follows:

- 2 gray birch trees (*Betula populifolia*)—4-6' tall
- 3 Sweet pepperbush (*Clethra alnifolia*)—3-4' tall
- 4 Witch hazel (*Hamamelis virginiana*)—3-4' tall
- 3 Highbush blueberry (*Vaccinium corymbosum*)—3-4' tall
- New England Roadside Matrix Upland Seed mix- 1 lb (to be used within the compensatory storage area as well as along the upgradient slope.

Step 9: Monitoring and Reporting. Monitoring for three full growing seasons shall occur with annual reporting to the Acton Conservation Commission. Monitoring will include documentation of success or failure of the replication area and the restoration areas. Success will be measured by the replication standards in the Wetlands Protection Act, specifically, suitable wetland soils, wetland hydrology, and 75% cover of wetland vegetation after two seasons. Where plant mortality or other indicator of failure is evident, the wetland scientist will recommend steps to correct. A soil, plant (with % coverage), and wildlife inventory will be submitted with each inspection report.

<u>Performance Standards for Soils</u>

1. If manmade topsoil is used in the replication area, the topsoil will consist of a mixture of equal volumes of organic materials and topsoil. Decomposed clean leaf compost is the preferred soil amendment.
2. "Clean" soils refer to a negligible amount of physical contaminants (plastic) or chemical contaminants (hazardous to plants and/or animals).
3. Compost should be free of invasive plant species.
4. Stockpiling standards are as follows:
    a. Soil should not be stockpiled in wetlands or waters
    b. Seek approval for location of stockpiled materials
    c. Avoid stockpiling compost organics in piles over 4 feet in height
    d. Protect stockpiles from surface water flow by containing them with hay bales and/or silt fence
    e. Cover stockpiles with a material that prevents erosion (tarp, erosion control mat, straw, and/or temporary seed)
    f. Inspect and repair protection measures listed above regularly (weekly), as well as before (if possible) and after storm events
    g. Maintain moisture in the soils during droughty periods
5. Avoid soil compaction if possible or have measures prepared to rectify compaction.
6. Irrigate the plantings in the wetland replication area during the first growing season after planting to prevent drying out.

<u>Invasive Plant Species Management</u>

1. The existing replication area and BVW has few invasive plant species. To prevent the spread of invasive plant species into the site, the following measures are suggested:
    a. Check machinery and clean it before entering the site to prevent the spread of seeds.
    b. Ensure that the soils and compost brought on site are from companies that do not mix contaminated soils.
2. Should invasive plant species be found within the replication and restoration areas, the following measures are suggested to remove and discourage the species:
    a. Mechanical measures:
        i. Hand-pulling
        ii. Hand-cutting
    b. Chemical measures: (to be used as a last resort or if mechanical measures will not impact the specific invasive species)
        i. Cut-stump treatment
3. The invasive plant species, like European buckthorn, within 20 feet of the wetland replication area will be hand-removed.
4. The wetland replication and restoration areas will be monitored for a period of two years following the completion of the work for invasive species growth. Management will be performed as necessary.