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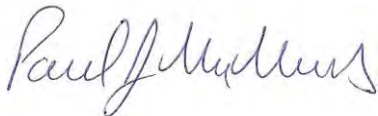
WILDLIFE HABITAT EVALUATION:

The Residences at Johnson Farm
189 Landham Road
Sudbury, Massachusetts

Prepared For:

Madison Place Sudbury, LLC
15 Brickyard Lane
Westborough, MA 01581

Prepared By:



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President



Scott M. Morrison, RPSS
Sr. Environmental Scientist

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INTRODUCTION

The Sudbury Conservation Commission (“SCC”) and Zoning Board of Appeals (“ZBA”) have each requested supplemental information relative to the issue of impacts of the proposed Johnson Farm project to wildlife habitat. The regulatory background and performance standards for the evaluation and protection of wildlife habitat under the Massachusetts Wetlands Protection Act (M.G.L. Ch. 131, § 40; the “Act”) and its implementing regulations (310 CMR 10.00 *et seq.*; the “Regulations”) as administered by the SCC and the Sudbury Wetlands Protection Bylaw and associated Regulations (“the Bylaw”) as administered by ZBA under the Comprehensive Permit application are presented in a separate Wetlands Performance Standards Evaluation prepared by EcoTec. This Habitat Assessment was conducted for the proposed Johnson Farm residential apartment community project to evaluate the site as requested by the Sudbury Conservation Commission and Zoning Board. This Habitat Assessment was conducted by Scott M. Morrison, RPSS; and Paul J. McManus, PWS. Brief descriptions of our experience and qualifications are attached. As noted in EcoTec’s Wetlands Performance Standards Evaluation under separate cover, a wetland wildlife habitat evaluation in conformance with the Massachusetts Wetland Regulations has previously been completed and submitted. This additional assessment described herein has been provided in response to requests for further evaluation by the Commission and ZBA. As a framework for this additional requested assessment, EcoTec has utilized the evaluation process outlined in the Massachusetts Endangered Species Act (MESA) regulations for review of projects for a “take” of state-listed species in Priority Habitat on sites of more than 10 acres as outlined in 321 CMR 10.18 and 10.20. Please note that although the MESA assessment process is being utilized, the project site is located outside of Priority Habitat for state-listed species and no MESA jurisdiction exists on the site.

COVER TYPE ASSESSMENT:

EcoTec obtained a site plan from TetraTech, which included aerial photography, the boundaries of BVW and vernal pools, and Riverfront Areal. This plan, and field observations made on November 22, 2011 by Mr. Morrison and Mr. McManus, were utilized by EcoTec to generate a generalized cover type map for the Site (see Appendix B: Existing Cover Type Plan). The cover type plan with the development overlay is included to this report as Appendix C.

The habitat on the Site includes eight distinct upland cover types:

- (1) Aspen-Birch Forest (“UF-1”);
- (2) Oak-Pine Forest (“UF-2”);
- (3) Northern Red Oak (“UF-3”);
- (4) Red Maple Forest (“UF-4”);
- (5) Early Successional Red Maple Forest (“UF-5”);
- (6) Shrub Opening (“SO”);
- (7) Cultivated Field (“CF”); and

(8) Grass (“G”).

and four wetland cover types:

- (1) Forested Swamp (“FS”);
- (2) Shrub Swamp (“SS”);
- (3) Wet Meadow (“WM”); and
- (2) Vernal Pools (“VP”).

Representative photographs of the various cover types found on the Site are attached to this report.

A discussion of cover type distribution, the typical dominant vegetation observed within each cover type, and other features pertinent to the habitat assessment are provided below.

Upland Cover Types:

The eight general upland cover types observed on the Site have been classified in accordance with DeGraaf and Rudis (1983) and are described in the paragraphs below.

Aspen-Birch Forest (“UF-1”):

Upland forest cover type UF-1, which covers a total of 1.44 acres of the Site, is best categorized as Aspen-Birch Forest with saplings and trees in the pole timber to sawtimber class per DeGraaf and Rudis (1983). This forest cover type is dominated by gray birch (*Betula populifolia*) with lesser amounts of big-tooth aspen (*Populus grandidentata*), trees and saplings; apple (*Pyrus malus*), eastern white pine (*Pinus strobus*), glossy buckthorn (*Rhamnus frangula*), multiflora rose (*Rosa multiflora*), and black birch (*Betula lenta*) shrubs; and tree clubmoss (*Lycopodium obscurum*), hair-cap moss (*Polytrichum* sp.), goldenrods (*Solidago* sp.), and swamp dewberry (*Rubus hispidus*) ground cover. This forest cover type contains a minimal amount of natural wood debris with 0.5 to 1 inches of leaf litter. This upland forest cover type is located between the intermittent and perennial streams in the southeastern portion of the Site and occurs primarily on flat to gentle slopes. The Site has been subject to agricultural activities in the past, creating this early to mid successional forest. The Aspen-Birch forest on the Site consists of a relatively even-aged stand that is estimated to be 20 to 30 years of age, which provides 80 to 100% cover within this area, with a sparse to moderate understory.

Oak-Pine Forest (“UF-2”):

Upland forest cover type UF-2, which covers a total of 1.33 acres of the Site, is best categorized as Oak-Pine deciduous forest with saplings and trees in the sawtimber to large sawtimber class per DeGraaf and Rudis (1983). This forest cover type is dominated eastern white pine (*Pinus strobus*) and northern red oak (*Quercus rubra*), with lesser amounts of red maple (*Acer rubrum*) and white oak (*Quercus alba*), trees and saplings; highbush blueberry (*Vaccinium corymbosum*), eastern white pine (*Pinus strobus*), and

glossy buckthorn (*Rhamnus frangula*) shrubs; and cinnamon fern (*Osmunda cinnamomea*), and tree clubmoss (*Lycopodium obscurum*) ground cover. This forest cover type contains a minimal to moderate amount of wood debris with 1 to 2 inches of leaf litter. This upland forest is located in the west-central portion of the site and occurs on a level to gentle slope. The upland Oak-Pine Forest on the Site consists of a relatively uniform-aged stand that is estimated to be 40 to 60 years of age, which provides 80 to 100% cover within this area. The UF-2 forest has a closed canopy with a sparse understory. As indicated for UF-1 above, the Site has been subject to agricultural activities in the past, with these forest stands being the oldest on the site.

Northern Red Oak (“UF-3”):

Upland forest cover type UF-3, which covers a total of 0.58 acres of the Site, is best categorized as Northern Red Oak forest with saplings and trees in the pole timber to sawtimber class per DeGraaf and Rudis (1983). This forest cover type is dominated by northern red oak (*Quercus rubra*), with lesser amounts of black oak (*Quercus velutina*), red maple (*Acer rubrum*), and eastern white pine (*Pinus strobus*) trees and saplings; highbush blueberry (*Vaccinium corymbosum*) shrubs; and cinnamon fern (*Osmunda cinnamomea*), tree clubmoss (*Lycopodium obscurum*), and sheep laurel (*Kalmia angustifolia*) ground cover. This forest cover type contains a minimal amount of wood debris with 2 to 3 inches of leaf litter. This upland forest is located adjacent to the BVW bordering the perennial stream in the northeastern portion of the Site and occurs on a flat to gradual slope. This forest consists of a relatively uniform-aged stand that is estimated to be 40 to 50 years of age, which provides 80 to 100% cover within this area, with a minimal to moderate understory. As indicated above for UF-1 and UF-2, the Site has been subject to agricultural activities in the past, with this cover type being one of the older stands on the site.

Red Maple Forest (“UF-4”):

Upland forest cover type UF-4, which covers a total of 6.84 acres of the Site, is best categorized as a Red maple forest with saplings and trees in the pole timber to saw timber class per DeGraaf and Rudis (1983). This forest cover type is dominated by red maple (*Acer rubrum*) with lesser amounts of northern red oak (*Quercus rubra*), and big tooth aspen (*Populus grandidentata*) trees and saplings; white pine (*Pinus strobus*), and glossy buckthorn (*Rhamnus frangula*) shrubs; and cinnamon fern (*Osmunda cinnamomea*), and tree clubmoss (*Lycopodium obscurum*) ground cover. This forest cover type contains a moderate amount of wood debris with 2 to 3 inches of leaf litter. This upland forest is located in northern portion of the Site and generally occurs on level areas. This forest consists of a relatively uniform-aged stand that is estimated to be 30 to 50 years of age, which provides 80 to 100% cover within this area, with a moderate to dense understory. As indicated above for UF-1 and UF-2, the Site has been subject to agricultural activities in the past, with this cover type being the older of the red maple dominated forest stands.

Early Successional Red Maple Forest (“UF-5”):

Upland forest cover type UF-5, which covers a total of 7.73 acres of the Site, is best categorized as Early Successional Red Maple Forest with saplings and trees in the

regeneration through seedlings to sapling class per DeGraaf and Rudis (1983). This forest cover type is dominated by eastern red maple (*Acer rubrum*) with lesser amounts of eastern white pine (*Pinus strobus*), gray birch (*Betula populifolia*), and big tooth aspen (*Populus grandidentata*), trees and saplings; glossy buckthorn (*Rhamnus frangula*) shrubs; and cinnamon fern (*Osmunda cinnamomea*), tree clubmoss (*Lycopodium obscurum*), hair-cap moss (*Polytrichum* sp.) ground cover. It is worth noting that the white pine becomes more dominant in the northern portions of this cover type, but the cover types are very similar and therefore not separated into subsets of the general cover type. This forest cover type contains a moderate amount of wood debris with 2 to 3 inches of leaf litter. This upland forest is located in the central portion of the Site and generally occurs on a very gradual slope. This forest consists of a relatively uniform-aged stand that is estimated to be 10 to 20 years of age, which provides 80 to 100% cover within this area, with a moderate to dense understory. As indicated above for UF-1 and UF-2, the Site has been subject to agricultural activities in the past, with this cover type being the younger of the two red maple forest cover types.

Shrub Opening (“SO”):

Upland shrub opening cover type SO, which covers a total of 0.75 acres of the Site, is best categorized as shrub openings with very few saplings or trees per DeGraaf and Rudis (1983). The trees located within this cover type are generally large sugar maples (*Acer saccharum*) located along the northern property line in the eastern portion of the site. This shrub opening type is dominated by glossy buckthorn (*Rhamnus frangula*), gray birch (*Betula populifolia*), black cherry (*Prunus serotina*), white ash (*Fraxinus americana*), American elm (*Ulmus americana*), and tartarian honeysuckle (*Lonicera tatarica*) shrubs; with Oriental bitter-sweet (*Celastrus orbiculata*) climbing woody vines; and bramble (*Rubus* sp.), deer-tongue grass (*Dichanthelium clandestinum*), and goldenrods (*Solidago* sp.), ground cover. This cover type contains a moderate amount of wood debris with 1 to 2 inches of leaf litter. This upland shrub opening is located along the perimeter of the agricultural fields and to the west of the existing house and lawn areas in the eastern portions of the Site and generally occurs on a gradual slope adjacent to the fields. This cover type consists of a relatively uniform-aged stand that is estimated to be 5 to 20 years of age, which provides 80 to 100% cover within this area, with a moderate to dense understory. As indicated above, the Site has been subject to agricultural activities in the past, with this area likely developing when agricultural activities were recently abandoned.

Cultivated Field (“CF”):

Upland cover type CF, which covers a total of 1.50 acres of the Site, is best categorized as cultivated per DeGraaf and Rudis (1983). These areas appear to have been tilled agricultural cropland until recently. These areas are transitioning toward a shrub/old field cover type and, without intervention, will continue to do so over time. This cover type is dominated by grasses (Gramineae sp.), northern dewberry (*Rubus flagellaris*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), common dandelion (*Taraxacum officinale*), golden-rods (*Solidago* sp.), fragrant-golden-rods (*Euthamia* sp.), common milkweed (*Asclepias syriaca*), deer-tongue grass (*Dichanthelium clandestinum*), common

plantain (*Plantago major*), Queen Anne's lace (*Daucus carota*), annual ragweed (*Ambrosia artemisiifolia*), and violet (*Viola sp.*) ground cover. This cover type contains no woody debris with 0 to 0.5 inches of leaf litter. These cultivated fields are located in the northeastern and central portions of the Site and generally occur on level areas with a very gradual slope. These fields contain relatively uniform herbaceous layers, with the rear westerly field appearing to have been left fallow for a longer period of time allowing for some bramble (*Rubus sp.*) and Autumn olive (*Elaeagnus umbellata*) shrubs to begin to propagate. The vegetation provides 95 to 100% herbaceous cover within this area.

Grass ("G"):

Upland cover type G, which covers a total of 1.76 acres of the Site, is best categorized as Grass class per DeGraaf and Rudis (1983). This cover type includes the areas around the existing single family house, barns, out-buildings, driveway and landscape features. This cover type is dominated by manicured lawn ground cover with several scattered ornamental Norway maple (*Acer platanoides*), red maple (*Acer rubrum*), white ash (*Fraxinus americana*), and blue spruce (*Picea pungens*) trees. This cover type is located in the southeastern portion of the site and generally occurs on gradual slopes that are nearly level. It appears that this area has been maintained lawn and landscaping for a very long time based upon the apparent age of the house and outbuildings.

Wetland Cover Types:

The wetland cover types observed on the Site have been classified in accordance with Cowardin (1979) and are described below.

Forested Swamp (FS):

A forested swamp/perennial stream system, which would be classified as a Palustrine Forested Wetland by Cowardin (1979), covers 3.94 acres of land to the north of the existing cart path crossing, within the isolated wetland in the central portion of the site, and in the extreme southwestern and northwestern corners of the Site. The portion of the forested swamp system located to the north of the existing cart path drains in a northerly direction flowing through a culvert beneath Coolidge Lane to the north, ultimately reaching Hop Brook. The forested swamps in the extreme northwestern and southwestern corners of the site are associated with an off-site perennial stream on the Sudbury Valley Trustees property, which also flows in a northerly direction toward Hop Brook. Plant species observed include red maple (*Acer rubrum*), and American elm (*Ulmus americana*) trees and saplings; poison ivy (*Toxicodendron radicans*) climbing woody vines; highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), arrow-wood (*Viburnum dentatum*), silky dogwood (*Cornus amomum*), and glossy buckthorn (*Rhamnus frangula*), shrubs; and tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), bristly blackberry (*Rubus hispida*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), woodfern (*Dryopteris sp.*), skunk-cabbage (*Symplocarpus foetidus*), spotted touch-me-not (*Impatiens capensis*), sedges (Cyperaceae sp.), and sphagnum moss (*Sphagnum sp.*) ground cover. Evidence of wetland hydrology, including hydric soils, high groundwater, saturated soils, pore linings, and evidence of flooding, was observed within this wetland system. It should be noted

that the portions of the forested swamp adjacent to the perennial stream contain histisol soils, which contain greater than 16 inches of organic soil layer. Much of this area contains an organic layer that exceeds 24 inches. This is indicative of soils that have aquic conditions within the upper part of the soil for some period of time in most years and likely remain saturated or inundated for most of the year. These areas contain a dominance of red maple trees with buttressed root systems and tussock sedge and skunk cabbage ground cover. The forested swamp extending from the perennial stream toward the vernal pool to the west and the forested swamps in the central, northwestern and southwestern corners of the site do not contain these types of soils and therefore have a somewhat dryer hydrologic regime, with dominant red maples lacking buttressed root systems. These areas generally also lack the tussock sedges.

Shrub Swamp (“SS”):

A shrub swamp/perennial stream system, which would be classified as a Palustrine shrub/scrub Wetland by Cowardin (1979), covers 5.68 acres of land. This Shrub Swamp system to the south of the existing cart path crossing on the Site is associated with the perennial stream and drains in a northerly direction flowing through a culvert beneath an existing cart path. Plant species observed include red maple (*Acer rubrum*), and American elm (*Ulmus americana*) saplings; glossy buckthorn (*Rhamnus frangula*), speckled alder (*Alnus rugosa*) common winterberry (*Ilex verticillata*), arrow-wood (*Viburnum dentatum*), and silky dogwood (*Cornus amomum*) shrubs; and tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), bristly blackberry (*Rubus hispidus*), cinnamon fern (*Osmunda cinnamomea*), sensitive fern (*Onoclea sensibilis*), woodfern (*Dryopteris sp.*), skunk-cabbage (*Symplocarpus foetidus*), spotted touch-me-not (*Impatiens capensis*), sedges (Cyperaceae sp.), skunk-cabbage (*Symplocarpus foetidus*) and sphagnum moss (*Sphagnum sp.*) ground cover. Several small inclusions of dense stands of broad-leaf cattail (*Typha latifolia*) were observed within this shrub swamp. It is also worth noting that the gas easement that bisects this shrub swamp was recently clear-cut, which did not change the species composition within this area; rather this area is distinctly shorter than the surrounding shrub swamp. Evidence of wetland hydrology, including hydric soils, high groundwater, saturated soils, pore linings, and evidence of flooding, was observed within this wetland system. A portion of the Shrub Swamp stand exists on historic fill located along the existing grass cart path. This area was delineated as a wetland but is elevated relative to the native (unfilled) wetland and lacks the strong wetland hydrology and dominance by the wetter plant species classifications in the native shrub swamp.

A shrub swamp/vernal pool system, which would also be classified as a Palustrine shrub/scrub Wetland by Cowardin (1979), is located in the central portion of the Site. This Shrub Swamp system is associated with the vernal pools and drainage flows in both a westerly a northeasterly directions flowing into both of the perennial streams. However, it appears the majority of the flow exits the system toward the west into the off-site perennial stream. Plant species observed include red maple (*Acer rubrum*) saplings; common winterberry (*Ilex verticillata*), arrow-wood (*Viburnum dentatum*), and silky dogwood (*Cornus amomum*) shrubs; and cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), and sphagnum moss (*Sphagnum sp.*) ground cover. Evidence of

wetland hydrology, including hydric soils, high groundwater, saturated soils, and pore linings, was observed within this wetland system.

Wet Meadow (“WM”):

A wet meadow system, which would be classified as a Palustrine wet meadow by Cowardin (1979), covers 0.20 acres of land to the northeast of the existing cart path crossing and in the extreme southern portion of the agricultural field in the central portion of the Site. These wet meadow communities exist due to recent cessation of mowing activities which have historically prevented the development of a woody plant community. Plant species observed include deer-tongue grass (*Dichanthelium clandestinum*), reed canary grass (*Phalaris arundinacea*), grasses (Gramineae sp.), sedges (Cyperaceae sp.), rushes (Juncaceae sp.), purple loosestrife (*Lythrum salicaria*), tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*), spotted touch-me-not (*Impatiens capensis*), golden-rods (*Solidago sp.*), fragrant-golden-rods (*Euthamia sp.*), sensitive fern (*Onoclea sensibilis*), and beggar-tick’s (*Bidens sp.*) ground cover. Evidence of wetland hydrology, including hydric soils, high groundwater, saturated soils, and pore linings, was observed within this wetland system.

Vernal Pools (“VP”):

Based upon a review of the *Massachusetts Natural Heritage Atlas*, 13th edition, Priority Habitats and Estimated Habitats, Framingham Quadrangle, valid from October 1, 2008, no Certified Vernal Pools are located on the Site. However, during the Abbreviated Notice of Resource Area Delineation (ANRAD) approval process four areas that would qualify as a vernal pool under the local Bylaw were identified. The local Bylaw defines a “Vernal Pool” as:

"The term "vernal pool" shall include, in addition to that already defined under the Wetlands Protection Act, G.L. Ch. 131, §40 and Regulations thereunder, 310 CMR 10.00, any confined basin or depression not occurring in existing lawns, gardens, landscaped areas, or driveways which, at least in most years, holds water for a minimum of two continuous months during the spring and/or summer, contains at least 200 cubic feet of water at some time during most years, is free of adult predatory fish populations, and provides essential breeding and rearing habitat functions for amphibian, reptile, or other vernal pool community species, regardless of whether the site has been certified by the Massachusetts Division of Wildlife and Fisheries."

Based upon this definition, EcoTec conducted a site inspection and delineated areas that appear to meet this definition. These areas were delineated by flags XA1 through XA40, XB1 through XB77, XC1 through XC38, and XD1 through XD29, as affirmed through the ANRAD process. The delineation was based upon the apparent maximum extent of flooding. A detailed description of these areas is presented below.

XA Ponding Area:

This ponding area is located in the central portion of the Site, and consists of an approximately 50-foot wide by 360-foot long (maximum) area of ponding, with two main ponding areas connected via a rutted historic cart path generally forming the connection. The westernmost ponding area contains depths of 1- 8 inches of ponding. This ponding area contains numerous shrubs within and surrounding the ponding area. The easternmost ponding area is located primarily within the cart path and contains ponding depths of 1-18 inches in depth, with a large portion of the area having water depth of 6 inches or less. Plant species observed include red maple (*Acer rubrum*) trees and saplings; red maple, highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), and silky dogwood (*Cornus amomum*) shrubs; tussock sedge (*Carex stricta*), and soft rush (*Juncus effusus*) ground cover.

On May 25, 2010 and April 19, 2011 the XA ponding area was inspected and it was found that the westernmost ponding area contained very shallow ponding with no vernal pool indicators observed. The easternmost portion of the delineated ponding area contained a ponding area that was roughly 50 feet long and 20 to 30 feet in width, with a maximum depth of 14 inches and an average depth of roughly 8 inches during the 2011 inspection, with less ponding observed in 2010. This can be attributed to the inspection occurring a month later. In 2010, EcoTec dip-netted the XA ponding area and observed wood frog (*Rana sylvatica*) tadpoles and mosquito larvae. In 2011, EcoTec dip-netted the pool again and found similar results, observing 7 wood frog egg masses, tadpoles, and mosquito larvae with no other vernal pool indicators found or observed. It should be noted that this pool was easily evaluated due to its relatively small size, open canopy, and limited available egg mass attachment sites. Thus, the findings are considered to be relatively complete.

XB Ponding Area:

This ponding area is located in the northern portion of the Site, and consists of an approximately 200-foot wide by 560-foot long (maximum) area of ponding, with three main ponding areas connected via shallow ponding. The westernmost ponding area contains depths of 6-12 inches of ponding. This ponding area contains numerous shrubs within and surrounding the ponding area. The northern ponding area contains a large area of ponded forest containing 1 to 10 inches of ponding with an average depth of roughly 4 inches. The central ponding area consists of a large roughly 100 foot circular are of open water, which is appears to be attributed to the depth and prolonged ponding. Plant species observed in these areas include red maple (*Acer rubrum*) trees and saplings; red maple (*Acer rubrum*), highbush blueberry (*Vaccinium corymbosum*), common winterberry (*Ilex verticillata*), and silky dogwood (*Cornus amomum*) shrubs; with little or no ground cover. The western portion of this ponding area contains a large area of open water surrounded with a fringe of buttonbush (*Cephalanthus occidentalis*). This ponding area appears to be quite deep with maximum depths estimated at roughly 5 to 6 feet. This area is depicted as a Potential Vernal Pool on the MassGIS data layer.

On May 25, 2010 and April 19, 2011 the XB ponding area was inspected and it was found that the northernmost ponding area contained very shallow ponding with no vernal

pool indicators observed. During these inspections a significant portion of the delineated ponding area contained standing water. In 2010, EcoTec dip-netted the XB ponding areas and observed a diverse community of facultative vernal pool indicator species, including dragonfly (Insecta; Odonata spp.), isopod (Crustacea; Isopoda Sp.), caddisfly (Insecta; Trichoptera Spp.), aquatic oligochaete worms (Annelida, Oligochaeta), and mosquito larvae (Insecta; Diptera; Culicidae). In 2011, EcoTec dip-netted the pools again and found one wood frog egg mass, fairy shrimp (*Eubbranchipus vernalis*), dragonfly, isopod, caddisfly, aquatic oligochaete worms, and mosquito larvae. It should be noted that this pool contains significant areas of ponding with thousands of potential attachment sites for amphibian egg masses, many within dense stands of buttonbush. Additionally, substantial areas were too deep to safely reach with waders. Given the fact that fairy shrimp, an obligate vernal pool indicator, was observed in large numbers, and the pool is deep with a long hydroperiod, it is expected that this area provides breeding habitat for amphibians. No juvenile amphibians were observed within this ponding area during the inspections, but should be assumed to be present, potentially in large numbers.

XC Ponding Area:

This ponding area is located in the western central portion of the Site, and consists of an approximately 160-foot wide by 320-foot long (maximum) area of ponding, with one main ponding area consisting of an area of open water in the western portion and ponding areas containing dense shrubs in the eastern and southern portions. The western most ponding area contains depths of 4- 20 inches of ponding with a large area of open water. The eastern and southern portions of the ponding area contain similar depths of ponding with dense shrub hummocks and overhanging vegetation. Plant species observed include red maple (*Acer rubrum*) trees and saplings around the perimeter; highbush blueberry (*Vaccinium corymbosum*), shrubs; and sphagnum ground cover.

On May 25, 2010 and April 19, 2011 the XC ponding area was inspected and it was found that a significant portion of the delineated ponding area contained standing water. In 2010, EcoTec dip-netted the XB ponding area and observed dragonfly larvae, backswimmers (Insecta, Hemiptera, Notonectidae), isopods, water scavenger beetle larvae (Insecta, Coleoptera, Hydrophilidae), and mosquito larvae. In 2011, EcoTec dip-netted the pools again and found isopods, and mosquito larvae. It should be noted that this pool contains significant areas of ponding with thousands of potential attachment sites for amphibian egg masses. It is expected that this area provides breeding habitat for amphibians. However, no such indicators were observed within this ponding area during the inspections, but should be assumed to be present, possibly in large numbers.

XD Ponding Area:

This ponding area is located in the western central portion of the Site, and consists of an approximately 120-foot wide by 200-foot long (maximum) area of ponding, with one main ponding area containing dense shrubs. The ponding area contains depths of 4- 12 inches of ponding with dense shrub hummocks and overhanging vegetation. Plant species observed include red maple (*Acer rubrum*) trees and saplings around the perimeter; highbush blueberry (*Vaccinium corymbosum*), shrubs; and sphagnum ground cover.

On May 25, 2010 and April 19, 2011 the XD ponding area was inspected and it was found that a significant portion of the delineated ponding area contained standing water. In 2010, EcoTec dip-netted the XB ponding area and observed isopods, and mosquito larvae. In 2011, EcoTec dip-netted the pools again and found isopods, and mosquito larvae. It should be noted that this pool contains significant areas of ponding with thousands of potential attachment sites for amphibian egg masses. It is expected that this area provides breeding habitat for amphibians. However, no such indicators were observed within this ponding area during the inspections, but should be assumed to be present.

Based upon a review of the Potential Vernal Pool GIS data layer, no additional Potential Vernal Pools are mapped the Site; the closest mapped Potential Vernal Pool is located across Landham Road within the Brookside Farm development. During the site inspection, EcoTec staff looked for additional areas that might provide vernal pool hydrology for consideration as a possible vernal pool. One such area was observed on the Site and is delineated with the BD series wetland flags. However, this area does not hold water for two contiguous months during the spring and/or summer. Therefore, this area does not have the appropriate hydrology to support vernal pool indicator species.

Site Landscape Context:

The Site is bordered to the east by Landham Road, with the Brookside Farm Lane subdivision located across Landham Road. To the north the site is abutted by (in the eastern portion) a residential cul-de-sac subdivision known as Stagecoach Drive and one single-family home off Coolidge Lane; and (in the western portion) by undeveloped wetlands. The Site is bordered to the south by the Cutler Farm Subdivision and homes fronting on Landham Road. These developed parcels contain houses with lawn and landscaping. The extreme western portion of the site is abutted immediately to the south by undeveloped forest west of the Cutler Farm development. The Site is bordered to the northwest and west by undeveloped forest similar to UF-4 and FS found on the Site. This northern and western abutting parcel is Sudbury Valley Trustees (SVT) property, which is protected open space. The proposed project maintains a significant portion of the site that directly abuts the SVT property to increase the amount of protected open space in the area.

The site is mapped by Biomap 2 as Core Habitat, which is a prioritization tool intended for conservation planning purposes with no regulatory significance. It is worth noting that 24% of the State of Massachusetts is mapped as Core Habitat and that, despite this and other planning designations, the Town of Sudbury, through Town Meeting, has previously declined to act to acquire the site for open space. Core habitat prioritizes large intact landscapes and it is to be expected that a large tract of undeveloped land located between SVT property and the Great Meadows National Wildlife Sanctuary would be mapped as Core Habitat. Given the proposed clustered nature of the Johnson Farm development, portions of the site closest to currently protected open space are planned to be maintained as open space, consistent with typical cluster development goals. Therefore, a significant area between the proposed development and Hop Brook will

maintain a substantial wildlife corridor connecting the SVT property to the Great Meadows property. In this way, the project strikes a balance in fulfilling components of sometimes competing regulatory goals by (i) the establishment of significant new open space buffers around the project's clustered development and (ii) advancing the Town's purported interest in creating new mixed-income rental housing, long identified as the most critically-needed housing type in Town.

POTENTIAL HABITAT UTILIZATION AND PROJECT IMPACT EVALUATION:

As noted above, this habitat assessment follows the outline for conducting a habitat assessment within Priority Habitat under MESA. Typically under MESA, after stand mapping, the habitat value of the existing site and proposed alterations to each stand type are then evaluated in the context of a particular state-listed species for which the habitat assessment is conducted. In the current case, the site is not subject to MESA, and thus no particular species focus is required. Therefore, this assessment considers more general habitat utilization as requested by the Commission even though the vast majority of the proposed project is located in the Buffer Zone, which is not a resource area under the Wetlands Protection Act. Because vernal pools are known to exist on the site, and there appears to be a focus on vernal pools by the Town of Sudbury, the assessment below considers vernal pool amphibians in particular. To a certain degree, vernal pool amphibians serve as a surrogate in this evaluation for other terrestrial species.

Vernal pool amphibians are known to utilize the on-site vernal pools for breeding. Most vernal pool amphibians (e.g., spotted salamanders, wood frogs) migrate to flooded pools in the spring to mate and deposit eggs. Larvae develop in flooded pools, and emerge to spend the majority of the year in upland areas, typically forested areas. This seasonal pattern is not universal, however. Other species (marbled salamanders) have a different life history that uses shallow pools and pool edges for breeding activities. Female marbled salamanders create nests and lay eggs near the margin of the pools. Adults will leave the nest and return to the adjacent forest to overwinter. Salamander larvae will overwinter in vernal pools and will usually metamorphose between late May to mid-July when the salamanders will leave the pool and disperse into the surrounding forest. However, if the pool remains flooded, the larvae may stay in the pool longer, sometimes until fall, before transforming.

Juvenile and adult salamanders may utilize the upland forest (UF2, UF3, UF4, & UF5), forested swamp (FS), and shrub swamp (SS) surrounding the site vernal pools for feeding and overwintering habitat. Salamanders will often utilize small animal burrows, but can also be found beneath surface materials including leaf litter, logs, bark, rocks, and drift for cover, feeding and overwintering. Salamanders may use all cover types on the Site including the meadow areas for migration.

Areas of the Site that provide potential habitat for each of the life requisites for the vernal pool amphibians are discussed above. The Existing Cover Type Plan, prepared by

TetraTech (Appended) is based on field evaluation by EcoTec and shows the proposed project layout on 35.4 acres. The cover types described above and shown on the Existing Cover Type Plan that would provide potential amphibian foraging and overwintering habitat would include the Oak-Pine Forest (“UF-2”), Northern Red Oak (“UF-3”), Red Maple Forest (“UF-3”), Early Successional Red Maple Forest (“UF-4”), Shrub Opening (“SO”), Forested Swamp (“FS”), and Shrub Swamp (“SS”). Breeding habitat is strictly associated with the four Vernal Pools (VP) located on the Site.

Table 1 below provides a summary of impacts associated with the proposed project on the potential site upland habitat of pool-breeding amphibians. This table summarizes the area of the Site that consists of each general cover type, the area of each general cover type that may serve as potential habitat for these species, the amount of each general cover type that will be impacted by the proposed development, the area of each general cover type that may serve as potential habitat that would be impacted by the proposed development, and notes the percentage of potential habitat on the Site that would be impacted as a result of the proposed project.

Table 1: Foraging, Breeding, and Overwintering Impact Summary (Areas in Acres) for Vernal Pool Breeding Amphibians

Cover Type	Total Site Area	General Project Impacts
Aspen-Birch Forest (“UF-1”)	1.44	0
Oak-Pine Forest (“UF-2”);	1.33	0
Northern Red Oak (“UF-3”);	0.58	0.35
Red Maple Forest (“UF-4”);	6.84	0
Early Successional Red Maple Forest (“UF-5”);	7.73	5.64
Shrub Opening (“SO”);	0.75	0.17
Cultivated Field (“CF”);	1.50	0.78*
Grass (“G”).	1.76	1.51*
Forested Swamp (“FS”);	3.94	0.19
Shrub Swamp (“SS”);	5.68	0.16
Wet Meadow (“WM”);	0.20	0.02
Vernal Pools (“VP”).	3.69	0
Total	35.44	6.53 or 18.4%**

*utilized only for possible migratory corridors

** Excludes areas utilized for possible migratory corridors

Other (non vernal pool) species: As noted above, detailed calculations and discussion are provided in the context of vernal pool species. Clearly there are numerous other wildlife species that could occur on the site. The proposed project proposes the conversion of some undeveloped areas to developed conditions, and this change would result in the loss of some terrestrial habitat for those species as well. However, EcoTec has observed no

noteworthy unique terrestrial habitat on the site. As noted in Table 1, there are a number of different habitat cover types, and none of those cover types would be eliminated by the proposed project. Rather, as noted, the project design results in the preservation of significant areas on the site as open space. Thus, while the proposed project development would eliminate some terrestrial upland, that upland is not rare or otherwise of special importance on the site, locally, regionally or as Priority Habitat under the NHESP. Other significant areas of the site are preserved for habitat and/or as open space by the project design associated with the cluster type project. The primary migration corridor (from SVT to Great Meadows) along the northerly portion of the site would be preserved by the project.

Summary:

Based upon the Existing Cover Type Plan, a total of 32.18 acres or 90.1% of the 35.44 acre Site may serve as potential habitat for vernal pool amphibians and other species. Approximately 6.53 acres of potential vernal pool amphibian habitat (20.3%) would be impacted by the proposed project. There are 3.26 acres of developed areas (i.e., the developed house and lawn areas and agricultural fields) in the eastern portions of the Site that currently do not provide potential habitat, other than potential migratory habitat, for vernal pool species. These areas are proposed to be converted and maintained, to a significant degree, to agricultural fields or meadow. Due to the near cessation of large-sale agriculture, regionally and state-wide, meadow habitat is the type of habitat in shortest supply.

Based upon site inspections and review of the aerial photographs, from a regional perspective, preservation of the western and northern portions of the Site offers connectivity to important undeveloped habitat to the north and west. Areas to the east, northeast, and south have largely been developed.

In summary the proposed project would:

- Impact 6.53 acres or 20.3% of the 32.18 acres of existing potential amphibian salamander habitat on the 35.4 acre Site;
- Provide long term protection to a substantial portion of the site while significantly advancing the Town's purported urgent yet unfulfilled interest in the creation of mixed-income rental housing.
- Increases the amount of open meadow on the site, which is an important type of habitat.
- Protects the majority of the habitat surrounding the vernal pools and will result in permanent protection of the biological functioning of the broader regional wildlife habitats

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011



Shrub Opening (SO)



Grass (G)



Cultivated Field (CF)



Shrub Swamp (SS)

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011



Shrub Swamp w/ in gas easement (recently cut)



Forested Swamp (FS) north central portion of the site



Wet Meadow (WM)



Crossing SW

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011



Cultivated Field (rear)



Wet Meadow



Aspen-Birch Forest (UF-1)



Early Successional Red Maple Forest UF-4 (cart path)

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011



Early successional forest (UF-5)



XA Ponding Area: East section



XA Ponding Area: West section



Early successional UF-5 Northern (more WP sapling)

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011



Oak-Pine Forest (UF-2)



XC VP – SE corner



XD Ponding Area



XB Ponding Area – Center (open Water)

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011



XB Ponding Area – North



XC Ponding Area Northwest



Red Maple Forest (UF-4)



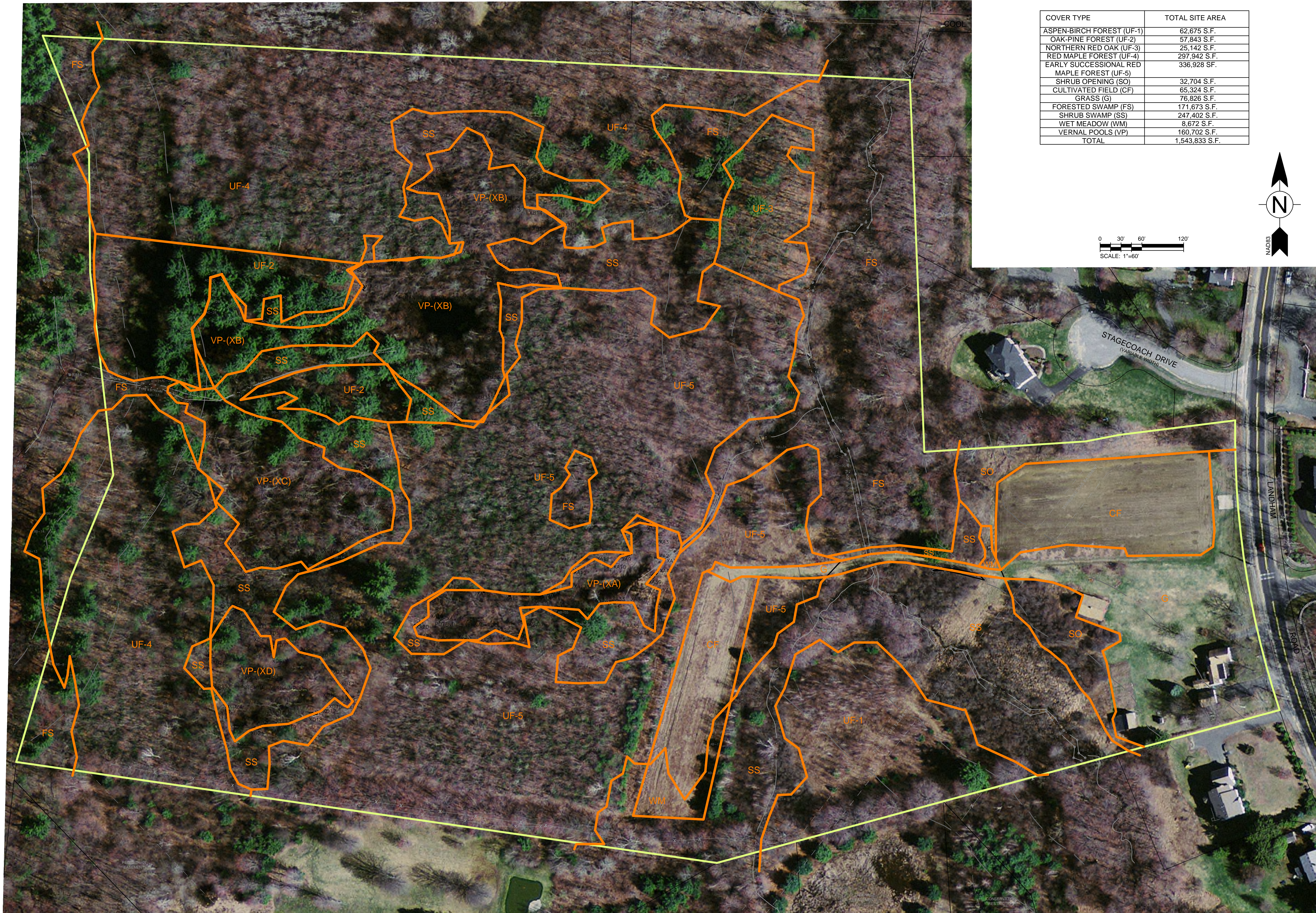
XB Ponding Area – West

PHOTOGRAPHS TAKEN DURING INSPECTION ON NOVEMBER 22, 2011

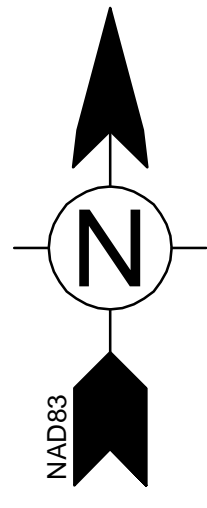
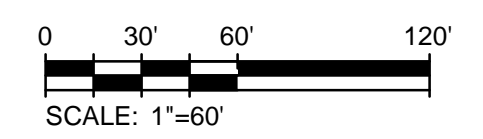


Northern Red Oak Forest (UF-3)

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COVER TYPE	TOTAL SITE AREA
ASPEN-BIRCH FOREST (UF-1)	62,675 S.F.
OAK-PINE FOREST (UF-2)	57,843 S.F.
NORTHERN RED OAK (UF-3)	25,142 S.F.
RED MAPLE FOREST (UF-4)	297,942 S.F.
EARLY SUCCESSIONAL RED MAPLE FOREST (UF-5)	336,928 S.F.
SHRUB OPENING (SO)	32,704 S.F.
CULTIVATED FIELD (CF)	65,324 S.F.
GRASS (G)	76,826 S.F.
FORESTED SWAMP (FS)	171,673 S.F.
SHRUB SWAMP (SS)	247,402 S.F.
WET MEADOW (WM)	8,672 S.F.
VERNAL POOLS (VP)	160,702 S.F.
TOTAL	1,543,833 S.F.



TETRA TECH

www.tetra-tech.com
 One Grant Street
 Framingham, MA 01701
 PHONE: (508) 903-2000 FAX: (508) 903-2001

MARK	DATE	DESCRIPTION	BY
	9-19-11	STORMWATER MANAGEMENT PLAN FILING	
	10-4-11	NOTICE OF INTENT FILING	
1	10-4-11	UPDATED COMPREHENSIVE PERMIT PLANS	
2	12-15-11	REV. PLANS PER TOWN, MEPA & DEP COMMENTS	

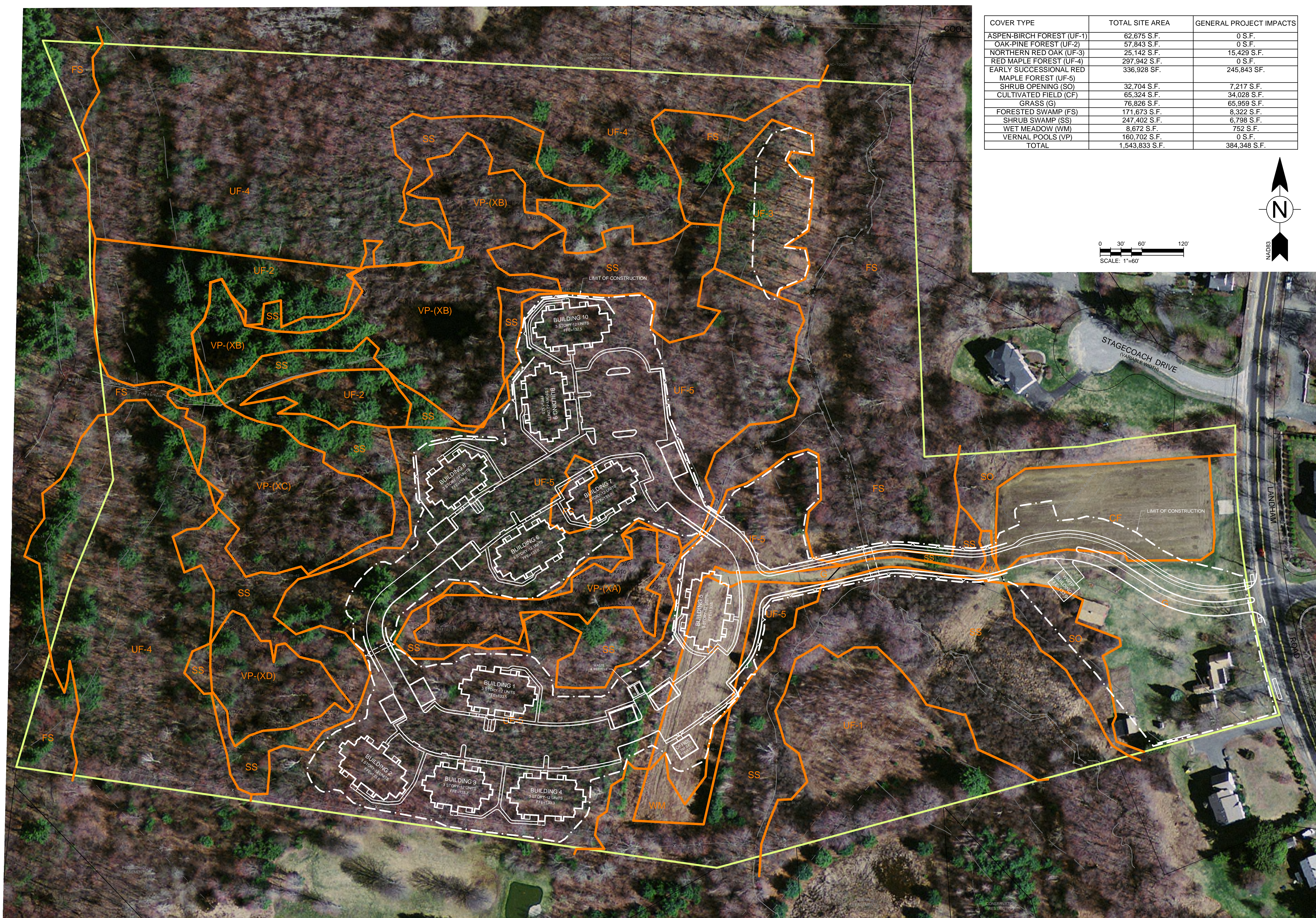
Client: Madison Piece Subury LLC
 Proj. Loc.: Subury, MA

The Residences at Johnson Farm
 Landham Road, Subury

**Cover Type Plan
 Existing Conditions**

Project No.: 127-14331-11001
 Designed By: G.K.D.
 Drawn By: J.L.P.
 Checked By:

12/28/2011 1:42:52 PM - P:\14331\127-14331-11001\CAD\SHEETFILES\ZZ-COVER TYPE PLAN.P.DWG - PAPPAS, JUD



COVER TYPE	TOTAL SITE AREA	GENERAL PROJECT IMPACTS
ASPEN-BIRCH FOREST (UF-1)	62,675 S.F.	0 S.F.
OAK-PINE FOREST (UF-2)	57,843 S.F.	0 S.F.
NORTHERN RED OAK (UF-3)	25,142 S.F.	15,429 S.F.
RED MAPLE FOREST (UF-4)	297,942 S.F.	0 S.F.
EARLY SUCCESSIONAL RED MAPLE FOREST (UF-5)	336,928 SF.	245,843 SF.
SHRUB OPENING (SO)	32,704 S.F.	7,217 S.F.
CULTIVATED FIELD (CF)	65,324 S.F.	34,028 S.F.
GRASS (G)	76,826 S.F.	65,959 S.F.
FORESTED SWAMP (FS)	171,673 S.F.	8,322 S.F.
SHRUB SWAMP (SS)	247,402 S.F.	6,798 S.F.
WET MEADOW (WM)	8,672 S.F.	752 S.F.
VERNAL POOLS (VP)	160,702 S.F.	0 S.F.
TOTAL	1,543,833 S.F.	384,348 S.F.

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Client: Madison Place Subury LLC
 Proj. Loc.: Subury, MA

The Residences at Johnson Farm
 Landham Road, Subury

Project No.: 127-14331-11001
 Designed By: G.K.D.
 Drawn By: J.L.P.
 Checked By: