

## TOWN OF PLYMOUTH COMMUNITY PRESERVATION COMMITTEE

# MEMO

TO: Town Meeting, Board of Selectmen, and the Advisory & Finance Committee  
From: The Community Preservation Committee  
Date: Monday August 29, 2016  
Re: ANNUAL FATM 2016: CPA Article 9E

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**ARTICLE 9E: To see if the Town will vote to authorize the Board of Selectmen to acquire by purchase, gift, eminent domain or otherwise, for open space and recreational purposes pursuant to G.L. c.44B and to accept the deed to the Town of Plymouth, of a fee simple interest of land located off Beaver Dam Road in the Town of Plymouth comprised of 127.8 acres more or less being made up of lot 8, 24-20 and lot 28E shown on Assessors Map 76 said land to be held under the care, custody and control of the Conservation Commission, to appropriate \$599,000.00 for the acquisition and other costs associated therewith from the Community Preservation Fund estimated annual revenues, fund balance, or reserves, and/or borrow said total sum which shall be reduced by the amount of any grants received by the Town pursuant to G.L.c.44B, section 11 or G.L. c.44, section 7 or any other enabling authority; and further to authorize the Board of Selectmen to grant a conservation restriction in said property in accordance with G.L.c.44B, section 12 meeting the requirements of G.L. c. 184, sections 31-33; and to authorize appropriate Town officials to enter into all agreements and execute any and all instruments as may be necessary on behalf of the Town to effect said purchase; or take any other action relative thereto.**  
**COMMUNITY PRESERVATION**

CPC RECOMMENDATION: Approval (unanimous)

The Community Preservation Committee voted 5 in favor 3 opposed of Article 9E at its meeting held Monday August 29, 2016

SUMMARY & INTENT:

The Community Preservation Committee is recommending the purchase of land off Beaver Dam Road. The intention is to preserve the waters of Beaver Brook and surrounding areas. The water from this property runs along Beaver Brook to Bartlett Pond and to White Horse Beach. The land comprises of 127.8 acres of cranberry bog upland woodlands, and extensive frontage on Beaver Dam Road. It also includes the so-called "Church Lot", which sits at over 300' elevation and is part of the highest elevated landscape on the eastern seaboard south of Acadia National Park. Massachusetts Audubon Society is purchasing approximately 190 acres of land to the east and is planning to build a Nature Visitor Center.

**APPLICATION  
to the  
PLYMOUTH  
COMMUNITY PRESERVATION  
COMMITTEE**

**DECEMBER, 2014**

**PROJECT: TIDMARSH WEST ACQUISITION**

**LOCATION: BEAVER DAM ROAD  
(*west side*)**

**ACREAGE: Approximately 127.8 acres**

**CURRENT OWNERS:**

**TIDMARSH FARMS, INC.**  
*Map 76, Parcels 8, 24-20, and 28E*

**CURRENT ASSESSED VALUES: \$424,602** (*Ch. 61A  
value, and inclusive of improvements*)

**PROJECT SUMMARY:** The Wildlands Trust (“WLT”) hereby submits an application to the Plymouth Community Preservation Committee, pursuant to the possibility of the Town acquiring a substantial tract of open space off of the west side of Beaver Dam Road.

Known colloquially as “Tidmarsh West”, the Premises comprises 127.8 acres of cranberry bog, upland woodlands, and extensive frontage on Beaver Dam Road. It also includes the so-called “Church Lot”, which sits at over 300’ elevation and is part of the highest elevation landscapes on the eastern seaboard south of Acadia National Park. It is relatively proximate to State Road (Rt. 3A), Rt. 3, and several village centers, and is within walking distance of several neighborhoods.

The Premises is particularly notable for its strategic location amidst several substantial open space holdings. It is proximate to and serves as a critical link between the so-called Tidmarsh East complex that is anticipated to become a Massachusetts Audubon Society (“MAS”) Sanctuary, and multiple landscape-scale tracts of forest land that comprise much of the geographic feature (not to be confused with the development of the same name) known as the Pine Hills. These latter holdings are long-standing preservation priorities for the Town and a wide range of conservation interests.

The Premises possesses considerable natural resource values. It is partially within several areas designated by the Commonwealth of Massachusetts Natural Heritage and Endangered Species Program (“NHESP”) as important wildlife habitat, including Bio Map 2 “Core Habitat” and “Critical Natural Landscape”, Priority Habitats of Rare Species “PH 777” and “Estimated Habitats of Rare Wildlife”, and a small strip in the northwest corner of the Premises is identified as Sandplain Natural Community Systems “Grassland”. Its scenic qualities are confirmed by its inclusion within an area designated by the Commonwealth’s Scenic Landscape Inventory as a “Noteworthy Scenic Landscape”.

The Premises’ cranberry bogs will witness one more harvest (2015), following which it will be taken out of production permanently following a pending sale of a Wetlands Reserve Program (“WRP”) easement by the landowners to the United States Department of Agriculture. The WRP easement will encompass 61 acres of the Premises, and will be in place when the Town would acquire the Property. The Town’s Department of Marine and Environmental Affairs will take the lead on advancing ecological restoration efforts for the bogs, similar to efforts at other locations in Plymouth that have proven quite successful.

The proposed acquisition meets seven of the nine “Open Space Goals and Criteria” enumerated in Plymouth’s Community Preservation Committee Application, and is consistent with several of the goals and objectives articulated in the current Town of Plymouth Open Space and Recreation Plan.

It is of special interest to note that the proposed acquisition meets more of the “Open Space Goals and Criteria” than all but one other potential acquisition parcel recommended to the Plymouth Community Preservation Committee by WLT across a decade of submitted applications.

**PROJECT HISTORY:** Tidmarsh Farms Inc., the current owner, acquired the Premises in a series of transactions in the 1980's in conjunction with the acquisition of extensive acreage across Beaver Dam Road.

In 2007, a WLT representative met with Tidmarsh Farms President Evan Schulman and Trustee Glorianna Davenport to begin discussions about potential conservation options for the Tidmarsh Farms complex. Those discussions culminated in the sale of a WRP easement on approximately 192 acres of Tidmarsh East to the United States Department of Agriculture in 2011.

Contemporaneously, discussions with other stakeholders were initiated to advance a longer-range vision for the Tidmarsh complex. This vision now encompasses the future establishment of a MAS Sanctuary and associated Living Observatory, a research and educational resource focused on providing local insights into landscape resilience and the impact of climate change in Southeastern Massachusetts.

In September 2014, several existing and potential stakeholders, including representatives from the Town of Plymouth and WLT, met with Mr. Schulman and Ms. Davenport to discuss the desired conservation outcome for Tidmarsh West. The desired outcome is for the Town of Plymouth to acquire Tidmarsh West with a WRP easement already in place on a portion of the Premises, and to subsequently grant a Conservation Restriction on the Premises to WLT in accordance with the requirements of the Community Preservation Act. Tidmarsh West would then become a critical adjunct to the adjacent MAS Sanctuary and Living Observatory situated on Tidmarsh East. This application is pursuant to helping advance that vision.

**DEVELOPMENT POTENTIAL/THREAT OF CONVERSION:** (Note: as previously stated herein, the USDA Wetlands Reserve Program easement currently in progress, and expected to be completed sometime in 2015, will encompass approximately 61 acres of the Premises. That leaves approximately 66 acres potentially available for development).

The Premises are situated within two zoning districts, the Rural/Residential Zoning District and the R-25 District. Beals and Thomas prepared a conceptual subdivision plan for the Premises in 2009 (copy of said plan and associated memorandum included herewith in the Attachments section). This plan depicts a by-right 29-lot residential subdivision that would include a total of 35 units of housing. However, this plan is only conceptual, has not been independently vetted or reviewed, does not take into account the WRP easement, nor does it reference the potential of development by the abutting land-owner from the top of the ridge. Therefore, it is included herewith for informational purposes only.

The appraisal prepared in conjunction with this application will be submitted separately, but more or less concurrently, to the Community Preservation Committee.

### **ACQUISITION PLAN:**

The Town would acquire the entirety of the Premises sometime in late 2015 or early 2016, after the sale of the WRP easement is finalized. Said WRP easement would encompass approximately 61 acres.

The Conservation Restriction that the Town will grant to WLT will encompass the entire Premises except for a small envelope encompassing most of the existing improvements, and will be subservient to the WRP easement where they overlap. It is anticipated that the CR will be completed no more than six months following the Town's acquisition of the Premises.

**NATURAL RESOURCES SUMMARY:** The Premises includes a mix of level and rolling topography and are partially wooded, with a pine/oak-dominated forest cover typical for this area of Plymouth. It includes one of the highest elevations in Plymouth within its so-called "Church Lot", which encompasses 42.4 acres of upland woods that offer glimpses of Cape Cod Bay. The Premises' cranberry bogs are still in production, but following the completion of the WRP easement will be the subject of ecological restoration efforts designed to restore pre-conversion habitats and hydrological conditions.

The Premises lies within multiple areas designated as ecologically significant by the Commonwealth of Massachusetts Natural Heritage and Endangered Species Program ("NHESP"), including:

- Partially within Bio Map 2 "Core Habitat" and "Critical Natural Landscape"
- Almost entirely within Priority Habitats of Rare Species "PH 777" and "Estimated Habitats of Rare Wildlife"
- A small strip in the northwest corner of the Premises is identified as Sandplain Natural Community Systems "Grassland"

In addition, the western portion of the Premises is within an area designated by the Commonwealth's Scenic Landscape Inventory as a "Noteworthy Scenic Landscape".

**LANDSCAPE CONTEXT:** The Premises sits literally in the midst of large tracts of open space, and provides an important connection between these tracts. The Tidmarsh East complex, to eventually become the center of a MAS Sanctuary and associated "Living Observatory" Educational Center, lies just across Beaver Dam Road to the east. Extensive holdings of the Pine Hills LLC directly abut to the south, west and north, and a 572-acre portion of the Entergy Company's holdings abuts to the north.

**IMPROVEMENTS/ACCESS:** Lot 28E includes a c. 1900 saltbox style residential dwelling, a utility building, and a small shed-type structure, all situated within close proximity to each other. The appraisal to be prepared for this project should include an updated assessment of each structure's condition.

**LONG-TERM MANAGEMENT PROGNOSIS:** The Town could utilize the residence in a number of ways, including staffing it with a caretaker to ensure a constant presence on the

Premises. The Town's Department of Marine and Environmental Affairs has expressed an interest in using the utility building for winter storage of boats and other seasonal equipment. It is likely that the Town will collaborate with MAS on conceptualizing a comprehensive stewardship vision for the entire Tidmarsh complex, inclusive of both Tidmarsh West and East. This vision will include a prominent public access component.

**OTHER:** A proposal for a Native Plant Center and Nursery could frame a distinct set of activities on the property and could result in developing a synergistic relationship between the Town of Plymouth, the Living Observatory and botanists Irina Kadis and Alexey Zinovjev of Salicicola.com. The goal of the project is twofold: to develop native plant stock for ecological restoration, highway and other public projects and to raise the visibility and viability of using native species in garden contexts. An early version of a proposal outlining this concept is attached.

### ALIGNMENT WITH COMMUNITY PRESERVATION ACT GOALS FOR OPEN SPACE

**GOAL 1:** *Preserve Plymouth's Rural Character.* The Premises has extensive frontage on Beaver Dam Road, and its cranberry bogs provide scenic open vistas that comprise an integral part of Plymouth's rural character. The scenic qualities of the Premises will endure even after the bogs are taken out of active agricultural production by the WRP easement.

**GOAL 2:** *Protect rare, unique, and endangered plant and wildlife habitat.* The Premises lie partially within several NHESP-designated areas of ecological significance, including Bio Map 2 "Core Habitat" and "Critical Natural Landscape", "Priority Habitats of Rare Species PH 777" and "Estimated Habitats of Rare Wildlife", and a small strip in the northwest corner of the Premises is identified as Sandplain Natural Community Systems "Grassland".

**GOAL 4:** *Ensure adequate size and connection of protected natural areas to maximize environmental and habitat benefits.* The Premises serve as a critical link between the presumptive MAS Sanctuary to the east and the vast tracts of undeveloped woodland to the west and north. These latter tracts are preservation priorities for the Town and its conservation partners.

**GOAL 5:** *Balance open space with development demand to reduce service demands and tax burden on town.* The Town's acquisition of the Premises would preclude its conversion to a housing development, thereby obviating the need for large expenditures on road improvements, schools, and other infrastructural investments that would potentially strain town budgets.

**GOAL 6:** *Increase the Town's ability to protect environmentally sensitive, historic and culturally significant properties.* As described above, the Premises provides a connection between the Tidmarsh East complex and the large tracts of woodland that comprise the geographic Pine Hills, one of Plymouth's most compelling natural features. It is possible that the Town's acquisition of the Premises could serve as a catalyst for preservation efforts involving the substantial tracts that include the geographic Pine Hills.

**GOAL 7:** *Improve public access and trail linkages to existing conservation, recreational and other land uses.* The Premises includes woods roads that can easily transition to serving as walking paths. These woods roads provide access to the aforementioned Church Lot, one of the highest elevation locations in Plymouth and heretofore not open to public access.

**GOAL 8:** *Enhance the quality and variety of passive and active recreational opportunities for all age groups and for people with disabilities.* On its own and in conjunction with the adjacent Tidmarsh East complex, to include an MAS Sanctuary, the Premises' size and extensive upland areas could recommend it for a wide variety of passive recreational pursuits, including hiking, nature study, and cross-country skiing. It is also possible that some portion of the Premises might eventually be serviced by handicapped-accessible facilities.

**OTHER SUPPORTING INFORMATION:** The proposed acquisition would be consistent with several of the goals and objectives enumerated in the updated 2009 Town of Plymouth Open Space and Recreation Plan, including:

Section VIII, GOALS & OBJECTIVES, pp. 100-102:

Recreation

- *Goal: "Improve the availability and maintenance of recreation areas throughout Plymouth.* In conjunction with the Tidmarsh East preservation effort, the Town's acquisition of the Premises will create a new and sizable recreational amenity in Southeast Plymouth.

Maintenance of Biodiversity and Wildlife Habitat

- *Goal: "Maintain the biodiversity and wildlife habitat in Plymouth."*
- *Objective: "Work with non-profit conservation organizations to identify, protect, and manage lands of significant ecological habitat value, including an overall assessment of priority areas".* Two nonprofit conservation organizations, WLT and the Mass. Audubon Society, are helping to facilitate this project that will preserve wildlife habitat identified as significant by the Commonwealth of Massachusetts.

Scenic Views

- *Goal: "Maintain the existing scenic views in Plymouth that give Plymouth a distinctive sense of place."*
- *Objective: "Protect lands with distinctive landscapes".* The Premises includes the Church Lot, a critical part of one of the geographic Pine Hills, one of Plymouth's most distinctive landscape features.

Historic Character

- *Goal: "Maintain the historic character of the Town and of individual villages that is found in certain open space land uses and recreational areas."*
- *Objective: "Provide large tracts of open space at village fringes to help preserve rural character and village identity."* The Premises are proximate to the village center of Manomet.

**PROJECT BUDGET**

*Proposed Sales Price* \$ TBD following Appraisal

Funding Sources

*Town of Plymouth CPC Funds* \$ TBD

*USDA "WRP" Easement* \$TBD

*LAND Grant* \$ 400,000<sup>1</sup>

*Other* \$ TBD

Project Costs

*Due Diligence* \$ 30,000<sup>2</sup> (to potentially include survey plan, EHA, closing and legal costs)

*Stewardship Endowment* \$ 10,000<sup>3</sup>

*Trail Maintenance/Public Access Mgt.* \$ TBD<sup>o</sup>

**Project Total** \$ **TBD**

<sup>1</sup>The "LAND" Grant land acquisition grant program is administered by the Commonwealth of Massachusetts Executive Office of Environmental Affairs ("EOEEA"). The program offers municipalities up to \$400,000 toward the purchase of land to be held for conservation purposes. The CPC and the Town should pursue this funding source if circumstances permit.

<sup>2</sup>Estimated figure—some of the indicated due diligence steps, particularly a survey, may not be required.

<sup>3</sup>Any conservation restriction holder, including Wildlands Trust, will require a stewardship endowment contribution. The indicated contribution is an estimate, and will need to be verified by a property-specific stewardship endowment calculation.

<sup>o</sup>It is anticipated that MAS will manage public access on the Premises, in cooperation with the Town and in conjunction with implementing the public access vision for Tidmarsh East.

## PROJECT TIMELINE

- Submission of Application to CPC—December 2014
- Appraisal completed--December 2014
- CPC Deliberations on Application/Vote—December 2014
- Town Meeting Vote on Warrant Article Authorizing CPC Expenditure on Project—April 2015
- Execution of P+S/Letter of Intent—April/May 2015
- Due Diligence Initiated/Completed—Spring 2015
- Completion of WRP Easement—late 2015
- Closing—Sometime in late 2015 or early 2016, subsequent to completion of NRCS/Wetland Reserve Program easement
- Completion of WLT CR--Within six months after Closing

## **ATTACHMENTS/EXHIBITS**

- **ASSESSORS FIELD CARDS FOR SUBJECT PARCELS**
- **DEEDS AND ASSOCIATED PLANS OF LAND FOR SUBJECT PARCELS**
- **COPY OF ACCESS EASEMENT ENCUMBERING SO-CALLED "CHURCH LOT"**
- **LANDSCAPE CONTEXT MAP DEPICTING SUBJECT PROPERTY AND ADJACENT OPEN SPACE HOLDINGS**
- **MAP DEPICTING ANTICIPATED COVERAGE AREA OF WRP EASEMENT**
- **CONCEPTUAL SUBDIVISION PLAN AND ASSOCIATED MEMORANDUM PREPARED BY BEALS AND THOMAS**
- **COPY OF CONSERVATION ASSESSMENT AND SANCTUARY PLAN PREPARED BY MAS**
- **PRELIMINARY PLAN FOR A NATIVE PLANT NURSERY PROPOSED FOR THE PREMISES**

## Unofficial Property Record Card - Plymouth, MA

### General Property Data

Parcel ID 076-000-028E-000	Account Number 49596
Prior Parcel ID 1100 -G01 -076*0028*	
Property Owner TIDMARSH FARMS INC	Property Location 85 BEAVER DAM RD
	Property Use MIXED USE
Mailing Address 69 MOUNT VERNON ST	Most Recent Sale Date 1/1/1900
	Legal Reference 5147/141
City BOSTON	Grantor:
Mailing State MA Zip 02108-1330	Sale Price 0
ParcelZoning RR	Land Area 83.329 acres

### Current Property Assessment

Card 1 Value Building Value 142,900	Xtra Features Value 46,100	Land Value 207,346	Total Value 396,346
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### Building Description

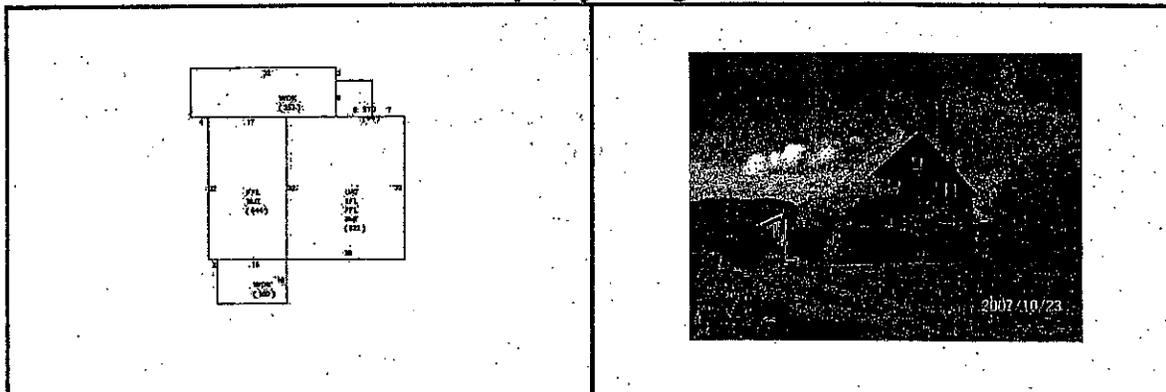
Building Style Salt Box	Foundation Type BRK/STN	Flooring Type AVERAGE
# of Living Units 1	Frame Type WOOD	Basement Floor CONCRETE
Year Built 1900	Roof Structure GABLE	Heating Type FORCED H/W
Building Grade AVERAGE	Roof Cover Asphalt	Heating Fuel OIL
Building Condition Average	Siding Frame/Shingl	Air Conditioning 0%
Finished Area (SF) 2208	Interior Walls AVERAGE	# of Bsmt Garages 0
Number Rooms 5	# of Bedrooms 3	# of Full Baths 2
# of 3/4 Baths 0	# of 1/2 Baths 0	# of Other Fixtures 0

### Legal Description

### Narrative Description of Property

This property contains 83.329 acres of land mainly classified as MIXED USE with a(n) Salt Box style building, built about 1900, having Frame/Shingl exterior and Asphalt roof cover, with 1 unit(s), 5 room(s), 3 bedroom(s), 2 bath(s), 0 half bath(s).

### Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.

## Unofficial Property Record Card - Plymouth, MA

### General Property Data

Parcel ID 076-000-008-000	Account Number 13652
Prior Parcel ID 9600 -C01 -076*0023*	Property Location OFF BEAVER DAM RD
Property Owner TIDMARSH FARMS INC	Property Use PRDWOOD
Mailing Address 69 MOUNT VERNON ST	Most Recent Sale Date 1/1/1900
	Legal Reference 6421/204
City BOSTON	Grantor
Mailing State MA Zip 02108-1330	Sale Price 0
Parcel Zoning RR	Land Area 42.450 acres

### Current Property Assessment

Card 1 Value	Building Value 0	Xtra Features Value 0	Land Value 1,656	Total Value 1,656
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### Building Description

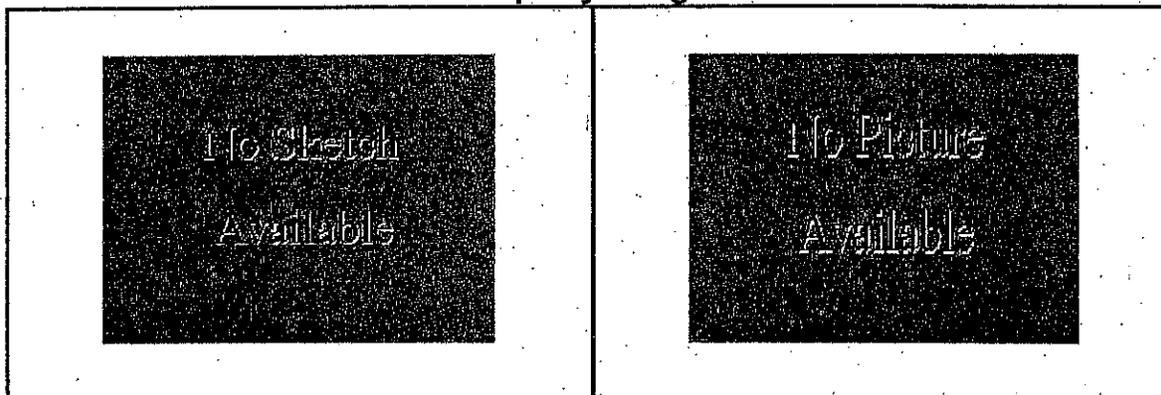
Building Style N/A	Foundation Type N/A	Flooring Type N/A
# of Living Units N/A	Frame Type N/A	Basement Floor N/A
Year Built N/A	Roof Structure N/A	Heating Type N/A
Building Grade N/A	Roof Cover N/A	Heating Fuel N/A
Building Condition Average	Siding N/A	Air Conditioning 0%
Finished Area (SF) N/A	Interior Walls N/A	# of Bsmt Garages 0
Number Rooms 0	# of Bedrooms 0	# of Full Baths 0
# of 3/4 Baths 0	# of 1/2 Baths 0	# of Other Fixtures 0

### Legal Description

#### Narrative Description of Property

This property contains 42.450 acres of land mainly classified as PRDWOOD with a(n) N/A style building, built about N/A , having N/A exterior and N/A roof cover, with N/A unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

### Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.

## Unofficial Property Record Card - Plymouth, MA

### General Property Data

Parcel ID 076-000-024-020	Account Number 64596
Prior Parcel ID 9100 -G01 -076*0022S	
Property Owner TIDMARSH FARMS INC	Property Location BEAVER DAM RD
	Property Use UNBUILDBL
Mailing Address 69 MOUNT VERNON ST	Most Recent Sale Date 10/23/1997
	Legal Reference 15580/252
City BOSTON	Grantor
Mailing State MA Zip 02108-1330	Sale Price 7,000
Parcel Zoning R25	Land Area 2.139 acres

### Current Property Assessment

Card 1 Value	Building Value 0	Xtra Features Value 0	Land Value 26,600	Total Value 26,600
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### Building Description

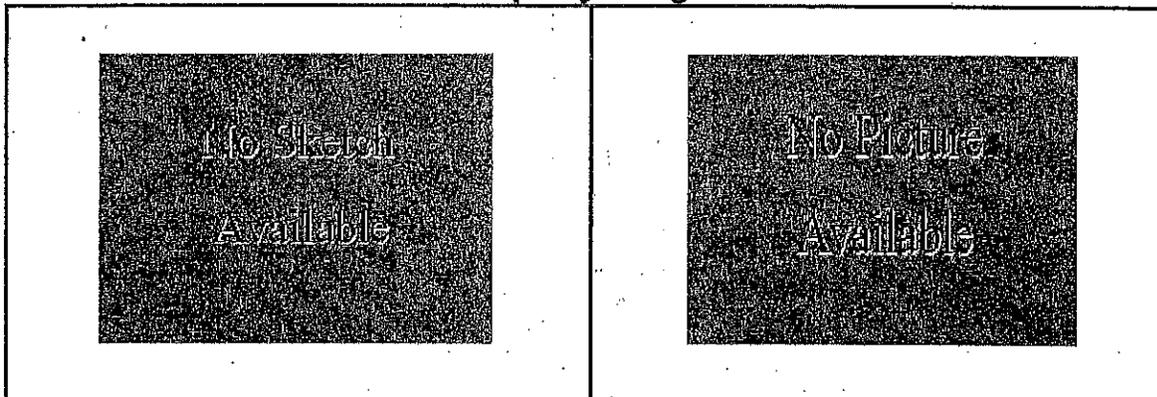
Building Style N/A	Foundation Type N/A	Flooring Type N/A
# of Living Units N/A	Frame Type N/A	Basement Floor N/A
Year Built N/A	Roof Structure N/A	Heating Type N/A
Building Grade N/A	Roof Cover N/A	Heating Fuel N/A
Building Condition N/A	Siding N/A	Air Conditioning 0%
Finished Area (SF) N/A	Interior Walls N/A	# of Bsmt Garages 0
Number Rooms 0	# of Bedrooms 0	# of Full Baths 0
# of 3/4 Baths 0	# of 1/2 Baths 0	# of Other Fixtures 0

### Legal Description

### Narrative Description of Property

This property contains 2.139 acres of land mainly classified as UNBUILDBL with a(n) N/A style building, built about N/A, having N/A exterior and N/A roof cover, with N/A unit(s), 0 room(s), 0 bedroom(s), 0 bath(s), 0 half bath(s).

### Property Images



Disclaimer: This information is believed to be correct but is subject to change and is not warranted.

WE, ROBERT L. RICHMOND and MARGARET R. RICHMOND, husband and wife,  
of Plymouth, Plymouth County, Massachusetts

for consideration paid, and in full consideration of THREE HUNDRED THOUSAND  
(\$300,000) DOLLARS,  
grants to TIDMARSH FARMS, INC., a Massachusetts corporation with a  
mailing address of c/o Evan Schulman, 3 Exeter Street, Boston, Suffolk  
County, Massachusetts 02116,  
with quitclaim covenants

the land in

[Description and encumbrances, if any]

Five certain parcels of land with the buildings thereon situated  
in Plymouth, Plymouth County, Massachusetts, bounded and described  
as follows:

PARCEL #1

A certain lot or parcel of land situated in Plymouth in that part  
known as Manomet, bounded and described as follows:

Beginning at a point on the Easterly side of Beaver Dam Road, which  
point is in the range of the High Tension Pole line of the Plymouth  
County Electric Company; thence in said range Southeasterly by land  
now or formerly of Leonard E. Wood et ux, about 205 feet to a fence  
at other land now or formerly of said Wood; thence Northeasterly by  
said fence and land now or formerly of said Wood, 130 feet, more or  
less, to a fence corner; thence turning and running Southeasterly  
by a fence and land now or formerly of said Wood, about 270 feet to  
a fence corner; thence about South 82° 30' East about 500 feet, to a  
point 100 feet from Fresh Brook or Bartlett Brook, so-called, at land  
of the United Cape Cod Cranberry Co.; thence Southerly and South-  
westerly by a line parallel to said Bartlett Brook and 100 feet there-  
from, by land of said United Cape Cod Cranberry Co. to Beaver Dam  
Brook; thence upstream to the Northwesterly corner of the first  
parcel described in a deed of Leonard E. Wood et als to Harvey E.  
Halunen et als, dated April 15, 1947, which deed is duly recorded  
with Plymouth County Registry of Deeds, which corner is also the  
Northeasterly corner of land now or formerly of Harvey E. Halunen et  
als; thence Northwesterly by said land now or formerly of Halunen  
et als 125 feet; thence Westerly substantially 90° to the preceding  
course by a line substantially parallel to said Beaver Dam Brook and  
by said land now or formerly of Halunen et als to a point located  
125 feet from said Beaver Dam Brook, in the line of land now or  
formerly of said Halunen et als; thence Northwesterly by said land now  
or formerly of said Halunen et als to a White Oak Tree at Beaver Dam  
Road; thence Northeasterly by said Beaver Dam Road 820 feet to the  
point of beginning.

Subject to an easement to the Plymouth County Electric Co. dated  
December, 1965 and duly recorded in Plymouth County Registry of Deeds.

PARCEL #2

The land in Plymouth, Plymouth County, Massachusetts, in that part  
known as Manomet, with the buildings thereon, situated on Beaver Dam

LEL

Road, so-called, and bounded and described as follows:

Beginning at a white oak tree standing between land of Matiah Blackmer, now or formerly, and said land hereby described, and thence running in a Southerly direction by said highway to land now or formerly of George Griswold; thence Easterly by said Griswold land to Beaver Dam Brook; thence Northerly by said Brook to above-named Matiah Blackmer land; and thence Westerly by said Blackmer land to the point of beginning. Containing about 8 acres of land.

PARCEL #3

Also the land in that part of said Plymouth known as Manomet, with the buildings thereon, bounded and described as follows:

Beginning at a point on the Northwesterly corner of the granted premises at land now or formerly of the United Cape Cod Cranberry Co. and Beaver Dam Brook, thence running in a Northeasterly direction by land now or formerly of the United Cape Cod Cranberry Co. 127 feet, more or less, to a stone bound; thence turning and running in a Southwesterly direction by land now or formerly of Leonard E. Wood et al, 921 feet, more or less, to a large stone; thence turning and running in a Northwesterly direction still by land now or formerly of said Wood et al 110 feet, more or less, to said Beaver Dam Brook; thence turning and running in a Northeasterly direction by said Beaver Dam Brook to the point of beginning.

PARCEL #4

Also the land in said Plymouth, in that part known as Manomet, bounded and described as follows:

Beginning at Beaver Dam Brook at the Northwesterly corner of the third parcel hereinbefore described; thence Northwesterly by land now or formerly of S. Maynard Holmes et ux, 125 feet; thence Southwesterly substantially 90° to the preceding course by a line substantially parallel to Beaver Dam Brook by said Holmes' land to the second parcel herein; thence Southeasterly by said second parcel to said Beaver Dam Brook and the third parcel herein; thence Northwesterly by said Beaver Dam Brook downstream and by said third parcel to the point of beginning.

PARCEL #5

A certain parcel of land with the buildings thereon consisting of upland and cranberry bog, situated on the Northwesterly side of Beaver Dam Road, in that part of PLYMOUTH, Plymouth County, Massachusetts known as MANOMET, and more particularly bounded and described as follows:

Beginning at a point in the Northerly sideline of Beaver Dam Road in line of land now or formerly of Bresnahan;

thence South 89° 30' West by said Bresnahan land, 8 rods 22 (146.52 feet);  
Thence South 2° East by said Bresnahan land and by land of Ivan Richmond et al 26 rods 8 links, (434.28 feet);  
thence South 19° 15' West by said land of Ivan Richmond et al, 8 rods and 11 links, (139.26 feet);  
thence South 82° 45' West by land of Ivan Richmond et al, 11 rods and 24 links, (197.34 feet);

thence South 68° 30' West by land of Ivan Richmond et al, 20 rod  
 (330 feet);  
 thence South 73° 45' West by land of Ivan Richmond et al, 10  
 rods, (165 feet);  
 thence South 14° West by land of Ivan Richmond et al and by  
 land of John Davis, 10 rods, (165 feet);  
 thence South 6° West 14 rods by land of said John Davis, 14 rods  
 (231 feet);  
 thence North 58° West by said Davis land, 40 rods, (660 feet);  
 thence North 22° West by land of the Second Congregational  
 Church of Plymouth, known as the "Parish Lot", 7 rods 17 links,  
 (126.72 feet);  
 thence North 5° West by said Parish Lot, 22 rods, (363 feet);  
 thence North 33° 30' East by said Parish Lot, 7 rods 17 links,  
 (126.22 feet);  
 thence Westerly by the Parish Lot, 21 rods 7 links, more or  
 less, (351.12 feet);  
 thence Northerly by land of Joseph Leto, twelve hundred (1200)  
 feet to a Cement Bound and corner at land of John G. Talcott, Jr.;  
 thence Easterly by said land of John G. Talcott, Jr., two  
 hundred fifty (250) feet to a Cement Bound;  
 thence Northerly by said land of John G. Talcott, Jr., sixty  
 (60) feet to Cement Bound;  
 thence North 0° 24' 00" East by land of Boston Edison Co.,  
 seven hundred eighteen and 11/100 (718.11) feet to a corner and  
 land of Walter J. Burt, et ux;  
 thence South 80° 39' 20" East by land of Walter J. Burt et ux,  
 three hundred thirty-five and 26/100 (335.26) feet to a Cement  
 Bound;  
 thence turning and running Northerly by said Burt land, three  
 hundred sixty-five (365) feet, more or less, to land of Arthur W.  
 and Margaret C. Elliot;  
 thence running Southeasterly by said Elliot land and by land of  
 Robert L. Richmond et ux, two hundred ninety (290) feet, more or  
 less, to the center of an old road;  
 thence running South 38° 51' 34" West, by land now or formerly  
 of New Bedford Gas & Edison Light Co., fifty-four (54) feet, more or  
 less, to a Cement Bound;  
 thence continuing the same course by said land of New Bedford  
 Gas & Edison Light Company, four hundred five (405) feet to a Cement  
 Bound;  
 thence South 78° 07' 03" East by land of New Bedford Gas &  
 Edison Light Co., seven hundred sixty-eight and 88/100 (768.88) feet  
 to a Cement Bound;  
 thence North 6° 48' 23" East by land of New Bedford Gas and  
 Edison Light Co., four hundred seventeen and 37/100 (417.37) feet  
 to a Cement Bound;  
 thence continuing the same course, twenty (20) feet to the  
 center of an old roadway and to land formerly of Dolphin, now  
 or formerly of Robert L. Richmond et ux;  
 thence running Easterly by the center of said old roadway in  
 line of land formerly of Dolphin now or formerly of said Richmonds  
 to a point two hundred fifty (250) feet, more or less, from Beaver  
 Dam Road, in line of land formerly of Goddard, later of Symmes;  
 thence turning and running Southerly, parallel to and two  
 hundred fifty (250) feet distant from Beaver Dam Road (as it  
 existed April 16, 1963) by land of said Symmes, eight hundred  
 fifty (850) feet, more or less, to a bound marking the Southwest  
 corner of the homestead property formerly of Will C. Snell now or  
 formerly of Frederick W. Symmes et ux;

thence turning and running Easterly, by said Symmes land two hundred fifty (250) feet to a Cement Bound in line of Beaver Dam Road;

thence turning and running Southerly by Beaver Dam Road, five hundred sixty-two (562) feet, more or less, to the point of beginning;

Also including herein so much of the land lying Northerly of the Symmes Homestead (formerly the Snell Homestead) as consists of a cranberry bog, known as the Frying Pan Bog, together with a strip of land, 1 rod in width around the edge of the Frying Pan Bog, wherever said Frying Pan Bog lies within two hundred fifty (250) feet of Beaver Dam Road.

Saving and excepting from said Parcel #5 those premises described in the deed from Robert L. Richmond and Margaret R. Richmond to John Alden Sportsman Club dated January 25, 1974 recorded with said Deeds in Book 3964, Page 140.

Said Parcel #5 is conveyed together with the benefit of an easement to maintain electric line across the land of Symmes in the location presently existing.

Said Parcel #5 is conveyed together with and subject to all rights of flowage and drainage which we may have as appurtenant to the said premises; and together, also, with all our sanding rights and together with and subject to any rights of way of record which cross said premises. Said Parcel #5 is subject to the pole rights and easements of the Plymouth Electric Light Company granted by said Will C. Snell under instrument acknowledged March 30, 1925, and recorded with said Deeds in Book 1494, Page 336, insofar as in force and applicable, but specifically excluding any right to use the existing driveway through the side yard of the Symmes Homestead.

Said Parcel #5 is also conveyed subject to the easement given to the Plymouth County Electric Company by instrument dated November 1949, recorded in Plymouth County Registry of Deeds, Book 2078, at Page 17, insofar as in force and applicable.

Said Parcel #5 is also conveyed subject to any other easements of record given to Plymouth County for the layout of Beaver Dam Road and to the Plymouth County Electric Company for the erection and maintenance of power lines, insofar as in force and applicable.

Said Parcel #5 is substantially the premises shown as Lots 27, 28B, 29 and 30 on Plat 76 of the January 1, 1981 Plymouth Assessors' Map.

There is conveyed as appurtenant to said Parcel #5 rights of way reserved in the deed of Robert M. Briggs and Gertrude R. Briggs to the New Bedford Gas & Edison Light Company dated September 1971; and said Parcel #5 is subject to rights granted therein over land of the grantees as set forth in an easement dated September 14, 1971 from Robert L. Richmond and Margaret R. Richmond to Robert M. Briggs and Gertrude R. Briggs, insofar as in force and applicable.

Said Parcel #5 is also conveyed together with the same rights and easements contained in an instrument from G. & V. Realty Trust dated September 13, 1971, and duly recorded in Plymouth County Registry of Deeds.

The conveyance of the five above-described parcels includes the 1982

Witness OUR hands and seals this 12<sup>th</sup> day of May 1982

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Robert L. Richmond  
Robert L. Richmond  
Margaret R. Richmond  
Margaret R. Richmond  
\_\_\_\_\_

The Commonwealth of Massachusetts

Suffolk, ss

May 12, 1982

Then personally appeared the above named Robert L. Richmond and Margaret R. Richmond

and acknowledged the foregoing instrument to be their free act and deed, before me

Bob B. Rosenthal  
BOB B. ROSENTHAL Notary Public - Justice of the Peace

My Commission Expires June 14 1985

REC'D MAY 12 1982 AT 2-45 PM AND RECORDED

See  
Bk. 9260  
Pg. 140

SECOND CHURCH OF PLYMOUTH (Congregational), a Massachusetts not for profit corporation organized under M.G.L. c. 180 on March 4, 1930,

grant to TIDMARSH FARMS, INC., a Massachusetts corporation with a mailing address of 3 Exeter Street, Boston, Massachusetts,

for consideration paid and in full consideration of SIXTY-TWO THOUSAND FIVE HUNDRED DOLLARS AND 00/100 (\$62,500.00)

WITH QUITCLAIM COVENANTS

A certain parcel of land with the buildings and improvements thereon, if any, situated off Beaver Dam Road in Plymouth, Plymouth County, Massachusetts, and more particularly bounded and described in a deed recorded with Plymouth County Registry of Deeds in Book 106, Page 206, as follows (or however otherwise said premises may be bounded, measured and described):

A certain tract of Woodland lying in said Plymouth at Monument Ponds on the Easterly side of the pine hills so called containing forty one acres more or less and bounded as follows:

Beginning at the Southwest corner of Deacon Blackmers land thence to run West twelve rods to the land of Ichabod Morton Jr. and others thence South by said Morton and others land forty one rods and a half to a pine tree marked then to run East to Clark's land thence bounded Northerly by Clarks land to said Deacon Blackmers land to pine tree thence West by said Blackmers land to the bounds first mentioned and is the piece of land I purchased of the heirs of the late Maver Ivory DuGas. Reference being had to that Deed for further description of said land.

Meaning and intending to convey and hereby conveying the premises shown as "TOTAL AREA 1,848,919 S.F. (42.445 ACRES)" on a plan entitled "PLAN OF LAND Off Beaver Dam Road Plymouth, Massachusetts for: Second Church of Plymouth," dated October 17, 1985 by Stenbeck & Taylor, Inc., to be recorded herewith.

For Grantor's title, see deed recorded with Plymouth County Registry of Deeds in Book 106, Page 206.

CANCELLED  
COMMONWEALTH OF MASSACHUSETTS  
DEEDS & EXCISE  
14250

Executed under seal as of Nov. 13, 1985.

Nancy L. Williams  
Nancy L. Williams

Vanessa B. Hammond  
Vanessa B. Hammond

Grace A. Pleadwell  
Grace A. Pleadwell

Peter C. Renaud  
Peter C. Renaud

Doris A. Craig  
Doris A. Craig

Clarence A. Mörpfe  
Clarence A. Mörpfe

James E. Hammond  
James E. Hammond

As Trustees of  
the Second Church  
of Plymouth  
(Congregational)

Nancy L. Williams, clerk  
Nancy L. Williams, Clerk of  
the Board of Trustees of the  
Second Church of Plymouth  
(Congregational)

James E. Hammond  
James E. Hammond, Moderator  
of the Second Church of  
Plymouth (Congregational)

COMMONWEALTH OF MASSACHUSETTS

Plymouth, ss

November 13, 1985

Then personally appeared the above named, JAMES E. HAMMOND of the Second Church of Plymouth (Congregational) and acknowledged the foregoing to be his free act and deed and the free act and deed of the Second Church of Plymouth (Congregational), before me.

9-26-86  
Commission Expires

[Signature]  
Notary Public

REC'D NOV 13 1985 AT 3-29 PM AND RECORDED



BK 15580PG252

111601

WE, IVAN W. RICHMOND and GARY D. RICHMOND, as we are Trustees of R & R Realty Trust under Declaration of Trust dated June 22, 1995, and recorded at Plymouth County Registry of Deeds, Book 13649, Page 37, for consideration paid in the sum of Seven Thousand and No/100 (\$7,000.00) Dollars; grant to: TIDMARSH FARMS, INC., a Massachusetts corporation having a usual place of business at 3 Exeter Street, Boston, Massachusetts, 02110, with QUITCLAIM COVENANTS the following described property:

A certain parcel of land located on the westerly side of Beaver Dam Road, Plymouth, Plymouth County, Massachusetts, and shown as Lot 24-20 consisting of approximately 99,016 square feet (2.13 acres) on a Plan entitled "Definitive Subdivision Plan of Beaver Brook Estates, Plymouth, Massachusetts, prepared for R & R Realty Trust, Scale 1" = 40'", dated March 12, 1996, revised August 16, 1996, and further revised August 20, 1996, drawn by Land Management Systems which plan was recorded at Plymouth County Registry of Deeds on October 22, 1996 at Plan Book 39, Page 454.

WITNESS our hands and seals this 2nd day of December, 1996.

*Ivan W. Richmond*  
Ivan W. Richmond  
Trustee as aforesaid

*Gary D. Richmond*  
Gary D. Richmond  
Trustee as aforesaid

Received & Recorded  
PLYMOUTH COUNTY  
REGISTRY OF DEEDS  
23 OCT 1997 02:10PM  
DEAN DAVENPORT  
REGISTER  
Bk 15580 Pg 252



BK 13944 PG 193

97165  
Received & Recorded  
PLYMOUTH COUNTY  
REGISTRY OF DEEDS  
06 NOV 1995 01:04PM  
JOHN D. RIORDAN  
REGISTER  
Bk 13944 Pg 193

GRANT OF ACCESS EASEMENT

This Grant of Access Easement is made by TIDMARSH FARMS INC, a Massachusetts corporation (the "Grantor"), to JOSEPH LETO of Plymouth, Massachusetts (the "Grantee").

WHEREAS, the Grantor is the owner of certain real property located off Old Sandwich Road in Plymouth, Plymouth County, Massachusetts, as more particularly described in a deed to the Grantor dated November 13, 1985 recorded with Plymouth County Registry of Deeds in Book 6421, Page 204 (the "Burdened Premises"), which Burdened Premises are located approximately as shown as Lot 8 on the plan attached hereto as Exhibit A;

WHEREAS, the Grantee is the owner of certain real property located off Old Sandwich Road in Plymouth, Plymouth County, Massachusetts, as more particularly described in a deed to the Grantee dated May 22, 1946, recorded with Plymouth County Registry of Deeds in Book 1919, Page 246 (the "Benefitted Premises"), which Benefitted Premises are located approximately as shown as Lot 6A on the plan attached hereto as Exhibit A; and the Grantee has an access easement over land of Digital Corporation as set forth in a certain Land Court Decree, a copy of which is recorded with said Deeds in Book 12853, Page 302.

WHEREAS, the Grantor has agreed to grant an access easement for the benefit of the Benefitted Premises on and over that certain portion of the Burdened Premises consisting of a strip of land approximately 10 feet in width, located approximately where the "Jeep Trail" crosses said Lot 8 as shown on the attached Exhibit A, (the said strip is hereinafter referred to as the "Easement Area"); and the Grantee has agreed to certain limitations, conditions, and obligations relating to such access easement as set forth herein;

NOW THEREFORE, for good and valuable consideration, <sup>Nominal</sup> and intending to be bound hereby, the Grantor hereby grants to the Grantee the following easement, and the Grantee hereby agrees to the following restrictions, conditions, and obligations, all subject to the terms contained herein:

1. (a) The Grantor does hereby grant and convey to the Grantee, without covenants, upon and subject to the terms and conditions herein contained, for the benefit of the Benefitted Premises and running with and as appurtenant to the Benefitted Premises, the perpetual, non-exclusive right and easement in, on, over and across the Easement Area for the purpose of access and egress on foot, on bicycles, on horses, and in passenger motor vehicles, including without limitation pick-up trucks, to pass and repass from Old Sandwich Road to the Benefitted Premises, in order to use and enjoy the Benefitted Premises for picnicking, family gatherings, enjoying nature, and other similar activities, and in other motor vehicles required to perform maintenance and repair work permitted herein. The easement granted pursuant to the preceding sentence shall include the right to perform at the Grantee's sole cost and expense reasonable maintenance and repair work in and on the Easement Area as necessary or desirable to maintain safe year-round vehicular access as described and permitted herein, including grading, additions of gravel or other material, snow plowing, provisions for drainage, removal of

Wm V Hovey  
155 FEDERAL ST - 4TH FLOOR  
BOSTON, MA 02110

vegetation, and landscaping and seeding to prevent erosion. Notwithstanding the foregoing, no maintenance or repair work other than snow plowing and temporary emergency repairs shall be performed by or on behalf of the Grantee until the date that is twenty-one (21) days after the date that the Grantor receives from the Grantee a reasonably detailed written description of the proposed maintenance or repair work. The Grantee shall not, however, cause or allow the Easement Area to be paved with any material which would materially change its character, nor shall the Grantee widen the Easement Area beyond a width of ten (10) feet. The Grantor reserves the right to use the Easement Area for any purposes not inconsistent with the right and easement granted herein.

(b) Notwithstanding the foregoing, the Grantor shall have the right, at any time and from time to time, to relocate the Easement Area to a new location on the Burdened Premises, (the "New Easement Area") provided that (i) the strip of land that constitutes the New Easement Area is at least as wide for its entire length, (ii) the New Easement Area provides access and egress that is not different, except insubstantially, from the access and egress provided through the Easement Area, (iii) the New Easement Area connects with the Easement Area at the boundaries of the Burdened Premises in the same location as the Easement Area, including without limitation the same connection points as set forth in said Land Court Decree, (iv) the entire cost of such relocation, including without limitation, the cost of a new survey and plan, drafting and recording a new grant of easement is borne by the Grantor, (v) such relocation shall not interfere or interrupt the Grantee's easement rights except insubstantially, and (vi) the Grantee shall continue to have the easement rights set forth in subparagraph (a) of this paragraph 1 above in the then current location of the Easement Area until the time that the New Easement Area is available for exercise of such easement rights by the Grantee. At the time that a New Easement Area is available for exercise of the easement rights granted under subparagraph (a) of this Paragraph 1, the Grantor shall record with the Plymouth County Registry of Deeds an amendment to this Grant of Access Easement defining the boundaries of the New Easement Area, and from and after the date of such recording (until the recording of a subsequent amendment, if any, designating another New Easement Area) and the Grantee's receipt of such amendment mailed or delivered to the Grantor at 129 Warren Avenue, Plymouth, MA 02360, or such other address designated by the Grantor to the Grantee, the rights and obligations of the Grantor and the Grantee hereunder shall apply to the New Easement Area as defined in such amendment.

2. The Grantee hereby releases to the Grantor, and permanently waives, all rights of the Grantee or of any person claiming by, through, or under the Grantee in or to the Easement Area or any other portion of the Burdened Premises, except for the easement rights granted hereunder.

3. The Grantee agrees to indemnify and hold the Grantor harmless from and against all costs, claims, expenses, damages (including personal injury and property damage), and liabilities of any nature whatsoever (including, without limitation, court costs and reasonable attorneys' fees), incurred by the Grantor (a) as a result of or in connection with any personal injury or property damage that occurs in, on, or around the Burdened Premises in connection with any exercise of the rights granted to the Grantee hereunder, (b) as a result of or in connection

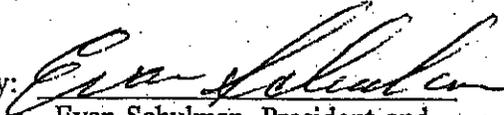
with any failure by the Grantee to comply with the provisions of this instrument, or (c) otherwise resulting from or relating to any exercise of the right granted to the Grantee hereunder, unless such cost, claim, expense, damage or liability is a result of the conduct of the Grantor or the Grantor's agents, employers or contractors. Without limitation of the terms of the preceding sentence, the Grantee shall pay to the Grantor all legal expenses incurred by the Grantor in connection with the enforcement of the provisions of this instrument and the recovery of damages or equitable relief relating to any failure by the Grantee to comply with the provisions of this instrument, in all instances only if and when the Grantor prevails in said legal or equitable actions. Likewise, the Grantor shall pay to the Grantee all legal expenses incurred by the Grantee in connection with the enforcement of the provisions of this instrument and/or the recovery of damages or equitable relief relating to any failure by the Grantor to comply with the provisions of this instrument, in all instances only if and when the Grantee prevails in said legal or equitable actions.

4. As used herein, the terms "Grantor" and "Grantee" shall include their respective heirs, legal representatives, successors, assigns, and successors in title, and the rights, agreements, and obligations contained herein shall be covenants running with the land and shall be binding upon and inure to the benefit of the parties hereto and those claiming title to or interest in the Burdened Premises and/or the Benefitted Premises.

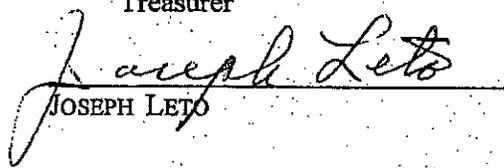
EXECUTED under seal this 31st day of July, 1995.

GRANTOR: TIDMARSH FARMS, INC.

By:

  
Evan Schulman, President and  
Treasurer

GRANTEE:

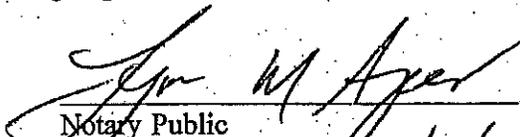
  
JOSEPH LETO

Commonwealth of Massachusetts

Suffolk, ss.

August 16, 1995

Then personally appeared the above-named Evan Schulman, President and Treasurer of Tidmarsh Farms, Inc., and acknowledged the foregoing instrument to be the free act and deed of said Tidmarsh Farms, Inc., before me,

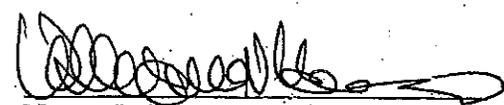
  
Notary Public  
My commission expires: 5/19/2000  
Lynn M Ayer

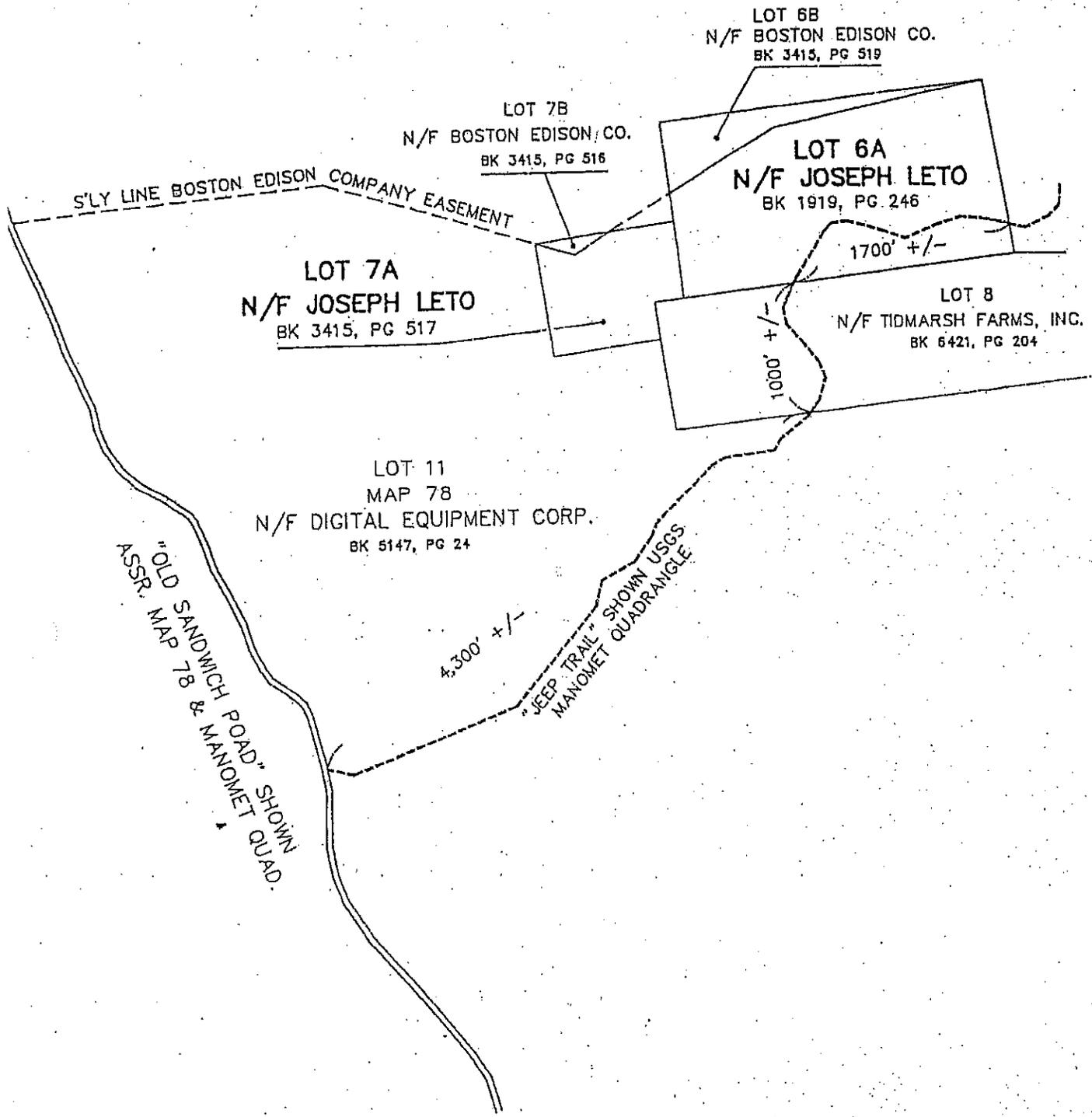
Commonwealth of Massachusetts

Plymouth, ss.

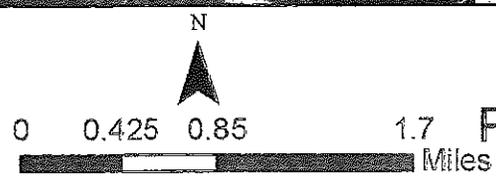
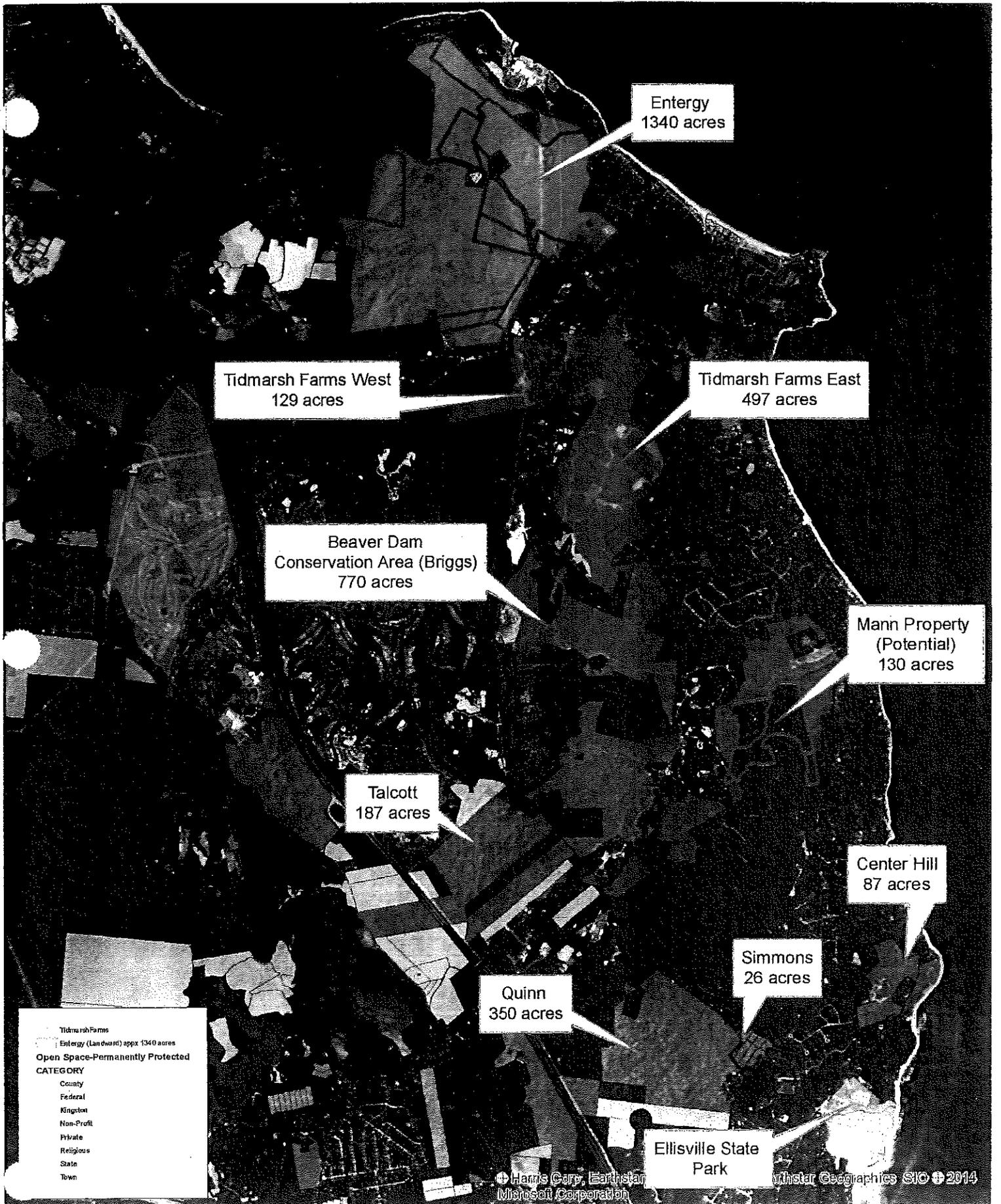
July 31, 1995

Then personally appeared the above-named Joseph Leto, and acknowledged the foregoing instrument to be his free act and deed, before me,

  
Notary Public  
My commission expires: 12-1-2000  
William V Hovey



← END OF INSTRUMENT →



# Open Space & Potential Future Acquisitions



Tidmarsh Farm  
Plymouth MA  
WRE 2014  
Easement/Access Map

7/7/14



- Property (83.8 ac)
- Easement (61.7 ac)
- Bogs (40.6 ac)
- NRCS access to easement



0 375 750 1,500 Feet

2012 APFO orthophoto mosaics



Building foundation and shed not included in NRCS easement

Access Road not part of easement

Proposed WRE will be comprised of approximately 61.7 acres (outlined in red) and being part of parcel 076-000-028E-000. Proposed access easement (shown in blue) is off Beaver Dam Road

BEAVER DAM ROAD

ANTHONY SWEET INC

32 Court Street  
Plymouth, Massachusetts 02360  
mail@btiweb.com

Tel: 508-746-3288  
Fax: 508-746-6407  
www.btiweb.com

**TO:** Evan Schulman  
Glorianna Davenport  
Angus Jennings  
Randy Parker

**FROM:** David Johnson

**DATE:** March 25, 2009

**REFERENCE:** Tidmarsh Farms Concept Sketches  
BTI Project No. 2143.00

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Beals and Thomas, Inc. has prepared initial concept sketches for Planning Areas 1, 2, 3/4 (hybrid), and 6. The purpose of this task was to establish whether the as-of-right lot count obtained in the conventional subdivision plans could be achieved in a conservation development scheme or schemes utilizing the various zoning tools available in the Plymouth Zoning Bylaw. In order to accomplish this goal, a number of assumptions were made relative to the development standards that would apply in each planning area. A thumbnail summary of the zoning requirements, our assumptions and design considerations for each planning area is provided below for your review and comment. Please note that these assumptions can be modified as the design evaluation process unfolds.

For the initial abstraction we have used single family development on individual lots as the development scheme for all Planning Areas with the exception of Planning Area 3/4 in its hybrid configuration. Detached single family is the only allowed use in Planning Areas 1 and 6 (Rural Residential zoning). Although multi-family use is allowed in Planning Area 2 by special permit under the VOSD bylaw, this has not been explored as yet.

The attached sketches are intended to provide a basic starting point for discussion toward developing a preferred alternative. Note that the house sizes, locations and orientations are shown for basic design and discussion purposes only. The actual siting and orientation would be based on a site evaluation conducted for the development of the final plans for the preferred alternative. In the gravel pit areas grading plans to terra form and create different elevations for house siting would be also be an integral part of the final planning.

### Planning Area 1

Zoning: Rural Residential

Allowed Use: Single Family detached dwellings only

By-right Lots: 24 lots (including 2 existing dwellings)

Recommended Zoning Technique: Rural Density Development with Transfer of Development  
Rights out to Planning Area 6

Proposed Lots: 13 lots with 11 lots additional lots to be TDR'd to Planning Area 6

Minimum Lot Size Allowed: 20,000 SF

Proposed Minimum Lot Size: 45,000 SF (150' x 300' typical) not including the 2 existing  
dwellings which will be larger

Minimum Lot Width Allowed: 50'

Proposed Lot Width: 50' for lots 6 and 7

150' minimum for all others

### Design Considerations

- Provide extensive buffer between the existing Tidmarsh dwellings and the proposed new development
- Separate individual lots by permanent open space (approx. 150' +/- in width) in common ownership with a conservation restriction on tree cutting, etc. to create nestling-in of homes
- Site houses at different elevations and setbacks
- Maximize views in multiple directions where possible based on field evaluation
- Maximize driveway separation and minimize visibility of houses and garages when looking along driveways
- Minimize tree removal
- Create unique and attractive roadway network; improve existing roads where feasible
- Provide open space which enhances rural atmosphere and preserves forested areas

### Options

- Individual lots can easily be increased in area, if larger or less lots are desired

## Planning Area 2

Zoning: R-25

Allowed Use: Single Family detached dwellings or duplexes by special permit  
Multi-family units under a VOSD Special Permit.

By-right Lots: 27 single family lots or 36 units\*

Recommended Zoning Technique: Village Open Space Development

Proposed Lots: 23 Single-family lots

Minimum Lot Size Allowed: 6,000 SF

Proposed Lot Size: Minimum of 12,000 SF (80' x 150' typical)

Minimum Lot Width Allowed: 60'

Proposed Lot Width: 80'

## Design Considerations

- Site houses at different elevations and setbacks
- Maximize views in multiple directions where possible based on field evaluation
- Avoid development on the steep slopes
- Create attractive roadway network that minimizes grading onto slopes
- Minimize visibility of the new development from the existing Tidmarsh dwellings
- Provide connectivity to open space areas in the adjacent subdivision as well as the open space provided on the Master Plan.

## Options

- Planning Area 2 may be the most appropriate area for the contemplated artist community due to its location, size and smaller number of lots proposed. It has a more neighborhood setting while the number of lots/units proposed in Planning Area 3 would likely be more inventory than this unique market sector will demand.
- Multi-unit buildings or duplexes may be considered as an optional scheme that would allow for increased flexibility and creativity in site design and a greater variety of housing types, if desired.

**Planning Area 3/4 (Hybrid)**

Zoning: R-25

Allowed Use: Single Family detached dwellings or duplexes by special permit  
Multi-family units under a VOSD Special Permit.

By-right Lots: 34 lots or 54 units

Recommended Zoning Technique: VOSD with Transfer of Development Rights  
in from Planning Area 5

Proposed Development: 73 units in 4-unit buildings including the existing Tidmarsh Farms building and 23 units to be TDR'd in from Planning Area 5

Minimum Lot Size Allowed: 6,000 SF (SF) 15,000 SF (MF)

Proposed Lot Size: variable, most are greater than 40,000 SF

Minimum Lot Width Allowed: 50' (SF) 100' (MF)

Proposed Lot Width: 50' min. with most > 100'

**Design Considerations**

- Site houses at different elevations and setbacks with terra forming
- Final plan to employ staggered facades and foundation elevations
- Maximize views in multiple directions where possible based on field evaluation
- Provide useable common open space and connectivity to other open space areas proposed on the Master Plan
- Provide community building with maximum views of open space areas

**Planning Area 5**

Zoning: R-25 and Rural Residential

Allowed Use: Single Family detached dwellings or duplexes by special permit

By-right Lots: 29 lots (35 units)

Recommended Zoning Technique: Transfer of Development Rights for the Rural Residential  
lots and VOSD for the R-25 duplex lots

Proposed Lots: 23 lots to be TDR'd to Planning Area 3/4 (hybrid) as units

12 units to be included in a VOSD in Planning Area 5 within the R-25 portion of  
the property

### Planning Area 6

Zoning: Rural Residential  
Allowed Use: Single Family detached dwellings only  
By-right Lots: 9

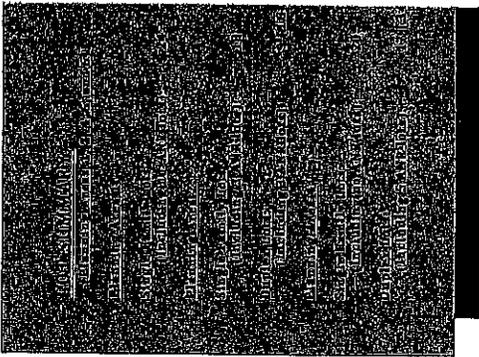
Recommended Zoning Technique: Rural Density Development with Transfer of Development  
Rights in from Planning Area 1

Proposed Lots: 20 lots including 11 lots to be TDR'd in from Planning Area 1  
Minimum Lot Size Allowed: 20,000 SF  
Proposed Minimum Lot Size: 20,000 SF (100' x 200' typical)  
Minimum Lot Width Allowed: 50'  
Proposed Lot Width: 100'

### Design Considerations

- Site houses at different elevations and setbacks with terra forming
- Maximize views in multiple directions where possible based on field evaluation
- Create unique and attractive roadway network
- Provide useable common open space and connectivity to other open space areas proposed on the Master Plan



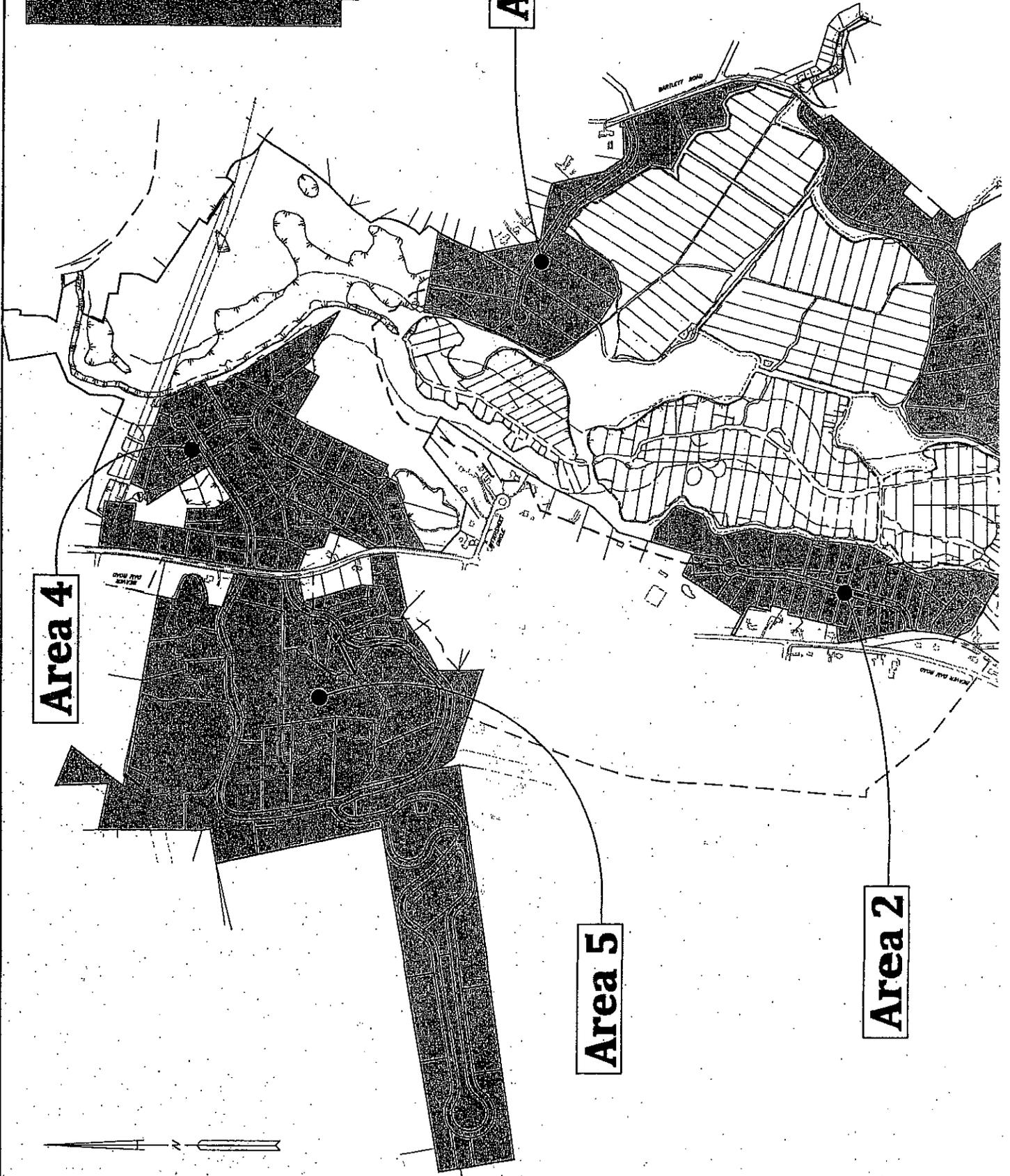


**Area 6**

**Area 4**

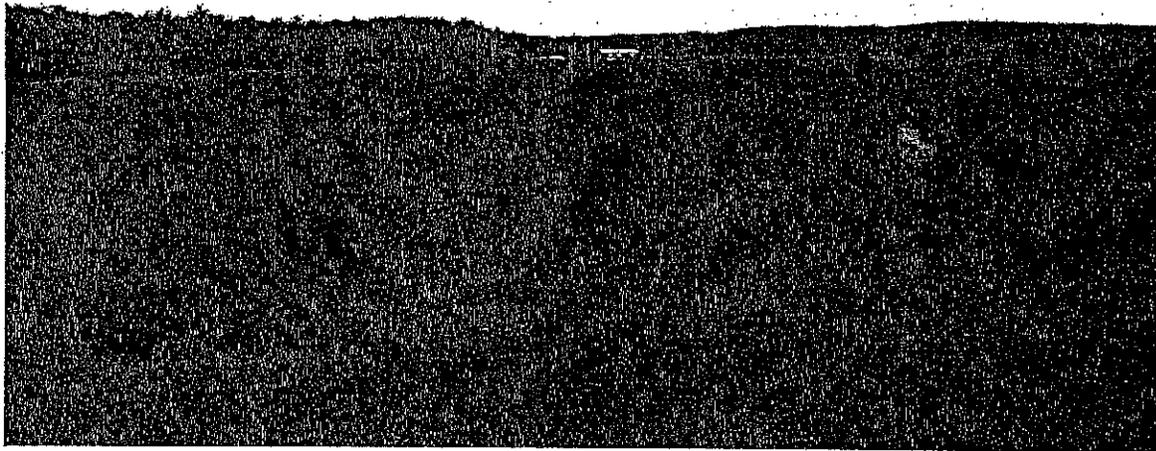
**Area 5**

**Area 2**





**A Conservation Assessment**  
and  
**Wildlife Sanctuary Concept Plan**  
for  
**Tidmarsh Farm**  
In Plymouth, Massachusetts



Submitted by

Jeffrey Collins

September 2014

Ecological Extension Service  
Mass Audubon  
208 South Great Road  
Lincoln, Massachusetts 01773

781 259 2159  
781 259 2359 (fax)

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## Introduction

Tidmarsh Farm is a +/- 630 acre cranberry bog and forest property in the Manomet section of Plymouth, Massachusetts assembled by Evan Schulman over the past 30 years and currently owned by Evan's children – Yvonne, Audrey and Eric. (Figure 1). The name Tidmarsh comes from Evan's grandfather's farm in England. While much of the land has been heavily altered for cranberry production, many of the bogs have been abandoned in recent years and the site currently features a wide range of habitats and an extensive network of farm roads that makes for a rich landscape for exploration and observation of wildlife.

Evan, his current wife, Glorianna Davenport, and his children would like to see Tidmarsh Farm converted to a property open for the public to explore and enjoy with an education program focused on restoration of landscape processes and wildlife habitat, particularly through the use of innovative technology to reveal hidden aspects of the land. To this end, they have initiated planning for the restoration of ~140 acres of cranberry bog to a more natural peatland system and are exploring options for permanent protection of the land. As they are not in the financial position to fund the restoration nor to donate the property to a conservation entity, they are working with the Massachusetts Department of Ecological Restoration to design and fundraise for the restoration component of the project, and they have approached Mass Audubon to consider developing a wildlife sanctuary on the property.

For Mass Audubon to fully evaluate the opportunity, our Ecological Extension Service (EES) was engaged to prepare this report. EES is Mass Audubon's fee-for-service technical assistance program through which we share our expertise with conservation partners. While Jeff Collins, Director of Ecological Management, is the primary author, this report reflects the input of additional Mass Audubon staff including Bob Wilber, Director of Land Conservation; Sue MacCallum, Director of South Shore Sanctuaries; Kathy Sferra, Regional Director for the Southeast, Cape and Islands; Robert Buchsbaum, Regional Scientist for the Southeast, Cape and Islands; Mark Faherty, Science Coordinator at Wellfleet Bay Wildlife Sanctuary; and Stu Weinreb, Director of Capital Assets and Planning.

We begin this work with some basic operating assumptions (see Figure 2 for locations):

1. The landowners desire a conservation outcome for the property.
2. The cranberry bogs east of Beaver Dam Road will be restored to a wetland and stream complex with a focus on biodiversity including diadromous fish habitat.
3. As the landowners are not in a position to donate the property, funds will need to be identified to support the costs of restoration, land protection and ongoing operations of a wildlife sanctuary including research and monitoring, ecological management, visitor services, and sanctuary defense.
4. Evan Schulman and Glorianna Davenport will retain rights to access and enjoy the main house through a life estate agreement or other instrument or by retaining ownership outright.
5. Any proposals for visitor access are secondary to the ecologically appropriate restoration of functioning wetland and stream habitat.

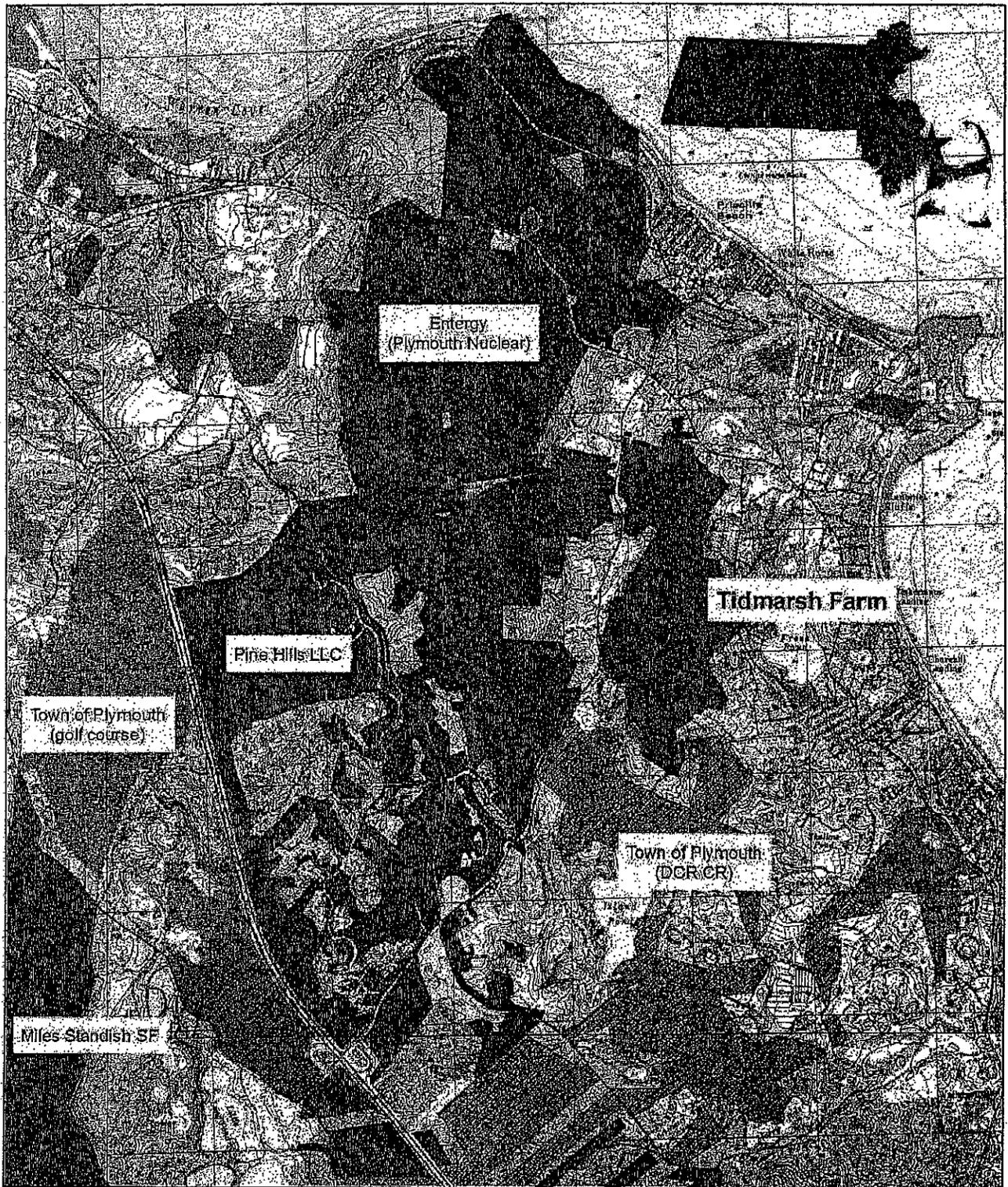


Figure 1. Tidmarsh Farm Location and Conservation Setting.

0 0.5 1 Mile



6. The bogs west of Beaver Dam Road are not planned for restoration at this time and are suitable to remain in production

With those assumptions in mind, the goals of this conservation assessment and concept plan are to evaluate the opportunities for creating a safe and attractive entrance and trail system that allow for the typical activities permitted at Mass Audubon wildlife sanctuaries, identify steps that would be necessary to prepare the site for public use, estimate capital costs and ongoing costs associated with opening, operating and maintaining the site and any remaining structures, and identify opportunities and constraints to be considered as the landowners explore permanent protection of the land. If Mass Audubon ultimately does not acquire an interest, it is hoped that this document will form the basis for discussions with other conservation partners.

## The Site

Tidmarsh Farm consists of two distinct pieces of the property, separated by Beaver Dam Road. We will refer to them as Tidmarsh West and Tidmarsh East (Figure 2). Tidmarsh West comprises 130 contiguous acres and includes ~60 acres of active cranberry bogs and appurtenant land as well as ~70 forested acres including the Ridge Parcel that reaches west to the top of Pine Hill Ridge. Tidmarsh East comprises 500 acres, including ~180 acres of former cranberry bogs and appurtenant land; 320 acres of forest, marsh, grassland, and swamp; and the main residence.

## Tidmarsh East

### Topography and Soils

Tidmarsh East resembles a bowl with the bogs creating a large, flat bottom to the bowl while low forested hills to the north, west, and south enclose it. The land opens up only to the east, where Bartlett Road runs adjacent to the bogs.

### Natural Resources

The ~140 acres of cranberry bog (including berms and roadways) on Tidmarsh East, which have been intensively manipulated and managed for decades, are no longer active and are slated for complete restoration to a more natural combination of peatland, swamp, marsh, pools, and streams. These bogs were taken out of production beginning around 2000. As bogs were taken out of production, vegetation and water levels in the bogs have been largely unmanaged.

Cell 2 appears to have been the first area to be abandoned and today hosts a well-developed early successional stand of white pine, quaking aspen, cherries, and red maple among other species. The more southerly bogs are characterized by low vegetation with grasses the most common plants establishing themselves among the cranberries. While a variety of wildlife would have made use of the bogs during the period of active cranberry production and a greater variety are making use of the former cranberry bogs now that they have been left fallow, these areas are far from natural and will benefit tremendously from an intensive restoration effort.

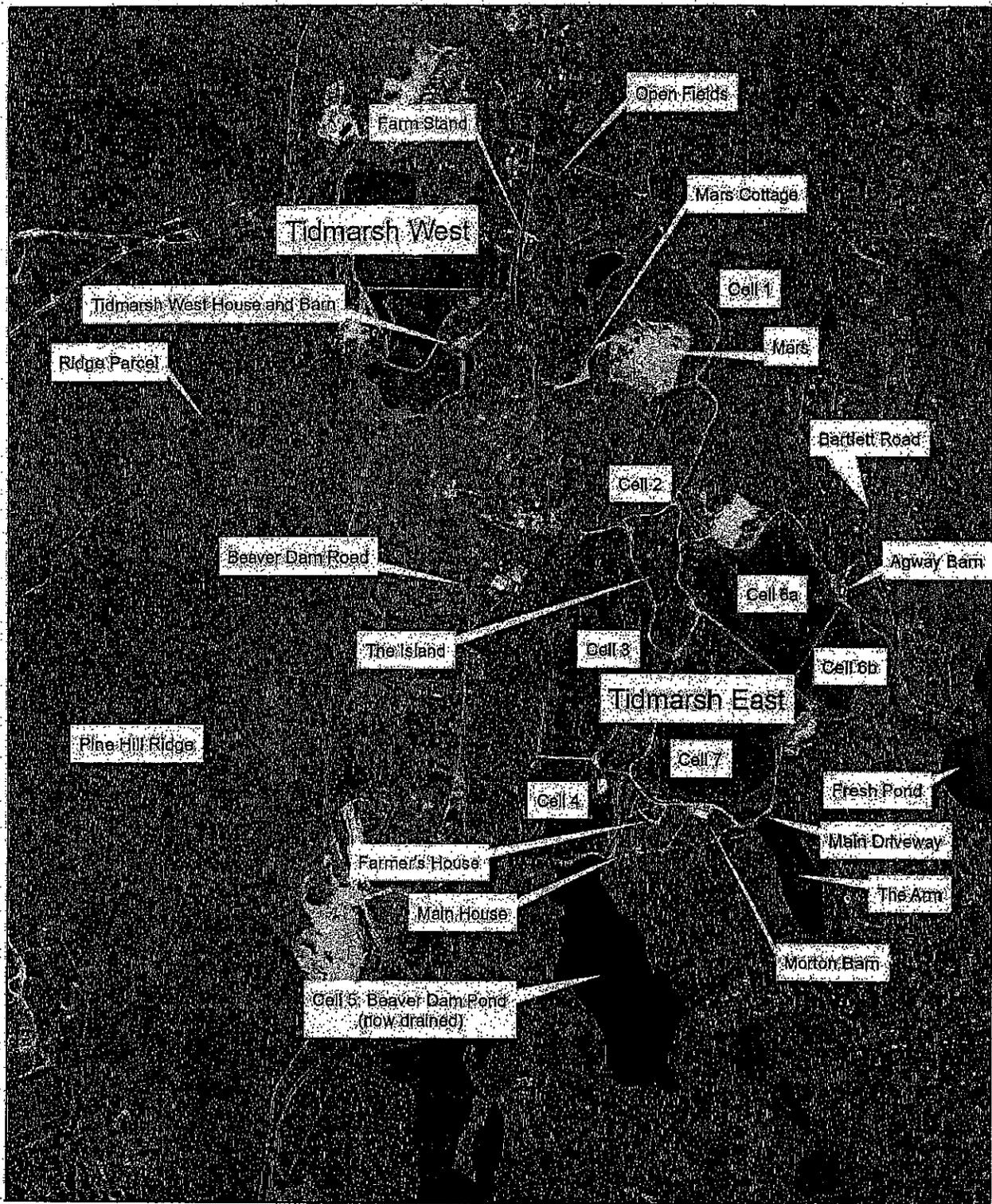


Figure 2. Locations referred to in the report.

0 1,000 2,000 Feet



The following locations and terms are used throughout this report and are keyed to Figure 2.

1. Tidmarsh West – The ~130 acres of land located west of Beaver Dam Road.
2. Tidmarsh East – The ~500 acres of land located east of Beaver Dam Road.
3. Bartlett Road – A quiet local road, narrow in places, on the east side of the property.
4. Beaver Dam Road – A larger local road providing access to both sections of the property.
5. Main House – Location of Gianna and Evan's part-time residence, studio, and guest house.
6. Farmer's House – House currently occupied by farmer, Don Badeau.
7. Agway Barn – A farm equipment and storage shed, currently houses network equipment for Living Observatory.
8. Morton Barn – A farm equipment and storage shed.
9. Tidmarsh West House – A rental house.
10. Tidmarsh West Barn – A barn used for cranberry bog operations.
11. Mars – A 10-acre partially restored sand and gravel extraction site.
12. Mars Rental Cottage – A small rental cottage.
13. The Island – A spur of highland surrounded by bogs.
14. Open Fields – 10 acres of old fields and long-abandoned, small cranberry bogs currently in grass with some early successional trees.
15. Farm Stand – A small building, formerly used as a farm stand, equipped with electricity, water, and a walk-in freezer.
16. Main Driveway – Driveway to Farmer's House, Morton Barn, and the Main House.
17. Bog Cells 1-8 – Various discrete cells that were used for cranberry farming on Tidmarsh East.
18. Beaver Dam Pond – Former location of this 33-acre reservoir created by a dam at the northern end. The reservoir was drained in 2011 and this is now a cattail marsh with meandering stream channel.
19. The Ann – A shallow pond/emergent marsh upstream of Cell 7, connected by a culvert under the Main Driveway.
20. Fresh Pond – A pond upstream of Cell 66, connected by a narrow channel under Bartlett Road. The presumed destination for aged tomous fish.
21. Pine Hill Ridge – A north-south ridge running along the west side of Tidmarsh West.
22. The Ridge Parcel – A rectangular parcel stretching from the edge of the Tidmarsh West bogs to the top of the Pine Hill Ridge.
23. Pine Hills LLC – Parcels owned by Pine Hills LLC, a large holding including many residential cluster developments.

**Natural communities/cover types outside the bogs themselves include:**

1. Borrow Pits – two large areas and multiple small areas where sand was extracted for use on the bogs and roadways. These large areas of exposed coarse soil can provide nesting habitat for turtles and for bank-nesting birds such as bank swallows and belted kingfishers. Tire tracks indicate that ATV and dirt bike riders use the larger pits which may disturb any wildlife use.
2. Beaver Dam Pond – the former headwaters reservoir used to support bog operations was created by a dam at its northern end. The ~33-acre reservoir was drained in 2011 and

restored on its own to cattail marsh with a meandering stream channel. Some Atlantic White Cedars have been planted in this area as well.

3. Forests – The forests to the south of the Main House, to the west of Cell 4, on The Island, and to the north of Cell 6 are characterized by a canopy of black oak, white oak, white pine and pitch pine, and a shrub layer dominated by ericaceous shrubs. These mature forest stands provide habitat diversity on the site and buffer the site from roads and residential areas to the west, south, and northeast.
4. Red Maple Swamp – The northeast corner of Tidmarsh East includes an extensive red maple-black tupelo swamp. This swamp was probably drained to some extent by creation of a channel that runs straight along its west side, which would have hastened movement of water through this area. Nonetheless, the swamp has maintained itself, and with restoration of the natural channel in this area, will continue to thrive.
5. Fields – The fields north of the Farm Stand have begun to succeed to 'old field' and are dominated by little bluestem and other grasses with birches, aspens, cherries, and white pine pioneers growing widely spaced. A wetter section is characterized by sedges and sphagnum moss.
6. Mars – This 9-acre site was utilized for commercial sand and gravel extraction in 2005. The name 'Mars' refers to its barren appearance post-mining. After operations ceased in 2009 or 2010, the site was restored with storm water control structures including berms and a storm water catch basin at the lowest point of elevation, and a meadow seed mix. The catch basin, consisting of very coarse, angular stones and plastic culverts, is of a utilitarian design and is not very attractive. The vegetation that has taken hold on these very droughty, nutrient poor soils is sparse and dominated by weedy species.

Overall, this combination of natural settings creates habitat for and opportunities to encounter a wide range of plants and animals on the property and could be interpreted through educational programs for visitors of all ages.

#### **Access & Infrastructure**

Existing farm roads and bog infrastructure create opportunities for establishing a public entrance and trail system, however existing buildings may not be consistent with management as a wildlife sanctuary.

#### ***Points of Access***

There are five existing points of vehicular access to Tidmarsh East, three from Beaver Dam Road and two from Bartlett Road.

1. Beaver Dam Road -- Beaver Dam Road is approximately 30 feet wide with a paved shoulder. It is a well-used pass-through between Route 3A and Route 3. The intersection with Route 3A is a traffic light. The speed limit is 40 miles per hour.
  - a. The northern-most access point enters the northwest corner of the property. A gravel road leads into the property 125 feet then forks, with the main gravel road turning north and running to an adjacent property and a narrower gravel road continuing straight for ~1,000 feet to the stream. The main gravel road serves as a driveway for the

- neighbor to the north. There is no parking currently developed in this area. The fields just south of the small gravel road, with low vegetation and soils that are flat and appear to be well-drained, could be a suitable location for a small parking lot; however this location is distant from existing trails and the areas to be restored.
- b. There is a broad pull off on the side of Beaver Dam Road at a small building (875 Square feet) called 'the Farm Stand'. The dirt/gravel-surfaced parking area in front of the Farm Stand is poorly defined. A dirt road leads past the Farm Stand and into the property. The pull-off and gravel lot could be upgraded to a more formal parking area: the location has excellent visibility from Beaver Dam Road, connects to a trail leading into the property, and is directly across Beaver Dam Road from Tidmarsh West; yet as with the more northerly access point, this location is rather distant from the most attractive parts of Tidmarsh Farm.
  - c. The third point of access from Beaver Dam Road is through the driveway to the rental cottage and the Mars site. As this access point was developed for truck access during sand and gravel excavation operations at Mars, the first ~100-foot segment is paved, it is flat, and it is at least 20 feet wide for its entire ~1,000-foot length into the Mars site. Mars was severely disturbed by a sand and gravel extraction process between 2005 and 2010 and is now in a state of restoration with a sparse cover of perennials and grasses establishing on well-drained soils. While the entire site has a rough amphitheater shape, with the lowest point to the south, the driveway enters at the northwest corner where a flat driveway could be located.
2. Bartlett Road -- Bartlett Road is approximately 25 feet wide with narrow sandy shoulders and is quite curvy in places, especially near the entrance to Tidmarsh Farm. Traffic is primarily local residents. As a 'thickly settled area' the limit would be 30 mph. The intersection with Route 3A does not include a traffic light. Turning left from Bartlett Road onto Route 3A is frequently difficult.
- a. The more northerly access point from Bartlett Road is a narrow dirt road that leads ~400 feet to the north service barn. The ground around the service barn is either clear of vegetation or in very short grasses, and is used for parking by people visiting the property to walk around the bogs. Access roads lead northwest and southeast from this point, circling the bogs. This location is easily accessible from Bartlett Road, is flat and well-drained, and is close to the bogs; however the options for walking are more limited from this location, the access drive is relatively narrow, and a driveway at this location would be glaringly visible from some of the most attractive viewing points on the property.
  - b. The more southerly access point is the driveway to the farmer's residence and the main house. A former borrow pit a short distance along this sandy driveway could be converted to a parking area, however this location has many of the same issues as the northern access point. In addition, using the main house driveway as a public access point could lead to confusion and unwanted traffic to the main house.

In addition to the above existing points of vehicular access, the property abuts October Lane and Island Pond Road to the southeast, new development off of Hollis Road to the southwest, a stretch of Beaver Dam Road to the southwest, and Route 3A/State Road to the northeast. None of these is a suitable location for the primary public access to this property.

1. Frontage on October Lane is approximately 120 feet at the very end of the cul-de-sac itself with the property here being densely forested. There is not adequate parking on the cul-de-sac, and it would not be desirable to clear forest in this area to create a parking lot. There is a trail that leads into the property from October Lane, and this location could be considered for a less formal point of pedestrian access for neighbors. Evidence of ATVs and dirt bikes accessing the property from this location suggests that some fencing or other barriers would be desirable to dissuade these users.
2. Island Pond Road is effectively a long driveway where it abuts the very southern end of Tidmarsh East and is unsuitable as an access point.
3. There is no suitable access from Hollis Road.
4. The southwest corner of Tidmarsh East, fronting on Beaver Dam Road and a short spur off of Beaver Dam Road, is forested and slopes to the east. A trail leading onto the property from the bypass might be maintained as an access point for neighbors, but there is no opportunity here for a more developed public access point.
5. Frontage on State Road/Route 3A is less than 100 feet and includes a stream with only narrow strips of land on either side of the stream outlet as it runs between the Moose Lodge property and a residential lot on State Road. Lack of parking and the absence of any trail connecting to the larger portion of the property make this inadequate as an entry point.

### *Structures*

There are three houses on Tidmarsh East as well as two large barns and the Farm Stand.

#### *Houses*

The Main House is used as a residence by Evan Schulman and Glorianna Davenport. The ~4,500 s.f., architect-designed house and detached studio/guest house (~2,500 s.f. on two floors), built in the late 1990s, are very attractive and are in exceptional condition. The house site is well-landscaped with gardens and walkways and includes a detached studio with guest accommodations. Access is from Bartlett Road via bog-side farm roads and a dirt driveway (0.6 mi. in total). The driveway is essentially single-lane in places, and portions would need to be improved if the house were ever to be used as a nature center or other visitor facility.

The Farmer's House is a 1,900 s.f.<sup>1</sup> Cape-style house sitting 600 feet northeast of the Main House, on the south edge of Cell 7 of the bogs. It is currently used by Donny Badeau, the farmer who managed the cranberry bogs on the entire farm and still manages the bogs on Tidmarsh West. This house is accessed from Bartlett Road, following the same bog-side roads that lead to the Main House for ½ mile, then its own dirt driveway.

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<sup>1</sup> Building size information from Plymouth Assessor records or estimated from aerial photos.

The Mars Cottage is a 530 s.f. cottage currently occupied by a renter. It is accessed via the Mars driveway from Beaver Dam Road.

#### **Barns and Other Structures**

The Agway Barn is a ~2,000 s.f. metal-sided barn on a concrete pad formerly used for farm equipment storage on Tidmarsh East. The barn has electricity and was recently wired with high speed Comcast internet connection so that it can house networking equipment for the Living Observatory project. The barn is accessed from Bartlett Road via a 350-foot sandy farm road.

The Morton Barn is a ~7,500 s.f. metal sided barn on a concrete pad which was also used for farm equipment storage and farm operations on Tidmarsh East. The barn has electricity, and is accessed via the same farm roads that lead to the Main House and the Farmer's House. The barn currently has 130 solar panels installed on the roof. These panels provide electricity that is used across the farm. The cleared sandy ground around the Morton Barn may be used for a greenhouse to raise plants for the site restoration.

The Farm Stand is a small (~875 s.f.) one-story building on a concrete slab located alongside Beaver Dam Road on Tidmarsh East. In the past, the building was used by the former owner of Tidmarsh West to sell vegetables and other goods. The building has its own (low demand) electric meter as well as water service and a walk-in freezer. The Farm Stand is not currently being used, but it is being considered as a facility for raising plants for use in the site restoration.

Finally, there are a number of concrete pads and sheds associated with water pumps throughout the bogs. All sheds have been removed from Tidmarsh East but concrete pads remain in four locations.

#### **Current Public Use**

Members of the public commonly use the bog-side access roads on Tidmarsh East for walking, dog walking, jogging, mountain biking, and horseback riding. These trails are also used by dirt bike and ATV riders. The trails south of the Main House are used by ATV riders and the trails leading north from Mars seem to be the most heavily used by ATVs. Walkers appear to most commonly park at the North Service Barn or along the main driveway and walk the wide, flat roads that run around the bogs. ATVs and dirt bikes appear to enter from the northwest corner of the property or from the southeast corner of the property.

#### **Existing Easements and Agreements**

This is a summary of known easements and agreements involving the land based on conversations with the landowners and a search of the Plymouth County Registry of Deeds. This does not represent a formal title search. Copies of all documents are included in Appendix A.

1. NRCs Easement – The current landowners entered into a Conservation Easement with the USDA Natural Resource Conservation Service in December, 2010. The easement, which covers the areas of the bogs identified as Cells 1, 2, 3, 4, 6a, 6b, and 7, prohibits harvesting, alteration, development, dumping, drainage, grazing, degrading habitat, etc. It also prohibits the

- placement of structures within the easement area, "except for structures for undeveloped recreational use".
2. Chapter 61 – The bulk of Tidmarsh East is enrolled in Chapter 61A. One lot south of the Main House is in Chapter 61 for forestry. The very northern-most parcels of Tidmarsh East are not enrolled in Chapter 61, nor is the small forested parcel directly adjacent to October Lane south of the Main House.
  3. Covenant with the Town of Plymouth (1997) – This covenant limits use of the Main House and the Farmer's House to use by either an officer of Tidmarsh Farm or a family member of an officer or by a person employed full time in the agricultural use of the premises "until and unless said premises is subdivided". The current owners report that this covenant is still in effect.
  4. Utility Easement (1998) – Tidmarsh Farms, Inc. granted to the Commonwealth Electric Company at to New England Telephone and Telegraph Company to "locate, relocate, erect, construct....necessary equipment and apparatus" over the main parcel of Tidmarsh East. The location of the easement area is not mapped, rather "the location of said easement shall be established by the installation and/or existence of said lines." The lines run from Beaver Dam Road, across the north end of the fields along Beaver Dam Road, across the to-be-restored channel and east through the red maple swamp to neighboring land.
  5. Driveway Easement – The driveway leading to 36 Beaver Dam Road appears to cross the northwest corner of Tidmarsh East. I haven't been able to find any easement that covers this land, but the landowners understand that an easement exists.
  6. The owner of the "Gilmore bogs", located east of Hollis Road at the southwest corner of Tidmarsh East, has rights to release water into the adjacent bog of Tidmarsh East. The restoration design includes structures to minimize inputs of agricultural chemicals from this drainage.
  7. The holding pond north of Mars and a lift pump located on the east side of Beaver Dam Road are essential to operation of the bogs on Tidmarsh West.

A full title search may unearth other easements regarding water use and drainage as part of transactions pre-dating establishment of Tidmarsh Farm.

## **Tidmarsh West**

### **Topography and Soils**

Tidmarsh West has two distinct components: the broad, flat cranberry bogs with farm roads and house and barn directly adjacent lying directly west of Beaver Dam Road; and the long narrow parcel that reaches further west, up the Pine Hill Ridge to the ridge top and a few hundred feet beyond. The bog area and toe of the Pine Hill ridge consist of sandy soil while the higher ridge is characterized by glacial till and till-derived sandy loams with some stones.

### **Natural Resources**

The majority of Tidmarsh West is taken up the cranberry bogs which are still in production. The flat land around the bogs has some native plants on upland areas and in a small forested area at the very southeast corner, however it is of limited value for wildlife. The Ridge Parcel includes a well-developed

mixed oak-white pine forest with a thick shrub layer of dry-site species. The parcel, valuable for wildlife on its own, is of even greater importance given its location within a 2,500-acre block of forest that stretches south to north along the ridge, reaching Plymouth Harbor at the Pilgrim nuclear power plant.

#### **Access & Infrastructure**

Approximately 38 acres of cranberry bogs and another 12 acres of appurtenant land remain actively used on Tidmarsh West. Operations include six distinct bogs, access roads, pumps and structures, a shed, and old barn foundation, a service barn and small house with parking area for bog operations.

#### **Access**

The main access to Tidmarsh West is from Beaver Dam Road. A wide, well-maintained, dirt driveway leads from Beaver Dam Road into the property, accessing the farm buildings and bog-side road network.

A woods road runs north-south along the top of the ridge and crosses the western half of the Ridge Parcel. This road is an extension of Sacrifice Rock Road which leaves Old Sandwich Road on the west side of the ridge and is the access route to a portion of the Pine Hills LLC development. The road continues north, off of the Tidmarsh parcel, to a clearing where one can take in a dramatic easterly view, over the wooded foreground of Manomet, across Cape Cod Bay, to the outer Cape. While there are no trails within the Ridge Parcel that connect the bogs of Tidmarsh East to the woods road, it is possible to walk from the bogs to the woods road via footpaths that run on land adjacent to the Ridge Parcel.

#### **Structures**

##### **Houses, Barns and other Structures**

1. The Tidmarsh West House is a 2,200 s.f., two-story shingle house that is currently occupied by a renter. Current tenants are very familiar with farm operations on the site and assist with restricting ATV access to the site. The house is accessed via a well-maintained, 600-foot dirt driveway from Beaver Dam Road.
2. The Tidmarsh West Barn is a ~3,000 s.f. metal-sided barn used for equipment storage and farm operations. The barn is directly adjacent to the Tidmarsh West House and is accessed via the same driveway from Beaver Dam Road.
3. Another small barn (~1,000 s.f.) is found on Tidmarsh West, near the edge of the bogs. It has not been maintained for some time and appears to be largely unused.
4. An unused mobile home trailer (~48' x 11'), also located on Tidmarsh West, is in very poor condition.

##### **Existing Easements and Agreements**

1. Chapter 61 – The bog areas of Tidmarsh West are enrolled in Chapter 61A. The Ridge Parcel is enrolled in Chapter 61 for forestry.
2. Ridgeline Easement (13944/193) – The owner of the parcel directly north of the Ridge Parcel (formerly Joseph Leto, now Pine Hills LLC) holds a limited access easement along Sacrifice Rock Road across the Ridge Parcel. The easement area is defined as the 10-foot wide strip of the jeep road and allows for access “in order to use and enjoy the Benefitted Premises for picnicking, family gatherings, enjoying nature, and other similar activities”.

3. Powerline Easement – A power line on large metal towers runs along west side of the bogs, but I was unable to locate an easement referring to these structures.

## **Existing Initiatives at Tidmarsh Farm**

### **Cranberry Bog Restoration**

Led by the Division of Ecological Restoration in the Massachusetts Department of Fish and Game, the restoration of Tidmarsh East bogs involves several partnering agencies. This group hired Interfluve, Inc. to develop engineering designs and over see permitting for the project. The design includes three broad changes to the landscape:

1. Removal of bog crossings and dams – All berms crossing the cranberry bogs will be 'shaved down' to bog level. The dam that created Beaver Dam Pond will be removed or permanently opened so that flow is unrestricted between the former pond area and the bogs to the north.
2. Restoration of natural streams and pools – The bog surface will be shaped so that water that currently flows in straight channels will instead flow in meandering stream beds that mimic natural peat system streams. Open pools will be placed along the stream channels or in other parts of the bog surface.
3. Restoration of flow to west side of The Island – Channels created as part of the bog infrastructure carry water from Fresh Pond through Cells 6b and 6a directly to the outlet stream north of Cell 1. The restoration will fill the channel between Cell 6a and Cell 1 so that all flow goes through Cells 7, 4,3,2, and 1 before leaving the former bog area.
4. Restoration of stream through swamp – The artificial channel which carries the stream north from Cell 1 will be filled in places so that the stream re-oriens into the historic meandering channel. The road running along-side the artificial channel will be restored to stream bank and re-vegetated.
5. Restoration of aquatic connections to Fresh Pond and The Arm – The channel to Fresh Pond (off of the property) will be restored to enhance fish passage habitat, and the existing culvert located under the driveway to the Main House which connects the bogs to The Arm will be upgraded to a structure that does not impede flow or fish passage.

The team is currently working on finalizing the restoration design and budget estimate and will be pursuing permits for the work and fundraising in the coming months. The current plan is to begin permitting work in October, 2013 and initiate site work in summer of 2014. Restoration will be supported in part with funds received from NRCS that were committed at the time the easement was finalized as well as other funds currently being raised. These funds come with a requirement to begin work in 2014. The restoration team, led by DER, will seek additional funds from NRCS and other funders.

## **Living Observatory**

The brainchild of Glorianna Davenport and inspired by the innovative thinking of her colleagues in the MIT Media Lab, Living Observatory<sup>2</sup> is an effort to use new technologies to deliver environmental education messages to new audiences and to reach existing audiences in new ways. From the website:

Climate change adaptation requires new models for environmental leadership, new frameworks for the study of ecology and new approaches to land stewardship. A Living Observatory for the 21st Century, an integral component of the restoration effort and future parkland, affords the public the opportunity to experience the environment across three venues: the outdoor parkland, a Visitor Center, and a live website. Our goal is to equip each visitor with tools to better understand relationship between ecological processes, human lifestyle choices, and climate change adaptation.

Throughout the parkland advanced sensor technologies will capture ecological vital signs. With the help of creative interactive applications and time lapse technologies, everyday visitors and specialists can collaborate, allowing their eyes and ears to experience the rhythms of biodiversity that are almost imperceptible in the field, even to specialists. Captured in audio-visual & statistical databases, the observatory streams information about water quality, micro-climates, plant colonization, native and migratory bird species, insect populations and other wildlife to provide an unprecedented record of wetlands transformation. Scientists, naturalists, teachers, students and everyday visitors have the opportunity to participate in research, even as they enjoy the evolving environment.

Several Living Observatory initiatives have already been launched at Tidmarsh Farm including distribution of audio sensors on the bogs and live streaming the sounds of Tidmarsh to the website. The initial work in conceiving of Living Observatory creates tremendous potential for the site to be a demonstration and experimentation site for truly cutting edge methods for bringing people to the site, bringing the site to people virtually, revealing ecological patterns that are impossible for visitors to discern on their own, and tracking and illustrating restoration of the site. At the same time, we would need to fully explore and evaluate the costs and expertise necessary to maintain Living Observatory and to expand the system in the future.

## **Land Protection**

Current landowners Evan Schulman's children, Yvonne, Audrey and Eric, have a very strong interest in the land being permanently protected in some fashion. They are not in a position to donate a conservation interest in the land, and they would like their father and his wife Glorianna Davenport to retain lifetime access to the main house and grounds for their personal enjoyment. The landowners also have a sense that the Town of Plymouth and area residents would look most favorably on a conservation outcome that includes dedicated access for uses including dog-walking on a portion of the land.

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<sup>2</sup> [http://tidmarshfarms.com/index.php?option=com\\_content&view=article&id=82&Itemid=87](http://tidmarshfarms.com/index.php?option=com_content&view=article&id=82&Itemid=87)

Any evaluation of the conservation opportunity must weigh several factors, including:

1. The conservation value of the parcel – Tidmarsh Farm is a large property with significant interior in an otherwise suburban landscape. While much of the site has been altered for cranberry production, the property still hosts wetlands and uplands of conservation interest and will be the subject of an intensive and exciting habitat restoration exercise which will result in aquatic and wetland habitat that is significant for this part of the state and would be significant within Mass Audubon's land portfolio. The property is adjacent to undeveloped and protected land stretching to the south and large blocks of land, some of which will likely be developed, to the west and northwest.
2. Potential for enriching nature experiences for a wide range of visitors – An extensive existing network of farm roads and trails creates a starting point for a rich trail system that would bring visitors to all of the various habitats of Tidmarsh Farm. Existing entry points to the property could be improved to accommodate a driveway and parking area for visitors. Site topography and the planned restoration create a number of dramatic viewpoints where visitors can take in a sweep of the property including forests, grasslands, and wetlands. The bog-side roads/trails, level and mostly consisting of well-packed sand, could accommodate visitors with limited mobility.
3. Potential for education programming on the site – With the wide range of habitat types represented on the property and the planned restoration to unfold in the years to come, the site would be an exceptionally rich resource for environmental education. The educational programming potential is further enhanced by the existence of Living Observatory (LO), an effort to develop and deploy innovative sensor technology on the site to reveal hidden patterns. LO is led by Glorianna and involves a collaboration with students and faculty of the MIT Media Lab, University of Massachusetts, Boston University. With appropriate planning and funding, LO could expand to make Tidmarsh Farm a unique laboratory for the application of technology in environmental education.
4. Near-term and ongoing costs and prospects for meeting those costs – Immediate costs will include land protection and preparing the site for public use. Ongoing costs will include maintenance of structures and improvements such as the parking lot and trails, ecological management of the property including maintenance of the restoration area, protection of the property from encroachment and inappropriate uses, and delivery of educational programs. These costs will need to be covered through grants, private fund-raising, program income, and potentially through partnerships or other income-generating activities at the site.

An ultimate conservation outcome for Tidmarsh Farm may not involve all of the farm property as it exists today. While the inherent scale of the existing property is part of its attractiveness, some parcels may not fit with the natural resource protection goals and mission of Mass Audubon or another conservation buyer. With that in mind, the primary goals of the land protection effort, in descending order of priority, would be to:

1. protect the core of the restored bogs and wetland system and sufficient surrounding land so that the Beaver Dam Brook system is buffered from residential lands nearby;

2. incorporate sufficient land to accommodate parking and a diverse and coherent trail system that meets the passive recreation and educational programming goals of the conservation owner and to provide a buffer between program area and nearby roads and residences;
3. Protect access to the ridge on the west side of the property and trail access so that visitors could someday enjoy the dramatic view to the east;
4. acquire land and access points leading to the existing main residence so that in the future it might be used as part of the conservation property.

These goals lead to a number of variables to be considered as part of the land protection discussion including ownership of the bogs on Tidmarsh West and the Ridge Parcel, and near-term and long-term treatment of the Main House and immediate surrounding land.

### **Design Vision for a Wildlife Sanctuary**

The overall goal of converting the property from a working agricultural landscape with some informal recreational use to a well-functioning wildlife sanctuary will involve: reducing the number of access points to the property; simplifying the current network of roads and trails to a diverse, easy-to-navigate trail system; and using signage to direct visitors to approved access points and inform visitors of permitted uses, habitat values, and points of interest. General design principles for the wildlife sanctuary include:

1. Create a single arrival point and limit other points of access to the property – All visitors should enter via a single, well-marked entry and parking area with information on programs and approved uses in a kiosk or visitor contact station. Alternative, informal entrances will be closed to limit prohibited uses of the property.
2. Offer a variety of walks from entrance – The trail network should offer walking options for a wide range of visitors on a series of loop trails varying in length and habitat types encountered while leading from the main entrance to the major points of interest on the property. Ideally, at least one trail would meet ADA requirements for accessibility.
3. Limit wetland crossings in the trail network – The wetland design calls for removing all flow restrictions including the berms that criss-cross the bogs. The trail design will support this goal by using boardwalks for a limited number of bog crossings and using completely open spans where a trail crosses a stream channel.
4. Minimize views of nearby trails/viewpoints – While the site is very large, the open nature of the bogs grants long-sight lines across the property. Taking in mind the future development of vegetation on the site, viewpoints and major trails will be located to maintain a visual separation among various users.
5. Stay away from neighborhood houses – The trail system will aim to take advantage of existing slopes and vegetation to buffer the trails from adjacent residential areas as much as possible.
6. Emphasize:
  - a. Viewpoints – get excellent views of various habitats and to take in scale of property
  - b. Restoration – get close to and interpret the restoration

- c. Habitat diversity – lead visitors to various habitat types: bog, swamp, open water, stream, grassland, forest
- d. Options for length of walk – short walks, long walks
- e. Buffer – maintain distance between visitor areas and nearby roads and residences.

While the Main House would be a very attractive central location for arrival, contact with visitors, and delivery of education programs, the current owner's interest in retaining lifetime rights to the Main House mean that this will not be a feasible use in the near term. For this reason, the entire site design treats the Main House as if it were a private residence within the conservation property.

## Arrival & Parking

### Mars – Preferred Alternative

Mars is the most feasible option for a near-term public entry point and parking lot for a number of reasons.

- Access to Mars is from Beaver Dam Road. Beaver Dam Road is a wide, well-maintained town road with a lighted intersection with Route 3A. This approach is preferable to using Bartlett Road which is narrower and has a difficult intersection with Route 3A.
- The existing driveway into Mars is paved where it meets Beaver Dam Road; the existing driveway is wide enough for an entry lane and an exit lane; and there is good visibility in both directions for exiting.
- The Mars site has been recently disturbed and vegetation remains sparse and somewhat weedy. As such, installation of a parking area and information signage would not impact well-developed habitat.
- The site is close to the areas of the property to be restored and to other attractive destinations, trails, and a variety of habitat types.
- The Mars cottage sits directly adjacent to the Mars driveway. The cottage could house a caretaker or property manager who could assist with keeping an eye on the entrance and parking lot.

Currently, the entryway to Mars retains the look of its most recent use, as a service entrance for dump trucks hauling sand and gravel out of the site. The driveway as it meets Beaver Dam Road is lined on either side with large boulders and the vegetation lining the drive is somewhat sparse and weedy. After ~100 feet the driveway changes from pavement to dirt and narrows a bit as it passes between two former cranberry bogs. The driveway then passes the Mars Cottage, turns left nearly 90-degrees and proceeds another 500 feet into the upper part of the disturbed Mars site.

The Mars site slopes downhill, from north to south, with steeper slopes rising to the west and east, giving the site the overall feel of a large, south-facing amphitheater. Converting this area to a visitor entrance and parking area would require several improvements:

- 1) Clean up the entry way from Beaver Dam Road, remove boulders, and define and revegetate edge of driveway – The entry would be more attractive if the existing large boulders were

removed and grasses and native shrubs were used to define the edges of the driveway. The edges of the dirt portion of the Mars driveway have grown in with vegetation since the sand and gravel operation ceased. This vegetation would need to be cleared back and the road widened to accommodate two vehicle lanes.

- 2) Improvements to Mars Cottage area – The Mars Cottage currently sits a mere 30 feet from the edge of the Mars driveway. This close proximity could be a problem for the residents of the cottage and could cause confusion to arriving visitors. The cottage could be buffered from the driveway by the addition of a fence, landscaping, and signage indicating that the cottage is a private residence. A small storage garage just north of the Mars Cottage might be removed, relocated, or replaced if necessary. Fencing that restricts access to the Mars site, located just past the Mars Cottage, would be removed.
- 3) Create parking lot – A parking lot would be located as close as possible to the point where the driveway emerges into the wider Mars site. The modest slopes, sparse vegetation, deep sandy soils, and distance from wetlands translate to significant flexibility in locating the parking lot; however some large boulders left behind from the mining operation may need to be relocated with heavy equipment. Creating an adequate parking surface may be limited to light grading and a layer of crushed stone (Benpak, Romapak, etc.) over the existing coarse sandy soil. Fencing or stones or other barriers would be recommended around the parking lot to restrict vehicle access into the Mars area and adjacent trails.  
The lot would be designed to accommodate 10-20+ vehicles. For comparison, Rough Meadows (unstaffed) has 6 designated parking spots and a bus turnaround. The new entrance to Burncoat Pond (unstaffed) has 11 designated parking spots and a bus pull-off alongside the road. The lot could be designed with a wide gate in the perimeter that could open onto an area designed for overflow parking. A bus turnaround, which is a design goal for all Mass Audubon wildlife sanctuaries, could possibly be accommodated as a loop around the parking spaces.
- 4) Build trails within Mars – At a minimum, trails from the parking area would lead to the bog side trails (~750 feet) and to the south-facing viewpoint (~800 feet). Two existing woods roads could be converted to trails leading north to a small pond. If the trail network extends to the Tidmarsh West parcel, a trail could lead through the woods and across Beaver Dam Road.
- 5) Modify existing storm water detention structure – Upon closure of the Mars site after the end of sand and gravel operations, a large storm water detention structure was installed where the site abuts the bog-side service road, to minimize siltation of the adjacent bog. The structure today presents an unattractive feature in a central part of the entry experience and complicates the issue of getting visitors from bottom of the Mars ‘amphitheater’ down another 10 feet or so to the level of the bog side trail. The bog restoration plan is to incorporate removal of the heavy riprap from this drainage structure and replacement with a less-intensive/invasive solution.

#### **Alternatives to Mars**

There are three alternatives to the Mars arrival, however the downsides to each of these sites strengthens the case for using Mars as the main arrival point.

- 1) Farm Stand – The Farm Stand is an attractive location for several reasons: it is on Beaver Dam Road; it is highly visible from the road and has excellent visibility in both directions for exiting vehicles; the existing lot around the Farm Stand, while currently poorly defined, could be improved to accommodate many cars; the Farm Stand itself could serve as an arrival, interpretive, and programming structure; and an existing dirt road leads from this location into the property. The major, and possibly fatal limitation, is the distance from the bog-side trails and the most interesting locations on the property. A visitor would have to walk ½ mile from the parking lot before first encountering the restoration area.
- 2) Area of the Agway Barn – The Agway Barn sits on a several-acre triangle of land between Bartlett Road and Cell 6b. There is an existing dirt driveway to the barn and sufficient flat sandy ground in this area to accommodate a parking area (with the removal of the barn), however there are several problems with this site:
  - a. Bartlett Road is a narrower, curvier road than Beaver Dam Road and has a difficult intersection with Route 3A, so is a much less desirable route of visitor access to the property.
  - b. Visibility for exiting is less-than-ideal.
  - c. The site is directly on the bogs, creating a visual intrusion on the visitor experience, and yet it is relatively far from the most attractive portions of the property and involves a significant walk (almost ½ mile) before reaching the beginning of a loop trail.
- 3) Along the Main Driveway – There are several flat areas and a former borrow pit adjacent to the driveway to the Main House. These sites suffer the same limitations as the Agway Barn location, namely access via Bartlett Road and the distance from prime destinations on the property. An additional downside to this entrance is that the driveway would continue to serve as the access to the Main House, so a gate or signage would be necessary to limit public access further down the driveway.

### **Other Points of Pedestrian Access**

A number of trails enter the property from adjacent parcels or where the property has frontage on side roads. Many of these trails appear to be used informally.

- 1) October Lane – A wide trail leads from the end of October Lane into the forested area south of the Main House. Observations and an encounter with an ATV rider indicate that this entrance is used for access by ATVs and motorbikes. Although attempting to block ATV access with barriers can be futile, some form of barrier is needed at this point as well as signage indicating permitted and prohibited uses of the land. A narrow gate at this point could be maintained for pedestrian access by neighbors.
- 2) Beaver Dam Road bypass – A narrow trail leads off of this lane into the Western Forest. The trail appears to be used occasionally by dirt bikes and equestrians. The trail outlet is not an attractive location nor are there many houses in this area. The trail should be closed at the roadside and for the first hundred feet and the trail rerouted so that it reaches the bog-side trails to the southeast.

- 3) Heather Drive – A narrow footpath leads from the small sandpit east of Cell 1 to the backyard of a house on Heather Drive. This trail does not appear to be heavily used currently, but it does provide direct access to the property.

While offering alternative means of pedestrian access may be an attractive option to build rapport with neighbors, several of these points of access appear to be used by dirt bike and ATV riders and would need to be secured to dissuade their access to the property.

## Approved Uses

If the property is to become a Mass Audubon wildlife sanctuary, uses will need to align with typical approved uses on our other wildlife sanctuaries. Most of our sites allow walking, snowshoeing, and cross-country skiing but not jogging, horseback riding, dog-walking or mountain biking. Motorized vehicles are typically not allowed. Approved forms of passive recreation include wildlife observation, photography, and similar activities.

The site is currently used by neighbors for dog-walking. The current owners sense that dog walking has come to be perceived as a traditional community use of the property and that townspeople may be more supportive of the restoration and land protection effort if dog walking were not completely eliminated from the property. Mass Audubon would not open the *entire* trail system for dog walking, however there may be ways to separate dog walkers from other users so that dog walking is accommodated while most of the site permits uses that are more in keeping with the goals of a Mass Audubon wildlife sanctuary – to protect wildlife and minimize conflicts among different visitors.

- 1) Allow dog walking on Tidmarsh West – A parking area could be created on Tidmarsh West and dog-walking allowed on the farm roads around the bogs west of Beaver Dam Road. This would be the best alternative in terms of minimizing confusion about approved uses on Tidmarsh East, however public access here would need to be managed so that it does not conflict with farm operations.
- 2) Allow dog walking from the Farm Stand – A secondary parking lot could be created at the Farm Stand and dog walkers could use the trails that loop north from here. The farm roads and trails connecting between the Farm Stand through Mars to the larger Tidmarsh East parcel could be closed, or “No Dogs Beyond this Point” signage could be used to separate dog-walking areas from non-dog-walking areas. This is an attractive alternative to using Tidmarsh West, yet two entrances from Beaver Dam Road could create confusion as to how to find the larger property. With signage and perhaps by assigning a different name to the Farm Stand lot, this potential for confusion could be managed.

Mass Audubon has prohibited dogs completely at all wildlife sanctuaries, as a matter of statewide practice, since 1981. Our wildlife sanctuaries are dedicated to the conservation of wildlife and other natural resources and are used as outdoor classrooms for the appreciation and interpretation of the natural world. Unrestrained dogs can cause serious problems on sanctuaries, because they conflict with these conservation purposes. Dogs running free may harass and kill wildlife, fight with other dogs, intimidate sanctuary visitors, and destroy nests and habitat. For years, Mass Audubon utilized a “dogs on leash only” policy at many sanctuaries to prevent such occurrences, but compliance with this rule was, in general, poor. For these reasons, dog walking would not be permitted within the core of a wildlife sanctuary at Tidmarsh Farm.

Some have proposed allowing dog-walkers to enter the property from Bartlett Road with a small parking lot at the Agway Barn, since most dog walkers appear to enter on this side of the property currently. This idea is unappealing since the trails that lead from this point would intersect with trails leading from

the envisioned main entry at Mars. Thus dog-walkers would inevitably interact with non-dog-walkers who have come from the main parking lot where signage indicates that dog walking is not allowed.

## Destinations

The entry points and trail system should be designed to lead visitors to the most attractive points on the property, be they vistas, exemplary habitats, prime wildlife viewing points, or unique natural features.

Such points at Tidmarsh include:

- 1) Tidmarsh Vista (Mars) – Directly east and uphill from the storm water basin in the Mars site, the dramatic topography and low vegetation combine to present the most impressive vista point to be found on the entire property. The view from here takes in all of Mars, Cell 1, the Island, and Cells 2, 3, and 4 stretching into the distance. Visitors to this point will have an excellent perspective on the restoration of the bogs as it proceeds and on the scale of the property. This should be designed and built as an all-person accessible trail.
- 2) Restored channel and red maple swamp – The existing relic stream channel in Cell 1 will be reestablished as the main stream channel during site restoration. A viewpoint where the first meander comes near the existing farm road offers glimpses along the stream channel and into the swamp.
- 3) Highview (top of large sandpit) – The second most expansive vista point is found atop the large borrow pit north of Cell 6b. The view takes in all of Cells 6a, 6b, and 7.
- 4) East end of former dam – This point offers the best views, from a modest height, into the self-restoring cattail marsh in the former Beaver Dam Pond and the actively restored bogs of Cell 4. While this is a lower viewpoint than the Mars and Borrow Pit vistas, the visitor will be closer to the wetlands here and have a better opportunity for wildlife viewing.
- 5) Cattail marsh – A low sandy bank on the east side of the former Beaver Dam Pond offers a more solitary, quiet contact with the shallow marsh.
- 6) Large erratic location – A large glacial erratic on the east side of Cell 2. Trails will bring visitors to this impressive feature.
- 7) Open water feature – the current restoration design incorporates an area of open water east of The Island. This would be an excellent location for a bird viewing blind.
- 8) Pine Hill Ridge – As discussed elsewhere, excellent easterly views are to be had from the Pine Hill ridge. A clearing on the property to the north of the Tidmarsh parcel demonstrates the potential for a view as far as Cape Cod. Establishing a viewpoint on Tidmarsh land would require significant tree clearing.

## Trails

Features of an appealing trail network include loop walks of varying lengths, attractive views, wildlife viewing opportunities, points to rest and sit in the shade, and opportunities to visit a variety of habitats.

We begin the design of a trail network with some basic assumptions:

- 1) The bog restoration is of primary importance on the site, and location of trails and visitor amenities must fit within the restoration design.

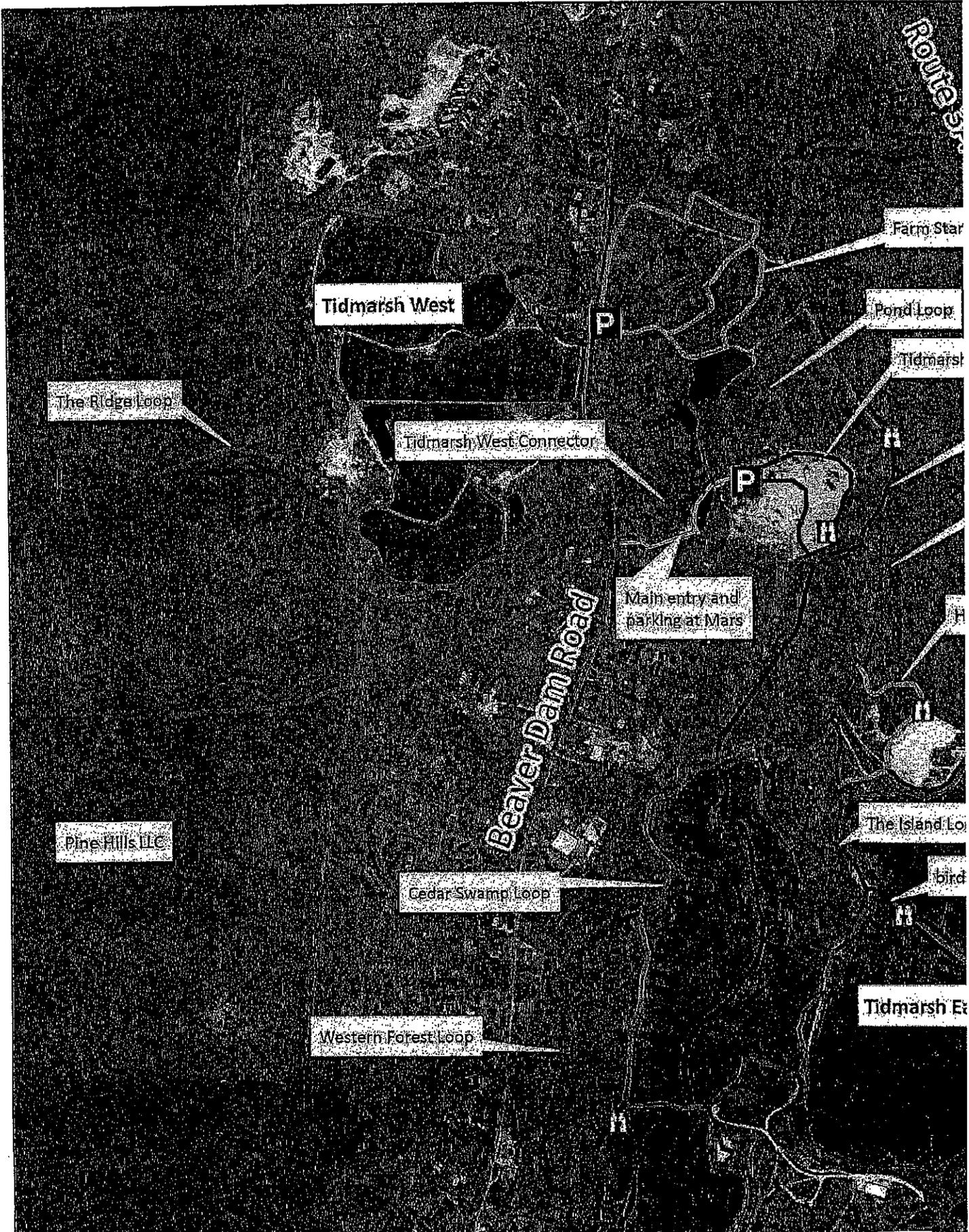
- 2) The trail network and visitor experience should include a variety of walk options including loop walks of varying distances; should accommodate a wide range of visitors including those with mobility-, hearing-, and/or vision-related accessibility needs; and should bring visitors through a range of habitats including meadow, sandplain grassland, oak-pine forest, shallow marsh, stream, swamp, bog, and pool.
- 3) As the site would likely be minimally staffed or unstaffed, at least initially, we would want a distinct sense of arrival and Mass Audubon 'presence' such as with an interpretive structure to orient visitors to the property and to Mass Audubon, such as the shed at Daniel Webster Wildlife Sanctuary.
- 4) Visitors on the trails should have a sense that they are moving through and looking out upon a wild landscape, mostly without seeing others visitors using trails in the distance.
- 5) As the current owners have expressed their interest in retaining some form of exclusive lifetime rights to the use and enjoyment of the Main House, any trail network must avoid the Main House and accommodate vehicle access along the Main Driveway.

The proposed trail network is presented in Figure 3. The bog-side trails would make use of existing farm roads ringing the bogs and would need very little improvement beyond some filling and light grading to address areas where water pools on the roads. These trails would require periodic maintenance, but as they are built on deep sand and have been well compacted over the years, they should function well as footpaths and for occasional use by maintenance vehicles.

Some of the trails will require surfacing to accommodate a wide range of visitors including those with mobility-, hearing-, and/or vision-related accessibility needs and to resist erosion on slopes. The trail from the Mars parking area to the bog-side trail will require some sort of stone dust or other semi-permeable material to allow users of all abilities to reach the restoration areas. As the trail will need to navigate the slope from the top of Mars to the bog level, the surface material will need to stand up to rain running down the trail.

Bog crossings will consist of boardwalks surfaced either with weather-resistant wood or with pvc decking. The restoration team has indicated that the existing berms will be 'shaved down' from their present height so that they do not protrude above the surface of the restored bog; however the sandy bases of these berms will remain and will serve as a footing upon which to lay boardwalks. Bridges will be necessary to span the restored channel in four locations.

- 1) Trails from the main parking area in Mars.
  - a. Trail to the bogs (750 feet) – The main trail would follow the gentlest slopes south, downhill from the parking area to the bog-side trails. As the bog-side trails are so wide and flat and thus suitable for visitors with a range of mobility issues, this trail should be surfaced with a hard-packing material to ensure that these visitors can easily reach the bog-side trails. A hard-packing surface will also limit channeling of these highly erodible soils which would surely occur if the trail was left with a natural surface. While most of this trail route slopes gently to the south, the very southernmost portion, where the trail meets the bog-side service road, is currently too steep. Some design work and earth-moving may be necessary to complete this portion of the trail.



Route 50

Farm Star

Pond Loop

Tidmarsh

Tidmarsh West

The Ridge Loop

Tidmarsh West Connector

Main entry and parking at Mars

Beaver Dam Road

Pine Hills LLC

Cedar Swamp Loop

The Island Loop

bird

Western Forest Loop

Tidmarsh E

- b. Tidmarsh Vista (1,000 feet) – The high point at the southeast corner of Mars offers a dramatic view south that takes in the length of the property, all the way to the former Beaver Dam Pond. This point is a prime destination on the entire property and would be a good location for a bench and possibly interpretive panels describing the site. As the ground drops off steeply to the west, the best approach would be a trail that follows the perimeter of Mars and approaches this point from the north. This trail may also require stone dust or other hard-packing material to ensure that it is accessible to all at most times of the year.
  - c. Pond Loop (1,500 feet) – An existing farm road leads through the woods from Mars north to a small, attractive pond. A footpath that has been widened and roughened by ATVs leads back to Mars. If the area around the Farm Stand is not designated as a multi-use area, these paths could link to additional paths to the north.
  - d. Tidmarsh West Connector (700 feet) – If there is any intention of directing visitors to Tidmarsh West, it would be possible to route a trail west from the parking lot, alongside the driveway or in the woods north of the driveway, to a pedestrian crossing across Beaver Dam Road, and on to the Tidmarsh West parcels.
- 2) The Nursery Loop – This 1-mile loop on existing farm roads around Cell 2, a.k.a. The Nursery, will bring the visitor to the early successional vegetation currently found on Cell 2, portions of the restored channel in Cell 1, and the bog crossing between Cells 2 and 3 with views into the restored areas in Cell 3 and to the south. A side trail would lead to a high point at the large erratic on the east side of Cell 2.
  - 3) Red Maple Swamp Spur – A 650-foot spur trail leading from the northern end of the Nursery Loop along the remnants of an existing farm road to an attractive view into the restored stream channel and red maple swamp.
  - 4) The Island Loop – A half-mile addition to the Nursery Loop, leading around The Island, taking in grand views of the restored bogs, and including a bird blind looking out onto the open pools created between Cells 6 and 7.
  - 5) Highview Loop – A ¼-mile addition to the Nursery Loop or The Island Loop climbing to dramatic elevated, southerly view of the restored bogs in Cells 6a, 6b, and 7. The trail leads through forest to the north and crosses the filled channel that currently lies east of Cell 2.

*Nursery, Island, and Highview Loops from parking area = 1.6 miles*

- 6) Cedar Swamp Loop – A 1-mile loop on existing farm roads and new bog crossings leading visitors down the west side of Cell 3 (to be restored to Atlantic White Cedar swamp), past a little bluestem grassland and across long boardwalks on the bogs, and returning via The Island and Nursery Loops.

*Nursery, Cedar Swamp, and Island Loops = 2.4 miles*

- 7) Western Forest Loop – A 2/3-mile addition to the Cedar Swamp Loop, passing through rolling pitch pine-mixed oak forest on the west side of the restored bog area.
- 8) Bartlett Road Loop – A 1.3-mile trail leading around the east side of the bogs, alongside Bartlett Road, and back to The Island. This trail, running on existing farm roads and a small bridge across the

stream from Fresh Pond, would be part of the longest walk available at Tidmarsh Farm and would offer the biggest westerly views of the bogs.

- 9) Southern Forest Loop – A 1-mile addition to the Bartlett Road Loop leading through the pine-oak forest south of the Main House. The trail passes fantastic viewpoints into the shallow marsh developing in Cell 5 (former Beaver Dam Pond) and runs parallel to The Arm for nearly 1,000 feet.

*Nursery, Western Forest, Southern Forest, Bartlett Road Loops = 4 miles*

- 10) Farm Stand Trails – Existing and new trails connecting to the Farm Stand could be utilized as multi-use trails if accommodation of some dog walking is identified as a priority for the site. One mile of trails could be linked in this area, including an open field and a small pond. Existing farm road connections to Mars would be blocked or restored, or signage would be used, to indicate that dog walking is not permitted on the trails to the south.
- 11) The Ridge Loop – A 2-mile loop from Mars, across Beaver Dam Road, along the southern edge of the Tidmarsh West bogs and along trails ascending the Pine Hill Ridge, running along its crest, and descending back to the bogs, with potential for a dramatic easterly view to Cape Cod. Trails on Tidmarsh West and to the Ridge Parcel are reliant to some degree on agreements with Pine Hills, LLC to allow access to trails that run across their land.

### **Amenities**

A bench and flat-gathering area at the Mars viewpoint would be a popular and easily accessible destination with views running the length of the restored bog system to the former Beaver Dam Pond.

A bench and small fenced area would create a very attractive destination at the top of the largest sandpit. From this vantage point the viewer takes in the large expanse of Cells 6a, 6b, and 7 with the restored channels flowing from Fresh Pond and The Arm.

A bench at the end of the Red Maple Spur would offer a quiet destination less than ½ mile from the parking lot.

A wildlife observation blind would ideally be located overlooking the open water pool to be created near the current intersection of Cells 6a, 6b, and 7. The blind would have excellent views to the northeast, east, and south with excellent lighting in the afternoon.

A raised viewing platform at the east end of the dam that formerly created Beaver Dam Pond would give the visitor a dramatic view of the restored headwaters and the bog areas.

Similarly, or alternatively, a slightly raised platform at the northwest corner of Cell 4 would afford excellent easterly views of the restored bogs. A platform could be built on the existing concrete pad which used to support pumping equipment.

## Necessary Improvements

### Limiting Vehicular Access

All points of vehicular access to the property, other than those specifically intended for approved access points, should be closed. Other points of pedestrian access should be closed and re-vegetated as well unless there is an overriding benefit to keeping them open. Access to farm roads that will be used for maintenance access should be closed with gates or other moveable barriers. Entry points that will likely no longer be used for any form of access should be blocked with more permanent barriers and re-vegetated.

- 1) Northwest corner of Tidmarsh East – A dirt drive enters the property from Beaver Dam Road at the north end of the fields north of the Farm Stand. The first 200 feet serves as a driveway for the property directly to the north. The neighbor apparently has an easement to use this length of driveway across the property, so the initial portion of the drive must be maintained. Where the driveway turns north and runs onto the adjacent parcel, a narrower dirt road continues east, providing access to the stream channel which will be restored. This length of road will be used for vehicle/equipment access to the stream during the restoration project. If future access to the stream is needed, a narrow dirt road should be maintained but blocked with a gate. If river-side access is no longer required, the road should be managed to revert to a footpath, and the entry point from the driveway should be temporarily blocked with stones while vegetation establishes.
- 2) Farm Stand entrance – If the Farm Stand area is not to be used as a multi-use access point, the entry to the parking area should be blocked off (possibly by pulling the section of wooden fencing that runs perpendicular to Beaver Dam Road and using it to extend the existing section of fencing running parallel to Beaver Dam Road so that it blocks off the old Farm Stand parking lot), the Farm Stand should be removed, and the sandy parking area and former building location should be restored to extend the existing meadow habitat. Blocking access to the parking lot would serve to block off the road leading into the property. The road-side fencing could include a gate for maintenance access.
- 3) The Mars entry is likely to be maintained, either as the main visitor entry point or at least for access to the existing house. Access beyond the cottage is currently limited by a metal farm gate.
- 4) North access point on Bartlett Road – The access point leading to the north service barn should be blocked with a metal gate. This access would likely be maintained for service vehicle access.
- 5) The Main House driveway will likely be maintained to provide access to the house and for service vehicles. Signage will be necessary to indicate that the driveway is only for maintenance vehicles and for access to the private residence.

### Boardwalks and Bridges

Several boardwalks and bridges will be necessary to make a viable trail system. Since the existing berms crossing the bogs will be removed, or 'shaved down' to the bog level, as part of the restoration project, these structures will be necessary to connect trails on the east and west side of the restored wetland.

Without these crossings, the trail system would be limited to a long out-and-back walk down the west side or east side of the bogs or a loop around The Island.

- 1) Crossing between Cells 2 and 3 – This crossing is the highest priority for a cross-bog connection, as it will permit a pleasant loop walk around Cell 2 and connect to the trail looping around The Island. The crossing will require approximately 300 feet of boardwalk and a footbridge spanning the stream channel. The span length of this footbridge will depend on the final in-field shaping of the channel in this area and could range from 20 to 40 feet.
- 2) Crossing between Cells 3 and 7 – This is the second highest priority crossing, connecting trails on the northern and southern sides of the bogs and creating a long loop walk around Cells 6 and 7. The crossing would require approximately 750 feet of boardwalk and a 15-25 foot pedestrian bridge to span the stream channel. The 90% Restoration Design from InterFluv shows an open water feature along the path of the existing berm between Cells 3 and 7, with final location to be determined in the field. Depending on the final location of this open water, the boardwalk will need to divert slightly from the existing route of the berm. This will add some length to the boardwalk and may require more expensive building techniques as the boardwalk will sit on the bog surface rather than on the base of the former berm. (The NRCS easement over the bogs does allow for the placement of structures “for undeveloped recreational use”.)
- 3) Crossing between Cells 3 and 4 – This crossing is critical for creating the most diverse set of loop walks around the bogs. While it would serve on its own to connect the west side of the bogs to the east and would create the opportunity for a very long walk around the full perimeter of Cells 2, 3, 6, and 7, this crossing should be seen as a complement to the crossing between Cells 3 and 7. With these two, visitors could enjoy a pleasant 2 mile walk taking in the restored bogs from various angles.
- 4) Crossing the stream from Fresh Pond – The trail system as envisioned would include a new trail running between Cell 6 and Bartlett Road. This new trail will be necessary to create a full loop trail around the bogs. Without the new length of trail and a stream crossing, visitors would have to walk along Bartlett Road, which is narrow and has no shoulder at this point; this is not safe, so a stream crossing here is a critical component of this trail loop. The stream crossing will require a 10 to 15 foot span and the trail can largely be located on upland between the bogs and Bartlett Road or atop the material used to fill the perimeter ditch on the east side of Cell 6b.

### **Structures to be Moved or Removed**

Several structures currently found on the property speak primarily of the site’s agricultural past and will detract from experiencing the site as a restored landscape. While each currently has utility on the site, they should ultimately be relocated or demolished as the property is converted to conservation.

- 1) Agway Barn – This large barn stands directly adjacent to the bogs and with a bog-side trail running very close to it. While relatively few visitors would walk all the way past the barn from the Mars entry point, the barn would be prominent in views from many points on the bog-side trails. Networking equipment for Living Observatory currently housed in the Agway Barn could be moved or housed in a smaller structure built at this site.

- 2) Morton Barn – This barn is even larger than the Agway Barn and more visible from the best viewpoints on the property. In the interest of restoring the visual landscape, it would be best to remove this barn, in which case the solar panels on the roof could be sold, re-used elsewhere on-site, or transferred to another Mass Audubon site. On the other hand, logistical considerations of the existing electrical systems on the property and income from Solar Renewable Energy Credits generated by the solar panels may argue for retaining the building and using a fresh coat of paint and some landscaping improvements to knit the barn into the view.  
Alternatively, the barn could be retrofitted for use as an education facility and greenhouse with a portion maintained for storage of maintenance equipment. Landscaping and external design improvements could
- 3) Farmer's House – Unless there is a change in the covenant with the Town of Plymouth that restricts the use of the Farmer's House it may have to be moved or demolished. The covenant restricts use of the house to Trustees of Tidmarsh Farm or family members or an employee engaged in agriculture "on the premises". Since the covenant is written to cover only the parcel on which the Main House and the Farmer's House stand, "the premises" may mean only that parcel and not include Tidmarsh West and agricultural activities carried on there.
- 4) The Farm Stand – The structure will most likely serve as an attractive nuisance and should be removed.

### **Restoration**

Several areas of Tidmarsh Farm will require restoration beyond the cranberry bog restoration effort. These include sandpits, informal trails and entrances, and the bulk of the Mars area which, although seeded with a meadow mix after cessation of sand and gravel extraction, would benefit greatly from supplemental planting.

### **Staffing & Costs**

Physical improvements will be necessary to complete the conversion of the property from an agricultural landscape to a conservation property open for public visitation, ongoing monitoring and management will be necessary to maintain the site, and staff time will be required for planning and delivering educational programs. The costs presented below are initial estimates, to be refined based on further discussions. The figures are derived from recent Mass Audubon projects at Rough Meadows Wildlife Sanctuary in Rowley, Burncoat Pond Wildlife Sanctuary in Spencer, and the experience of our property staff at various sites.

### **Start Up Costs**

#### **Planning & Permitting**

In addition to this conceptual plan, establishing a Mass Audubon wildlife sanctuary at Tidmarsh Farm would require more specific planning work by Mass Audubon staff and contractors including, but not limited to, design for the parking lot and entry, site restoration, more specific boardwalk and bridge plans, and wetlands permitting. These are seen as one-time costs.

Planning & Permitting	\$45,000
Ecological Management Plan	\$10,000
Visitor Services Plan	\$5,000

#### **Mars Driveway and Parking Lot & Farm Stand Parking Lot**

The Mars driveway will require some landscaping at the side of Beaver Dam Road and along its length, removal of boulders near Beaver Dam Road and in the parking lot area, some improvements to the dirt road that currently accesses Mars, and creation of the parking lot itself. The Farm Stand lot, if needed for a multi-use trail location, would require definition and restoration of disturbed soils. Recent projects for cost comparison include Rough Meadows Wildlife Sanctuary and Burncoat Pond Wildlife Sanctuary.

Driveway improvements	\$20,000
Parking lot – 20 spots and bus turnaround	\$20,000
Orientation structure	\$10,000
Trails within Mars – ~1,500 feet compacted surface	\$10,000
Restoration planting in Mars – 10 acres @ \$2,500/ac.	\$25,000
Farm Stand parking improvements	\$10,000

#### **Trails, Trail Infrastructure, and Maintenance Equipment**

Necessary trail improvements focus on building boardwalks and bridges to cross the bogs at 3 points, benches and viewing stands/wildlife observation structures for visitors, and surfaced trails within Mars for accessibility and erosion prevention. Although staff from South Shore Sanctuaries may dedicate some time to maintenance tasks at Tidmarsh, it is too far from other sites to transport equipment on a regular basis, so some new equipment will be needed.

Signage – Core Package design, fabrication, installation	\$15,000
Trail surface improvements & new trails	\$10,000
Boardwalks – 1,700 feet	\$275,000
Bridges – 4 bridges from 10 to 20 feet	\$150,000
Gates – 5 gates to limit vehicle access	\$15,000
Wildlife viewing structures, benches	\$30,000

#### **Demolition**

Several buildings would be removed as part of the conversion from agricultural property to conservation property. At a minimum we would recommend that the Farm Stand, Agway Barn, and Morton Barn be removed. Unless the restriction on use of the Farmer's House is changed, it may have to be moved or demolished.

Costs are difficult to estimate. The metal of the barns may be valuable to the salvage operator, driving down the cost, yet the buildings are in multiple locations which may increase costs. For comparison: demolition of three large wooden barns and one slab at Rough Meadows Wildlife Sanctuary in Rowley cost \$34,000. Demolition of a small house and a concrete block barn on slab at Burncoat Pond Wildlife Sanctuary in Spencer cost \$27,000. I will use an intermediate figure.

Demolition	\$30,000
Subtotal of Estimated Startup Costs	\$680,000
<u>10% contingency</u>	<u>\$68,000</u>
<b>Total Budget for Startup</b>	<b>\$748,000</b>

## Annual Operating Costs

### Property Stewardship/Maintenance

Basic monitoring and property management at the site would require at least a half-time property manager. Additional costs would include ecological management such as invasives treatment, mowing, and additional restoration work; building maintenance; and materials for upkeep of boardwalks and other amenities. With estimates for these annual costs, I calculate the value of an endowment necessary to cover these costs in perpetuity, based on a 4% annual spending rate.

Half-time property manager	\$25,000
Maintenance equipment and materials (vehicle, parking, trails, etc.)	\$20,000
Ecological management (invasives, monitoring, etc.)	\$5,000
<u>Maintenance of Farmer's House, Mars Cottage, Bog House, Main House</u>	<u>\$20,000</u>
Annual Property Budget	\$70,000
<b>Property Management Endowment</b>	<b>1,750,000</b>

Maintenance costs of the Main House may be much higher when it comes under control of the conservation owner.

### Education Programming

Educational programming could range from periodic programs offered by South Shore Sanctuaries staff, to a part-time educator connected with another entity within the community, to full-time onsite staff offering a range of program activities. For purposes of discussion, I offer annual budget ranges for staffing costs associated with these three models and associated endowments based on a 4% spending rate.

<u>Staffing Model</u>	<u>Annual Cost</u>	<u>Endowment</u>
Periodic (twice monthly) education programs	\$3,500	\$87,500
Half-time educator	\$30,000	\$750,000
Full-time educator	\$60,000	\$1,500,000

## Conclusions

Tidmarsh Farm is an attractive potential location for a wildlife sanctuary from a natural resource conservation and environmental education perspective. It is a large tract of land adjacent to other undeveloped tracts in an increasingly densely-settled part of the commonwealth, and it has a range of habitat types that will attract diverse plants and animals. The existing farm roads present an excellent basis for an extensive trail system, and previously-disturbed areas could be improved to accommodate

parking and a trailhead structure. Finally, the planned cranberry bog restoration and the Living Observatory project could combine to make Tidmarsh a unique destination for learning about ecological restoration through the use of advanced technology.

Challenges to converting the site to and maintaining it as a wildlife sanctuary include the costs associated with land protection and design and development of a trail network and visitor amenities; the need to work closely with the restoration team to ensure retention of features necessary for a trail network and feasibility of stream crossings where desirable; the continuing cranberry operations on Tidmarsh West; the long-term feasibility of owning and maintaining the Main House; ongoing requirements for ecological management of the restored bogs; protecting the sanctuary's integrity from encroachment; and ongoing requirements for the tools developed by Living Observatory. Another factor of importance is the future development of the Pine Hill Ridge as part of the Pine Hills community.

There are several questions that need to be addressed as part of the conservation discussion, most of them driven by issues of cost. These include:

1. Living Observatory – Who owns this going forward, who funds it, where does infrastructure go if existing structures are moved or demolished.
2. Main House – How will the house be used and accessed in the near term. How will it be used and funded in the long-term. Does the existing covenant with the Town of Plymouth restrict its future use by a conservation owner.
3. Tidmarsh West – Is there a strong case for conservation of the bog parcel. Would the active cranberry bogs be a revenue generator. Would it be feasible from both cost and ecological perspectives to manage the bogs as wading bird habitat.
4. Restoration Management -- Who owns ongoing requirements of any Orders of Conditions associated with the restoration. What costs will be associated with ongoing maintenance of the bogs.

This report should serve as a basis for engaging in discussion of these questions and as a starting point for assessing the conservation opportunity at Tidmarsh Farm.

## **A Native Plant Propagation Nursery at Living Observatory, Tidmarsh Farms, Plymouth, MA**

**Lead Botanists: Irina Kadis, Alexey Zinovjev**

### **Introduction**

We propose to establish a Native Plant Propagation Center and Nursery as part of Living Observatory at Tidmarsh Farms, Plymouth, MA. The goal for the center/nursery is to provide a diverse selection of plant species native to southeastern Massachusetts and promote the planting of native species in restoration projects, developments, private gardens, and along roads.

The nursery will be jointly developed by botanists Irina Kadis and Alexey Zinovjev (Salicicola.com and Living Observatory) and the future landowners of Tidmarsh Farms. Irina and Alexey founded Salicicola.com ten years ago; their photo gallery of native and non-native naturalized plants in Massachusetts (with a focus on Plymouth County) now embraces about 1,400 species. They have developed wild-plant inventories for many entities, including Myles Standish SF, Ellisville Marsh, Plymouth Long Beach, and Tidmarsh Farms, and are widely recognized as experts in the identification and propagation of plants native to Plymouth County. Irina was engaged with temperate woody plant propagation at the Arnold Arboretum Greenhouse from 1994 to 2013 and now continues at the Arboretum's Curation Department. She has a MSc Degree in Plant Ecology. Alexey holds a PhD in biology, specializing in taxonomy and insect-plant interactions. He is an expert on the challenging group of willows. Additionally, he is a skillful programmer and database specialist. Over the recent years, Irina and Alexey have collaborated in pilot propagation projects at Myles Standish State Forest and most recently at Tidmarsh Farms.

While the costs of establishing the proposed center/nursery are reasonably modest, it could jumpstart productive volunteer activities as well as educational outreach at Tidmarsh West.

### **1. The need**

The existing sources for plants native to SE Massachusetts are few, plants expensive, and their assortment insufficient. Those few natives that are available at nurseries are mostly wetland plants; we have identified the additional need for growing native species appropriate for dry habitats typical of SE Massachusetts.

New England Wild Flower Society (NEWFS) recently recognized the need to shift emphasis to propagation of New England natives and even announced a change in policy; however, due to environmental features of both their nurseries (Garden-in-the-Woods and Nasami Farm) and lack of immediate access to plants of the dry sandy habitats of southeastern Massachusetts, growing the latter category of plants remains a challenge for NEWFS.

Those involved in planning and implementing restorations, roadways, and other public facilities as well as smaller gardens are now considering native plantings as an option. The interest is being driven by increased concern about climate change, the desire of many to become better stewards of the land, and rising costs of landscape maintenance. This is good news for the environment and an opportune time to establish a native plant center in Plymouth County.

In 2013, we initiated a pilot project at Tidmarsh Farms to meet the immediate needs of the Tidmarsh Farms Restoration Project. This project requires collection of diverse wetland and upland species (current propagule collections include 34 woody species--25 shrubs and 9 trees) and more than 50 herbaceous, including grasses, sedges, other monocots, and dicots. While many collected plants are of wetland, we also concentrated on those that could be used in upland and transitional areas. The plants propagated in 2014-2015 are intended to augment the native seed bank in both wetland and transitional areas of the Tidmarsh Farms Restoration Project. Since many useful natives have never been in cultivation, we consider this a trial period for those species.

As part of this restoration effort, we have the opportunity to propagate and re-introduce to Plymouth County those native plants that have disappeared from the area or become very uncommon. These plants will not only be introduced to the Tidmarsh Farms site, but also grown in pots as part of phase 1 of the Nursery, to be then shared with others. Examples of such locally rare plants whose propagation does not require NHESP permit: dwarf upland willow and other native willows, mountain holly (*Nemopanthus mucronatus*), native trilliums, some smartweeds (e.g., *Polygonum careyi*). We have plans to also propagate New England blazing star from donor plants that we already have grown from seed with a permit from NHESP.

The proposed nursery project seeks to establish Tidmarsh Farms as an important long-term propagation station for the plants of southeastern Massachusetts in general, and in particular, for some rarer species. We note there is currently no institution specializing in the propagation of these plants. Proposals to propagate rare (officially listed) species for the purpose of their genetic conservation (in situ) and possible subsequent re-introduction must receive interest and support from NHESP. Such projects contain realistic opportunities for grant funding.

## **2. General concept of possible nursery locations on the property**

To exercise an economical approach to restoration at Tidmarsh Farms and facilitate further plant sharing with other entities, we expect to establish permanent plantings of donor (or source) native plants of documented local wild origin. From these, one could obtain propagules (seeds or cuttings) to either produce potted plants or to be applied directly to the areas in need of restoration. The latter approach would eliminate the time- and labor-consuming stage of growing potted plants and subsequent transferring them onto the grounds. Other material could be potted and sold/distributed as seedlings and rooted cuttings. This approach, however, does require agreement of the future owners of Tidmarsh East and Tidmarsh West to allow for seed collection from locations where planting and colonization have been successful.

Many potential locations exist within both Tidmarsh East and Tidmarsh West. If the projected nursery could be framed as a collaboration between the different future owners of Tidmarsh East and Tidmarsh West and Living Observatory, the existing abandoned nursery at Tidmarsh East, along Beaver Dam Road could provide a suitable area for permanent plantings of donor (source) woody plants, which could be then propagated from cuttings. This territory has been already altered, so that further usage as a nursery would not inflict damage to the existing natural vegetation. It is located at a wetland margin and thus includes both wet and dry habitat, which would provide an opportunity for growing both wetland and dry-habitat plants. The farm stand (also on Tidmarsh East) could provide storage space related to the projected nursery. Another advantage is an easy vehicular access.

Source plantings of small plants of dry habitat--asters, goldenrods, pinweeds, rockroses, heathers, jointweed, etc. (list included below)--can be started in single-species small beds at one or two sandy areas along the main (access) roads. This would have a dual purpose: both as property restoration and demonstration of the potential of many plants that are currently not available commercially.

## **3. Costs and Ownership**

The nursery can begin slowly and grow over time. Funds can be raised through grants and contracts to supply for projects, such as roadway improvements and restoration.

A large portion of seed collection, propagation, and development of educational materials can be carried out by volunteers and interns.

The center would require a small office space with access to bathroom facilities, a greenhouse, a secure space for potted material outside the greenhouse, and storage space for supplies (implements, pots, soil, etc.).

## **Table of Expenses**

Salaries on-site staff (I.Kadis, A.Zinovjev), estimate after year 3: \$120,000

Greenhouse: The project requires one or more greenhouses (similar to the greenhouse currently installed on Tidmarsh East. Estimate: \$ 20,000 per greenhouse

Materials and supplies Estimate: \$15,000 per year

Other fees: rent/taxes etc.

Living Observatory 2 % of grants and contracts/or fee basis

Ownership of the center can evolve in various ways. Ideally, ownership interests can partially offset salaries and/or other fees.

#### 4. Sample assortment of plants native to Plymouth County that can be propagated (non-exhaustive listing)

##### Trees--Wet Habitat

Atlantic white cedar *Chamaecyparis thyoides*

tupelo *Nyssa sylvatica*

black willow *Salix nigra*

ironwood *Carpinus caroliniana*

swamp white oak *Quercus bicolor*

##### Trees--Forest (Mesic) and Transitional Habitat

paper birch *Betula papyrifera*

hop-hornbeam *Ostrya virginiana*

hackberry *Celtis occidentalis*

white oak *Quercus alba*

##### Large and Medium-Sized Shrubs Wet Habitat/Banks

elderberry *Sambucus canadensis*

winterberry holly *Ilex verticillata*

mountain holly *Nemopanthus mucronatus* (*Ilex mucronatus*)

purple chokeberry *Aronia x prunifolia*

pussy willow *Salix discolor*

diamond willow *S. eriocephala*

spicebush *Lindera benzoin*

##### Large and Medium-Sized Shrubs Relatively Dry Habitat

wild raisin viburnum *Viburnum nudum* var. *cassinoides*

smooth shadbush *Amelanchier laevis*

upland willow *S. humilis*

beaked hazelnut *Corylus cornuta*

American hazelnut *Corylus americana*

mountain laurel *Kalmia latifolia*

##### Low /Stoloniferous Shrubs Dry to Mesic Open Rocky/Sandy Habitat

creeping sand cherry *Prunus susquehanae*

running serviceberry (shadbush) *Amelanchier spicata* (= *A. stolonifera*)

dwarf upland willow *Salix occidentalis* (= *S. tristis*)

dwarf chestnut oak *Quercus prinoides*

New Jersey tea *Ceanothus americanus*

winged sumac *Rhus copallina*

##### Groundcovers/Low Woody and Semi-Woody Plants Dry Sandy Habitat

lowbush blueberry *Vaccinium angustifolium*

golden heather *Hudsonia ericoides*

beach heather *Hudsonia tomentosa*

seabeach pinweed *Lechea maritima*

#### **Herbaceous vines**

hog-peanut *Amphicarpaea bracteata*

groundnut *Apios americana*

climbing hempvine *Mikania scandens*

#### **Herbaceous Plants Wet Habitat**

long-stalked aster *Symphyotrichum dumosum*

downy swamp milkweed *Asclepias incarnata* ssp. *pulchra*

Carey's smartweed *Polygonum careyi* (*Persicaria careyi*)

pinkweed *Polygonum pennsylvanicum* (*Persicaria pennsylvanica*)

#### **Herbaceous Plants Dry Open Sandy habitat**

sickle-leaved golden aster *Pityopsis falcata*

spruce aster *Ionactis linariifolia*

showy aster *Eurybia spectabilis*

skydrops aster *Symphyotrichum patens*

sweet goldenrod *Solidago odora*

silverrod *Solidago bicolor*

rattlesnake-root *Prenanthes trifoliolata*

clasping milkweed *Asclepias amplexicaulis*

butterfly milkweed *Asclepias tuberosa*

starry Solomon seal *Maianthemum stellatum* (*Smilacina stellata*)

long-branch frostweed (rockrose) *Helianthemum canadense* (*Crocianthemum canadense*)

low frostweed (low rockrose) *Helianthemum propinquum* (*Crocianthemum propinquum*)

jointweed *Polygonella articulata* (*Polygonum articulatum*)

#### **Sedge Family Plants Wet Habitat**

bristly sedge *Carex comosa*

sallow sedge *Carex lurida*

pondshore flatsedge *Cyperus dentatus*

#### **Sedge Family Plants Dry Sandy Habitat/Open Sand**

sandsedge *Bulbostylis capillaris*

Gray's flatsedge *Cyperus grayi*

Long's sedge *Carex longii*

#### **Grasses Wet Habitat**

wild rice *Zizania aquatica*

coastal mannagrass *Glyceria obtusa*

warty panic-grass *Panicum verrucosum*

#### **Grasses Dry Habitat**

purple sand-grass *Triplasis purpurea*

barrens needle-grass *Aristida longespica*

poverty grass *Sporobolus vaginiflorus*

little bluestem *Schizachyrium scoparium*

purple lovegrass *Eragrostis spectabilis*

switchgrass *Panicum virgatum*

# AVERY ASSOCIATES

REAL ESTATE APPRAISERS - COUNSELORS

January 30, 2015

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Melissa Arrighi, Town Manager  
Town of Plymouth  
11 Lincoln Street  
Plymouth, MA 02360

Henry Evan Schulman  
Tidmarsh Farms Inc.  
69 Mount Vernon Street  
Boston, MA 02108

RE: 3 Parcels of Land Totaling  
127.92 Acres of Land  
85 Beaver Dam Road  
Plymouth, Massachusetts

Dear Ms. Arrighi and Mr. Schulman:

In response to your request we are pleased to transmit the appraisal report detailing our estimate of the market value of the above referenced real property. This report sets forth the value conclusions, together with supporting data and reasoning which forms the basis for our conclusions.

The subject property consists of 127.92 ± acres of cranberry bogs, wetlands and support lands for the operating cranberry bog plantation Tidmarsh Farms, Inc. There are 40.06 ± total acres of active cranberry bogs and 87.86 ± acres of support land along with an older colonial style dwelling and a pre-engineered warehouse building. The subject properties are located in both the Rural Residence (RR) Zoning District and the R25/Residential District. The property had been part of a larger cranberry farming operation by the owner for many years. Our analysis is for the entire property, at highest and best use.

The subject parcels are being appraised using the following **Extraordinary Assumption**:

- That the modified conceptual 25 lot configuration, for the subject property prepared by Beals & Thomas Inc. in 2009, as modified by Avery Associates in 2014, could be refined to an approvable level and that each proposed home site can meet all local and state requirements for development of a single-family residence.

Page 2  
January 30, 2015  
Melissa Arrighi, Town Manager  
Henry Evan Schulman

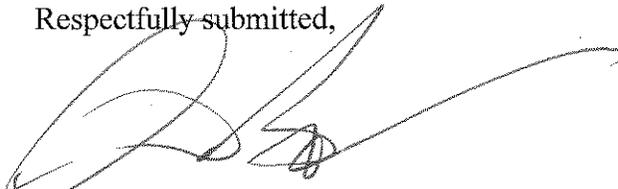
The appraisal developed in support of the value opinions is qualified by certain definitions, limiting conditions and certifications presented in detail in the appraisal report.

Based on the analysis presented in this appraisal, it is our opinion that the market value of the entire 127.92 ± acres subject property, to a single purchaser, subject to the **Extraordinary Assumption**, limiting conditions, and assumptions as of December 30, 2014, is:

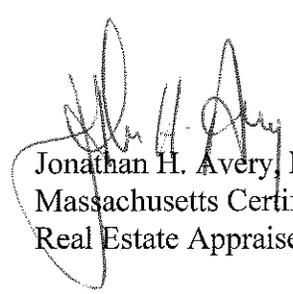
**SEVEN HUNDRED SEVENTY-FIVE THOUSAND DOLLARS (\$775,000)**

This letter must remain attached to the report, which contains 44 pages plus related exhibits, in order for the value opinion set forth to be considered valid.

Respectfully submitted,



Richard W. Bernklow, SRA  
Massachusetts Certified General  
Real Estate Appraiser #3111



Jonathan H. Avery, MAI, CRE  
Massachusetts Certified General  
Real Estate Appraiser #26

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Addenda

**SUMMARY OF IMPORTANT FACTS AND CONCLUSIONS**

**ADDRESS:** 85 Beaver Dam Road  
Plymouth, Massachusetts

**OWNER OF RECORD:** Tidmarsh Farm, Inc.

**CLIENT:** Melissa Arrighi, Town Manager, Town of Plymouth  
Henry Evan Schulman, Owner

**DATE OF VALUE ESTIMATE:** December 30, 2014

**INTEREST APPRAISED:** Fee Simple, see the definition section of the  
Addenda

**LAND AREA:** 127.92 Acres  $\pm$  per Plymouth Assessor, Beals &  
Thomas Plans and Forestry Plan

**IMPROVEMENTS:** 85 Beaver Dam Road—1900 vintage colonial  
dwelling and pre-engineered wood and steel farm  
warehouse building.

**ZONING:** R-25 & RR Residential Districts  
Floodplain Overlay District

**HIGHEST AND BEST USE:** As conceptually proposed for 25 lot residential  
subdivision on the entire property. Cranberry bog  
sites are incorporated within house lots and not  
separately valued.

**ESTIMATE OF VALUE:** \$775,000

**APPRAISED BY:** Richard W. Bernklow, SRA  
Jonathan H. Avery, MAI, CRE  
Avery Associates  
Post Office Box 834  
282 Central Street  
Acton, Massachusetts 01720

**PURPOSE OF THE APPRAISAL:** The purpose of this appraisal is to estimate the market value of the subject property under current market conditions. In estimating this value it has been necessary to make a careful physical inspection, examination, and analysis of the property. The definition of market value can be found in the Addenda section to this report.

**INTEREST VALUED:** Fee simple estate. Please see the definitions section of the Addenda.

**DATE OF VALUATION:** The date of valuation is December 30, 2014. All data, analysis and conclusions are based upon facts in existence as of the date of valuation.

**DATE OF REPORT:** The date of this report is January 30, 2015.

**INTENDED USE/USERS OF REPORT:** The intended use of this appraisal is to estimate the market value of all rights, title, and interest in and on the subject property, as detailed, for the clients, Melissa Arrighi, Town Manager, Town of Plymouth and property owner, Henry Evan Schulman, Tidmarsh Farm, Inc. and their assigns are the intended users.

**SCOPE OF THE APPRAISAL:** Richard W. Bernklow, SRA inspected the subject property on November 28, 2014, accompanied by Donny Badeau, farmer for Tidmarsh Farms, Inc. Jonathan H. Avery, MAI, CRE also inspected the subject property, unaccompanied. The property was inspected on several occasions afterward. Robert Wilbur, Director of Land Conservation, Mass Audubon, provided the appraisers with the following information:

- Conceptual Development Plan for the subject site drawn by Beals & Thomas in 2009.

In addition to the inspections, Mr. Bernklow:

- Discussed the subject property, the Beals and Thomas Development plans and residential development activity in general in Plymouth with Town Planner, Lee Hartmann, in October 2014.
- Obtained additional information regarding the property from the Plymouth Assessor's Department, Town Clerk, Planning Department, the soil maps of the USDA/NRCS, flood maps provided by FEMA, and all subject deeds from the Plymouth Registry of Deeds.
- Discussed selected comparable sales with principals involved in the transactions and investigated any appraisals available in the normal course of business for review on the potential comparable sales.

A review has been made of municipal tax and zoning material, pertinent documents and proposals for development at the subject property contained in the Planning Department of Plymouth. Data has then been gathered pertinent to valuation of the property. The approaches to value employ many sources including municipal and county records, sales recording services, cost services and interviews with professionals active in the real estate field. Deeds were reviewed when available and data confirmed with parties to the transactions as a means of verification, when possible.

Available local information resources were used such as Massachusetts Municipal Profiles, Community Profiles on the Internet, Massachusetts Department of Employment and Training, Plymouth Reporter, Plymouth Clipper, Plymouth Assessor's Office, Plymouth Planning Office, local real estate brokers and local web sites.

Upon the verification of the data, recognized valuation techniques were then employed in deriving value indications from appropriate cost, sales and income perspectives, as applicable.

The subject parcels are being appraised using the following **Extraordinary Assumption**:

- That the modified conceptual 25 lot configuration, for the subject property prepared by Beals & Thomas Inc. in 2009, and modified by Avery Associates in 2014, could be refined to an approvable level and that each proposed home site can meet all local and state requirements for development of a single-family residence.

#### **CONSIDERATION OF HAZARDOUS SUBSTANCES IN THE APPRAISAL PROCESS**

No specific geotechnical engineering information or Phase One site investigation has been provided to the appraisers. Under federal and state laws, the owner of real estate which is contaminated and from which there is a release or threatened release may be held liable for cost of corrective action. A Phase One site investigation is customary business practice. Such an investigation entails a review of the property, its history and available government records to determine if there is reason to believe that contamination may be present.

Unless otherwise stated in this report, the existence of hazardous substances, including with limitation asbestos, polychlorinated biphenyls, petroleum leakage, agricultural chemicals or urea formaldehyde foam insulation, which may or may not be present on the property, were not called to the attention of nor did the appraiser become aware of such during inspection. The appraiser has no knowledge of the existence of such materials on or in the property unless otherwise stated. The appraiser, however, is not qualified to test for such substances. Since the presence of such hazardous substances may significantly affect the value of the property, the value as estimated herein is predicated on the assumption that no such hazardous substances exist on or in the property or in such proximity thereto which would cause a loss in value.

If such substances do exist, then the value as estimated herein will vary dependent on the extent of contamination and the costs of remediation.

The subject property **is not included** on the List of Waste Sites and Reportable Releases (Bureau of Waste Site Cleanup, Massachusetts DEP web site, surveyed January 2015). We have appraised the subject property based on the assumption the site is not contaminated; however, if the subject site becomes or is found contaminated, the value estimate contained herein will change.

## IDENTIFICATION AND HISTORY OF SUBJECT PROPERTY

The Town of Plymouth identifies the subject property in the following manner:

<u>Map</u>	<u>Parcel</u>	<u>Acreage</u>	<u>Address</u>	<u>Legal Reference</u>	<u>Date</u>	<u>Consideration</u>	<u>Grantor</u>
76	8	42.45	Off Beaver Dam Rd	6421/204	13-Nov-85	\$62,500	Second Church
76	28E	83.329	85 Beaver Dam Rd	5147/141	12-May-82	\$300,000	Richmond
76	24-20	2.139	Off Beaver Dam Rd	15580/252	23-Oct-97	\$7,000	Richmond

The present owner bought the majority of the subject property in 1982 from Robert & Margaret Richmond, with the second major purchase in 1985.

The property at 85 Beaver Dam Road is improved with a colonial dwelling home along with a pre-engineered steel/farm building. This is the only property with an address. The total combined acreage of all three parcels according to the assessor's maps and plans is 127.92 ± acres.

Two of the three properties are subject to the following Agricultural Tax Liens pursuant to MGL Chapter 61, recorded in:

- Parcel 76-8, subject to Chapter 61 lien recorded in Plymouth County Registry of Deeds, Book 9074, Page 329, dated April 7, 1989.
- Parcel 76-28E, subject to Chapter 61A lien recorded in PCRD, Book 38677, Page 331, dated Jun 29, 2010.

There is a formal Forest Management Plan on the 42.45 (Parcel 76-8) acre site that has been in place since 2008 overseen by Gary Goldrup, NE Forestry Cons. Inc. It details a cutting in Stands 1 & 2, for 10 cords of firewood (valued at \$100) between 1998 -2001. There are no requirements for any cutting in the near future.

There is active cranberry farming in process at the subject, however, none of the details of the harvest and or contract for the produce has been made available to the appraisers. Because the bogs are incorporated into the proposed development plan, they have been treated as open space land in the valuation analysis.

**Rental/Offering:** According to the owner, the subject property has not been offered for sale or lease since acquisition we are not aware of any unsolicited offers to purchase. Copies of the deeds and Plymouth Assessor's Maps are attached in the report Addenda.

**AREA ANALYSIS**

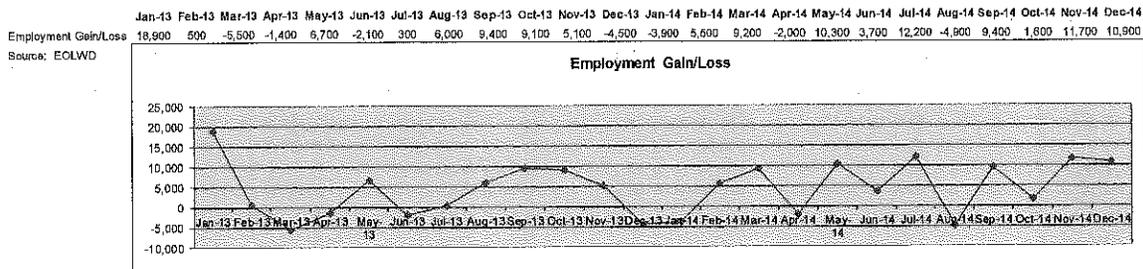
The subject property is located in the Town of Plymouth. It is the seat of Plymouth County, and is surrounded on the south by Bourne; Wareham on the southwest; Carver on the west; Kingston on the north; and the Atlantic Ocean on the east. The 2010 Federal Census population is 56,468 persons which is a 9.22% increase over the 2000 census figure of 51,701 persons. The median household income per the 2010 census is \$77,228, up 41.24% from the 2000 census median income figure of \$54,677. The median house price in 2013 was \$285,000, up \$10,000 over the 2012 median price but still down some -22.8% from the 2005 peak at \$350,000. The price decline is typical of southern Massachusetts.

The coastal community of Plymouth is a town steeped in history. It is referred to as "America's Hometown" because it is the site of the first successful North American colony founded in 1620. It is the largest city or town, in terms of land area, of any of Massachusetts' 351 communities, including Boston.

The downtown area is a quaint village with brownstone homes, brick sidewalks, and a waterfront park focused on "Plymouth Rock" and a replica of the Mayflower. The town has experienced tremendous growth in its population over the past 30 years. Once an isolated coastal community, improved highways, commuter rail, and affordable real estate prices have caused the population of the town to surge 178% since 1970. Plymouth has emerged as a far-south suburb of Boston because of its proximity to Route 3 and the Kingston Branch of the Old Colony Rail Road.

**Economic Indicators:**

The unemployment rate in Plymouth for November 2014 was 5.3%, slightly below the state average for November 2014 that decreased to 5.8% while the national average also fell to 5.8%. Nationally, it was reported that the economy created 252,000 jobs in December, 353,000 jobs in November, 261,000 jobs in October, 271,000 in September, 203,000 jobs in August, 243,000 jobs in July, 267,000 jobs in June, 229,000 jobs in May, 304,000 jobs in April, 203,000 jobs in March, 222,000 jobs in February and 144,000 jobs in January. The economy finished 2013 by creating over 2.1 million new jobs and the national economy finished 2012 by creating 1.9+ million new jobs. Massachusetts reported the following job gains/losses since January 2013:



Massachusetts job growth remained strong through most of 2013 and over 40,000 new jobs were created in the state. It was hoped the December/January 2014 figures were a fluke and not a trend carried over too far into the new year. The February return to job growth is considered a better figure especially when coupled with the state's falling unemployment rate.

Year to date in 2014, the state jobs growth is over 50,000 new jobs. The large drop in August was attributed to the stall over Market Basket which was then a large reason for the upswing in September and to a lesser degree in October. November and December made significant gains in employment for the end of the year.

The Massachusetts (dated March 21, 2013) jobs release stated Massachusetts surpassed pre-recession job levels (with 3,318,500 jobs) and that the state now has more total jobs than in April 2008 (3,304,300 jobs) at the start of the recession and continues to slowly increase. The 2011 New England Economic Partnership predicted that Massachusetts's unemployment would peak at 9.3% and thereafter should create 200,000 new jobs over the next 5 years. The UMASS Donahue Institute December 2014 MassBenchmarks stated:

*Massachusetts real gross domestic product grew at an estimated annual rate of 4.7 percent in the fourth quarter of 2014 according to the MassBenchmarks Current Economic Index, released today by MassBenchmarks, the journal of the Massachusetts economy published by the UMass Donahue Institute in collaboration with the Federal Reserve Bank of Boston. U.S. real domestic gross product grew at an annual rate of 2.6 percent according to the advance estimate of the U.S. Bureau of Economic Analysis.*

*The Massachusetts and U.S. economies finished 2014 with three successive quarters of strong growth. Based on the latest available information, we now estimate that in the third quarter of 2014, the state economy expanded at a 6.0 percent annualized rate; in the second quarter, it was 5.2 percent; and in the first quarter it declined by 2.4 percent (largely due to an extended spell of nasty weather courtesy of the polar vortex). Nationally, the US expanded at an annual rate of 5.0 percent in the third quarter; 4.6 percent in the second quarter; and negative 2.1 percent in the first quarter.*

*All four components of the MassBenchmarks Current Economic Index exhibited strong growth in the second half of 2014. State payroll employment expanded at a 2.0 percent annualized rate in both the third and the fourth quarters. Employment levels in Massachusetts in the fourth quarter of 2014 were 1.7 percent higher than they were in the fourth quarter of 2013, reflecting the creation of over 60,000 net new jobs in 2014, the best performance since 2000. Nationally, employment expanded at a 2.4 percent annualized rate in the fourth quarter and 2.1 percent in the third quarter. National employment levels were 2.1 percent higher in the fourth quarter of 2014 than during the same period in 2013.*

*The Commonwealth's unemployment rate fell from 6.0 percent in September to 5.5 percent in December. It is now 1.6 percentage points lower than it was in December of 2013. The U.S. unemployment rate fell from 5.9 percent in September to 5.6 percent in December and is now 1.1 percentage points below its December 2013 level. Massachusetts wage and salary income – as estimated from state withholding taxes – grew at a 10.7 percent annual rate in the fourth quarter following growth of 9.1 percent in the third quarter. Wage and salary income in the fourth quarter was 6.0 percent higher than the fourth quarter of 2013. State spending on items subject to the regular sales tax and motor vehicle sales tax grew at a 7.4 percent annual rate in the fourth quarter, following 1.1 percent in the third quarter. Fourth quarter spending was 5.1 percent higher than in the fourth quarter of 2013.*

*"The state and national economies appear to have achieved escape velocity following an extended but steady recovery from the 'Great Recession'," noted Alan Clayton-Matthews, MassBenchmarks Senior Contributing Editor and Associate Professor of Economics and Public Policy at Northeastern University, who compiles and analyzes the Current and Leading Indexes. The results of the household survey strongly suggest there were significant improvements in the state labor market in 2014. In the fourth quarter of 2014, the state's labor force grew at a 4.5 percent annual rate while resident employment grew at a 4.7 percent annual rate. Year over year, between December 2013 and December 2014, the state's labor force grew by 83,300 while resident employment grew by 134,700. "While the household survey is subject to considerable sampling error and should be interpreted cautiously, this is the strongest year-over-year labor force growth recorded by these measures in the history of the data series going back to January 1976," Clayton-Matthews added.*

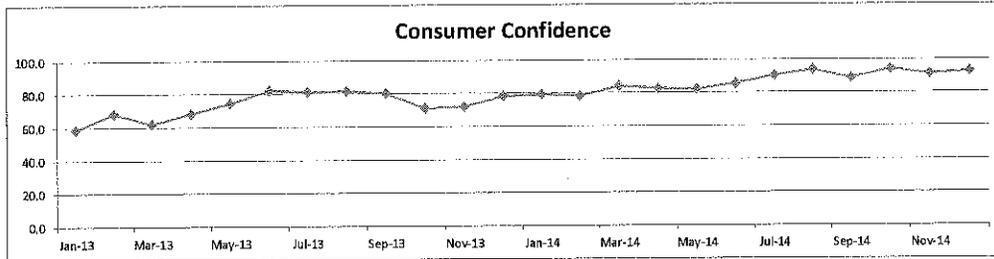
*Notably, while the state's unemployment rate remains high for the young and the less well-educated, it fell faster for these groups in 2014 than for the overall labor force. The annual average unemployment rate for Massachusetts residents under 25 years old fell from 15.8 percent in 2013 to 13.5 percent in 2014; for those without a high school diploma, it fell from 20.1 percent in 2013 to 14.1 percent in 2014; and for those with a high school diploma, it fell from 9.3 percent in 2013 to 6.9 percent in 2014. The state's "U-6" unemployment rate, which includes workers who want to work full-time but can only find part-time work, and persons who want a job but have not looked recently (the so-called "marginally-attached" members of the labor force), fell from an annual average of 13.2 percent in 2013 to 11.5 percent in 2014.*

*The MassBenchmarks Leading Economic Index for December is 5.2 percent, and the three-month average for October through December is 5.7 percent. The leading index is a forecast of the growth in the current index over the next six months, expressed at an annual rate. Thus, it indicates that the economy is expected to grow at an annualized rate of 5.2 percent over the next six months (through June 2015), with expected first quarter growth of 5.6 percent and second quarter growth of 5.2 percent. For the forecast of state domestic product growth in the fourth quarter of this year and the first quarter of next year, productivity growth is assumed to return to its trend.*

Consumer confidence had been falling in New England and across the country, however, it appears that confidence bottomed out in early 2009 and has slowly begun to climb back toward strength in the last 24 months. The trends in consumer confidence data from January 2013 through the present is detailed in the following chart:

	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
Consumer Confidence	58.4	68.0	61.9	68.1	74.3	82.1	81.0	81.5	80.2	71.2	72.0	76.1	79.4	78.3	83.9	82.3	82.2	85.2	90.3	90.4	89.0	94.1	91.0	82.6

Source: The Conference Board



The September figures were one of the largest declines in the last year. The data presented portrays the ups and downs of the economy since January 2013 and show much of the year in a valley with consumers starting to get more optimistic in the second/fourth and first & second quarters 2013-2014.

The still moderately growing economy appears to be having an effect of only gradually increasing consumer confidence instead of large increases due to a rebounding economy. According to the December 2014 Conference Board: *Consumer confidence rebounded modestly in December, propelled by a considerably more favorable assessment of current economic and labor market conditions. As a result, the Present Situation Index is now at its highest level since February 2008. Consumers were moderately less optimistic about the short-term outlook in December, but even so, they are more confident at year-end than they were at the beginning of the year.*

### Residential Market:

Banker and Tradesman reported the following about the December 2014 Massachusetts housing market:

Single-family home sales in the Bay State ended the year with a gain of nearly 10.0 percent in December, marking the largest increase in 2014, according to the latest report by The Warren Group, publisher of Banker & Tradesman. A total of 4,209 single-family homes sold in Massachusetts during the month, compared with 3,841 in December 2013, a gain of 9.6 percent. For the year, sales fell 2.0 percent with 48,963 homes sold compared with 49,992 during 2013. Sales were up 1.4 percent in the fourth quarter, rising to 12,224 compared with 12,058 during the fourth quarter of 2013.

Median prices of single-family homes increased by 2.1 percent in December, rising to \$320,000 compared with \$313,500 a year earlier. The median price for the full year rose by 2.5 percent to \$330,000 compared with \$322,000 for 2013. Fourth quarter median prices increased almost 3.0 percent with a price of \$320,000 compared with \$311,000 in the same quarter last year.

"We closed 2014 with increases in both single-family home sales and median price in December," said Timothy M. Warren Jr., CEO of The Warren Group. "The 9.6 percent gain in sales volume was exceptionally strong. We have not seen a bump like that in over a year. With rates hitting historic lows for 30-year mortgages and strong job growth, I am confident that we will see a strong start to 2015 market."

**Plymouth Market:**

Plymouth has a wide variety of housing types and prices. The smallest starter homes are capes and ranches and some can be bought for under \$100,000, but most starter homes begin around the \$200,000 price. New construction starts at the \$399,900 price for isolated lots and at \$550,000 for homes in new attractive subdivisions such as Pinehills Developments.

Plymouth is also home to large custom homes and multi-million dollar mansions along the ocean. The newer house sizes range from 2,000 sf to 3,000 sf with sales prices from \$499,000 to \$1,000,000+, depending on size, view, and amount of land. The homes along the ocean start at \$300,000 for the smallest cottages and up to \$5 million for large custom built mansions.

The following chart details Plymouth Single Family Market conditions by MLS/Pin and is presented for the term 20010-2013; the second chart details MLS/Pin statistics for lots/land:

<b><u>2010 Statistics</u></b>		<b><u>2011 Statistics</u></b>	
# of Price Changes	739	# of Price Changes	686
Average Price Change	-7.74%	Average Price Change	-8.08%
# Of Houses Sold	458	# Of Houses Sold	499
Sales Pace	38/Month	Sales Pace	41.5/Month
Average Sales Price	\$317,925	Average Sales Price	\$306,625
Average Marketing Time	151 Days	Average Marketing Time	157 Days
<b><u>2012 Statistics</u></b>		<b><u>2013 Statistics</u></b>	
# of Price Changes	680	# of Price Changes	540
Average Price Change	-6.44%	Average Price Change	-5.91%
# Of Houses Sold	586	# Of Houses Sold	659
Sales Pace	48.8/Month	Sales Pace	54.9/Month
Average Sales Price	\$305,278	Average Sales Price	\$316,153
Average Marketing Time	158 Days	Average Marketing Time	146 Days
<b>Sales Price Change 10-13</b>	<b>-0.56%</b>		

**Land:**

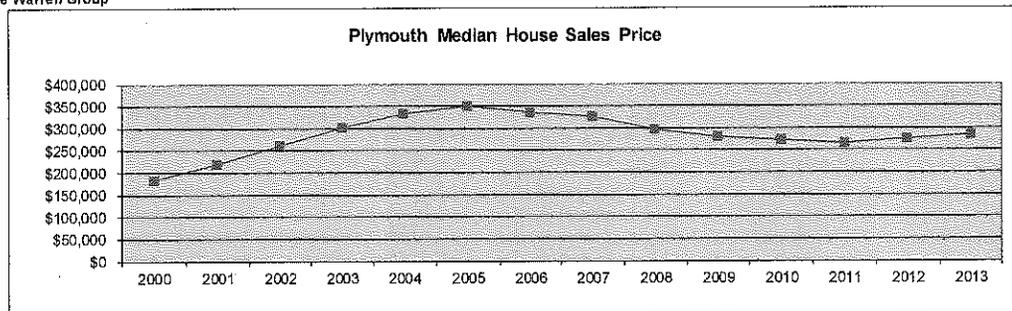
<u>2010 Statistics</u>		<u>2011 Statistics</u>	
# Of Lots Sold	17	# Of Lots Sold	17
Sales Pace	1.41/Month	Sales Pace	1.41/Month
Average Sales Price	\$115,691	Average Sales Price	\$124,753
Average Marketing Time	237 Days	Average Marketing Time	139 Days
<u>2012 Statistics</u>		<u>2013 Statistics</u>	
# Of Lots Sold	15	# Of Lots Sold	20
Sales Pace	1.25/Month	Sales Pace	1.67/Month
Average Sales Price	\$106,708	Average Sales Price	\$96,275
Average Marketing Time	279 Days	Average Marketing Time	200 Days

**Sales Price Change 10-13 -16.78%**

These statistics demonstrate that although house prices may no longer be decreasing, land prices appear soft. Additional data detailing values is found in the median home sales price for the last 10 years as detailed in the following chart:

<b>Year</b>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
<b>Median Sales Price</b>	\$182,000	\$219,900	\$259,900	\$302,000	\$334,500	\$350,000	\$335,000	\$325,000	\$297,750	\$280,750	\$272,500	\$265,500	\$275,000	\$285,000

Source: The Warren Group



These price declines are typical of Southern Massachusetts and the adjacent markets. It appears that Plymouth house prices may have bottomed out with values rising consistently since 2011. The 2014 year to date MLS/Pin residential data is detailed below:

- There are 183 active listings with an average price of \$469,459 and marketing time of 184 days.
- There have been 621 price changes at an average decrease of -6.46%.
- There are 66 homes pending sale at an average price of \$369,761 and average marketing time of 187 days.
- There have been 686 sales at an average price of \$343,690 and average marketing time of 124 days.

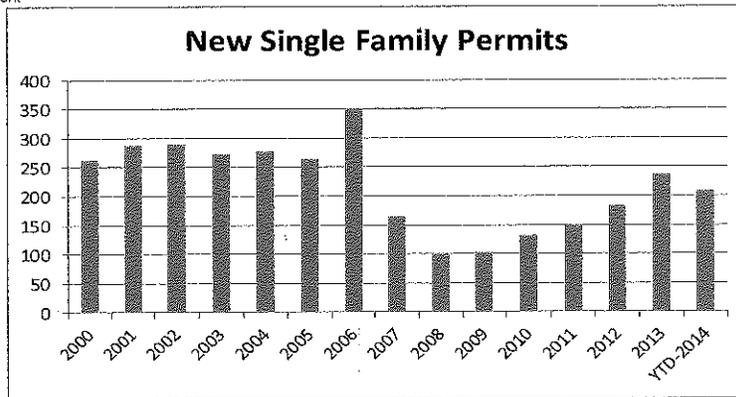
The current statistics still appear to have a large difference (\$469,459 vs. \$369,761 pending prices, and vs. \$343,690 sold prices) between listing prices and the pending & selling prices. While Plymouth is a desirable town, this large a difference is an indication that there remains a disconnect between buyers and sellers; although the gap between pending sales and actual sales is much closer. All these figures are still higher than the median house prices noted over the last few years.

## New House Permits:

A key measure of market health and demand is the demand for new house permits. This is shown in the following chart for the last 13+ years:

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	YTD-2014
New Single Permits	263	288	289	273	277	265	349	164	101	104	132	149	182	238	208

Plymouth Building Department



Demand for new dwellings peaked in 2006, before the market fell and has been increasing steadily since the bottom/weakest demand in 2008. New permit demand in 2011 was almost 12.5 units a month, 15 units in 2012 and 20 units in 2013. Demand for 2014 is almost on pace to match 2013 at 18.9 units per month.

Finally, to determine the actual positive or negative trend in values, because the median house prices and MLS data over the last 4 years is inconclusive we performed a sale/resale analysis as shown in the following chart:

Plymouth Sale/Resale Chart 2014

Sale	Location	Sales Date	Sales Price	Resale Date	Resale Price	Appreciation	Months	Monthly	Annual	
1	8 Alden Ct	Apr-10	\$259,000	Dec-14	\$315,000	\$56,000	56	0.4%	4.6%	
2	36 Beatrice Av	Jun-11	\$435,000	Dec-14	\$446,500	\$11,500	42	0.1%	0.8%	
3	28 Hall St	Jun-11	\$227,500	Dec-14	\$250,000	\$22,500	42	0.2%	2.8%	
4	28 Lisa Av	Aug-12	\$304,000	Dec-14	\$325,000	\$21,000	28	0.2%	3.0%	
5	26 Archer St	Aug-10	\$230,000	Nov-14	\$206,000	(\$24,000)	51	-0.2%	-2.5%	
6	75 Dickenson Dr.	Apr-10	\$290,000	Nov-14	\$270,000	(\$20,000)	55	-0.1%	-1.5%	
7	15 Marscot Way	Jul-13	\$402,900	Nov-14	\$427,000	\$24,100	16	0.4%	4.5%	
8	147 Micajah Pond	Aug-13	\$269,900	Nov-14	\$317,000	\$47,100	15	1.2%	13.9%	
9	18 Grant St	Aug-11	\$305,000	Oct-14	\$328,000	\$23,000	38	0.2%	2.4%	
10	18 Thrush	Nov-10	\$178,250	Aug-14	\$214,000	\$35,750	45	0.4%	5.3%	
11	203 Carver Rd	Jun-13	\$225,299	Aug-14	\$250,000	\$24,701	14	0.8%	9.4%	
12	18 Driftwood	Feb-11	\$650,000	Aug-14	\$675,000	(\$175,000)	42	-0.5%	-5.9%	
13	7 Hawks Perch	Jul-10	\$765,915	Aug-14	\$750,000	(\$15,915)	49	0.0%	-0.5%	
14	710 Ship Pond	Apr-12	\$424,500	Aug-14	\$545,000	\$120,500	28	1.0%	12.2%	
15	25 Janet St.	Feb-09	\$140,000	Jul-14	\$190,000	\$50,000	65	0.5%	6.6%	
16	8 Center Hill	Nov-10	\$368,000	Jul-14	\$375,000	\$7,000	44	0.0%	0.5%	
17	19 Fuller Way	Jul-13	\$405,000	Jul-14	\$451,000	\$46,000	12	0.9%	11.4%	
18	12 Grasshopper	May-12	\$213,000	Jul-14	\$244,900	\$31,900	26	0.6%	6.9%	
19	94 Manomet	May-10	\$335,000	Jul-14	\$362,500	\$27,500	50	0.2%	2.0%	
20	98 Valley Rd	Nov-10	\$330,000	Jul-14	\$338,500	\$8,500	44	0.1%	0.7%	
21	23 Weathervane	Dec-11	\$340,000	Jul-14	\$380,000	\$40,000	31	0.4%	4.6%	
22	30 Cross Wind	Jul-11	\$397,000	Jul-14	\$452,000	\$55,000	36	0.4%	4.6%	
23	4 George St	Aug-10	\$197,000	Jul-14	\$225,000	\$28,000	47	0.3%	3.8%	
24	120 Lakeview	Jul-12	\$201,000	Jun-14	\$250,000	\$49,000	23	1.1%	12.7%	
25	6 Menotomy Rd	Jun-10	\$420,000	Jun-14	\$480,000	\$60,000	48	0.3%	3.6%	
26	8 Cabot Cir	Apr-12	\$220,000	Jun-14	\$245,000	\$25,000	26	0.4%	5.2%	
27	52 Champlain Cir	Apr-10	\$335,000	Jun-14	\$360,000	\$25,000	50	0.1%	1.8%	
28	22 Fieldstone	Aug-10	\$265,000	Jun-14	\$285,000	\$20,000	46	0.2%	2.0%	
29	1 Persistence	Jun-11	\$373,000	Jun-14	\$430,000	\$57,000	36	0.4%	5.1%	
30	48 Spencer	Mar-13	\$239,000	Jun-14	\$279,000	\$40,000	15	1.1%	13.4%	
31	120 Warren Ave	Nov-12	\$725,000	Jun-14	\$795,000	\$70,000	19	0.5%	6.1%	
32	8 Millers Joist	Apr-11	\$320,000	Jun-14	\$355,000	\$35,000	38	0.3%	3.5%	
33	55 Esta Rd	Dec-10	\$230,000	Jun-14	\$220,000	(\$10,000)	42	-0.1%	-1.2%	
34	5 Brine Ave	May-10	\$240,000	Jun-14	\$225,900	(\$14,100)	49	-0.1%	-1.4%	
35	20 Leeward	Apr-10	\$216,000	May-14	\$275,000	\$59,000	49	0.6%	6.7%	
36	103 Alewife	Sep-12	\$290,000	May-14	\$299,000	\$9,000	20	0.2%	1.9%	
37	6 Bourne Rd	Apr-11	\$258,500	Apr-14	\$299,000	\$40,500	36	0.4%	5.2%	
38	42 Tenderwood	Apr-11	\$350,000	Apr-14	\$370,000	\$20,000	36	0.2%	1.9%	
39	27 White Trellis	Jun-12	\$355,000	Apr-14	\$357,400	\$2,400	22	0.0%	0.4%	
40	28 Manomet Beach	May-12	\$169,900	Mar-14	\$200,000	\$30,100	22	0.8%	9.7%	
41	70 7 Hills Rd	Jun-11	\$225,000	Mar-14	\$260,000	\$35,000	33	0.5%	5.7%	
42	28 Cross Wind	Dec-13	\$378,000	Feb-14	\$378,000	\$0	2	0.0%	0.0%	
43	16 John Paul	Aug-12	\$345,000	Jan-14	\$360,000	\$15,000	17	0.3%	3.1%	
44	7 Wallwind	Sep-10	\$170,000	Dec-13	\$165,000	(\$5,000)	39	-0.1%	-0.9%	
45	76 Palmer Rd	Sep-12	\$285,000	Dec-13	\$270,000	(\$15,000)	15	-0.4%	-4.2%	
								Average	0.3%	3.8%
								Median	0.3%	3.5%

In this chart, negative price changes are shown in white while positive price changes are shown in gray and the gray figures clearly outnumber the negative figures. This is the most definitive evidence that the market value of houses is increasing after years of declining prices and demonstrates prices rising at almost 4% annually for houses. Some of this increasing value is likely also being transferred to land because the demand for new homes is growing (based on new permit demand). With increasing prices, higher demand is anticipated for land.

**Conclusions:** The national economy has made slow but steady progress coming out of the 2008 recession despite producing only moderate job growth. Residential real estate values finally began to show some strength in the last 18-24 months in Eastern Massachusetts and across the country. Massachusetts' economy has fared better than the national economy with overall positive job growth/recovery from 2010 to 2013, stronger than the national economy despite increasing unemployment and loss of money due to the Sequester. 2014 is expected to finish strong as well in employment trends and the state economy and should be boosted by the improving housing market. The Massachusetts Economy has recovered all of the jobs lost in the recent 2008 recession, however, the present level of employment is about where the state was at the beginning of 2003. The economic growth expected should continue to positively impact both the economy and the residential housing market.

Historically, new residential developments in Plymouth have been very successful, however, the slow/weak market conditions in Southeastern Massachusetts from 2008-2012 impacted Plymouth and slowed new development. It appears the residential market is making a recovery with median house prices slowly increasing and median MLS/Pin prices increasing. There is strong demand for new housing units in town.

### **NEIGHBORHOOD SUMMARY**

The subject property is located south off State Road Route 3A, along Beaver Dam Road in the village of Manomet. Manomet is a seaside village of Plymouth named for the Manomet Native American sub-group of the Wampanoag whose settlement was located atop the dominant hill in the region when European settlers arrived in Plymouth in 1620.

The intersection of Beaver Dam Road and State Road/Route 3A is a major intersection with commercial properties and services. Further south along Route 3A, there are shopping plazas, drug stores, Stop and Shop market, various restaurants and stores.

Beaver Dam Road leads out to the Pine Hills development, a 3,600 unit fully permitted development with houses, condominiums, golf course, private amenities/beaches ponds, recreational areas and self-supported shopping and services. The area is located just off Route 3 at Exit 5. Since construction started 10 years ago, more than 1,800 units and homes have been sold in this neighborhood. And on an annual basis, the Pinehills accounts for about 50% of the annual new permits issued in Plymouth. This is one of the most popular developments in Plymouth and a major contributor to the stability of house and condominium prices. Because it is a long term project it will continue to impact the town for likely another 10 years.

Other features in the area include the Manomet Transfer station on Beaver Dam Road, various mixed single family residences on side streets and the main road, additional larger commercial and other properties including: Mobile Home Park Patriot Circle, Mare Willow Horse Farm, John Alden Sportsman Club/Minuteman Lane, United Tree Services/Beaver Dam Rd, Pine Hills Village Condominium on Tide View Path, George Richmond Excavation, Woodcrest Apartments and Old Field 55+ age restricted condominiums. Fresh Pond is a recreational pond nearby with town beach and parking area. Resident passes are required.

**Conclusions:** This is an attractive section of Plymouth due to the proximity to Route 3 and the amenities located nearby in the neighborhood and Manomet Beaches. Houses are mixed in terms of ages, constructions and styles but appear to be mostly compatible. Newer developments have occurred in areas around the ponds, considered the most appealing. The lack of utilities (water & sewer) has not proven adverse to area development.

## TAX SUMMARY

The subject is assessed to Tidmarsh Farms, Inc. in the following manner:

2015 Tax Year				Land	Building	Total	Tax	CPA	Total	
Map	Parcel	Acreage	Address	Assessment	Assessment	Assessment	Rate	Taxes @ 1.5%	Taxes	
76	8	42.45	Off Beaver Dam Rd	\$1,613		\$1,613	\$15.54	\$25.07	\$0.38	\$25.44
76	28E	83.329	85 Beaver Dam Rd	\$207,346	\$189,000	\$396,346	\$15.54	\$6,159.22	\$92.39	\$6,251.61
76	24-20	2.139	Off Beaver Dam Rd	\$26,600		\$26,600	\$15.54	\$413.36	\$6.20	\$419.56
<b>Totals</b>		<b>127.92</b>				<b>\$424,559</b>				<b>\$6,696.61</b>

The tax rate in Plymouth for fiscal year 2015 is \$15.54/thousand dollars of assessed value and Plymouth has a single tax rate applied to all property types. Plymouth passed the Community Preservation Act and applies a 1.5% surcharge on taxes. The assessment represents 100% of market value at 100% ratio.

Plymouth maintains a single tax rate for all property types. This is an advantage to business in Plymouth as many other towns apply a higher rate to commercial property.

## **Chapter 61 Forest & Chapter 61AA – Agricultural use land**

The subject property is encumbered by two agricultural tax liens pursuant to MGL Chapter 61A, noted in the Identification Section. The property would need to be discharged from this program if the property is proposed for alternative use prior to sale and roll back taxes paid based on the difference in assessed value and full and fair value for the trailing five years. The full & fair taxes are shown for fiscal 2014 detailed below:

2015 Tax Year			Full & Fair	CPA	
Map	Parcel	Acreage	Assessment	Taxes	@ 1.5% Difference
76	8	42.45	\$848,837	\$13,190.93	\$197.86 \$13,363.35
76	28E	83.329	\$1,313,279	\$20,408.36	\$306.13 \$14,462.88
76	24-20	2.139	\$26,600	\$413.36	\$6.20 \$0.00
			<b>\$2,188,716</b>		<b>\$27,826.22</b>

As shown above, under full assessment, the property would be assessed for \$2,188,716 with an additional \$27,826.22 due in taxes. If the property is offered for sale while in this classification, the town has the ability to match any bona-fide offer within 120 days. Rollback Tax implications on the property have not been included as part of this analysis. Taxes on the property have only been deferred; rollback taxes are an obligation of the owner much like a mortgage and do not impact market value.

*The full tax value of this property appears to overstate its market value based on the analysis contained in this report.*

### **ZONING SUMMARY:**

**Zoning District: Rural Residential;** this district is designed to discourage development in areas remote from public utilities and facilities. It is also to preserve valuable rural character of the town by prohibiting scattered small lot development.

**Permitted Uses:** Conservation of soil water & plants, wildlife shelters, outdoor recreation, nature study, boating and boat landings, day camps, fishing & hunting; single family dwellings & home occupations.

<b>Dimensional Requirements:</b>	<b><u>Rural Residential</u></b>
<b>Minimum Lot Area (sf):</b>	120,000 (2.76 Acres)
<b>Minimum Lot Frontage:</b>	200 ft
<b>Minimum Lot Depth:</b>	200 ft
<b>Maximum Lot Coverage:</b>	15%
<b>Minimum Setbacks:</b>	
<b>Front</b>	70 ft
<b>Side</b>	30 ft
<b>Rear</b>	50 ft
<b>Maximum Height:</b>	35 feet/3 stories

**Please Note:** The zoning requirement for a RR lot in a subdivision is 60,000 provided that the development as a whole is completed at a density of 1 dwelling unit/120,000 sf of land. See Table 5 footnote 6, and also Section 205-62 for RDD. Our conceptual development plans created by Beals and Thomas utilize this lot size and allowed density ratio to create residential lots in this zoning district at the subject property.

**Comments:** This is a low-density area requiring large lots and large amounts of road frontage in order to discourage small lot development and reduce strain on town services in remote areas. Off street parking regulations call for two (2) spaces per dwelling unit. This zoning district affects the subject along a section of Beaver Dam Road.

**Zoning District: R-25 (Residential);** this district is designed to retain suburban residential development of adequate spaciousness within close proximity of the several village centers of Plymouth and thus avoid haphazard scattering of subdivisions in rural areas. This district is to provide areas for a reasonably spacious residential environment.

**Permitted Uses:** Conservation of soil water & plants, wildlife shelters, outdoor recreation, nature study, boating and boat landings, day camps, fishing & hunting; single family dwellings, two family dwellings (on minimum 35,000 sf lots) & home occupations.

**Dimensional Requirements:** Residential-25

<b>Minimum Lot Area (sf):</b>	25,000 (0.574 Acres)
<b>Minimum Lot Frontage:</b>	110 ft
<b>Minimum Lot Depth:</b>	175 ft
<b>Maximum Lot Coverage:</b>	25%
<b>Minimum Setbacks:</b>	
<b>Front</b>	35 ft
<b>Side</b>	15 ft
<b>Rear</b>	40 ft
<b>Maximum Height:</b>	35 feet/3 stories

*Cul-de-sacs are limited to 500 linear feet in all districts unless waived by the Planning Board for significant reasons.*

**Comments:** This residential zoning district has more modest lot size requirements. Plymouth frontage is based on lot requirements for front yards and lot width as measured. Residential development is the most appealing land use option in this district because of ongoing demand. More will be presented in the highest and best use analysis.

**Floodplain Requirements:** All encroachments including fill, new construction, substantial improvements to existing structures and other development are prohibited unless certification by a registered professional engineer is provided by the applicant demonstrating that such encroachment shall not result in any increase in flood levels during the occurrence of a one hundred year flood. This requirement has been incorporated into the Beals and Thomas Conceptual Designs

**Wetlands Area:** Where any portion of a lot lies within a wetland area that portion may be used to satisfy the area and yard requirements for the district in which the lot is situated provided that not less than 10,000 sf or 60% of the lot, whichever is greater, is outside the wetland area. Areas covered by water for any part of the normal year shall not comprise more than 15% of the required lot area. This requirement has been incorporated into the Beals and Thomas Conceptual Designs.

## **Rivers Protection Act**

The Rivers Protection Act, Chapter 258 of the Acts of 1996, protects nearly 9,000 miles of Massachusetts's riverbanks - helping keep water clean, preserving wildlife habitat, and controlling flooding. The law creates a 200-foot riverfront area that extends on both sides of rivers and streams. The 200 foot buffer is divided into two 100 foot zones. The first 100 feet closest to the river or stream, no development or disturbance is allowed. For the second 100 foot zone, limited disturbance development may occur, but depends on individual circumstance.

The Rivers Protection Act **may be** applicable to the subject property, although there is no direct river or stream located on the property, the cranberry bogs are likely served by some water source that may be part of a river system. This requirement has been incorporated into the Beals and Thomas Conceptual Designs.

## **Residential Development Phasing:**

Section 205-68 of the Plymouth Zoning By-Law, Residential Development Phasing, affects any development of the subject land. It states that residential lot development in the 120,000 sf zoning district is limited to not more than 10 lots in any development, or 12.5% of the total lots, whichever is lesser, can be developed in any one year. This does not mean that lots cannot be subdivided and sold; rather building permits for new houses will not be issued for more than 10 lots in any development.

## **Aquifer Protection District:**

The purpose of this district is:

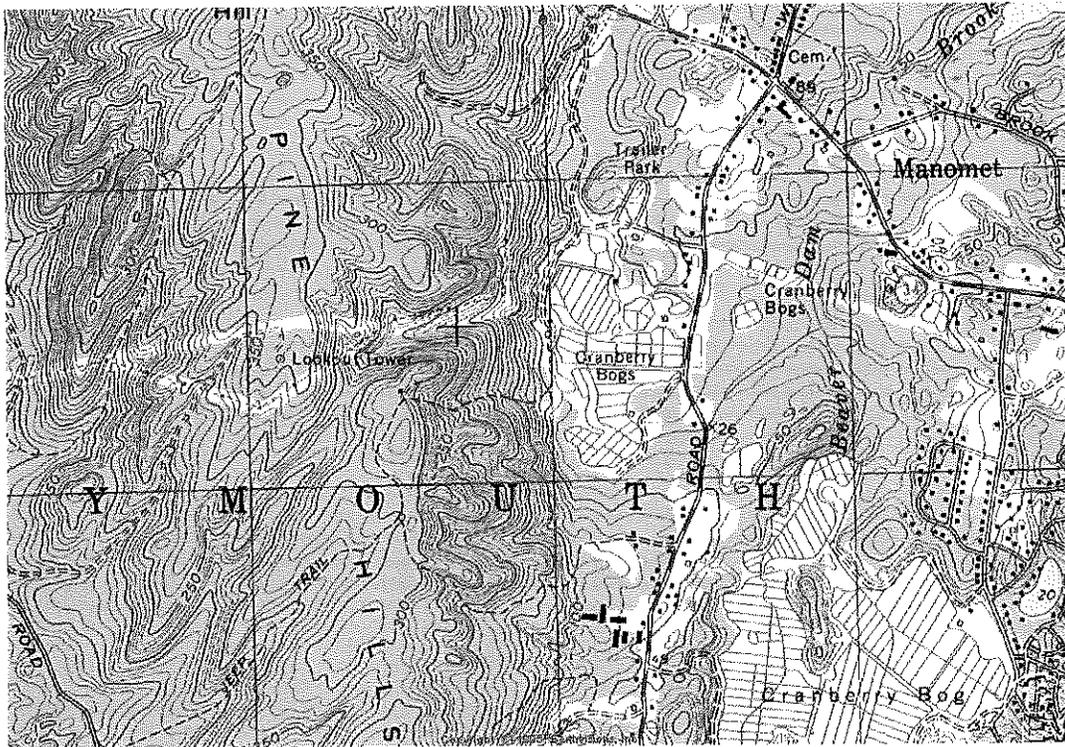
- To preserve and protect the groundwater resources of the Town of Plymouth;
- To protect, preserve and maintain the existing and potential groundwater supply and surface water quality for present and future residents of the Town;
- To prevent pollution of ground and surface water and water supplies;
- To assure the continued availability of the potable and recreational water supply of the Town; and
- To promote and protect the public health, safety and general welfare.

The Aquifer Protection District shall be considered as overlying other zoning districts. Any uses permitted in the portions of the districts so overlaid shall be governed by the restrictions of the underlying district. This has been incorporated into the Beals and Thomas Conceptual Designs

## DESCRIPTION OF THE SUBJECT PROPERTY

### Site:

**Total Land Area:** 127.92 ± acres, (5,572,108 ± square feet) according to the Plymouth Assessor's data. The site topography and cranberry bogs are shown in the topo map:



**Topography/Shape:** The site has a highly irregular shape. In looking at the topo map the property follows around the cranberry bogs shown on the west side of Beaver Dam Road and includes land surrounding the bog and an additional 42 acres stretching west across the Pine Hills toward the noted lookout tower on the above map. These 42 acres is called the Church lot (from the seller) and is mostly rectangular and perpendicular to the remaining 80 acres. The elevation ranges from road grade, to below grade where the wetlands and bogs are located and then sharply rises up along the Pine Hills. The eastern side is very steep while the western side is more of a plateau. The elevation is about 250 feet higher than the bogs. There appears to be a trail up the hills toward the lookout tower. Not all of this trail appears to be located on the subject land.

**Frontage/Access:** According to the scale of the Plymouth Assessor's Map we estimate the subject site has roughly 600 linear feet of frontage on Beaver Dam Road. The conceptual subdivision plans require creation of two loop roads, one is 5,325 linear feet long and the second is 5,987 lf in order to create frontage for the 29 proposed lots. *We have modified this plan due to economic considerations in order to create 25 lots with 5,825 lf of roads.*

**Utilities Available:** Electricity and telephone are available along Beaver Dam Road. Any proposed building lot must support both onsite well and an onsite subsurface sewage disposal (septic) system in conformance with Massachusetts Title V and Plymouth Board of Health Regulations.

**Wetlands:** The subject site is heavily impact by wetlands and appears to be about a 40/60 combination of wetlands and uplands.

**Timber Value:** We have reviewed the timber cruise for Parcel 76-8, and it states there are no current timber stands suitable for current exploitation. The subject site appears to have little current marketable timber; any timber value is considered as part of the fee simple estate of the property.

**Wildlife/Endangered Species:** The appraisers have not been given a wildlife assessment report of the subject property. According to the Natural Heritage Bio2 Maps, the entire subject is located in an area (769) of core habitat and critical natural landscape for rare species or estimated rare habitat. It is our assumption in this report that there are potential endangered species or critical habitat on the subject parcel and any development proposal must undertake appropriate requirements imposed under Natural Heritage concerns.

**Wetlands/Flood Plain:** Because of the substantial amount of cranberry bogs and related wetlands, the subject site (active bogs) does appear to be located within a flood zone, according to FIRM Panel #25023C0387J, dated July 17, 2012.

**Soil Conditions:** Soil types are considered important to potential property development. We reviewed soil survey maps from the United States Department of Agriculture, Soil Conservation Service and found the following three soil types:

**Soil Conditions:** Soil types are important to either potential development or potential for agriculture at the subject. We reviewed online soil survey maps from the United States Department of Agriculture, Soil Conservation Service to estimate the sites potential capacity to service any on site septic system. According to our analysis the predominant soil types found encompassing the subject are:

- **Water**
- **Rainberry**
- **Gravel pits**
- **Eldridge fine sandy loam**
- **Raynham Silt Loam**
- **Freetown Muck**
- **Freetown coarse sand**
- **Swansea Coarse sand**
- **Scio very fine sandy loam**
- **Windsor loamy sand**
- **Barnstable loamy sand**
- **Plymouth loamy coarse sand**

Apart from the water and Freetown Muck soils, the subject soils are typical of the area and are not considered to be adverse to development. The two major soils are Freetown coarse sand and Plymouth loamy coarse sand. Predominately sandy soils should not require extensive or extraordinary site work when creating access roads.

**Easements/Restrictions:** Inspection of the subject deeds and plans revealed a so called 'jeep trail' crossing Parcel 76-8 and shown on the plan for the property. The deed makes no reference to this right of way because it was recorded in 1995 - Book 13944, Page 193.

The following easements come from the deed for the majority of the bog acres, Book 5417, Page 141, Parcels 1-5:

- Parcel 1 is subject to an easement to the Plymouth County Electric Co. dated December 1965 and duly recorded in the Plymouth County Registry of Deeds.
- Parcel 5 is conveyed together with benefit of an easement to maintain electric line across the land of Symmes in the location presently existing.
- Parcel 5 is conveyed together with and subject to all rights of flowage and drainage which we may have appurtenant to the said premises; and tighter, also with our sanding rights, and together with and subject to any rights of way of record which cross said premises.
- Parcel 5 is subject to pole rights and easement of the Plymouth Electric Light Company granted by said Will C. Snell under instrument acknowledged March 30, 1925, and recorded with said deeds in Book 1494, page 336, insofar as in force and applicable, but specifically excluding any right to use the existing driveway through the side yard of the Symmes Homestead.
- Parcel 5 is also conveyed subject to the easement given to the Plymouth County Electric Company by instrument date November 7, 1949, and recorded in Book 2078, Page 17, insofar as in force and applicable.
- The parcels under Book 5147, Page 144 are "Said parcel 5 is conveyed subject to the easement given to the Plymouth County Electric Company by instrument dated November 7, 1949, recorded in PCRD Book 2078, Page 17 insofar as in force and applicable."
- The parcels under Book 5147, Page 144 are "Said Parcel 5 is also conveyed subject to any other easements of record given to Plymouth County for the layout of Beaver Dam Road and to the Plymouth County Electric Company for the erection and maintenance of power lines, insofar as in force and applicable."
- The parcels under Book 5147, Page 144 are "Said Parcel 5 is conveyed as appurtenant to parcel rights of way as reserved in the deed of Robert M. Briggs and Gertrude Briggs to the New Bedford Gas & Edison Light Company dated September 1971; Parcel 5 is subject to rights granted therein over land of the grantees as set forth in easement dated September 14, 1971 from Richmond to Briggs insofar as in force and applicable."
- Parcel 5 is conveyed together with the same rights and easements contained in an instrument from G&V Realty Trust dated September 13, 1971 and duly recorded in PCRD.

- Agricultural tax lien pursuant to MGL Chapter 61A, Plymouth County Registry of Deeds, Book 40434, Pages 203-204, dated October 13, 2011, 328.06 acres.
- Agricultural tax lien Parcel 76-8, subject to Chapter 61 lien recorded in Plymouth County Registry of Deeds, Book 9074, Page 329, dated April 7, 1989.
- Agricultural tax lien Parcel 76-28E, subject to Chapter 61A lien recorded in PCRD, Book 38677, Page 331, dated Jun 29, 2010.

**Conclusions:** The property is significantly impacted by wetlands, covering roughly 40% of the site. Second, the site has limited frontage and any proposed development would likely entail road construction due to the lack of available existing road frontage. Third the site has a rising topography, not specifically around the bogs, but rather the 42 acres that extends west from the site up a steep hill (Pine Hill) and will be more difficult to develop because of topography. This should make the resulting house lots more appealing due to higher elevation but may incur increased costs for road construction and drainage.

**Improvements:** There are active channels for directing water along with a reserve pond dam and other means for directing water flow. These items are considered minor improvements. Once the bogs are incorporated into residential lots these improvements lack any utility to the land.

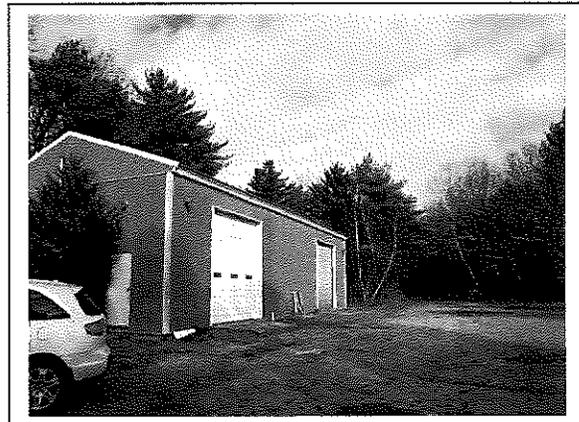
### **85 Beaver Dam Road**

This parcel is improved by a 1900 vintage colonial-style dwelling in average condition and featuring large first floor living room, kitchen and bathroom. The second floor contains 3 bedrooms and a semi-modern bathroom. There is a partial basement. Heat is oil-fired forced hot water. The 275 gallon oil tank is located in a separate side shed. There is a single wall a/c unit for the living room. The living room also has a fireplace. In any development of the subject property this improvement would be razed because it is not modern and would be detrimental to development of new lots.



### **85 Beaver Dam Road**

This is a pre-engineered, wood and steel frame farm building with two 12' overhead entry doors. There are two bays with concrete floors, a full bath and 150 amp electrical panel. Heat is propane-fired, drop down Modine-style space heaters. There is a small tank farm for storing fuel Located behind this building. In any development of the subject property this improvement



would be dismantled or razed and it no longer contributes value to the overall property for residential purposes.

There is also an older barn, which is falling down and considered unsafe for use. It should be razed.

### Development Potential

For this assignment, we have examined the Beals and Thomas conceptual development plans for the subject property prepared in 2009 and which details development of 29 total residential lots conforming to zoning districts at the subject property. The subject was designated as Area 5 for development. A breakdown of the proposed lots follows:

Location Area 5 Western Side of Beaver Dam Road	Lot #	Lot Size (sf)	Lot Size (Ac)	Lot Type	Lot #	Lot Size (sf)	Lot Size (Ac)	Lot Type
Zoning Area--Rural Residence (RR)	Lot 5-1	131,000	3.01	Subdivision	Lot 5-16	121,000	2.78	Subdivision
60,000 sf Minimum/200' minimum lot width	Lot 5-2	35,000	0.80	Subdivision	Lot 5-17	121,000	2.78	Subdivision
with 1 lot/120,000 total density	Lot 5-3	35,000	0.80	Subdivision	Lot 5-18	120,000	2.75	Subdivision
	Lot 5-4	160,000	3.67	Subdivision	Lot 5-19	120,000	2.75	Subdivision
Zoning Area--R-25/Single/Duplex (R25)	Lot 5-5	35,000	0.80	Subdivision	Lot 5-20	138,000	3.17	Subdivision
25,000 sf Minimum/110' minimum lot width	Lot 5-6	35,000	0.80	Subdivision	Lot 5-21	144,000	3.31	Subdivision
35,000 sf Minimum/110' minimum lot width-Duplex	Lot 5-7	37,000	0.85	Subdivision	Lot 5-22	121,000	2.78	Subdivision
	Lot 5-8	120,000	2.75	ANR	Lot 5-23	157,000	3.60	Subdivision
Road 5-1 Length--5,325 lf	Lot 5-9	121,000	2.78	Subdivision	Lot 5-24	121,000	2.78	Subdivision
Road 5-2 Length--5,987 lf	Lot 5-10	120,000	2.75	Subdivision	Lot 5-25	143,000	3.28	Subdivision
	Lot 5-11	120,000	2.75	Subdivision	Lot 5-26	146,000	3.35	Subdivision
	Lot 5-12	120,000	2.75	Subdivision	Lot 5-27	158,000	3.63	Subdivision
Total Acreage--75.57 Acres	Lot 5-13	120,000	2.75	Subdivision	Lot 5-28	128,000	2.94	Subdivision
	Lot 5-14	120,000	2.75	Subdivision	Lot 5-29	125,000	2.87	Subdivision
	Lot 5-15	120,000	2.75	Subdivision				

The total number of lots proposed is 29; only one (1) of which would be Approval Not Required (ANR) lot and the balance within subdivisions. All older improvements would be razed and the land prepared for residential development. With the large number of proposed lots and the elimination of agriculture as a viable enterprise on the subject land, there is no need or market demand for older barns, so they would likely be razed or sold and moved.

In this proposed plan, Lots 5-11 through 5-19 are located on the Church Lot, the section of land with the highest elevation (Parcel 76-8). These should be more appealing due to hillside location than level lots located closer to the bogs. This will be reflected in retail lot prices.

Discussion with the Plymouth Town Planner indicated that the density of development appeared to be achievable without overstressing the site or proposing development that would require a special permit. These conceptual pans are for "by right use" and are assumed to be possible with approval of the Plymouth Planning Board for a definitive subdivision. However, because of the large amount of roads required for relatively small number of lots, the expense of road building is a limiting factor affecting value. We have considered a less dense development but one that requires far less road construction.

Because of the shape and size of the three combined parcels, the Church Lot, should have less dense development and far fewer roads. If set up as a 500 lf cul-de-sac instead of 5,985 lf of roads, you could still create 5 conforming lots, and substantially reduce infrastructure costs. One lot would be oversize, roughly 28 acres, and would be considered a premium lot not just for size but for elevation and privacy. This is more financially feasible than the proposed 29 lot build out with 11,000 lf of roads. Our modification is for 25 lots (including one significantly oversize 'Kingdom' lot) with 5,825 lf of roads.

In the modified conceptual plan, the higher elevation lots are labeled H-1 through H-5. H-3, at the back of the cul-de-sac, is oversize, while the other four are at least 2.75 acres in size. The modified plan and lot size summary is as follows:

<u>Lot #</u>	<u>Lot Size (sf)</u>	<u>Lot Size (Ac)</u>	<u>Lot Type</u>	<u>Lot #</u>	<u>Lot Size (sf)</u>	<u>Lot Size (Ac)</u>	<u>Lot Type</u>
Lot 5-1	131,000	3.01	Subdivision	Lot H-4	120,000	2.75	Subdivision
Lot 5-2	35,000	0.80	Subdivision	Lot H-5	120,000	2.75	Subdivision
Lot 5-3	35,000	0.80	Subdivision	Lot 5-20	138,000	3.17	Subdivision
Lot 5-4	160,000	3.67	Subdivision	Lot 5-21	144,000	3.31	Subdivision
Lot 5-5	35,000	0.80	Subdivision	Lot 5-22	121,000	2.78	Subdivision
Lot 5-6	35,000	0.80	Subdivision	Lot 5-23	157,000	3.60	Subdivision
Lot 5-7	37,000	0.85	Subdivision	Lot 5-24	121,000	2.78	Subdivision
Lot 5-8	120,000	2.75	ANR	Lot 5-25	143,000	3.28	Subdivision
Lot 5-9	121,000	2.78	Subdivision	Lot 5-26	146,000	3.35	Subdivision
Lot 5-10	120,000	2.75	Subdivision	Lot 5-27	158,000	3.63	Subdivision
Lot H-1	120,000	2.75	Subdivision	Lot 5-28	128,000	2.94	Subdivision
Lot H-2	120,000	2.75	Subdivision	Lot 5-29	125,000	2.87	Subdivision
Lot H-3	1,219,680	28.00	Subdivision				

## HIGHEST AND BEST USE

The Dictionary of Real Estate Appraisal, Fifth Edition, 2010, Appraisal Institute, Page 93, defines highest and best use as *"the reasonably probable and legal use of vacant land or an improved property, which is physically possible, appropriately supported, financially feasible and results in the highest value. The four criteria the highest and best use must meet are legal permissibility, physical possibility, financial feasibility and maximum profitability."*

Highest and best use is a forecasting process, which answers three questions: Should a site be left as is? Should it be improved? What improvement provides the greatest value? Highest and best use analyses the demand for and use of a property and the timing when change in use should occur. Our analysis is for the property as it is today.

**Legally Permissible:** The subject is located in both the Rural Residence (RR) and R-25 Residence Districts. The first requires 120,000 sf per lot and 200 feet of frontage. The second requires 25,000 sf of land and 110 feet of frontage. The subject exceeds the minimum lot size for both the zoning districts and frontage. There appear to be sufficient land areas to create multiple lots on the acreage. The existing cranberry bogs would be abandoned because portions of the bogs would be included in individual lots that will be created.

**Physically Possible:** The site is mixed topography with uplands and wetlands. The bogs are wetlands and flood plain that cannot be developed, but they can be included within a potential building lot. There appears to be enough uplands to accommodate residential development. The soils in the area are typical and not considered to be overly adverse to development. The portions of the site impacted by wetlands would not be included in residential development (18 acres are reserved for drainage). The utilities in the area include electricity and telephone. Any lot must accommodate both onsite well and septic system in conformance with Plymouth Board of Health regulations and Massachusetts Title V rules. The site appears physically capable of development.

**Financially Feasible:** Residential use appears to be financially feasible. Median house prices are moving up, demand for new homes has climbed over the last 3 years and house prices are increasing. Demand for land will be increasing in concert with this demand. The bog lands are considered more valuable for residential development than farming. Proposed lots could be protected from additional development and this could enhance any proposed residential development. With the recovering market for new houses, increasing demand noted by new house permits and the sale/resale data indicating positive house prices, residential development is concluded to be financially feasible.

**Maximally Productive:** Using the Beals and Thomas conceptual lot layouts, with consideration of the zoning rules and financial feasibility, we have modified the original proposed plan from 29 lots to 25 total lots on half the required roads. This modified plan is considered the maximally productive use of the property. The cranberry bogs will be assimilated into the proposed lots and not sold off separately. In this fashion they add to lot sizes, but would likely remain unfarmed and open space land.

The highest and best use for the subject is for the creation of a 25 lot residential development.

### TYPICAL EXPOSURE TIME

Proper analysis and valuation includes exposure in the market. The majority of properties will sell within the typical time frame of their market. This duration of time is measured in two ways: Marketing and exposure time.

#### **Exposure Time:**

Is defined as: The time a property remains on the market. The estimated length of time the property interest being appraised would have been offered on the market prior to the hypothetical consummation of a sale at market value on the effective date of the appraisal; a retrospective estimate based on an analysis of past events assuming a competitive and open market. (3)

An appraiser considers the time a property takes to sell and appropriate exposure time is incorporated in our definition of market value. Prolonged or shortened exposure to the market affects value. Exposure time is considered to happen prior to the date of valuation.

It is our opinion, based on the subject property and its highest and best use, that the exposure time is 4 to 12 months.

(3) The Dictionary of Real Estate Appraisal, Appraisal Institute, 2010, Fifth Edition - Page 73.

## APPRAISAL PROCESS

The methodology traditionally used for the valuation of real property is derived from three basic approaches to value: the Cost Approach, the Sales Comparison Approach and the Income Capitalization Approach. From the indicated values produced by each of these approaches and the weight accorded to each, an estimate of market value is made. The following is a brief summary of the method used in each approach to value.

### **Cost Approach:**

The Cost Approach is an analysis of the physical value of a property; that is the market value of the land, assuming it were vacant, to which is added the depreciated value of the improvements to the site. The latter is estimated to be the reproduction cost of the improvements less accrued depreciation from all causes.

### **Sales Comparison Approach:**

The Sales comparison Approach is based upon the principle of substitution; when a property is replaceable in the market, its value tends to be set at the cost of acquiring an equally desirable, substitute property assuming no costly delay in making the substitution. Since few properties are ever identical, the necessary adjustments for differences between comparable properties and the subject property must be market based and tempered by the appraiser's experience and judgment.

### **Income Capitalization Approach:**

The Income Capitalization Approach is an analysis of the subject property in terms of its ability to produce an annual net income in dollars. This estimated net annual income is then capitalized at a rate commensurate with the relative certainty of its continuance and the risk involved in ownership of the property.

### **Cost of Development Approach:**

The Cost of Development Approach is an additional valuation tool available to the appraiser when subdivision and development represent the highest and best use of a property. After determining the number and size of units/lots that can be created from the appraised parcel, a sales comparison analysis of the finished units/lots is undertaken. After adjusting the comparable sales for differences, the appraiser estimates the most likely retail sales prices of the units/lots, the probable development period and the absorption rate.

All direct and indirect costs associated with the development and conveyance of units/lots to individual purchasers is deducted from their projected sales prices. Development and entrepreneurial profit are then deducted from projected gross sales price to arrive at the net sales proceeds. The result is the indication of value of the subject property

The subject parcels are being appraised using the following **Extraordinary Assumption**:

- That the modified conceptual 25 lot configuration, for the subject property prepared by Beals & Thomas Inc. in 2009, and modified by Avery Associates in 2014, could be refined to an approvable level and that each proposed home site can meet all local and state requirements for development of a single-family residence.

### **Valuation Methods Used**

We have presented a Cost of Development Approach, which is considered a good method of analysis for the subject property given the modified conceptual development plan and capacity to create 25 residential lots. The Cost of Development Approach produces a cash flow for valuation, based on estimating retail lot prices along with all expenses required to create the lots with the net cash flows the value for the subject property.

## COST OF DEVELOPMENT APPROACH

### **Retail Lot Values**

The Cost of Development Approach begins by focusing on the proposed lots in the conceptual subdivision layouts. The characteristics of these subject lots are compared to other lots sold in the Plymouth marketplace. The subject lots are compared and contrasted with lots from our survey. The most similar comparable sales are weighted in the analysis and used as a basis for projecting retail value. The conceptual lots were presented in the Development Potential Section and consist of lots in the 25,000 sf size zoning district and in the district with a minimum lot size of 120,000 sf. There are only 5 lots of 35,000 sf or less with the balance (20) being greater than 120,000 sf in size. This includes one 'Kingdom' oversize lot around 28 acres in size along Pine Hill Ridge.

The projection of retail lot pricing is accomplished via examination of lots sold in Plymouth. While this is an active market, due to the 2006-2011 slowdown in new construction, there have been few recent lot sales. This may be an indication that builders with lots in inventory are holding rather than selling them in order to build new homes. Several developments examined seem to be following this pattern.

In our MLS/Pin data presented earlier, for 2013/2014, we noted a number of lot sales, however, when we investigated them the majority were Approval Not Required lots on existing roadways. A number of which are used later in our analysis to demonstrate the value impact lot price has on overall house price.

Because the majority of our conceptual lots will be located within subdivisions and because of the greater costs but also compatibility of development in newer subdivisions, we chose to focus on sales from within subdivisions. We did use a number of ANR sales to demonstrate matched pairs for lot size differences, which our lots require due to the two different zoning districts.

We specifically sought examples of lots sold in newer subdivisions. This is considered the best match to the conceptual subject lots. We have included an ANR lot located in Manomet Village for additional consideration because we will have some ANR lots located along Bartlett and Beaver Dam Road. Many of the lot sales in Plymouth are well outside our neighborhood or sold with another amenity (pond frontage) for example and not considered good examples for comparing.

The property rights sold with the comparable sales are considered to match our definition of interest appraised. The following sales are considered the best examples from the market for our analysis.

### Lot Sale 1

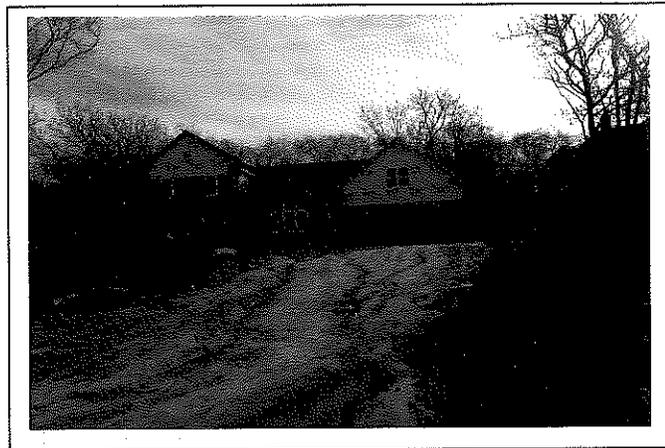
**Address** 55 Orchard Hill Dr.  
**Town:** Plymouth  
**Sales Date** June 4, 2014  
**Sales Price** \$160,000  
**Book/Page** 44386-90  
**Grantor** Irwin Holdings  
**Grantee** Barry Tassinari Construction  
**Lot Size** 0.94 Acres  
**Map/Lot** 89-15-6



**Comments:** This lot is located in Orchard Hills, a 25-lot subdivision located off Billington Street on the west side of Route 3. The development was approved in 2006 and about 8 homes have been built. The streets consist of Orchard Hill Drive and Perrington Way with Orchard Hill being finished and Perrington only roughed out. Distance to downtown Plymouth is about 1.5 miles and there is easy access to Route 3. Another new home sold in this development in 2013 for \$590,000. This lot is located toward the rear of the cul-de-sac and is under development with a new colonial-style dwelling. All sites required onsite wells and septic systems. The development in the Rural Residence Zone was constructed using the open space requirements with open space offsetting smaller than zoning required lot sizes.

### Lot Sale 2

**Address** 7 Whitney Lane  
**Town:** Plymouth  
**Sales Date** June 4, 2014  
**Sales Price** \$145,000  
**Book/Page** 44751-196  
**Grantor** Winterson  
**Grantee** Draper Homes  
**Lot Size** 0.55 Acres  
**Map/Lot** 54-10A-204



**Comments:** This lot is located in Carbide Shores a 1960's development as a remainder lot. The site is 23,547 sf in size and parallelogram-shaped. It rises up slightly from road grade and was wooded at time of sale. All town utilities are available in this subdivision. The lot was listed for sale at \$164,900 and was on the market for 455 days. The seller paid \$5,000 in closing costs. The listing describes a glimpse of the ocean but this is highly unlikely given the elevation and distance to the water from this lot. The buyer is a builder and is offering a 2,400 sf, 7-3-2.5 colonial for sale at \$515,000, which is pending sale. The location is south of Manomet in Cedarville Village closer to the Cape Cod Canal.

### Lot Sale 3

**Address** 888 State Road  
**Town:** Plymouth  
**Sales Date** May 15, 2014  
**Sales Price** \$105,000  
**Book/Page** 44320-119  
**Grantor** Bows/888 State RT  
**Grantee** Lane/Putters Lane RT  
**Lot Size** 0.395 Acres  
**Map/Lot** 48-49-175



**Comments:** This grandfathered lot is located on State Road/Route 3A in the Manomet Section of Plymouth, not far south of the intersection with Beaver Dam Road. The lot is flat and mostly level and on the corner of Park Avenue and Mayflower Park subdivision, with beach rights to Manomet Bluffs. This lot offers electricity, gas and town water to aid in development. The site is located in the R-25 Zoning District but predates current zoning. The largest negative factor is traffic flow, which is very heavy along this section of Route 3A/State Road.

### Lot Sale 4

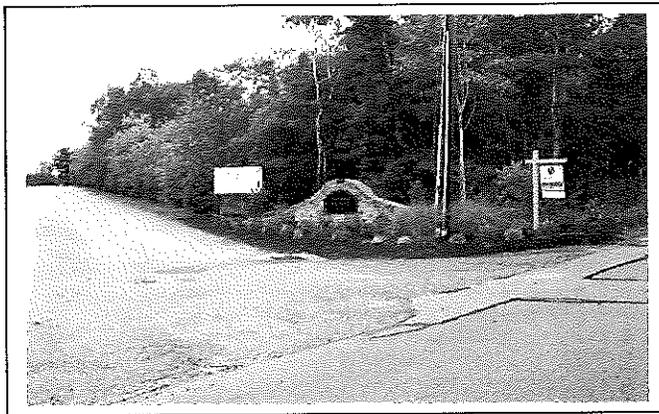
**Address** 16 Nautical Way  
**Town:** Plymouth  
**Sales Date** September 29, 2011  
**Sales Price** \$120,000  
**Book/Page** 40380-116  
**Grantor** Little Hios/Fitzgerald  
**Grantee** Barbosa  
**Lot Size** 1.5 Acres  
**Map/Lot** 50-37-66



**Comments:** This subdivision lot is located in Shipyard Estates, a newer loop road subdivision approved in 2006 and with construction commencing around 2010. It is located in the RR Zoning District and the subdivision was created using the 60,000 sf subdivision lot at a density of 1 lot per 120,000 sf of land area. New homes in the development are selling in the low to upper \$400,000 price range for 8 room 3 bedroom, 2.5 bath colonials with 2 car attached garage and 2,000 sf of size. This is a more remote location than the subject, being located off Ship Pond Road, about 1.5 miles off State Road/Route 3A. The area is more rural and less appealing than Manomet. All sites required onsite wells and septic systems.

## Lot Sale 5

**Address** 25 Nautical Way  
**Town:** Plymouth  
**Sales Date** June 5, 2014  
**Sales Price** \$110,000  
**Book/Page** 44389-278  
**Grantor** Flavin & Flavin  
**Grantee** NE Spec, Inc./Cimbron  
**Lot Size** 1.46 Acres  
**Map/Lot** 48-18-4



**Comments:** This subdivision lot is located in Shipyard Estates, a newer loop road subdivision approved in 2006 and with construction commencing around 2007. It is located in the RR Zoning District and the subdivision was created using the 60,000 sf subdivision lot at a density of 1 lot per 120,000 sf of land area. New homes in the development are selling in the low to upper \$400,000 price range for 8 room 3 bedroom, 2.5 bath colonials with 2 car attached garage and 2,000 sf of size. This is a more remote location than the subject, being located off Ship Pond Road, about 1.5 miles off State Road/Route 3A. The area is more rural and less appealing than Manomet. All sites required onsite wells and septic systems. This lot was purchased in 2007 for \$230,000 in anticipation of building however market collapse altered the seller's plans and it was sold at a loss in 2014.

## **Lot Sales Analysis:**

In addition to the lot sales presented, we have investigated how much land value contributes to overall home price. This is shown in the following chart:

<u>Ex.</u>	<u>Address</u>	<u>Sales Price</u>	<u>Lot Sales Price</u>	<u>Zone District</u>	<u>Lot Price as % of Price</u>	<u>Year Sold</u>
1	7 Whitney Rd	\$515,000	\$145,000	R25	28.2%	2014
2	63 Graffam	\$449,900	\$135,000	RR	30.0%	2014
3	61 Graffam	\$449,900	\$135,000	RR	30.0%	2014
4	210 Little Sandy Pond	\$395,000	\$110,000	RR	27.8%	2014
5	202 Little Sandy Pond	\$389,900	\$110,000	RR	28.2%	2014
6	19 Graffam	\$377,000	\$110,000	RR	29.2%	2014
7	21 Lunns	\$370,000	\$115,000	R25	31.1%	2014
8	391 Little Sandy Pond	\$350,000	\$105,000	R25	30.0%	2014
9	6 Dorothy	\$369,500	\$110,000	RR	29.8%	2013
10	6 Bradford Terrace	\$349,900	\$100,000	R20S	28.6%	2013
11	67 Liberty	\$335,000	\$125,000	R20S	37.3%	2013
12	17 Samoset	\$305,000	\$110,000	R20S	36.1%	2013

This chart details the information from a number of ANR lot sales and the sales prices for the homes finished on them. In general, it appears that land values are roughly 30% of the total value for a new, finished house.

We applied this ratio to two nearby subdivisions, which are located near Manomet and would be considered similar to any development proposal for the subject property:

<u>Address</u>	<u>Year Sold</u>	<u>Sales Price</u>	<u>Zone District</u>	<u>Implied Lot Value @ 30%</u>
25 Anderson	2013	\$439,000	R20S	\$131,700
30 Anderson	2014	\$479,000	R20S	\$143,700
35 Anderson	2014	\$485,885	R20S	\$145,766
55 Orchard Hill	2014	\$658,000	RR	\$197,400
50 Orchard Hill	2013	\$590,000	RR	\$177,000
44 Orchard Hill	2013	\$550,000	RR	\$165,000
42 Orchard Hill	2012	\$612,000	RR	\$183,600
56 Orchard Hill	2012	\$525,000	RR	\$157,500

Because we have limited data from appealing subdivisions in close proximity to the subject and because we also have more information on new home sales we used this as a test of value range for lots in Manomet. The first 3 sales come from a small development called Nestle Downs. It consists of Anderson Way and Harbor Seal Way with 15 lots. There have been no lot sales but 3 recent house sales. Lots were offered to the market priced from \$159,900 to \$199,000, but expired. These figures are slightly high given our chart.

The second set of sales comes from Orchard Hills, where our Lot Sale 1 comes from and is reflected as the 2014 house sale. This is an appealing subdivision closer to Plymouth Center than our property. It also carries higher prices than Nestle Downs and likely higher value that our subject would engender. We used this information to aid in our analysis of the subject lots.

Another analysis taken from the ANR lots is a size adjustment. This is made based on the following matched pair information:

<u>Address</u>	<u>Town</u>	<u>Sales Price</u>	<u>Sales Date</u>	<u>Lot Size</u>	<u>Lot Size Difference (SF)</u>	<u>Lot Size Per Acre Adj.</u>	<u>Per Acre Adj.</u>
<b>Ex. 1</b> L39-1 Little Sandy Pond	Plymouth	\$130,000	6-May-13	3.03	10,890	\$0.37	\$16,000
L39-3 Little Sandy Pond	Plymouth	\$126,000	10-May-13	2.78			
<b>Ex. 2</b> L39-3 Little Sandy Pond	Plymouth	\$126,000	10-May-13	2.78	81,457	\$0.26	\$11,230
L25-3 Little Sandy Pond	Plymouth	\$105,000	31-Oct-12	0.91			
<b>Ex. 3</b> L39-1 Little Sandy Pond	Plymouth	\$130,000	6-May-13	3.03	92,347	\$0.27	\$11,792
L25-3 Little Sandy Pond	Plymouth	\$105,000	31-Oct-12	0.91			
<b>Ex. 4</b> L39-2 Little Sandy Pond	Plymouth	\$130,000	11-Jun-13	2.77	81,022	\$0.31	\$13,441
L25-3 Little Sandy Pond	Plymouth	\$105,000	31-Oct-12	0.91			

Using a number of sales located in a similar area with similar features except size, we estimate that size has an impact on lot price. Because we are dealing with lots in two different zoning districts (25,000 sf & 120,000 sf) we use an adjustment of around \$12,000 per acre for the marginal lot size difference.

### **Kingdom Lot Valuation:**

In examining the Plymouth Market, we found only 1 truly oversize lot sold in the last 4 years. This was 90 Fuller Farm Road, an 11.75 acre lot located near the Great South Pond, and which could not be subdivided. It was offered for sale in 2010 @ \$289,900 and expired after being on the market for 320 days. It was offered again in 2011 @ \$225,000 and expired again after 153 more days. The lot finally sold privately in 2013 for \$200,000. It is a rolling site with well and septic system required, (well already installed) along with a partially installed foundation. This example coupled with the direction for the matched pair lots presented before guides us to conclude a retail lot value for the subject oversize lot (Lot H-3 at 28 ± acres) at \$325,000. The elevation and privacy of the proposed subject lot is superior to this sale and the other lots presented in our research.

### **Conclusion - Retail Lot Prices:**

The lot sales displayed prices from \$105,000 for the ANR lot with high traffic volume to \$160,000 for a lot in an appealing, newer development. It might be possible for all subject lots to achieve prices toward the upper end of this range, because we are located in an appealing village area of Plymouth and many amenities are a short drive away. If priced at the upper end of the market range, time to achieve sellout would likely be highly extended. The longer time a sellout takes, the greater risk is involved and changing market conditions can render significant value changes. This is demonstrated by Lot Sale 5, selling for \$230,000 in 2007 and then for \$110,000 in 2014. Clearly, changing market conditions can have value impact. If all lots could have been sold at the higher price, the development would not have been subject to the significant falloff in demand occurring over the 12-24 months after 2007.

Investigation into the land market for southeastern Massachusetts did not develop any lot sales where the property abutted and was enhanced by the proximity to natural, protected watercourses. We searched a number of roads and subdivisions surrounding the Eel River Restoration project to determine any value enhancement because of the river restoration. We did not find any evidence of value enhancement after the restoration in the current market.

Therefore, while we find the subject to be in an appealing market area with lots that would be somewhat protected from outside development by including portion of the bog area as buffers and to increase the typical lot size, we find the upper end of the lot price range is unrealistic for all lots.

The most appealing lots within the development should be those at the upper elevations, Lots 5-10 through 5-19 along the Pine Hill. These are considered more appealing because of elevation and proximity to the Pinehills Development.

Lot pricing around the \$105,000 to \$110,000 price is also considered too low to be applicable. This is the reason why we analyzed the finished home sales in Nestle Down, to see where in the range of value, the lots at the subject should be priced. We find the subject's location superior to Nautical Way/Shipyard Estates and to the ANR lot along State Road.

The best range from the comparable sales, despite lacking any specific lot sales examples is from \$110,000 to \$160,000 and this range is considered most applicable to the conceptual subject lots.

The four lots with highest elevations (H-1-H-5 but not H-3) are, therefore, projected at \$175,000 each. The higher elevation overlooking the entire development and bogs should be more appealing than typical lots (like Lot Sale 2 for example with slightly raised elevation). For the lots located at the more level locations and with the subject's appealing location and larger lots size (24 out of the 29 lots will be greater than 1 acre in size), we conclude an average retail lot price of \$135,000. The 5 smallest lots are projected at \$125,000 due to smallest size.

This is about 18% higher than Lot Sales 3-54 and 19% lower than Lot Sale 1 and 7% lower than Sale 2. It is also on the lower side of lot prices predicted for Nestle Downs by our earlier chart of finished home prices and lot sales. Given all of the positive and negative features of the subject lots, this price is considered appropriate recognizing lot size, location, density of development, buffer lands and the Manomet location.

The average lot price for all of the proposed subject lots is \$135,416, rounded to \$135,000. The average retail price is used in the Cost of Development Model because the subdivision needs to be constructed, and because it is difficult to know which lots would sell first. We maintain the value for the kingdom lot and sell that separately in our analysis, because it would be the more appealing part of the development once established. Using the average retail price is considered the best means to represent the development in the cash flow model.

These are retail prices estimated for the Cash Flow Model. These prices are for finished lots, which require a significant amount of expenditure to create. These figures are used in the income portion of the Cost of Development Model. The next section deals with pace of lot absorption.

### Absorption

The next step in this analysis is to project absorption - how long to sell the subject lots. The lots are only conceptual; they would require Planning Board Approval and then construction of the road before they would exist as saleable lots. One positive factor is that new permits have been increasing over the last 2 years as the chart in the Residential Section of the Area Analysis detailed. There is always competition from Pinehills (1,800 units sold, 2,063 units to be built) in any development in Plymouth, but notwithstanding Pinehills, demand is on track for an average of 15-17 new house permits per month and it follows demand for land should follow a similar pace. The existing supply near the subject includes:

- Orchard Hills (10 lots remain)
- Nestle Downs (10 lots remain)
- Fox Hollow Farms (42 lots remain)
- Ship Pond Hills (45 lots remain)
- Bayview (13 lots remain)
- Stone Gate Farms (33 lots remain)

These developments total 153 lots, which at the current annual demand rate of 17 lots monthly means all could be sold in under a year if demand remained strong, and if there were no other competition. We have considered the demand pattern and the outstanding supply along with the amount of subject lots to be created and placed into the Plymouth market. From this information, we project the following sales pace:

- 3 lots sold in the first period including the only ANR lot. We anticipate 4-6 months for approvals and allow some time for road construction to begin.
- 6 lot sales in Period 2 along with the Kingdom Lot
- 5 lot sales in Period 3,
- 6 lot sales in Period 4
- 4 Sales in Period 5, selling out development.

In our model we first project selling the ANR lot, along with a couple from once the first road is proposed and started. We estimate full sellout in 2.5 years or 5 periods, given present demand, required approvals, required road construction and the number of lots to sell. The premium lots (H-1-H-5) sell starting in Period 3 once road construction reaches that section of the site.

#### **Market Conditions Adjustment:**

We have applied a +1.5% per period market conditions adjustment after Period 1 once the project is established. This is based on the sale/resale chart presented earlier and also reflects the anticipated strong demand moving forward. Projecting into the future is more difficult and the reason why we applied a 3% annual increase.

#### **Expense Adjustment:**

In the Cost of Development Model, we have applied a cost inflation factor of 3% annually to reflect price increases based on typical CPI increases and investor studies over the last few years. This is applied to taxes and road construction costs after the first period. The following is an estimate and summary of these expenses.

#### **Development Expense Analysis**

The next step in the Cost of Development Approach is an estimate of the potential net revenues to be derived from development and sale of lots. An important component is an estimate of those expenses, which may reasonably be expected in proceeding with the development. The following is a summary of these expenses.

**Legal & Approvals:** The subject site will be developed through the definitive subdivision process. Given the complexity, size of land, topography, survey requirements, wetlands, and proposed number of lots, we have projected a cost of \$1,750 per lot for the subdivision approvals. Typically it can cost \$25,000 to \$100,000 to secure a definitive subdivision approval, depending on land size, density, time and the town involved. The greater cost involves a larger number of consultants, engineering, lots & road design. This covers not only material for presentation but also experts and their time required at multiple board hearings.

**Road Costs:** The revised conceptual development plans require a large amount of infrastructure and road construction of 5,825 linear feet of roads to create the 25 lots. We consulted several other developments and other road construction costs from projects we are familiar with, presented in the following chart:

<u>Town</u>	<u>Project</u>	<u>Road(LF)</u>	<u>Road Cost</u>	<u>Price/LF</u>	<u>Date</u>	<u>Comments</u>
Acton	Robbins Mill Estates	8,066	\$2,944,090	\$365.00	2002	High road specs
Ayer	Stratton Hill	5,600	\$2,000,000	\$357.14	2005	Rising topography and hillside
Bolton	Butternut Farm	2,225	\$390,000	\$175.28	2000	Minimal Rd Specs
Bolton	Danforth Brook	1,750	\$570,000	\$325.71	2001	Cistern
Chelmsford	Buttercup Lane	1,590	\$412,590	\$259.49	2002	Level but Wetlands
Dracut	Meadow Creek	5,052	\$1,606,500	\$317.99	2002	Phase I only
Groton	Surrenden Farm	10,150	\$3,111,200	\$306.52	2003	134 Lot Dev. On 194 Acres
Hopedale	Green Mill Estates	16,372	\$4,711,000	\$287.75	2001	Ledge/Blasting required
Leominster	Lexington Cir	620	\$292,000	\$470.97	2006	Part of Open Field Hillside
Leominster	Sheldon Hill	1,705	\$573,472	\$336.35	2010	Part of Open Field Hillside
Northborough	Stirrup Brook Est.	1,500	\$439,500	\$293.00	2004	Level site, granite curbs
Pepperell	Hadley Estates	6,077	\$1,135,659	\$186.88	1999	Minimal Rd Specs
Shirley	Hazenwood	1,900	\$400,000	\$210.53	2000	Minimal Rd Specs
Stow	Orchard View	1,100	\$255,000	\$231.82	2001	Minimal Rd Specs
Stow	Pondview	2,440	\$550,000	\$225.41	2000	Minimal Rd Specs
Stow	Derby Woods Phase II	850	\$350,000	\$411.76	2009	Top of Hill, pave existing driveway, too

Most of the site is level, where the road is proposed and this also helps reduce costs. Based on this examination of road costs along with the Marshall Valuation Cost Service Manual along with the examples of road costs from Acton, Ayer, Bolton, Groton, Hopedale, Pepperell and Stow, we project a linear foot road cost at \$300 LF. The smaller size of the road, along with the topography, warrant a figure around this indicator. Road construction starts in the first period after approvals are granted.

**Demolition:** There are existing former cranberry operation buildings (one pre-engineered metal structures along with a former farmhouse that need to be razed as well as farm dykes, old barn, dams and other water controls that need to be removed from the site. We have allocated a cost for this of \$20,000, based on the size of the existing structures and amount of work anticipated.

**Septic System Design Expense:** Each site will require soil testing and a septic design in accordance with Massachusetts Title V and Plymouth Board of Health Regulations. We anticipate a cost at \$2,500 per lot to create the necessary plans--some scale of economy is achieved with this figure due to the volume of plans required.

**Legal Expense:** The transfer tax on the sale of real estate in the Commonwealth of Massachusetts is \$4.56 per thousand dollars of sale price. We have taken a closing cost expense of \$4.56/\$1000, plus \$750 per lot to pay for the representation of an attorney at closings.

**Real Estate Taxes:** The current taxes at the subject total \$6,997. We have used this figure for the first year (first 2 periods) of our analysis, because it will likely take one year for the assessor to re-value the property based on the new lot subdivision. For the third period and subsequent periods, we used a tax projection of \$2,043 per lot per year or \$1,052 per 6 month period (rounded) based on average projected sales price and 2015 Plymouth tax rates. The developer is responsible for all lots held in reserve and for the taxes on 50% of those sold per period (shared with the buyer). Taxes increase at the rate of inflation after the 2nd period.

**Marketing:** An allowance for marketing, advertising and promotion of the property is based upon total sales revenue and is inclusive of allocations for brokerage commissions, advertising and promotion. We have estimated this expense at 5% of gross sales revenue and based on typical commissions in Plymouth.

**Developer's Overhead & Profit:** An overhead and profit estimate is made with consideration that the entrepreneur buying the property will require a rate of return for risk and a return on investment. An overhead and profit allowance of 15% of gross sale proceeds has been taken after discussing with local developers their profit expectations and our experiences with similar projects. Profit is high because there are significant expenses required to develop the subject site. This is considered a moderately higher risk development primarily because of the amount of required road construction. Profit is an allowance rather than an expense; this is the reward for a developer to proceed with development, and a return based on risk.

**Discount Rate:** The discount rate in this analysis includes a rate that recognizes the time value of money and compensation for the illiquidity of funds. This rate includes a factor for the risk associated with installing roadways, carrying costs and selling the various components of the development. The discount rate in this analysis will convert the net development proceeds over the 2.5 year development time frame into a net present value.

We reviewed recent investor/developer surveys, (PWC Korpacz 2nd Quarter 2014) excerpts of which can be found in the Addenda section to this report. The range of discount rates from this developers' survey, which include overhead and profit in the rate, range from 10%-25%, with the average at 18.15%. If 'entitlements' (approvals) are not in hand, the same surveys suggest an increased range of 300 to 1,500 basis points or an additional 20% to 50%. Because our project is not approved, this increases risk and a higher rate of discount would be called for.

Finally, because we are in a recovering market, there must be sufficient profit motive for a developer to take the time to secure approvals and to construct the property. Assuming a total development and sellout period of 2.5 years, the net proceeds over time, we have applied a discount rate of 8.5%. This rate excludes developer's profit, which is why it is a lesser figure because we utilized a separate, large deduction for profit to entice a developer.

## Summary

After making expense deductions, the net cash flows are derived and the present worth of the investment calculated. The attached Cost of Development Model has been prepared. Based upon the analysis and assumptions presented, the indicated market value of the subject property, under the **Extraordinary Assumption**, to a single buyer, as of December 30, 2014, is \$775,000.

The Cost of Development Model follows:

**SUBDIVISION DEVELOPMENT ANALYSIS MODEL**

**Subject Property**

Tidmarsh Farm  
 85 Beaver Pond Road  
 25 Residential Lots  
 127.92 Acres  
 Plymouth, MA  
 Six Month Periods

**Development Assumptions/Expenses**

Date of Valuation 30-Dec-14  
 Average Lot Price \$135,000  
 Annual Retail Price Increase 1.50%  
 Annual Expense Change 1.50%  
 Legal - Closing Cost per lot \$4.56/\$1000+\$750  
 Taxes per Approved Lot/Period \$1,051 Per lot per period  
 Advertising, brokerage 5.0%  
 Developer's Overhead & Profit 15.0%  
 Discount Rate 8.5%

25x 150 =

	25	3	6	5	6	4	TOTALS
	Number of lots to be sold	Period 1	Period 2	Period 3	Period 4	Period 5	
Income							
Proceeds from Lot Sales		\$405,000	\$822,150	\$695,402	\$846,999	\$564,666	\$3,334,218
Proceeds from Kingdom Lot				\$325,000			
Total Proceeds		\$405,000	\$822,150	\$1,020,402	\$846,999	\$564,666	\$3,659,218
EXPENSES							
Legal & Approvals	@	\$43,750					\$43,750
Road Construction	5,825 lf @	\$436,875	\$443,428	\$450,080	\$456,831		\$1,787,213
Demolition of Older Improvements	@	\$20,000					\$20,000
Septic Design & Testing per Lot	@	\$7,500	\$15,225	\$12,878	\$15,685	\$10,457	\$61,745
Legal Expense/Closing Costs	@	\$4,097	\$8,999	\$6,921	\$8,362	\$5,575	\$33,954
Real Estate Taxes During Sellout	@	\$6,997	\$6,997	\$13,535	\$7,693	\$2,231	\$37,453
Advertising, brokerage	@	\$20,250	\$57,358	\$51,020	\$42,350	\$28,233	\$199,211
Total Expenses		\$539,469	\$532,007	\$534,433	\$530,921	\$46,496	\$2,183,326
Developer's Overhead & Profit	@	(\$134,469)	\$290,143	\$485,969	\$316,078	\$518,170	\$1,475,892
Net Development Proceeds		\$60,750	\$123,323	\$153,060	\$127,050	\$84,700	\$548,883
Discount Factors							
Discounted Proceeds		(\$195,219)	\$166,821	\$332,909	\$189,028	\$433,470	\$927,009
PRESENT WORTH OF NET PROCEEDS @ 8.5%		\$775,000	\$772,134	\$775,000	\$775,000	\$775,000	\$772,134

## RECONCILIATION AND VALUE CONCLUSION

The final step in estimating the market value of the subject property is a correlation of the value from each of the approaches utilized in the appraisal process. Based on our highest and best use analysis of the subject, we presented a Cost of Development Approach.

The subject parcels are being appraised using the following **Extraordinary Assumption**:

- That the modified conceptual 25-lot configuration, for the subject property prepared by Beals & Thomas Inc. in 2009, and modified by Avery Associates in 2014, could be refined to an approvable level and that each proposed home site can meet all local and state requirements for development of a single-family residence.

Should this assumption prove false, the value as estimated herein is subject to change.

The Cost of Development Approach is considered a reliable indicator of the market value of the property. Retail price projections for the conceptual lots were made based upon an analysis of recent sales in and around Plymouth. Expenses necessary to sell the lots, including approval costs, road construction, taxes due during development, brokerage, legal and recording and developer's overhead and profit, were deducted from the gross sales proceeds producing an income stream over development time. This development model is similar to the analysis performed by market participants when considering a development opportunity. The Cost of Development Approach provides an indication of market value of \$775,000.

The Cost of Development Approach is considered the best method of analyzing the subject property. The subject's central Manomet location and significant amount of protected land would help enhance the individual lots. Expenses required to create the lots are subtracted and a value concluded. Because of the scarcity of large sales of tracts of land and the significant investment in conceptual planning, this is considered the best method of analysis for the subject.

Based on the analyses presented in this report, it is our opinion that the market value, of the 127 ± acre subject property, under the **Extraordinary Assumption**, sold to a single purchaser, subject to the definitions, limiting conditions and certifications as of December 30, 2014, is:

**SEVEN HUNDRED SEVENTY-FIVE THOUSAND DOLLARS (\$775,000)**

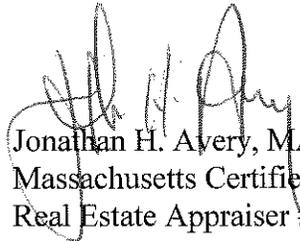
## CERTIFICATION

We certify that, to the best of our knowledge and belief,...

- the statements of fact contained in this report are true and correct.
- the reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are our personal unbiased professional analyses, opinions, and conclusions.
- we have no present or prospective interest in the property that is the subject of this report, and we have no personal interest or bias with respect to the parties involved with this assignment.
- we have performed no appraisal services of the subject property of this report, within the three-year period immediately preceding acceptance of this assignment.
- our engagement in this assignment was not contingent upon developing or reporting predetermined results.
- our compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- our analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice and requirements of the Code of Professional Ethics and the Standards of Professional Practice of the Appraisal Institute.
- the use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
- Mr. Bernklow and Mr. Avery are currently certified under the voluntary continuing education program of the Appraisal Institute.
- as of the date of this report, Richard Bernklow has completed the Standards and Ethics Education Requirements for (Candidates or Practicing Affiliates) of the Appraisal Institute.
- we have made a personal inspection of the property that is the subject of this report.
- no one provided significant professional assistance to the persons signing this certification.
- the appraisal assignment was not based on a requested minimum valuation, a specific valuation, or the approval of a loan.



Richard W. Bernklow, SRA  
Massachusetts Certified General  
Real Estate Appraiser #3111

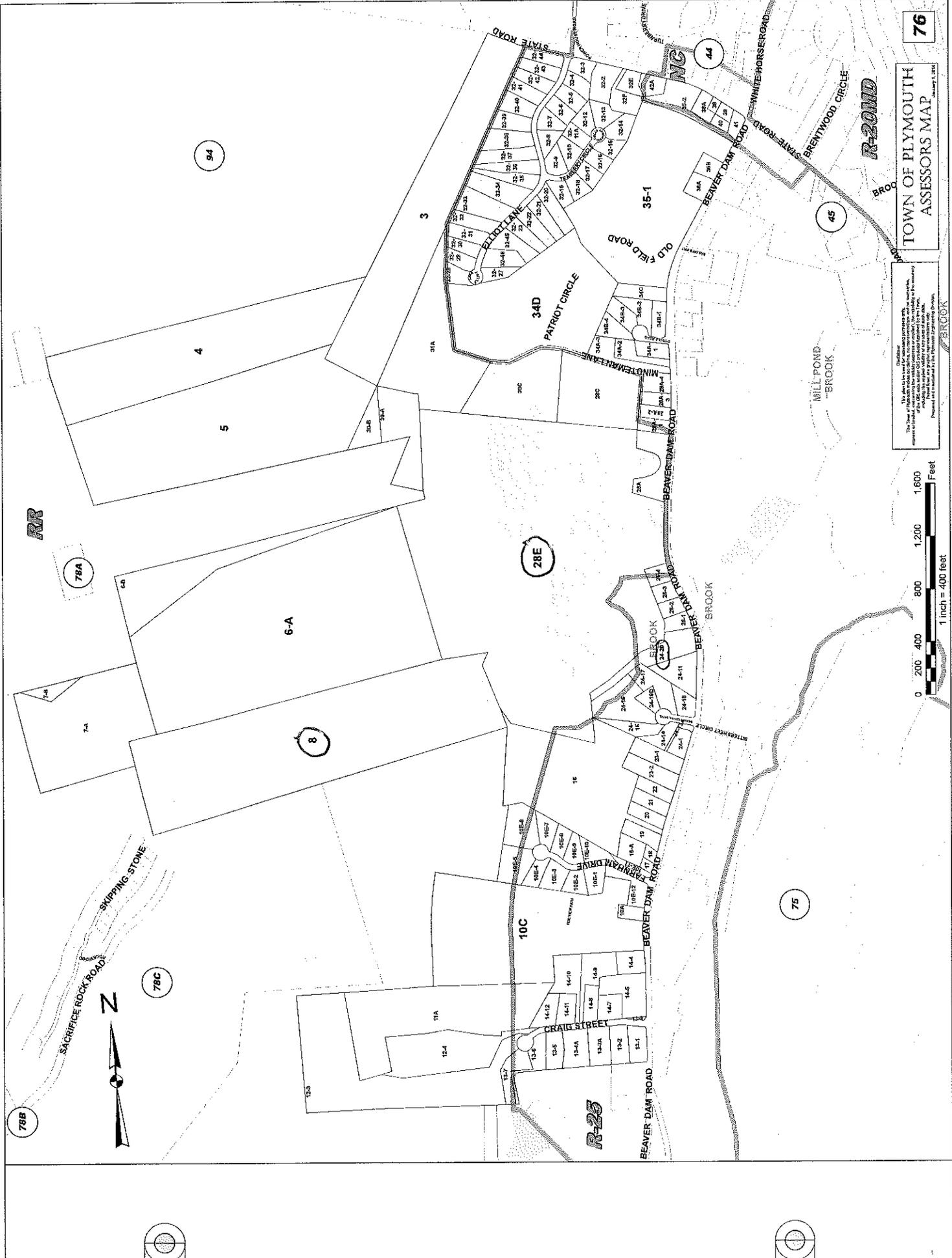
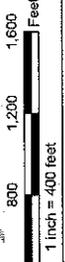


Jonathan H. Avery, MAI, CRE  
Massachusetts Certified General  
Real Estate Appraiser #26

TOWN OF PLYMOUTH  
ASSESSORS MAP

This map is to be used for assessment purposes only. It does not constitute a warranty of accuracy or a guarantee of value. The assessor's office is not responsible for any errors or omissions. The assessor's office is not responsible for any errors or omissions. The assessor's office is not responsible for any errors or omissions.

Prepared and published by the Plymouth Engineering Division.



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R-25

R-201D

RR

BROOK

MILL POND BROOK

BROOK

BROOK

BROOK

BROOK

STATE ROAD



New England  
Forestry Consultants, Inc.

Prepared By:  
Gary H. Gouldrup  
Consulting Forester  
10/16/2008

72 Townsend Street  
Pepperell, MA 01463  
(978) 433-8780

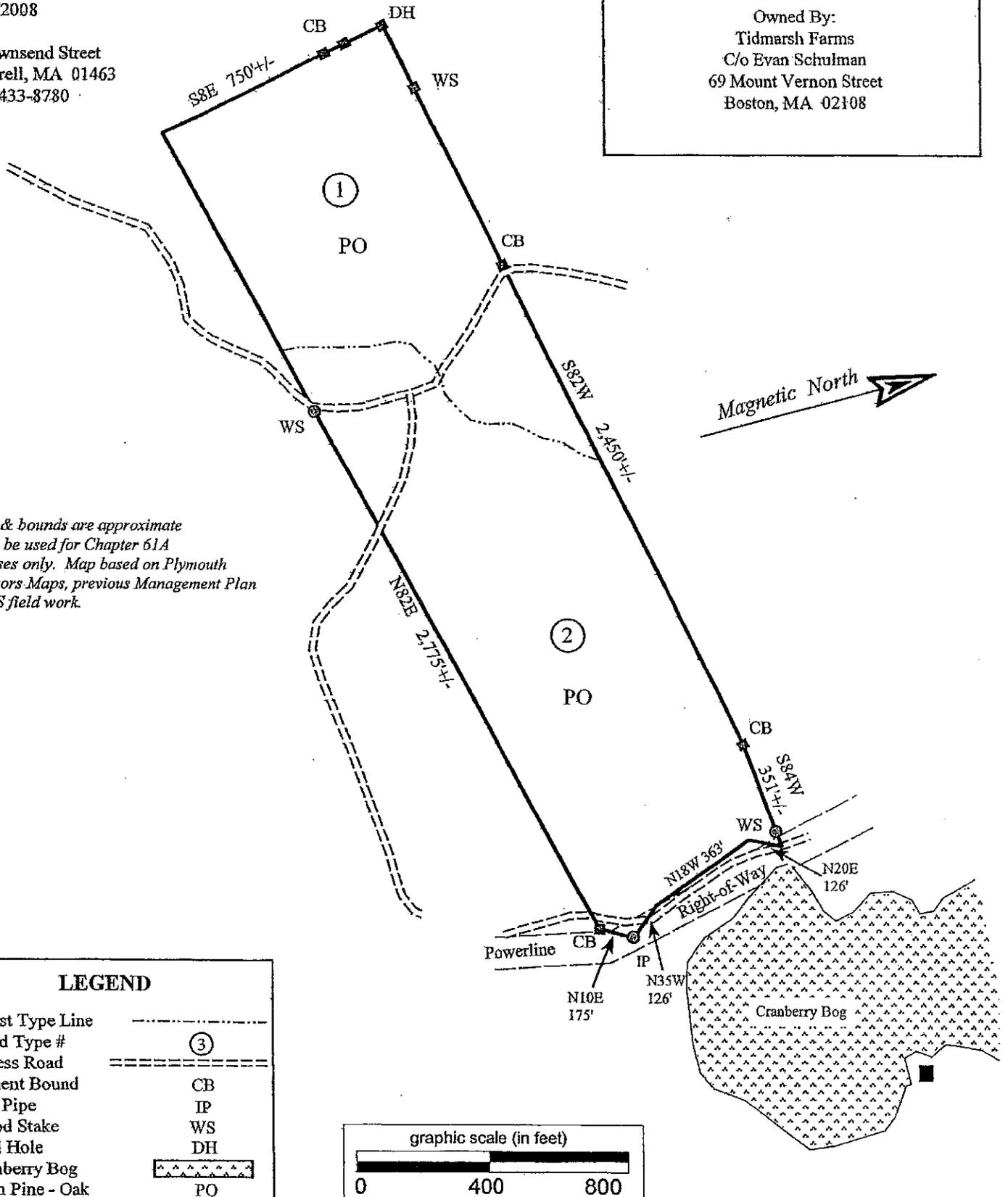
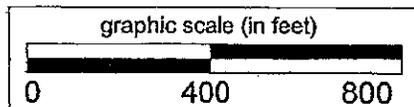
### BOUNDARY & STAND TYPE MAP

Land in Plymouth, MA  
The Church Lot

Owned By:  
Tidmarsh Farms  
C/o Evan Schulman  
69 Mount Vernon Street  
Boston, MA 02108

*Metes & bounds are approximate  
and to be used for Chapter 61A  
purposes only. Map based on Plymouth  
Assessors Maps, previous Management Plan  
& GPS field work.*

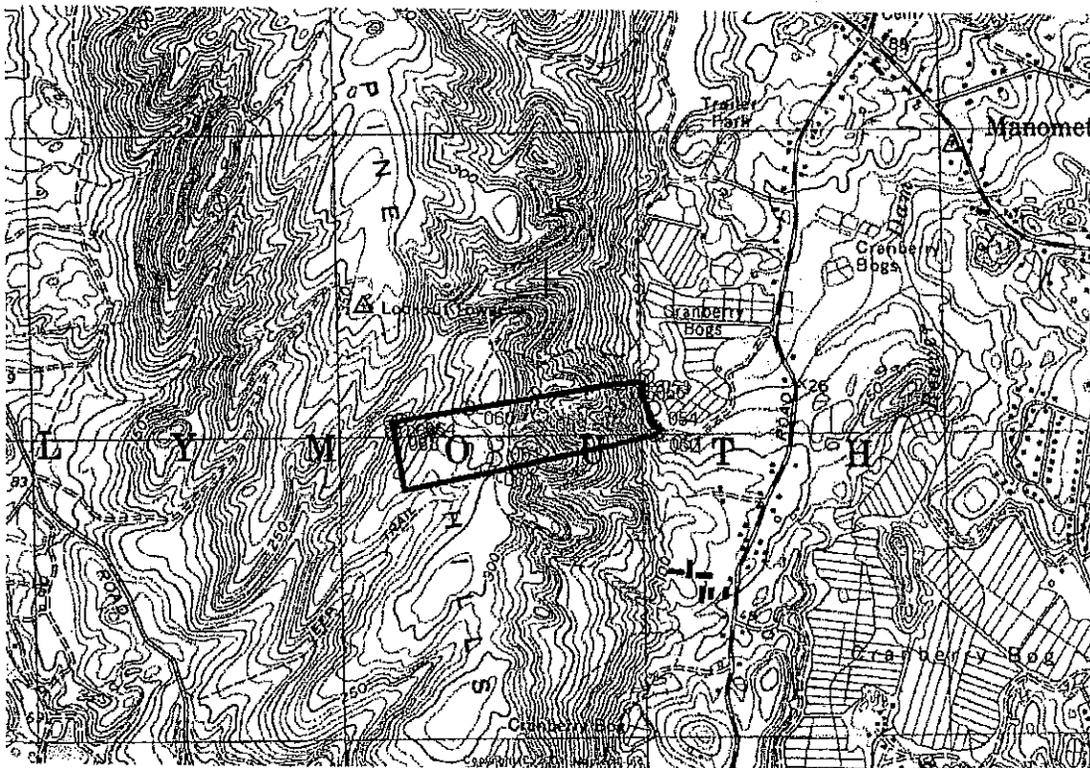
LEGEND	
Forest Type Line	-----
Stand Type #	③
Access Road	=====
Cement Bound	CB
Iron Pipe	IP
Wood Stake	WS
Drill Hole	DH
Cranberry Bog	
Pitch Pine - Oak	PO



# TOPOGRAPHICAL MAP

Land In:  
Plymouth, MA

Owned By:  
Tidmarsh Farms, Inc.  
69 Mount Vernon Street  
Boston, MA 02108



Topographical Map – Manomet, MA Quadrangle

Scale 1" = 2000 feet

October 16, 2008

Prepared By: Gary H. Gouldrup, New England Forestry Consultants, Inc.

# Town of Plymouth Massachusetts Official Zoning Map

Sheet 1 of 2

Adopted 2012 Fall Annual Town Meeting Article 25

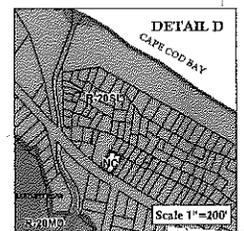
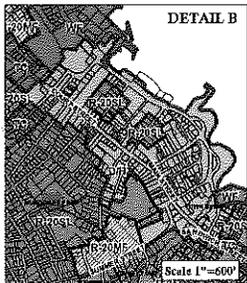
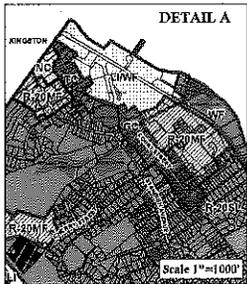
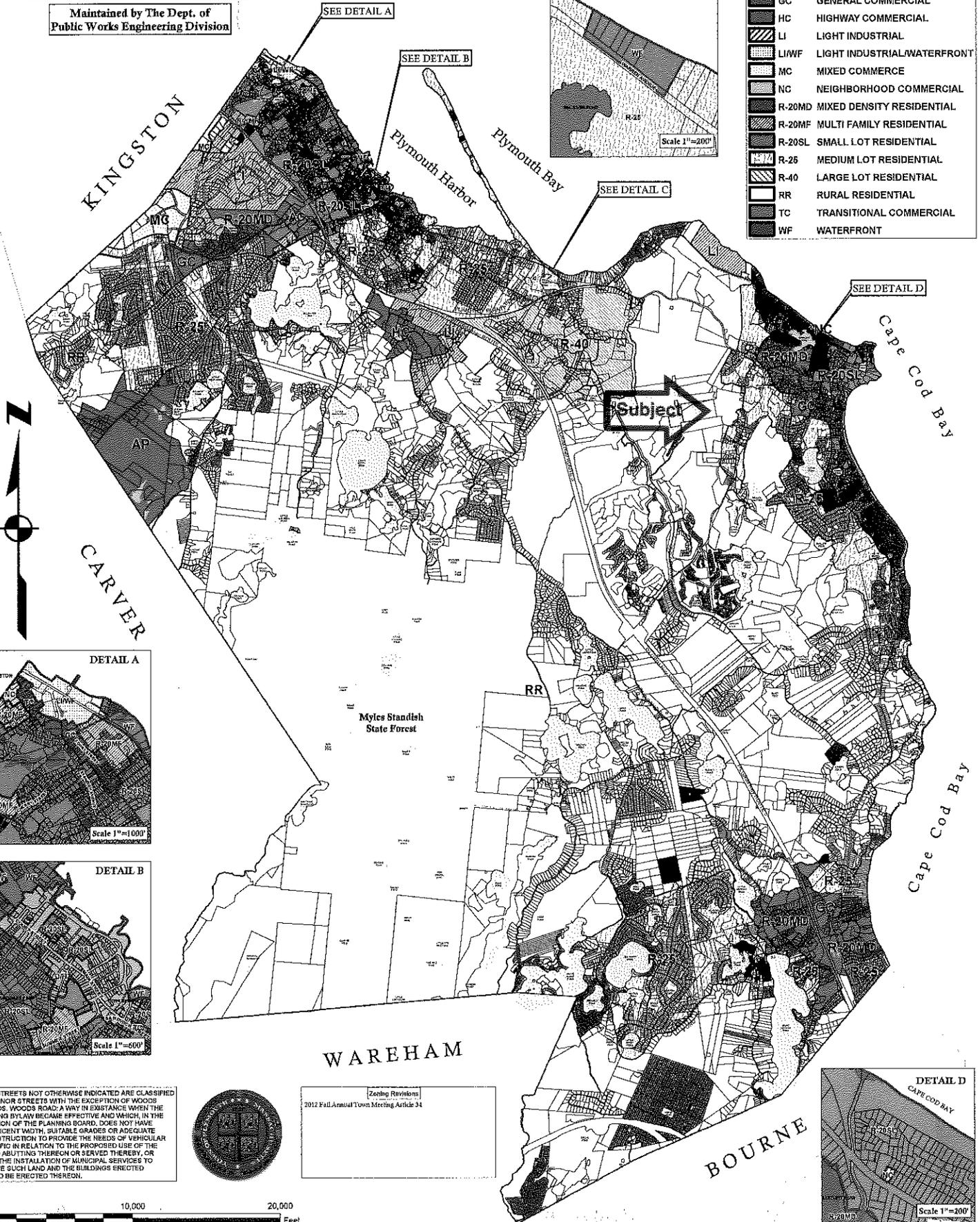
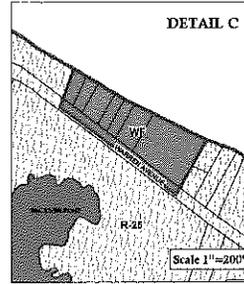
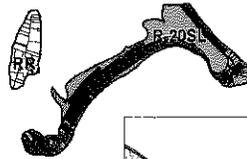
Maintained by The Dept. of  
Public Works Engineering Division

DUXBURY

## Plymouth

Standard Zoning

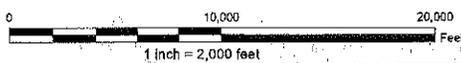
	AC	ARTERIAL COMMERCIAL
	AP	AIRPORT
	DH	DOWNTOWN/HARBOR
	GC	GENERAL COMMERCIAL
	HC	HIGHWAY COMMERCIAL
	LI	LIGHT INDUSTRIAL
	LI/WF	LIGHT INDUSTRIAL/WATERFRONT
	MC	MIXED COMMERCE
	NC	NEIGHBORHOOD COMMERCIAL
	R-20MD	MIXED DENSITY RESIDENTIAL
	R-20MF	MULTI FAMILY RESIDENTIAL
	R-20SL	SMALL LOT RESIDENTIAL
	R-25	MEDIUM LOT RESIDENTIAL
	R-40	LARGE LOT RESIDENTIAL
	RR	RURAL RESIDENTIAL
	TC	TRANSITIONAL COMMERCIAL
	WF	WATERFRONT

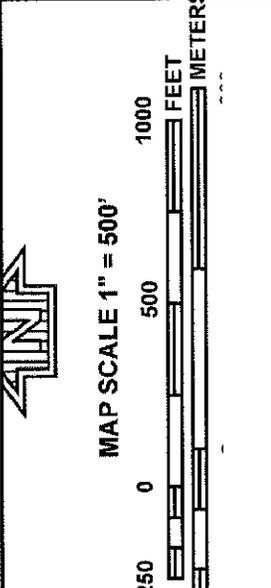


ALL STREETS NOT OTHERWISE INDICATED ARE CLASSIFIED AS MINOR STREETS WITH THE EXCEPTION OF WOODS ROADS, WOODS ROAD-AWAY IN EXISTENCE WHEN THE ZONING BYLAW BECAME EFFECTIVE AND WHICH, IN THE OPINION OF THE PLANNING BOARD, DOES NOT HAVE SUFFICIENT WIDTH, SUITABLE GRADES OR ADEQUATE CONSTRUCTION TO PROVIDE THE NEEDS OF VEHICULAR TRAFFIC IN RELATION TO THE PROPOSED USE OF THE LAND ADJUTING THEREON OR SERVED THEREBY, OR FOR THE INSTALLATION OF MUNICIPAL SERVICES TO SERVE SUCH LAND AND THE BUILDINGS SERVICED OR TO BE ERRECTED THEREON.



Zoning Revisions  
2012 Fall Annual Town Meeting Article 34





**NATIONAL FLOOD INSURANCE PROGRAM**

**PANEL 0387J**

**FIRM**  
 FLOOD INSURANCE RATE MAP  
 PLYMOUTH COUNTY,  
 MASSACHUSETTS  
 (ALL JURISDICTIONS)

**PANEL 387 OF 650**  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**  
 COMMUNITY NUMBER 250278    PANEL NUMBER 0387J  
 PLYMOUTH, TOWN OF

**Notice to User:** The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
 25023C0387J  
**EFFECTIVE DATE**  
 JULY 17, 2012

  
 Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

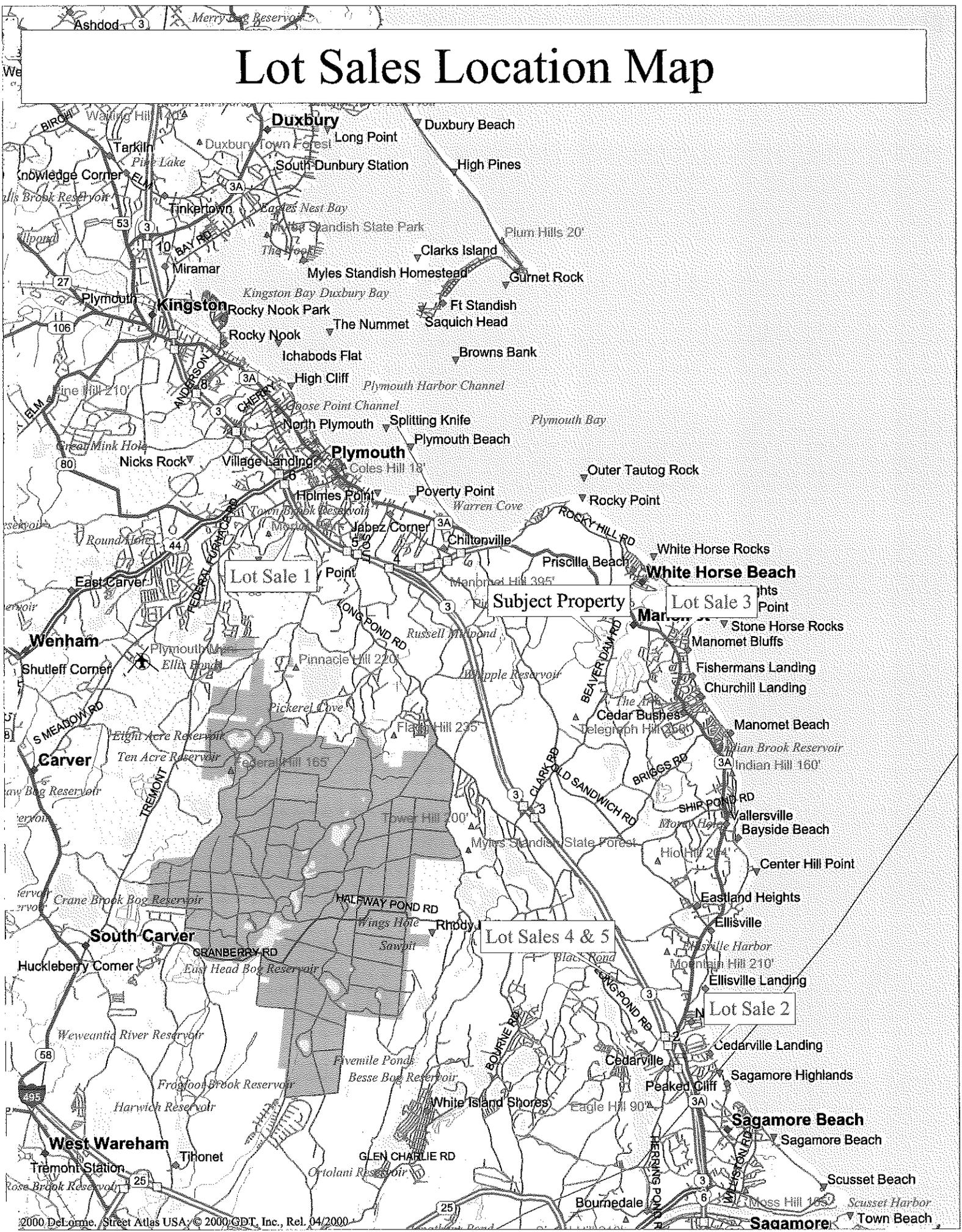
# Subject Neighborhood Map



**COMPARABLE LOT SALES LOCATION MAP**

**DEVELOPER SURVEYS**

# Lot Sales Location Map



Lot Sale 1

Subject Property

Lot Sale 3

Lot Sales 4 & 5

Lot Sale 2

# National Development Land Market

As both the U.S. economy and the commercial real estate (CRE) industry's fundamentals show continued signs of improving, interest in CRE development has picked up across each main property sector – office, retail, industrial, apartments, and lodging. As a result, certain investors in the national development land market are looking to acquire new parcels, finish entitling owned tracts, and/or convert parcels into readied sites. “We are seeing more interest from developers and expect to reduce our existing land inventory over the next several months,” shares a participant.

As is typically the case, the resurgence of development land opportunities is following the recovery path of both the U.S. housing market and the U.S. economy. “Job growth markets are seeing construction activity pick up first in order to support growing local economies,” says an investor. After several dormant years, the pick-up in activity is welcome news for development land investors. In fact, for the first time in quite a while, our surveyed investors are unanimous in their expectations that values for development land will increase over the next 12 months.

Total spending on U.S. private construction was up 12.5% on a year-over-year basis in March 2014, according to the U.S. Census Bureau (see Table DVL-1). Within this total,

residential construction was up 15.2% while nonresidential was up 4.4% over that time frame. Office, lodging, and communication sectors reported the highest year-over-year gains in spending in the nonresidential sector, as of March 2014. In contrast, U.S. private construction spending dropped the most in the religious and public safety sectors over the past 12 months.

## DISCOUNT RATES

Free-and-clear discount rates including developer's profit range from 10.0% to 25.0% and average 18.15% this quarter (see Exhibit DL-1). This average is down 16 basis points from the fourth quarter of 2013 and assumes that entitlements are in place. Without entitlements in place, certain investors increase the discount rate between 400 and 1,500 basis points (an average increase of 1,040 basis points).

## GROWTH RATE ASSUMPTIONS

Growth rates for development expenses, such as amenities, real estate taxes, advertising, and administration, typically range from 1.0% to 5.0% and average 3.2%. For lot pricing, investors indicate a range up to 5.0%; the average growth rate for lot pricing is 2.0%.

## ABSORPTION PERIOD

The absorption period required to sell an entire project varies significantly depending on such factors as location,

size, and property type. This quarter, preferred absorption periods for participants range from 12 to 240 months. The mean absorption period is 100 months (just over eight years), about two years lower than the absorption period reported six months ago.

## FORECAST VALUE CHANGE

Over the next 12 months, all investor participants expect development land values to increase. Appreciation ranges up to 10.0% and averages 3.6% – up quite a bit from six months ago when the average was 2.6%. No surveyed investors expect property value declines in the national development land market over the next 12 months.

## MARKETING PERIOD

The typical time that a development land parcel is on the market prior to selling ranges from 9 to 240 months and averages 53 months. ♦

Exhibit DL-1

### DISCOUNT RATES (IRRS)<sup>a</sup>

Second Quarter 2014

	CURRENT QUARTER	FOURTH QUARTER 2013
<b>FREE &amp; CLEAR</b>		
Range	10.00% – 25.00%	10.00% – 25.00%
Average	18.15%	18.31%
Change		- 16

a. Rate on unleveraged, all-cash transactions; including developer's profit

Table DVL-1

### U.S. CONSTRUCTION SPENDING\*

March 2013 to March 2014

	Year-Over-Year Change
<b>Nonresidential</b>	
Communication	+ 32.5%
Lodging	+ 29.6%
Conservation & Development	+ 15.3%
Office	+ 10.9%
Transportation	+ 9.6%
Highway & Street	+ 8.5%
Commercial	+ 7.4%
Manufacturing	+ 7.3%
Religious	- 19.4%
Public Safety	- 10.3%
Health Care	- 5.3%
Educational	- 3.8%
Total	+ 4.4%
<b>Residential</b>	+ 15.2

\* Private construction

Source: U.S. Census Bureau; seasonally adjusted

**DEFINITIONS**

**AND**

**ASSUMPTIONS**

## APPRAISAL LEXICON

### MARKET VALUE

"The most probable price, which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently, knowledgeably and assuming the price is not affected by undue stimulus. Implicit in this definition is consummation of a sale as of a specified date and passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are motivated;
2. Both parties are well informed or well advised and each acting in what he considers his own best interest;
3. A reasonable time is allowed for exposure in the open market;
4. Payment is made in terms of cash in U.S. dollars, or in terms of financial arrangements comparable thereto; and
5. The price represents the normal consideration for the property sold unaffected by special or creative financing, or sales concessions granted by anyone associated with the sale." (1)

### FEE SIMPLE ESTATE

Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power and escheat. (2)

### HIGHEST AND BEST USE

The reasonably probable and legal use of vacant land or an improved property, that is physically possible, appropriately supported, financially feasible, and that results in the highest value. The four criteria the highest and best use must meet are legal permissibility, physical possibility, financial feasibility and maximum productivity. Alternatively, the probable use of land or improved property – specific with respect to the user and timing of the use – that is adequately supported and results in the highest present value. (3)

### LEASED FEE INTEREST

A freehold (ownership interest) where the possessory interest has been granted to another party by creation of a contractual landlord-tenant relationship (i.e., a lease). (4)

(1) FIRREA 12 CFR Part 323.2.

(2) The Dictionary of Real Estate Appraisal, Appraisal Institute, Chicago, IL, 2010, Fifth Edition - Page 78.

(3) Ibid. - 93.

(4) Ibid. - 111.

## **MARKETING TIME**

An opinion of the amount of time it might take to sell a real or personal property interest at the concluded market value level during the period immediately after the effective date of an appraisal. Marketing time differs from exposure time, which is always presumed to precede the effective date of an appraisal. (5)

## **MARKET RENT**

The most probable rent that a property should bring in a competitive and open market reflecting all conditions and restrictions of the lease agreement, including permitted uses, use restrictions, expense obligations, term, concessions, renewal and purchase options, and tenant improvements (TIs). (6)

## **EXPOSURE TIME**

1. The time a property remains on the market.
2. The estimated length of time the property interest being appraised would have been offered on the market prior to the hypothetical consummation of a sale at market value on the effective date of the appraisal; a retrospective estimate based on an analysis of past events assuming a competitive and open market. (7)

## **PROSPECTIVE OPINION OF VALUE**

A value opinion effective as of a specified future date. The term does not define a type of value. Instead, it identifies a value opinion as being effective at some specific future date. An opinion of value as of a prospective date is frequently sought in connection with projects that are proposed, under construction, or under conversion to a new use, or those that have not yet achieved sellout or a stabilized level of long-term occupancy. (8)

## **RETROSPECTIVE OPINION OF VALUE**

A value opinion effective as of a specified historical date. The term does not define a type of value. Instead, it identifies a value opinion as being effective at some specific prior date. Value as of a historical date is frequently sought in connection with property tax appeals, damage models, lease renegotiation, deficiency judgments, estate tax, and condemnation. Inclusion of the type of value with this term is appropriate, e.g., "retrospective market value opinion." (9)

(5) Ibid. - 121.

(6) Ibid. - 121.

(7) Ibid. - 73.

(8) Ibid. - 153.

(9) Ibid. - 171.

## ASSUMPTIONS AND LIMITING CONDITIONS

This appraisal report has been made with the following general assumptions:

1. This is a narrative Appraisal Report which is intended to comply with the reporting requirements set forth under Standards Rule 2-2(a) of the Uniform Standards of Professional Appraisal Practice for an Appraisal Report. Supporting documentation concerning the data, reasoning, and analyses is retained in the appraiser's file. The information contained in this report is specific to the needs of the client and for the intended use stated in this report. The appraisers are not responsible for the unauthorized use of this report.
2. No responsibility is assumed for the legal description or for matters including legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated.
  1. The property is appraised free and clear of any or all liens or encumbrances unless otherwise stated.
  2. Responsible ownership and competent property management are assumed.
  3. The information furnished by others is believed to be reliable. However, no warranty is given for its accuracy.
  4. All engineering is assumed to be correct. The plot plans and illustrative material in this report are included only to assist the reader in visualizing the property.
  5. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for arranging for engineering studies that may be required to discover them.
  6. It is assumed that there is full compliance with all applicable federal, state, and local environmental regulations and laws unless noncompliance is stated, defined, and considered in the appraisal report.
  7. It is assumed that all applicable zoning and use regulations and restrictions have been complied with, unless a nonconformity has been stated, defined, and considered in the appraisal report.

8. It is assumed that all required licenses, certificates of occupancy, consents, or other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.
9. It is assumed that the utilization of the land and improvements is within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in the report.

This appraisal report has been made with the following general limiting conditions:

1. The distribution, if any, of the total valuation in this report between land and improvements applies only under the stated program of utilization. The separate allocation of land and building must not be used in conjunction with any other appraisal and are invalid if used.
2. Possession of this report, or a copy thereof, does not carry with it the right of publication.
3. The appraiser, by reason of this appraisal, is not required to give further consultation, testimony, or be attendance in court with reference to the property in question unless arrangements have been previously made.
4. Neither all nor any part of the contents of this report (especially any conclusions as to value, the identity of the appraiser, or the firm with which the appraiser is connected) shall be disseminated to the public through advertising, public relations, news, sales, or other media without the prior written consent and approval of the appraiser.
5. Any value estimates provided in the report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in the report.
6. The forecasts, projections, or operating estimates contained herein are based upon current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes in future conditions.



Town of Plymouth, Massachusetts  
**Department of Marine and Environmental Affairs**  
11 Lincoln Street, Plymouth, MA 02360 | 508-747-1620



# MEMO

**To:** John Moody, Chairman, Advisory and Finance Committee  
**Through:** Melissa Arrighi, Town Manager  
**From:** David Gould, Director of Marine and Environmental Affairs  
**Re:** Article 9E – Beaver Dam Open Space Acquisition  
**Date:** January 14, 2016

The Beaver Dam Open Space site is part of the former agricultural operation in Manomet known as Tidmarsh Farms (West). The Tidmarsh Farms (East) is currently undergoing the largest freshwater wetlands restoration ever completed in New England. These parcels provide connectivity to the approximately 770 acres of conservation land at Beaver Dam/Briggs Conservation Area as well as connecting to Entergy land. The Town of Plymouth has been working to restore and protect this property since 2009. Without this acquisition the land protection, the grant funding and the overall ongoing restoration of these properties will be jeopardized.

Details on funds acquired to date are listed below:

## **Tidmarsh West (Beaver Dam Acquisition)**

- Land includes cranberry bogs and so-called “Church” lot to the crest of the Pinehills. Approximately, 129 acres in total.
- 2014 appraisal values land at \$775,000. Owner has agreed to sell for \$700,000.
- \$51,000 is available for the Tidmarsh West acquisition via MA Landscape Partnership Grant.
- \$375,000 would become available from NRCS Wetlands Reserve Program (Eel River, Tidmarsh East) for restoration of Tidmarsh West bogs.

•

## **Tidmarsh East**

- Land consists of approximately 497 acres. The appraised value is \$3,400,000 to be acquired by Mass Audubon for \$2,300,000.
- Mass Audubon has \$949,000 in Landscape Partnership Grant funding for acquisition. MAA has over \$300,000 in pledges.
- There is a \$1,000,000 National Coastal Wetlands Conservation Grant (with the Town) that is pending. Announcement anticipated in late fall 2016.
- Restoration funds to date \$3,500,000.
- This restoration would improve water quality and habitat within Beaver Dam Brook, Bartlett Pond and White Horse Beach.

Acquisition of this property will ensure that no grant funds will need to be returned and that the on-going restoration work to improve water quality and natural resources habitat along Beaver Dam brook can continue.