

Rec. @ hearing
5/14/14
from Sharon
Van Lieu

MEMORANDUM

Date: November 25, 2013

To: Joshua Posner, President, Sconset Beach Preservation Fund

From: Maria Hartnett and Les Smith, Epsilon Associates, Inc.

Subject: Emergency Status for Homes and Public Infrastructure Along Baxter Road, Nantucket, MA

This memo defines those properties within the "Baxter Road Temporary Stabilization" project area (DEP File No. 048-2610) from 85-107A Baxter Road that require protection under an Emergency Certification. This analysis is based upon existing distances from the top of the coastal bank to homes and Baxter Road, the long-term erosion rate, and the maximum anticipated winter erosion rate (based on actual top of bank loss during the 2012-2013 winter season).

Existing Conditions

Existing Conditions at Sconset are presented on Figures 1 and 2. Figure 1 is an oblique aerial photo taken in June 2013; the distances presented on Figure 1 are based on May 30, 2013 field measurements of the minimum distances between the top of the coastal bank and existing homes and Baxter Road. Figure 2 is an aerial photo taken in July 2013 with transects spaced every 20 feet that list the distance between the edge of Baxter Road and the top of the coastal bank. To develop this figure, GIS was utilized to digitize the eastern edge of pavement for Baxter Road and the 2013 top of coastal bank line, and then to generate the 20 foot transects with listed distances. These figures demonstrate the following:

- o The homes at 93 and 97 Baxter Road are between 8 and 24 feet from the edge of the bluff.
- o The distance from the edge of Baxter Road to the top of the bluff for the vacant lots at 91, 99, 101, and 105 Baxter Road is as little as 29 feet and averages approximately 50.6 feet (Table 1). This distance gradually starts to increase south of 91 Baxter Road.

Potential Threat from Erosion

We have previously determined the long-term erosion rate for the area from 85-107A Baxter Road as 4.6 feet/year, in a memo from Epsilon Associates dated November 1, 2013. Given the significant bank losses that occurred during the winter of 2012-2013, we also recommend the consideration of potential single-season coastal bank loss at Sconset when determining those properties that require immediate protection.

As previously mentioned, the winter of 2012-2013 resulted in significant coastal bank erosion at Sconset. An analysis of the erosion that occurred between 2012-2013 was conducted by digitizing

top of bank lines from 2012 and 2013 aerial photographs (Figure 3) and then calculating retreat distances along shore-perpendicular transects spaced every 20 feet. This analysis indicates that the average erosion in the area from 85-107A was 20 feet and ranged up to 40 feet (Table 2).

Criteria for Defining an "Emergency"

It is our opinion that the situation at Sconset constitutes an emergency, and that all properties and public infrastructure that may be lost due to erosion during the next few winter months require immediate protection. The above analysis of 2012-2013 erosion demonstrates that up to 40 feet of coastal bank can be lost during a single winter; this distance represents the basis of the below criteria for those homes and sections of roadway that require immediate protection.

- Emergency Criteria for Homes. All homes within 40 feet of the top of the coastal bank require immediate protection.
- Emergency Criteria for Public Infrastructure (Baxter Road). All sections of Baxter Road within 65 feet of the top of the coastal bank require immediate protection. This distance is based upon the sum of the potential single-season erosion (40 feet) plus the minimum distance of 25 feet that needs to be maintained seaward of the Baxter Road pavement for structural stability. This 25 foot distance is based upon information presented in the November 8, 2013 letter from Milone & MacBroom. After conferring with the well-respected geotechnical firm Haley & Aldrich, Milone & MacBroom reported that "[t]he town can maintain travel on Baxter Road until such time as the top of the bluff is 25 feet or less from the edge of pavement. When the top of the bluff is within 25 feet of the pavement edge, the road should be closed to traffic until a detailed assessment can be completed by a geotechnical engineer."

Utilizing the above criteria to define which portions of 85-107A Baxter Road require immediate protection yields the following conclusions:

- Homes Requiring Immediate Protection. The pre-1978 homes located at 93 and 97 Baxter Road require immediate protection.
- Sections of Baxter Road Requiring Immediate Protection. The sections of Baxter Road along the southern two-thirds of 105 Baxter Road, 101 Baxter Road, 99 Baxter Road, and 91 Baxter Road require immediate protection. (In limited parts of 91 Baxter Road, the distance between the edge of pavement and top of the bluff is just over 65 feet. We recommend providing protection across 91 Baxter its entirety to avoid discontinuous protection and/or end effects.) We also note that the adjacent lot at 87 Baxter Road has a small section where the distance between the top of the bluff and edge of pavement are less than 65-feet. Protection for 87 Baxter Road could also be provided if this can be accomplished without compromising the ability to protect the more threatened areas from 91-105 Baxter Road during the limited time available before the winter storm season. Finally, we note that Baxter Road provides access to pre-1978 homes both on its seaward and landward sides,

19 wide, 6.5 feet tall, and 100-200 feet long. The bottom tube will be buried in the beach to elevation 0.0 MLW and the top tube will be set at elevation 26.0 MLW. A scour apron and four-foot-diameter anchor tube are included, extending five feet seaward of the lowest geotextile tube at elevation 0.0 MLW. The four geotubes will overlap by approximately 1/3 of their circumference, yielding an effective slope of 2 Horizontal:1 Vertical. There will be shorter return tubes on the return ends to minimize flanking. Jute fabric will be placed on the upper bank face; and vegetation will be planted in the following spring. The Project will be installed at the toe of the bank parallel to Baxter Road from 91-105 Baxter Road (only the narrowest portion of 105 Baxter Road will be included), for an approximate length of just under 900 feet. The geotextile tubes will be covered with sand. The sand cover will be maintained and sacrificial sand will be added for protection and to ensure a minimum volume (equivalent to the annual volume contributed by the eroding coastal bank) is contributed annually. The Project is readily removable. Failure criteria and information related to protocols for and cost of removal are set forth in the October 25, 2013, November 5, 2013, and November 19, 2013 letters from Milone & MacBroom, submitted herewith.

II. THE COMMISSION'S VOTE

As stated above, the Initial Request and supporting material were submitted to the Commission on November 26, 2013 and the Commission met on November 27, 2013 to address the Initial Request. Mr. Steven Cohen, Esq., of Reade, Gullicksen, Hanley, Gifford & Cohen, LLP, appeared on behalf of SBPF. Six of the Commission's seven members were present.

The Commission voted 5-1 to deny the Initial Request and included in their motion to deny was the finding that the Initial Request did not satisfy three criteria: 1) no public agency ordering or performing the project, 2) not protecting public health or safety, and 3) proposal is more than necessary to abate the emergency.

III. GROUNDS FOR APPEAL

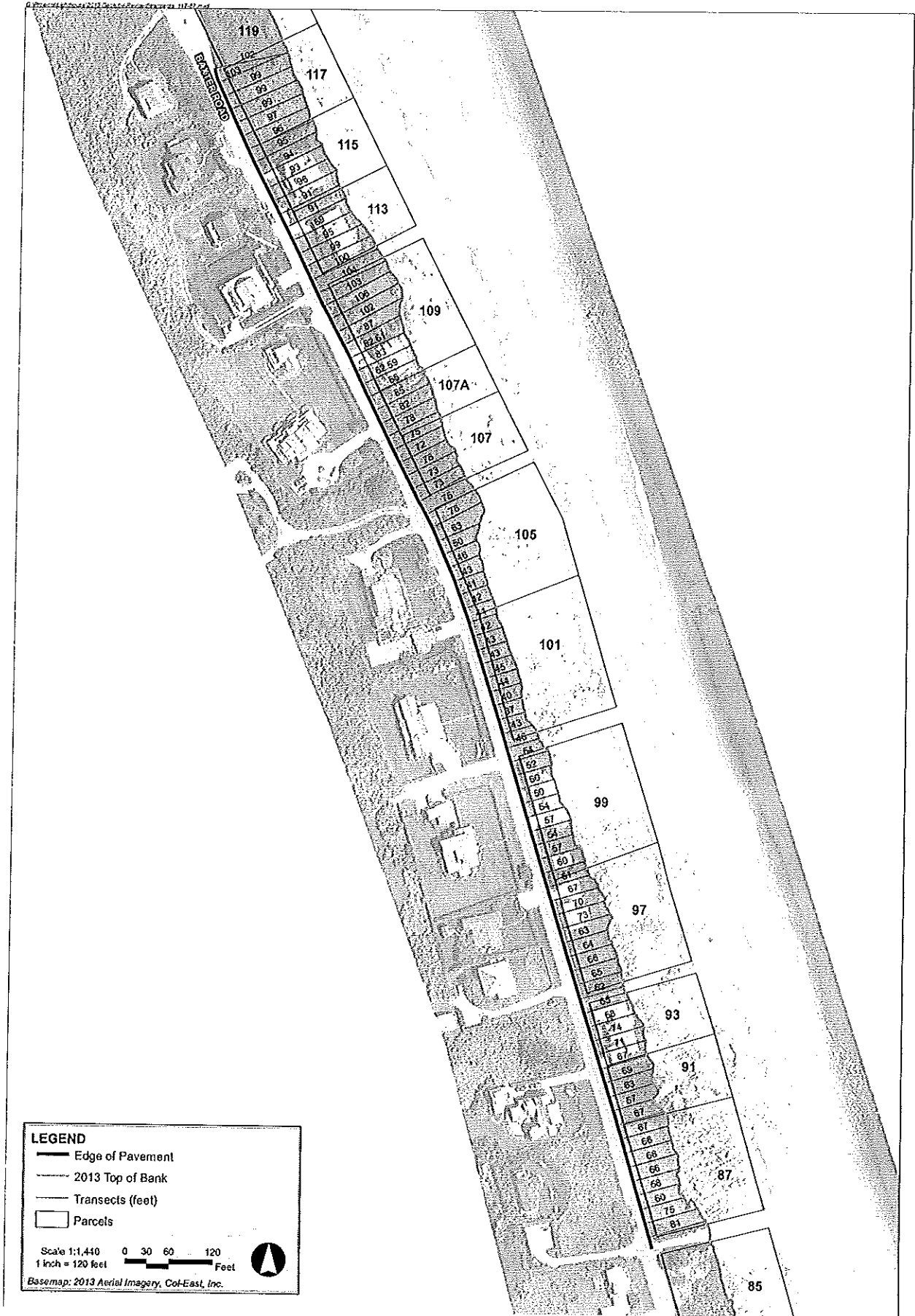
There can be no doubt that there is an emergency.

There can be no doubt that, to be performed effectively, the Emergency Project cannot await compliance with the notice requirements and appeal period associated with the filing of a notice of intent. As is established by the memos from Epsilon Associates dated November 1, 2013 and November 25, 2013 submitted herewith, the average long-term rate of retreat of the Bluff from 85-107A Baxter Road has been 4.6 feet/year, though erosion greater than or less than this rate can occur in a given year. Indeed, last year, in particular locations, the edge of the Bluff retreated landward as much as 40 feet, as presented in the memo from Epsilon Associates dated November 25, 2013. The Town of Nantucket had already concluded that "certain private homes located on or near Siasconset Bluff and Baxter Road, a public way, may be imminently

and that protecting Baxter Road is critical to maintain access to the pre-1978 homes on the landward side of Baxter Road adjacent to 91, 99, 101, and 105 Baxter Road.



Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, MA



Baxter Road and Sconset Bluff Storm Damage Prevention Project Nantucket, Massachusetts

Figure 2
Geotube Analysis

Transect ID	Street Number	2012-2013 Retreat (ft)
73	97	26.8
74	93	25.6
75	93	11.5
76	93	8.1
77	93	16.5
78	93	20.0
79	91	16.4
80	91	6.1
81	91	7.5
82	91	20.5
83	87	13.2
84	87	22.8
85	87	22.1
86	87	27.2
87	87	40.1
88	87	38.2
89	87	18.7
90	87	11.4
91	85	18.2
92	85	11.2
93	85	11.4
94	85	15.4
95	85	5.8
96	85	21.5
97	85	17.4
98	85	17.3
99	85	13.1
100	85	16.2
101	85	23.7
102	85	25.7
103	85	24.9
Average Retreat		20.3
Maximum Retreat		40.1

Table 1. Distance from Edge of Pavement to Top of Coastal Bank, 91, 99, 101, and 105 Baxter Road, Nantucket, MA

<i>Transect</i>	<i>Lot</i>	<i>Distance from EOP to 2013 TOB (ft)</i>
37	105	63
38	105	50
39	105	46
40	105	43
41	105	41
42	105	42
43	101	41
44	101	42
45	101	43
46	101	43
47	101	45
48	101	44
49	101	40
50	101	37
51	101	43
52	101	46
53	99	54
54	99	52
55	99	50
56	99	50
57	99	54
58	99	57
59	99	54
60	99	57
61	99	60
75	91	67
76	91	69
77	91	63
78	91	57
79	91	67
Average		50.6

Table 1. 2012-2013 Retreat Distances for 85-107A Baxter Road, Nantucket, MA

Transect ID	Street Number	2012-2013 Retreat (ft)
30	107A	22.1
31	107A	22.6
32	107A	25.9
33	107	24.4
34	107	27.2
35	107	18.6
36	107	20.6
37	107	22.0
38	105	16.9
39	105	10.5
40	105	17.5
41	105	33.2
42	105	27.3
43	105	25.2
44	105	25.0
45	105	24.5
46	105	21.8
47	101	25.2
48	101	17.1
49	101	21.5
50	101	18.6
51	101	13.9
52	101	18.9
53	101	25.2
54	101	23.6
55	101	17.0
56	Public Access	18.9
57	99	16.6
58	99	23.6
59	99	22.4
60	99	26.4
61	99	19.1
62	99	17.2
63	99	19.6
64	99	15.3
65	99	22.5
66	97	23.5
67	97	20.5
68	97	19.0
69	97	25.0
70	97	27.4
71	97	22.4
72	97	23.5