COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

April 1, 2011

Docket No. WET-2009-040
File No. SE-10-2533

In the Matter of Scott Glass,
Trustee of Hill and Dale Nominee Trust — Chatham

RECOMMENDED FINAL DECISION

Scott Glass, Trustee of Hill and Dale Nominee Trust (the "Petitioner" or "Mr. Glass"), sought a permit for the construction of a rock revetment that he claimed was necessary to protect his house, which is located about 125 feet from the coastal bank in Chatham. The work is proposed on coastal beach, coastal bank, and land subject to coastal storm flowage, all within an Area of Critical Environmental Concern ("ACEC") designated for Pleasant Bay. The work is subject to the requirements of the Wetlands Protection Act. M.G.L. c. 131, § 40; 310 CMR 10.00. The Chatham Conservation Commission (the "Commission") and the Southeast Regional Office of the Massachusetts Department of Environmental Protection (the "Department") both denied the project. Both the Commission and the Department noted that other shoreline protection alternatives were feasible at the site and the revetment was not required to protect the house. Mr. Glass filed this appeal.[1] After consideration of the testimony and legal argument, I conclude that the Department properly denied the project as proposed.

[1]The Pre-hearing Conference was held on June 8, 2010 in the Southeast Regional Office in Lakeville. This matter was stayed twice pursuant to 310 CMR 10.05(7) and 310 CMR 1.01(6)(h). The appeal was stayed because the

ISSUES FOR ADJUDICATION

1. Whether the project meets the performance standards for work on a coastal bank at 310 CMR 10.30(3), because

a. the revetment is required to prevent storm damage to the house, which was constructed prior to 1978; and
b. the revetment is designed and constructed to minimize adverse effects on adjacent or nearby coastal beaches due to changes in wave action; and
c. the applicant has demonstrated that no method of protecting the building other than the proposed revetment is feasible?

2. Whether the project meets the requirements of 310 CMR 10.24(5)(a) for work in an Area of Critical Environmental Concern?

3. Whether the project complies with the performance standard for work in or within 100 feet of salt marsh at 310 CMR 10.32(3)?

THE PROJECT AND THE SITE

The property is located at 10 Sedge Lane in Chatham, adjacent to Pleasant Bay, an ACEC designated in 1987 based upon its natural characteristics, uniqueness, and threats to its resources from inappropriate development. See Mahala PFT, Exh. 3; 301 CMR 12.00.[2] Pleasant Bay is separated from the Atlantic Ocean by a barrier beach, Nauset Beach, which developed a new inlet in 2007 to the south of the Glass property. A barrier beach is a low-lying strip of coastal beach and dunes extending roughly parallel to the coast and separated from the mainland by a body of water or marsh. 310 CMR 10.29. The tidal range may vary between the open ocean

---

Chatham Conservation Commission had denied the project under its local bylaw and the Petitioner appealed the denial under the bylaw to court. The stay was lifted after the Superior Court determined that the local bylaw was not more stringent than state law, and thus, the matter was properly before the Department. The matter was stayed a second time pending compliance by the Petitioner with the Massachusetts Environmental Policy Act ("MEPA"). Although advised by the Department in its Superseding Order that compliance with MEPA would be required if an appealed was filed, the Petitioner had not filed an Environmental Notification Form. The stay was lifted after the Petitioner submitted the ruling from MEPA demonstrating completion of the MEPA process. Finally, the Petitioner requested additional time to engage an expert witness and the Department requested designation of this matter as "major and complex" based upon the significance of the issue of revetment construction along the coast. I designated the matter as major and complex, allowing a 30 day addition to the otherwise six month timeline, which is tolled during stays, for the resolution of wetlands permit appeals.

[2] Hereinafter, "PFT" refers to prefiled testimony, "Exh." refers to exhibits, and "Cross" refers to cross-examination at the hearing.

side and the inland side of a barrier beach, and the 2007 breach caused an increase in tidal range in Pleasant Bay, the inland side of Nauset Beach.[3] The Petitioner owns a house constructed prior to 1978 and situated about 125 feet from the top of the coastal bank.[4] The orientation of the site is north northeast, and the inlet from the 2007 breach is located to the east and slightly to the south of the site, beyond Strong Island. The bank is 7 to 8 feet high, with the toe shown at approximately an elevation of 5 to 6 feet on the plan. Plan Showing Proposed Shorefront Protection, Rev. 3/23/09 ("Plan").[5] In addition to coastal bank, proceeding from the bank seaward, other resource areas shown are an area of the high salt marsh plant species *Spartina patens* which is identified on the plan as coastal beach at elevation 5 to 5.5 feet, with Mean High Water ("MHW") at 3 feet, and an area further seaward of the low salt marsh plant species *Spartina alterniflora* which is identified on the plan as salt marsh. The velocity zone, where 3 foot waves are expected in storms, is seaward of the MHW as shown on the plan.

Shoreline protection may be characterized as "hard," such as rock revetments, or "soft," such as beach nourishment and/or fiber rolls. A revetment is a layer of large rocks embedded on the face of a bank. Beach nourishment generally refers to the placement of sand on a beach or over another shoreline protection measure. Fiber rolls are "a product composed of coconut fibers bound into a tight roll which must be trenched into the toe of a slope and properly anchored." Mahala PFT at para. 15; Okurowski concurrence on cross. The property to the west has rock "riprap" on the bank which apparently predated the 1978 regulations; the Commission denied

[3] Nauset Beach is a spit that has historically elongated in a southerly direction; a storm event may overwash the spit, breaching the barrier beach and form an inlet that provides a more efficient exchange of water, in a cyclical pattern. Mahala Cross.

[4] 310 CMR 10.30 defines Coastal Bank as "the seaward face or side of any elevated landform, other than a coastal dune, which lies at the landward edge of a coastal beach, land subject to tidal action, or other wetland."

[5] Because the project plan shows proposed work superimposed on existing conditions, it is difficult to determine where the existing grade extends under the revetment.

permission for the installation of a revetment in 1992 but has allowed restacking of the stones. Andres PFT. The Town owns property immediately to the east of the Glass property where it maintains a town landing and parking area near the beach. The Town therefore has observed the area for years, noted periodic erosion related to storm events, and has used sand nourishment and fiber rolls to protect its infrastructure, which as shown on the plan is much closer to the bank than the Glass house. Keon PFT, paras. 4-7. The Petitioner had obtained an Order of Conditions from the Commission to install fiber rolls in 1994 and 2003. In 2009, after the 2007 breach, the Petitioner proposed the construction of an 85 foot rock revetment up to elevation 7 NGVD with two rows of fiber rolls at the top to prevent overtopping accompanied by the annual placement of sand over the revetment.

ARGUMENT AND TESTIMONY OF THE PARTIES

The Petitioner argued that the proposed revetment was required to protect the existing house, and that a showing that the house was in "immediate danger" was not imposed by the regulations. Instead, the Petitioner argued that a showing that more intense wave velocities and increased erosion rates was sufficient to justify the installation of a coastal engineering structure to protect a pre-1978 building. While conceding that erosion control methods will cut off sediment supply, the Petitioner argued that the annual placement of sand over the revetment would serve as mitigation to prevent negative impacts to adjacent properties. The Petitioner stated that the revetment was the only feasible means to protect the house, because it is permanent, in contrast to "soft solutions" which are temporary and require repair and replacement over time at additional expense. The Petitioner argued that the project met the "no adverse effect" standard for work in an ACEC and will ensure the survival of the salt marsh because of the beneficial effects of the beach nourishment.

Roy E. Okurowski, a Professional Engineer at Coastal Engineering Company, Inc., provided expert testimony for the Petitioner.[6] He designed the project and analyzed conditions at the site beginning in 2008. Okurowski Cross. He described the bank as "an unstable retreating escarpment" that had been subjected to erosion and the loss of vegetation after a 2007 storm. He testified that he had quantified the erosion since 2008 using a GPS survey, and stated that the bottom of the bank had lost two feet but the top of the bank was the same; he further stated that the top of the bank had moved 1 to 3 feet closer to the house in three years. Okurowski Cross. He stated that he either had not measured erosion prior to 2007, or had not submitted the rates. Okurowski Cross. Due to the higher tides and increased wave heights since the 2007 break in Nauset Beach, he recommended the installation of an 85 foot rock revetment for slope stabilization combined with fiber rolls to prevent overtopping during storm events, covered with sacrificial sand to maintain the beach profile at the site and adjacent areas. Okurowski PFT.

Mr. Okurowski testified that, if the project were not installed, "the bank will continue to erode at an accelerated rate." The term "accelerated" was a comparison of the rate before 2007 to the current rate, which he gave as one foot per year and attributed to more frequent higher tides and the loss of bank vegetation making the bank more vulnerable. Okurowski Cross. He identified the alternatives to the project as "do nothing," aggressive vegetation, aggressive vegetation with draft fences, fiber rolls, and Longard Tubes. He concluded that none were feasible for the site, because the base of the bank was not stabilized and they were not permanent solutions. He also stated his opinion that the revetment on adjacent property to the west

[6]Scott Glass, the Petitioner, provided prefiled direct testimony, but did not appear at the hearing for cross-examination and therefore, his testimony was excluded from the record. The Petitioner also sought to introduce into the record the Order of Conditions issued by the Chatham Conservation Commission for the Eastward Ho! Country Club. The Department and the Commission objected, as they had not reviewed the document and its submission at the hearing was not timely. This document is properly excluded from the record. Although allowed under the Schedule for Adjudication, the Petitioner did not file any rebuttal testimony.

concentrates wave energy on the Glass property's bank, causing heightened erosion rates. In his view, the fiber rolls that had been installed were a failure because they are not designed to be used in a velocity zone such as this site. When questioned about the salt marsh, Mr. Okurowski stated that salt marsh was outside the project site, but then stated that S*partina patens* would be covered with sand and replanted. He distinguished between *Spartina patens* and *Spartina alterniflora,* and stated that the *S. alterniflora* was closer to the water and would not be affected. Okurowski Cross. He testified that the sand placed annually over the revetment would result in the project's compliance with the performance standard of "no adverse effect" in the ACEC and that the project would enhance the salt marsh that would otherwise "die off in a few years." Okurowski PFT.

The Chatham Conservation Commission argued that the revetment was not necessary to protect the house because there was no evidence of a material change in the location of the top of the bank since the late 1980s. The Commission has identified fiber rolls as an alternative means of addressing erosion at the toe of the bank, which together with nourishment was successful on adjacent properties. The Commission filed the expert testimony of John Ramsey, a Professional Engineer at Applied Coastal Research and Engineering, Inc., Kristen Andres, the Commission's Agent since 2000, Theodore L. Keon, the Director of Coastal Resources for Chatham, and John W. Geiger, II, a 17 year member of the Commission. Each has extensive experience with coastal processes in Pleasant Bay, as well as the area of the Glass property due to the adjacent Town Landing with the exception of Mr. Ramsey who had not visited the site. Mr. Ramsey concurred that the new inlet has affected tides but believed that the effect was an increase in MHW of about .5 feet, lower than the assessment provided by Mr. Okurowski. He stated that the waves at the site were limited by the fetch, the length of water over which wind travels and waves develop,

which was not changed by the inlet, and there was no justification provided for the assertion that there would be an increase in future erosion rates. Ramsey, PFT, para. 1. He noted that the "existing rubble mound structure" on the adjacent property had been in place for at least 33 years, and although the stones had been restacked after periods of major storms bringing increased wave heights, there was no evidence it had become unstable since the 2007 breach. Id.

Ms. Andres testified that the 1994 Order of Conditions issued for the Glass property included a plan showing the house 126 feet from the top of the bank and a flagpole approximately five feet from the bank. Andres PFT, Exh.2. The Commission issued another Order in 2003 that anticipated the maintenance of fiber rolls and re-nourishment, but testified that these activities had not been undertaken. She also provided a copy of the denial by the Commission in 1992 of a proposed project by the adjacent property owner to construct a revetment; the Commission had allowed restacking of stones in 2001 and 2005 because the stones had predated the regulations. Andres PFT, Exh. 8. Finally, Ms. Andres provided information on other properties to the east of the Glass property. These properties either have no protection or fiber rolls with the addition of regular nourishment, and the shoreline appears stable. From her observations, she stated her opinion that shoreline changes were the result of episodic erosion from storm events rather than chronic erosion from continual sand loss.

The shoreline protection activities to the east of the Glass site on the Town's Strong Island Town Landing were further described by Mr. Keon. Keon PFT, paras. 4-6. He stated his opinion that the new inlet had increased the frequency of erosion-causing events because higher water levels enabled waves to travel higher up the beach. However, he did not believe that the inlet would result in a new high rate of progressive erosion, meaning an ongoing rate of shoreline recession. Keon PFT, para. 7. Mr. Keon testified that the Glass house, at 120 feet from the top

of the bank, was "significantly outside the range of impact from erosion during storm events." Keon PFT, para. 8. At this time, there was minor erosion during storm events but no chronic erosion that would suggest "a progressive increase in the vulnerability of the structure" or "an imminent threat to the structure." Keon PFT, para. 8. Mr. Geiger provided historical information about the site dating back to planting of the bank in 1991, and noted in particular the consistent location of the flagpole which indicates that the toe and some portions of the face of the bank may have been eroded but "the bank has not retreated from the top since 1992." Geiger PFT.

The Department argued that the Petitioner had failed to meet the performance standards for coastal bank, work in an ACEC, or salt marsh. From the perspective of the Department, the regulatory language that a coastal engineering structure "shall be permitted when *required* to prevent storm damage to buildings . . . " means that a *building* must be in jeopardy from storm damage; a coastal engineering structure is not allowed simply to prevent naturally occurring erosion of a coastal bank. 310 CMR 10.30 (emphasis added). The Department argued that denial is warranted where an "anticipated loss may never occur" and there was no evidence in support of an imminent threat to the building. Matter of Nelson and Hicks, Docket Nos. 93-090, 93-089, 1999 MA ENV Lexis 714. In response to the Petitioner's argument that there is no "immediate danger" standard in the regulations, the Department argued that the top of the bank is too far away to require a revetment to prevent storm damage.

As an alternate ground for denial, the Department argued that the Petitioner was required to use the "best available measures" to prevent adverse effects; in its view, fiber rolls would meet this criterion while the rock revetment would not. Similarly, the Department argued that the conclusory rejection of alternatives by the Petitioner does not conform to the regulations. As to

the ACEC standard of "no adverse effect," the Department argued that the Petitioner's use of mitigation in the form of beach nourishment concedes an adverse effect that is not small enough to be negligible as required. See 310 CMR 10.23(Definition of Adverse Effect). Finally, the Department argued that the project would include destruction of salt marsh, which is prohibited under the regulations. Thus, the Department argued that failure to meet the standards for work in an ACEC or in salt marsh are also adequate alternate grounds for denial of the project.

James Mahala, a wetlands staff member at the Department since 1986, served as the Department's expert witness. He stated his opinion that, although the fiber rolls at the site are currently in disrepair and need maintenance, they were less reflective of wave energy than a revetment and would slow erosion at the toe of the bank. He appended to his testimony the Office of Coastal Zone Management's Shoreline Change map for the area, which showed that the mean tide shoreline had accreted a short distance between 1886 and 1994 but indicated a relatively stable shoreline. Mahala PFT at para. 16, Exh. 5. He acknowledged that the new inlets in 1987 and 2007 had increased the tidal range within Pleasant Bay, which could lead to an increase in erosion, but did not believe that Mr. Okurowski had proven there was an accelerated rate of erosion at the site. Mahala PFT at para. 16.

As to work in an ACEC, Mr. Mahala testified that the proposed rock revetment would have an adverse effect on the statutory interests of storm damage prevention and flood control by increasing erosion and changing the form and volume of the beach. As a "hard" structure, a revetment would reflect rather than dissipate wave energy leading to increased scour, change in the fronting beach, and loss of beach on neighboring properties, followed by requests from those properties owners to build hard structures. Mahala PFT at para. 21. Mr. Mahala cited to the Pleasant Bay Resource Management Plan that cautioned against the proliferation of hard

structures that would interfere with natural erosion processes and urged alternatives to mitigate the effects of bank loss. Mahala PFT at para. 22 and Exh. 7. Finally, Mr. Mahala noted that the Petitioner's plan described the removal, temporary stockpiling, and replacement of salt marsh. The performance standards for salt marsh, in his opinion, do not allow the destruction of any portion of a salt marsh, 310 CMR 10.32(3), and do not allow the replication of salt marsh as is allowed for freshwater bordering vegetated wetlands under 310 CMR 10.55. Thus, Mr. Mahala viewed the work within the ACEC and the effect of the work on salt marsh as alternate grounds for denial of the proposed project.

FINDINGS AND CONCLUSIONS

The Petitioner has the burden of going forward pursuant to 310 CMR 10.03(2), and proving its direct case by a preponderance of the evidence. 310 CMR 10.05(7)(j)(3)b. I find, as a threshold matter not genuinely disputed, that the coastal bank at the Glass site serves as a source of sediment to the coastal beach system, serving the interests of flood control and storm damage prevention, and accordingly, the bank must be protected to serve this function through the natural process of erosion.[7] Thus, the Petitioners must show that the revetment is required to prevent storm damage to the house, the revetment will minimize adverse affects on adjacent beaches, and no other methods to protect the house are feasible.[8] Coastal engineering structures, such as the

[7]The preamble states: "When a proposed project involves dredging, removing, filling, or altering a coastal bank, the issuing authority shall presume that the area is significant to storm damage prevention and flood control. . . . When issuing authority determines that a coastal bank is significant to storm damage prevention or flood control because it supplies sediment to coastal beaches, coastal dunes or barrier beaches, the ability of the coastal bank to erode in response to wave action is critical to the protection of that interest(s)." 310 CMR 10.30.

[8] 310 CMR 10.30 provides:
When a coastal bank is determined to be significant to storm damage prevention or flood control because it supplies sediment to coastal beaches, coastal dunes or barrier beaches . . .

> (3) No new bulkhead, revetment, seawall, groin or other coastal engineering structure shall be permitted on such a coastal bank except that such a coastal engineering structure shall be permitted when required to prevent storm damage to buildings constructed prior to the effective date of 310 CMR 10.21 through 10.37 or constructed pursuant to a Notice of Intent filed prior to the effective date of 310 CMR 10.21 through 10.37 (August 10, 1978), including

revetment proposed here, interrupt natural coastal processes and may adversely affect adjacent properties. The regulations are intended to prevent flooding and storm damage "caused by the destruction of natural landforms which perform that function. . . . [t]hese regulations essentially prevent the creation of a nuisance by property owners who would prevent the natural disposition of sand along the beachfront. Lummis v. Lilly, 385 Mass. 41 (1982)." Wilson v. Commonwealth, 31 Mass. App. Ct. 757, n. 16 (1992); see also, Wilson v. Commonwealth, 413 Mass. 352 (1992); see also Matter of M.J. Kiley, Docket No. 86-15, Final Decision (April 16, 1987) (regulations "prohibit the construction of revetments and other coastal engineering structures except in limited circumstances when specified conditions are met.").

I conclude as a matter of law that the regulations mean what they say, the revetment may be allowed only when *required* to protect a pre-1978 *building*. 310 CMR 10.30(3). Revetments are not allowed simply to protect a bank from erosion. Coastal banks serve as a source of sediment to beaches, their erosion is part of natural coastal processes and it is the intent of the regulations to allow these natural littoral processes to continue unimpeded by coastal engineering structures.[9] I give weight to the factors identified by Mr. Mahala to determine whether a coastal engineering structure is required to protect a pre-1978 building properly, principally 1) the distance between the top of the bank and the structure and 2) the average annual erosion rate at

---

reconstructions of such buildings subsequent to the effective date of 310 CMR 10.21 through 10.37, provided that the following requirements are met:

(a) a coastal engineering structure or a modification thereto shall be designed and constructed so as to minimize, using best available measures, adverse effects on adjacent or nearby coastal beaches due to changes in wave action, and

(b) the applicant demonstrates that no method of protecting the building other than the proposed coastal engineering structure is feasible.

[9]As stated in the preamble, "Coastal banks composed of unconsolidated sediment and exposed to vigorous wave action serve as a major continuous source of sediment for beaches, dunes, and barrier beaches . . . . The supply of sediment is removed from banks by wave action, and this removal takes place in response to beach and sea conditions. It is a naturally occurring process necessary to the continued existence of coastal beaches, coastal dunes and barrier beaches which, in turn, dissipate storm wave energy, thus protecting structures of coastal wetlands landward of them from storm damage and flooding.: 310 CMR 10.30(1).

the site. Mahala PFT at para. 17. Secondary factors include the height of the bank, with higher banks more vulnerable to undermining, and the fetch, with a longer distance over open water allowing more vigorous wave action and a higher erosion rate. Mahala PFT at para. 17.

As to the distance between the top of the bank and the structure, although the numbers very slightly, the Glass house is undisputedly more than 120 feet from the top of the coastal bank. In evaluating the question of whether the revetment is necessary to prevent storm damage to the house, I turn to the evidence related to the asserted increase in the rate of erosion at the site since 2007. The parties agree that the water level in Pleasant Bay is higher due to the 2007 inlet in Nauset Beach, but disagree as to the extent of the increase. All parties appear to have relied on NOAA tide data, which was taken a gauge in Chatham Harbor as there is no station close to the Glass site. Mr. Okurowski stated that the tides were higher since the 2007 breach, with the "more frequent higher tides rang[ing] from one foot on a daily basis to over five feet in major storm events." Okurowski PFT, as corrected at hearing. At the hearing, he explained that references to an increase in tidal range were to an increase in water level above MHW, not to an increase in the range from high to low water. Okurowski Cross. The Data Analysis Summary appended to his testimony gave an increase in tidal range of approximately 1.5 feet in Chatham Harbor, which was not consistent with his testimony that higher tides range from one foot on a daily basis to five feet in major storms.[10] Okurowski PFT, Exh. 4. Mr. Okurowski testified that the project was located in a velocity zone, with waves of 3 to 6 feet and up to 5 to 10 feet in a storm surge, and that when storm events occur at high tide, the bank is eroded at an accelerated

[10] The Data Analysis Summary did not provide a basis for Mr. Okurowski's testimony that higher tides range to over five feet in major storm events, but it does refer to tides above 5 feet NGVD. Although none of the parties mentioned the discrepancy, the Data Analysis Summary was apparently prepared for John Nicolson, 19 Cow Yard Lane in Chatham, and thus the references to "the site" would appear to be to 19 Cow Yard Lane rather than the Glass property at 10 Sedge Lane. Cow Yard Lane is located to the south of the Glass site, much closer to the breach. The data Analysis Summary also evaluated the difference between actual and predicted NOAA data. Mr. Okurowski acknowledged that the predicted data reflected a 19 year timeframe, and thus did not materially reflect the 2007 breach. Okurowski Cross.

rate. Because he conceded that there was no material erosion prior to 2007, however, an accelerated rate of erosion would be any amount of erosion. Okurowski Cross.

Mr. Ramsey testified that the difference in MHW based upon NOAA data measured at the Chatham Fish Pier was an increase of .5 feet after the new inlet in 2007. He stated his opinion that .5 feet is "a measurable, but not substantial increase in MHW elevation." Ramsey PFT, para. 3. He disagreed with Mr. Okurowski's opinion that storm tides had increased by five feet; he believed that the change in maximum flood elevation would be similar to the change in MHW, or .5 feet. Id. Mr. Ramsey believed that the .5 foot increase in maximum tide elevations is not large enough to cause an increase in waves at the shoreline. He stated that the seaward extent of the bank was landward of the velocity zone, and therefore waves would be less than three feet rather than 3 to 6 feet as asserted by Mr. Okurowski. Ramsey, PFT, para. 2. Mr. Keon at the hearing agreed that after the 2007 breach high water was higher, about .5 feet higher, but would vary; at a recording tide gauge in April 2009 at Chatham Harbor, to the south of the Glass site, mean high water had increased by .25 feet, low water had decreased by .8 feet, with a mean change of about 1.1 foot increase in tidal range. Keon Cross. The changes in water levels in Pleasant Bay are expected, as the system reaches equilibrium. Keon Cross.

Based on the more specific testimony of Mr. Ramsey and Mr. Keon, I find that the NOAA tide data at the Chatham Fish Pier showing that MHW had increased by about .5 feet after the 2007 inlet provides a reasonable basis for a conclusion that the water level at the Glass site has also increased by approximately .5 feet. Ramsey PFT at para. 2; Keon Cross. Because the waves in Pleasant Bay are wind-generated and the fetch is limited and unchanged by the 2007 breach, waves heights would not increase substantially due to the increased water level. Ramsey PFT at para. 2. Based upon this persuasive reasoning, I find that the change in

maximum flood elevation would be similar to the increase in MHW, or an increase of approximately .5 feet. Although the water level in Pleasant Bay is somewhat higher than before the breach, there is no factual support in the record for Mr. Okurowski's contention that storm tides have increased by five feet due to the breach.

The parties agree that the higher water levels in Pleasant Bay will allow waves to travel further landward on the beach, therefore reaching the bank with greater frequency and increasing erosion to some extent. Keon PFT at para.7; Okurowski PFT; Mahala PFT at para. 16. The parties disagree on the significance of the increased water levels to the rate of erosion at the site. Mr. Mahala testified that the bank was only 7 to 8 feet high and the fetch was limited by Nauset Beach and the closer Strong and Little Simpson Islands, thus there was no likelihood the "bank would experience catastrophic failure leading to a threat of storm damage to the building." Mahala PFT at para. 19. Ms. Andres and Mr. Keon testified that erosion at the site appears to be episodic, meaning erosion caused by storm events, rather than progressive, meaning a continual chronic shoreline regression. Andres PFT; Keon PFT at para. 7. The parties generally agreed that the top of the bank had retreated very little over the last 20 years, and Mr. Okurowski did not claim that past erosion was progressive. Mr. Okurowski stated that the rate would be accelerated as compared to the rate prior to the breach and quantified the rate after the 2007 breach at one foot per year. Okurowski Cross. Mr. Keon did not believe there was a "rate" of erosion, because it was episodic in nature. Keon Cross. Mr. Mahala quantified a rate, when pressed at the hearing, at less than .1 foot per year, as an average annual rate from an historical perspective. All parties acknowledged that the future of breaches of Nauset Beach is unknown, but Mr. Mahala testified there is a likelihood that inlet movement will be southerly, away from the Glass site. Mahala Cross.

I find that the erosion at the Glass site will increase as a result of the 2007 breach, but the increase will result in more frequent occurrences of episodic erosion rather than progressive erosion, as described by the Chatham witnesses. I find that erosion under current conditions will be slow, and to the extent a rate can be calculated due to the episodic nature of the erosion, the rate will be low. Based upon the 2001 and 2010 photographs which reflect the instability resulting from the 2007 breach, the distance between the bank and the house decreased from 124 feet to 121 feet, which would translate into an erosion rate of three feet over 9 years or one foot per three years. Hearing Exh. 1. Even assuming the faster rate of erosion predicted by Mr. Okurowski, one foot per year, I find that the Glass house is not vulnerable to damage from erosion of the coastal bank for many decades, perhaps as long as a century, under current conditions in Pleasant Bay.

Accordingly, I find that a revetment is not required to protect the Glass house. Mr. Mahala testified that the Department had never allowed a revetment where a building was a similar distance to a coastal bank as the Glass house to this bank. Mahala PFT at para. 18. Even where the top of a coastal bank had eroded to within 10 to 12 feet from a house, the Department insisted that the design use best available measures to avoid adverse effects on adjacent beaches. Matter of Helen Valocin, Docket No. 97-028, Tentative Final Decision (March 12, 1998) (denying the proposed project but allowing the applicant to file plan changes). The Department has also required applicants to consider moving the building further landward. Id. Mr. Okurowski expressed concern about the potential for damage to the house from another, larger breach, hurricanes overtopping Nauset Beach, and sea level rise. These events may be likely or even certain to occur at some time, but do not provide justification for an exception to the Department's consistent past practice for Mr. Glass.

Nothing in the record suggests that the current state of erosion at the Glass site even remotely resembles the situation faced by a few property owners when the 1987 mile-wide breach occurred, exposing previously protected shoreline to the Atlantic Ocean. See Wilson v. Commonwealth, 31 Mass. App. Ct. 757, 758 (1992). Testimony indicates that the 2007 breach, which does not expose the Glass site to open water or otherwise cause the type of damage as occurred after the 1987 breach, is predicted to move southward, away from the Glass property. Mahala Cross. Even at the erosion rate predicted by Mr. Okurowski, a revetment would not be required to protect the house for decades, and at the rate estimated by the Department for centuries. But it is not necessary to predict the future, it is enough to conclude that at the present time the revetment is not required and may not be allowed. Should conditions change so that the facts support a finding that the house requires such protection, Mr. Glass then may apply for a revetment. To allow Mr. Glass to construct a revetment with a 120 foot setback from the bank and a speculative erosion rate of one foot per year would undermine the efforts of local and state government to reduce the potential for erosion for all waterfront property owners by avoiding wherever possible the installation of coastal engineering structures.

As to the question of whether there is a feasible alternative to the proposed revetment, it is clear from the testimony of the Commission and Department witnesses that either would approve the installation of fiber rolls with beach nourishment. Based on the testimony of Ms. Andres and Mr. Keon related to their experience with the use of fiber rolls with additional sand on the Town's adjacent lot, I find that fiber rolls are an alternative that will achieve the objective of stabilizing the toe of the bank. Although Mr. Glass sought a method that would be permanent and lower costs of ongoing maintenance, the fiber rolls would have less potential for adverse effects on adjacent properties. I find that the cost of sand, estimated at $6 per cubic yard by Mr.

Keon with the Town using 50 to 200 yards of its project on the adjacent lot, would not render beach nourishment infeasible. If the Department and the Commission would accept the installation of fiber rolls with beach nourishment as a plan revision consistent with the Plan Change Policy, this revised project could be permitted through this proceeding.[11]

The project must also meet the "no adverse effect" standard for the interests of storm damage protection and flood control related to work in an ACEC.[12] I accept the view of Mr. Mahala that denial of the SOC is consistent with the Pleasant Bay Resource Management Plan which urges the use of alternatives to "hard" structures be used "wherever possible." Mahala PFT at para. 22. Although Mr. Okurowski states that the addition of sand over the revetment will compensate for the armoring of the bank, it is not consistent with the policy objectives for the area of avoiding the "proliferation of hard structures." Mahala PFT at para. 22.[13] Mr. Mahala testified that the Department did not have a blanket prohibition on revetments in ACECs.

Finally, I conclude that the proposed work does not meet the performance standard for salt marsh, based not only on the testimony but also on the Applicant's plans.[14] Under the

---

[11]The revised plan should avoid impacts to salt marsh. Because this Recommended Final Decision has not been adopted, any revisions to the plan within this proceeding could be handled through the Commissioner's Decision. In the alternative, Mr. Glass could submit a new Notice of Intent to the Chatham Conservation Commission.

[12] 310 CMR 10.24(5)(b) provides:

> When any portion of a designated Area of Critical Environmental Concern is determined by the issuing authority to be significant to any of the interests of M.G.L. c. 131, s. 40, any proposed project in or impacting that portion of the Area of Critical Environmental Concern shall have no adverse effect upon those interests . . . .

[13]Ironically, Mr. Okurowski testified that the coastal armoring to the east of the Glass property caused waves to concentrate and accelerated erosion of the Glass bank. Okurowski PFT. Mr. Glass has proposed a revetment with the placement of sacrificial sand. While the placement of sand in combination with a revetment may cause fewer impacts to adjacent beaches than a revetment without added sand, the use of "soft" structures such as fiber rolls with added sand is the more benign project design.

[14] 310 CMR 10.32(3) provides:

> A proposed project in a salt marsh, on lands within 100 feet of a salt marsh, or in a body of water adjacent to a salt marsh shall not destroy any portion of the salt marsh and shall not have an adverse effect on the productivity of the salt marsh. Alterations in growth, distribution and composition of salt marsh vegetation shall be considered in evaluating adverse effects on productivity. . . .

definition of salt marsh, both *Spartina patens* and *Spartina alterniflora* are salt marsh plant species.[15] The Plan Showing Proposed Shorefront Protection, with the most recent revision on March 23, 2009 and provided at the hearing, Section A-A shows the extent of salt marsh as limited to the presence of *S. alterniflora*. There is unquestionably an area of *S. patens* in the area of the toe of the proposed revetment, where the plan states "Existing Spartina patens (to be replanted)." The plan notes state "Existing Spartina patens shall be replanted along the entire property shorefront from elevation 5.0' - 5.5' NGVD." Mr. Okurowski testified that sand would be beneficially placed over the *S. patens*. The "no adverse effect" performance standard for salt marsh is strict and does not include a clause allowing replication. Thus, the Petitioner has not demonstrated that this performance standard has been met.

CONCLUSION

I recommend to the Department's Commissioner that the denial of an SOC for the proposed revetment be sustained for the reasons stated. I recommend that, provided the Department and the Chatham Conservation Commission concur that a plan change would be consistent with the Department's Plan Change Policy, the Petitioner be allowed to submit revised plans for the placement of fiber rolls with beach nourishment at the site.

_____

Pamela D. Harvey
Presiding Officer

---

[15] Salt Marsh is defined as a "coastal wetland that extends landward up to the highest high tide line, that is, the highest spring tide of the year, and is characterized by plants that are well adapted to or prefer living in, saline soils. Dominant plants within salt marshes are salt meadow cord grass (Spartina patens) and/or salt marsh cord grass (Spartina alterniflora). . . ." 310 CMR 10.32.

NOTICE- RECOMMENDED FINAL DECISION

This decision is a Recommended Final Decision of the Presiding Officer. It has been transmitted to the Commissioner for his Final Decision in this matter. This decision is therefore not a Final Decision subject to reconsideration under 310 CMR 1.01(14)(e), and may not be appealed to Superior Court pursuant to M.G.L. c. 30A. The Commissioner's Final Decision is subject to rights of reconsideration and court appeal and will contain a notice to that effect.

Because this matter has now been transmitted to the Commissioner, no party shall file a motion to renew or reargue this Recommended Final Decision or any part of it, and no party shall communicate with the Commissioner's office regarding this decision unless the Commissioner, in his sole discretion, directs otherwise.