

Wetlands and Coastal Dune Board

Regular Session Agenda Cape Charles Civic Center – 500 Tazewell September 26, 2016 4:00 P.M.

1. Call to Order; Roll Call
2. Invocation and Pledge of Allegiance
3. Consent Agenda
 - A. Approval of Agenda Format
 - B. Approval of Minutes
4. New Business
 - A. None
5. Old Business
 - A. Approval of Final Public Beach Recommendations to send to Town Council
6. Announcements
7. Adjourn



Wetlands/Coastal Dune Board

Reconvened Meeting

Civic Center
August 25, 2016
6:00 p.m.

At approximately 6:00 p.m., Chairwoman Ann Hayward Walker, having established a quorum, called to order the Wetlands/Coastal Dune Board Meeting. Board members Russ Dunton, Joe Fehrer, Bill Prickett and Bob Roche were in attendance. Also present were Town Planner Larry DiRe, Town Clerk Libby Hume, Mr. Hank Badger from the Virginia Marine Resources Commission, applicants Mr. John Calder and Mrs. Beth Calder, and Mr. Wayne McCoy from Mid-Atlantic Environmental. There was one member of the public in attendance.

The Pledge of Allegiance was recited by all in attendance.

CONSENT AGENDA

Russ Dunton requested that discussion regarding next week's beach management meeting be added as Item 2A.

Motion made by Bill Prickett, seconded by Russ Dunton, to approve the agenda as amended. The motion was approved by unanimous vote.

ORDER OF BUSINESS:

JPA 16-0860 3 Bay Vistas Way – 184 Linear Feet of Revetment Stone and Beach Access Steps
Town Planner Larry DiRe summarized the activity regarding the Joint Permit Application (JPA) stating that an advertisement ran for two weeks in the newspaper and a public hearing was held on July 25, 2016. The only comments received was a report submitted by the Virginia Institute of Marine Science (VIMS). At the July meeting, the Board requested a supplemental VIMS report and recessed the meeting until such report had been received. The report was received on August 16 and distributed to the Board for review. In the interim, the applicants prepared a presentation which was also distributed to the Board prior to this meeting. The applicants were invited to speak.

Mr. Wayne McCoy thanked the Board for the continuance which allowed the applicants to coordinate with VIMS and Mr. Hank Badger for a site visit which was not done prior to the last VIMS report.

Mrs. Calder reviewed her presentation with the Board detailing the history of their efforts to protect their property from erosion. (Please see attached.) Mrs. Calder concluded by asking the Board for their approval of the proposed revetment to protect their property from future storms.

There was much discussion regarding the August 16, 2016 VIMS report (attached) and the Calder's revised plans increasing the size of the rock, increasing the depth of the toe and changing the slope of the revetment as recommended in the VIMS report.

Motion made by Russ Dunton, seconded by Bill Prickett, to approved the plans with the proposed changes as discussed. The motion was approved by unanimous vote.

Beach Management Discussion

The next meeting to discuss beach management was confirmed for Wednesday, August 31, 2016, from 3:00 p.m. – 5:00 p.m., in the Town Hall conference room.

There was much discussion regarding the following: i) Public Works Foreman John Lockwood was communicating daily with the contractor for the U.S. Army Corps of Engineers' (USACE) dredge project; ii) The contractor would be installing fencing on the beach after the dredging was completed and sprigging should be done in November; iii) The drawings did not show fence openings at the beach access walkways. The Board suggested "wing openings" at the walkways as suggested by Mr. Lee Perkins, Manager of Environmental Services for Beach and Sand Dune Management for the City of Norfolk, during his site visit on July 26. The fencing at Monroe Avenue was already done in this manner and could be shown to the contractor as an example; iv) Ann Hayward Walker and Larry DiRe had a conference call with the USACE on August 10 regarding specifications in the dredge contract. Methods of work were not specified and could possibly be changed as long as it did not result in a cost increase; v) The town should have reached out to Mr. Ryan Young of East Carolina University who had completed much work regarding the coast. The USACE had experts who were all engineers but trying to engineer a beach was different than a natural beach; vi) There was a lot of sand around the fishing pier that needed to be pushed out before the fencing was installed. The opening for equipment, which was closed up by the town, needed to be reopened; vii) The Board's concerns needed to be written down for review by the USACE and contractor; viii) After the contractor had completed the project with the installation of fencing and sprigging, the town would need to run a couple rows of fencing to trap the sand to keep it from blowing everywhere. There was much discussion regarding placement of the fencing; ix) The dunes needed to be wider and lower; x) John Lockwood already talked to the contractor regarding the installation of extra sand in the low area at Madison Avenue. It needed to be backed up by the elected officials to talk to the contractor and the USACE; xi) The Board needed to present a "wish list" to the town and the town needed to approach the USACE with the list; xii) The immediate need was the south end of the beach by the fishing pier; and xiii) Ann Hayward Walker would send an email to Larry DiRe and Town Manager Brent Manuel with the items that needed to be done in working with the USACE and contractor.

Motion made by Joe Fehrer, seconded by Bill Prickett, adjourn the Wetlands/Coastal Dune Board Meeting. The motion was approved by unanimous vote. The meeting adjourned at 7:11 p.m.

Chairwoman Ann Hayward Walker

Town Clerk

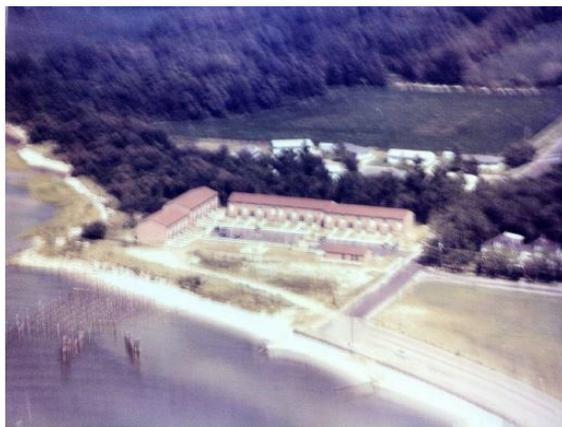
Revetment Request VMRC #16-0860

For the Consideration of the Cape Charles
Wetlands Board

Overview of the Calder's bay front lots

1985

Significant land has eroded behind the buildings since the Seabreeze was built, perhaps 200 feet where Bay Vistas is now located.



2

November 2010

The Calders purchased the lot next to the Seabreeze, last of the lots to be purchased. Escarpment was 4-5 feet high. This photo is low tide. In high tide the water reached the escarpment. Beach had eroded to its clay foundation. Scouring was evident at the Seabreeze end due to hardening of shore with riprap. Erosion is greatest on Calder's lot although significant erosion of entire beach began after installation of the Bay Creek breakwaters to the northeast.

The 3 lot owners sought approval for a stone breakwater. Approval granted in 2011 but the construction bid received was not affordable.



3

September 2012

Mid Atlantic Environmental was employed to find an affordable solution for the 3 lot owners plus the Seabreeze. The Wave Attenuation Device (WAD) was selected. The cost to build was 1/3 of the previously quoted stone breakwater. The Seabreeze's share, based on the linear footage, was approximately 1/2 and the 3 lot owners shared the remaining one half. WAD installation began in August.

To southwest, before WAD installation



To northeast. Bay Creek lot, which has a breakwater, also eroded.



4

November 3, 2012

a few days after Sandy. Water breached the escarpment and tore into the foundation of the Seabreeze. Notice all bushes and most of riprap in front of Seabreeze were washed away.



5

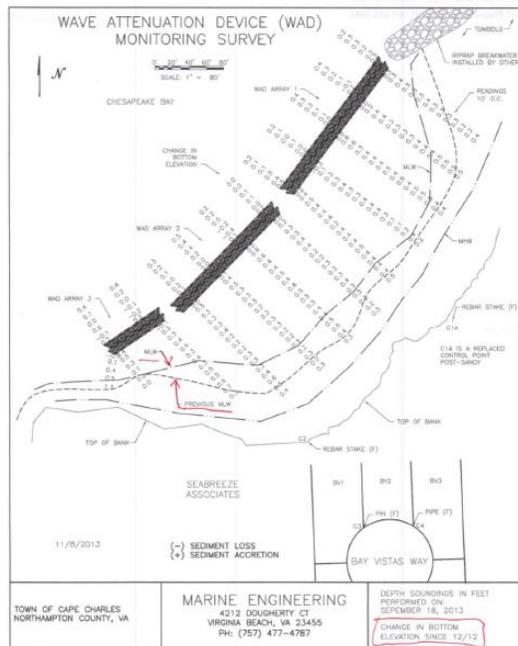
WAD Survey Sep. 2013

9/2012 compared to 9/2013

In one year:

>MLW moved seaward as much as 40 feet (compare the two MLW lines).

>Sand accreted as much as .7 feet.



6

November 2013

One year after Sandy and WAD installation. We noted that the beach had accreted a lot because it was deeper. Much of the riprap (see the Sept. 2012 photo) had become buried in sand. Per the marine survey (previous page) MLW had moved seaward significantly. The Seabreeze installed a concrete retaining wall.



7

June 2014

Beach was nourished.

June 2014, immediately after beach nourishment



Nov. 2015, after the October 2-5 storm. Retaining wall is exposed.



8

2015

American beach grass was planted in February and October of 2015. Beach had settled with a slight slope.



October 2-5, 2015 storm

Storm lingered 3 days, eating away at the escarpment. Water reached top of concrete retaining wall. 12-15 feet of beach grass lost. The strongest waves and greatest erosion are from the Seabreeze end where the WADs end. Waves are not broken at this end because the owner to the southwest of the Seabreeze did not participate in the WAD project.



Photo taken during break in storm. Water reached top of Seabreeze retaining wall.



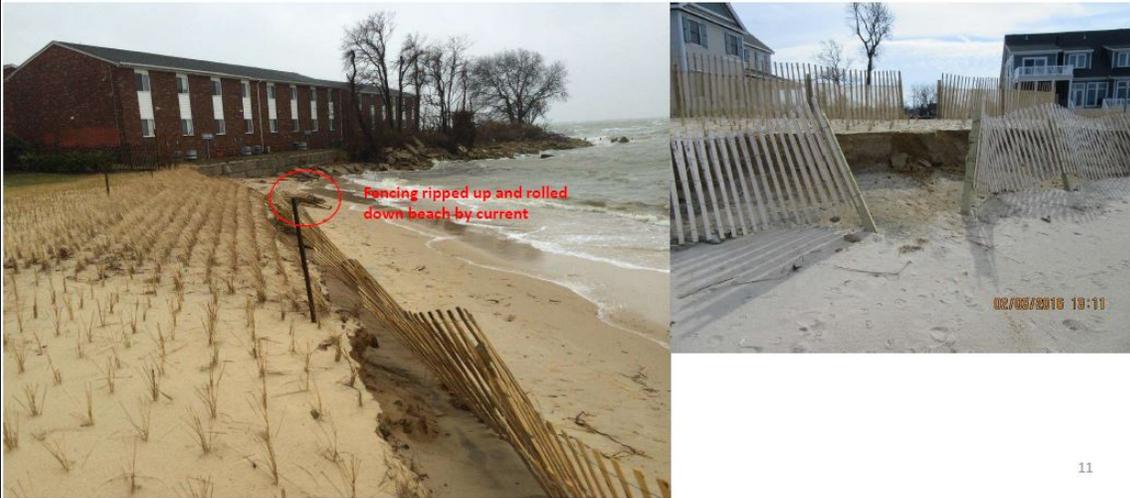
Escarpment moved 12-15 feet landward, 12-15 feet of beach grass lost.



Photo taken during break in storm. Waves strongest near Seabreeze.

Effect of January 22-23, 2016 storm

Sand fencing (double wrapped, with 4x4 posts) had been installed in October. It was completely ripped up on the lot next to the Seabreeze during the January storm. 2-3 more feet of beach grass was lost.



11

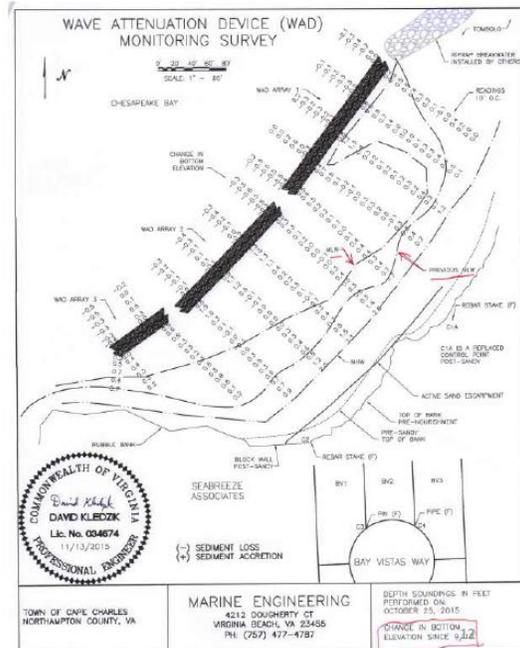
WAD Survey

9/2012 installation date compared to 9/2015.
Survey is after 2014 beach nourishment.

>MLW had moved seaward further in the southwestern side (compare 2 MLW lines).

>Additional sand accretion on southwestern side.

>A sort of tombolo has formed on the side near the stone breakwater where there is sand accretion as much as .9 feet.



VIMS report to Wetlands Board July 2016

Their recommendations are based on a 2012 photo (our house was not yet built) and do not consider our particular site challenges.

Recommendations:

- *add beach nourishment (done in 2014)
- *add marsh buffer: wave action is very strong due to north facing beach and vortex currents entering the beach from the southwestern most point of the WADs. A marsh area would be washed away in a minor storm.
- *America beach grass was added in 2015 and as much as 18 feet was lost in the Oct. 2015 and Jan. 2016 storms.

Sand fencing was installed in 2015 and much of it was ripped up or undermined.

Coastal Ecosystem Based Recommendation Details (16-0860)



If active erosion is occurring along this shoreline, the preferred approach for erosion control to preserve and maintain tidal wetland ecosystems is to:

- Maintain Beach OR Offshore Breakwaters w/ Beach Nourishment
- Enhance Riparian/Marsh Buffer

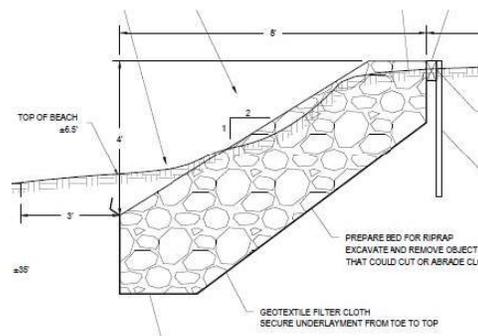
On-shore revetments sever the connection between the upland and intertidal area interrupting and/or eliminating natural functions to the detriment of the shoreline ecosystem. It would be beneficial to the tidal shoreline environment to maintain the connection between the upland and the intertidal area by not installing riprap and enabling the natural processes and connections dependent upon the water/sand continuum to occur, increasing the probability that tidal shoreline ecosystems will be sustained in the future.

VIMS Site Assessment August 2016

- Assessment
 - Calder property is in a geological transition zone, with breakwaters to the north and a vertical retaining wall and riprap to the south. These will continue to alter sand transport on the Bay Vistas lots such that the sand supply will be limited or even exhausted.
- Recommendation for a revetment
 - "Based on the current shoreline situation and recent events, a revetment is a reasonable alternative to additional beach nourishment. Since there are no coastal primary dunes on the Calder property, a revetment would have minimal impact to natural shoreline processes."

Revetment request

The side of our lot next to the Seabreeze is now only 30 ft. from escarpment.



15

Conclusion

We need a revetment to protect our property during a storm. Although the WADs break the waves they cannot provide protection from a high tide during a storm.

Our challenges:

- *the wave action is severe because we are north facing with a fetch all the way to Baltimore.
- *the wave currents are much stronger on the Seabreeze end of our beach. The waves enter our beach with force where the WADs end.
- *the storm waves swirl in a vortex in front of the Seabreeze due to the curve in the land which is armored with riprap and a vertical retaining wall. Our lot next to the Seabreeze is much more eroded than the other 2 lots.
- *the beach is not very wide, approx. 40 ft. to MHW. This is much less wide than that in front of the Bay Creek Marina beach, which also suffered erosion of its escarpment during recent storms.

Efforts and results to date:

- *WADs installed in 2012. There was significant movement seaward of the MLW and sand accretion on beach.
- *Beach nourished in June 2014. Most of the sand has been washed away.
- *In 2015 beach grass was planted, ½ has been washed away. Sand fencing was installed and ripped up in the January 2016 storm.

We hope with the WADs plus a revetment that the beach would remain stable. The escarpment has moved as much as 18 feet landward after the 2 recent storms. It is now 30 feet from our house. We need to be protected during storm tides. The revetment will protect our property from further erosion.

16

August 16, 2016

Mr. Hank Badger
Environmental Engineer, Sr.
Habitat Management Division
Virginia Marine Resources Commission
2600 Washington Avenue
Newport News, VA 23607

Dear Mr. Badger:

The Virginia Institute of Marine Science has completed the requested assessment of a proposed riprap revetment along a sandy Bay shoreline within the Town of Cape Charles (John Calder, VMRC #16-0860). Personnel from the Office of Research and Advisory Services and the Department of Physical Sciences Shoreline Studies Program contributed to this review. Our assessment involved a site visit, review of past shoreline stabilization projects at the Calder property and along this shoreline reach, analyses of natural and man-influenced historical shoreline dynamics, and analyses of appropriate alternative approaches to current and future shoreline stabilization.

The Calder property is located in a geological transition zone. Coastal primary sand dunes are located along the northern section of this shoreline, with a transition to sandy clay-based uplands at, and near, the Calder shoreline. The Calder shoreline was sprigged with American beachgrass (*Ammophila breviligulata*) after sand nourishment, which created a vegetated berm channelward of the upland scarp that functioned to control shoreline erosion (in conjunction with the offshore sill) that resulted mostly from storm waves and high water events. This feature was compromised by recent storms that contributed high amounts of wave energy and/or tidal inundation to Bay shorelines (these include three hurricanes (Irene of 2011, Sandy of 2012, and Joaquin of 2015), two tropical storms (Lee of 2011 and Andrea of 2013), and six other events of significant high waves and surge). A portion of the original American beachgrass plantings remain along the upland scarp, but appear stressed and are likely not contributing significantly to shoreline stabilization. The optimum environment for American beachgrass is semi-consolidated sand and therefore the sandy clay substrate under the thin layer of sand fill upon the scarp may be inhibiting growth and spreading.

The current local shoreline situation includes nourished breakwater fields north and south of the Calder property, an adjacent riprap revetment and concrete block bulkhead, and a sill constructed of WAD (Wave Attenuation Devices) units directly channelward of the Calder shoreline. These structures have influenced the shoreline and nearshore dynamics of this entire reach. Prior to the placement of most of these structures the Calder shoreline was consistently stable, containing small marsh headlands (similar to other sections of the shoreline north of the Calders) and a generally stable upland margin until at least late 2008. The eleven storms since then have contributed to the erosion of the upland scarp and (based on nearshore surveys) has deflated the shoreline and depleted the nearshore sand supply.

We understand that the WAD units were placed in their permitted location and configuration a few weeks prior to hurricane Sandy. Therefore, these offshore structures were in-place for six of the eleven storm events of significance since 2008. Hurricane Joaquin and winter storm Jonas were the only two storm events that occurred post-beach nourishment. Evidence provided by the applicant and the agent shows significant upland erosion occurring post-construction of the WAD units and also after the beach was nourished.

For typical Bay wave conditions and low- to mid- level storm events we foresee the combination of WADs and beach nourishment working effectively to control shoreline erosion. The continuing and significant erosion along the Calder shoreline is evidence that the WAD units and beach nourishment are not providing sufficient erosion control during larger storm events. Although it is not reasonable to expect any residential-level erosion control approach situated on the Chesapeake Bay mainstem to fully abate all levels of marine storm energy without consequence, a large proportion of the limitations of the current approach can be attributed to the low elevation of the WAD units coupled with their distance offshore. The ability for a substrate (sand, concrete, rock) to attenuate wave energy is primarily based on the elevation of the substrate in relation to the height of the storm tide and also the width of the substrate at the effective height. Most of the recent storm events that have affected this shoreline reach produced tide levels between five and seven feet above mean lower low water, significantly higher than the mean tidal range for Cape Charles of approximately two feet.

Based on the current shoreline situation and recent events, a revetment is a reasonable alternative to additional beach nourishment. Since there are no coastal primary dunes on the Calder property, a revetment would have minimal impact to natural shoreline processes. We do not expect the WADs (in their current configuration) to effectively trap sand that may move onshore or along the shoreline. Additionally, the structures north and south of the Calder property will continue to alter longshore sand transport to the degree that they greatly limit or exhaust any significant natural sand supply to the area landward of the WADs.

The current lack of beach sand due to losses of the nourishment material resulting from storm events is problematic even if a revetment is constructed due to the proposed design of the riprap toe. Cross-section plans show the toe above the elevation of mean high water, which creates a situation promoting the likelihood of toe scour and revetment failure during high water and wave events. If a revetment is deemed appropriate, we recommend the following modifications for consideration to improve function and reduce potential environmental impacts:

- (1) The stability of the revetment would be enhanced by significantly increasing the depth of the toe. It is common to place the toe below the mean low water elevation. If a clay substrate is located above mean low water, the toe can be situated a reasonable depth below the clay surface. For this shoreline situation, with a four- to five- foot scarp, a depth of at least one foot into a clay layer is recommended.
- (2) The revetment is proposed to be constructed of Class I stone at a 1.5:1 slope. For open Bay exposures we recommend either using Class II stone at the proposed slope and/or increasing the slope to 2:1.
- (3) To reduce the loss of beach habitat we recommend placing the toe of the revetment landward of the beach.

(4) Each of the above recommendations will result in a further encroachment into and upon the upland scarp and thus the planted American beachgrass community. However, since this community appears to be contributing little to the stability of the scarp we do not consider impacts to this area to be detrimental from a marine environmental perspective.

(5) The northeast end of the proposed revetment, which adjoin a neighboring property, may create conditions during high water and wave events that affect the stability of the neighboring shoreline adjacent to the revetment. The likely effects to the adjacent shoreline cannot be reasonably anticipated and are heavily dependent upon the nature of the storm event(s). There are limited remedial design and construction approaches, beyond those proposed, that can address the potential effects that a hardened shoreline may have on an adjacent natural shoreline.

Alternatively, the applicant's may wish to consider modifications to the WAD units that would increase their effectiveness against storm events. Shoreline protection would be enhanced by moving the WAD sills closer to the shoreline, reworking them into shorter features of higher elevation, and placing enough sand of appropriate grain size landward of the structures so that they (1) have the robust elevation necessary to absorb storm waves and (2) form a functional connection with the beach and upland.

Please contact me if you have questions or require additional information.

Sincerely,



Lyle Varnell
Associate Director for Advisory Services



DRAFT
Wetlands/Coastal Dune Board
Work Session
Cape Charles Town Hall
2 Plum Street
August 31, 2016
3:00 p.m.

At approximately 3:00 p.m., Chairwoman Ann Hayward Walker, having established a quorum, called to order the Wetlands/Coastal Dune Board Work Session. Board members Russ Dunton, Bob Roche, Joe Fehrer, and Bill Prickett were in attendance. Also present were Vice-Mayor Chris Bannon, Town Planner Larry DiRe and Assistant Town Clerk Tracy Outten. There were two members of the public in attendance.

Chairwoman Ann Hayward Walker welcomed the Board, Town staff and the members of the public to the meeting.

REVIEW OF RESEARCH MATERIALS, DOCUMENTS AND RECOMMENDATIONS DRAFT:
Discussion was based on attached materials.

NEXT STEPS:

Ann Hayward Walker would finalize the draft PowerPoint Wetlands/Coastal Dune Board recommendations to be presented to Town Council at an upcoming meeting.

Chairwoman Ann Hayward Walker thanked the Board, Vice-Mayor Chris Bannon, Town staff and members of the public for their time and adjourned the Wetlands and Coastal Dune Board Work Session.

Chairwoman Ann Hayward Walker

Assistant Town Clerk

Cape Charles Dune Board Recommendations – 3 Sept. 2016

Implement NOW before USACE fencing is installed

1. Town - Clear/move sand to make one access point for people and equipment next to the pier. Close the other one in the middle of the dune by filling in with sand. Leave the large flat area in front for gathering/picnic tables on the boardwalk side.
2. Town - Move piles of excess sand at the south end to fill shallow hole by Madison and any remaining to the north end but don't move sedge grass to other parts of the beach!!!!
3. Town - Spray/kill the sedge grass before it can spread and before it goes dormant – use Round up with dye. See photos of sedge on the next page (Ann Hayward Walker can identify); don't spray other plants. Joe Fehrer has the dye and can assist Public Works Superintendent, John Lockwood.
4. Town - Move volleyball courts seaward / away from the base of the dunes (100-200 yards SW)
5. USACE - Reallocate sand fencing so as to not block beach access walkways. Instead use the fence to define dune “wings” next to the walkway access points along the entire beach to prevent sand from blowing into the walkways. Town planner, Larry DiRe, to indicate on Sheet 6 of 14, dated 04 Feb 2016. Larry DiRe and Joe Fehrer to meet with Project Engineer as appropriate to clarify and/or indicate the location. Town to pile sand in the wings if needed before the grass is planted.
6. Suggest to USACE - install new sand fences seaward at least 20' seaward from the existing dune line, rather than at the toe of the existing dune as indicated on Sheet 10 of 14 dated 04 Feb 2016.
7. Town - Purchase now /order ABG to be planted later – need to order in advance so grass can be grown! (about \$70 for 1000 scrapes/plants; Norfolk source: Peter McClintock, Emerald Forest in Norfolk for ABG and other plants <http://www.emeraldforestnursery.com/>). Larry DiRe and John Lockwood to calculate number of plants needed (north end, widen .
8. Town – Identify volunteers to plant ABG in Jan.-Feb. Possibilities – schools, New Roots, others
9. Town - Close access at Neptune statue (fill in) and define single access for pedestrians and/or equipment at the foot of Washington Ave. near where the stones protect the outfall
10. Town – stop grooming/any mechanical activity in the upper beach near dunes ASAP

Implement after USACE installs fences and plants but before winter

1. Town - Install multiple rows of sand fencing at the south end (east-west) and north end to mitigate sand blowing during the winter in layout to be discussed with Board
2. Town – stay on top of keeping boardwalk, street/curbs, and all sidewalks clear of sand for pedestrian safety, e.g., Bay Ave. sidewalk in front of 1 Madison Ave. Deposit sand back on the north end of the beach. Ask Public Works Superintendent for a plan (Perhaps use Dan Dabinet's little bobcat to run up and down sidewalks with sand)

Implement during the winter (Jan. Feb)

1. Town – Plant ABG where thick grass growth is needed to create lower /wider dunes in the broad parts of the beach where people don't sit (photos available)
2. Town – stay on top of keeping boardwalk, street/curbs, and all sidewalks on Bay Ave. clear of sand for pedestrian safety, e.g., Bay Ave. sidewalk in front of 1 Madison Ave. Deposit sand back

on the north end of the beach. Ask Public Works Superintendent for a plan for sidewalks and winter fencing (Perhaps use Dan Dabinet's little bobcat to run up and down sidewalks with sand).

Implement in spring (Mar. – May)

1. Town - Fertilize ABG with 10-10-10. Need to check how often.
2. Town - For any newly forming dunes at the north end on boardwalk side, leave at least 5' buffer between toe of dune and the boardwalk
3. Town - Refine/replant street side of dunes (in 5' minimum path next to boardwalk). Visit Norfolk 27th St. demonstration garden for ideas. Town planner, board to develop a vegetation plan for the length of the boardwalk. Plant considerations:
 - a. Panicum amarum 'Dewey Blue' Switchgrass or beach grass is good on the street/back side of the dune (doesn't like salt and wind as much as ABG)
 - b. Other native vegetation, e.g., goldenrod
 - c. Remove Virginia creeper to simplify maintenance, plant other suitable plants

Other good practice recommendations - TBD

1. Town and board - Develop guidance about using mechanical equipment on the beach for equipment operators and train
2. Town and board - Develop signs/other things to educate public on dune benefits and values – why they should stay off

Photos of Japanese sedge – 8/30/16



Wetlands and Coastal Dune Board Staff Report

From: Larry DiRe 
Date: September 26, 2016
Item: 5A – Approval of draft final public beach recommendations
Attachments: Board's draft final report and recommendations to Town Council

Background

Over the past several years the Town has taken various steps as part of an overall beach sand management practices strategy. These include gathering data on dune height and using the public works department to perform regular cleaning and maintenance of the beach. Since March 2015 the Town public beach has been the deposit site for approximately 120,000 +/- cubic yards of dredge material as part of the US Army Corps of Engineers' federal harbor dredging project. While the dredging and material placement is completed, the final phase of the project will begin mid-December with sprigging the dunes.

The Wetlands and Coastal Dune Board met over the summer to study beach sand management practices in the wake of substantial beach sand wind erosion and accumulation on public streets and private residential properties along the beach front that occurred in spring 2016. The Board reviewed past and currently employed beach sand management practices. This review, along with consultations with subject area experts and practitioners, allowed them to draft appropriate recommendations to Town Council and provided an opportunity for residents' input into the scale of the sand wind erosion problem and potential practices to mitigate future erosion events.

Discussion

The attached document represents the draft final report and recommendations as requested by Town Council. The report describes scope of work, resources consulted, and methodology used for developing the draft recommendations. These draft recommendations to Town Council are classified based on the calendar of implementation, and assign specific tasks to be completed. Please review and amend as needed.

Recommendation

Following discussion provide direction to staff.

Public Beach Recommendations

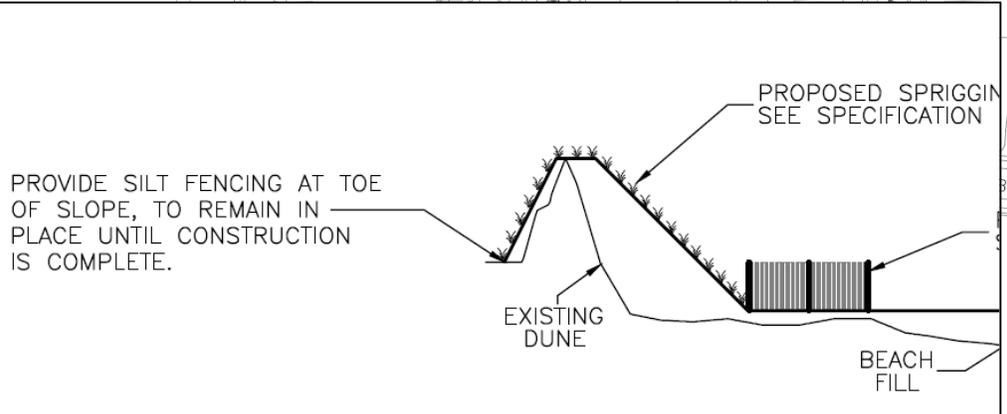
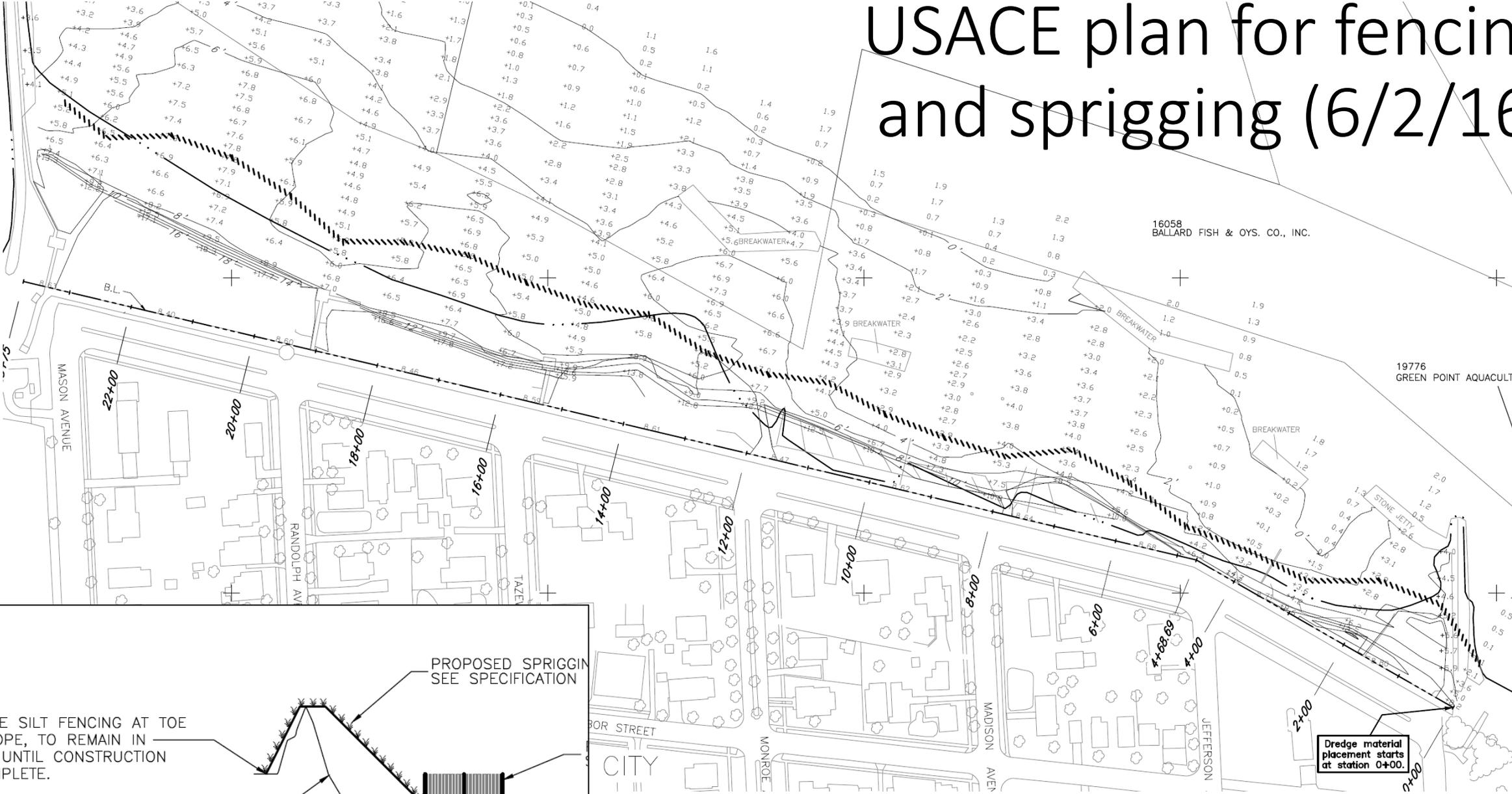
Cape Charles Wetlands – Dune Board

September 26, 2016

Background (Staff report 6/1/16)

- Over the past several years the Town has taken various steps as part of an overall beach sand management practices strategy. These include gathering data on dune height and using the public works department to perform regular cleaning and maintenance of the beach.
- Since March 2015 the Town beach has been the deposit site for approximately 80,000 cubic yards of dredge material as part of the US Army Corps of Engineers' federal harbor dredging project. The final phase in the current dredging cycle was carried out and an additional 30,000 cubic yards of dredge material was deposited at the north end of the beach.
 - USACE will install both fencing and sprigging as sand management practices following the deposition of dredge material (sand).
- The town asked the Board to review past and currently employed beach sand management practices and to make appropriate recommendations to Town Council:
 - Provide an opportunity for residents' input into the scale of the sand wind erosion problem,
 - Identify potential practices to mitigate future wind erosion events, and
 - Consider/identify possible synergies with the USACE sand deposition, fencing and sprigging.

USACE plan for fencing and sprigging (6/2/16)



Dredge material placement starts at station 0+00.

Our “Homework”

(Key references attached)

- Review of applicable guidance and science
 - Cape Charles Dune Ordinance (1994)
 - Cape Charles Comprehensive Plan (2009)
 - Town files for past dune/sand management monitoring and reports to FEMA
 - Virginia Dune Guidelines (1993)
 - Shoreline Evolution Chesapeake Bay Shoreline Northampton County, Virginia (VIMS 2004)
http://web.vims.edu/physical/research/shoreline/docs/dune_evolution/Northampton/NHShoreEvolutionReport.pdf NOTE: Cape Charles is “Reach II”
 - The Dune Book – North Carolina Sea Grant
http://www.seagrants.umaine.edu/files/chg/RogersNashdune_booklet.pdf
- Review of beach, dune, sand management plans of other coastal towns (approximately 23 plans, plus > 35 additional documents)
 - Ocean vs. sheltered/enclosed waters
 - Norfolk, Virginia Beach

VIMS Report (Hardaway, 2004)

Shoreline Evolution Chesapeake Bay Shoreline Northampton County, Virginia

- The Chesapeake Bay coast of Northampton County is very dynamic in terms of shoreline change and sediment transport processes.
- The overall net movement of sands along the coast is to the south. Long term trend for the county is about -1.0ft/year. Shoreline recession is the overall trend.
- Cape Charles = Reach II. Conventional thinking would indicate that the addition of large amount of sand from 1940s harbor dredging would enhance and provide large volumes of sand to the southern, “downdrift” shorelines, possibly even causing more infilling to Old Plantation Creek. It appears, however, that the opposite has happened. The dredge material has moved mostly offshore to form a large shoal which, in turn, may have impacted the local wave climate. The sand fill has been reduced but remains a significant headland.



Additional Activities

- Public input
 - Information Meeting – June 15, 2016
 - Questionnaire
- City of Norfolk Rep Visit – July 26, 2016 (with Board)
 - Pre-sand deposition
- Board working sessions – June 1, July 20, August 31
- Board beach walks – 10, 19 Sept. 2016
 - Post-sand deposition and post-fence installation

(Town logo)

Wetlands and Coastal Dune Board—Public Comment—Sand Management

June 15, 2016

Please take this opportunity to express your thoughts, interests, and/or concerns regarding the management of the sand and dunes along the public beach in our town of Cape Charles, VA. We look forward to reviewing your comments and thank you for your interest in our community!

Name: _____ (you can choose to remain anonymous)

Address: _____

How long have you lived in/visited Cape Charles? _____

- 1) How is the beach important to you?
- 2) Has the blowing sand and/or dunes affected your property or business? If so, how?
- 3) What questions or concerns do you have regarding the sand dunes, given the dynamic nature of sand movement by high winds and storm surge?
- 4) Do you have any historical observations about the beach, sand, and/or dunes that you believe are important to future planning?
- 5) Other comments, suggestions:

Relevant Language from the CC Comp Plan

(no particular order)

- Protect public beach from degradation (continue with beach nourishment) for present and future generations
- Preserve the integrity of and accessibility to the water's edge
- Control dune, beach and shoreline erosion
- Enhance the beach as an amenity for residents and visitors
- Protect amenity - views of beach (and harbor)
- Natural erosion of the shoreline must be abated to maintain the safety of the residents' homes, welfare and recreational opportunities
- Protect and preserve the coastal dunes
- Establish a plan for funding continual maintenance and sand replenishment of the beach

Multiple Town Goals and Priorities

(some competing priorities)

- Make the best of the USACE beach nourishment opportunity
- Town beach is known for sunset views – especially at north end
- Beach is vital town asset (both resident recreation and tourism-based economy)
- Sand management - Maximize sand retention on beach, prevent sand migration landward to Bay Ave.
- Dune management - Stabilize dunes for wave attenuation and protection of public property by low, wide dune profile going forward
- Implement actions to avoid jeopardizing FEMA funding when needed after storms

Noteworthy Points from Review

(Public questionnaires scanned & attached)

- Highlights of public questionnaires (7 returned)
 - Importance of view; dunes block view; need to keep sand off streets, sidewalks, and property; sand has caused property damage and blocked beach and fishing pier access; diminished view; preferred height of dunes (some suggested NTE 3' above boardwalk); disbelief of dunes preventing danger from storms; also some recognized value of dunes and to keep people off them
- City of Norfolk, Manager of Environmental Services (30+ years beach and dune mgmt.)
 - Bay front shore; similar beach/sand/dune management issues, including dunes blocking view by adjacent traditional houses
 - Difference – public boardwalk and street is next to dunes, then houses
 - Provided specific guidance points for managing the sand, beach, and dunes
 - **The essential value of dunes is to attenuate waves and mitigate damage.**
 - **In case of Cape Charles – protect public property of boardwalk and street**

About Dune Height

- The Board has given serious consideration to citizens requests for establishing a set dune height, e. g, 3' above boardwalk which is 8.5' above sea level, to be maintained
- After reviewing the many gathered plans, guidelines, and studies, as well as speaking with both scientific (Scott Hardaway at VIMS) and practitioner experts (Lee Perkins, City of Norfolk), this board is unable to justify the lowering of existing dunes to a specific height
 - Leave existing dunes, extend them seaward AND PLANT with American Beach Grass (ABG) to trap sand on beach and prevent the dunes from becoming taller

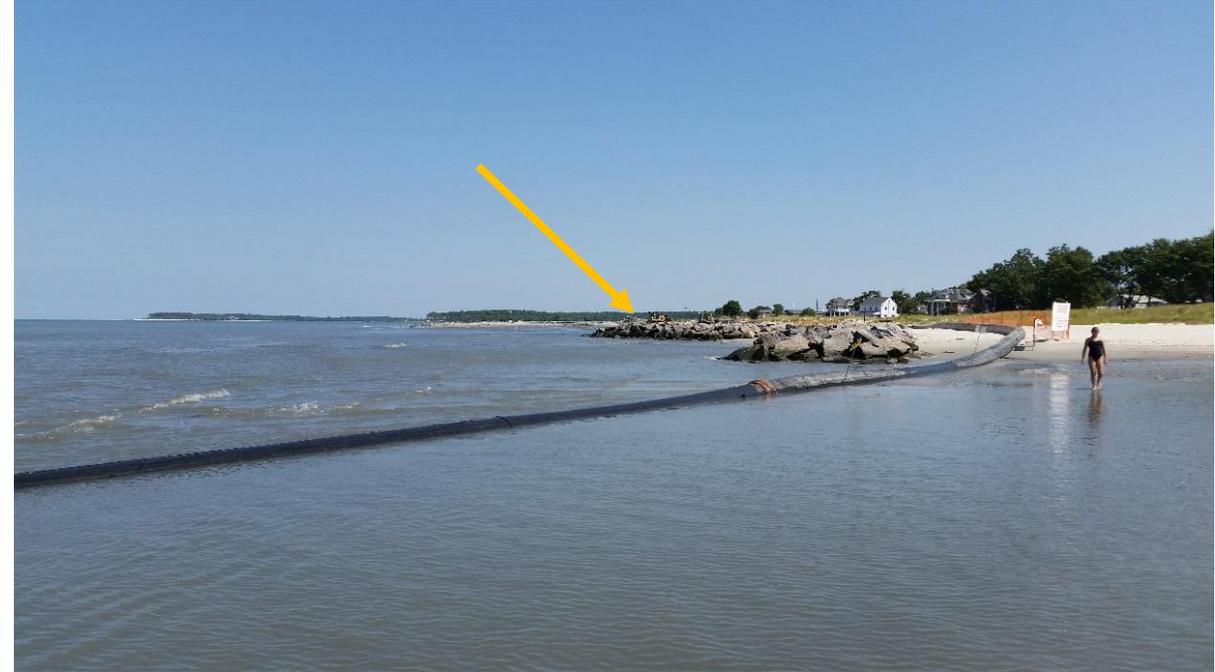
Beach and sand movement is dynamic, therefore

- Beach sand needs continuing management and nourishment
- Dunes with plants help stabilize sand migration landward

8/9/2015



8/30/2016



Considerations and Observations

- Public uses beach at water's edge, not the entire beach face
- There is adequate space to extend low dunes to mid-beach to help retain sand and prevent sand migration (as Norfolk has done successfully)



Looking north from Monroe Ave.



Looking south from Monroe Ave.

Norfolk has extended dunes seaward, lower and wider, to attenuate wave damage and stabilize sand



East Ocean View



East Beach dunes 2004

City of Norfolk – Approach and Results



About Dune Plants

- American Beach Grass (ABG) is best for seaward side of dune
 - Cost is about \$70 for 1,000 plants
 - Planting density – Plant 9” deep, and 3 colms minimum per hole (they compete to take hold) – promotes thicker growth faster
 - Best time to plant – Jan-Feb; they should hit their peak growth by the end of June. Takes about 3-5 years for ABG planting to mature.
- Other plants for the landward side
 - Panicum amarum 'Dewey Blue' Switchgrass or beach grass is good on the street/back side of the dune (doesn't like salt and wind as much as ABG)
 - 3-leaf vine is dune bean



Invasive Plant at South End

Japanese Sedge –photo below from town beach (7/26/16)

Root secretion kills ABG



Spike grows, hardens, is a safety hazard



Eradicate Japanese Sedge by Round-up (See Norfolk slides 111-119)

Photos on CC beach 9/10/11



Immediate Recommendations – page 1

(Prior to USACE planting of ABG, which will be “no earlier than Nov. 15” per ERM Planting Plan)

1. Town – To protect pier from drifting sand, make permanent access for people and equipment next to the pier. To do this, adjust the new sand fence to the new permanent access opening (away from the pier and against the toe of the dune) NO LATER THAN NOV 1st.
2. Town - Close the existing access between Mason and Randolph by adjusting the new sand fence to be in front of it NO LATER THAN NOV 1st (optional – fill in the gap in the middle of the dune with sand). Leave the large flat area in front for gathering/picnic tables on the boardwalk side.
3. Town – Adjust new sand fence at Jefferson to open access pathway there NO LATER THAN NOV. 1st.
4. Town - Close access at Neptune statue (adjust new sand fence and fill in); also widen access for pedestrians and equipment at the foot of Washington Ave. (near where the stones protect the outfall) NO LATER NOV. 1st
5. Town - Move volleyball courts away from the base of the dunes to the south and higher areas with more sand NO LATER NOV. 1st
6. Town – At Madison Ave., extend sand fences and angle access walkway away from the north winds NO LATER NOV. 1st

Immediate Recommendations – page 2

(Prior to USACE planting of ABG, which will be “no earlier than Nov. 15” per ERM Planting Plan)

7. USACE request for clarification. Paragraph 2 of “Installation Summary early to mid winter” - there is no dune per se, therefore suggest to clarify to contractor to vegetate from boardwalk to fence for the area from Stations 0+00 to 6+00
8. Town - Remove temporary silt fence at north end when the USACE begins planting so area can be completely planted
9. Town - Purchase now /order ABG to be planted later – need to order in advance so grass can be grown! (about \$70 for 1000 scrapes/plants; Norfolk source: Peter McClintock, Emerald Forest in Norfolk for ABG and other plants <http://www.emeraldforestnursery.com/>) ; also see suppliers in USACE Planting Plan. Larry DiRe and John Lockwood to calculate number of plants needed.
10. Town – Spray to kill the sedge grass ASAP before it goes dormant. Use Round up with dye. See photos of sedge on the next page; don't spray other plants. Joe Fehrer has the dye and will accompany Public Works Superintendent, John Lockwood.

Recommendations to implement fall 2016, prior to Jan. 15, 2017

11. Town – To prevent sand from blowing into the pier and harbor, install 3-4 rows of sand fencing running east-west mid-beach (not all the way to the water) between Randolph Ave. and the jetty, just for the winter months. Remove this fence before beach season.
12. Town – Monitor the sand at the north end. If it starts to blow and move, install silt fencing to mitigate sand blowing during the winter, in layout to be discussed with Board
13. Town – Identify volunteers to plant ABG in Jan.-Feb. Possibilities – The Nature Conservancy, schools, New Roots, others
14. Town – Public Works Superintendent to develop a winter sand maintenance plan, with Board review, to keep sand out of street, clear sidewalks, and install winter fencing

Final Recommendations

Recommendations for Jan. - Mar. 2017

page 1

15. Town – Plant ABG where thick grass growth is needed to create lower /wider dunes in the broad parts of the beach (photos on slide 12).
Board will provide recommendations on locations needing more ABG.
16. Town – According to the plan (Rec. #14), stay on top of keeping boardwalk, street/curbs, and all sidewalks clear of sand for pedestrian safety, e.g., Bay Ave. sidewalk in front of 1 Madison Ave. Deposit sand back on the north end of the beach.
 - This is not the responsibility of property owners!
17. Board/Town – Review City of Norfolk slides 46-48 at <http://www.norfolk.gov/DocumentCenter/View/20818> for details on plant cost (and other slides for related issues, benefits, access)

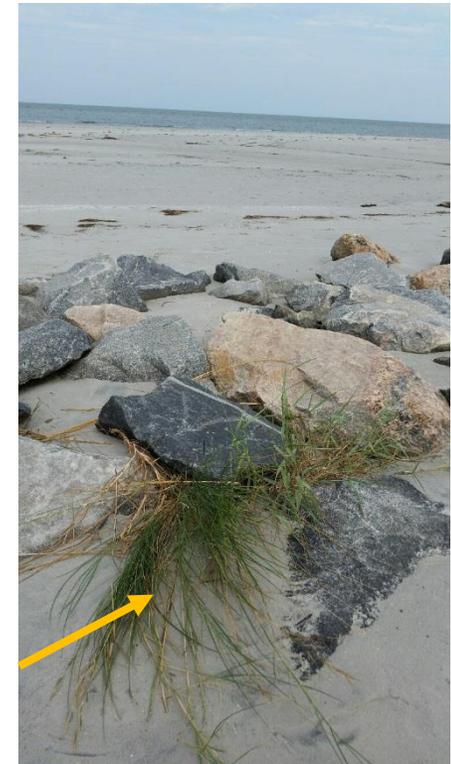
Recommendations for Jan.- Mar. 2017

page 2

18. Town – Purchase 1000 *Spartina patens* springs to catch sand and build up beach in low area between Monroe and Madison Aves. (which is prone to over wash, e.g., storm on 9/3). Board (Dunton lead) to assist with planting a 4' strip of *Spartina patens* seaward about 35' dune.

- This grass will tolerate salt water which ABG will not.
- This will give ABG space and time to extend seaward and build lower, wider dune.

One small patch of *Spartina patens* is on beach in that area now. Photo 9/10/16



Recommendations for Spring and Summer 2017

19. Town – Stop grooming/any mechanical activity in the upper beach near dunes; grooming lower beach by the water is OK during the summer season
20. Town - For any newly forming dunes at the north end on boardwalk side, leave/clear at least 5' buffer between toe of dune and the boardwalk
21. Town - Refine/replant street side of dunes (in 5' minimum path next to boardwalk). Town planner, Board to develop a vegetation plan for the length of the boardwalk. Example plant considerations:
 - Panicum amarum 'Dewey Blue' Switchgrass or beach grass is good on the street/back side of the dune (doesn't like salt and wind as much as ABG)
 - Remove trumpet vine that is encroaching on boardwalk to simplify maintenance, plant other suitable plants
 - Review Norfolk guide, visit 27th St. demo site for ideas about plants (next slide)
<http://www.norfolk.gov/DocumentCenter/View/3830> .

Additional Recommendations – page 1

22. Town – When any excess sand is recovered, deposit on the north end
23. Town and board - Develop good practice guidance about using mechanical equipment on the beach for equipment operators and train, e.g., avoid emerging vegetation on beach
24. Plan and budget (equipment and labor) for ongoing maintenance - routine, preventative and proactive before storms, e.g.,
 - Keep boardwalk, streets/curbs, and sidewalks clear of sand (not the responsibility of property owners); perhaps rent Dan Dabinet's small front end loader
 - Annual planting of ABG as needed
 - After the tourist season, let beach naturalize over the winter (don't remove seaweed)
 - Budget for regular sand nourishment (regularly groom USACE spoil area to sustain as viable sand supply source, or sell and designate those funds for sand renourishment)
25. Town and board to develop new signage with positive wording (e.g., respect the dunes) and roped paths to protect dunes from foot traffic and mechanical equipment

Additional Recommendations – page 2

26. Update the Cape Charles Wetlands and Dune Board charter
 - Board to suggest wording in response to Councilwoman Natali's request, e.g., establish Beach Advisory Board to provide beach status report at the end of the tourist season (September) and at the end of the winter season (March) to advise before the summer season.
27. Town should develop a beach/sand/dune management plan
 - Board is willing to develop an initial suggested outline
 - Include recommendations for ongoing beach nourishment
 - Review gathered references and plans from other areas (provided by Board)
28. Ask USACE for their dune survey data; share with VIMS
29. Ask VIMS for a cost estimate to routinely monitor (and recommend frequency) the beach and dunes using their established GPS stations, the timing should mesh with the beach status report (Rec. #26)
30. Plan for/budget to construct dune-appropriate (open pile) walkways across the dunes