

ATTACHMENT A

ADJACENT PROPERTY OWNERS NOTIFIED IN PUBLIC NOTICE PROCESS

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OTHER INTERESTED PARTIES

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Mark, Annette, and Brooke Batson
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Steve Andraka
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Cindy Shay
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Francesca Cartwright
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Steve Hill
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Tom and Francie McCollum
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Cliff and Tina Rose
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Public Hearing Report Attachment B

Regarding Tidal Wetlands License Under COMAR 26.24.01.05.H.

<u>Application No.:</u>	17-WL-0367	<u>Date:</u>	January 22, 2018
<u>Applicant:</u>	James and Janet Clauson	<u>Time:</u>	6:00 PM
<u>MDE Staff</u>	Andrew May April Field Heather Hepburn	<u>Location:</u>	Severn Community Library 2624 Annapolis Road Severn, MD 21144

*Advisory: This report and its attachments reflect only the statements, comments, and questions made during the public hearing and following comment period. **This hearing was recorded and this report is based upon personal notes taken by the Hearing Officer and Department Staff during the hearing.** It does not represent any statement of fact by the Department, or a decision to recommend approval or denial of a license to the Board of Public Works.*

1. Hearing Opened: Andrew May, of MDE, serving as Hearing Officer, opens the Hearing at 6:00 PM. Presented overview of hearing purpose, authority and procedures, in accordance with COMAR 26.24.01.05.
2. Elected Officials Present
 - None
3. Opening Presentation by Applicant

Presenter

- Underwood and Associates, Agent to the Applicants, James and Janet Clauson and Diane Lawrence. Underwood and Associates was represented by Keith Binstead and Heather Johnson.

Main Points

- Project proposes to construct five tombolos on the channelward side to protect sand and plants.
- Designed to divert and break waves, which will protect the shore and dissipate energy.
- Designed to capture sediment drifting towards the south side of the project (towards Fox Creek).

- Woody debris used to lessen extent of project and to also divert and break waves.

4. Questions and Comments

The hearing was well attended (See Attachment **A**: Interested Parties List) and many attendees spoke. The majority of the statements were in opposition to the project. The following is a summary of all comments and questions presented at the hearing and during the comment period ending on February 21, 2018. Please see “Attachment **C**: Public Hearing Notes” for a detailed compilation of notes taken by the Hearing Officer and staff during the hearing.

General Questions Regarding the Project: The Hearing Officer began by soliciting questions directly related to the proposed project. The Agents responded to several of these statements. Their responses have been included where appropriate and are in italics.

- Does the project cross onto Mrs. Lawrence’s property?
Applicants’ agent answered that the proposed project crosses onto Mrs. Lawrence’s property.
- During Underwood and Associates’ presentation, it was stated that they had designed and constructed similar types of projects. Has the agent designed a project with similar fetch and wave action? Does this project have the integrity to withstand the fetch?
Applicants’ agent stated that they would not be able to answer that question during the hearing. They would provide a response to MDE at a later date.
- What happens if the project fails during a hurricane?
The Agent responded that the proposed project has been designed to withstand the 100-year storm. Agent believed that a 100-year storm would be similar to a hurricane.
- Why are the Applicants choosing to protect their shoreline now, but were against restoration in the past?
The Agent responded that they did not have an answer at this time.
- What does Underwood and Associates do? What are their credentials and background?
The Agents provided a background of the company. They discussed their focus on stream restoration and shoreline projects. Additionally, the company works between Washington D.C. and the Eastern Shore, with a focus on Anne Arundel County.
- How many project like the proposed project has Underwood and Associates done? How many of those projects have failed?
Agent is not want to guess the total number of projects, but have not had a project fail. Projects often incorporate adaptive management. Similar style projects usually need small adjustments after construction. This adaptive management usually includes small adjustments like moving some cobble and additional plants.
- Will Underwood and Associates remove sediments in the channel?
The Agents were unable to provide an answer for that during the hearing.

- Have the agents considered constructing a jetty to capture drift?
Agents answered that is the intention of the larger tombolo at the end of project, before the creek inlet.
- Will there be vegetation planted on the cobble along edges of tombolos? Will the cobbles be a navigation hazard?
Agent answered that there would be vegetation on the cobble on the edges of the tombolos. The nearest tombolo will be 80 feet from the dredge channel and will not be a navigation hazard into the inlet.
- Is Underwood and Associates willing to redesign if Fox Creek expert recommends a design change?
Agent stated that the project is still in the permitting process. MDE and the Army Corps of Engineers can still ask for design changes.
- Would Underwood and Associates be willing to use a Coastal Engineer?
Agent stated that they would need to talk to their supervisors.
- Was a wave analysis done at the site?
Agent stated that they were unsure if a wave analysis had been done.

Project Comments Summary: In general, the parties attending the hearing and making comment to the Department were against the project. The primary concerns involved the stability and integrity of the proposed Living Shoreline and impacts to navigation of the dredge channel at into Fox Creek. Any corresponding responses made by the Applicant, Agent or Hearing Officer are summarized below in italics.

- Design and Stability of Living Shoreline: Comments included concerns regarding specific aspects of the design and the potential for failure of the Living Shoreline and Phragmites removal area, which may result in the failure of the adjacent slope. Commenters also expressed concerns that site characteristics would not allow for the establishment of marsh vegetation. Multiple members of the Public expressed support for shoreline erosion control, but do not want the project constructed in a manner that may fail.
- Existing Dredge Channel into Fox Creek: Several comments expressed concern that the plans do not include protection of the existing dredge channel into Fox Creek and failure of the project would result in loss of access and riparian rights to property owners on Fox Creek. Additionally, members of the Public did not want the proposed project to impact their existing use of the channel and want assurances of protection of the channel.
Hearing Officer Response: State Decision stands regarding the License to dredge the channel into Fox Creek.

- Depiction of Existing Dredge Channel into Fox Creek: Several comments included concerns that the existing dredge channel was not depicted on the plan sheets that were included with the Public Notice letter. Additionally, the revised plan sheets, which include the channel, do not have accurate water depths. Do not want inaccurate water depths in the channel to become an official record of the channel's conditions.

Agent Response: There was no malicious intent for not including the channel on the plan sheets. One of the project goals is to provide continued navigable access to the channel. Underwood and Associates will work with MDE to make the plans more readable. The channel has been added during revisions.

MDE Response: The channel is relevant and has been added to the plans. Regarding the water, MDE's previous decision regarding the dredge channel stands and we acknowledge Fox Creek Association's Licenses.

Hearing Officer Response: The Department believed that the dredge channel was a relevant feature and it has since been added to the plans. Additionally, the legally defining depth that was authorized by the State and the Corps is acknowledged.

- Impacts to Resources: A member of the Public indicating that the plans depict mapped submerged aquatic vegetation (SAV) and Fox Creek Association's dredging permit includes time of year restrictions for SAV and oyster bars. This comment also stated that regulations do not allow for mitigation for impacts to SAV and/or resource trading.
- Comments in Support: Mrs. Clauson spoke in support of her project. She stated that the purpose of the project is to protect the eroding cliff and keep the channel into Fox Creek open. She anticipates that the project will succeed, but if they do nothing the cliff will continue to erode. After the project is complete, you will not see the existing revetment or bulkhead. She understands that they could request additional revetment, but have seen the impacts of these structures downstream. She is grateful that living shorelines are an option today and that they are continually evolving and getting better. Similar projects have been done, but each one needs to be designed to the specific site.

5. Hearing Closed

- a. Participants notified that comments are due by 5:00 PM on Monday, February 21, 2018; must be post marked by that date or via email.
 - i. Member of Public requested a 28 day comment period in order for the project to be reviewed by a Coastal Engineer. This request was granted by the Hearing Officer.
- b. The Department may request additional information from the applicant.
- c. Hearing is adjourned by Andrew May at 7:05 PM.

6. Comments Received after Hearing: Additional comments were submitted to the Department after the Public Hearing. Many of these comments were similar to those submitted during the

Hearing. Comments received were both for and against the project. The primary comments that were in support of the application included the enhancement of habitats, stabilization of the shoreline, and prevention of further accretion in Fox Creek. Primary comments against the application included the design and stability of the project, notice provided to property owners in Fox Creek, impacts to resources, impacts to coastal processes and water quality, and riparian rights. The comments received by two Coastal Engineering Firms are included as Attachments **D and E**, and are not summarized below. Mr. Scott Hardaway of Coastal Design PC reviewed the project on behalf of Fox Creek Association. Mr. Al McCollough of Sustainable Science LLC reviewed the project on behalf of the Applicant. Comment received after the Hearing that differ from or expand upon those received at the Hearing are described below.

Support:

- Enhancement of Coastal and Marine Habitat: Comments were submitted in support of the objectives of the project, which include the enhancement of coastal and marine habitats. According to commenters, this project provides a scarce living shoreline and soft beach strand on the Severn River. The proposed project will prevent the continuous erosion of fine sandy loams from the side that prohibits the regeneration of SAV. According to these comments, a marginal improvement to preventing the sandy loams from entering the water column will result in a significant resurgence of SAV. Currently, there are SAV barren bottoms directly in front of the eroding cliffs on the project site.
- Shoreline Stabilization: Commenters submitted comments in support of the stabilization of the shoreline. As stated above under “Enhancement of Coastal and Marine Habitat”, comments stated that the proposed project will prevent the continuous erosion of fine loamy sands into the Severn River. Additionally, the proposed project supports Maryland’s Living Shoreline Act and a property owner who is willing to bear the expensive cost of protecting their property with a living shoreline, instead of armoring the shoreline, should not be denied. The proposed project will have the added benefit of removing existing stone revetment and bulkhead.
- Prevention of Further Accretion in Fox Creek: Commenters stated that the proposed project will allow for the stabilization of Fox Creek and will not obstruct it. According to comments provided, the project will prevent further accretion of heavier grained soils into the entrance of Fox Creek. Once the adjacent cliffs are stabilized, the channel will stabilize or even improve in a subsequent sand starved high energy regime.

Against

- Coastal Engineer Recommendations:
- Design and Stability of Living Shoreline: Members of the public expressed concerns about the stability of the proposed design for the living shoreline and marsh enhancement area.
 - Phragmites/Sand Spit: Some of these comments were associated with the proposed activities on the existing Phragmites marsh on the sand spit.

Commenters were concerned that the sand spit will be unstable during regrowth of marsh vegetation after the Phragmites has been removed, there is no provision in the plans to maintain the boundary of the spit and stop migration of materials into Fox Creek, the project will directly encroach into the dredge area, and the sand spit is not accurately depicted on the plan sheets.

- Stability of Living Shoreline: Commenters were also concerned about the short-term and long-term stability of the proposed living shoreline. According to one member of the public, Underwood and Associated did not provide information regarding whether the construction material would be sufficient to provide adequate protection from a severe storm. These comments pertained to the ability of the cobble and woody debris to maintain stability while root systems develop and that plant roots are the only method proposed to stabilize the planting mix and cobble. Furthermore, they are unsure of the effectiveness of woody debris over the long-term because it has not been previously proposed in a similar high energy environment. A comment was also received regarding the slope and stability of the proposed rock outcrops.
 - Survival of Marsh Vegetation: Other comments expressed concerns about the survivability of the marsh plantings. These comments stated that low marsh typically does survive in breakwater systems, the low marsh will wash out, and the planting will not survive due to the fetches, waves, and boat wakes.
 - Other Design Elements of Living Shoreline: Other commenters had concerns or suggestions regarding the design of the living shoreline. One member of the public asked if the north east vector had been taken into consideration during the design of the project. Another member of the public was concerned that the plan underestimate the 15 mile fetch and the effects of constant wave action from significant boat traffic. Also, a commenter who understood that by its nature a living shoreline includes the filling of tidal wetlands, suggested minimizing the amount of fill by reducing the channelward encroachment and not placing fill in the area that is currently protected by existing revetment and bulkhead.
- Notice Provided to Affected Property Owners: Commenters expressed concerns that all of the property owners along Fox Creek were not notified during the Public Notice of the proposed project.
 - Impacts to Resources: Multiple comments were received in regards to potential impacts to natural resources, including SAV, oysters, and anadromous fish. According to a commenter a post-bathymetric survey was completed for Fox Creek Association's dredging License. This survey noted that there was an area of SAV adjacent to the Applicant's shoreline. Additionally, the project is located in a historic SAV bed and that two SAV surveys should have been completed at the project site. Comments included concerns that the project would impact shallow water habitat and destroy a documented SAV bed that provides nutrients and habitat to fish and crustaceans. Fish may also be impacted by loss of access to Fox Creek. Comments also noted that the project is located on the Severn River, which is designated as a Scenic and Wild River. They stated that the project would not maintain the scenic and wild river.

- Impacts to Coastal Processes and Water Quality: Comments were received regarding potential changes to water quality and coastal processes along the Applicants' shorelines and in Fox Creek. Commenters expressed concerns that flooding in Fox Creek during storm events may be exacerbated by waters backing up into the headwaters upstream. Furthermore, one commenter did state the pushing littoral drift along the Applicants' shorelines further offshore would benefit Fox Creek, if the project survived long-term. The public also thought that the proposed project would reduce the flushing of Fox Creek, elevate water temperatures and lower dissolved oxygen levels.
 - Riparian Rights and Use of Waterway: Comments expressed concerns about the continued use and access of Fox Creek. Commenters were concerned about the loss of navigation and recreation associated with ingress/egress of Fox Creek, navigation will be impacted from increased siltation of the channel, and vessels may run aground. Furthermore, members of the Public were concerned that if the project fails, it will deprive them of their riparian rights, and devalue their properties.
7. Other Responses Received After Hearing: Additional responses to questions and comments submitted during and after the Public Hearing were provided by the Agent. Responses are listed below and in italics.

Questions

- During Underwood and Associates' presentation, it was stated that they had designed and constructed similar types of projects. Has the agent designed a project with similar fetch and wave action? Does this project have the integrity to withstand the fetch?
Agent Response: Underwood and Associates have designed and constructed many projects with fetches in the range of 1-3 miles, which is not dissimilar to the average fetch of this project. Additionally, the project is designed to withstand the 100-year storm event. To ensure that this goal will be met, all recommendations from both engineering firms (Coastal Design PC and Sustainable Science LLC).
- Have the agents considered constructing a jetty to capture drift?
Agent Response: The terminal structure proposed in the current design serves this purpose. The predominate direction of littoral drift in the Severn River is downriver (southeast), although the local drift more closely parallels the shore in a southwest direction. The proposed terminal structure is proposed to extend roughly perpendicular to the shore, thereby intercepting the littoral drift and protecting the downstream dredge channel from shoaling due to littoral materials. The hook extends further channelward than the preceding structures to capture littoral drift and is back with additional cobble to prevent wash-out of sediment. IAs recommended by both engineering firms to promote stability, the terminal structure was revised to capture drift from upriver. It was designed with larger, coarser material. It will also serve as a fail-safe in the off-chance that an upstream breakwater or tombolo release a significant amount of material. The dredge channel cannot be protected from wind-driven littoral drift originating from downstream.

Additionally, the Agent responded that adding another structure closer to Fox Creek's channel than the terminal hook structure would serve little purpose due to its redundancy, would impair navigation in the channel, and detract from the natural aesthetic of the project.

- Was a wave analysis done at the site?

Agent Response: Yes, wave assessment results in a conservatively sized 2.9 foot wave.

Comments

- Coastal Engineer Recommendations:

Agent Response: Coastline Design PC suggested raising the crest of each breakwater and specifically on the southernmost headland to reduce wave action, thereby protecting the marsh plantings, and reducing shear. In response, the Agent has added erratic headland boulders intended to act as a partial barrier above the design elevations to fulfill the intended function of the raised crest. These boulders will sit on top of the cobble toe at the channelward extent of each structure, raising its crest to +2 MHW as suggested by Mr. Hardaway. The Agent has incorporated intermittent boulders instead of a continuous sill to allow some wave action to pass through the gaps to hydrate the marsh above the water line behind the boulders. The intermittent boulders will protect the low marsh and headland structures by functioning on a small scale in much the same way as the whole sill; by diffracting and dispersing wave energy rather than reflecting it as a bulkhead or revetment or, to a lesser extent, a sill. These boulders will be placed on well graded granular soils which provide superior supporting qualities for pavement and foundation support. For foundation support, these soils have bearing values between 2500 and 3000 pounds per square foot. According to the Agent, this will be more than adequate for boulder support. The intermittent boulders were not added to the sand spit because the sand spit is sheltered by Long Point from the longer fetches that could potentially reach the rest of the project area.

Sustainable Science LLC provided two recommendations, both also focused on the southernmost headland. Per the first recommendation, in order to increase the resiliency of the southern portion, this portion of the project is specified to be constructed using a well graded mix of sands, gravels, and small cobbles. In addition, the southernmost headland has been raised to tie into the bank at elevation 6 in order to protect the remainder of the project from the large southeast fetch. As the plans now incorporate the combined recommendations of both engineers, the Agent stated that no doubt about the stability of the project should remain.

- Design and Stability of Living Shoreline

Agent Response: Due to the relatively high level of engineering and design complexity required by this approach, it is not a common living shoreline approach, but this does not mean that the method is experimental. It is based on the traditional breakwater design as its starting point and augments that base with innovative techniques to maintain stability and maximize habitat benefits. Fox Creek Association graciously hired Scott Hardaway

(Coastal Geologist) and Glenn Gass (Coastal Engineer) of Coastline Design PC to review the terminal structure closest to the dredge channel – their suggestions have been taken into consideration. In responses to numerous requests from the public hearing, we the applicant have also engaged the services of Albert McCollough (Coastal Engineer) of Sustainable Science LLC to review the entire project in detail. All recommendations from both engineering firms to promote stability have been incorporated into the plans, and as such will provide the intended shoreline protection goals without risk of project failure.

According to the Agent the size and weight of armoring, the length, elevation, and channelward extent of the breakwater crest, embayment width, and amount of bank grading or armoring are variables when sizing a breakwater design (C. Scott Hardaway & Byrne, 1999) (Center for Coastal Resources Management, 2016) (Hardaway, Milligan, & Duhring, 2010). These variables must be adjusted based on site characteristics including fetch, climate, topography, bathymetry, and wind speeds/base flood elevation applicable to the desired storm event. To size this project to the 100 year storm, wind speeds and baseflood elevations were obtained from the FEMA Flood Insurance Rate Map (FIRM) report for the Severn River. To remain stable in the 100 year storm at this location, an appropriately sized breakwater & tombolo design requires 80 feet long breakwaters with a crest elevation of 2 feet placed approximately 75 feet channelward and spaced 120 feet apart, and armored bank up to elevation 7.4. These criteria were used to develop the submitted design. An independent analysis by Albert McCollough (a third-party Coastal engineer) used the strongest extratropical winds (speed & duration) and the Thomas Point Lighthouse summer and winter peak winds to define wave height and shoreline approach angle to evaluate the design. This wind analysis revealed that the project was stable.

The Agent also stated all prudent measures will be taken during construction to control sediment and erosion runoff, including the use of a turbidity curtain during construction. These controls will be maintained until stability is achieved as required by State and local permits. In order to ensure the long-term success of the project, the Agent will adaptively manage the project. In contrast to typical planting of plugs on these projects, the Agent favors more resilient plantings by transplanting several plugs into a five gallon bucket to grow together. According to the Agent, this more mature clump planting system has proven more successful in the long-term establishment. In regards to the woody debris, the Agent stated that it will last as long as the life expectancy of the average structural approach such as bulkheads or revetments.

Due to concerns raised about the stability of the sand spit after the removal of the Phragmites, the plan has been revised to address the Phragmites by used of herbicide then filling over the rootmat with 4 inches of grading mix, rather than excavation as previously planned. Plan sheets have also been revised to clearly show that work on the sand spit will not impact the dredge channel.

Updated tidal review sheets that reflect adaptations to the plans at the suggestions of both engineering firms were attached to the Agent's response. As the plans now

incorporate the combined recommendations of both engineers, the Agent stated that no doubt about the stability of the project should remain.

- Existing Dredge Channel into Fox Creek
Agent Response: The Fox Creek channel will not be negatively affected as a result of the proposed project. Depths within the channel will not be decreased as a result of the project.
- Impacts to Resources
Agent Response: Revetment was not selected as the chosen design approach despite drastically reduced direct impact to offshore SAV due to indirect impacts resulting from installing an armored shoreline. The impact of the existing armored sections of shoreline on nearby SAV beds is evident in the 2012 SAV beds mapped by VIMS – the mapped SAV exists only offshore of the “soft” unprotected shoreline and is not present offshore of armored shoreline to the north or south. Armoring of the unprotected shoreline with revetment or bulkhead would increase wave reflection and therefore stress upon nearby SAV, thus indirectly impacting SAV beds. Further, state law mandates that shore erosion control projects must use Living Shoreline techniques unless extenuating circumstances including excessive erosion, severe high energy conditions, extreme water depths, or a narrow waterway are present at the project site. According to the Agent, their design is evidence that a living shoreline is feasible and therefore a structural practice cannot be entertained. This breakwater & tombolo design was selected over a comparable offshore sill design in part due to a significantly reduced (11,665 sqft less) direct impact to SAV beds as mapped by VIMS in 2011 and 2012, and reduced indirect impact to SAV near the project area.

The placement of the terminal structure as shown on the submitted design plan is critical to the overall sustainability of the sand spit. It is the Agent’s intention to allow sand to build up on the north side of the terminal structure which will make for a more robust and ecologically viable natural feature. Their overall objective when designing this project was to avoid any impacts SAV. However, the Agent found it difficult to avoid all impacts - particularly on the southern end of the project area where it is imperative to maintain an ecologically robust natural feature (the sand spit). This natural feature was placed in that design position to avoid the use of revetment and to help maintain the opening into Fox Creek. In helping to maintain the opening of Fox Creek, this structure decreases the frequency of dredging required to maintain the channel, thereby benefiting SAV by decreasing the frequency of a recurring disturbance in the area.

For these reasons and others explain in the design narrative, the Agent stated that they cannot drastically avoid/minimize impacts to SAV more than currently proposed. However, we were able to narrow the width of the terminal structure and reduce the channelward encroachment of the beach strand just north of this structure – this revision results in a reduction of 1,001 square feet of impact to the 2012 VIMS SAV bed. Further reduction in width of the terminal structure could yield more reductions in impacts to SAV but would require steepening the proposed slopes – this would decrease ecological

benefits and increase the risk of instability.

According to the Agent, they received regulatory guidance early in the design process that the last five years of available SAV maps provided by VIMS were to be used in evaluation of SAV impact – at this time, VIMS SAV data is available at <http://web.vims.edu/bio/sav/maps.html> for 2017. Based on the past five years of VIMS data (2013 to 2017), there would be no negative impacts to SAV as a result of this project.

- **Impacts to Coastal Processes and Water Quality**
Agent Response: Littoral drift may be relocated off shore by the projects channelward encroachment. If the littoral drift is alternated in a positive way to benefit the channel of the Creek, then this could be beneficial to the Fox Creek Association and result in less frequency of maintenance dredging. This is only predicted on a designed project that is survivable long-term at the project site and a proven design.

References

C. Scott Hardaway, J., & Byrne, R. J. (1999). Shoreline Management in Chesapeake Bay. Gloucester Point, Virginia: Virginia Institute of Marine Science - College of William and Mary. Retrieved from <http://web.vims.edu/GreyLit/VIMS/sramsoc356.pdf>

Center for Coastal Resources Management. (2016). Living Shorelines: Structural or "Hybrid" Options. (V. I.-C. Mary, Producer) Retrieved 03 14, 2017, from Living Shorelines: http://ccrm.vims.edu/livingshorelines/design_options/structural.html

Hardaway, C. S., Milligan, D. A., & Duhring, K. (2010). Living Shoreline Design Guidelines for Shore Protection in Virginia's Estuarine Environments. Gloucester Point: Applied Marine Science and Ocean Engineering. Retrieved from http://www.vims.edu/research/departments/physical/programs/ssp/_docs/living_shorelines_guidelines.pdf

Public Hearing Sign In Sheet

NAME	MAILING ADDRESS	PHONE NUMBER	EMAIL	FOR/AGAINST PROJECT
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Cindy Shay	309 Kyle Road, Crownsville, MD 21032	410-923-4385	Cshay.wvu@gmail.com	Against
Tony Luna	307 Kyle Road, Crownsville, MD 21032	410-923-8669		Against
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Steve Hill	315 Kyle Road, Crownsville, MD 21032	410-903-5039 / 410-627-3353		Against

Bill Morgante				
Joe Burke	305 Kyle Road, Crownsville, Md 21032	410-923-3735		
Dru Burke	305 Kyle Road, Crownsville, MD 21032	410-923-3735		

Attachment C: Public Hearing Notes

Note - This public informational hearing was recorded, but not transcribed. The following represents a “good-faith” effort to summarize the recording and personal notes taken by Department Staff during the public hearing.

1. Hearing Opened
 - a. Andrew May (Hearing Officer) of the Maryland Department of the Environment (MDE) Tidal Wetlands Division opens the Hearing at 6:05 PM.
2. Opening Presentation by Applicant
 - a. Keith Binstead (KF) and Heather Johnson (HJ) of Underwood and Associates, Agent to Applicant “James and Janet Clauson and Diane Lawrence presented the proposed project.
 - i. Presented visual representations and aerial imagery of the proposed project.
 1. Photos included the existing Fox Creek dredge channel and the Phragmites marsh at south end of the Applicants’ property.
 - ii. Described the design of the project. Proposing to construct five tombolos with cobble on the channelward side of the project to protect sand and plants. Designed to divert and break waves to protect shore and dissipate energy, and capture sediment drifting towards the south end of the project and prevent it from getting into the dredge channel at the south end of the project (Fox Creek).
3. Andrew May, asked for any questions directly related to the description of the project.
 - a. Does part of the project cross onto the neighbor, Ms. Lawrence’s property?
 - i. KB: Yes
 - b. Underwood and Associates mentioned similar projects in their presentation, has this structure been tested with similar fetches (over 10 miles)?
 - i. KB: Would need to check and make sure. Will provide responses to MDE.
 - c. What happens if a hurricane hits and the project fails?
 - i. KB: Designed the project to withstand the 100-year storm event, probably a hurricane level. During a storm there will be other issues as well.
 - d. In the past, the Clausons were reluctant to do anything to protect their shoreline, what has changed that makes them want to do it now? Are their plans for the upland portion of the empty property?
 - i. KB: Will need to coordinate with the Clausons to answer that question.
 - ii. HJ: Can only answer the first question. Will need to get back to them with an answer.
 - e. The headland breakwater designs have historically had massive stone structures. Proposed design is the opposite. Doesn’t believe that they have put anything equivalent in similar environment. Other similar designs are experimental and in different conditions.
 - f. Want to keep egress to the creek and protect dredge channel. Do not want something experimental constructed and possibly does not work. Don’t want to have to worry about dredging again. Don’t want creek affected any more than it currently is.

- g. What do Underwood and Associates do? What are their qualifications for doing a project like this? Who is the designer?
 - i. HJ: Underwood and Associates has been around for 30 years. Keith Underwood, the founder of the company, is an innovator in stormwater management, sand seepage, and shoreline restoration. A lot of the initial work done in this field was done by Keith on an experimental basis about 20 years ago. Keith Underwood is the designer, with Keith Binstead as an environmental scientist, and other engineers. Have a wide varied team. This type of project is all that they do, stream restoration and shoreline erosion. It is their niche and specialty. Works in Eastern Shore to D.C., but focus in Anne Arundel County. Small project to very large project.
 - h. How many projects of this nature have you done? How many have failed? How many have succeeded?
 - i. HJ: Can't give a specific number. Don't want to guess. Have never had a project that has failed, only needed minor adaptations. Shoreline are most of their work for the past 10-15 years. Projects often need adaptive management. A previous comment talked about armoring. They prefer to take a softer approach. For example, they will go back after the first rain storm and make corrections. Don't want to over armor. Will continue to monitoring immediately after construction.
 - i. Is it possible or probable that there will be a need because of sediment to come and tweak and dredge because of this?
 - i. HJ: Added clarification on adaptive management. Means slight changes to placement of cobble. Not talking major changes to project. Adding more plants to a specific area.
 - j. If a change needs to be made to the project and the sediment enters the entrance, would Underwood and Associates sign a contract right now that they would dredge it?
 - i. HJ: Can't answer that right now.
 - k. As a safe guard, because littoral drift enters the creek, have they thought of using a jetty at the entrance of the creek to capture sediment?
 - i. KB: That is the intention the last structure. It reaches out further and is more armored than the other structures. With the intention that it will capture any sediment coming from the waterway, not necessarily the project.
 - l. Please point out the cobbles on the large picture. Will there be vegetation on the cobble? Will it be a navigation issue? The last tombolo is in the path used sometime to enter dredge channel.
 - i. KB point out the cobble on the imagery that was presented earlier.
 - ii. KB: Yes, the intention is to plant as much as possible. Much of the cobble is also below mean low water.
 - iii. KB: Dredge channel can be seen on imagery and the closest point to spit in 80 feet.
4. Hearing Officer opens floor for audience comments in Opposition to the Application
- a. Doldon Moore (DM; Representing Fox Creek Association): He has a long history with Fox. First Application for dredging by Fox Creek and Associates in 2002 and wasn't issued until late 2008 by Maryland Board of Public Works (BPW). Asks MDE to staff to review the Administrator's report from 2008 to get the history and he did quite a bit of work on littoral

drift in that report. They have active maintenance dredging authorizations from U.S. Army Corps of Engineers and BPW in 2016. Maintenance dredging needs to be done every other year or more often. Wants to the flaws that he sees based on his experience. In terms of the site, the project is located on a historic submerged aquatic vegetation (SAV) bed. Habitat trading is not allowed and you can't mitigate for SAV. There are time of year restrictions on other Licenses in area for SAV, oyster bars and anadromous fish. He did a post dredge survey after Fox Creek's maintenance dredge and noted sparse SAV. Thinks it was in the same area as in 2002-2008. Concerned that with the Phragmites removal that can be a 2-3 year period of time before Phragmites is removed and native vegetation is reestablished. No hard stabilization, only have cobble and woody debris. That spit would be subject to overwash by tides and boat wakes. Has a wave analysis been done?

- i. KB: Not sure. Would need to look into it.
- b. DM (con'd): A neighboring property had one done. In his experience, he hasn't seen this style of Living Shoreline in this type of environment, maybe in headwaters. History shows that grasses need time to stabilize and grow in calm environment. Tomolos usually have massive stone structures. These plans only show cobble underwater held in place by root mat. That root mat will need time to establish. Typically have seen the low marsh behind breakwaters/tomolos washout and die. Only high marsh has survived. On cross-section, the stone toe near the cliff is almost at a 1:1 slope. Soil Conservation will usually only approve at most a 2:1. If marsh fails, then the stone toe could cause the cliff to fail. For woody debris, doesn't know how it will function initially and stay in place. It is wood in an area will it be submerged and exposed and it will rot away. Believes wave heights at neighboring property were in 4-5 foot range. Littoral drift is downstream. Placement of fill without adequate design to reduce nearshore energy and provide protection to wetlands that are being planted, it will fail. Concern for the filling in and closure of Fox Creek entrance is depriving 14 property owners of their riparian rights that were recognized by BPW. Proposal may be in violation of Environmental Article 4-413. Cannot place material near shore in waters of the U.S. that may migrate and pollute. Fox Creek Associates does not propose the protection of the shoreline, but want it in an environmental manner and does not impact dredge channel. Thinks any Living Shoreline should have a terminal structure (put sides on the sand box).
- c. Cindy Shay: Does not oppose the erosion being addressed. Believes that erosion is directly impacting creek. Took a very long time and at significant cost to receive their dredging permit. Through the process, Mrs. Clauson was the leader of the opposition to that dredging. Many are skeptical and distrustful of anything that has to do with the opening of that creek. Concerns that nothing on the plans shows nothing about protecting that channel or impacts to channel. First set of plans did not show dredge channel. Second plans show area of dredge, but still show 1-foot of depth in middle of channel. Doesn't show accurate depths. Any project that is approved that assures by condition of approval that the dredge channel is protected.

5. Hearing Officer opens floor for audience comments in Support to the Application

- a. Francesca Cartwright: Not trying to oppose, want to support. Want to help. Let them work with you to make sure it's done right.
- b. Kurt Fisher: The whole creek is for everyone to use in the State. That must be taken into consideration. All the sediment coming in the creek entrance comes into his pier. Need to secure that channel. There appears to be some answers with heavy stones. Why now?

- c. Janet Clauson: The whole purpose is to protect the cliff and prevent erosion and keep channel open. It has been the intention of the design. Has no reason to this that Underwood and Associates would not look at that as a primary motivation. Design does include Diane Lawrence's property. After project is complete, you will not see the existing revetment and bulkhead. The fetch is long. Anticipate that the project will succeed, but if they do nothing there will still be an eroding cliff. Never been reluctant to protect the shoreline. Glad they didn't do it earlier. They know what happens with stone revetments. They have one. The drift comes down the river and it scours out at the end of the revetment. Could ask for additional revetment, but think that it will create issues downstream. Are now grateful that there are options available today like Living Shorelines and they have evolved. Each time that these types of systems are built they get a little bit better. Some of you have seen the project on Pines on the Severn. Similar style with a smaller fetch and it is succeeding. If nothing is done, the dredging will continue. Optimistically, you will not need to dredge again. Trees that fell into the water 20 years ago are still there. Similar to what will be used in the project to break waves. Similar projects have been done, but each one needs to be designed to the specific location because each location is different.
- d. Kurt Fisher: Admitted that you did three different things and they all failed. You keep presenting yourself as the expert in this. I want a guarantee that the dredge channel is not at risk. She denied it for years, but now it is manageable. There is too much at risk.
- e. Steve Andrade: In support of concept of a Living Shoreline. Thinks that at the end the larger structure will be strong enough to withstand. Don't know if it needs larger rocks or up to mean high tide. Use a safeguard to catch littoral drift. Has seen what hardened shorelines do and cause littoral drift and cause erosion at the end, but a perpendicular structure captures that littoral drift. Needs something sufficient enough to catch that littoral drift.
- f. Francesca Cartwright: Are open to modifications on project? If a Coastal Engineer showed that the design would not work?
 - i. JC: Hope that it does everything that it is intended to do.
 - ii. HJ: Still in permitting process with MDE. MDE can still direct us to make changes before License is issued. Underwood believes project is designed where it should be, but process is not done.
 - iii. AM: Same for Army Corps of Engineers
- g. Francesca Cartwright: In the best interest of the Clausons would you be open to working with a Coastal Engineer because you are not coastal engineers.
 - i. HJ: Keith Underwood would make that decisions
 - ii. AM: If you have competing evidence and would like it added to the record, please provide it and it will have to be addressed.
- h. Max Nafty: Why in the formulation of proposed plans, why was there no indication of a navigation channel?
 - i. KB: No malintent. From the beginning, part of the project goal was to protect this channel. Part of the process is working with MDE to make sure what is on the plans to reduce clutter and make things readable. Don't want to speak to why it wasn't on the plans to begin with, but it is now.
 - ii. HJ: First draft of any plan set, focuses on the area that they are looking at and then will expand around that.

- iii. AM: The Department believed that it was a relevant feature and it has since been added to the plans.
 - i. Cindy Shay: Depths on the dredge channel is still not accurate.
 - j. Kurt Fisher: Concerned that there is a document in the records with false depths
 - i. AM: State Decision stands and the legally defining depth that was authorized by the State and the Corps is acknowledged.
- 6. Hearing Closed
 - a. Request that comment period be extended to 30 days from closure of Hearing to allow for review by a Coastal Engineer.
 - b. Request granted by Hearing Officer. Comments due by 5:00 PM on Wednesday, February 21, 2018.
 - c. The Department will review and determine relevance of any comment. The Department may request additional information from the applicant.
 - d. Hearing is adjourned by Andrew May at 7:05 PM.



May 11th, 2018

Mr. Keith Binsted
Underwood & Associates
1753 Ebling Trail
Annapolis, Maryland 21401

Re: Coastal Engineering Review
Clauson Living Shoreline Project
301 Kyle Road
Anne Arundel County, Maryland

Dear Mr. Binsted,

As requested, Sustainable Science LLC (SS) has reviewed the design and construction documents for the above referenced project. In addition, SS has executed a historical shoreline analysis using the 1847 coastal geodetic chart and historical aerial photography (1952, 1963, 1970, 1988 & 2014). The purpose of the review is to verify the design methodology and to provide recommendations as needed. The documents reviewed included:

- ✓ Report entitled *Clauson Living Shoreline Design Narrative* by Underwood & Associates, Inc. dated February 5, 2017; 37 pages
- ✓ Public Comment Response Letter to Heather Hepburn from Underwood & Associates, Inc. dated November 20th, 2017; 5 pages
- ✓ Construction drawings entitled *Clauson Living Shoreline* by Underwood & Associates, Inc. dated January 19, 2018; 14 sheets.
- ✓ Wetland License 17-WL-0367 Public Hearing Written Comments (Luna: 2-13-18, Dolden: 2-21-18, & Batson: 2-22-18)
- ✓ Wetland License 17-WL-0367 Public Hearing Comments dated 1-21-18

Of prime concern is maintaining navigation access to Fox Creek/Old Town Creek hence the review primarily focused on these coastal engineering project aspects.

Referring to the attached historical analysis (Sheets 1 through 6) several observations were noted:

- In 1847, the inlet to what was then known as Otter Pond was oriented towards the southeast then turned north before discharging into the Severn River.

- In the 167 year analysis timeline, the opening width was observed to be open in relatively the same position with an average opening width of 44.5 feet (+/-13 ft.) determined from the six (6) time periods.
- Downriver sediment transport movement is evident in each of the 1952 to 2014 aerial series with ebb and flood deltas also noted on either side of the creek inlet.
- Between 1988 and 2014 shows the thinning of the upriver peninsula hence is assumed to be the primary sediment inlet shoaling source.
- An upriver embayment is apparent with the same shape in each of the aerial series.

Seasonally the Chesapeake Bay has prevailing winds from the northwest in the winter and from the south in the summer. Northeasterly storms are notoriously known for their erosive ability from the large waves generated by high speed, long duration northeasterly winds. A record of 43 Chesapeake Bay northeaster storms from 1954 to 2003 indicates winds average at 31 mph with the highest wind recorded at 41 mph for 2.5 days beginning at noon on January 21st, 1954 (*Table 2 in Int. J. Ecol.; Dev.: Vol 10, No. S08, Summer 2008*). Wave generation in the Chesapeake Bay are almost entirely limited by the open water distance and not by wind duration. Wind duration length, as opposed to peak gusts, develop larger wave heights. Boat wake waves also impart wave energy onto the shoreline.

The project site is protected from the prevailing southerly summer winds with about a 0.1 mile winter wind fetch measured on the creekside exposure. The northeasterly fetch exposure is measured at 1.08 miles. In the referenced 2-5-17 design narrative report, the design wave was based on the longest fetch (14.9 miles) prevailing from the southeast (135 degrees) resulting in a 2.9 foot design wave. Crosschecking this design wave height using the U.S. Army Corps of Engineers paper entitled *Wind-Wave Generation on Restricted Fetches (Miscellaneous Paper CERC-91-2)* methodology confirms the same design wave height. It is important to note that this wave height would only occur when 55 mph winds consistently blow at a 135 degree angle for a day or more. Should these winds deviate either way by 3 degrees, the fetch decreases by over 80 % with a very significant reduction in associated wave heights. The Thomas Point Lighthouse wind record set (*1/1990 to 12/2001: 67,892 records*) reveals that winds prevailing from 135 degrees occur 7.3 % of the time.

Additional design wave analysis was executed for summer, winter and northeaster storms to further define the project wave energy settings. The above Thomas Point Lighthouse data set indicates the summer wind angle (180 degrees) averages at 11 mph with winter winds averaging at 13 mph. Peak gusts in the same data set indicates wind speeds at 38 mph for the summer and 44 mph in the winter. The winter design wave is therefore slight at 0.1 feet high with a 1.0 second wave period. Using the 41 mph 1954 storm, this northeaster storm even would result in a 1.2 foot design wave height with a 2.1 second wave period.

One of the primary design goals is to minimize inlet shoaling. From the above information, we judge that the primary inlet sediment source arises from bank erosion upriver from the inlet during northeaster storm events occurring at elevated tide stages. The eroded sediment is then transported downriver during these storm events causing inlet shoaling. During long duration southeasterly wind events that produce the 2.9 foot design wave condition, the sediment

transport is reversed moving upriver causing inlet shoaling and will remain unchanged even after the project is implemented.


The proposed design substrates were also reviewed and are judged to be appropriately sized for the 1.2 foot design northeaster storm waves. The 1952, 1963, 1970, 1988 & 2014 measured upriver embayment ratios averaged 2.38 width to a 1.00 depth ratio. The proposed embayment ratios average to a 2.28 width to a 1.00 depth ratio hence are judged to have the correct plan geometries. All grade tie-in elevations lie a minimum of 2 feet above mean high water hence are judged adequate to protect against a 1.2 foot design wave height.

Since the downriver shoreline proposed peninsula at Sta. 2+00 protects the proposed upriver tombolos from the southeasterly 2.9 foot design wave, two design recommendations include:

1. Use materials that satisfy well graded gravel (GW) Unified Soil Classification criteria in the "SAND/FILL" & "C-33 CONCRETE SAND" zones noted in the "TYPICAL SECTION THROUGH TOMBOLO" detail on Sheet 10 of 14. The particle sizes should range between 1 millimeter and 50 millimeter diameter ranges. Well graded coarse soil textures are inherently stable and effectively resist being displaced.
2. Raise the existing bank grade tie to elevation 6.0 at the crest elevation. This heightened structure grade will provide more protection for this infrequent though large design wave condition.

Provided the above recommendations are implemented, we submit our opinion that project will be stable hence provide the intended shoreline protection goals. Sustainable Science appreciates the opportunity to provide coastal engineering services for you at this project. Should you have any questions or need further information, please do not hesitate to contact me.

Best regards,

A handwritten signature in blue ink, appearing to read "F. Albert McCullough III".

F. Albert McCullough III, P.E., PWS
Principal Engineer

Cc: File



SCALE:	1 inch = 400 feet
DRAWN BY:	A. McCullough
DATE:	May 10th, 2018
LAST REVISION:	NONE
SS PROJECT NO:	18004
SHEET	1
NUMBER	OF 6

**SUSTAINABLE
SCIENCE LLC**
Ecological Engineering Services
410 S. Second Street
Denton, Maryland 21629
Phone: (410) 924-4316
www.sustainablesience.com

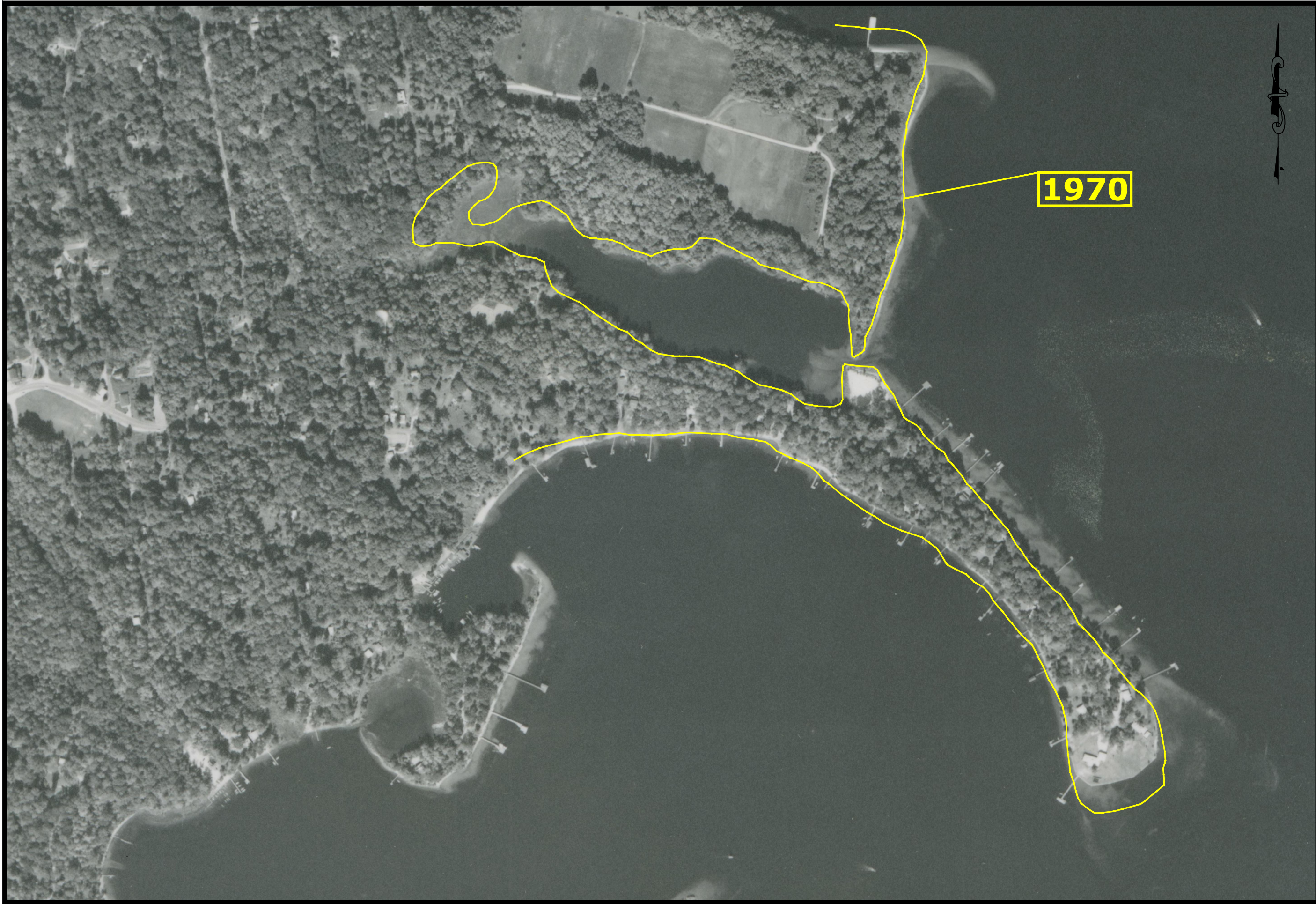
1847 MAP & 1952 SHORELINE
Historical Shoreline Analysis
Clauson Living Shoreline Project
Anne Arundel County, Maryland



1952 PHOTO & 1963 SHORELINE
Historical Shoreline Analysis
Clauson Living Shoreline Project
Anne Arundel County, Maryland

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SCALE: 1 inch = 400 feet
DRAWN BY: A. McCullough
DATE: May 10th, 2018
LAST REVISION: NONE
SS PROJECT NO: 18004
SHEET 2 OF 6
NUMBER



1963 PHOTO & 1970 SHORELINE

Historical Shoreline Analysis
Clauson Living Shoreline Project

Anne Arundel County, Maryland

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SCALE:	1 inch = 400 feet
DRAWN BY:	A. McCullough
DATE:	May 10th, 2018
LAST REVISION:	NONE
SS PROJECT NO:	18004
SHEET NUMBER	3 OF 6

9



1988



1970 PHOTO & 1988 SHORELINE

Historical Shoreline Analysis

Clauson Living Shoreline Project

Anne Arundel County, Maryland

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SCALE:	1 inch = 400 feet
DRAWN BY:	A. McCullough
DATE:	May 10th, 2018
LAST REVISION:	NONE
SS PROJECT NO:	18004
SHEET	4
NUMBER	OF 6



1988 PHOTO & 2014 SHORELINE

Historical Shoreline Analysis
Clauson Living Shoreline Project

Anne Arundel County, Maryland

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Phone: (410) 924-4316
www.sustainablesience.com

SCALE:	1 inch = 400 feet
DRAWN BY:	A. McCullough
DATE:	May 10th, 2018
LAST REVISION:	NONE
SS PROJECT NO:	18004
SHEET	5 OF 6
NUMBER	



2014 PHOTO & ALL SHORELINES

Historical Shoreline Analysis

Clauson Living Shoreline Project

Anne Arundel County, Maryland

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Denton, Maryland 21629
Phone: (410) 924-4316
www.sustainablesience.com

SCALE:	1 inch = 400 feet
DRAWN BY:	A. McCullough
DATE:	May 10th, 2018
LAST REVISION:	NONE
SS PROJECT NO:	18004
SHEET	6 OF 6
NUMBER	

Coastline Design PC

P.O. Box 157

Achilles, VA 23001

Clauson Shore Assessment

For Doldon W. Moore and Associates

February 20, 2018

1.0 Introduction and setting

The Clauson project is located on the south side of the Severn River in Annapolis, Maryland (Figure 1). Refer to attached project plan set. The project site lies on the south end of the reach defined by Kyle Point and Old Place Creek (Fox Creek), about 1,500 feet, Figure 2. The purpose of this report is to provide a general assessment of the project, its durability and potential impacts on sedimentation at the mouth of Fox Creek. It should be understood that we have not visited the site and that comments on the project are only meant to improve its performance and minimize potential impacts to the adjacent shoreline.

The long term shoreline change along the Kyle Pt/Fox Creek reach is shown in Figure 3. This data is from the MD shoreline data base. The 1845 shoreline is curious and questionable but the rest indicate the erosive nature of the reach. There are several pertinent shore features in Slide 4, 2002 imagery. Kyle Point is modest spit feature with an associated shoal extending eastward offshore. This indicates a net eastward direction of sediment transport from the shoreline upriver of Kyle Point. The shoreline south of Kyle Point extends about 600 feet to an existing rock revetment. This subreach of shoreline occurs as a narrow beach and the offshore shoal from Kyle Point turns sharply landward, narrowing, before moving back offshore in front of and along the rock revetment. The nearshore shoal then turns back landward and continues along the Clauson project reach to Fox Creek. The revetment is about 300 feet long.

Kyle Point was hardened by 2004 (Figure 5) with a sill system. The shoreline southward to the revetment had a narrow beach and a slight curvilinear aspect, we'll call the "north bay". The Clauson project shoreline extended along about the same contour as the toe of the revetment. Over time the shoreline has evolved with the North Bay shoreline remaining fairly stable and the Clauson shore receding. The revetment and the sill are very much intact and providing protection, examples of "standard" elements of shoreline construction around Chesapeake Bay.

The Clauson project shoreline occurs as a low narrow marshy spit feature from Fox Creek northward for about 190 feet before intersecting an eroding upland bank that rises to about 30 feet MLW. The vertically exposed nature of the upland bank is indicative of chronic erosion cause by wave action "constantly" impacting the base of the bank rendering the bank face unstable (Figure 6). There is a very narrow beach at low water and almost none at high water to help abate the impinging wind/wave climate unlike the North Bay reach. The eroding bank

material appears to be composed of clays (CL) and silty fine sands (SM) easily re-suspended once eroded. A shore protection project is warranted as the eroding Clauson upland is contributing to the local sedimentation including that at the mouth of Fox Creek.

There has been some limited wave analyses done by DNR and fetch distances made for the SE and NE wind wave exposure. Straight line fetch of 2.5 and 1.1 miles, respectively. Given these analyses and the geomorphic evolution of the coast there appears to be a general onshore offshore sediment movement with a slight net to the south. Wind driven waves can probably reach 1 to 2 feet under severe storms at the project site. Enough to erode the upland bank and drive sediment transport.

2.0 Clauson Project

The Clauson shoreline project is not your typical sill. The headland breakwater nature is always a good start for providing shore protection. However, the sand fill is being held by a low cobble toe on the distal end of each headland with wetlands plantings and the low marsh down to MLW, the top of the cobble toe (Figure 7). During modest wind/wave events the sand fill will most likely shear landward and laterally depending in wind direction and water level. An established wetlands planting would reduce this but a modified fill gradient should be expected.

3.0 Recommendation

The concern about sand fill being released into the littoral system and adding the Fox Creek maintenance effort could be reduced by raising the cobble toe to be more of a sill structure particularly on the end and south side of the southernmost headland (Figure 8). This modification, to say + 2 MLW, would make the structure more capable of reducing wave action onto the planted marsh, reduce shear, maintain the fill and allow the plantings to take hold thereby providing a more predictable long term stable system.

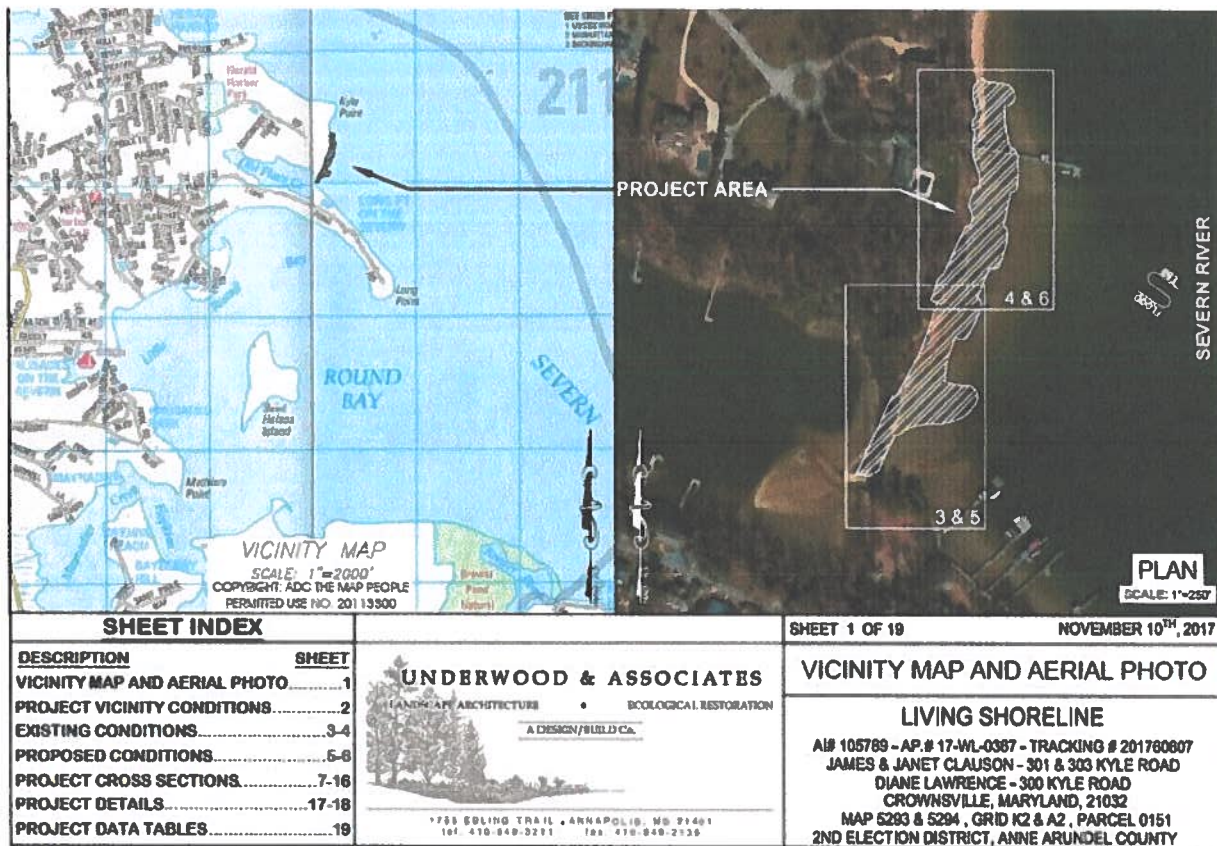


Figure 1



Pink = 1845
Purple = 1965
Blue = 1994
Aerial = 2015

Figure 3



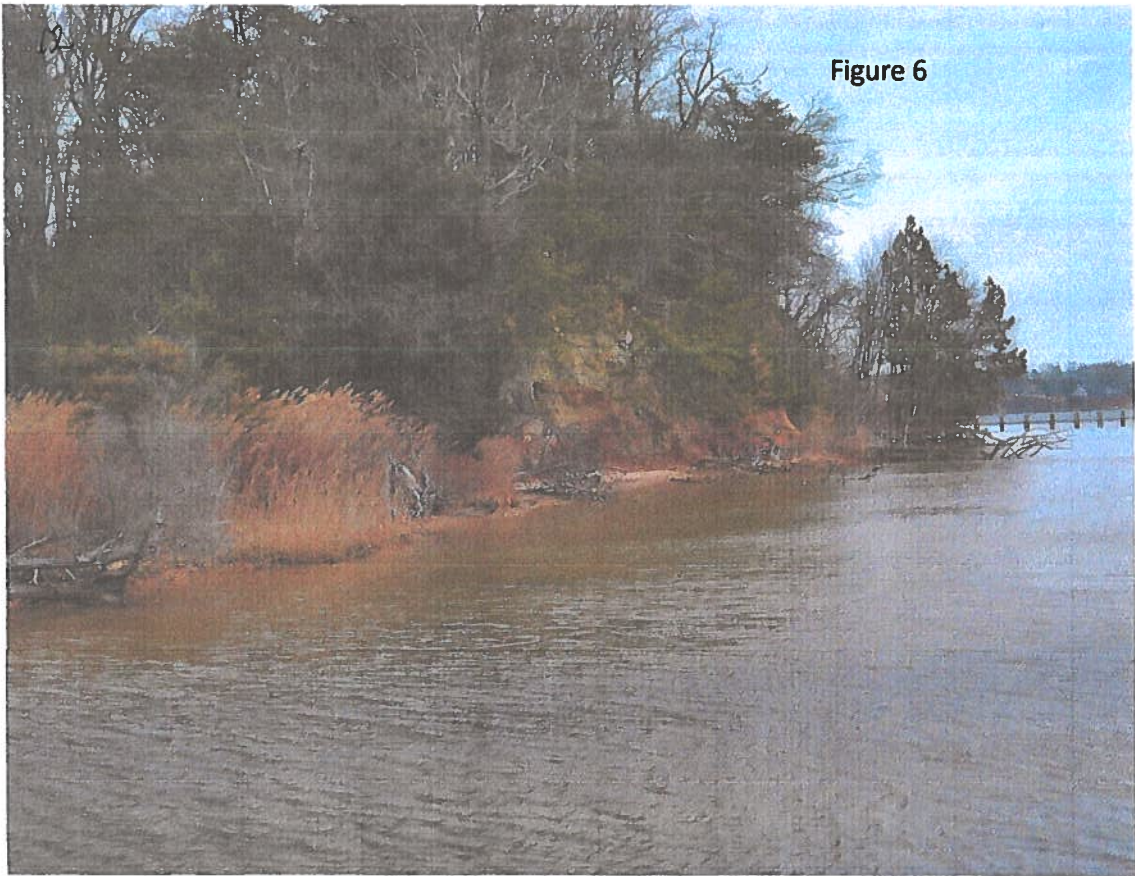
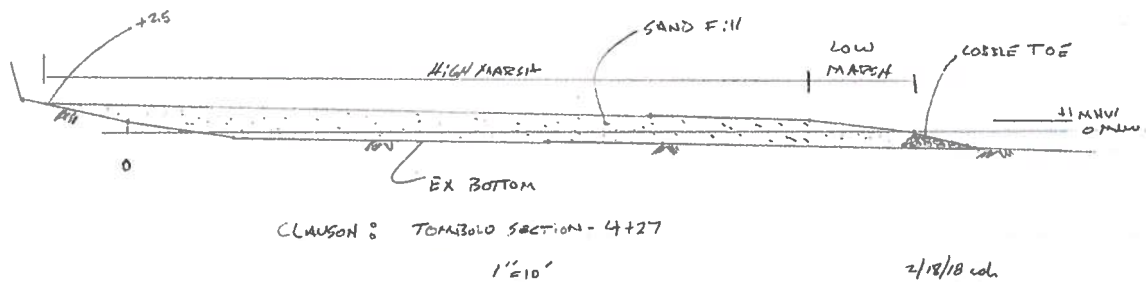


Figure 7 : Section 4+27 at 1:1, no vertical exaggeration



Fwd: Considerations - fox Creek

From: scott coastlinedesignpc.com <scott@coastlinedesignpc.com>
To: dwmoorej@verizon.net
Date: Wed, Feb 21, 2018 8:55 am

Here are Glenn's full comments.

----- Original Message -----

From: Glenn Gass
To: "Hardaway, Scott"
Date: February 20, 2018 at 5:34 PM
Subject: Considerations - fox Creek

Sir: Typically when tasked to develop a shoreline protection plan, that tasking involves designing the enhancement to a specific design frequency... usually the design follows established procedures including addressing the 'physics' associated with the movement/resistance of objects in a higher energy environment.

The old axiom that 'big rock don't move' is proved somewhat true at the subject site where elements of two previous, somewhat standard elements of shoreline construction (the revetments) seem to not only survive but also continue to afford a degree of protection.

Nothing is wrong with trying new and untested methods - but when really non standard (size) materials are used the 'physics' come into play - no guarantee that the structures WILL fail but certainly there is a lot less chance that the section will survive in a high energy environment...

Elementary concerns include the use of aggregate materials undersized for typical wave forces and the use of salvaged trees - which have no defined engineering section, are difficult to anchor and have few or no or definable quality metrics...

If luck holds the installation can be successful but luck doesn't stand up in court!!!

meaning the banks could not be graded and all work had to be performed from a rig barge. The project was completed in 1999 at a cost of \$1.3 million.

Patuxent River Naval Air Station, Fuel Pier, St. Mary's County, MD The project consists of a system of 5 headland breakwaters with beach sands obtained from the adjacent 60-foot sandy upland banks to create a series of stable pocket beaches. Dune vegetation was planted to help support the tombolos and backshore regions. There is a bimodal wave climate of 4 miles to the northwest and over 12 miles to the northeast. The project spans approximately 2,200 feet of shoreline at a total cost of \$900,000. The site took a direct hit from Hurricane Isabel with no significant impacts.

Patuxent Naval Air Station, Gate 4, St. Mary's County, MD Gate 4 was a shoreline segment including part of the West Basin seawall and part eroding bank and beach coast. Large breakwaters and spurs with beach fill and wetlands plants were placed along 1,500 feet of eroding shore, the site of the new O Club. The project costs were about \$1.7 million along about 1,800 feet of shoreline. It was completed in 2005 and received a Coastal America award in 2006.

Indian Head Naval Base, Calvert County, MD: Coastline Design, P.C. designed Phase 0 (completed, 2008 at a cost of about \$4 million) and Phase 1 (completed 2010 at about \$4 million) and Phase 2 (\$7 million) completed 2012. All phases include approx. 3.0 miles (25.4 acres) of Living Shorelines consisting of breakwaters, stone sills, beach fill and wetlands plantings.

Swan Point Development, Charles Co, MD. Completed in spring of 2012, this project consists of a series of 13 breakwater units, sills, beach nourishment and wetland/dune plantings along about 4,000 feet of shoreline on the Potomac River. Project costs approx. \$ 4million and created over 11 acres of beach , dune and wetland habitat.

.....
Education

B.A. Geology, East Carolina University, 1973
M.S. Geology, East Carolina University, 1979

Registrations

Professional Geologist, North Carolina , since 1985
Professional Geologist, Virginia, since 1984

Coastline Design, PC
P.O Box 157
Achilles, Va 23001

Email: scott@coastlinedesignpc.com
Cell: 757.288.9062
Fax: 804.684.7404



DEPARTMENT OF THE ARMY
BALTIMORE DISTRICT, CORPS OF ENGINEERS
ATTN: REGULATORY BRANCH
2 HOPKINS PLAZA
BALTIMORE, MD 21201

Operations Division

Mr. and Mrs. James and Janet Clauson
301 & 303 Kyle Road
Crownsville, Maryland 21032

Dear Mr. and Mrs. Clauson:

This is in response to your application, **CENAB-OP-RMN (Clauson, James & Janet / Living Shoreline) 2017-60607**, requesting Department of the Army (DA) authorization to discharge dredged or fill material into Waters of the U.S. associated with the construction of a living shoreline for the purpose of providing shore erosion protection in the Severn River at 301 & 303 Kyle Road, Crownsville Anne Arundel County, Maryland.

The primary purpose of the project is to protect the existing eroding shoreline from further erosion and to provide ecological uplift to the Severn River through the installation of a living shoreline along 911 linear feet of shoreline. The proposed living shoreline will extend a maximum of 140 feet channelward from the approximate mean high water shoreline and will permanently impact approximately 77,382 square feet of shallow tidal water habitat including mudflats and tidal wetlands. The proposed project is specified to be constructed using sand, gravel, small cobbles, wood chips and woody debris, stabilized with wetland plantings and a low profile "cobble spine" and "headland boulders".

As background, a fundamental precept of the Clean Water Act Section 404 regulatory program is that impacts to wetlands and other waters of the U.S. will be avoided and minimized, where it is practicable to do so. Under the Section 404(b)(1) Guidelines, only the least environmentally damaging practicable alternative can receive DA authorization. Note that an alternative is practicable if it is available and capable of being done after taking into consideration cost, logistics, and existing technology in light of overall project purposes.

Specifically, the Corps along with NMFS, EPA, and MDE, all share the same concern that the channelward extent and overall length of the proposed project will result in unacceptable adverse impacts to mudflats, shallow open water habitat, and submerged aquatic vegetation, all special aquatic resources. The Section 404(b)(1) Guidelines clearly state that mudflats are considered to be a significant special aquatic site. The proposed discharge of dredged or fill material over these special aquatic sites will basically eliminate mudflat biota, foraging areas and nursery areas causing an unnecessary loss of these special aquatic resources.

We strongly recommend minimizing the scope of the project to reduce and minimize unnecessary impacts to the aquatic resources. We agree that a form of shoreline

stabilization is necessary along the section of the shoreline that is actively eroding. However, we recommend that the section of shoreline currently stabilized by the bulkhead and stone revetment should remain in place and the project should not extend along that section of shoreline.

Based on the Corps evaluation of the permit application, it has not been demonstrated that impacts to waters of the U.S. have been avoided and minimized to the maximum extent practicable, as required by applicable regulations and the 404(b)(1) Guidelines. Therefore, the application is considered incomplete. In order to be fully consistent with the requirements of the Clean Water Act, the following information must be incorporated into the application and/or plans and returned to this office. We are requesting an alternatives analysis for the project to include an evaluation of the practicability of the following shore erosion protection alternatives:

- (1) A living shoreline along the existing eroded shoreline extending a maximum distance of 35 feet channelward of the approximate MHW shoreline;
- (2) A living shoreline along the existing eroded shoreline extending a maximum distance of 50 feet channelward of the approximate MHW shoreline.

Finally, using the proposed type and size of fill material (i.e., woodchips, cobbles) and proposed elevations of the cobble spine/headland boulders raises our concern as to whether or not the fill material will remain in place, not only during typical wind and wave events, but stable enough to withstand high energy storm events along a shoreline with significant open fetch. We feel there is a greater chance of the project failing or continuously requiring corrective measures, causing additional adverse impacts to waters of the U.S. We understand that newly constructed living shorelines are dynamic, in the sense that shifting of material will continue until the system reaches a level of equilibrium and stability, however in this case, it may take several years. Therefore, relying on woody debris, wetland plants, in the form of plugs, and the proposed cobble spine/headland boulder elevation to retain this size of a structure at this location is another concern the Corps and the regulatory agencies have with the proposed project. Please submit documentation that the project will be stable.

When you submit the required information, please reference the application number cited above. If we do not receive the required information within 60 days of the date of this letter, it will be assumed that you are no longer interested in pursuing the project, and your application will be considered withdrawn. However, if the required information is furnished at a later date, the application can be reopened, and will receive our prompt review.

In conclusion, please be assured that the Corps is very supportive of efforts to use natural methods to stabilize eroding shorelines. In this regard, redesigning the proposed living shoreline project to minimize the channelward encroachment, length along the shoreline, and overall impacts to shallow tidal waters and mudflats, with no impacts to SAV, will likely result in an expedited permit review and authorization under the DA MDSPGP-5, Category A or B procedures. We would be pleased to participate in

an interagency field meeting with you and other interested reviewing agencies to discuss this letter and your project.

If you have any questions please contact me at 410-962-0694 or by e-mail at richard.kibby@usace.army.mil.

Sincerely,

J. Richard Kibby
Maryland Section Northern

Cc: (e-mail)

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Mr. Keith Binsted, Underwood & Associates (keith.binsted@ecosystemrestoration.com)

Enclosure: Technical Comments on 20017-60607

1. The review of historic aerial imagery and the 1972 Jurisdictional Boundary (as shown on the project plans) shows minimal erosion of the shoreline within the project area compared to other sites within Maryland waters. To determine that the proposed project represents the Least Environmentally Damaging Practicable Alternative (LEDPA) and help support the Corps' permit decision, please explain how project impacts were avoided and minimized with this design approach. Also, discuss the need for the channelward extent of the structures into shallow open water habitat.
2. Vegetated Shallows (Submerged Aquatic Vegetation "SAV") is identified as a Special Aquatic Site under Sec. 230.43 of the Section 404 (B)1 Guidelines. The proposed project intends to impact between 10,000-15,000 square feet of previously mapped SAV habitat. Please describe how the project design avoided and minimized impacts to the SAV habitat. The Design Report dated March 17, 2017, prepared by Underwood and Associates states the proposed project is expected to benefit SAV habitat within and near the project area. EPA recommends a detailed survey is conducted prior to construction to identify any SAV within the project area, determine the species composition of the SAV bed, and delineation of any living species. Post construction monitoring should be required as the project expects to benefit SAV. Any SAV existing pre-construction that is not existing post construction should be mitigated for appropriately at a higher ratio than the loss.
3. It is EPA's understanding that typical living shoreline projects reviewed within Maryland waters do not utilize gravel, cobble, and woodchips. Please provide an example of project which was previously constructed utilizing the proposed design approach within a similarly situated environment, including any lessons learned and if they will be applied in this project. Also, include an explanation of the purpose and need of these materials within this design and how the installation will prevent erosion of these materials, particularly the woodchips, during construction and prior to vegetation establishment.
4. It is not apparent what type of trees will be utilized for the course woody debris and root wads. Please clarify this information. Also, provide an example of a similar situated project that utilizes this approach and include documentation about the stability of those structures over time. Additionally, please explain measures to ensure the woody debris does not become a potential hazard to navigation.
5. The information available for review does not explain the type of boulders, e.g. granite, schist, gneiss, to be utilized in the construction. Please clarify this information.
6. It is unclear if the project will be constructed using land or water (barge mounted) based equipment. Also, it is not evident how the material be stockpiled on-site to reduce erosion. Please provide this information to better document avoidance and minimization efforts.
7. At Section 5 +78 the plans identify an existing stormwater drain that will be modified and discharged through slotted HDPE pipe. To better understand how this may affect the proposed project, please provide a description of the size and type of drainage area that flows to this discharge pipe. The description should also include an explanation of how the potential discharge could affect the material placed for the living shoreline, such as a scour hole or instability in the project design.

8. It is not apparent from the project plans within the Public Notice where the steep bluff abutting the shoreline will be graded and stabilized. Please clarify this information. Likewise, explain if a structural approach to contain the bluff material and allow for natural sloughing of the slope was studied within the alternatives analysis. Is there a benefit to utilizing the native soils from the project site over quarried sand?
9. Based upon the information available for review, it is unclear how the existing spit (north of channel to Fox Creek) will be stabilized after the *Phragmites* is removed and prior to the establishment of rooted marsh (*Spartina sp.*) vegetation. It should be noted that *Phragmites* forms dense root mats, which when removed will destabilize the existing spit adjacent to the navigation channel for Fox Creek. Furthermore, *Spartina* plugs will take several years to form a root mat with the ability to stabilize the site. Therefore, EPA recommends providing additional information about how this area will be stabilized and not impact the navigation channel for Fox Creek.
10. Should the project be authorized, EPA recommends the Corps require a construction bond or similar financial assurance to ensure the entrance channel to Fox Creek is protect against the diversion, partial blockage, or the restriction of water flow to ensure residents within Fox Creek will continue to have navigable access in the event of a structural failure to the proposed living shoreline. The bond or other mechanism should be sufficiently funded for the maintenance of the navigation channel and the reconstruction and/or stabilization of any failed structures within the living shoreline.

Attachment I: Works Cited

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