COASTAL GEOLOGIC SERVICES

*memorandum*

**Date:** Sep. 12, 2022

**To:** [redacted],
[redacted] Silverdale, WA 98383

**Cc:** Christina Kereki, Kitsap County Department of Community Dev.

**From:** Jim Johannessen, Licensed Engineering Geologist, MS

**Re:** **Coastal Geologic Site Visit Memo for Shore Friendly Kitsap Program – Final**

State of Washington
Freidman
2022.09.12 17:12:41 07'00'
Engineering Geologist
353
Licensed Geologist
James W. Johannessen

## Introduction and Purpose

This memo outlines findings and recommendations following the site visit conducted through the Shore Friendly Kitsap program at your shoreline property. Shore Friendly Kitsap provides incentives for voluntary bulkhead removal and soft shore alternative projects on private properties to improve beach health and people's use and enjoyment of their shorelines. Funding for Shore Friendly Kitsap comes from the Washington Department of Fish and Wildlife's Estuary and Salmon Restoration Program (ESRP) and the National Estuary Program (NEP)*. With your permission, Coastal Geologic Services Inc. (CGS) was requested to perform a site visit at your shoreline property, review relevant coastal processes, geology, and general feasibility for bulkhead removal, and provide this memo outlining findings and recommendations. This memo will help you to better understand the dynamics of your shoreline property and make a decision in considering removing some or part of your bulkhead and soft-shore protection alternatives.

Jim Johannessen, Licensed Engineering Geologist and MS of CGS, visited your property and met with you on August 16, 2022, along with [redacted], Environmental Planner and Shore Friendly Kitsap program coordinator and Eurydice Pentz of Shore Friendly Kitsap. You expressed the following interest/concern during the site visit regarding the properties:

- The general feasibility of rock bulkhead removal and restoration along the estuary/ embayment shore of your two adjacent parcels.

## Site Conditions Overview

The site consists of two adjacent parcels owned by you on the north shore of an embayment and saltmarsh complex in NE Dyes Inlet (Figure 1). The two parcels are side by side and have approximately 300 FT of shoreline combined. The western parcel has the home you live in and a boathouse with approximately 128 FT of shore, and the eastern parcel is planned for a new house, and has approximately 175 FT of shore (Figure 2). A large parcel owned by the Christa Ministries is present northwest of the site with a nearby undeveloped portion containing large wetlands. The shore to the east is composed of several smaller residential parcels with single family buildings (Figure 3).

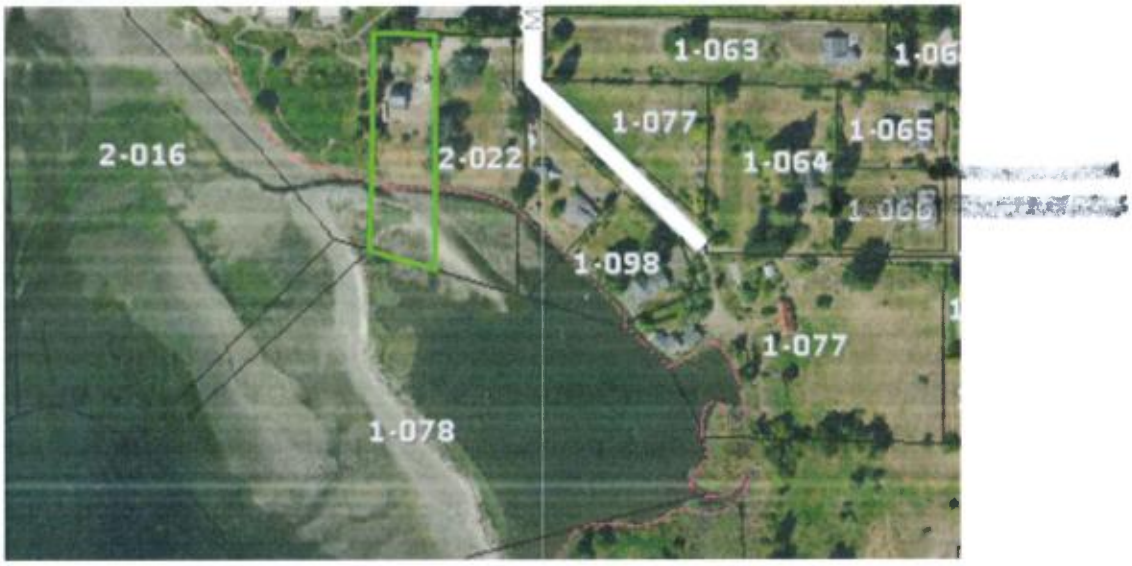


**Figure 1.** Site location map and parcel ownership from Kitsap County Assessor. Highlighted parcel and the adjacent parcel to the east are the subject parcels.

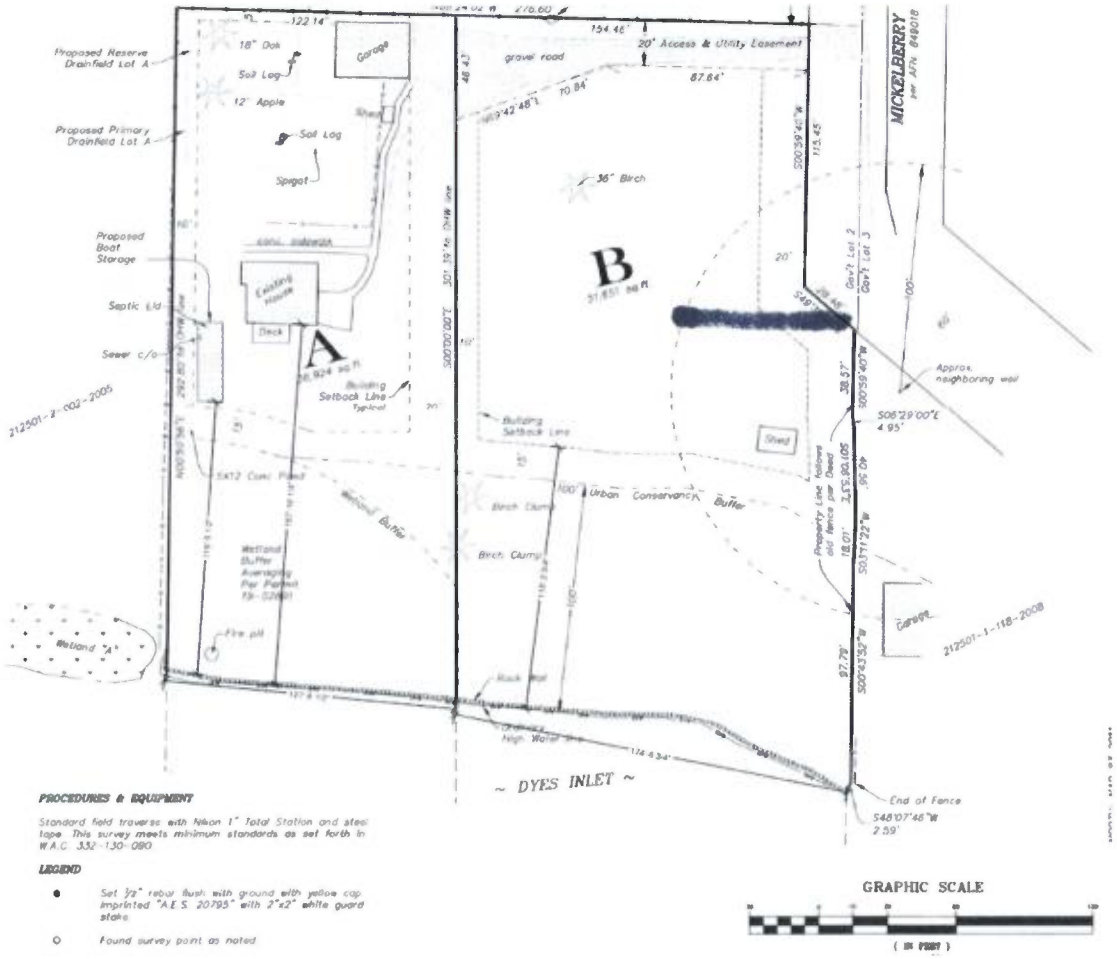


**Figure 2.** Excerpt of survey map by AES Consultants 2019 (setback distances added).

**Figure 3.** Oblique aerial photo excerpt of the two parcels and estuary inlet area from 2016 (WA Dept. of Ecology). House on western parcel is visible in center left and the eastern parcel extends up to the road corner.

The minimum setback from the rockery wall along the north shore of the embayment to the existing house was measured at 156 FT and the boathouse was setback at least 122 FT. We understand you have permits almost fully approved for a new house on the eastern parcel. Drawings show an approximately 115 FT house setback from the low bank for the new building. We also understand the existing and proposed new septic drainfields are/will be located landward of the houses.

The geology of the uplands was mapped a glacial till, a relatively dense and high-strength glacial sediment composed of gravelly, sandy silt and clay. The site is mostly level with minor depressions landward of the shoreline and slightly higher areas surrounding the house. Most of the site is covered with grass with scattered deciduous trees and several shrubs.

## Estuary

The estuary/embayment is approximately 12.5 acres in size including a large saltmarsh area extending south from the open water lagoon. The estuary is bounded on the Dyes Inlet (western) side by a barrier spit composed of gravel and sand in a natural state. The inner shores of the estuary are fringed with extensive salt marsh vegetation dominated by pickleweed (*Salicornia virginica*) and saltgrass (*Distichilis plicata*). Large intertidal gravel bars and a channel complex are also present with a considerable amount of open water at low tides. Estuaries like this one are considered among the highest value habitats in the Puget Sound nearshore (Strategic Needs Assessment: Analysis of Nearshore Ecosystem Process Degradation in Puget Sound (wa.gov)) (Schlenger et al. 2011).

The shores of the estuary are not in a net shore-drift (littoral drift) cell; they are classified as areas of no appreciable net shore-drift. The southern portion of the estuary was identified as a Tier 1 (highest) restoration project needs for restoration sediment transport and tidal flow in the 2016 *West Sound Nearshore Integration and Synthesis* report (Confluence Environmental Company et al. 2016).

## Shore Armor

A rockery wall was present along the entire shore of the two parcels at the site. This type of rock wall is also called a shoreline bulkhead or shore armor. The rockery wall ran along the full shore length of both parcels of 300 FT. The rockery wall was 6-7 FT high above grade in the lagoon and stood almost vertical. The wall was composed of 2-4 FT basalt boulders that were mostly angular but also contained partially rounded boulders. Overall, the rockery wall was in fair condition, but several rocks were displaced a small amount outside of the west end.

The west end of the rockery wall near the west property line had toppled and you informed me you had some planning work completed towards repairing this corner. I also understand that county permitting was not completed, and you may not be going forward with this repair.

# Summary and Conclusions

## Overall Summary

The south shore of the property borders on a high value estuary/embayment in terms of nearshore habitat for salmon and many other species of fish and wildlife. The estuary has extensive saltmarsh patches and a near pristine condition barrier spit. The estuary represents some of the most valuable nearshore habitat in Dyes Inlet as it is in relatively good condition.

The 300 FT of rockery wall shore armor along the entire south shore of the site appears to represent the biggest degradation/impairment of natural features in the estuary. The rockery wall has taken what was a gentler sloped and complex shore with fringing saltmarsh and other salt tolerant vegetation and simplified it into a near vertical wall with grass above and the channel pushed against the toe of the wall on the south side (Figure 3). Removal of the rockery and fill and some amount of the adjacent fill and restoring this shore to a natural condition would be a significant habitat lift for the estuary.

Shore armor removal is entirely feasible at the site with the substantial existing and proposed setbacks, and considering that the septic drain fields will be landward of the houses. There is very little elevation difference to work with other than the 6-7 FT high bank along the current estuary shore.

Several different elevation benches for saltmarsh growth could be established as part of the rockery wall removal and restoration. Stepping up in elevation to the north would allow for a moderate area of marsh growth with a gradual sloped bank higher up and revegetation of native species included in a restoration plan.

A new rockery return wall would be needed with armor and fill removal along the eastern shore in order to ensure that potential erosion did not affect the eastern neighbor's parcel. A return wall is a short reach of bulkhead wall that extends away from the shore, and in this case would be constructed out of salvaged rock and would run near the eastern property line. The return wall details would need to be determined with additional analysis and design work but would likely be on the order of 10-20 FT long.

## Summary and Next Steps

Removal of the shore armor and restoration of the adjacent area is feasible, as outlined above. The next steps to move this project forward would generally consist of the following:

- Full feasibility analysis to determine most beneficial project elements and extents
- Obtaining consensus from the owners

- Researching potential funding options
- Developing design drawings consisting of scaled existing site conditions map, proposed site conditions map, and other details
- Cost estimate
- Simple specifications package
- Applying for permits or permit exemptions
- Applying for grants to fund the project
- Bidding and project implementation

### More Information

There is a wealth of information available online for management of beaches and nearshore areas. See additional information below as well as in the References section:

- *Your Marine Waterfront: A guide to protecting your property while promoting healthy shorelines* http://wdfw.wa.gov/publications/01791/wdfw01791.pdf (WDFW 2016)
- *Marine Shoreline Design Guidelines*, chapter on stewardship and other sections http://wdfw.wa.gov/publications/01583/wdfw01583.pdf ((Johannessen et al. 2014)

## Limitations of This Report

This report was prepared for the specific conditions present at the subject property to meet the needs of specific individuals. No one other than the landowner and their agents should apply this report for any purposes other than that originally contemplated without first conferring with the geologist that prepared this report. The findings and recommendations presented in this report were reached based on a brief field visit. The report does not reflect detailed examination of sub–surface conditions present at the site, or drainage system designs, which are not known to exist. It is based on examination of surface features, bank exposures, soil characteristics, gross vegetation characteristics, and beach processes. In addition, conditions may change at the site due to human influences, floods, groundwater regime changes, or other factors. This report may not be all that is required to carry out recommended actions. More detailed design specifications may be needed for proper implementation of a habitat enhancement project.

## References

Confluence Environmental Company, Coastal Geologic Services, Wild Fish Conservancy, and Kitsap County. 2016. "West Sound Nearshore Integration and Synthesis of Chinook Salmon Recovery Priorities."

Johannessen, J.W., A.J. MacLennan, A. Blue, J. Waggoner, S. Williams, W. Gerstel, R. Barnard, R. Carman, and H. Shipman. 2014. "Marine Shoreline Design Guidelines." Department of Fish and Wildlife, Olympia, WA. http://repository.tudelft.nl/view/hydro/uuid:53b41f44-ec68-464d-95c2-a8a3c5572763/.

Schlenger, Paul, Andrea MacLennan, Erin Iverson, Kurt Fresh, Curtis Tanner, Betsy Lyons, Steve Todd, et al. 2011. "Strategic Needs Assessment: Analysis of Nearshore Ecosystem Process Degradation in Puget Sound." Technical Report 2011–02. Prepared for the Puget Sound Nearshore Ecosystem Restoration Project. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.297.2876&rep=rep1&type=pdf.

WDFW. 2016. *Your Marine Waterfront: A Guide to Protecting Your Property While Promoting Healthy Shorelines*. Washington Department of Fish and Wildlife. 44p.

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Protection Agency or the Washington Department of Fish and Wildlife, nor does it mention trade names or commercial products constitute endorsement or recommendation for use.

**Photo Page**

**Photo Page, Freidman site, taken August 17, 2022. Upper image is looking east, lower looking west.**