Peterson & VandenBerg Environmental, LLC

Wetlands • Critical Dunes • Permit Assistance
Threatened & Endangered Species • Wetland Mitigation

# SITE EVALUATION REPORT

**Areas of Interest at 5045 N Ridge Road**
Pentwater Township, Oceana County, Michigan

June 5, 2026







# Site Evaluation Report

**Area of Interest at 5045 N Ridge Road**

Parcel No. 001-033-400-01

Pentwater Township, Oceana County, Michigan

June 5, 2026

**Submitted to:**

Mary Jo Larson

mlarson@wnj.com

**Prepared by:**

Adrienne Peterson & Laurel Bronkella

Peterson & VandenBerg Environmental, LLC

12261 Cleveland Street, Suite D

Nunica, MI 49448

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**Supplementary Documents**


A. Site Photographs
B. Pentwater Twp. HREA Atlas
C. High Risk Erosion Fact Sheet
D. Common Activities Needing a Permit HREA
E. Aerial with Setbacks
F. EGLE Common Native Plants of Michigan Sand Dunes
G. Hemlock Woolly Adelgid Fact Sheet
H. Pentwater Twp. Rural Residential District Ordinance

# 1. Introduction

Pursuant to your request, Peterson & VandenBerg Environmental (PVE) conducted a High Risk Erosion site evaluation of the Area of Interest (AOI) located in Pentwater Township, Oceana County, Michigan, on May 11, 2026. The intent of this report is to provide a brief description of the physical characteristics of the site and the Michigan Department of Environment, Great Lakes, and Energy (EGLE) requirements for the site.

The AOI is located in the Michigan Department of Environment, Great Lakes, and Energy (EGLE) designated High Risk Erosion area (B). It is not located in the designated critical dune area. A permit is required from EGLE under Part 323 (Shorelands Protection and Management) for roofed structures or septic systems within the designated High-Risk Erosion Area, and Part 325 (Submerged Lands) for all activities that occur below EGLE's Ordinary High-Water Mark (OHWM) of 580.5' IGLD 1985 or the current water level if it is above that elevation. A permit is also required from the U.S. Army Corps of Engineers (Corps) for activities lakeward of the toe (bottom) of the main dune down to Lake Michigan. A permit is required from the District Health Department #10 for the installation of a septic system and/or well. A soil erosion and sedimentation control permit is required from the Oceana County Drain Commissioner for any projects that require a soil disturbance within 500 feet of a body of water.

# 2. High Risk Erosion Regulations – Part 323

Because the AOI is located within the designated High Risk Erosion area, a permit is required from EGLE to construct a new house or roofed structure and install a new septic system.

The High Risk Erosion areas along the lakeshore have two setbacks based on the yearly rate of the recession of the shoreline. The AOI is located in Pentwater Township's High Risk Erosion Area C1 where the setbacks are 55 feet for the 30-year setback and 100 feet for the 60-year setback. The setbacks can be measured from different locations depending on which benefits the applicant the most. These locations include the 583.7' IGLD 1985 elevation contour or the Erosion Hazard Line (EHL), whichever is more landward, or the top of the dune The EHL is the line along the shoreline that is the landward edge of the zone of active erosion or dense dune grass.

Depending on the height and slope of the dune, a multiplier may be applied to the setbacks when measured from the EHL, increasing the setback distance. At the southern end of the AOI between the existing houses, the dune measured approximately 27.1 feet high with an average slope of 28.1%, resulting in a multiplier of 1.16. The setbacks when measuring from the EHL in this location would then be 63.8 feet for the 30-year setback and 116 feet for the 60-year setback. At the northern end of the AOI near the stream, the dune measured approximately 20.7 feet high. At this height, no multipliers are required and the setbacks remain 55 feet for the 30-year setback and 100 feet for the 60-year setback when measured from the EHL in this location. The setback numbers may change slightly depending on where you measure from in the AOI and whether a multiplier is needed.

The location from which the setbacks are measured can also change depending on water elevation and erosion. The setbacks must be measured from the closest point of the EHL or

the top of the dune even if it is offsite on an adjacent property. If Lake Michigan water levels rise and the EHL moves east due to erosion, the High Risk Erosion setback locations could shift landward within the AOI. If the water levels recede and the dune continues to stabilize and re-establish with dune grass over time, it is possible that the EHL and setback locations could shift lakeward. Lake Michigan water levels can be viewed at the link below:

https://water.usace.army.mil/office/lre/reports/GreatLakesDWL

A new house typically must, at minimum, meet the 30-year setback measured from the EHL. Houses that are landward of the 30-year setback, but lakeward of the 60-year setback measured from the EHL must be designed to meet EGLE's definition of a "readily movable structure." Houses that are landward of the 60-year setback do not have any building restrictions from EGLE. The approximate setbacks for the AOI are depicted on the attached aerial image (E). There are two different sets of setbacks shown based on the dune heights that were measured onsite and the required multiplier.

EGLE considers a readily movable structure "a small permanent structure which is designed, sited, and constructed to accomplish relocation at a reasonable cost relative to other structures of the same size and construction. Access to and from the site shall be of sufficient width and acceptable grade to permit the structure to be relocated." They require that a structure has a covered area (foundation size, including any overhanging roofs or covered decks, not floors) less than 3,500 square feet, the foundation is a crawl space, basement (51% covered) or pilings, the above-grade walls must be stud or whole log construction, and an attached garage on-slab must be less than 676 square feet in size. The garage could be larger if it is placed on a basement or crawl space foundation.

The existing house and septic system at the southern end of the AOI meet the 60-year setback when measured from the EHL in this location, with the house measuring approximately 389 feet from the EHL. The existing house, detached garage, and septic system near the center of the AOI also meet the 60-year setback when measured from the EHL. The existing house measures approximately 130.5 feet from the EHL in this location, the garage measures approximately 209.5 feet from the EHL, and the septic system measures approximately 199 feet from the EHL. Any vacant lots split from the AOI would appear to have plenty of room to build landward of the 30-year or 60-year setback since the EHL is currently located so far lakeward. If the water level rises, it is likely the EHL will shift landward on this property, and the setbacks will shift east as well.

A new or replacement septic system must meet the 60-year setback and be a minimum of 50 feet from any wells. It must also be located 10 feet from any property lines, 10 feet from a basement/crawl space foundation, and 15 feet from downward slopes. The Health Department requires showing the location of both an initial and reserve drain field for the construction of a new structure. Because the EHL within the AOI is currently so far lakeward and the setbacks are relatively small, there are several areas within the AOI where a septic system could be located and meet the setbacks.

Pools, unroofed structures (e.g., decks, patios, pergolas), and gazebos under 225 square feet do not have to meet the High-Risk Erosion setback requirements but must meet any requirements from Pentwater Township, including any setbacks from the property lines.

# 3. Shoreline Stabilization

On the day of the site evaluation, the Lake Michigan water elevation was 579.26' IGLD 1985. This water level is approximately 2.94 feet lower than the previous all-time high (582.2' IGLD 1985) in 2020. It is anticipated that the 20-year cycle for Lake Michigan water levels may become shortened and more extreme due to climate change. Although the water level is down and the dune appears to be stabilized, it is possible that wave action may still erode toward the bottom of the dune during storm events if the water elevation increases. It can be difficult to determine the future water levels of Lake Michigan. The Corps monthly forecast can be found at the link below:

https://water.usace.army.mil/office/lre/forecast/weekly

The shoreline along the AOI and the adjacent properties did not have any shoreline protection. There are currently two small foredunes in front of the main dune that provide protection to the slope. Unprotected and inadequately protected dunes can be vulnerable to erosion via wave action. The amount of potential erosion on a site is highly variable and depends on many factors (water levels, storm events, littoral deposition etc.). Storm events play a large role in the amount of active erosion along the shoreline. The largest and most frequent storm events typically occur from the end of October through December until ice forms along the shoreline. If, or when, the water levels increase again, there is a chance that there could be erosion of the dune.

The only way to prevent erosion of the dune face via wave action is to install shoreline protection. The shoreline protection should run parallel to the toe of the dune and either secure into neighboring shoreline protection, extend onto the neighboring property, or return onto your property to prevent erosion from the sides. A permit is typically required from both the Corps and EGLE for this shoreline work. These agencies require shoreline protection to be installed at the toe of the main dune down to Lake Michigan and prefer the use of riprap for shoreline protection that is at least 3' to 4' in size on a 3:1 slope, but they may also permit sheet steel seawalls if it is proven necessary. Rock (i.e., toe stone) is typically required in front of a sheet steel seawall if permitted. Rock dissipates the wave action and prevents scouring which can undermine the wall. It is very important that shoreline protection is installed by a company that specializes in Lake Michigan shoreline protection.

For a full rock revetment, the rock should be limestone, 3-4 feet in size, puzzled/interlocked together, and placed on filter fabric on a 3:1 slope to an elevation that will prevent waves from overtopping the rock during most storms. A height of 10-12 feet above the water level or more is recommended for this area to prevent overtopping wave action. A 'splash zone' of smaller rocks on filter fabric is another option to reach a greater height at a lesser cost. It is also recommended that the rock is 'toed in' at least 6 feet beneath the ground to prevent the rock from settling into the sand, becoming less effective. It is critical that the rock is placed on filter fabric (we recommend overlapping filter fabric to prevent tears in the fabric), to prevent wave action from sucking sand out from behind the rocks, causing the rocks to settle and become less effective.

The rocks should be linked into neighboring shoreline protection, or if there is no shoreline protection on the adjacent property, it should be returned into the dune to attempt to prevent waves from coming around and eroding behind the rock. If adjacent neighbors do not also protect their properties, the erosion could possibly still come back around the returns onto your

property. When neighbors install shoreline protection at the same time, it helps to eliminate erosion from entering your property from a neighboring property, creating a united front against Lake Michigan.

Sandbags are less expensive than rock, but they provide less protection, and some erosion will still occur. Sandbags typically sink into the sand and create a much less effective 'wave-bump.' The sandbags can also be rolled out of place or ripped by drifting debris, leaving the shoreline unprotected. Overall, sandbags can lessen the erosion of the slope temporarily and at a considerably lower cost. This option is better than an unprotected shoreline but does not stop erosion in the long term. EGLE requires sandbags to be taken out once the lake level drops below the OWHM of 580.5' IGLD, which it already has. EGLE is unlikely to permit new sandbags if the water level is below 580.5' IGLD.

In any case, it is recommended to propose a full rock revetment for permits as you always have the option to do less than is permitted. A full rock revetment is highly recommended as it is the only method to stop erosion of the dune. Fully toed-in and properly constructed rock revetments are designed to dissipate wave action and minimize wave reflection as the waves run up the slope. Since the energy is dissipated, scouring and adjacent erosion is minimized compared to seawalls and Geotubes®. When rock is toed in, the rocks will not settle into the sand and become less effective. They are unlikely to shift or be knocked out of place due to wave action—as is common with sandbags—when installed properly.

Shoreline protection should be installed by a company that specializes in Lake Michigan shoreline protection. The dynamic action of Lake Michigan will destroy poorly installed and undersized shoreline protection. The cost for quality shoreline protection is relatively high, and the permitting process with the Corps and EGLE takes a minimum of 90 days. Prior to applying for EGLE and Corps permits, plans must first be put together that detail the proposed project. Currently, EGLE is not permitting shoreline protection unless a house or septic system is in jeopardy. It would be difficult to get a permit for shoreline protection on this property.

## 4. Slope Stabilization

The dune on this property appears to be mostly stabilized with trees on the slope, and some herbaceous vegetation. Herbaceous vegetation growth is likely limited on the slope due to the shade from tree cover. It may be beneficial to plant native vegetation where possible, as the roots of native vegetation help anchor the sand, catch blowing sand, and absorb water running down the slope. The establishment of a non-mowed buffer zone of native vegetation, a minimum of 3 feet wide, along the edge of the top of the dune can slow down and dissipate runoff that travels across the yard and over the edge of the dune. Planting a diversity of native plants in this buffer zone with deep roots systems will aid in preventing erosion of the bluff due to stormwater runoff. Enclosed is a list of native dune plants (F).

All storm water should be directed away from the top of the dune, as this can cause increased erosion down the slope. It is crucial to keep sprinklers away from the top of the dune, as a break in the sprinkler system can be very problematic and cause sizable loss of ground near the top of the slope. It is also important to avoid any funnel areas to the dune created by a sprinkler system or the slope of the yard.

It is not recommended to throw any yard waste (e.g., branches, leaves) over the slope of the bluff as this can prevent vegetation from growing on the slope. The root systems of plants growing on the slope aid in dune stabilization and hold the soil in place. Debris on the dune can cause funnel points for runoff, resulting in an erosion path from the top of the dune.

## 5. Tree Diseases

When trimming or removing trees on the property, it is important to be aware of hemlock woolly adelgid.

Hemlock woolly adelgid is a tiny insect that secretes white wax as they feed on sap of the hemlocks. Infected hemlocks will typically have a white, waxy material at the base of the needles. This often leads to the hemlocks being killed by other stress factors as their growth slows and they become weakened from the pests. It is important not to remove potentially infested materials from the site to prevent the spread of woolly adelgid. The trees on this property appear to have been treated for hemlock woolly adelgid.

For more information about hemlock woolly adelgid, see the attached fact sheet (G).

## 6. Pentwater Township Requirements

This property is in Pentwater Township's Rural Residential District. The setbacks for this district are 75 feet for the front yard setback, 25 feet for the rear yard setback, and 25 feet for the side yard setbacks. The waterfront yard is considered the front yard.

For more information, please see the enclosed zoning ordinance excerpt (H).

## 7. Permit Applications

If you would like to move forward with applying for a permit for any activities, Peterson & VandenBerg Environmental can assist you through the EGLE, septic, and SESC permit application processes. The following items are needed for the application packages.

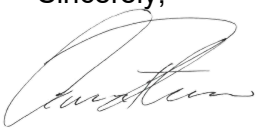
1. Project Plans – Elevation views, plan view, and cross-sections. The plans need to be at an easily measurable engineer scale (such as 1" = 20') on 8 ½ by 11-inch paper. The overall site plan needs to depict the EHL, setbacks, and all proposed activities on the property such as a house, additions, accessory buildings, septic system, etc.
2. SESC Permit – $125 application fee. PVE can put this permit application together.
3. Septic & Well Permits – $330 for a septic system and $180 for a well. PVE can put these permit applications together.
4. Construction Staking – Any proposed activities need to be staked onsite prior to an EGLE representative's review of the property. We recommend having a surveyor stake all proposed activities including the house, additions, accessory buildings,

septic system, garage, etc. to ensure accuracy. Each stake should be labeled as to what it is depicting.

5. EGLE Permit – $100 application fee for a new home and septic system.

Thank you for the opportunity to provide a site evaluation for this property. This site evaluation does not include all Pentwater Township requirements. Please let us know if you have any further questions or need assistance applying for any permits.

Sincerely,



**Peterson and VandenBerg Environmental, LLC**
Adrienne Peterson

Enclosures


Peterson & VandenBerg Environmental, LLC
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~30-year setback with no multiplier measured from EHL in this location: 55'
~60-year setback with no multiplier measured from EHL in this location: 100'
~30-year setback with 1.16 multiplier measured from EHL in this location: 63.8'
~60-year setback with 1.16 multiplier measured from EHL in this location: 116'
0 50 ft
1:2,000
ESRI:102121
05/27/2026
5045 N Ridge Road
Pentwater Twp, Oceana County, MI
~Property Line
~Area of Interest
Erosion Hazard Line
Stream
Setbacks with Multiplier
Setbacks without Multiplier