



NORTH CAROLINA  
Environmental Quality

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**MEMORANDUM**

**CRC-19-31**

**TO:** Coastal Resources Commission  
**FROM:** Ken Richardson, *Shoreline Management Specialist*  
**SUBJECT:** Review of Ocean Hazard Area Management Boundaries, Lines & Grandfathering

**Ocean Hazard Areas (OHA):**

Ocean Hazard Areas the grouping Areas of Environmental Concern (AECs), that are comprised of: 1) Ocean Erodible Areas (OEA); 2) Inlet Hazard Areas (IHA), and 3) Unvegetated Beach Areas (UBA). According to the Management Objectives for the Ocean Hazard Area (15A NCAC 7H .0303), these AECs collectively are considered natural hazard areas along the Atlantic Ocean shoreline where, because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean Hazard Areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative and soil conditions indicate a substantial possibility of excessive erosion or flood damage. The location and form of hazard area landforms (beaches, inlets, dunes) are in a permanent state of flux, responding to changes in the wave climate, sand supplies, and sea levels.

The Commission's rules for these AECs further the goals set out in G.S. 113A-102(b), and serve to minimize losses of life and property resulting from storms and long-term erosion, preventing encroachment of permanent structures on public beach areas, preserving the natural ecological conditions of the barrier dune and beach system, and reducing the public cost of inappropriately sited development.



## 1) Ocean Erodible Areas of Environmental Concern:

The Ocean Erodible Area of Environmental Concern (AEC), also referred to as the OEA, is the area along the oceanfront where there exists a substantial possibility of excessive erosion and significant shoreline fluctuation as a result of ocean related processes. Although day-to-day change is predominately influenced by natural forces, engineering practices such as beach nourishment can and do influence shoreline fluctuation. The oceanward boundary of this AEC starts at the mean low water line, while the landward boundary is measured landward from the first line of stable natural vegetation at a distance established by multiplying the long-term erosion rate setback factor by 90 (minimum distance of 180 feet). Because the erosion rate setback factor is not the same for all areas, and given that it is measured from the location of the vegetation line, this AEC boundary is not the same for all oceanfront locations, nor is it mapped regularly due to its potential to change significantly over a short period of time. Within this AEC there are multiple management lines used in the siting of development and identification of areas with known and/or measured high rates of erosion. For the purpose of this discussion, staff will describe each of the following lines used for siting construction: 1a) development setback; 2a) first line of stable and natural vegetation (FLSNV); 3a) Static Vegetation Line (SVL) & the SVL Exception; 4a) Development Line (DVL), and 5a) Measurement Line.

### Construction Setback Lines:

Oceanfront development setbacks were established by the Coastal Resources Commission (CRC) under the Coastal Area Management Act (CAMA) in 1979 for the primary purpose of minimizing losses of life and property resulting from storms and long-term erosion, while also preventing encroachment of permanent structures on public beach areas, preserving the natural ecological conditions of the barrier dune and beach systems, and reducing the public costs of inappropriately-sited development. In an effort to accomplish these management objectives, erosion rate setback factors were initially calculated and subsequently updated approximately every five years for two key reasons: 1) to properly site oceanfront development, and; 2) to determine the landward-most extent of the Ocean Erodible Area of Environmental Concern (OEA). The CRC's oceanfront setback rules are perhaps the most important with regards to the protection of life and property. In addition, the Federal Emergency Management Administration (FEMA) currently uses North Carolina's erosion rate updates to award Community Rating System (CRS) points to qualified coastal communities. The State's setback requirements help preserve spaces that can serve as undeveloped buffer areas for storm protection.

The OEA setbacks for siting oceanfront development are measured in a landward direction from the first line of stable and natural vegetation (vegetation line), the static vegetation line, or the measurement line. Setback distance is calculated by multiplying the erosion rate setback factor (a.k.a. "erosion rate") times a graduated variable that corresponds to the size of the proposed structure (*see Table 1*). The setback factor represents the statistically smoothed and blocked,



average, annual, long-term shoreline change rates, which are updated approximately every 5 years. For purposes of establishing a minimum development setback, “2” is the default minimum Setback Factor, which includes those areas with erosion rates less than 2 feet/year and areas where accretion is measured.

**Table 1.** Setback Factors & graduated setback.

<b>Structure Size</b>	<b>Setback Factor (feet)</b>	<b>example “setback factor = 2”</b>
< 5,000 sqft.	Minimum 60 feet or <b>30</b> x setback factor	2 x <b>30</b> = 60 feet
≥ 5,000 sqft.	Minimum 120 feet or <b>60</b> x setback factor	2 x <b>60</b> = 120 feet
≥10,000 sqft.	Minimum 130 feet or <b>65</b> x setback factor	2 x <b>65</b> = 130 feet
≥20,000 sqft.	Minimum 140 feet or <b>70</b> x setback factor	2 x <b>70</b> = 140 feet
≥40,000 sqft.	Minimum 150 feet or <b>75</b> x setback factor	2 x <b>75</b> = 150 feet
≥60,000 sqft.	Minimum 160 feet or <b>80</b> x setback factor	2 x <b>80</b> = 160 feet
≥80,000 sqft.	Minimum 170 feet or <b>85</b> x setback factor	2 x <b>85</b> = 170 feet
≥100,000 sqft.	Minimum 180 feet or <b>90</b> x setback factor	2 x <b>90</b> = 180 feet

**First Line of Stable Natural Vegetation (FLSNV):**

The First Line of Stable & Natural Vegetation (FLSNV), also referred to as the “vegetation line” is the primary reference feature for measuring oceanfront setbacks. This line represents the boundary between the normal dry-sand beach, and the more stable uplands. If the vegetation has been planted, it may be considered “stable” when most of the plant stems are from continuous rhizomes rather than planted individual root sets. Planted vegetation may be considered “natural” when most of the plants are mature and additional species native to the region have been recruited, providing stem and rhizome densities that are similar to adjacent areas that are naturally occurring.

While the vegetation line has been used as an oceanfront setback measurement line since 1979, the CRC has determined that when vegetation moves oceanward after a beach nourishment project, this creates an artificial situation that should not be considered “stable and natural” and therefore should not be used for measuring oceanfront setbacks. In 1995, the CRC codified a method of measuring setbacks on nourished beaches that utilizes the surveyed pre-project existing vegetation line, which became known as the “Static Vegetation Line.”

**Static Vegetation Line (SVL):**

The static vegetation line is established in areas within the boundaries of a large-scale beach fill project (>300,000 cubic yards) and represents the vegetation line that existed within one year prior to the onset of project construction. A static line is established in coordination with the Division



of Coastal Management. Once a static line is established, setbacks are measured from either the static line or the vegetation line, whichever is more landward. In addition, once a static line is established it does not expire.

The CRC's static line rule was based on three primary issues: 1) evidence that nourished beaches can have higher erosion rates than natural beaches, 2) no assurance that funding for future nourishment projects would be available for maintenance work as the original project erodes away, and 3) structures could be more vulnerable to erosion damage since their siting was tied to an artificially-forced system. The intent of the static line provisions has been to recognize that beach nourishment is an erosion response necessary to protect existing development but should not be a stimulus for new development on sites that are not otherwise suitable for building.

### **Static Vegetation Line Exception:**

Since the establishment of the Static Line rule and the increasing prevalence of beach fill projects, the Commission has found that some communities had demonstrated a long-term commitment to beach nourishment and maintenance of their nourished beaches. Due to this long-term commitment, beach vegetation had become stable and migrated oceanward of the static line. In many cases, proposed development on lots within these communities could meet the required setback from the new vegetation line but could not be permitted since they did not meet the setback from the static vegetation line.

To recognize local government efforts to address erosion through a documented long-term commitment to beach nourishment, and to offer relief from the static line requirements, the CRC adopted Static Vegetation Line Exception procedures in 2009. The Static Vegetation Line Exception allows a community to measure setbacks from the existing vegetation line rather than the static line, but includes certain limitations and conditions.

To be eligible for this exception, a community must petition the CRC by providing a beach management plan that describes the project area and design; identify sediment sources; identify funding sources to maintain the initial large-scale project; and, provide an update on project effectiveness and how it will continue to be maintained. The plan must be updated and presented to the CRC every five years for reauthorization. Under the exception, development must meet the required setback from the vegetation line, no portion of a building or structure can be oceanward of the landward-most adjacent neighbor or an average line of construction is determined by DCM, and no swimming pools may be permitted seaward of static line.



### **Development Line:**

In 2016, the Commission provided a second alternative to the Static Line by promulgating “Development Line” procedures. The Development Line allows use of the existing vegetation line for setback determinations, with local governments setting the oceanward limit of structures, subject to CRC approval. Unlike with the Static Line Exception, there is no requirement for a demonstrated long-term commitment to beach nourishment or beach management plan and structures are allowed to be constructed, replaced, or expanded to be in line with their seaward-most adjacent neighbor (as opposed to landward-most adjacent neighbor under the Static Line Exception). Establishment of a Development Line requires the following:

1. It is mapped by the community using an average line of construction and must be referenced in local ordinance(s).
2. It is to represent the seaward-most allowable limit of oceanfront development.
3. Must be approved by the CRC. Once approved, only the community can request a change.
4. Development must meet the applicable setback from the vegetation line.
5. No swimming pools may be permitted seaward of the static line.

### **Measurement Line:**

A Measurement Line represents the post-storm location of a vegetation line if a storm causes overwash or a loss of vegetation so that not enough vegetation exists to determine oceanfront setbacks. This line is located by using the most recent pre-storm aerial photography to map the pre-storm vegetation line, and then moving it landward a distance equal to the average width of the beach recession caused by the storm. Measurement lines are generally temporary until the vegetation is re-established to the point where it can once again be used for determining oceanfront setbacks but may also be permanently designated by the CRC.

In summary, there are currently twenty-one North Carolina communities with a static vegetation line. Eight of those communities have CRC-authorized Static Vegetation Line Exceptions, four have CRC-approved Development Lines, and two will have a section of their oceanfront with a temporary Measurement Line designation from the CRC (see Table 2).



**Table 2.** List of Communities with Static Vegetation Lines, SVL Exceptions, Development Lines, and Measurement Lines.

<b>Community</b>	<b>SVL</b>	<b>SVL Exception</b>	<b>DVL</b>	<b>Measurement Line</b>
<b>Ocean Isle</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Oak Island</b>	<b>Yes</b>	<i>No</i>	<b>Yes</b>	<i>No</i>
<b>Caswell Beach</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Bald Head Island</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Kure Beach</b>	<b>Yes</b>	<i>No</i>	<b>Yes</b>	<i>No</i>
<b>Carolina Beach</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>
<b>Wrightsville Beach</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Figure Eight Island</b>	<i>No</i>	<i>No</i>	<b>Yes</b>	<i>No</i>
<b>Topsail Beach</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Surf City</b>	<i>No</i>	<i>No</i>	<i>No</i>	<b>Yes</b>
<b>North Topsail Beach</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<b>Yes</b>
<b>Emerald Isle</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Indian Beach</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Salter Path</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Pine Knoll Shores</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Atlantic Beach</b>	<b>Yes</b>	<b>Yes</b>	<i>No</i>	<i>No</i>
<b>Buxton</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Rodanthe</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Nags Head</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Kill Devil Hills</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Kitty Hawk</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>
<b>Southern Shores</b>	<b>Yes</b>	<i>No</i>	<i>No</i>	<i>No</i>

## **2. Lessons learned through Implementation**

There are some notable differences between the Static Vegetation Line Exception and Development Line Rules. Implementation of these rules is complex and present some management challenges, specifically, when it comes to what structures, or parts of the primary structure, can or cannot be located seaward of one or more of the management lines (vegetation line, static line, or development line).

Development Line Rules (15A NCAC 07J .1300) allow construction setbacks to be measured from the existing FLSNV. What makes the DVL different from the SVL Exception are the procedures within the rules, and the process of defining the limits of development, including how to consider decks and other accessory structures outlined in 07H.0309, such as dune walkovers, gazebos, and parking areas. It is Staff’s understanding that decks and accessory structures should not be used to delineate DVLs. However, because DVLs have been delineated differently from one community



to the next, these structures may or may not be seaward of the DVL in some locations. Because the current Rule (15A NCAC 07H .0306(a)(2)) states that “in no case shall new development be sited seaward of the development line,” this creates questions, and potentially difficulties when reviewing permits, when decks and other structures listed under .0309 Exceptions are being proposed seaward of a DVL.

### **3. Grandfathering Rules:**

Current “grandfathering” rules (15A NCAC 07H .0306(a)(5)(L)) apply to replacement of single-family or duplex residential structures with a total floor area greater than 5,000 square feet, and commercial and multi-family residential structures with a total floor area no greater than 10,000 square feet, provided that the structure was built prior to August 11, 2009, does not exceed its original footprint or square footage, it is not possible for the structure to be rebuilt in a location that meets the required ocean hazard setback, and the structure can meet the minimum setback (60 feet from the FLSNV).

It is important to note that existing grandfathering provisions will also apply to structures within the proposed amendments to the Inlet Hazard Areas (15A NCAC 07H .0310). Staff will review several grandfathering rule provisions and looks forward to a discussion of how these various jurisdictional lines, setbacks, and exceptions apply in different scenarios.

