



FEMA

IN REPLY REFER TO: APPEAL RES

April 6, 2016

The Honorable Pat Voveris
Mayor, Town of South Bethany
402 Evergreen Road
South Bethany, Delaware 19930

Community: Town of South Bethany,
Sussex County,
Delaware
Community No.: 100051

Dear Mayor Voveris:

This letter is in response to a letter dated January 15, 2016, from your community regarding the Preliminary Flood Insurance Rate Map (FIRM) and Flood Insurance Study (FIS) report for the Town of South Bethany, Sussex County, Delaware dated May 18, 2015. Your community submitted a letter and report concerning the floodplain boundary for the Atlantic Ocean as shown on the May 18, 2015, Preliminary FIRM panel 1005C0518K in the area of South Bethany east of Route 1 and between coastal transects 1600 and 1650. Please note that the request is considered an appeal because it satisfied the data requirements defined in Title 44, Chapter I, Part 67 of the Code of Federal Regulations (44 CFR Part 67), and was submitted during the 90-day appeal period for the aforementioned Preliminary FIRM and FIS report.

The following scientific and/or technical data were submitted in support of this request:

- A report produced by Woods Hole Group with scientific and technical information to support an appeal;
- New 2014 National Oceanic and Atmospheric Administration (NOAA) Light Detection and Ranging (LiDAR) terrain data and derived Digital Elevation Model (DEM);
- Supporting data for a new wave height, wave runup and erosion analysis for the oceanfront properties within the Town of South Bethany; and
- Geographic Information System (GIS) shapefiles for revised floodplain boundaries for the oceanfront properties within the Town of South Bethany.

The U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) received all data necessary to resolve this appeal by January 19, 2016. The provided report asserts that the methodology used to generate the coastal floodplain boundaries for the oceanfront homes as shown on the preliminary FIRMs is technically incorrect and based on insufficient and poor quality data. To support this assertion, the report claims that 1) better terrain data exists for the area than what was used for the preliminary analysis, and that the United States Army Corps of Engineers (USACE)/Delaware Department of Natural Resources and Environmental Control (DNREC) South Bethany Storm Damage Reduction Project was not accounted for in the terrain data used for the preliminary analysis and should have been. The report asserts that 2) the Primary Frontal Dune

(PFD) line should be redelineated based on the new terrain that accounts for the storm damage reduction project. The report also asserts that 3) the methods and assumptions for the dune erosion analysis in the Preliminary study are scientifically and technically incorrect.

We have examined the report, and revised coastal analysis and mapping of this area provided by the Town as part of the appeal. We would like to address the 3 assertions listed above.

- 1) The dunes in the Town have recently been significantly eroded due to two large storm events and the terrain data used by the appellant no longer represents existing conditions for the dunes. The terrain data used by the appellant for the revised coastal analysis is 2014 NOAA LiDAR data for the topographic data and beach and nearshore profile survey data collected by the USACE at regular intervals following construction of the storm damage reduction project (2008 to 2014) for the bathymetry data. The 2014 LiDAR was collected by NOAA a few months after the completion of a nourishment project in September 2013. One of the recent storm events occurred in September/October 2015, and survey data collected by the USACE shortly after the storm indicates 20 to 40% of dune loss. After the second storm event, the Blizzard of January 2016, survey data collected by the USACE indicates approximately 45% dune loss at the northern end of the town and a gradual increase to complete dune loss at the southern end of the town. Therefore, the LiDAR data that the appellant used in their analysis does not reflect the existing conditions. The 2005 LiDAR data used for the preliminary analysis does not include dune elevations from the storm damage reduction project, and better represents the existing condition.

FEMA is consistent in how it evaluates coastlines across the country for flood risk and considers all coastal changes to a beach, whether created by nature or man-made. During the flood analysis process, FEMA evaluates all coastal changes including beaches, dunes, and upland characteristics of the study area. Man-made dunes may sometimes serve to reduce the effects of storm surge and wave action if they are well-established with long-standing vegetative cover and are sufficiently large. When these conditions are met, they may be accounted for during a flood study. The South Bethany Storm Damage Reduction Project was designed by the USACE to provide the maximum net economic benefit, and not to a specific design storm. So, while a nourished beach can provide a buffer against storm waves, beaches and dunes are dynamic in nature and may erode, and they do not always help reduce the 1-percent annual chance flood hazard.

- 2) The appellant moved the PFD line seaward of the first row of houses in South Bethany based on the location of the dunes built from the storm damage reduction project. The 2015 preliminary study identified the pre-nourishment project dune formation as the PFD, which is landward of the first row of houses on Ocean Drive based on the 2005 LiDAR data. The appellant moved the PFD line to be at the trough of the two dune ridges. Section D.2.9.3.1 of FEMA's Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update and 44 CFR 59.1 of the National Flood Insurance Program (NFIP) regulations state that the inland limit of the PFD "occurs at the point where there is a distinct change from a relatively steep slope to a relatively mild slope", also referred to as the heel of the dune. Based on this definition, the PFD should be placed at the heel of the second dune ridge, which is consistent with the preliminary 2015 study, regardless of which topographic data is used. The delineation of the

PFD line defines the extent of the Zone VE, and therefore the limits of the Zone VE in the revised mapping is incorrect and it should be landward of the first row of houses on Ocean Drive.

- 3) The appellant stated in the appeal that FEMA's standard dune removal methodology found in the FEMA guidelines should have been applied in this area and the 2015 preliminary study used a dune retreat erosion methodology. The erosion methodology used for the preliminary analysis was a non-standard methodology developed in coordination with State and local officials and based on historic data that indicated that the standard erosion methodologies would not sufficiently characterize the hazard in this area.

Based on FEMA guidelines, a retreat profile consists of three planar slopes: the uppermost is a retreated dune face slope of a 1:1, joining an extensive middle slope of 1:40, which is terminated by a brief segment with a slope of 1:12.5 at the limit to storm deposition. Part of the dune is un-eroded and the eroded sand is deposited seaward of the dune toe and remains part of the profile. A standard removal case will remove the sand from the dune toe with a slope of 1:50 and will not deposit the eroded sand. The erosion analysis applied in the preliminary study completely removed the dune but retained a steep slope of approximately 1:3 at Ocean Drive to reflect the roadway's non-erodible materials. This non-standard erosion methodology was developed based on review of photographs depicting erosion damage along Ocean Drive to the ocean front properties from historic storm events, NFIP Repetitive Loss data, and discussions with State and Local officials regarding firsthand experience of the beach erosion at South Bethany. The methodology used for the preliminary analysis is more representative of historic impacts; therefore, is more appropriate for use in this area.

We have resolved this appeal in accordance with the requirements of 44 CFR Part 67. We have reviewed the submitted data and determined that the Special Flood Hazard Area boundary for the Atlantic Ocean is correct as shown on the Preliminary FIRM and in the Preliminary FIS report, and that no changes are warranted at this time. Please submit any comments regarding this appeal resolution within 30 days of the date of this letter to the following address:

FEMA Region III
Mitigation Division
One Independence Mall, 6th floor
615 Chestnut Street
Philadelphia, Pennsylvania 19106-4404
Attention: Robert Pierson, CFM

If you feel that the technical issues originally raised have not been adequately addressed by this resolution letter and that an acceptable resolution will not be feasible through the submittal of additional comments as outlined above, please note that FEMA makes Scientific Resolution Panels (SRPs) available to support the appeal resolution process. SRPs are independent panels of experts in hydrology, hydraulics, and other pertinent sciences established to review conflicting scientific and technical data and provide recommendations for resolution. An SRP is an option after FEMA and a local community have been engaged in a collaborative consultation process without a mutually acceptable resolution.

Your community may contact me at (215) 931-5650 for additional information on the specific eligibility requirements for the SRP or refer to the enclosed SRP Fact Sheet. To request that an SRP review your scientific or technical data, your community must complete the enclosed SRP Request Form and submit it to the address above within 30 days of the date of this letter.

If we do not receive any comments or the completed SRP Request Form from your community during the 30-day review period associated with this resolution, we will finalize the FIRM and FIS report by issuing a Letter of Final Determination (LFD). The LFD will explain the adoption/compliance process and will state the date when the FIRM and FIS report will become effective.

We appreciate your community's comments and commitment to having the most accurate flood hazard information available reflected on the FIRM and in the FIS report. If you have any questions regarding this matter, please contact me by telephone at (215) 931-5650 or by e-mail at robert.pierson@fema.dhs.gov.

Sincerely,



Robert Pierson
Project Engineer
FEMA Region III

Enclosures:
SRP Fact Sheet
SRP Request Form

cc: Joe Hinks, Code Enforcement Constable, Town of South Bethany
Michael Powell, CFM, State NFIP Coordinator, Delaware Department of Natural Resources
Greg Williams, CFM, State NFIP Coordinator, Delaware Department of Natural Resources