Date: September 13, 2024

To: Mayor Vince Sera and Members of City Council

From: Rachael Beckner, CFM

Re: 2024 Repetitive Loss Area Analysis Plan Annual Progress Report

I. Background

The Brigantine City Council approved Resolution No. 2020-189 on October 21, 2020, authorizing the adoption of the Repetitive Loss Area Analysis (RLAA) Plan. The RLAA Plan identifies and evaluates repetitive loss properties throughout the City. The RLAA Plan delineates repetitive loss areas (RLA) based upon the location of the repetitive loss properties and suggests ways to mitigate or reduce flood losses in each RLA. The RLAA Plan also identifies specific projects for the City to complete to mitigate or reduce repetitive flooding in these areas. There is a total of six (6) Repetitive Loss Areas (RLA) identified throughout the City by the RLAA Plan.

The RLAA Plan was prepared as part of the City's participation in the FEMA Community Rating System (CRS) Program. Inclusion in the CRS Program provides flood insurance rate premium discounts to all property owners in the City.

In order to retain CRS credit for the RLAA Plan, the City must prepare an annual progress report on the various activities the City is performing as referenced in the RLAA Plan. This memorandum shall serve as the City of Brigantine's annual progress report for the period of October 1, 2023, to September 30, 2024.

The annual report has been distributed to the City Council via email and is currently available to the public for viewing through the City of Brigantine's website. A copy of the annual report is available for download off the City of Brigantine's website or by visiting the Building Department office located in City Hall at 1417 W. Brigantine Avenue.

II. Repetitive Loss Areas

Area 1: Delmar Court

Delmar Drive repetitive loss area consists of attached townhomes that have not been elevated and are built at-grade or close to it. The land under these properties ranges between 7.5 and 8 feet. Driveways slope downward to Delmar Drive, which has an elevation of approximately 6 feet directly in front of the houses. Heading west along Delmar Drive, the street slopes downward somewhat, reaching an elevation of 5.0 feet near the intersection with Lagoon Boulevard. Though Lagoon Boulevard has a slightly higher elevation in the median (7.0 feet), the lands on the western side are wetlands that have ground elevations of two feet. No bulkheads are present to prevent floodwaters from entering.

Area 2: Brigantine Boulevard

Atlantic-Brigantine Boulevard was constructed on fill circa 1920-1930 in conjunction with the bridge connection to Atlantic City. Properties along the route were sold and privately developed, resulting in a string of residential and commercial properties along the Boulevard heading into Brigantine. Brigantine Boulevard has an elevation ranging from 6 feet at its edges to seven feet near the median.

Driveways for these properties slope upwards to elevations between 7 and 8 feet. Elevation remains mostly level to the rear bulkhead areas. Brigantine's bulkhead ordinance (§127-1) requires beachfront bulkheads of 11 feet MSL and 9 feet MSL in all other areas. This repetitive loss area consists of three properties located at the intersection of Laurel Way and Brigantine Boulevard. Flooding in this neighborhood appears to be due to the overtopping of the rear bulkheads or inundation at areas where bulkheads are not present. Widespread overtopping and inundation appear to only occur during exceptional storm events, though some low-lying areas may be impacted during lunar tides. Though they were not directly visible to be measured for this study, a visual inspection from either side of the property indicates that bulkheads appear to be near grade (7 feet) for the edge properties.

Area 3: Bayshore Avenue

Bayshore Avenue includes low-lying lands along the street in the middle of the island. The area is desirable for its waterfront access and low traffic. However, the low-lying lands and fractal bulkhead ownership make flooding a significant concern. More than half of the properties surveyed were built before 1970. In Brigantine, homes built during this time period represent the largest losses. Since 2000, an uptick in home construction (resulting in predominantly elevated and floodproofed homes) has decreased both the number and proportion of older, pre-FIRM properties.

Area 4: North End

The North End is a large residential segment of Brigantine and contains a plurality of repetitive loss properties and the repetitive loss area. The North End includes a large golf course (now preserved open space), the City's schools, a small number of commercial properties, and hundreds of residential properties set along the waterfront or within the golf course. The neighborhood is almost entirely residential, containing mostly single-family detached homes. There are a small number of attached single-family homes, duplexes, and some triplexes, particularly along the waterfront and in blocks nearer to the beach. The North End is largely at a low elevation and is protected by a ring of private bulkheads. Similar to the other repetitive loss areas, the fractal ownership of these bulkheads and large number of private waterfront properties complicates a large-scale flood protection project. The North End's relative elevation is perhaps its largest vulnerability. In particular, the golf course area features elevations below 3 feet NAVD88. Many streets are between 4 and 5 feet NAVD88, and homes are generally located on lands between 5 and 6 feet high. Elevations are not uniform across the various sub-developments within the North End. For example, North Shore Drive – particularly near the Links Clubhouse – is at a high elevation that is outside of the mapped Special Flood Hazard Area. On the other hand, the area along Lafayette Boulevard and Evans Boulevard are at low elevations (>3 feet). Quay Boulevard, in the vicinity of the schools, is also at a very low elevation.

Another major vulnerability is the age of the housing stock in the neighborhood. Though there has been some new construction and home elevations, homes built between 1950 and 1980 (prior to Brigantine's adoption of Floodplain development standards) comprise nearly two-thirds of all structures in the area.

Area 5: Lighthouse District

The Lighthouse District consists of an area of mixed residential and commercial uses in the vicinity of Lighthouse Circle. The Lighthouse District sees considerable traffic owing to the number of businesses. The City's Public Works Department is also located in the neighborhood along Bayshore Avenue. In this district, all but one of the 12 properties surveyed were built before 1964. Road elevations in the neighborhood vary between four and six feet, with homes situated at-grade that is slightly above grade. Properties in this neighborhood tend to be older in age than other sections of the City. All of the subject properties are situated on streets that run between West Brigantine Avenue and Bayshore Avenue. Alleys (some of which are unimproved) bisect the lots. This district was

inundated and heavily damaged during Superstorm Sandy. Though Sandy saw exceptionally higher water levels, the neighborhood remains at risk of inundation and more frequently nuisance flooding resulting from drainage issues. Stormwater drainage in the district is lacking, particularly in the back alleys. Stormwater inlets are located along Bayshore Avenue, but not Brigantine Avenue. Brigantine Avenue is several feet higher than Bayshore Avenue. As a result, runoff is carried westward as the side streets slope westward towards the Bay. One resident of the Repetitive Loss Area noted that during lunar tides and rain events, water will pool at the rear. The Lighthouse Circle pump station has been installed and is fully functional.

Area 6: Ocean Avenue

The Ocean Avenue repetitive loss area exhibits some of the highest land of the repetitive loss areas studied. Street elevations surrounding the area range between eight and nine feet. The lowest points are those on the beach. This includes a watery depression at the terminus of 15th Street South (pictured below) and a lower sandy area in front of the Laguna Beach Bar. This is significantly lower than the beach in front of the repetitive loss area, which slopes upwards towards the dunes at a height of 10 feet at the foot of the dune. As of 2014, some of the dune heights reach upwards of 20 feet.

The structures in the repetitive loss area sit on land that is at least 10 feet NAVD88. The duplexes between 13th and 14th Street have foundations near 12.5 feet, with driveways that slope upward from the street which is at nine feet near the gutter. At the hotel, the center of the property is at a higher elevation (approximately 13.6 feet), and slopes downward to the surrounding streets. A bulkhead partially protects the 14th Street south end and the properties between 12th and 14th Streets. However, these properties are also protected by a 200' wide dune system between the homes and the beach. The topography demonstrates both a foredune and secondary dune. The height and width of these dunes likely protects the residential properties in this area, whereas the Hotel property is more exposed. The LiMWA line follows the trough between the dunes between 12th and 14th Streets but comes within feet of the base of the hotel. The Army Corps, NJDEP, and City have maintained the existing dune system as recommended in the Plan.

III. Mitigation Actions

Mitigation Action #1 - Flood Vents:

Flood vents are an important aspect of floodproofing in their ability to equalize hydrostatic pressure for foundation walls, thereby protecting the structural integrity of the house during a flood. Of the structures surveyed during the RLAA, approximately one-quarter could not be identified as having flood vents. However, nearly a majority (46 percent) of structures did have some type of foundation vents present. The City continues to encourage the installation of flood vents.

Mitigation Action #2 - Foundations:

Building foundations are a crucial aspect of building safety, particularly for flooding. Foundations that are not designed and built to withstand flooding can face failure when flooding conditions do occur. In Brigantine's repetitive loss areas, nearly two-thirds of surveyed structures were built off-grade on cinderblock stem-wall foundations with crawlspaces or enclosures underneath. A smaller, but significant portion of structures were built on what appeared to be slab foundations. A smaller proportion – approximately 12 percent – of structures were built on pilings or were not enclosed underneath. The continued trend of demolition to make way for new construction or elevation of existing homes is slowly rectifying this issue.

Mitigation Action #3 – Structure Elevations:
Structures that are properly elevated and floodproofed offer some of the best protection against flood damage. By locating habitable living areas and appurtenant equipment out of the flood zone, major flood damage to the building and contents can be mitigated. Structure elevations are often done with reference to a "base flood elevation", or the height to which waters are expected to rise during a base flood or design storm. In Brigantine, the base flood elevation varies depending on topographic factors. Base flood elevations of 8 and 9 feet NAVD88 are prevailing. In most of the City's Special Flood Hazard Area, where at-grade elevations are between five and seven feet, this equates to a design inundation of up to three feet. Brigantine incorporates a freeboard standard into its ordinance, which adds an additional three feet of flood water height to which structures must be designed in order to account future flooding conditions and changes to FEMA flood insurance rate maps.

Mitigation Action Item #4 - Preventive Activities:
This action item includes the implementation of volume control and runoff reduction measures as specified in the City's Building Codes in order to reduce flooding impacts of development and reduce susceptibility to flooding. The City's Building Development continues to ensure that all building code and design criteria are implemented on new construction and substantial improvements within each repetitive loss area.

Mitigation Action Item #5 - Property Protection Measures:
This action item included encouraging property owners to elevate inside and outside mechanical equipment above the base flood elevation or known flood protection level. This action item is achieved through building permit review of all properties located within the repetitive loss areas. The City continues to provide one on one consultation to property owners on ways to avoid or reduce future flooding.

Mitigation Action Item #6- Natural Resource Protection:
The City continues to install and maintain stormwater inlets and debris collectors. Living shorelines have been constructed along Brigantine Boulevard.

Mitigation Action Item #7 – Emergency Services:
The City has completed a feasibility study for elevating Brigantine Boulevard.

Mitigation Action Item #8 – Structural Projects:
This action item included prioritizing CIP projects to focus drainage improvement projects in watersheds containing repetitive loss areas.

Mitigation Action Item #9 – Public Information:
Includes annual outreach efforts to encourage property owners and tenants in the repetitive loss areas to obtain and keep a flood insurance policy. This is achieved through a mailout to every property identified in a Repetitive Loss Area (RLA). The Building Department completed this item in April 2024.

The City adopted an update Program for Public Information in late 2023. The message in the Program was updated to encourage risk avoidance and to promote the purchase of flood insurance. One of the targeted audiences called out in the Program is the repetitive loss areas. The repetitive loss areas receive outreach annually

IV. Updates for Mitigation Actions

The City of Brigantine has continued to implement an aggressive effort to encourage the elevation of existing homes. The City applies for FEMA Flood Mitigation Assistance Grants each year to assist property owners to gain funding to elevate. In 2022, 2023 and 2024 over a dozen property owners have submitted complete applications.