


Date: October 18, 2021
To: Honorable Chairman Jose “Pepe” Diaz
and Members, Board of County Commissioners
From: Daniella Levine Cava
Mayor 
Subject: Biscayne Gardens Engineering Study Related to Flooding to Identify Short-Term and Long-Term Solutions – Directive No. 211308

On July 8, 2021, the Board of County Commissioners (Board) adopted Resolution No. R-668-21, directing the County Mayor or County Mayor’s designee to conduct an engineering study related to flooding in the area of the County generally known as Biscayne Gardens, and more specifically, within the area bordered to the north by Northwest 167th Street; to the east by North Miami Avenue; to the south by Northwest 158th Street (east of Northwest 2nd Avenue) and Northwest 157th Street (west of Northwest 2nd Avenue); and to the west by Northwest 6th Avenue (the “study area”), to identify both short-term and long-term solutions to the problems that residents may be experiencing, and to prepare a report on the engineering study to be placed on an agenda of the Board within 90 days of the effective date of Resolution No. R-668-21.

Miami-Dade County’s Department of Regulatory and Economic Resources, Division of Environmental Resources Management (RER-DERM) maintains a set of integrated hydraulic and hydrologic watershed numerical models that provide a detailed analysis of the simulated performance of existing and planned stormwater infrastructure, with forecasts of short- and long-term sea level rise, for a broad range of design storm events and best management scenarios. These numerical models, coupled with data on infrastructure maintenance, water quality sampling, flood complaints, and repetitive losses, inform the County’s stormwater infrastructure short-, medium-, and long-term capital improvement projects. These models were utilized in the following Engineering Study, which articulates both short- and long-term planned improvements. Over the years, RER-DERM and DTPW have completed numerous projects in the area to improve conditions, which was developed years ago and prior to the adoption of current building standards. As redevelopment occurs, the Department implements improvements that capitalize on private investment to bring the entire area up to standards, and will continue to analyze investment and improvements into the future.

Engineering Study

The study area and existing stormwater infrastructure, shown in **Figure 1**, consists of a network of County-maintained catch basins and gravity drainage pipes that outfall into the C-8 Primary Canal (Biscayne Canal); a network of County-maintained catch basins and gravity drainage pipes ultimately discharging into the Biscayne Gardens Stormwater Pump Station which, in turn, discharges into the Spur #4 Canal; and a number of dispersed localized exfiltration trenches. The study area has historically been subject to frequent flooding, with 26 flood complaint records dating back to 2008 within the study area as shown in **Figure 2**.

Deficiencies in the stormwater system were identified with the support of integrated hydraulic and hydrologic watershed numerical models. **Figure 3**, **Figure 4**, and **Figure 5** show the model simulation results for the area and depth of inundation for a 1) 10-year, 24-hour storm, 2) 25-year, 72-hour storm, and 3) 100-year, 72-hour storm, respectively. This analysis was conducted using the 2060 model scenario with Sea Level Rise. The 10-year, 24-hour storm, is indicative of what the minimum elevations should be for finished lands and crowns of roads. The 25-year, 72-hour storm, establishes the minimum top of bank elevations and design criteria of canals to ensure there is sufficient storage and conveyance

capacity. Both of these targets impact infrastructure in the public right-of-way and were used to identify the engineering strategies below. The third target, 100-year, 72-hour storm, is mentioned herein as it controls the finished floor elevations of buildings, and mostly impacts the development of private properties in the study area showing elevation deficiencies.

The deficiencies identified in the stormwater system include the following:

- Limited conveyance upstream of the existing 192-inch culvert discharging from the secondary Spur #4 Canal into the primary C-8 Canal.
- Limited conveyance to and from the Biscayne Gardens #3 Pump Station.
- Canal bank elevation deficiencies for the Spur #4 Canal, impacting the canal storage capabilities.
- Elevation deficiencies for County-maintained roads within the study area.
- Biscayne Gardens Ditch capacity deficiency, which may impact the study area located upstream of said ditch.

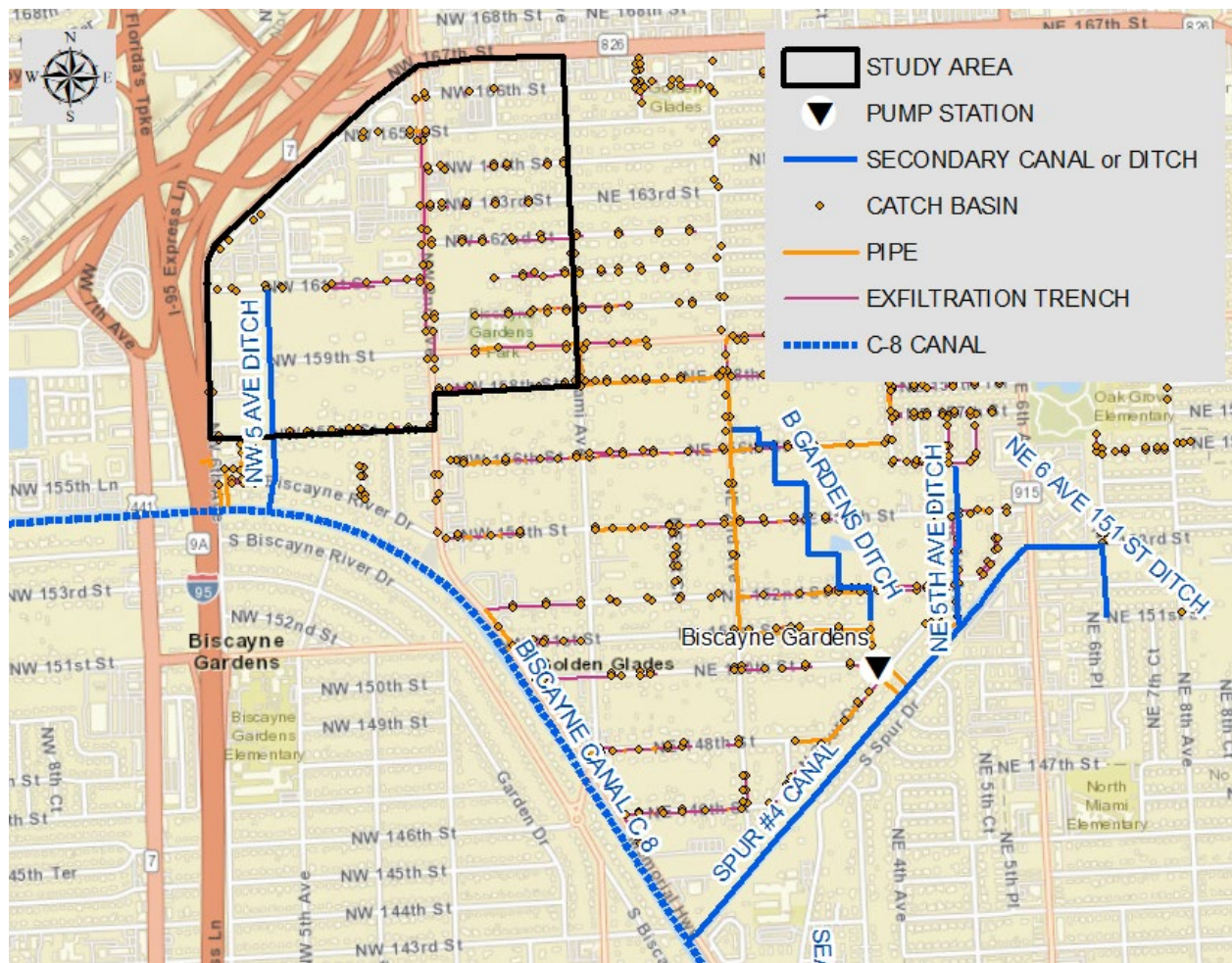


Figure 1. Study Area and Stormwater Infrastructure

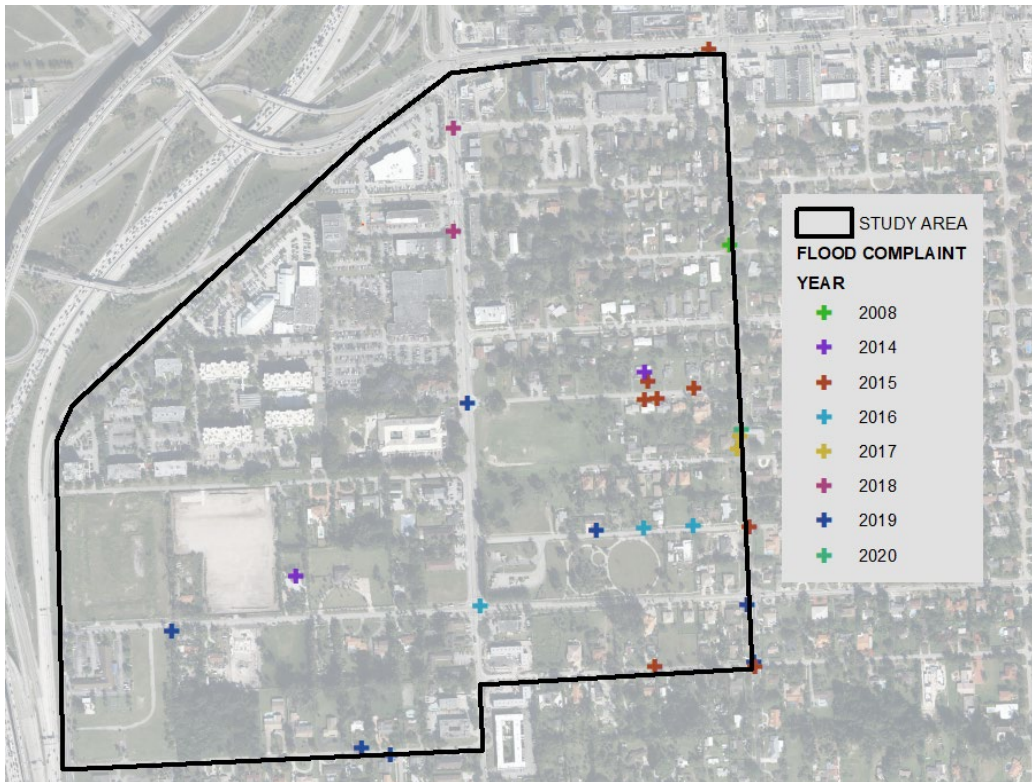


Figure 1. Historical Flood Complaints Within the Study Area

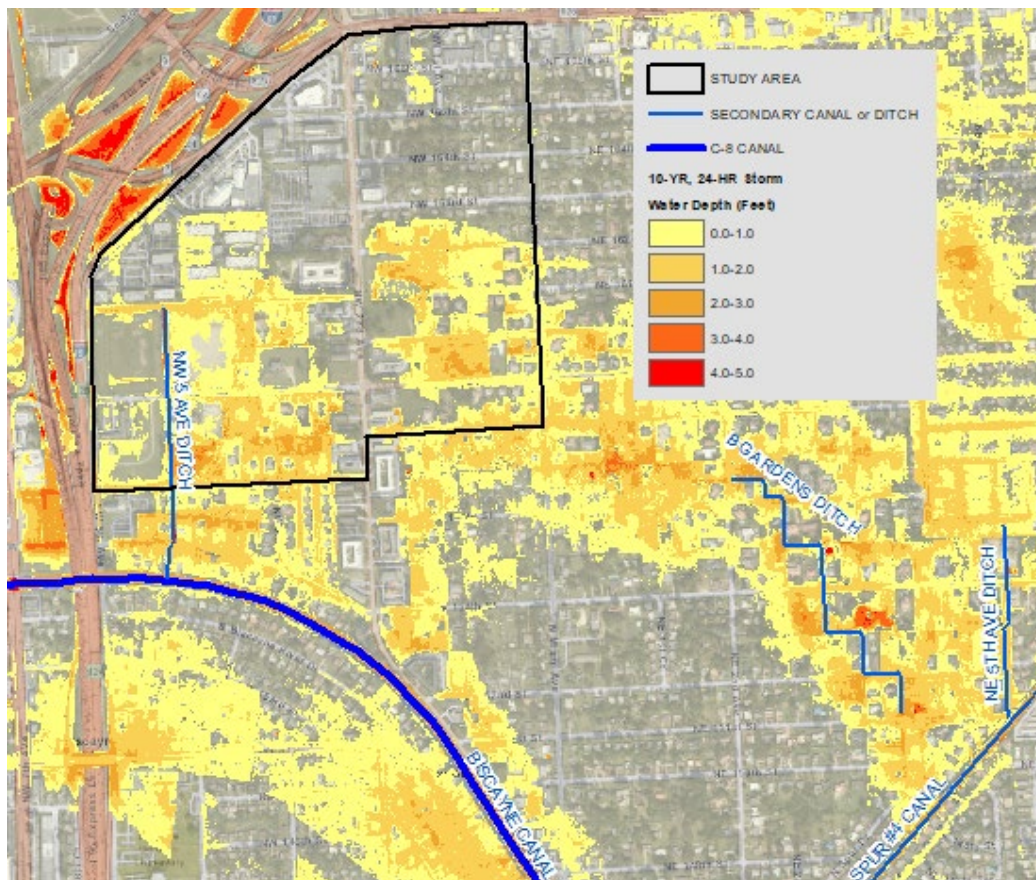


Figure 2. 10-Year, 24-Hour Simulated Area and Depth of Inundation

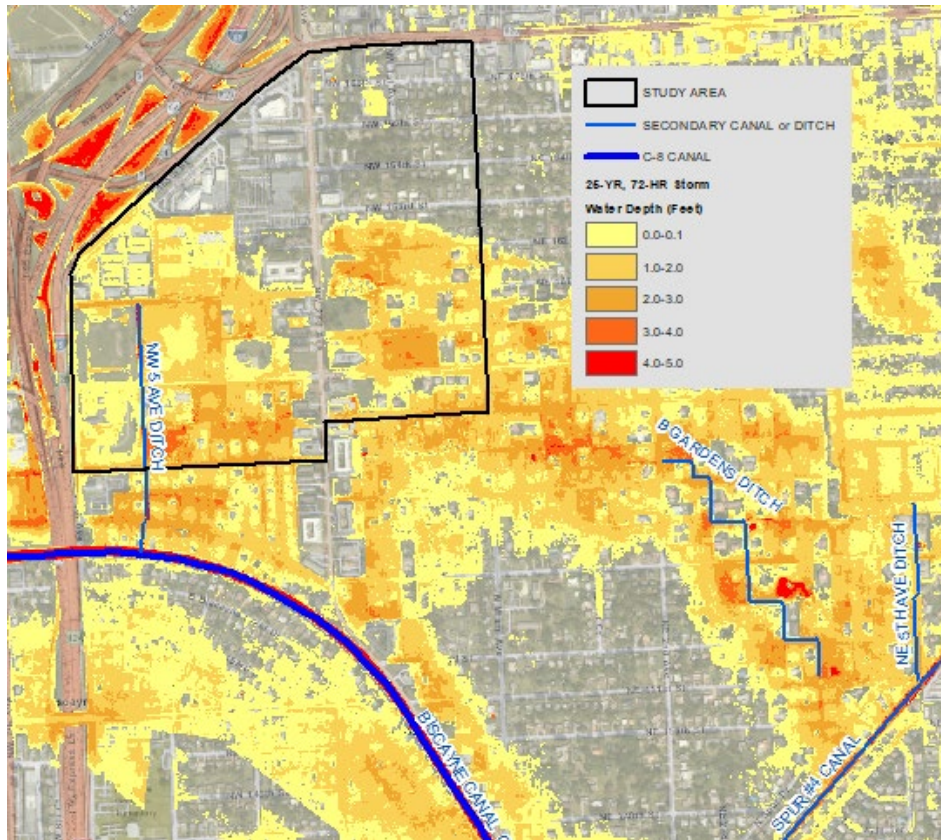


Figure 3. 25-Year, 72-Hour Simulated Area and Depth of Inundation

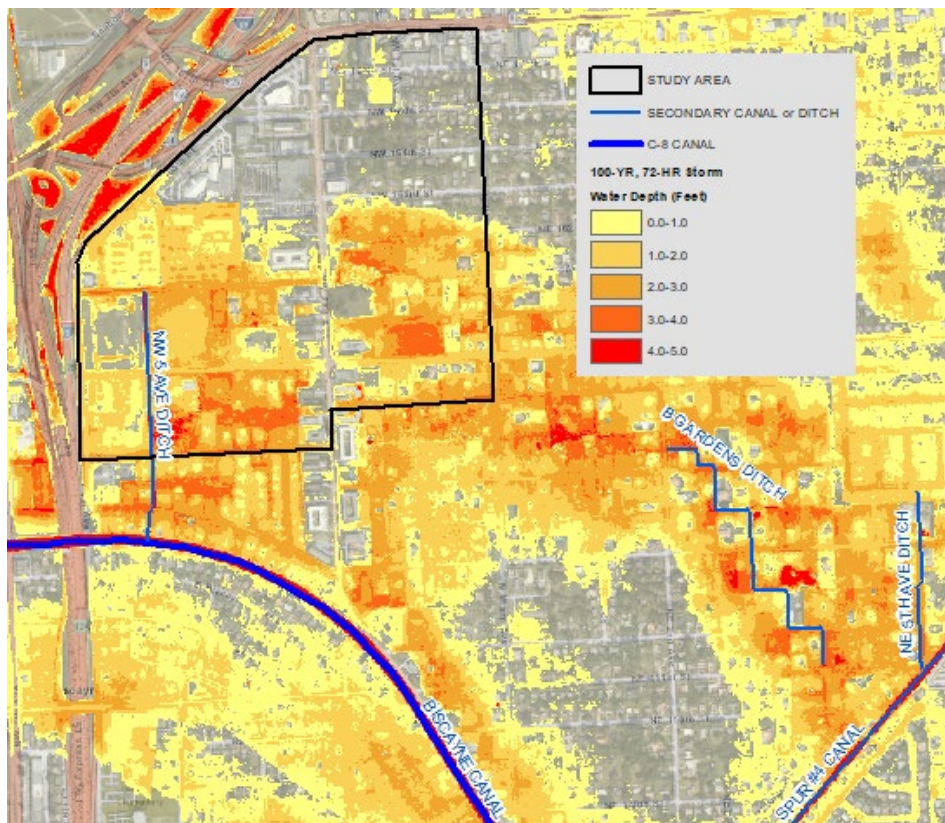


Figure 4. 100-Year, 72-Hour Simulated Area and Depth of Inundation

RER-DERM identified short-term strategies (to be implemented over the next 5 years) and long-term strategies (to be implemented over the next 10-30 years) in order to address these deficiencies and ameliorate chronic flooding conditions in the study area.

Short-Term Strategies

The following short-term strategies are designed to improve conveyance upstream of the existing 192-inch culvert discharging from the secondary Spur #4 Canal into the primary C-8 Canal, improve conveyance to and from the Biscayne Gardens #3 Pump Station, and buyout frequently flooded properties for future siting of new pump station sites:

- Dredging of approximately 300 feet of Spur #4 canal upstream of the 192-inch culvert discharging into the C-8 canal. The culvert is located at the discharge of the Spur #4 canal under Memorial Highway with inverts at -2.92’ NAVD88 (upstream) and -3.35’ NAVD 88 (downstream), respectively. Survey, design, permitting, bid, award, and construction are anticipated to take approximately 18 months.
- Optimizing existing Biscayne Gardens #3 Pump Station conveyance infrastructure through new piping, interconnections, and discharge improvements into the Spur #4 Canal. Service area modeling, survey, design, permitting, bid, award, and construction are anticipated to take approximately 24 months.
- Buyout properties, such as the one located at 326 NE 152nd Street, to be used for siting of a new stormwater pump station. Buyout and demolition of the property is estimated to take approximately 24 months. The estimated total cost for purchasing and demolishing this property is \$278,000. The property located at 326 NE 152nd Street has been approved for funding through the Federal Community Development Block Grant Disaster Recovery (CDBG-DR) Voluntary Home Buyout Program administered by the Florida Department of Economic Opportunity (DEO) Office of Disaster Recovery. Authority for the County Mayor or County Mayor’s designee to execute the subrecipient agreement with the DEO to provide block grant funding was granted via Resolution No. R-560-21 passed on June 2, 2021.

All short-term projects to improve drainage performance will include assessment and implementation of stormwater quality treatment and technologies as applicable.

Long-Term Strategies

The following long-term strategies are designed to increase drainage capacity of the service area into the Spur #4 and C-8 Canals, increase the drainage capacity of the Spur #4 Canal, increase the drainage capacity of the Biscayne Gardens Ditch, and address roadway elevation deficiencies:

- Design a new stormwater pump station to collect discharges from the Biscayne Gardens Ditch and collector piping. This pump station will utilize a wet well design, injection well, and vacuum pumping system and will discharge into the Spur #4 Canal, with pressurized discharge piping possibly running along NE 151st Street and will be located at the proposed buyout property on 326 NE 152nd Street. Service area modeling, survey, design, permitting, bid, award, and construction are anticipated to take approximately 36 months.

- Design a new stormwater pump station to collect discharges from the northwest area of the Biscayne Gardens neighborhood west of NW 2nd Avenue. This pump station will utilize a wet well design, injection well, and vacuum pumping system and will discharge into the C-8 Canal, with pressurized discharge piping possibly running along NW 2nd Avenue. Research for a suitable property in the area will be needed. Property identification and purchase, modeling, survey, design, permitting, bid, award, and construction are anticipated to take approximately 48 months.
- Canal bank elevation improvements to increase conveyance capacity. Survey, design, permitting, bid, award, and construction are anticipated to take approximately 24 months.
- Dredging of the Biscayne Gardens Ditch to restore conveyance capacity and facilitate maintenance. Survey, design, permitting, bid, award, and construction is anticipated to take approximately 24 months.
- Elevation improvements to roads within the study area that flood during a 10-year, 24-hour rain event. Service area modeling, survey, design, permitting, bid, award, and construction are anticipated to take approximately 48 months.

All long-term projects to improve drainage performance will include assessment and implementation of stormwater quality treatment and technologies as applicable.

Conclusion

Funding to initiate the projects identified under the short-term strategies is being prioritized for approval starting in FY21-22. The projects identified under the long-term strategies have been incorporated under the Stormwater Utility Long-Term Capital Improvement Plan.

In accordance with Ordinance No. 14-65, this report will be placed on the next available Board meeting agenda. If you have any questions or require additional information, please contact Lee N. Hefty, Assistant Director, Division of Environmental Resources Management in the Department of Regulatory and Economic Resources, at heftyl@miamidade.gov.

c:

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