

Date: June 28, 2023

Agenda Item No. 2(B)(3)
July 18, 2023

To: Honorable Chairman Oliver G. Gilbert, III
and Members, Board of County Commissioners

From: Daniella Levine Cava
Mayor



Subject: Report Evaluating the County's Drainage Infrastructure in South Dade - Directive No. 221437

Executive Summary

On September 1, 2022, the Board of County Commissioners (Board) adopted Resolution R-841-22 sponsored by Commissioner McGhee, directing the County Mayor or County Mayor's designee to evaluate the oldest County drainage infrastructure in South Dade, recommend repairs or other improvements to such infrastructure, outline the cost of such improvements, prepare a plan to fund such improvements, and prepare a report summarizing the findings.

When it comes to the evaluation of stormwater infrastructure, age is not a key indicator to determine if the system is performing adequately or if it is in need of improvements. Significant drivers affecting stormwater system performance and dictating when and what types of improvements are needed include: theoretical capacity to meet current drainage needs, routine operation and maintenance (O&M) challenges, and the future changes of hydrologic, hydraulic and land use conditions. Planned projects are evaluated based on their Flood Protection Level of Service (FPLOS) and priority areas are identified through the stormwater modeling results countywide. The County's Stormwater Master Plan and the mapping and modeling effort behind it provides the technical basis for capital improvements. Stormwater infrastructure projects are identified and prioritized based on the stormwater model results, including flood complaints, repetitive loss analysis, and strategic short- and long-term planning.

For modeling and capital planning purposes, the Stormwater Capital Improvement Plan (CIP) divides the County into Northern, Central and Southern basins. The Southern basins are comprised primarily of the geographic area of BCC Districts 8 and 9. The area enjoys a high level of pervious area due the presence of agriculture, environmentally protected lands, and lower levels of urbanization as compared to the Northern and Central basins. It is also served by more primary canals (5) than any other basin area. The CIP is programmed to invest approximately \$85 million in South Dade over the next 30 years funded by Stormwater Utility Fees (SWU), and an additional estimated cost of \$14 million for roadway elevation improvements through other funding sources supporting the County's roadway reconstruction projects. It is also anticipated that as subdivisions are constructed, additional roadway and right-of-way drainage will be implemented in sections of the South basins that are currently vacant and available for development.

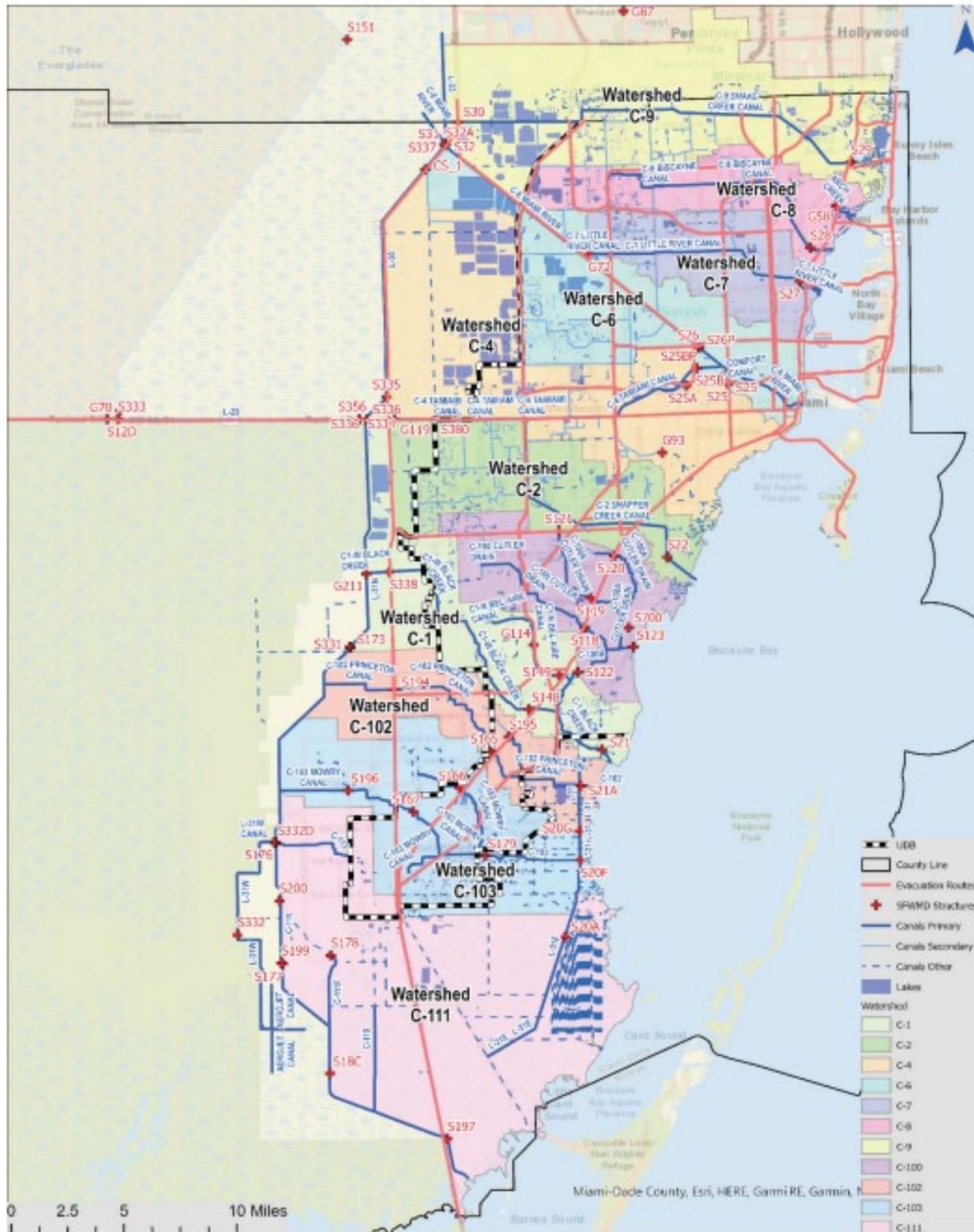
Evaluation of the Oldest County Drainage Infrastructure in South Dade, Recommendations, and Improvements Plan

The updated criteria from the County's Stormwater Master Plan has been regularly used for the last 25 years for the planning, design, and construction of both private and public projects. The design criteria derived from the watershed models is used to determine the maximum allowable discharges and changes in flood stages caused by new development, redevelopment, and infill projects. Evaluation of control measures through alternative model simulations are used to test strategies for stormwater improvements, mitigation of remaining repetitive losses, and addressing climate change potential impacts. From this effort, capital improvements are identified and added to the County's stormwater CIP.

As noted above, the performance of stormwater infrastructure, if well maintained, is not determined by the system's age. For example, stormwater conveyance systems may be excavated into the ground or constructed of corrugated metal, reinforced concrete, or plastic, and their lifespan may be projected to be 50 to 100 years. Storage and treatment systems such as detention and retention ponds may have an average lifespan between 20 to 30 years. Infrastructure age, however, is not the driving indicator to establish if a system is performing well and to current standards or if it needs a capital improvement. Instead, other significant drivers affect stormwater system performance and dictate when and what types of improvements are needed. These factors include: theoretical capacity to meet current drainage needs, routine operation and maintenance (O&M) challenges, and the future changes of hydrologic, hydraulic and land use conditions. Planned projects are evaluated based on their Flood Protection Level of Service (FPLOS) and priority areas are identified through the stormwater modeling results countywide. The County's Stormwater Master Plan provides the technical basis for capital improvements.

The impacts of increased urbanization on stormwater runoff and infiltration have been captured in the 2021 update. The average vacant land is 24% systemwide and varies from 5-9% for highly urbanized areas (watershed C-7, C-9, C-100), 12-16% for medium degree of urbanization (C-2, C-6, C-8), and 26-44% for low urbanization (C-1, C-4, C-102, C-103, and C-111). Watersheds that are highly urbanized experienced increased stormwater runoff and show higher overall flood protection severity scores. The South basins hold 67% of all the vacant land countywide. A map of the watershed basins modeled for the Stormwater Master Plan is shown below for reference.

Figure 1. Miami-Dade Watershed Basins



The Miami-Dade County RER Water Management Division administers the County's CIP through continuous implementation of this Stormwater Master Plan. Stormwater infrastructure projects are identified and prioritized based on the stormwater model results, including flood complaints, repetitive loss analysis, and strategic short- and long-term planning. Future impacts and mitigation scenarios are continually modeled and analyzed to effectively address infrastructure planning and stormwater management decisions.

Stormwater infrastructure projects are maintained in a GIS database and categorized as completed, active or planned. Once a project is completed and as-builts become available the infrastructure changes are incorporated into the stormwater model.

Stormwater Capital Improvement Plan Expenditures in South Dade

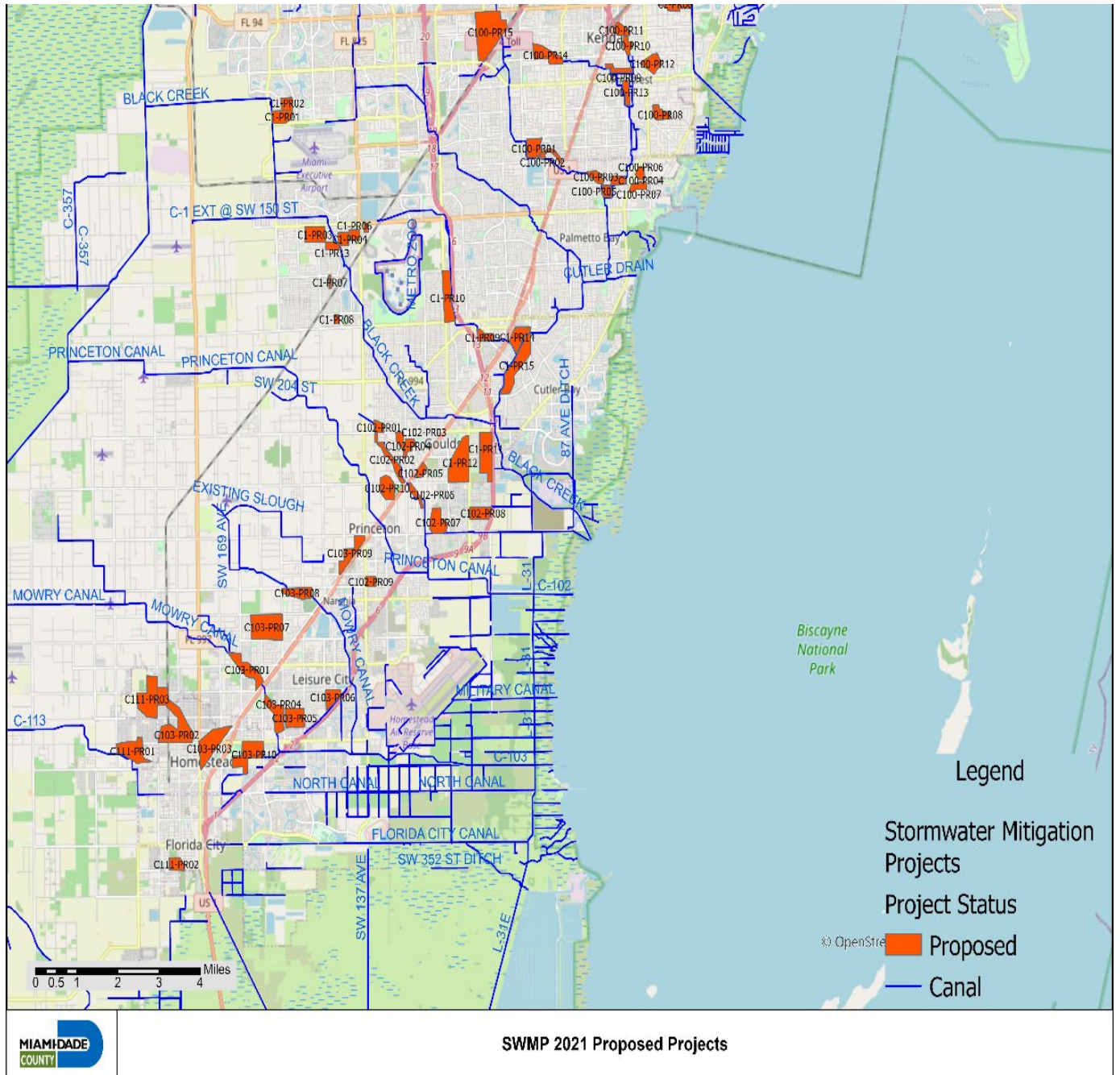
The County CIP (short- and long-term projects) includes stormwater projects for all the South basins. A total estimated expenditure of over \$85 million has been identified by the County for future investments in stormwater infrastructure improvements over the next 30 years. The South basins include watersheds C-1, C-100, C-102, C-103, and C-111; BCC Districts in the South basins are 7, 8, 9, and 11. Mitigation project areas identified in the Stormwater Master Plan are prioritized based on their Flood Protection Level of Service (FPLOS). Priority areas are identified through the stormwater modeling results countywide, and include flood complaints, repetitive loss analysis, degree of urbanization, and anticipated future development. The implementation timetable of improvements reflects the current "low urbanization" in the South basins. Three implementation horizons have been planned:

- 0 to 10 Years: Local drainage improvements of \$6.9 million
- 10 to 20 Years: Local drainage improvements of \$17.7 million and secondary canal improvements of \$36.6 million
- 20 to 30 Years: Secondary canal improvements of \$23.8 million. The current estimate does not include the cost for land acquisition for four of the new planned canals (~5 miles) at locations where no canal reservations currently exist. These planned canals for future development areas are included in the County's Water Control Map.

Additional local drainage projects are assumed to be identified through future updates to the stormwater master plan as a reflection of newer data and environmental conditions moving forward.

South Dade stormwater mitigation project areas are shown in the map below.

Figure 2. South Dade Stormwater Mitigation Project Areas



These planned South Dade projects are characterized as follows:

Elevation of Canal Banks

The analysis identified areas that may be improved by elevating the banks of selected secondary canals above the design stage in the 25- YR /72-HR 2060 future model with SLR scenario, thus improving the storage LOS of the network of secondary canals. Sixteen secondary canals (~14 miles) have been identified to be improved by elevating canal banks to increase stormwater storage and detention capability. These improvements enhance flood management and water quality treatment.

Interconnectivity Improvements

The analysis determined areas subjected to flooding which can be mitigated by providing interconnectivity of drainage areas, secondary canal segments and stormwater storage. This alternative shows the benefits of additional infrastructure used to mitigate flooded areas that are currently disconnected. Six secondary canals (~9 miles) have been identified for new canal segments and canal cross section improvements to increase interconnectivity with other existing stormwater infrastructure, stormwater storage and detention capability. These improvements enhance flood management and water quality treatment

Backflow for High Canal Stages.

The analysis determined the effects of installing backflow preventers at selected outfalls to eliminate flooding caused by backflow in canals during high stage periods. Backflow prevention is to be installed in existing outfalls (as needed) in the thirteen secondary canals identified for improvements to the elevation of canal banks. Backflow prevention in outfalls will be used as needed to prevent surface backflow during high stages in the secondary canal system. These improvements enhance flood management capability.

Exfiltration Trenches and Drainage Eells

The analysis identified locations for addition of stormwater exfiltration and other related drainage infrastructure. This alternative provides the benefits of improved drainage rates particularly during the initial period of storms. Approximately 2800 acres have been identified in the South basins for improvements to add exfiltration infrastructure. These improvements enhance flood management and water quality treatment.

Upgrades in Capacity

Alternative simulations were developed to determine conceptual designs for conveyance to upgrade system capacity and provide increased flood mitigation. This analysis was used to identify the stormwater infrastructure improvements listed above which will result in system capacity enhancements to provide protection for 2060 needs.

Short- and long-term implementation of CIP projects is funded by the County's Stormwater Utility Fees, and budgeted annually as approved by the Board. Planned projects are evaluated against target Flood Protection Level of Service (FPLOS) and priority areas are identified through the stormwater modeling results countywide. The highest priority projects are selected annually for design, permitting, and construction. The RER-DERM has been aggressively pursuing external funding such as Federal and State grants to help accelerate some of the longer-term projects that prepare the County service area for future forecasted conditions in 2060 and beyond.

This report will be placed on the next available Board meeting agenda. If you have any questions or require additional information, please contact Lourdes M. Gomez, RER Director.

- c: Geri Bonzon-Keenan, County Attorney
- Gerald Sanchez, First Assistant County Attorney
- Jess McCarty, Executive Assistant County Attorney
- Office of the Mayor Senior Staff
- Lourdes M. Gomez, Director, Department of Regulatory and Economic Resources
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- Yinka Majekodunmi, Commission Auditor
- Basia Pruna, Director, Clerk of the Board
- Eugene Love, Agenda Coordinator

MDC008

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~221 acres, flooding risks to be mitigated for ~857 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR12 Details in Section 5, SW Master Plan (September 2021)	C1	8 ; 9	\$448,000	0 YR - 5 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~165 acres, flooding risks to be mitigated for ~385 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR11 Details in Section 5, SW Master Plan (September 2021)	C1	8 ; 9	\$335,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~128 acres, flooding risks to be mitigated for ~344 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR10 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$260,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~73 acres, flooding risks to be mitigated for ~397 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR01 Details in Section 5, SW Master Plan (September 2021)	C1	11	\$148,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~177 acres, flooding risks to be mitigated for ~342 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR15 Details in Section 5, SW Master Plan (September 2021)	C1	8	\$360,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~53 acres, flooding risks to be mitigated for ~38 parcels. Details in Section 5, SW Master Plan (September 2021)	C100-PR15 Details in Section 5, SW Master Plan (September 2021)	C100	7	\$664,000	0 YR - 5 YR

MDC009

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~80 acres, flooding risks to be mitigated for ~189 parcels. Details in Section 5, SW Master Plan (September 2021)	C100-PR01 Details in Section 5, SW Master Plan (September 2021)	C100	8	\$1,010,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~76 acres, flooding risks to be mitigated for ~433 parcels. Details in Section 5, SW Master Plan (September 2021)	C102-PR08 Details in Section 5, SW Master Plan (September 2021)	C102	8	\$1,350,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~167 acres, flooding risks to be mitigated for ~353 parcels. Details in Section 5, SW Master Plan (September 2021)	C103-PR10 Details in Section 5, SW Master Plan (September 2021)	C103	8	\$526,000	0 YR - 5 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~287 acres, flooding risks to be mitigated for ~684 parcels. Details in Section 5, SW Master Plan (September 2021)	C103-PR02 Details in Section 5, SW Master Plan (September 2021)	C103	8	\$900,000	0 YR - 5 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~109 acres, flooding risks to be mitigated for ~403 parcels. Details in Section 5, SW Master Plan (September 2021)	C103-PR05 Details in Section 5, SW Master Plan (September 2021)	C103	8	\$345,000	5 YR - 10 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~180 acres, flooding risks to be mitigated for ~299 parcels. Details in Section 5, SW Master Plan (September 2021)	C103-PR03 Details in Section 5, SW Master Plan (September 2021)	C103	8 ; 9	\$564,000	5 YR - 10 YR
				\$6,910,000	

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Secondary canal bank resilience improvements to meet a higher LOS of 25-YR/72-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes improvements to the conveyance and storage capacity, raising canal banks, canal reconstruction, and related culvert improvements. SW Master Plan (September 2021)</p>	<p>C1-CANAL01 5 Secondary canals, ~2 miles of deficiencies/repairs. Detail in Table 104, SW Master Plan (September 2021)</p>	<p>C1</p>	<p>8, 9, 11</p>	<p>\$5,460,000</p>	<p>10 - 20 YR</p>
<p>UMSA roadway resilience improvements to meet a higher LOS, CFC adopted in October 2022, of 10-YR/24-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes correction of road elevation deficiencies by implementing road reconstruction and drainage improvements. SW Master Plan (September 2021)</p>	<p>C1-ROAD01 UMSA roadways, ~1 mile of deficiencies/repairs. Detail in Table 105, SW Master Plan (September 2021). Funding typically provided through Road Impact Fees for road/drainage reconstruction, or as development occurs</p>	<p>C1</p>	<p>8, 9, 11</p>		<p>10-20 YR</p>

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~85 acres, flooding risks to be mitigated for ~249 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR14 Details in Section 5, SW Master Plan (September 2021)	C1	8	\$171,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~98 acres, flooding risks to be mitigated for ~244 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR03 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$200,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~34 acres, flooding risks to be mitigated for ~193 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR06 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$69,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~43 acres, flooding risks to be mitigated for ~170 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR02 Details in Section 5, SW Master Plan (September 2021)	C1	11	\$87,000	10 YR - 15 YR

MDC011

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~39 acres, flooding risks to be mitigated for ~14 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR09 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$79,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~30 acres, flooding risks to be mitigated for ~150 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR13 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$61,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~42 acres, flooding risks to be mitigated for ~156 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR04 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$86,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~13 acres, flooding risks to be mitigated for ~55 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR08 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$25,000	10 YR - 15 YR

MDC012

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~10 acres, flooding risks to be mitigated for ~46 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR07 Details in Section 5, SW Master Plan (September 2021)	C1	9	\$22,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~12 acres, flooding risks to be mitigated for ~3 parcels. Details in Section 5, SW Master Plan (September 2021)	C1-PR05 Details in Section 5, SW Master Plan (September 2021)	C1	11	\$25,000	10 YR - 15 YR
Secondary canal bank resilience improvements to meet a higher LOS of 25-YR/72-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes improvements to the conveyance and storage capacity, raising canal banks, canal reconstruction, and related culvert improvements. SW Master Plan (September 2021)	C100-CANAL01 7 Secondary canals, ~7 miles of deficiencies/repairs. Detail in Table 125, SW Master Plan (September 2021)	C100	7, 8, 9	\$18,500,000	10 - 20 YR

MDC013

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~104 acres, flooding risks to be mitigated for ~96 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR14 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>7</p>	<p>\$1,310,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~41 acres, flooding risks to be mitigated for ~52 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR13 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>7</p>	<p>\$518,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~40 acres, flooding risks to be mitigated for ~50 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR09 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>7</p>	<p>\$503,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~30 acres, flooding risks to be mitigated for ~67 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR02 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>8</p>	<p>\$387,000</p>	<p>10 YR - 15 YR</p>

MDC014

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~53 acres, flooding risks to be mitigated for ~38 parcels. Details in Section 5, SW Master Plan (September 2021)	C100-PR011 Details in Section 5, SW Master Plan (September 2021)	C100	7	\$517,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~38 acres, flooding risks to be mitigated for ~53 parcels. Details in Section 5, SW Master Plan (September 2021)	C100-PR03 Details in Section 5, SW Master Plan (September 2021)	C100	8	\$486,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~32 acres, flooding risks to be mitigated for ~47 parcels. Details in Section 5, SW Master Plan (September 2021)	C100-PR05 Details in Section 5, SW Master Plan (September 2021)	C100	8	\$407,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~73 acres, flooding risks to be mitigated for ~45 parcels. Details in Section 5, SW Master Plan (September 2021)	C100-PR12 Details in Section 5, SW Master Plan (September 2021)	C100	7	\$925,000	10 YR - 15 YR

MDC015

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~35 acres, flooding risks to be mitigated for ~48 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR04 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>8</p>	<p>\$446,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~34 acres, flooding risks to be mitigated for ~43 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR10 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>7</p>	<p>\$434,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~53 acres, flooding risks to be mitigated for ~38 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR08 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>7</p>	<p>\$670,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~34 acres, flooding risks to be mitigated for ~22 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR07 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>8</p>	<p>\$437,000</p>	<p>10 YR - 15 YR</p>

MDC016

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~28 acres, flooding risks to be mitigated for ~20 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100-PR06 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C100</p>	<p>8</p>	<p>\$356,000</p>	<p>10 YR - 15 YR</p>
<p>Secondary canal bank resilience improvements to meet a higher LOS of 25-YR/72-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes improvements to the conveyance and storage capacity, raising canal banks, canal reconstruction, and</p>	<p>C102-CANAL01 3 Secondary canals, ~3 miles of deficiencies/repairs. Detail in Table 128, SW Master Plan (September 2021)</p>	<p>C102</p>	<p>8, 9</p>	<p>\$8,400,000</p>	<p>10 - 20 YR</p>
<p>UMSA roadway resilience improvements to meet a higher LOS, CFC adopted in October 2022, of 10-YR/24-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes correction of road elevation deficiencies by implementing road reconstruction and drainage improvements. SW Master Plan (September 2021)</p>	<p>C102-ROAD01 UMSA roadways, ~ 46 miles of deficiencies/repairs. Detail in Table 129, SW Master Plan (September 2021). Funding typically provided through Road Impact Fees for road/drainage reconstruction, or as development occurs</p>	<p>C102</p>	<p>8, 9</p>		<p>10-20 YR</p>

MDC017

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~32 acres, flooding risks to be mitigated for ~240 parcels. Details in Section 5, SW Master Plan (September 2021)	C102-PR09 Details in Section 5, SW Master Plan (September 2021)	C102	9	\$572,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~72 acres, flooding risks to be mitigated for ~133 parcels. Details in Section 5, SW Master Plan (September 2021)	C102-PR02 Details in Section 5, SW Master Plan (September 2021)	C102	8	\$1,290,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~39 acres, flooding risks to be mitigated for ~105 parcels. Details in Section 5, SW Master Plan (September 2021)	C102-PR04 Details in Section 5, SW Master Plan (September 2021)	C102	8 ;9	\$706,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~29 acres, flooding risks to be mitigated for ~50 parcels. Details in Section 5, SW Master Plan (September 2021)	C102-PR03 Details in Section 5, SW Master Plan (September 2021)	C102	8	\$528,000	10 YR - 15 YR

MDC018

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~100 acres, flooding risks to be mitigated for ~54 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102-PR07 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102</p>	<p>8</p>	<p>\$1,720,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~28 acres, flooding risks to be mitigated for ~61 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102-PR05 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102</p>	<p>9</p>	<p>\$496,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~31 acres, flooding risks to be mitigated for ~33parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102-PR01 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102</p>	<p>8</p>	<p>\$553,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~87 acres, flooding risks to be mitigated for ~30 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102-PR10 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102</p>	<p>8</p>	<p>\$1,560,000</p>	<p>10 YR - 15 YR</p>

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~39 acres, flooding risks to be mitigated for ~105 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102-PR06 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C102</p>	<p>8,9</p>	<p>\$578,000</p>	<p>10 YR - 15 YR</p>
<p>Secondary canal bank resilience improvements to meet a higher LOS of 25-YR/72-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes improvements to the conveyance and storage capacity, raising canal banks, canal reconstruction, and related culvert improvements. SW Master Plan (September 2021)</p>	<p>C103-CANAL01 1 Secondary canals, ~2 miles of deficiencies/repairs. Detail in Table 131, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8, 9</p>	<p>\$4,245,000</p>	<p>10 YR - 20 YR</p>

MDC020

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>UMSA roadway resilience improvements to meet a higher LOS, CFC adopted in October 2022, of 10-YR/24-HR storm event for a future 2060 scenario with a +2' SLR. Planned scope includes correction of road elevation deficiencies by implementing road reconstruction and drainage improvements. SW Master Plan (September 2021)</p>	<p>C103-ROAD01 UMSA roadways, ~ 41 mile of deficiencies/repairs. Detail in Table 132, SW Master Plan (September 2021). Funding typically provided through Road Impact Fees for road/drainage reconstruction, or as development occurs</p>	<p>C103</p>	<p>8, 9</p>	<p>\$334,000</p>	<p>10 YR - 20 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~106 acres, flooding risks to be mitigated for ~271 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103-PR04 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8</p>	<p>\$334,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~63 acres, flooding risks to be mitigated for ~234 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103-PR06 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8</p>	<p>\$200,000</p>	<p>10 YR - 15 YR</p>

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~242 acres, flooding risks to be mitigated for ~197 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103-PR07 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8</p>	<p>\$760,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~96 acres, flooding risks to be mitigated for ~58 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103-PR09 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8</p>	<p>\$302,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~119 acres, flooding risks to be mitigated for ~49 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103-PR01 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8</p>	<p>\$375,000</p>	<p>10 YR - 15 YR</p>
<p>Drainage improvements (new and/or replacement of SW infrastructure), ~82 acres, flooding risks to be mitigated for ~25 parcels. Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103-PR08 Details in Section 5, SW Master Plan (September 2021)</p>	<p>C103</p>	<p>8</p>	<p>\$260,000</p>	<p>10 YR - 15 YR</p>

MDC022

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Drainage improvements (new and/or replacement of SW infrastructure), ~190 acres, flooding risks to be mitigated for ~272 parcels. Details in Section 5, SW Master Plan (September 2021)	<p style="text-align: center;">C111-PR03</p> Details in Section 5, SW Master Plan (September 2021)	C111	8	\$2,660,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~53 acres, flooding risks to be mitigated for ~179 parcels. Details in Section 5, SW Master Plan (September 2021)	<p style="text-align: center;">C111-PR02</p> Details in Section 5, SW Master Plan (September 2021)	C111	9	\$725,000	10 YR - 15 YR
Drainage improvements (new and/or replacement of SW infrastructure), ~145 acres, flooding risks to be mitigated for ~73 parcels. Details in Section 5, SW Master Plan (September 2021)	<p style="text-align: center;">C111-PR01</p> Details in Section 5, SW Master Plan (September 2021)	C111	8	\$1,970,000	10 YR - 15 YR
				\$54,349,000	

MDC024

Project Description	Project Limits	MDC Master Plan Basin	BCC Commission District	Total Estimated Cost	Project Implementation Horizon
Secondary Canal Planned Project / FLOODWAY improvements (NO CANAL RESERVATION EXISTS LAND ACQUISITION MAY BE REQUIRED). Details in WCM adopted in October 2022 & SW Master Plan (September 2021)	C102-CANAL02 SW 204 ST, from SW 152 AVE to SW 162 AVE (~1 mile)	C102	8	\$2,100,000	20 YR - 30 YR
Secondary Canal Planned Project FLOODWAY improvements (NO CANAL RESERVATION EXISTS LAND ACQUISITION MAY BE REQUIRED). Details in WCM adopted in October 2022 & SW Master Plan (September 2021)	C103-CANAL03 C-103N EXTENTION CANAL, (From SW 240 ST to SW 268 ST) (~1.6 mile)	C103	8	\$10,200,000	20 YR - 30 YR
Secondary Canal Improvements Planned Project (NO CANAL RESERVATION EXISTS LAND ACQUISITION MAY BE REQUIRED). Details in WCM adopted in October 2022 & SW Master Plan (September 2021)	C103-CANAL03 SW 167 AVE, from SW 240 ST to SW 258 ST (~1 mile)	C103	8	\$2,106,000	20 YR - 30 YR
Secondary Canal Planned Project (NO CANAL RESERVATION EXISTS LAND ACQUISITION MAY BE REQUIRED) PRIVATE AG SLOUGH. Details in WCM adopted in October 2022 & SW Master Plan (September 2021)	C103-CANAL04 SW 169 AVE, from SW 240 ST to SW 258 ST (~1 miles)	C103	8	\$2,640,000	20 YR - 30 YR
Ditch improvements Planned Project. Details in WCM adopted in October 2022 & SW Master Plan (September 2021)	C111-CANAL01 SW 137 AVE from SW 348 ST to SW 384th ST (~2 miles)	C111	9	\$4,410,000	20 YR - 30 YR
Secondary Canal Planned Project. Details in WCM adopted in October 2022 & SW Master Plan (September 2021)	C111-CANAL02 C-113 Extension Canal Improvements (~2 miles)	C111	8 ;9	\$2,313,000	20 YR - 30 YR
				\$23,769,000	