South East Lee County Flood Mitigation Concept Projects

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Flood mitigation benefits within the South East Lee County study area are achieved when excess storm water is conveyed and/or stored appropriately. The concept projects reduce flooding levels and duration that inundate structures and roadways. These adverse conditions impact the health, safety, welfare of the residents and have a significant economic impact to the community.

The downstream conveyances generally west of I-75 are enhanced to provide greater ability to discharge higher volumes of water. Upstream, east of I-75, a connected system of storage facilities and conveyances is developed. These upstream improvements are then connected to the improved downstream conveyances and all are controlled with several water control structures. All sixteen concepts were modeled together in one "stitched" model. This was assisted by review of documents such as the Phase 2 reports for this project and Post Irma flooding aerials which showed the potential impact to structures and significant roadway flooding.

The contribution or benefit of each project concept is discussed as follows based on modeling results for the August 2017, 100-Yr, 3-Day storm event with gates west of I-75 open at 0 hour, and gates east of I-75 open at 0 hour, closed at the 48th hour and re-opened at 96th hour.

Below are the individual concept summaries noting the stitched model system benefit:

- 1.3.1 Halfway Creek Drainageways This conveyance concept project was developed to handle a large portion of the flood flow from east of I-75 and direct excess storm water to Estero Bay. The modeling results show a 419 cfs flow increase to 1,254 cfs. The benefits to directing large flows via this underutilized flow path connected via water control structures to the large preserve areas east of I-75 is to the Estero River North Branch and the Imperial River basins that experienced extreme flooding. Provision to timely recover from high water levels in the preserve areas may warrant a large capacity
- 1.3.2 **Estero River N. Branch Improvements** This conveyance concept project was developed for mitigation of flooding of the Estero River N. Branch basin, as well as, areas east of I-75. The Estero River N. Branch would be enhanced with overflow bypasses conveyances to better handle high flow conditions. The modeling results show a reduction in flood level of 4.24 feet in Country Creek neighborhood while slightly increasing the flow through this area. The downstream peak flow in the Estero River was reduced from the existing 1,781 cfs to 1,104 cfs with the system of concepts.
- 1.3.3 *FGCU Flow-way Improvements* This conveyance concept project was developed to improve flood flow in the FGCU area that has limited flow capacity to reach bridge and box culvert crossings under I-75. The trapped stormwater caused flooding in the NE quadrant of I-75 and Corkscrew Road that extended for many weeks. Under the concept project flow gates would close to utilize the vast wetlands as a storage reservoir and open following the storm. The system modeling results show flows increase by 305 cfs to 640 cfs and that water levels recovered soon after the storm. The area east and north of I-75 and Corkscrew Road residents are the beneficiaries of this project.
- 1.3.4 Alico Mine Lake Interconnects (West) This conveyance concept project which includes incorporating mine lakes for storm water reservoir storage was developed to direct flow to either the Estero River N. Branch or to the Crew/Flint-Pen/Kiker preserve to mitigate flooding in the vast area extending to the SW Regional Airport and the Wild Turkey Strand. Having water control through conveyance and storage allows limiting peak flows, conservation of water resources and the potential to direct flow south to the large preserve areas. When conditions are favorable the SW Regional Airport excess flows may be directed south to avoid overloading the Briarcliff and Ten -Mile Canal areas. The system modeling results show the potential to direct 279 cfs from the airport, to 186 cfs to the FGCU flow way and increase flow from 108 cfs to 559 cfs to the large Crew-Flint Pen/Kiker preserve areas. Water levels improve significantly in the mine lake near the regional airport from EL 25.44 to EL. 20.81 or a decrease of 4.63 feet and the potential to accept flood flow from the Regional Airport. The beneficiaries of this improvement include residents in the NE Quadrant of I-75 and Corkscrew Road, Ten-Mile Canal area and the hydrologic restoration of the Crew/Flint-Pen/Kiker
- 1.3.5 Alico Mine Lake Interconnects (East) This flood reservoir concept project stores excess flood water in mine lakes until the storm event passes. The mine lakes are connected by drainageway conveyances. The system model results show that large quantities of stormwater were satisfactorily stored to natural ground level, attenuated to and released with recovery to normal levels within a few days following the storm event. Approximately, one and one-half feet of vertical storage was achieved between EL. 24.91 and EL. 26.42 in the mine lakes and flows entering the lake system of 1,081 cfs (Blackstone Drive concept project) were reduced to 559 cfs at Corkscrew Road crossing. This concept project develops water control to mitigate flooding, so the Southeast Lee County community is the beneficiary of this project.
- 1.3.6 Alico Road Extension Drainageway This conveyance concept project was developed to as part of the proposed Alico Road to improve flood flow out the Green Meadows area and avoid flood flow overloading of the Wild Turkey Strand Preserve and the downstream community on Mallard/Devore Roads of Alico Road. The system modeling results show a 144 cfs flood flow concept project drainageway. The two communities are the beneficiaries of this project.
- 1.3.7 Blackstone Drive to Alico Mine Lakes Drainageway This conveyance concept project was developed to direct flow from Lehigh Acres at Blackstone Drive to the south. Although the flood peak elevations were not high enough to flow south, this area of south of State Road No. 82 directed substantial flows to the south. The system modeling results show the flood flow of 1,081 cfs entering the mine lakes which are attenuated by the mine lake reservoir storage. This concept project develops water control to mitigate flooding, so the Southeast Lee County community is the beneficiary of this
- 1.3.8 Alico Mine Lake to Halfway Creek Drainageway This conveyance concept project was developed to direct flood flow from the Alico Mine Lakes area lying north of Corkscrew Road in a southerly direction to the Crew-Flint Pen/Kiker Preserve. The excess stormwater will be stored in this natural reservoir and eventually released to the Imperial River, Spring Creek and Halfway Creek outfalls to Estero Bay. The system modeling results show increasing the flow to the south side of Corkscrew Road from 108 cfs to 559 cfs or a 451 cfs increase in flood flow. Water levels are increased from EL. 16.60 to EL. 17.39 or an increase of 0.79 feet. The Estero River and Grandezza residents and the business area at the intersection of I-75 and Corkscrew are the beneficiaries of this project. The hydrologic restoration of the Preserve areas is an additional benefit.
- 1.3.9 *I-75 to Spring Creek Drainageway (North)* This conveyance concept project was developed to improve flood flow out of the old Bonita Springs Golf & Country Club area to Spring Creek. The system modeling results show a peak water level reduction from EL. 12.72 to EL. 8.57 or a decrease of a 4.15 feet. This concept project was planned to accept flow from the east side of I-75, so flow increased in the golf course area from 42 cfs to 299 cfs. The Bonita Springs Golf Club residents are the main beneficiaries of this project along with Estero and Imperial River residents who benefit by the acceptance of flow from east of I-75.
- 1.3.10 I-75 to Spring Creek Drainageway (South) This conveyance concept project was developed to direct flow away from the Tropical Acres area lying northwesterly from the Bonita Springs High School. The system modeling results show 97 cfs flood flow towards the Spring Creek outfall with peak water levels at the approximate top of bank with a recovery to normal levels within a few days following the storm event. The Tropical Acres residents of Bonita Springs are the beneficiaries of this project.
- 1.3.11 *East I-75 Overland Flow Collection Drainageway* This conveyance concept project was developed to collect flood flow from the area east of I-75 that is being planned as a flood reservoir. This collector drainageway allows a balancing of flows through the various drainage structures under I-75. The residents west of I-75 along the Estero River and Imperial River are the beneficiaries of collecting flood flow and improving the outfall to the west of I-75.
- 1.3.12 *Imperial River Improvements East of I-75* This conveyance type concept project was developed to improve flow along the Imperial River. The system modeling results show a reduction in flood water levels between 2.47 feet and 4.75 feet with a recovery to normal levels within a few days without increasing the peak flow in the river. The Bonita Springs residents along the Imperial River are the beneficiaries of this project.
- 1.3.13 *Crew-Flint Pen Hydrologic Restoration* This flood reservoir concept project stores flood water on the east side of Interstate No. 75 until the storm event passes. The system modeling shows a reduction in the peak water level on the west side of I-75 from EL. 14.80 to EL. 11.17, or a 3.63-foot decrease in flood levels with a recovery to normal levels within a few days. Additionally, the system model results show a reduction in the peak flow for the Imperial River at Kehl Canal Gate from 526 cfs to 267 cfs or a 259 cfs decrease. The concept project provides an additional benefit with the ability to hold water and provide hydrologic restoration of extensive preserve lands east of I-75. The residents west of I-75 are the beneficiaries of this concept project.
- 1.3.14 *Imperial River Improvements West of I-75* This conveyance type concept project was developed to improve flow along the Imperial River. The system modeling results show a reduction in flood water levels between 1.55 feet and 4.33 feet with a recovery to normal levels within a few days following the storm event. The Bonita Springs residents along the Imperial River are the beneficiaries of this project.
- 1.3.15 *Railway Drainageway Improvements* This conveyance concept project was developed to improve flow in the Rosemary Canal area of Bonita Springs. The system modeling results show a reduction in flood water levels between 0.94 feet and 1.49 feet with a recovery to normal levels within a few days without increasing the peak flow to the river. The residents in this area of Bonita Springs are the beneficiaries of this project.
- 1.3.16 **Corkscrew East** This conveyance concept project was developed to direct flow southerly away from Corkscrew Road and on to the Corkscrew Swamp Sanctuary. These conveyances are intended to carry future flood flow through future development tracts to avoid blocking drainage to the south. The system modeling results show discharges ranging from 119 cfs to 398 cfs in flood flow to the Corkscrew Swamp. The beneficiaries of the planned conveyances will be the residents in this area along with

travelers on Corkscrew Road.

