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SFWMD C-8 AND C-9 WATERSHEDS FLOOD PROTECTION LEVEL OF SERVICE ADAPTATION PLANNING AND MITIGATION PROJECTS STUDY

Date: April 25, 2022

Time: 2:30 PM – 3:30 PM

Subject: Bi-Weekly Meeting #23

Attendees Highlighted:

- Hongying Zhao, **SFWMD**
- Ana Carolina Maran, **SFWMD**
- Nicole Cortez, **SFWMD**
- Akin Owosina, **SFWMD**
- Ann Springston, **SFWMD**
- Lichun Zhang, **SFWMD**
- Matahel Ansar, **SFWMD**
- Larry Brion, **SFWMD**
- Carol Ballard, **SFWMD**
- Ruben Arteaga, **SFWMD**
- Sashi Nair, **SFWMD**
- Francisco Pena Guerra, **SFWMD**
- Shahana Mona, **SFWMD**
- Vijay Mishra, **SFWMD**
- Irela Bague, **Miami Dade**
- Marina Blanco-Pape, **Miami Dade**
- Alberto Pisani, **Miami Dade**
- Gregory Mount, **Broward**
- Kevin Hart, **SBDD**
- Susan Bodmann, **Broward**
- Jennifer Jurado, **Broward**
- Rajendra Sishodia, **Broward**
- Virginia Walsh, **WASD**
- Omar Abdelrahman, **RER**
- Pamala Sweeney, **RER**
- Katherine Hageman, **RER**
- Valentina Caccia, **RER**
- Michael Zygnerski, **Broward Co**
- Karina Cordero, **RER**
- Michael DelCharco, **Taylor Engineering**
- Angela Schedel, **Taylor Engineering**
- Pat Lawson, **Taylor Engineering**
- Joseph Wilder, **Taylor Engineering**
- Stephanie Massey, **Taylor Engineering**
- Lynette Cardoch, **Moffatt & Nichol**
- Peter Sahwell, **Nova Consulting**
- John Loper, **Anclote Consulting**
- David Key, **ESP – Florida**
- Nathan Slaughter, **ESP – Florida**
- Sarah Hamm, Moffatt & Nichol
- Elton Smith, Taylor Engineering

Notes:

1. **Meeting Kickoff**
   - Roll Call
2. **Task 2 – Modeling: Scenario M2B Discussion**
   - Modeling results for what was increased or decreased with the raised levees and now with the ability to drain "interior" drainage. Blue is lower elevations and pink/red is higher. The NW corner of the map
   - 25-yr with SLR 2 and a 2,550 cfs pump
   - First couple of runs with smaller pumps and didn't see the results we needed for PM 1 and 5. So, Joseph added size until he got the results we needed.
   - South Broward is showing quite a bit of pink . That is because the system is pumped at certain thresholds. The residual we are seeing is from higher GW levels.
     i. Valentina would like to know what GW data we are using? *Several sources that have been merged such as USGS data, Miami-Dade potentiometric surface contours, Broward County Future Groundwater Map (2060), previous model input/output, etc. There are 4 different initial*

groundwater elevation maps for C8 C9, SLR0, SLR1, SLR2, and SLR3. Please refer to the C8 C9 FPLOS Phase 1 Final Report developed for SFWMD for details on data and creation process.

- The C8 basin mining pits are also seeing pink/red. This is due to higher future conditions groundwater. The location of the future Mega Mall is also seeing pink/red. The area with the most depth is the on-site storage pond with the surrounding area only about 0.1 ft higher, partially due to higher groundwater and partially due to changes in land use from current to future conditions. The center area in blue is the area that was raised to FEMA BFE and therefore has less flooding.
- The C7 basin is actually showing increases. They are interconnected. We will need some mitigation to keep them separate. The pump on C8 might be able to be smaller if we block it?
- Did we see this impact from C7 for M2A? *updated response, misunderstood the question* Yes- the impact is essentially Identical. It may appear less under M2B due to the larger pump capacity. For M2A, it was to a lesser extent as the goal is 25-year SLR1. For M2B, it looks like it is a larger extent as the goal is 25-year SLR2. So from that viewpoint, the impact from C-7 is lower due to the lower SLR scenario. But, if looking at the same design storm under M2A and M2B, the impact from C-7 is essentially identical.
- Hongying asked if the team knows if we could do anything to disconnect C7 from C8?
- Hongying – did you see any connection to the north to the C9 basin? Joe – no, there is no model-active connection from C-9 to the north to C-11. C-7 is not directly connected to C-9, but C-7 is directly connected to C-8 which is directly connected to C-9. We saw earlier that the systems from C-9 to C-11 that connect them remain closed. They are able to cut them off.
    i. Kevin Hart – FYI, SBDD has an internal Basin inter-connect across Pines Blvd that is only used in emergency situations.
- The C7 basin will need to be integrated more into these ideas. But, for now pump sizing etc will happen in another project. We can simply model a gate at the coastal boundary.
- Vijay asked about generating hydrograph on the C7. Hongying said the pump station sizing will need to be more deeply investigated.
- Hongying asked if the modelers had any comments on that approach? Carol agreed. Akin said it really tells us that we need to consider the C7 with the solution we end up proposing for the C8 and C9. So, we need to track the two of them together.
    i. Valentina is thinking that flooding is obviously important. But, how is WQ going to be impacted? HZ, we have asked the contractor to look at nutrient load reduction to the bay. Valentina – but what about WQ along the canal? Along the eastern and western sides of the canal? And changes the groundwater compositions?
    ii. Akin – if we think about existing conditions where we do nothing to address flooding, we see elevated water tables, increased runoff, etc. will be the same. This project will fix some of the flooding issues. But, the comparison between the two conditions does not change the WQ except for reducing the volume of water. So future conditions will mostly just change by the volume and timing of runoff.
        - Valentina – what are the ranges of the freshwater flow? HZ – it will be at or less than existing. Joe pointed out that the system changes from gravity flow through the gates to the pump. So, it may go from 4,000 cfs with the gravity structures to only 2,500 cfs for the pumps. Joe stated that we might have more total flow volume with

mitigation scenarios. But, likely not a higher peak discharge than design conditions as the gates operate less and at different timing.

iii. Kevin Hart added - I believe that all discharges into the C-9 Canal are required to meet water quality standards and allowable discharge rates per SFWMD criteria.

iv. Team reviewed PM 1 – looked at the difference between current conditions and with internal drainage with the raised berm. So, there is more water in the canal. And we need a slightly larger pump – from 1,500 to 2,000 to 2,500 cfs. Now we see the system is mostly achieving the results we are seeking. So, maybe we don't have to go up to 2,500 cfs (if the C-7 cutoff makes a significant enough impact).

v. M2C – discussed Joe – it is almost impossible to get back to Current Conditions for a 5 -yr event for SLR3. Can get back to current conditions for a 25-year or 100-year SLR storm event but getting 5-year SLR3 back to current conditions is very difficult. Because average low tide is in the 4 ft range, which is as high as the peak headwater under current conditions. So under SLR3, your headwater antecedent conditions is already as high as the 5-year current conditions was peaking with rainfall and surge. Essentially, under SLR3, you can't get the system to work for smaller rainfall events because the tailwater is so high. You will have to change antecedent condition assumptions. Having a lower headwater than tailwater long-term could lead to saltwater intrusion. The 25-year or 100-year SLR3 can be reduced back to current conditions since the 25-year and 100-year current conditions peak higher than the average low-tide under SLR3, providing the opportunity to operate the pumps aggressively pre-storm or as necessary when raining, and still allowing large flows through the gravity structure.

3. **Task 3 – Flood Damage Assessment**
   - Pat presented preliminary results for SLR 1, 2 and 3. The flood damage reductions range from 4% to 38% depending on the scenario and basin.
   - We have the costs from the District's mitigation grants. Very detailed cost estimates for M2A.

4. **Any comments from Partners?**
   - Kevin enjoyed the discussion.

5. **Additional action Items from Previous Meeting**
   - Schedule update
   - Mitigation Project Cost Development