MULTI-YEAR IMPLEMENTATION PLAN

The *Conceptual Plan* states a "suggested sequence for project implementation would include the following steps:

- Project Scoping and Scheduling
- Topographic Survey • Bathymetric Survey
- Evaluation of Property Acquisition & Easements
- Pump Systems Evaluation
- Design Consultation with City, County, State, & Federal Authorities
- Construction Document Design
- Permitting and Approvals
- Bidding
- Construction
- Monitoring and Maintenance"

STEPS FOR RENEWAL OF THE POND SYSTEM

We recommend going pond-by-pond until the renewal is complete, after which routine maintenance would ensue on a regular schedule. Building upon the recommendations from *The Conceptual Design* and the *Davey's Report* a multi-year phased-in approach would be similar to the following:

a. The overall configuration would not change the fundamental dimensions of the WFCA pond system:
b. Little, if any, IDEM/USACE permitting would be required.
c. Deepening the ponds below the normal water level would have negligible impact on the overall detention storage volume within the system, so the peak flow performance at the outfall of Pond 7 would not change, and no modification to the outlet controls (*weirs*) should be required.
d. However, there may still be some issues to address regarding access to construction areas, private property ownership, and WFCA common areas.
e. Prior to proceeding with the work plan described, the depth of accumulated sediment should be measured in all the ponds. Accurate depth measurements will help to estimate the volume of material that needs to be removed from the ponds, significantly impacting the cost.

1. Overall Considerations as each pond is addressed:

1. Obtain services of an experienced project manager to:
    a. Oversee permitting requirements, detailed dredging plan, and necessary surveys
    b. Participate in the selection of a contractor(s).
    c. Serve as liaison between WFCA Board/management and contractors
    d. Monitor quality of contractor work
    e. Obtain Better Estimates of Dredging Costs –see section **"**Estimating Future Dredging Based on Prior Actuals"
    f. Compare and provide advice concerning liner installation. (Research has revealed that though RPE liners have an indefinite lifespan, a UV-protected one with some sediment coverage will certainly last much longer than the non-UVC protected PVC liners that were originally installed. Such UV-protected liners are ranked more effective against punctures and are used at the bottoms of landfills to prevent material from seeping into the ground for at least 100 years. Some sediment coverages on the bottom would be helpful. If such liners were installed, the pond would not need to be dredged again.)
2. Drain down and remove sediment by mechanical dredging.
3. Restore eroded shorelines

4. Stabilize shorelines with geofabric-wrapped soil "shelves" stabilized with soil and plantings (Per discussion with a contractor there are options to line the shoreline in a manner to allow mowing up to the edge. Discussions have also leaned towards the agreement that the shoreline "fringe" does not deter the geese population and the elimination of the current weeds would be welcomed.)
5. Wherever the ponds are deepened, and new liners installed, install diffused aeration system in lieu of fountains.
6. Inspect and reseal spillway structures as needed. (*weirs*).
7. Restore access areas to be able to conveniently maintain with mowing, etc.
8. Use natural enzyme treatment to keep water quality good and muck from building up. (Clean Flo, a company that has been in business for 50 years provides a natural enzyme product line that breaks up muck much like Dawn breaks up grease. This product costs $70 every month the temperature is above 50 degrees. That is, three pounds of product for a pond the size of pond 3 and less for smaller ponds.)
9. Continue invasive species treatments to include primrose, as needed.
10. Stock with fish which the city recommends will improve water quality.
11. Set and maintain schedule to remove sediment from the foray to reduce the need for maintenance in the ponds downstream from Pond #3.
12. Reduce maintenance costs for water treatments by monitoring deeper water levels, reducing phosphorus from lawn fertilizers, and keeping the water recirculating system functioning.

2. Phased-in Approach:

Year 1 (2023) Pond 3:

1. Obtain a bid to install a sediment forebay.
2. Obtain a bathymetric survey and a dredge plan for pond 3 (A bid for this in 2018 was $2,800)
3. Solicit and obtain bids from pond dredging specialists to dredge pond 3, without trying to preserve the existing liner, and digging 2-3 feet deeper, in the manner outlined by Knust.
4. Engage experienced service providers to complete work of dredging, bank repair, new liner installation, erosion control at specific points, and reseeding
5. Remove liner and excavate to beneath the pond liner, increasing depth by 2-3 feet.
6. Install new liner.
7. Reinforce banks as needed to prevent erosion.
8. Install sediment forebay at north end of Pond 3.
9. Install valves and piping for alternate recirculation discharge location to Pond 3.
10. Construct stabilized access area for annual maintenance by vactor truck.

Year 2 (2024)

1. Allow funds to accrue
2. Obtain bathymetric study, engineering plans, etc.
3. Seed or vegetative plugs on Pond 3

Year 3 (2025) Pond 5: Follow the same steps 2-7 listed for pond 3

1. Evaluate well & pump system for continued use as supplemental water supply
2. Repair as needed

Year 4 (2026) Pond 4: Follow the same steps 2-7 listed for pond 3.

Year 5 (2027) Pond 6: Follow the same steps 2-7 listed for pond 3

Year 6 (2028) Pond 7: Follow the same steps 2-7.

1. Restore electrical service (or explore the option of solar power for the pump.)
2. Reinstall pump and aerators

3. **On-going Maintenance Recommendations. Please refer to Addendum D "Estimating Future Dredging Based on Prior Actuals" for additional information concerning on-going dredging expenses."**

a) **Invasive Vegetation and Algae Treatments**: Vegetation and algae treatments will be on-going for the life of the pond to maintain aesthetic character of the pond system.

b) **Water Level**: Water levels should be monitored to ensure an adequate supply of water is found within the pond system. Ground water may be pumped into Pond 5 during periods of drought. Water levels should be compared to the elevation of the outlet structure—do not compare the water level to the top of bank along the shoreline.

c) **Aerators, Fountains, and Water Pumps.** Companies such as Aquatic Control can be used to maintain this equipment. These companies will pull fountains out of the water during winter months for maintenance. They can be used as an on-call service provider for pumps and aeration services

d) **Wildlife Control:** Waterfowl (ducks and geese) can be deterred on an as needed basis. Decoys and other devises may be purchased. Maintaining a fringe of vegetation around the shoreline discourages their population.

e) **Enhancements** within the common areas could include public seating and native plantings. Potential landscape element opportunities may be in areas with pedestrian access through nearby sidewalks. Allowing places for residence that do not live directly on a pond will increase the overall community's ties with the success of the pond system. Residents could look out on the improved aesthetic appeal the pond system has once much of this plan is implemented.