

Lagoon Dikes Rehabilitation



Project Proposer/Champion: Martin Griffin

Project History and Status: Up until the early 1980s, the area of ponds and wetlands known as the lagoon area, served as storage lagoons for biosolids produced at the plant. Biosolids began to be cleaned out of the lagoons the early 1990s, and were reconstructed to provide habitat and recreational opportunities while providing valuable infrastructure to help the District treat high volumes of water during high flow events. After the reconstruction, under EPA direction, there was extensive monitoring, soil stability analysis, dike evaluations, etc. of the lagoon area to ensure that it would operate as intended. In recent years, as the site has become stable, EPA requirements related to evaluation and analysis have lessened. To date, current maintenance that has been done is mowing and controlled burns to control invasive plants, and tree and brush growth; nuisance animal control of geese and woodchucks, and building up of the low areas of the dike roads a mixture of woodchips and soil topped with a thin layer of road gravel.

Project Purpose: In August of 2018, during an extreme high flow event, Nine-springs creek was very high (near the southern and eastern exterior dike roads of the lagoon area) and the dike roads were so inundated that a small leak formed on the southern dike road causing water from nine-springs creek to move into the lagoon area. To avoid this from happening again and future potential issues to the integrity of the dikes, the District is proposing a multi-phase project intended to employ the assistance of an Engineering and Geotechnical team of experts to:

- Survey the dike roads, compare this to past survey data (which the District already owns), determine how much the roads have settled, how the current dike elevations compare to future max lake levels, how much freeboard should be maintained on the outside of the dikes, etc.
- Full Evaluation of the dikes (current erosion, erosive potential, sloughing, leaks, etc.) including:
 - evaluation of water drainage from the back lagoon to the front lagoon

- employing ground penetrating technologies to find where and how extensive holes are and where potential leaks could form
- Recommendation on How to keep interior dike roads and capped areas from pooling water due to increased precipitation in the future.
- Assess feasibility of re-meandering of nine-springs creek to alleviate hydrostatic pressure along the southern border of the lagoon dike road. and taking advantage of natural wetland area south of creek
- Determining maximum future lake levels and water levels around the lagoon system and use that information to make recommendations on what elevation the perimeter dike roads should be set at to avoid being overtopped by Nine-springs creek due to changing weather.
- Lagoon Maintenance plan that identifies potential critical hot spot areas that are prioritized in terms of timeline to fix; along with a maintenance management plan for maintenance of the system while and after the construction to fix hot spots is completed.
- Lagoon Construction and options plan, identifying the options for maintenance and construction plan to fix the critical areas starting with the high priority areas first and alternative options to repair dikes

Economic Analysis & Project Schedule: The following project schedule for dike stabilization is included in the Capital Improvements Plan (CIP) for planning purposes only. The schedule will be modified as initial phases are undertaken and completed. The project total is \$1.6 million

- Year 1: Survey and Evaluation to create an Engineering and Maintenance Prioritization Plan
- Year 2: High Priority Construction fixes
- Year 3: Medium Priority Construction fixes
- Year 4: Low Priority Construction fixes

	Start Date	Completion Date
Survey and Evaluation	2020	2021
Plan and Design	2021	2021
Bid Date	2021	2021
Construction	2021	2023

Fiscal Year Allocation (2019 \$):

	2020	2021	2022	2023
Engineering and Geotechnical Survey	\$250,000			
Engineering and Maintenance Prioritization Plan	\$100,000			
Planning and Design of Priority Construction Repairs		\$150,000		
Construction and Dike Repair		\$400,000		
Construction and Dike Repair			\$400,000	
Construction and Dike Repair				\$300,000
Total	\$350,000	\$550,000	\$400,000	\$300,000