Mason Farm WWTP Master Plan RFQ Pre-proposal Conference

Orange Water and Sewer Authority

04/19/2021

SUBMITTAL DEADLINE: MAY 14, 2021 2:00 PM (EST)

OWASA

Carrboro-Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services.

Agenda

- Introductions
- Objectives
- Key Drivers
- Background
- Scope
- Schedule
- Selection Process
- Questions



Objectives

- The primary objective is to prepare a near- and long-term road map of capital and non-capital improvements projects, implementation schedule and cost estimates for reliable and efficient wastewater (including solids) treatment to:
  - Accommodate Growth
  - Meet Regulatory Compliance

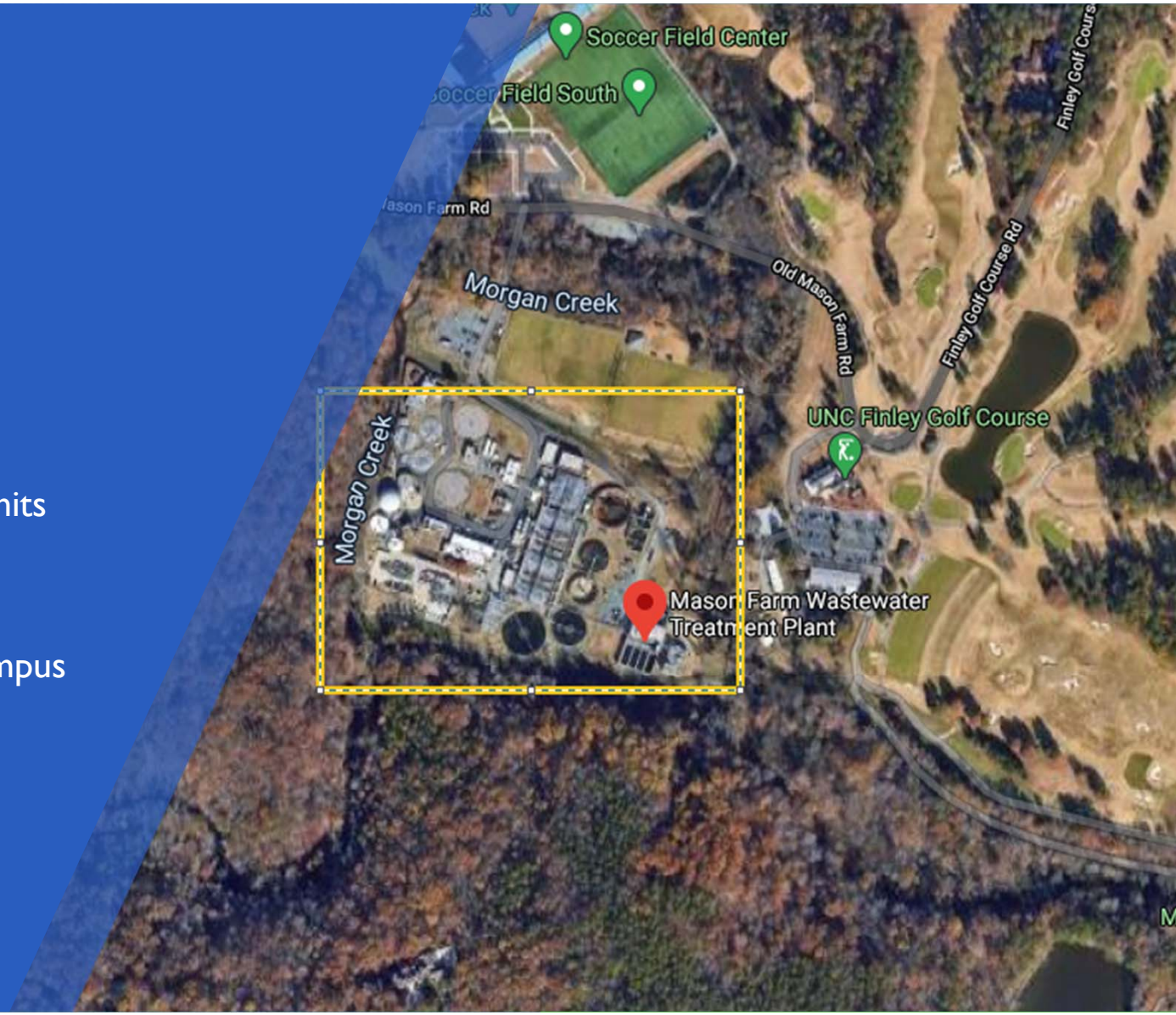


Key Planning Drivers

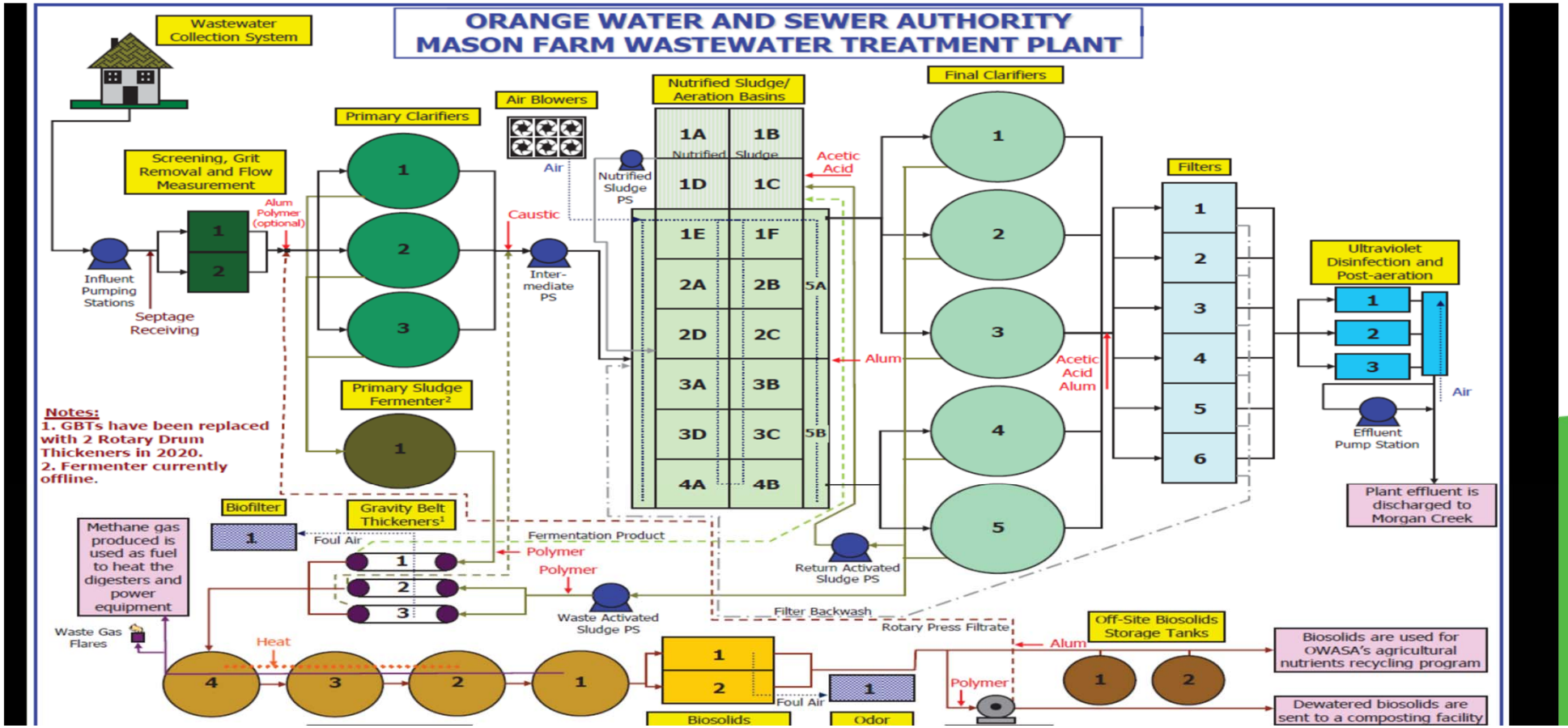
- System Resiliency and Reliability
- Long term viability
- Sustainable solution for future
  - Resource Recovery (water, energy, nutrients)
  - Energy Efficiency
  - Cost Effectiveness
  - Innovative Technology

Background

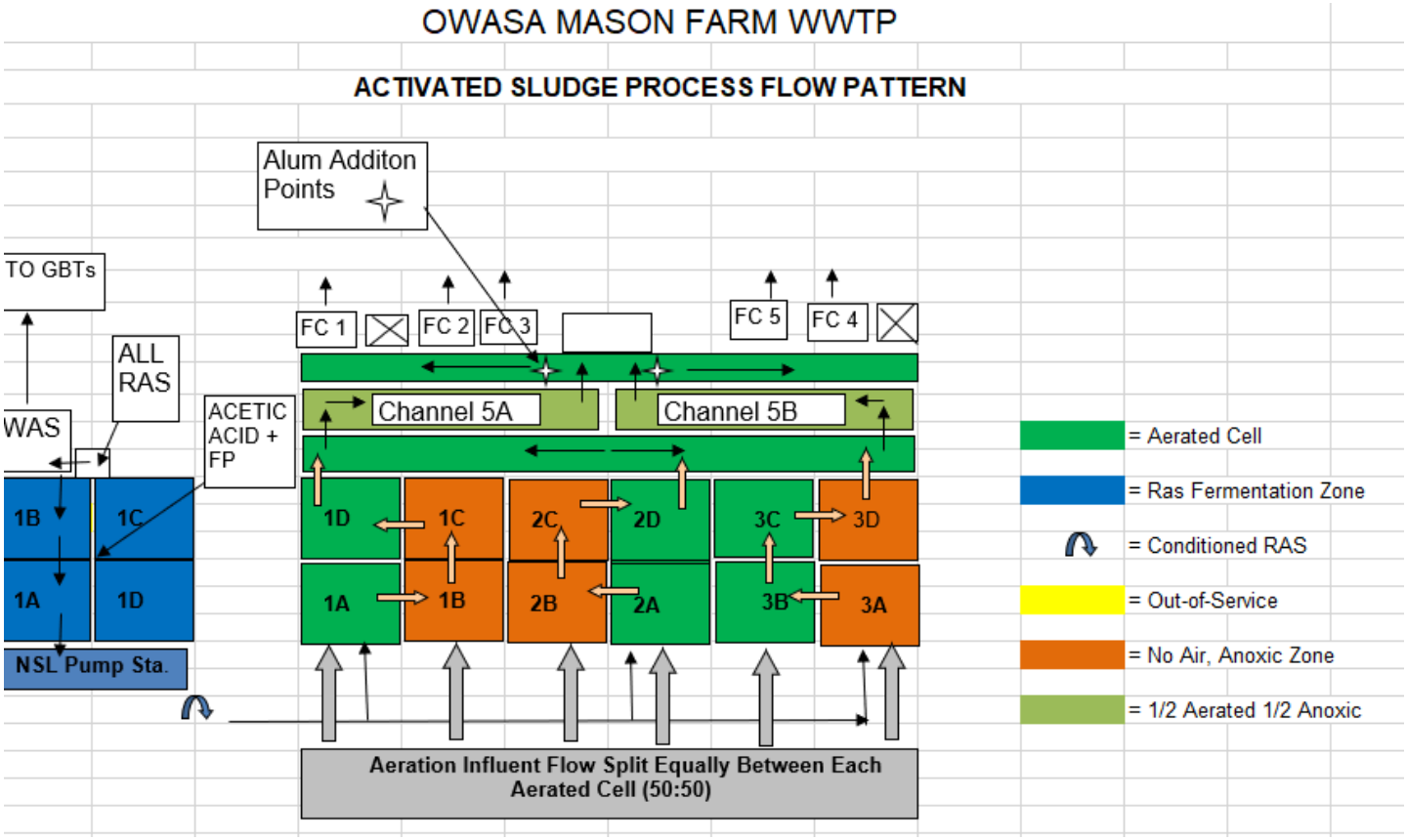
- MMF: 14.5 MGD
- PDF: 43.5 MGD
- Current ADF: 7-8 MGD
- Final Jordan Lake Nutrient Limits
  - TN: 3.0 mg/L
  - TP: 0.23 mg/L
- Reclaimed Water to UNC campus



Process Flow Diagram



Activated Sludge Flow Pattern



Previous Studies

- 2010 Hydraulic and Treatment Capacity Study
  - Hydraulic Capacity Evaluation
  - Process Optimization
  - Nutrient Removal Alternatives
  - BIOWIN Process Model
  - Plant Build out flow: 18.5 MGD

Attachment #1: List of Major Plant Studies

The following is a selection of studies from the last two decades for the Wastewater Treatment Plant and the resulting key outcomes from the reports.

Study	Key Outcomes
2002 WWTP Master Plan	Site limitations are present in the plant including space for EQ and buildout with redundancy using available technology at the time.
2004 14.5 MGD Expansion – Tech Memos	Detailed evaluations of unit processes were developed, and the resulting Process Control Plan generally represents the operational mode of the plant. The systems are heavily automated but major automatic sequences (i.e. solids transfer, filter backwash, Aeration sequences) were modified by operations and are now largely manual processes.
2010 WWTP Hydraulic and Treatment Capacity Study	Hydraulic limitations exist in the Primary clarifiers. When operated in denitrification mode, filters have insufficient high flow capacity but are sufficient when in high rate filter mode. Most other elements of the plant have adequate hydraulic and treatment capacity generally for build out. Detailed tables of treatment rates and plant characteristics are developed and compiled in this study.
2011 Biogas Study	Some economically viable opportunities for biogas use exist but better technology and gas cleaning as well as increased gas production will be necessary for an acceptable ROI on any biogas utilization project.
2015 Biosolids Management Plan	It is more efficient and cost effective to use the rotary press and recycling of biosolids through compost or landfill disposal. Only limited evaluation of mainstream impacts was considered. Ultimately, to satisfy OWASA's commitments to its land application partners, OWASA continues to recycle ~ 50% or more of its biosolids via land application of 2-3% biosolids.
2016 Intermediate Pump Station Evaluation	The IPS cannot be effectively expanded beyond its current capacity with its current configuration. Some systems needed rehabilitation (most elements of the system were repaired in 2018-2019 IPS project).
2019 RAS and Secondary Clarifiers – Summary Study	There is no immediate need for additional clarification capacity but both Clarifiers 1 and 4 have capacity limitations. There is space allocated for Clarifier #6 . OWASA completed rehabilitation of clarifiers 2, 3 in 2020 and anticipates to complete rehabilitation for #4 by 2022. Additional upgrades in the pumping, metering, discharge to the nutrified sludge basin and the potential for elimination of the nutrified sludge basin pump station was considered.
2020 Digester Mixing Study	Any significant new investment in the digester mixers will likely require a large investment in the digester roof and structure. This should be coupled to decisions on long term biogas generation, solids disposal plans and right- sized infrastructure.
2020 Final NPDES Permit	TN: 134,375 pounds per year (3.0 mg/l) and TP: 10,188 pounds per year (0.23 mg/l) at current permitted capacity of 14.5 MGD.
2020 Partnership for Clean Water – Self-Assessment	Staff identified and prioritized performance limiting factors. Additionally, data analysis is needed that require further evaluation to identify the best solutions to performance limiting factors. These include, the number of basins to have in service, ideal SRT vs nutrient performance, the need to continue to use primary clarifiers, equalization, etc.
2020 Energy Management Plan	Several options for improved mixing, reduced aeration demand, and innovative odor and nutrient treatment processes were identified as deserving further study. The technologies generally require integrated responses and increased automation for energy savings to be realized.
2020 AESC Plant Process Optimization Assessment	Energy and process assessment of MFWWTP; major energy savings projects include implementation of side stream treatment of digester filtrate, secondary treatment optimization, simultaneous nitrification and denitrification, etc.
2020 Pump Station Energy Evaluations	Energy efficiency process modifications and condition assessment ratings for Morgan Creek PS, Nutrified Sludge PS, Non-Potable Water PS, and Reclaimed Water PS.

Scope of Services

- WWTP Assessment
  - Hydraulic Capacity
  - Treatment Capacity
  - Condition Assessment
- Capital Improvements Plan Development
  - Alternatives Evaluation
    - Cost and Non-Cost Factors
    - Two Tier Evaluation
  - Economic Analysis
  - Multiyear Capital Improvement Program
- Other Services
  - Sampling Plans
  - Workshops
  - Pilot Studies
  - Vendor Presentations
- Deliverables

Important Dates

- SOQ Due: May 14, 2021 2:00 PM (EST)
- Contract Award: June 18, 2021
- NTP: July 9, 2021

Immediate Needs: Meet Current Effluent Nutrient Requirements in the Most Optimized and Efficient Manner

Selection Criteria

- Project Team [30]
  - Experience in similar projects
  - Team availability
- Project Approach [35]
  - Project understanding
  - Distinguishing approach to meet project goals
- Schedule [10]
  - Consultant Anticipated Schedule
  - Contract Award: June 18,2021
  - NTP: July 9, 2021
- Past Experience / References [20]
  - 3 similar projects in last 5 Years
  - Project Team
- Project Concerns [5]

Questions

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Pre-proposal conference recording link:

https://owasanc-my.sharepoint.com/:v:/g/personal/dkalyanam_owasa_org/EbxINAuhNtlBgtLtJi2jl-UBlJrUa0ZpgTMkVkqW1kqflA