

#12

Flagler Beach WWTF

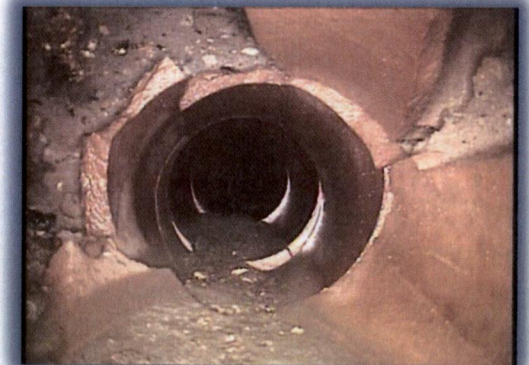
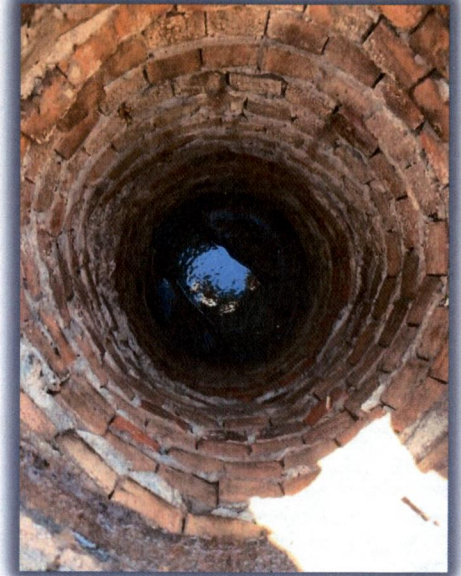
BNR Improvements Update

June 10, 2021



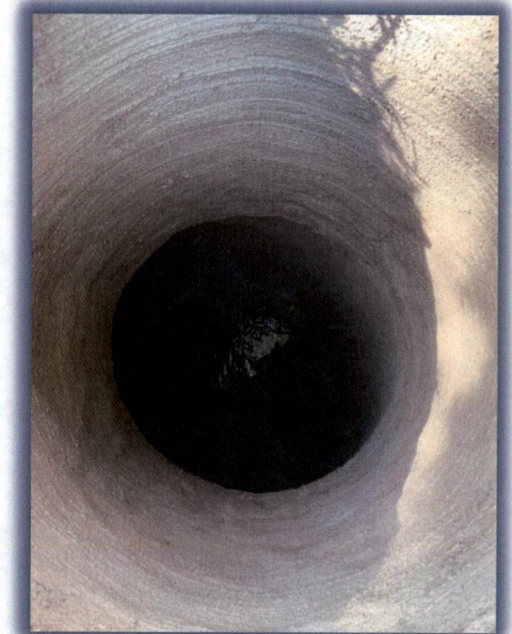
Wastewater Collection System

- Twenty-five (25) City lift stations
- Force main sizes: 4, 6, 10, 12 and 18-inch
- Gravity mains: 4, 6 and 8-inch
- Older manhole system throughout City
- Infiltration and Inflow (I/I) is conveying:
 - Extraneous flows to the WWTF (GW/Saltwater): **75,000 – 180,000 gpd**
(11 – 26% of the WW flow)
 - High concentrations of salt into the system
- A chloride (salinity) study is currently underway to identify areas of concern



Wastewater Collection System

- To reduce the amount of infiltration and inflow (I/I) entering the wastewater collection system, the City has been performing the following maintenance functions on an annual basis as funding becomes available:
 - Slip-lining pipes
 - Repairing and rehabilitating manholes



Existing Flagler Beach WWTF

○ Master Lift Station

- Past its useful service life
- New pumps and equipment required

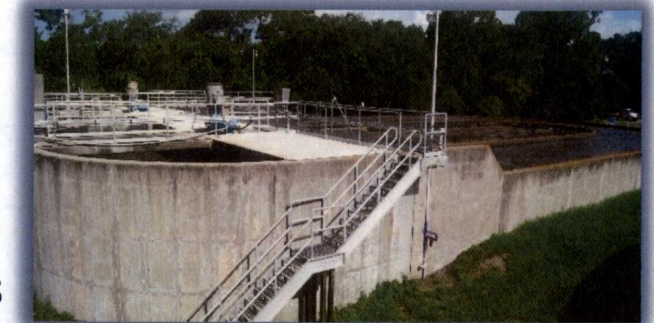


○ Influent Structure and Barscreen

- Undersized unit for the 20-year planning horizon
- Corrosion of equipment and facility structure
- Screenings getting around the barscreen
- Does not meet Class I Reliability requirements

○ Biological Treatment System

- Significant structural issues/damage
- Cannot meet new effluent or BNR standards
- Equipment is past service life – does not meet Class I Reliability



Existing Flagler Beach WWTF

○ Secondary Clarifier No. 1

- Hydraulic issues – not operational
- Corrosion of existing infrastructure
- Structural issues and damage

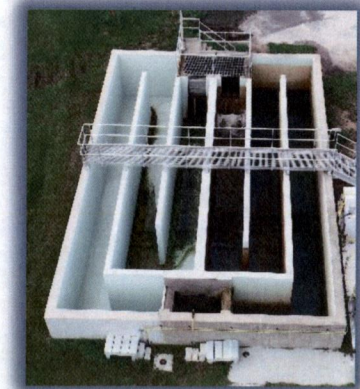


○ RAS/WAS Pumping Station

- Undersized unit for the 20-year planning horizon
- Corrosion of equipment and structure
- Safety issues associated with this Pump Station
- Does not meet Class I Reliability Requirements

○ Disinfection System

- Significant structural concerns / drainage issues
- Does not meet high-level disinfection requirements
- Oversized structure leads to excess chemical usage



Existing Flagler Beach WWTF

○ Sludge Holding/Overflow Tank (1975)

- Original treatment plant – past useful life
- Structural issues with the tank
- Minimal treatment/Not enough storage



○ Scum Ejector System

- System is not functional/operational
- Sludge continually spills onto the ground
- EPA/FDEP violations
- Pumps have been removed /system inoperable



○ Sludge Pumping System

- Only one sludge pump – single point of failure
- Oversized to meet future dewatering system
- Does not meet Class I Reliability requirements



Existing Flagler Beach WWTF

○ Sludge Drying Beds

- Used for the last 40 years – labor intensive
- Air drying system affected by weather
- May take 3 – 5 months to dry ~ inefficient
- Won't comply with future environmental permits



○ Digester Blowers

- Units beyond service life / replacement required
- Inefficient system / difficult to find spare parts
- Undersized for proposed digestion system

○ Facility Infrastructure

- No stormwater management system
- Security enhancements required to meet code
- No control system; does not meet current code



Existing Flagler Beach WWTF

○ Clarifier Ragging Issue

- Screening material getting past the barscreen
- Rags are collecting in clarifier wetwell
- Requires weekly "manual" removal of rags



○ Oxidation Ditch Ragging

- Screening material getting past the barscreen
- Material gets wrapped around aeration devices
- Decreases the ability to mix and aerate the wastewater
- Excessive torque is then applied to rotating vertical shaft impeller
- The vertical rotating shaft has sheared and fallen into tank twice





Proposed WWTF BNR Improvements

- Proposed WWTF improvements are required to:
 - Replace aging/obsolescent equipment that is at or past its service life
 - Replace concrete tankage that is structurally damaged
 - Replace infrastructure that is corroded
 - Meet current and future regulatory requirements
 - Provide Class I Reliability
 - Meet BNR standards (environmental stewardship)
 - Meet reclaimed water standards and potentially create revenue stream
 - Provide the initial improvements to eliminate effluent discharges to the Intracoastal Waterway (Florida Senate Bill 64)

Proposed WWTF BNR Improvements

○ Master Lift Station

- Triplex submersible pumping system: 12-foot diameter precast wetwell with integrated plastic liner (interior) to prevent corrosion

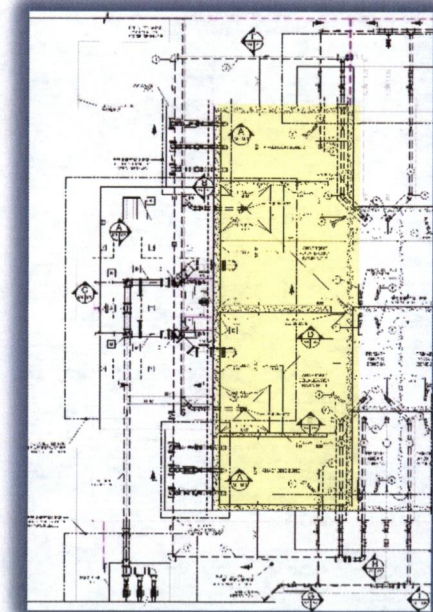
○ Influent Structure

- High efficiency mechanical drum screens (316 SS)



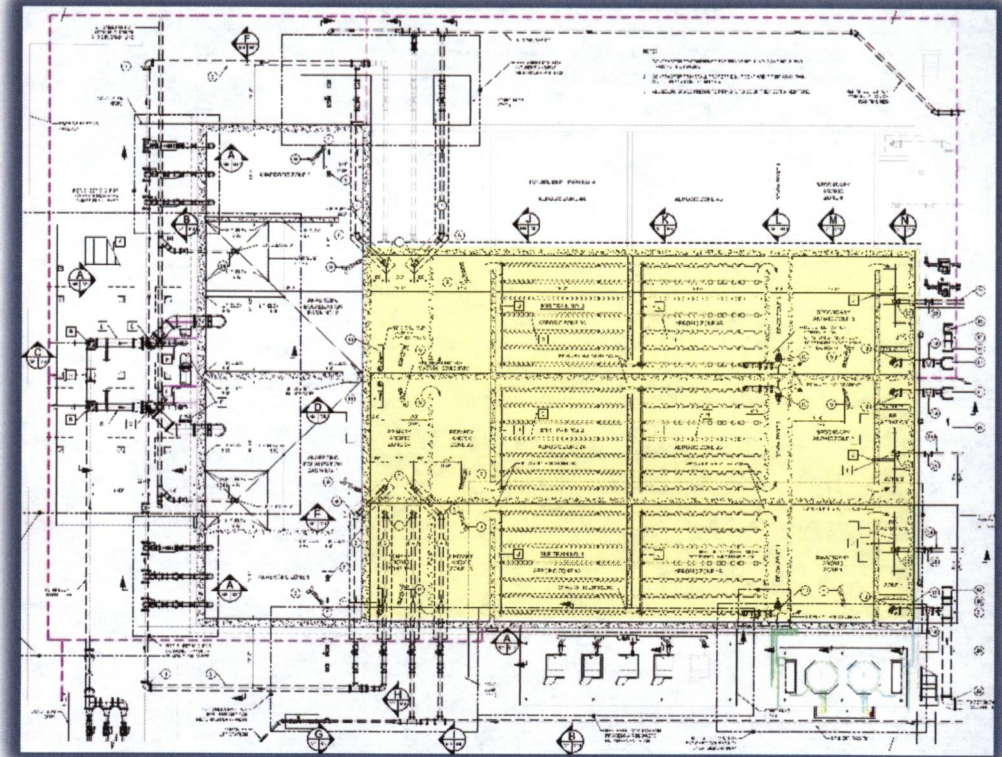
○ Flow Equalization Basin

- Anoxic/Anaerobic operation
- Provided to attenuate wastewater flow
- Integrated Grit Removal System; will save the City approximately \$0.8 – \$1.0 million
- EQ pumping station to convey flow BNR Process at a constant flow rate



Proposed WWTF BNR Improvements

- Planning for Future Facility Capacity
 - Construction of 3 treatment trains, each with a capacity of 0.5 MGD
 - Install BNR equipment into the first two trains only
 - Primary Anoxic, Aerobic, Deoxygenation, Secondary Anoxic and Reaeration Basins
 - Will produce an effluent meeting AWT requirements (low in nutrients)
 - New high efficiency blowers and retrievable submersible mixers
 - Meets Class I Reliability

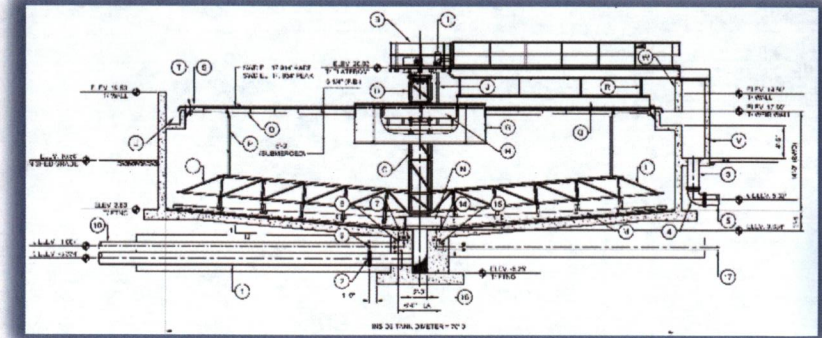


Future capacity expansion by adding equipment into 3rd train and a blower

Proposed WWTF BNR Improvements

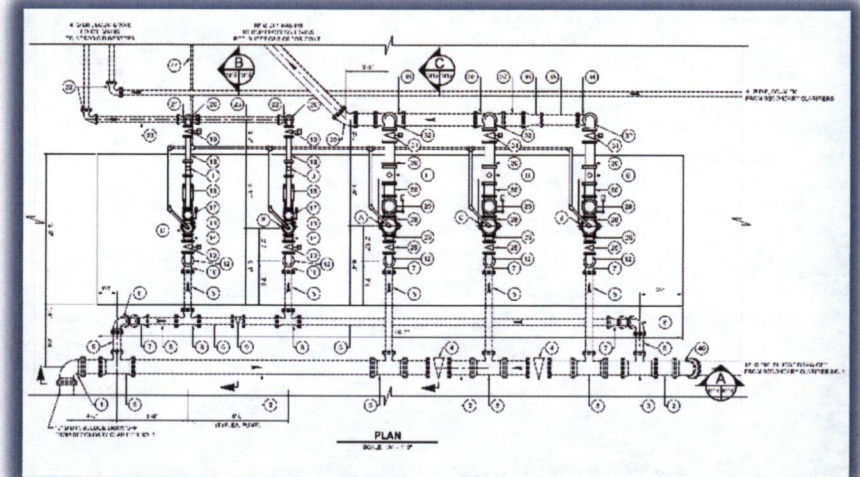
○ Secondary Clarification System

- Construction of a secondary clarifier flow splitter box
- Construction of 2 secondary clarifiers with high-efficiency spiral scrapers and an internal scum trapping system
- Concrete clarifiers with galvanized steel equipment for corrosion resistance
- Meets Class I Reliability



○ RAS/WAS Pumping System

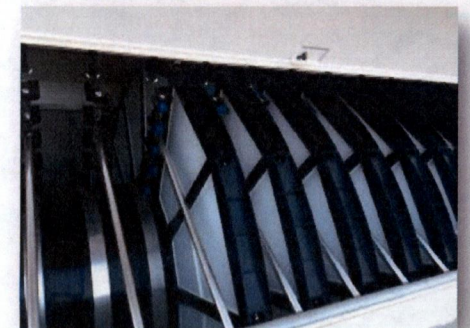
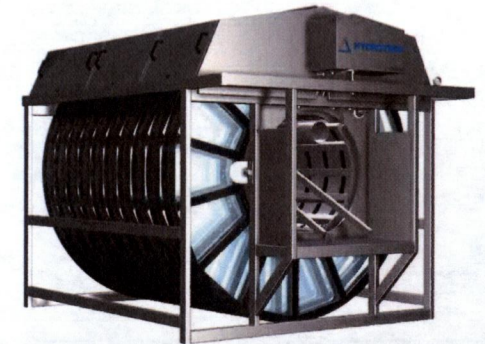
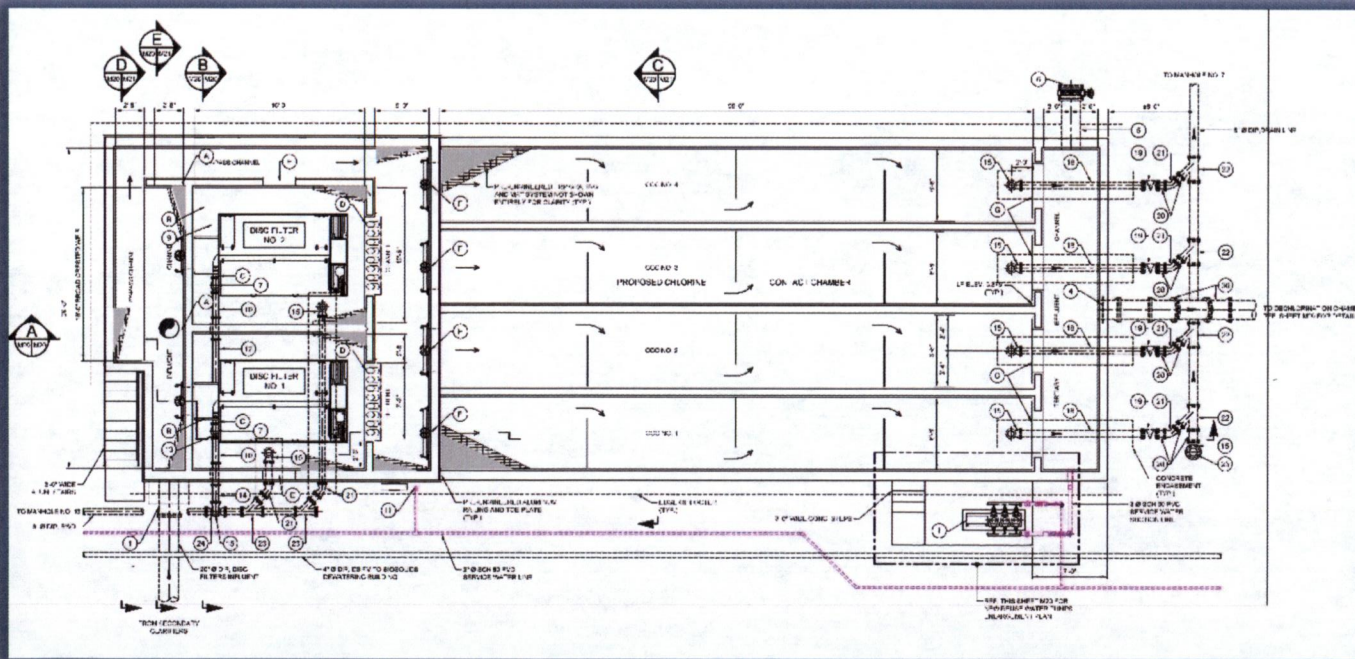
- Construction of a new combined RAS/WAS pumping system
- Meets Class I Reliability



Proposed WWTF BNR Improvements

○ Tertiary Filtration System

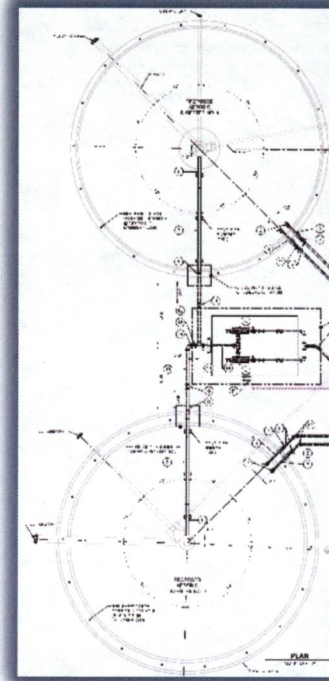
- Construction of an integrated Tertiary Filtration and Disinfection System Structure to meet TSS and high-level disinfection Standards
- Meets Class I Reliability and creates a “back-up” plan for the future
- Construction of 2 high performance disc filters
- Construction of 4 plug flow CCC compartments, 0.5 MGD each



Proposed WWTF BNR Improvements

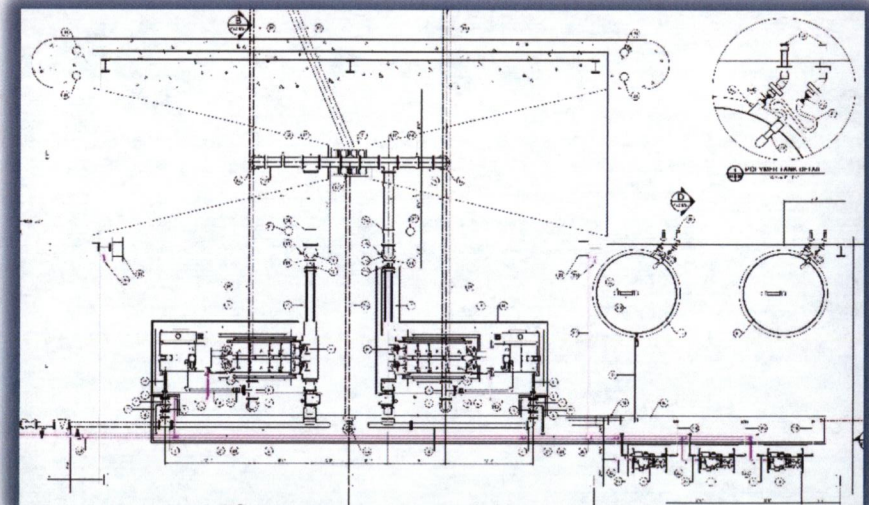
○ Aerobic Digestion System

- Conversion of the existing secondary clarifiers to digesters
- Addition of blowers, sludge pumps and diffusers to the tanks
- Aerobic – Facultative operation
- Designed to produce Class B Sludge (EPA 40 CFR, Part 503)



○ Biosolids Dewatering System

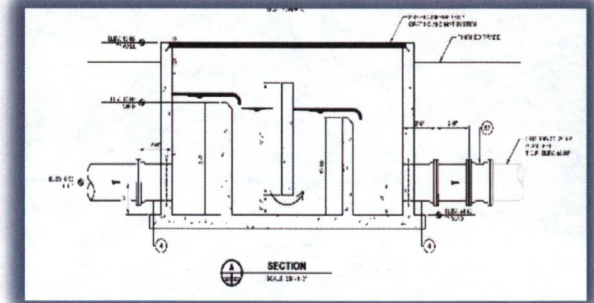
- Construction of covered facility to house biosolids dewatering screw press and infrastructure
- 24-hour operation to "reduce" equipment size and power costs
- 16 – 20% dry solids continuously



Environmental Protection Advantages

○ Dechlorination System

- Construction of new dechlorination structure
- Sodium bisulfite used to remove chlorine prior to discharge to ICW




○ Supervisory Control and Data Acquisition(SCADA) System

- Installation of a SCADA system and operational instrumentation and controls to maximize process operations; provide automated control, monitoring and alarm/failure notifications; and minimize manpower

○ Electrical, Controls and Instrumentation Improvements

○ Convert existing Biological Treatment (Caroussel) Tank to a Reclaimed/Reject Water Storage Tank

○ Nutrient Removal Credits from WMD for future use



Short-Term, Long-Term Strategies

○ Reclaimed Water Production

- WWTF improvements will produce a high-quality effluent, or reclaimed water
- Potential issue – high salt concentration ($[Cl^-] \leq 200$ mg/L)
- Resolution: reduce salt content in collection system or install RO system. City/CPH are currently working to resolve this issue
- Reclaimed water disposal (golf course, park, state park, medians, etc)?

○ Surface Water Discharge Elimination

- Need to eliminate discharge to ICW by January 1, 2032
 - Need to submit SW Elimination Plan to FDEP by November 1, 2021
- Conduct study to identify RW disposal options now
- Long-term study/evaluation of short-listed options

WWTF Improvements - Financials

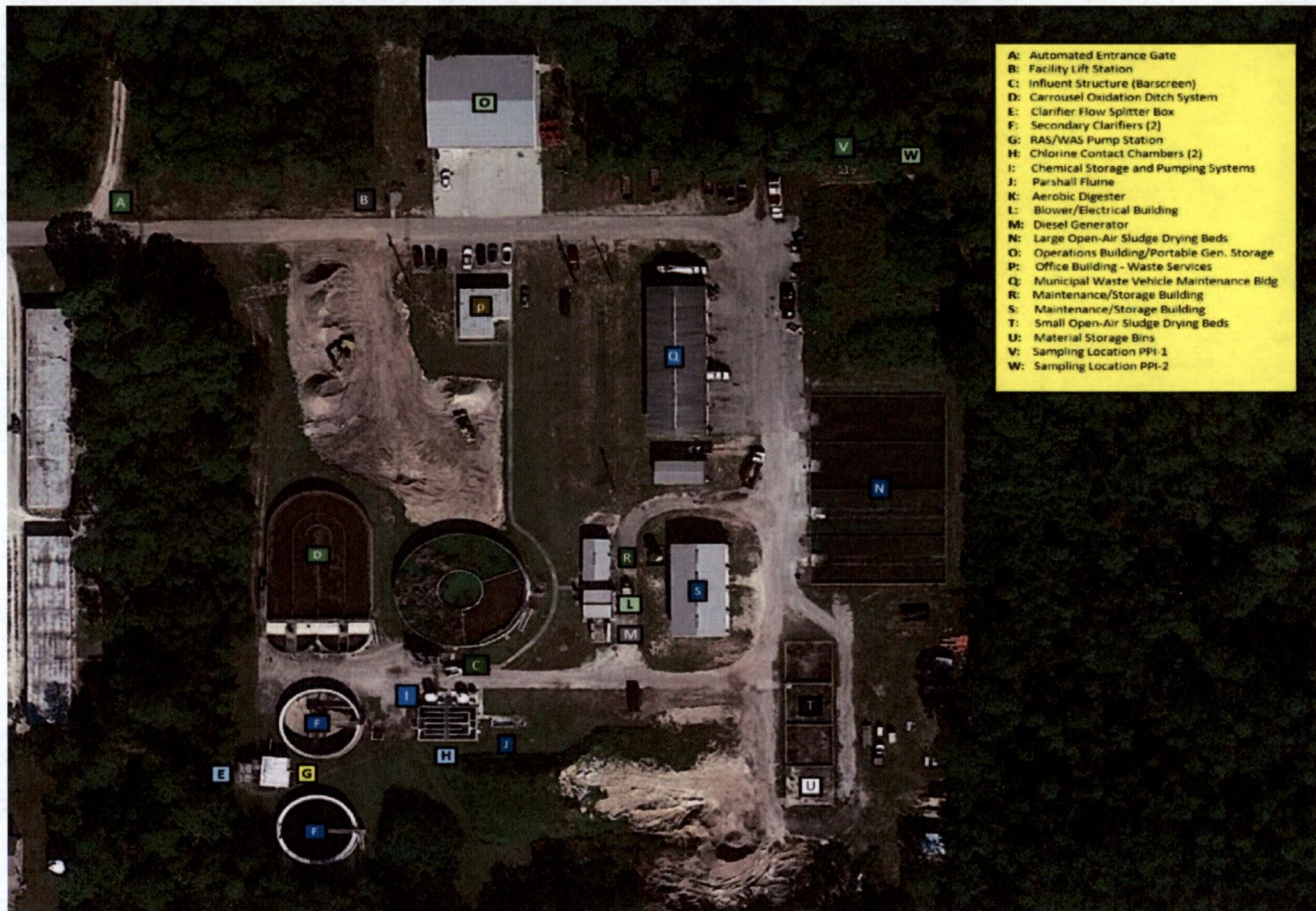
- Previously Approved WWTF Plan (Mead and Hunt, 2019)
 - \$11.04 million (2019 dollars)
 - FDEP SRF Loan financed at **3% interest** would yield an annual debt service payment of **\$773,000**
 - City would pay **\$3.81 million in interest** over the term of the loan (20-years)
 - M&H Cost Estimate was incomplete and did not provide the City with all relevant infrastructure for project completion. Including these items and with escalation this would be closer to \$12.94 million (2021 dollars)
 - FDEP SRF Loan financed at **3% interest** would yield an annual debt service payment of **\$870,000**
 - City would pay **\$4.46 million in interest** over the term of the loan (20-years)

WWTF Improvements - Financials

- Proposed Flagler Beach WWTF Improvements (CPH, 2021)
 - Current Opinion of Probable Construction Cost is in the \$15 million range. However, the current SRF interest rate is very low. Thus,
 - FDEP SRF Loan financed at **0.20% interest** would yield an annual debt service payment of **\$765,800**. This is less than the debt service of the previous plan.
 - City would pay **\$317,000 in interest** over the term of the loan (20-years); this is approximately **\$4.143 million less in interest payments**
 - At \$16 million; debt service is **\$816,900; total interest of \$338,100**

- Potential Cost Savings Items
 - CPH has assisted the City in receiving a *State Appropriation* in the amount of **\$850,000** for the WWTF Improvements Project
 - *Owner Direct Purchase (ODP)* of major equipment infrastructure and materials. This could lead to savings of **\$350,000 - \$500,000**
 - *SJRWMD Cost-Share Grant* – funding for reclaimed water infrastructure to be implemented at the facility

FB WWTP – BNR Improvements



QUESTIONS ?

#13

RESOLUTION 2021 - 19

STATE REVOLVING FUND (SRF) LOAN PROGRAM

A RESOLUTION OF THE CITY OF FLAGLER BEACH, FLORIDA, RELATING TO THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) STATE REVOLVING FUND LOAN PROGRAM; ADOPTION OF ALL SRF PLANNING DOCUMENTS FOR THE WASTEWATER TREATMENT FACILITY BNR IMPROVEMENTS; AUTHORIZING THE LOAN APPLICATION; AUTHORIZING ALL SRF LOAN DOCUMENTS; AUTHORIZING THE SRF LOAN AGREEMENT; AUTHORIZING THE EXECUTION, AND ALL ACTIONS NECESSARY, OF THE STATE OF FLORIDA GRANT FOR THE CONSTRUCTION OF IMPROVEMENTS TO THE WASTEWATER TREATMENT FACILITY; MAKING FINDINGS; EXECUTING ALL SRF LOAN DOCUMENTS; ESTABLISHING PLEDGED REVENUES; DESIGNATING AUTHORIZED REPRESENTATIVES; PROVIDING ASSURANCES; PROVIDING FOR CONFLICTS, SEVERABILITY, AND EFFECTIVE DATE.

WHEREAS, the City's Wastewater Treatment Facility has aging/obsolescent equipment and significant deficiencies that need to be corrected to serve the public health safety and welfare of the citizens of the City of Flagler Beach; and

WHEREAS, the City Commission of the City of Flagler Beach, Florida agrees with the findings and summary of necessary improvements as outlined in the Preliminary Design Report (PDR) and SRF Planning Document(s) and for the purpose of the improvements to City's Wastewater Treatment Facility; and

WHEREAS, Florida Statutes provide for loans to local government agencies to finance the construction of wastewater treatment facilities; and

WHEREAS, Florida Administrative Code rules require authorization to apply for loans, to adopt a State Revolving Fund (SRF) Planning Document outlining the necessary wastewater treatment facility improvements, to establish pledged revenues, to designate an authorized representative; to provide assurances of compliance with loan program requirements; and to enter into a loan agreement; and

WHEREAS, the City Commission of the City of Flagler Beach, Florida agrees with the findings and summary of necessary improvements as outlined in the SRF Planning Document/PDR for the Wastewater Treatment Facility BNR Improvements; and

WHEREAS; the City of Flagler Beach, Florida, intends to enter into a loan agreement with the Florida Department of Environmental Protection under the State Revolving Fund for project financing.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF FLAGLER BEACH, FLORIDA, AS FOLLOWS:

SECTION 1. APPROVAL OF RESOLUTION. The City of Flagler Beach, Florida, is authorized to apply for an SRF Program loan to finance, execute the SRF Loan, and execute the State of Florida Grant, for construction of BNR improvements at the Flagler Beach Wastewater Treatment Facility. The City Commission of the City of Flagler Beach hereby agrees to the terms and conditions of the SRF loan process, SRF loan application with the Florida Department of Environmental Protection and the State of Florida Grant recently signed into the State of Florida 2021-2022 budget.

SECTION 2. AUTHORIZATION TO EXECUTE. The City Manager is hereby designated as the authorized representative to provide the assurances and commitments required by the SRF loan application and all other necessary documents and the State of Florida Grant. The City Manager is authorized to negotiate the terms of the loan and grant agreements; carry out technical, financial and administrative activities associated with the loan application, loan approval process; execute the SRF loan agreement; and execute the State of Florida grant.

SECTION 3. SEVERABILITY. If any section or portion of a section of this Resolution proves to be invalid, unlawful, or unconstitutional, it shall not be held to invalidate or impair the validity, force, or effect of any other section or part of this Resolution.

SECTION 4. SCRIVENER'S ERRORS. Typographical errors and other matters of a similar nature that do not affect the intent of this Resolution, as determined by the City Clerk and City Attorney may be corrected.

SECTION 5. CONFLICTS. All Resolutions or part of Resolutions in conflict with any of the provisions of this Resolution are hereby repealed.

SECTION 6. IMPLEMENTING ACTIONS. The City Manager is hereby designated as the authorized representative to take any and all actions otherwise necessary and desirable pertaining to obtaining of funding and executing the SRF Loan Agreement from the State Revolving Fund and execution of the grant from the State of Florida. The City Manager is authorized to represent the City in carrying out the City's responsibilities under the SRF Loan and State Grant agreements. The City Manager is authorized to delegate responsibility to appropriate City staff to carry out technical, financial, and administrative activities associated with the loan agreement.

SECTION 7. EFFECTIVE DATE. This Resolution shall take effective immediately upon adoption by the City Commission.

DULY PASSED and ADOPTED by the City Commission of the City of Flagler Beach, Florida, on this _____ Day of June, 2021.