Freedom Sanitary District No. 1

Public Hearing for 2018 Wastewater Treatment Plant Upgrades

Presented by:
Freedom Sanitary District No. 1 & Cedar Corporation
June 20, 2018

History of Freedom Sanitary District No. 1 Wastewater Treatment Plant

- Original wastewater treatment plant (WWTP) placed into service in 1973
- Major facility upgrades in 1982 and 1997
  - Most current equipment and processes installed in 1997.
- Current WWTP Service Parameters:
  - Service Population: 3,448 people
  - Average wastewater flow: 0.261 MGD (261,000 gallons/day)
    - Includes 40,000 gallons/day from septage waste haulers

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WWTP Upgrade Overview

- Planning for WWTP upgrades began in April 2017
- Project Scope:
  1) Evaluate existing facility equipment and wastewater treatment processes
     - What equipment can continue to be used and what must be replaced?
  2) Evaluate future residential and industrial growth for Freedom Sanitary District No. 1 and develop 20-year projections
  3) Assess long-term needs
  4) Develop plan for economic, practical, and reliable future wastewater treatment service for the Sanitary District
  5) Present economical plan to Sanitary District for WWTP upgrades
  6) Proceed with design and construction of WWTP upgrades

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Why are WWTP Upgrades Needed?

- The Sanitary District must be able ensure adequate wastewater treatment for at least the next 20 years.
  - Avg. flows projected to increase from 0.261to 0.315 MGD
    - Service population projected to increase from 3,448 to 4,228 by 2036
  - Additional organic and chemical constituents in wastewater
  - (More wastewater in future and it will be stronger)
- Adequate wastewater treatment will be provided by completing the following tasks:
  - Proactive replacement of equipment near the end of its service life
  - Improve processing quality of septage receiving facilities.
  - Add equipment for supplemental solids and grit treatment.
  - Incorporate modern technology and tools into the day-to-day operations of the Sanitary District.

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WWTP Upgrade Project Phases

- Phase I (2018-2019)
  - Upgrade Septage Receiving Facilities
  - Replace blowers used for providing air for wastewater treatment
  - Replace pumps used for handling of sludge
  - Replace mechanical components on clarifiers
  - Implement modern-day control and electrical upgrades
  - Minor site modifications
- Phase II (When Needed)
  - Headworks modifications
  - Increase aeration capacity of WWTP
  - Increase sludge storage capacity of WWTP

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Phase I Project Schedule

- Engineering Planning Report – March 2018
- Project Public Hearing – June 2018
- Complete Plans & Specifications – June 2018
- Project Bidding – August 2018
- Begin Project Construction – September 2018
- Complete Project Construction – October 2019

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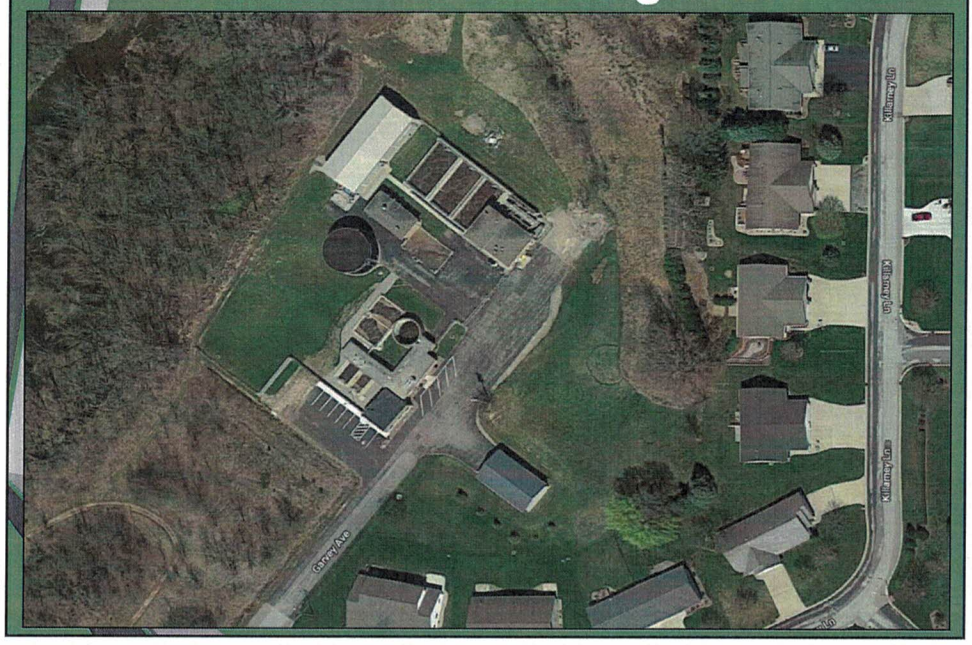
Overview of Existing WWTP



Description of WWTP Upgrades

- Construction of one new building
  - Septage Receiving Station (location shown on map)
- Mechanical Equipment Replacement
  - Blowers to supply air for wastewater treatment
  - New pumps for treatment operations
  - Repair of existing clarifier units
- Utility and Control Software Improvements (SCADA)

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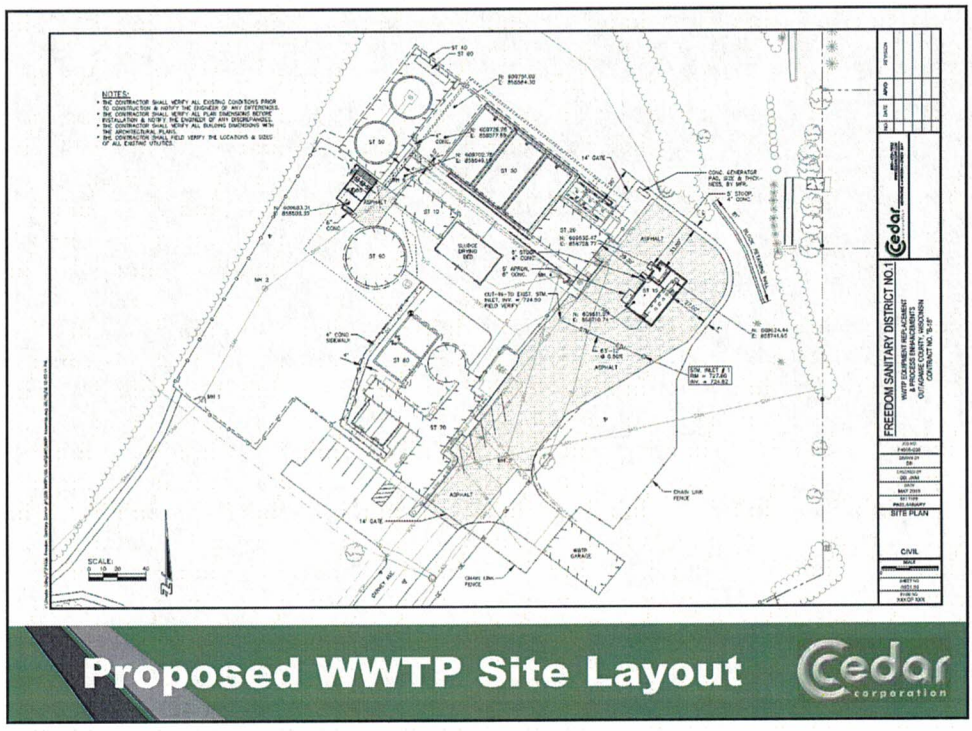
Proposed WWTP Site Layout
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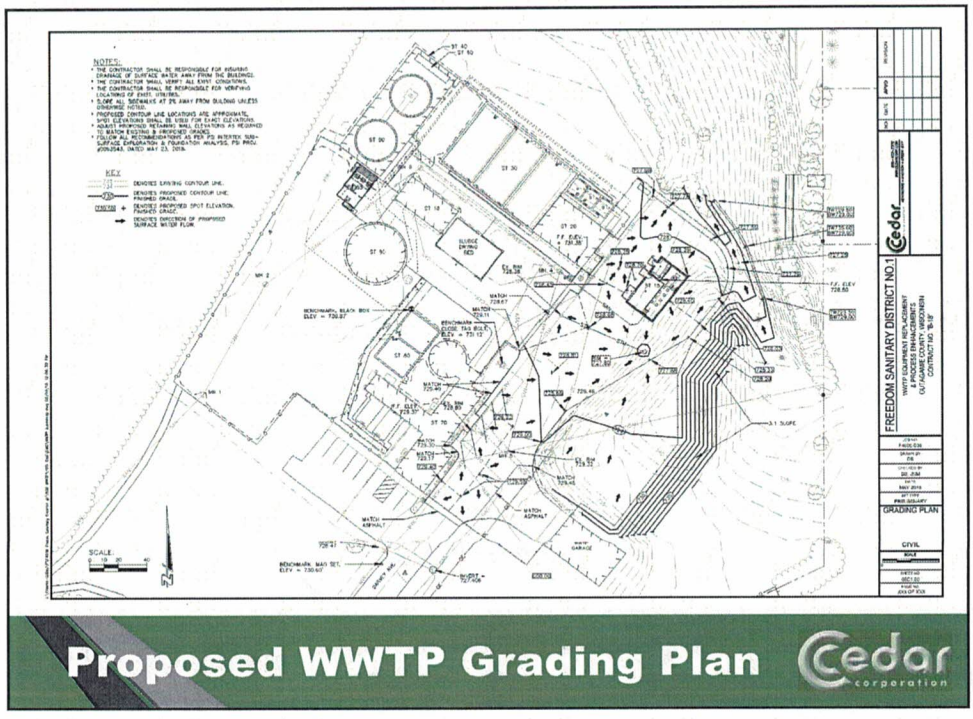
Proposed WWTP Grading Plan
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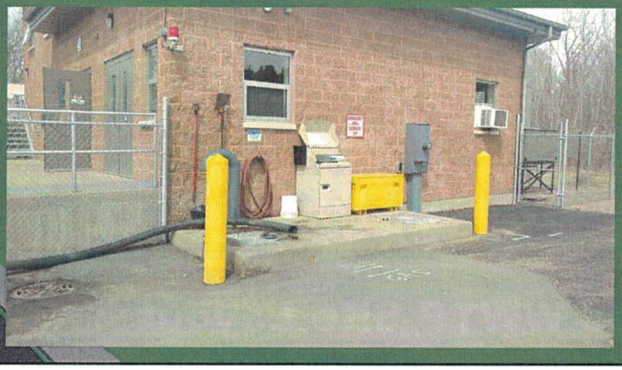
Existing Septage Receiving Facilities

- Hauling trucks unload into a manhole by gravity flow
- Hauled waste is mixed with wastewater from the Sanitary District collection system
- Minimal preliminary treatment of hauled waste



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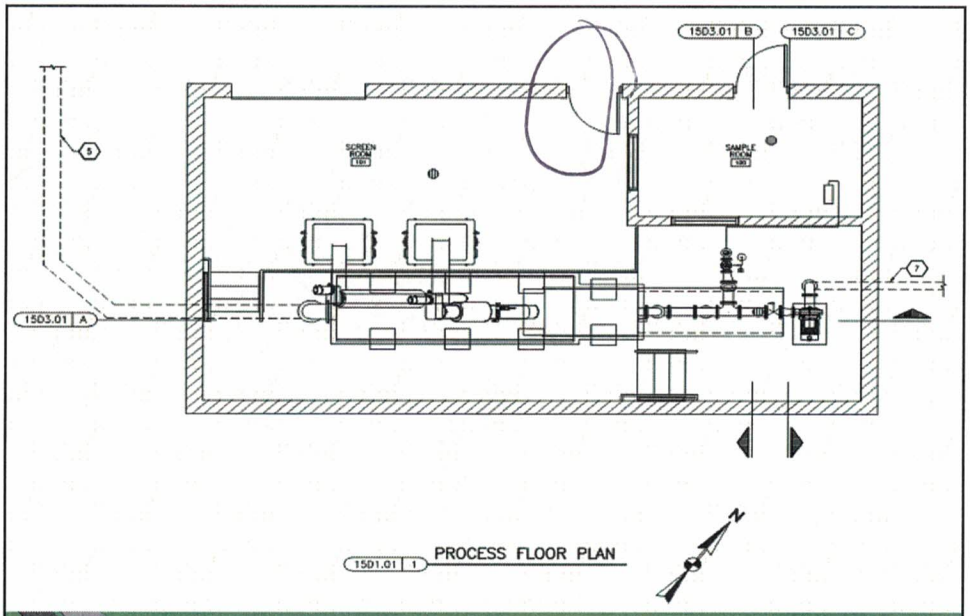

New Septage Receiving Building

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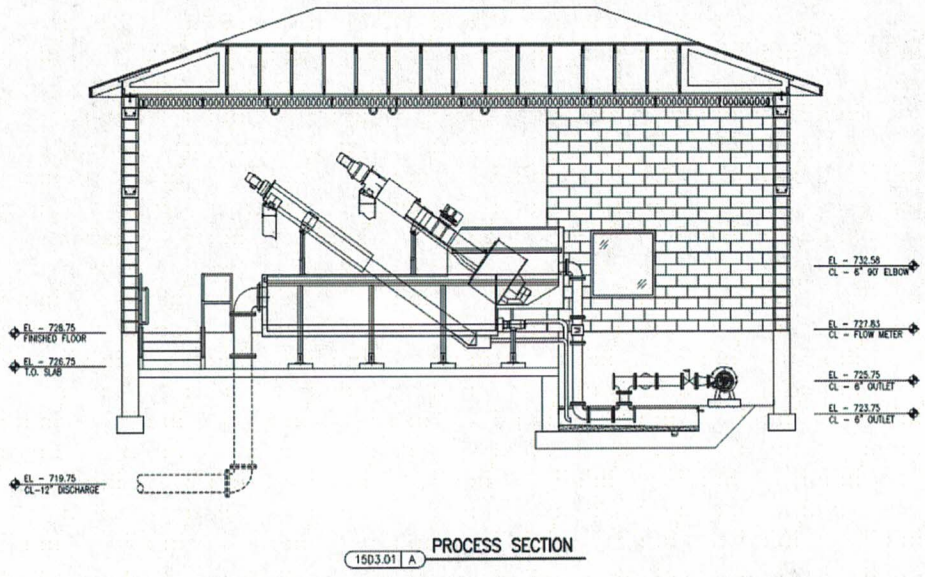

New Septage Receiving Building

Benefits of New Septage Receiving Facilities

- Improved treatment of hauled waste
- Better overall performance of WWTP
- Protection of downstream equipment
- Compliance with permit effluent requirements
- Processing of additional haulers = revenue for Sanitary District
- Reduction in odors

Existing Aeration Blowers

- Positive displacement units installed in 1997
- Required for biological treatment of wastewater
- Only one current blower is operated full-time

New Aeration Blowers

- Install 5 new blowers that utilize screw technology
  - 3 new blowers in aeration building (as pictured)
  - 2 additional blowers for aerobic digestion (not pictured)
- Greater energy efficiency and easier to operate/maintain
- Additional treatment capacity for at least the next 20 years
- Connect new blowers to SCADA upgrades

Existing Sludge Handling Pumps

- Single-speed pump units installed in 1997, near the end of useful service life
- Purpose: To return sludge from clarifiers back to the biological treatment section of the WWTP
- Current configuration provides limited operational control

- Existing pumps located in wet wells adjacent to clarifier building

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New Sludge Handling Pumps

- Install 3 new pumps in location of existing pumps
  - Include variable-frequency drives for energy efficient operation
- Construct piping modifications to optimize control and flexibility of system needs and operation
- Provide additional treatment capacity for at least the next 20 years
- Connect new pumps to SCADA upgrades

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Phase I Project Cost and Sewer User Impacts

- Budgeted Project Cost: $4,000,000 ($4 million)
- Project to be funded by DNR Clean Water Fund (CWF)
- No anticipated initial impact on existing sewer user charge rates
  - Due to recent repayment of existing CWF debt for 1997 construction project
- Itemized Cost Breakdown:
  - Septage Receiving Station: $985,100
  - Five Aeration Blowers: $413,500
  - Sludge Handling Pumps: $472,300
  - Clarifier Equipment & Misc. Site Work: $252,100
  - Electrical & SCADA: $1,875,800
  - Total: $4,000,000

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