

ITHACA AREA WASTEWATER TREATMENT FACILITY

TOWN OF ITHACA

CITY OF ITHACA

TOWN OF DRYDEN, OWNERS

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April, 14, 2016

To: City of Ithaca, Town of Ithaca and Town of Dryden Councilors

From: Dan Ramer, Chief Operator Ithaca Area WWTF

Subject: Support Memo for GHD Contract Approval Process

At the April 13, 2016 SJC meeting a resolution was approved recommending that the municipal owners fund a detailed engineering study to evaluate improvements to three portions of the treatment system and facilities. I have provided rationale for why we have prioritized the three areas. The design document and associated construction estimates will then be used to inform the SJC and associated legislative bodies and help determine what improvements we want to bid and seek funding for.

Three Improvements

1. Administration Building

Need Statement: The administration building has become inadequate with respect to laboratory needs, employee office space, employee bathroom and locker room space, security, trucked waste receiving log in and meeting and training space. In addition, the windows and skylights require significant heating and cooling energy during all seasons. The roof is thirty years old and needs to be replaced.

2. Mechanical thickening of biosolids

Need Statement: The current practice of gravity thickening is inefficient and subject to seasonal variation due to biological activity thwarting the gravity settling of the solids. The energy requirements for heating the solids prior to anaerobic digestion can be reduced by 50% (currently one of the deficiencies that Johnson Controls is trying to improve as part of their obligation for energy performance). The use of these solids to generate energy in the digesters would be greatly enhanced by doubling to tripling their density prior to pumping to the anaerobic digesters. There are many ancillary benefits to proceeding along these lines.

- The atmosphere within the thickeners is hazardous and uncontrolled making it a daily risk for employees
- The state of the scraper mechanisms and associated steel structures are deteriorating as a result of the moist atmosphere and will require significant investment sooner rather than later.

- We have built a large part of our infrastructure to enhance the acceptance of high strength organic matter to produce biogas. Mechanically thickening our biosolids and other thin solid waste will increase our biogas production and increase our capacity to accept more waste. Current revenue from our trucked waste is around \$300k and current electricity production is worth \$143,000 per year. Increases to both of these have real value to the rate payers and community.
- Mechanically thickening solids will result in doubling the solids concentration of solid feed to the digesters. The digester feed must be heated to 100 degrees F for anaerobic digestion. Doubling the solids content cuts the total feed rate in half which also cuts the energy required for heating in half
- The greater detention time within the digesters as a result of the reduced volumes of material pumped to the digesters benefits the dewatering of our biosolids prior to disposal in several ways. Thicker solids being pumped to the dewatering equipment lowers the amount of time we have to run our dewatering equipment, produces a better quality biosolid product for potential beneficial reuse and lowers the amount of loading sent back into the process from digester overflows.
- The improvements in the thickening will also allow us to mix both digesters which will increase biogas production.

3. **New Grit Removal**

Need Statement: Since the start up of this plant the cyclone degritting of our primary settling tank residuals has been inefficient.. The current process allows grit to accumulate in the long channels ahead of the primary tanks which then need to be manually cleaned. In addition grit which is not removed settles in the anaerobic digesters. This reduces the capacity and efficiency of the digesters and creates requirement for digester cleaning. Removing digester from service for cleaning interrupts the process and reduces digester gas and energy production. The current practice also dumps the grit into the same trailer as the biosolids. When we do need to prepare biosolids for beneficial reuse we must separate the grit from the biosolids which is problematic. Putting in a new grit removal system in the area where the now unused lime silo and lime slaking equipment reside would greatly improve grit removal efficiency and allow the grit to be disposed of separately. The quality of the grit for disposal would also be greatly improved and potentially reduce odors.