

**Indian River County, Florida
Solid Waste Disposal District
Board Memorandum**

Date: July 5, 2019

To: Jason E. Brown, County Administrator

From: Vincent Burke, PE, Director of Utility Services

Prepared By: Himanshu H. Mehta, PE, Managing Director, Solid Waste Disposal District

Subject: Focused Feasibility Evaluation of Landfill Leachate

Descriptions and Conditions:

On February 19, 2019, the Indian River County (IRC) Solid Waste Disposal District (SWDD) Board authorized CCNA 2018 Work Order No. 4 to Geosyntec in the amount of \$30,989 to provide professional services related to the Focused Feasibility Study to explore leachate/centrate treatment and disposal options.

The purpose of the study was to evaluate options for reducing the nutrient loading from the leachate and centrate that are impacting the stringent permit conditions at the West Regional Waste Water Treatment Facility (WRWWTF). The Class 1 Landfill is the source of the leachate (liquid that passes through the waste) and the Residuals Dewatering Facility (RDF) which is operated by the IRC Department of Utility Services (IRCDUS) is the source of the centrate (liquid portion of the dewatering process).

Geosyntec has provided the attached technical memorandum to present the results of the focused feasibility study that includes review of the liquid chemistry and flow data, an evaluation of liquids management options, discussion of conceptual costs, summary of findings and recommendations.

Analysis:

Although the quantity and quality of the centrate was included in this study, based on direction from IRCDUS, it was determined that the centrate constitutes a residential stream that does not require pretreatment. Therefore, the primary focus was on the quantity and quality of the leachate in meeting the IRCDUS pretreatment standards.

Based on the review of historical flows from June 2017 to February 2019, the landfill generated an estimated leachate flow of 16,000 gallons per day (gpd) and there is substantial fluctuation on the leachate generated based on climatic and operational conditions. For estimating purposes, a peak daily flow of 20,000 gpd was used in the study.

A review of the leachate characteristics based on laboratory sampling in April 2019 compared to historical data show that arsenic (As), total nitrogen (TN) and total dissolved solids (TDS) exceed the specified local limits on discharge referenced in Section 201.68 of the IRC Code. The leachate also contains ammonia nitrogen (NH₃-N), and biological oxygen demand (BOD) in excess of limits stipulated in 40 CFR 445.21.

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Based on previous direction from the Board, underground injection via a deep well was ruled out in the study as well as any consideration of direct discharge of treated leachate effluent. In addition, based on the chemistry of the leachate, NPDES discharge restrictions, footprint requirements, treatment of leachate via aerated lagoons, “Vetiver grass” and constructed wetlands were also ruled out.

Therefore, two primary leachate treatment / management options were evaluated with the goal to either continue to send the treated leachate to the WRWWTF or to manage the leachate onsite via thermal evaporation eliminating the need to send treated leachate to the WRWWTF. The first option involved the evaluation of a biological treatment approach using a Membrane Bioreactor (MBR) System combined with Reverse Osmosis (RO). Geosyntec obtained conceptual design and cost estimates from Dynatec Systems, Inc. The second option of evaluating leachate evaporation performed by Geosyntec utilized the design and costs from two different equipment vendors: APTIM and Heartland Water Technology.

The following table summarizes the various treatment technologies:

	APTIM	Heartland	Dynatec
Treatment Type:	Evaporator	Evaporator	Biological/Membrane
Design Capacity:	20,000 gpd	20,000 gpd	20,000 gpd
Meet Local Limits:	Yes	Yes	Yes
Delivery Time:	10 months	6 months	3.5 months
Require Permits:	Solid waste, Title V Air, Building	Solid waste, Title V Air, Building	Solid waste, Wastewater, Building
Electric/Fuel	Landfill Gas (333 SCFM at 50% methane)	Landfill Gas (315 SCFM at 50% methane) or engine exhaust, natural gas or any combination	Electric
By-Product:	12%-14%	5%	10%-13%
Capital Cost:	\$2,494,000	\$2,059,550	\$1,130,000
Annual Maintenance Cost:	\$177,600	\$175,200	\$405,500
Total 10 Year Costs:	\$4,270,000	\$3,811,550	\$5,185,004
Price per Gallon:	\$0.07	\$0.06	\$0.08

Geosyntec recommends that based on the technical and economic evaluation of the feasibility study, that there is a potential that the Heartland system could be a cost-competitive alternative to on-site treatment and continued discharge to WRWWTF. Geosyntec recommends a pilot study to further evaluate this approach.

Funding:

No funding is required at this time.

Recommendation:

Solid Waste Disposal District staff recommends that the Board approve the technical approach in further evaluating thermal evaporation technology as a potential solution for leachate treatment. Direct staff to obtain a pilot study proposal for Board approval at a future meeting.

Attachment:

1. Geosyntec Focused Feasibility Technical Memorandum (the complete report is on file in the Department of Utility Services)