Identifying High Strength Wastes Suitable for Co-Digestion at Blue Plains AWTP

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Overview

- Background
- Methodology
- Results
- Conclusions
High Strength Waste (HSW)

- Wastewater characterized by having elevated concentrations of:
  - organic matter,
  - solids, and/or
  - fats, oils and grease

- Common HSW generators:
  - Carbonated Beverage (Soft Drink) Bottlers
  - Non-Carbonated Beverage (Juice) Bottlers
  - Dairy Processing
  - Candy / Sugar Refinery
  - Snack Foods Producers
  - Fats, Oils, and Grease
  - Slaughterhouses / Meat Rendering
  - Distilleries / Breweries / Wineries
  - Airports
High Strength Waste Generation

Potential HSW Streams:
- Cleaning Activities
- Off-Spec Products
- Raw Materials
- DAF, HS side streams

Handling:
- Discharge to Sewer
- Pretreatment (& discharge to sewer)
- NPDES Permit (w/ direct discharge)
- Hauled off-site

Disposal / Beneficial Use:
- Municipal WWTP
- Receiving Waters
- Beneficial use (fertilizer, animal feed)
- Other post processing (WWTP, commercial processing)
- Landfill Disposal
Co-Digestion

- Digestion of domestic solids with other high strength organic wastes sourced largely from:
  - food production and processing facilities
  - organic fraction of municipal solids waste stream

- Benefits:
  - Better use of process capacity,
  - Offsetting operating costs,
  - Increasing bioenergy production,
  - Improved digester stability, and
  - Improved dewaterability.

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Co-Digestion at Blue Plains AWTP

- 330 MGD average daily flow
- Recently completed major solids handling upgrades
- Co-digestion considered to optimize infrastructure

Study Purpose: Evaluate availability of HSW for co-digestion at Blue Plains
Methodology

1. Review Local Hauled Waste and Surcharge Program Data
2. Survey Regional WWTPs
3. Interview Waste Haulers
4. Identify and Interview Potential HSW sources
5. Compile and Evaluate Results
Local Hauled Waste Program Review

- **Hauled Waste**
  - **Major contributors:**
    - Septage
    - Holding tank
    - Portable toilets
    - Municipal solids
    - Grease trap waste
    - Landfill leachate
  - Accepted at Blue Plains and 2 satellite receiving stations
- **Fee Schedule**
  - Based on vehicle size
  - Does not account for volume

> >9.5 million gallons per year
Local Surcharge Program Review

- Surcharge
  - District of Columbia Municipal Regulation (DCMR) provides DC Water with capability to develop High Strength Wastewater Surcharge Program
  - Limits have not been established or enforced
Regional WWTP Survey

- Multiple WWTPs w/in 50 miles accept HSW
- Few accept all types of HSW
- Limited number of VA WWTPs surveyed enforce surcharges
- Most MD WWTPs enforce surcharges
Waste Hauler Interviews

- Hauling Rates
  - $100 to $120 per hour for the vehicle and driver
- Distance
  - Max economically-viable hauling cost for most HSW is equivalent to a one-hour, one-way transport
  - In DC metro area, 1 hour = <50 miles
- Final Disposition
  - Municipal WWTP
  - On-Farm Anaerobic Digesters
  - Incentive(s) needed to haul to Blue Plains
    - Competitive pricing

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Identifying and Interviewing HSW Generators

• Information gathered:
  - Quantity of HSW generated
  - HSW characteristics
  - Current handling practices
  - Willingness to participate in alternative program

• Promising HSW generators identified in the following industries:
  - Dairy processing
  - Sugar refinery
  - Snack foods
  - Meat processing
  - Airports *
  - Carbonated Beverage *

*within DC Water Service Area
Conclusions and Lessons Learned

- Major factors influencing participation in co-digestion program:
  - Ability to discharge grease trap wastes at Satellite Receiving Stations,
  - Influence of Local Surcharge Fees,
  - Current Hauled Waste Pricing Structure,
  - Regional Competition,
  - Availability of preferred HSW generators locally.
Ability to discharge GTW at Local Receiving Stations

- Large volume of GTW already hauled to AWTP or satellite stations
- GTW good for co-digestion, bad for collection system
- Potential Solutions:
  - Prohibit GTW at satellite receiving stations
  - Develop competitive rates for hauling directly to Blue Plains

A clogged sewer
A clogged artery
Influence of Local Surcharge Fee

- Surcharge significantly influence disposition of HSW
- HSW surcharge rates not established in DC Water service area despite regulations
- Important for realizing true cost to treat HSW
- Potential Solutions:
  - Complete comprehensive survey of service area HSW dischargers
  - Study results help dictate enforcement of a surcharge program
Hauled Waste Pricing Structure

- Hauled waste is a very competitive market!
- Pricing strategies for hauled should reflect:
  - Cost avoidance for removal in collection system
  - Value of the energy generated during co-digestion
  - Cost to treat HSW
- Municipalities surveyed in MD and VA, fees ranging from $0.02 to $0.10 per gallon.
Regional Competition

- Neighboring municipalities hauled waste fee structure
  - Develop regionally competitive pricing
- Neighboring municipalities HSW surcharge fees
  - Target certain areas
- Competition from non-municipal hauled waste programs
  - On-farm digesters
  - Animal feed
  - Fertilizer
Availability of Local HSW Generators

- Urbanized area minimizes manufacturing sector
- Many facilities identified in preliminary search determined to be offices/warehouses
Lessons Learned

- Co-digestion can be an effective way to utilize solids handling infrastructure
- Many factors can influence viability of program
  - Implementation of local surcharge program
  - Regional surcharge and hauled waste programs
  - Regional availability of “ideal” HSW
    - Can be difficult to find “decision maker”
  - Cost/benefits analysis to accept HSW for codigestion
  - Other competition unique to the region (and seasonality)
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