Food Waste Anaerobic Digestion Demonstration Program at the Joint Water Pollution Control Plant

Presented to:
Alternative Technology Advisory Subcommittee
Los Angeles County Solid Waste Management Committee
Integrated Waste Management Task Force

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October 17, 2013
Project Overview

- Background.
- Objectives.
- Summary of the demonstration program.
- Polices that are driving food waste anaerobic digestion (AD) in California.

- Project details...
  - Food waste (FW) processing at Waste Management
  - Processed FW delivery and receiving at JWPCP
  - Testing and anticipated results
Background

● Districts performed 2011-12 feasibility study on FW/biosolids co-digestion at Districts WWTPs.

● Conclusion: A project at JWPCP...
  – Is technically feasible (economics still a question)
  – Is allowed under current regulations
  – Could assist L.A. County cities/haulers with diversion efforts

● Bench scale testing of co-digesting WM FW slurry and Districts biosolids...
  – Characterized FW slurry (developed FW slurry specifications)
  – Quantified biogas production potential
  – Determined no negative impacts on digester operations
• Assist Districts member cities and haulers in diversion efforts.

• Determine the impacts of full-scale food waste co-digestion on WWTP operations.

• Evaluate the performance and cost-effectiveness of food waste co-digestion at a WWTP.

• Use project results to determine feasibility of a larger food waste digestion program at Districts wastewater treatment facilities.
WM’s Strategy

- Develop the Centralized Organic Recycle and Energy (CORe) program
- Provide an innovative solution to support Southern California’s jurisdictional organics recycling goals
- Minimize collection and conversion carbon footprint
  - Collect and process materials without leaving urban areas
  - Anaerobic digester captures >99% of methane emissions from organic waste conversion
  - Uses existing digesters – no need for additional infrastructure
Digesting Organic Waste Streams at WWTPs

- **Advantages:**
  - Digester already exists
  - Energy recovery equipment may already exist

- **Concerns and challenges:**
  - Limited capacity statewide – a niche, not a solution
  - Can accept only relatively clean feedstock
  - Impact of additional residuals on biosolids
  - WWTPs have an important public health mission
Project Summary

- The Districts and Waste Management entered into a 2-year demonstration program agreement.

- WM will process 84 tons per day of food waste slurry at an off-site location and deliver to JWPCP.

- AT JWPCP, the slurry will be injected into one digester for co-digestion at 9% food waste/91% plant solids.

- WM and JWPCP’s Research team will monitor the program to evaluate the impacts and performance of food waste digestion when co-digested at a WWTP.

- Results will be used to determine the feasibility of a full-scale food waste AD program at Districts WWTPs.
Policy Drivers

- AB 341 establishes a statewide solid waste recycling goal of 75% in 2020.

- Diversion of organic material from landfills will be target of new regulations.

- Where can the organic materials go?
  - Anaerobic digestion
  - Composting
  - Other conversion technologies
WM’s CORe Program

- WM collects food waste from sources such as restaurants, food processing plants, and grocery stores.

- Food waste is screened through WM’s CORe facility to remove contamination (such as utensils, packaging, bones) and blended into *Bioslurry*, a proprietary slurry similar in thickness to cooked oatmeal.

- Bioslurry will be loaded into tanker trucks at WM’s facility for delivery to JWPCP.
Food Waste Receiving at JWPCP

- Food waste will be pumped from WM tanker trucks into closed, sealed storage tanks, controlling odors.

- As new food waste slurry enters the sealed storage tanks, the displaced air is scrubbed through an odor control filter.

- Food waste slurry will be pumped from the storage tanks into the test digester.

- Test Digester #16; Control Digester #15 for baseline data.
Joint Water Pollution Control Plant

- 24 active digesters each with a capacity of 3.7 million gallons.
- 4.4 million gallons of biosolids are added to digesters each day.
- Biosolids breakdown (digest) for 18-19 days before exiting digester.
- 5,500 scfm (or ~ 22 MW) of biogas is created.
- Non-digestable solids are dewatered and trucked off for use in composting and land application.
Reciprocating Engine-Generators

JWPCP has been using digester gas for energy since 1938.
JWPCP Total Energy Facility

- Combined Cycle Cogeneration Power Plant

- (3) 9 MW Solar Mars T-13000 gas turbine generators

- (1) 3 MW DeLaval HJT steam turbine generator

- 22 MW used to meet on-site load
Testing and Results

- The testing program is scheduled for 2 years and is expected to start up in early 2014.
- FW slurry will be injected into one digester so that biogas production can be measured and the digestion process can be monitored.
- The result… Renewable energy created from digestion of 84 tons FW slurry could be used for:
  - digester heating ~200 scfm
  - or
  - vehicle fuel ~1,500 GGE
  - or
  - electricity generation ~800 kW
Thank you. Questions?

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