



Anaerobic Digestion in Maine

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MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

Protecting Maine's Air, Land and Water

The Statistics

- Over 96% of U.S. food waste goes to a landfill or an incinerator
- ~33 million tons landfilled annually in U.S.
- ~1.77 million tons of MSW generated in ME in 2011
- Food residuals constitute ~28% of MSW in Maine*

*Criner, G. & Blackmer, T. (2011). 2011 Maine Residential Waste Characterization Study Report



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DEP License Required?

- Facilities digesting only manure and agricultural wastes → No
- Facilities (including farms) digesting manure and residuals/solid waste from off-site → **Yes**
- WWTPs digesting own sludge → No
- Facilities digesting Type II (or Type III) from off-site → **Yes**



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Application Process

- Pre-application meeting with Department staff
- List of possible feedstocks
- Analytical data for Type II and Type III residuals
- Final disposition of digestate
 - Could require waste discharge license for liquid
 - Could require agronomic utilization license for solids



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Design and Operating Standards

- Design capacity – accommodate throughput
- Sampling and Analytical Work Plan for feedstocks and digestate
- Run-off, storm water and leachate control for 25-year, 24-hour storm
- Odor control
- Class A Pathogen and Vector Attraction Reduction may be required
- If digester is below grade, leak detection required



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Regulating Anaerobic Digesters

- Annual (at least) DEP inspection
- Annual reports
- Analytical requirements – feedstock dependent
 - Heavy metals
 - Salmonella or fecal coliform
 - Semi-Volatile Organic Compounds (SVOCs)
 - Volatile Organic Compounds (VOCs)



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Exeter AgriEnergy

- Colocated with Stonyvale Farm in Exeter, Maine
 - 1,000 milking cows
 - 150 dry cows
 - 800 young stock
- Licensed in July 2011, went online December 2011
 - \$2.9 million project
 - Two 396,000-gallon digesters
 - Mesophilic temperatures, 25-30 day retention time
 - One 1-MW biogas engine



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Exeter AgriEnergy (cont)

- Family business – Adam, John & Sarah Wintle
- Current feedstocks
 - On-farm manure (7 million gallons in 2013)
 - Food scraps from Hannaford, WalMart, Whole Foods
 - Some food scraps from Portland-area restaurants
 - Fats, oils, grease (FOG)
 - Glycerine
 - Total of 9,590 tons in 2013



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Exeter AgriEnergy (cont)

- Output in 2013
 - 7,100 MW-hrs sold to Bangor Hydro
 - 10,000 yds³ of dewatered digestate used as dairy bedding at Stonyvale Farm
 - 8 million gallons of liquid digestate spread per CAFO Nutrient Management Plan at Stonyvale Farm
- Expansion licensed in January 2014
 - Two additional 396,000-gallon digesters
 - Two additional 1-MW biogas engines



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Exeter AgriEnergy



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On the Horizon

- Lewiston-Auburn Water Pollution Control Authority
 - \$12 million upgrade to WWTP
 - Two digesters with total capacity of 1.38 million gallons
 - Two 230-KW engines
 - Went online in 2013
 - May add food scraps in the future



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On the Horizon (cont)

- Village Green – Brunswick, Maine
 - 850,000-gal AD accepting WWTP sludge, septage, FOG, food residuals
 - One 1-MW biogas engine
 - License should be issued in the next month or so
- Clinton AgriEnergy – Clinton, Maine
 - Colocated with Flood Brothers Farm in Clinton, Maine
 - Manure from 1,600 milking cows (3,900 total), FOG, food scraps
 - 5.86 MW output
 - Target date 2015-2016



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