

NE Digestion Roundtable

July 1, 2016

Presentations by

Mac Richardson, LAWPCA

Jim Jutras, Essex Junction WWTF



**First Friday each Quarter:
12:00 - 1:30 pm. Have lunch.**



October 7: Topic TBD

Dial:

712-832-8300

Enter code

344378 ("digest")

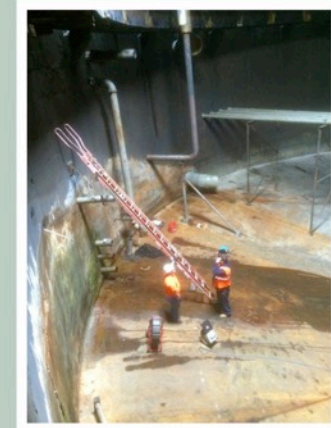
Go to url: <https://join.me/nebiosolids>

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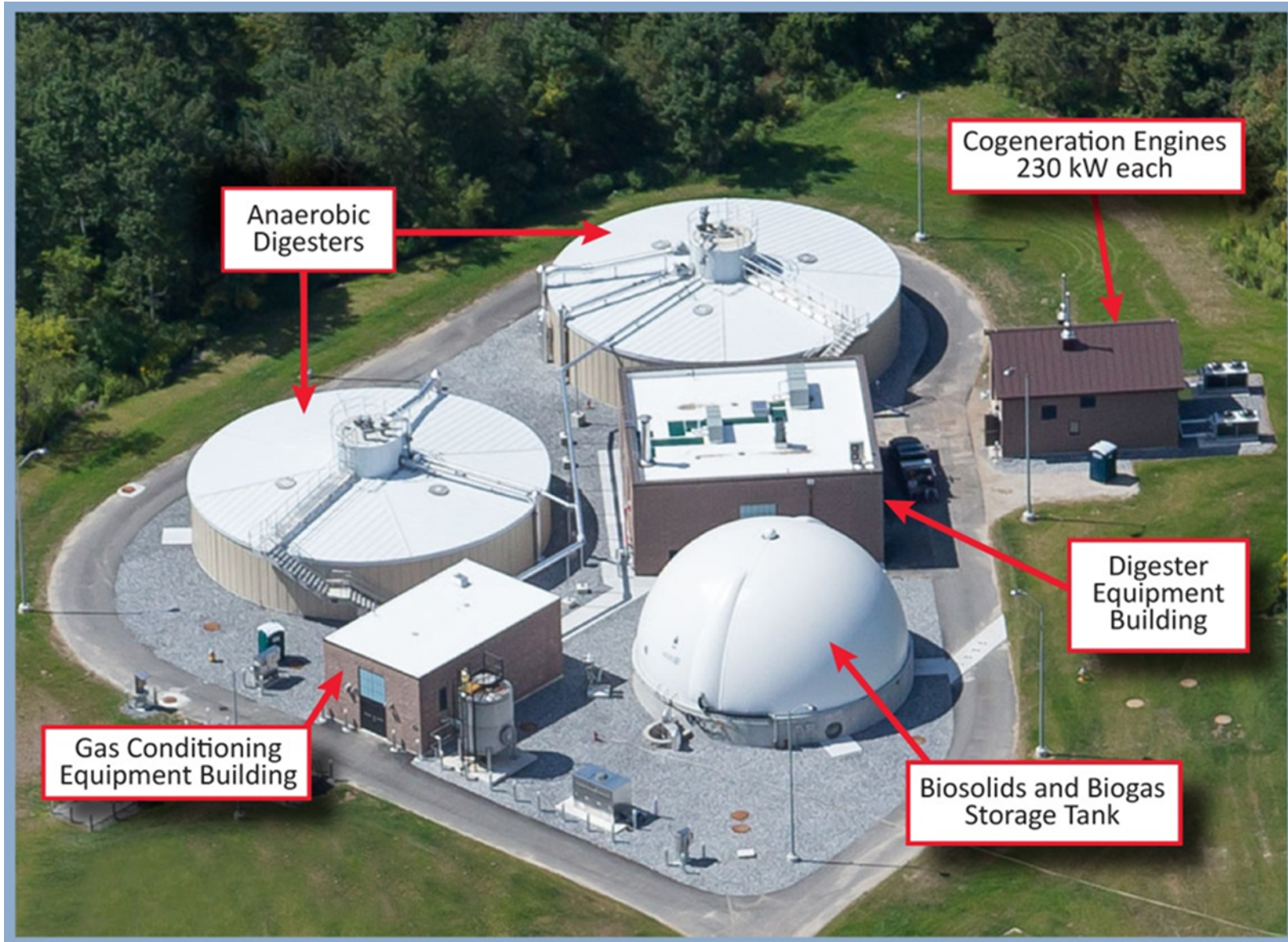
[www.nebiosolids.org/
ne-digestion-roundtable](http://www.nebiosolids.org/ne-digestion-roundtable)
603-323-7654
info@nebiosolids.org



Northeast Digestion Roundtable 2016

Quarterly webinars to share technical operations experiences & advance best practices regarding anaerobic digestion in this region.

Lewiston-Auburn WPCA



Basic System Stats

- Activated sludge TP 14 MGD(des)/10.5 (avg)
- Two primary mesophilic digesters 0.7 MG ea fixed covers, straight sidewalls rotomix system
- Digestate and biogas storage tank(168k gallons and 33K ft³)
- Two 230 kW Liebherr Co-generation engines
- H₂S removal –iron sponge, Siloxane removal (recent)
- Temporary feedstock receiving station.

Feedstocks: The Holy Gruel

- Gruel: A thin, easily digested soup
- Repurpose 15K gallon Septic Receiving Tank
- Strength and measuring gas potential
- Markets and Pricing
- Toxicity
- Plugging, contaminants, and handling issues
- Balancing Benefits, Expectations and Problems

What do we want in a feedstock?

- High energy potential ~ BTU, COD, BOD?
- Readily degradable low concentration of inerts and refractory compounds/materials
- Flowable, non clogging
- Steady, dependable supply
- Tipping Fee worthy material



Sure. A pretty Picture, but aren't we supposed to be using that gas?



Where is the Market?

- Rapid changes in an “immature” market
- What is disposal worth?
- What does alternate disposal cost?
- On what basis to charge for wastes (Strength, volume, hassle factor, whatever I can get?)
- LAWPCA settled on \$0.02 per gallon (never start with free!)

Foaming, Rapid Rise Digester Upset

- RR occurs at low (or no) mixing due to an increase in viscosity of the bulk solution
- As gas bubbles are trapped volume increases
- May have been thought of as “foaming” in past(Matthew Higgins, Bucknell University)
- Feed Rate for feedstocks vs base load



Normal Digestate Draw Off Point and Digestate Overflow

Problems!

- Digesters go Bad Quickly but Recover Slowly!
- Keeping Co-generation engines running – why accept feedstocks if you can't use the gas!
- “Grease” plugging lines and coating flow meters
- Keeping a steady feed rate to your digester.
- Pre-processing and removing contaminants—especially plastics.

Village of Essex Jct. VT



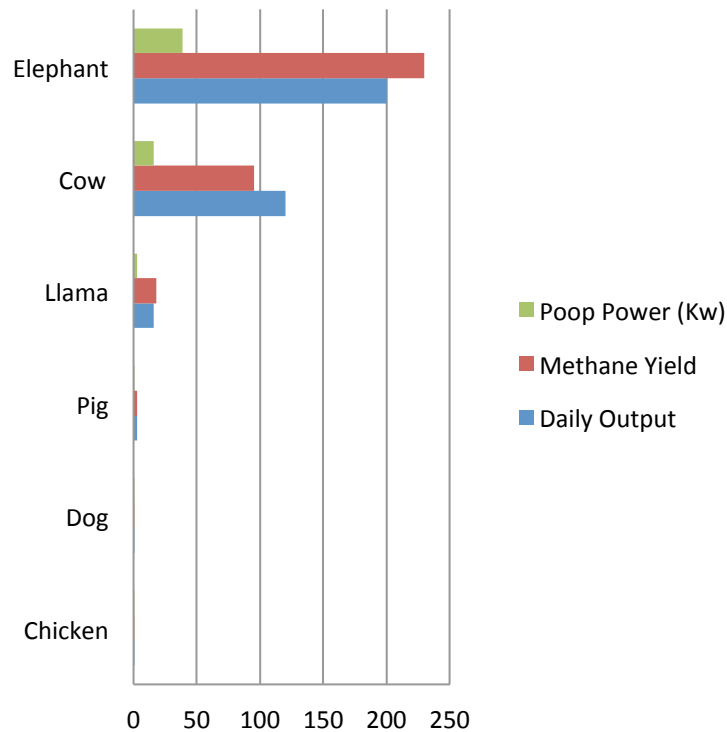
Basic System Stats

- Advanced Activated Sludge TP 3.3 MGD(des)/1.8 MGD(avg)
- One primary mesophilic digester 0.35 MG fixed covers, straight sidewalls gas cannon mix system
- Seasonal N removal, Total P limit 0.8 mg/L soon to be 0.2 mg/L
- One secondary digester 0.35 MG Spiral floating cover/gas holding cover
- Digester Biosolids to 2 x 1 MG Storage Tanks
- Supernatant/decant to the process
- One 150kW 2G Man Co-Generation engine
- NO H₂S removal needed
- Siloxane removal
- Primary Clarifier feedstock receiving station.. High Strength receiving under construction by staff.

What do we want in a feed stock?

(Popular Science October, 2008)

DAILY OUTPUT!



Feedstock

- High Strength Waste Suited to digestion rather than Processing by Conventional Act. Sludge
- Readily degradable High in BOD/COD, 2% to 5% digestible solids OR Hi Strength with no solids
- Steady, dependable supply
- Conformance with Septic Receiving Policy
- Volume suitable for Surplus Capacity in Digester

Where is the Market?

- Take it to Essex!
- Potential Process impacts
 - Hydraulic Overload impacting performance
 - Increased supernatant for reprocessing
- Charge for wastes by handling class. Included hassle factor
- Essex Jct:
 - \$0.095 Septage -\$0.120 FOG
 - \$0.020 Graywater
 - \$0.035 Direct Digestion with regular evaluation

[Basis is Wholesale Treatment Rate plus Mark up. Treatment uses surplus capacity paid for by others]

One Man's Waste.....

sevendaysvt.com, bidnesstc.com, food.ninemens.com



**MADRIVER
DISTILLERS**





Friendly Competition
OUR CUSTOMERS
supporting programs
VT is a small state!
CSWD.net, Greenmountainpower.com

Feed Points



Old/New

Capstone

2G



2G CHP



Maintenance Items



Process Control

Process upsets

- Upsets are communication by the Bugs!
- Foaming Rapid Rise as discussed by Mac
 - As gas bubbles are trapped volume increases
 - May have been thought of as “foaming” in past(Matthew Higgins, Bucknell University)
- Process Control Feed Rate for feedstocks vs base load
 - “Our Mission is to service those connected”
- VS reduction: Loss of Class A/B Certification.
- Adjustments: Slow and Steady, Trend data

Digester Rapid Recovery



**NEBRA is a resource for you.
Support it.**

Ned Beecher

ned.beecher@nebiosolids.org

603-323-7654

