GREATER LAWRENCE SANITARY DISTRICT
ORGANICS TO ENERGY PROJECT
The Next Step Towards Net Zero Operation

Wastewater Advisory Committee to the MWRA
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BACKGROUND

- Established by Massachusetts Legislation in 1968
- Operational Since April 1977
- Governed by a Board of Commissioners
- Second largest WWTP in Massachusetts (52 mgd average / 135 mgd peak design)
- Interceptors
  - 9 Miles
  - 24” through 108”
- Riverside Pump Station
  - 2 - 800 HP pumps
  - 2 - 1,250 HP pumps
Massachusetts Organic Waste Disposal Ban

- Effective October 1, 2014 – Producers of >1 ton of food waste per week banned from landfills or incinerators
- Impacts hotels, restaurants, universities, hospitals, supermarkets, food processors and wholesalers
- MassDEP estimates 350,000 tons of organic waste will be diverted from landfills yearly
- GLSD will be utilizing 40% of this volume
Limited New England Digestion Facilities

- Acceptable outlets include digestion facilities
- GLSD is one of only six in Massachusetts
- Second largest digestion facility in Massachusetts
- Other Farm Based Digesters are available

- 11,000 Square Foot Building
- Two Thermal Drying/Pelletization Trains
- Design Capacity = 38 Dry Tons per Day
- On-site Product Storage/Removal by Truck
The 10-Year Report Card: Product Beneficial Use

• 100% of GLSD Biosolids to Beneficial Use
• Originally, Land Applied in Florida
• Currently, Land Applied in Massachusetts
• Distribution Managed by Casella Organics
ORGANIC WASTE RECEIVING TANKS AND PUMP STATION

- Organic (SSO) Tanks
  - Two Separate Tanks
  - 119,000 gallons each
  - 35’ x 35’ x 13’

- Organic Waste Transfer Pumps
  - 2 per tank
  - 10 horsepower
  - 50 gallons per minute

- Organic Waste Mix Pumps
  - 2 per tank
  - 25 horsepower
  - 1,500 gallons per minute
Biogas Conveyance and Treatment

- Fixed media (iron sponge) for hydrogen sulfide treatment
- Carbon media for siloxane treatment
- Expanded gas conveyance capacity
- New flare for increased capacity
Pilot Program Biogas Production
Pilot Program Biogas Production (through 4/28/18)

- Began Receiving SSO on 2/1/17
- Feeding Schedule
  - 5,000 gpd up to 28,000 gpd
  - Mixing SSO with primary and secondary sludge
- Monitoring these parameters for stability of the digesters
  - Volatile solids loading rate
  - COD loading rate
  - Specific energy loading rate
  - Total Dissolved Solids
  - COD
  - Sulfate
  - Ammonia and Phosphorus
  - Alkalinity and pH
  - Potential Rapid Rise and Foam Generation
  - Biogas Quality and Quantity
The Next Step Towards Net Zero Operation at GLSD

- One of two Caterpillar 1.6 MW CoGen engines during factory testing
CHP Engine Emissions Control

- Oxidation Catalyst (OC) technology to remove volatile organics carbons and carbon monoxide
- Selective Catalytic Reduction (SCR) technology to remove nitrogen oxides
- Best Available Control Technology (BACT) as determined by MassDEP
CLEAN ENERGY FOR OUR KIDS FUTURE