Utilizing Excess Capacity

Is it right for your facility?
What is Excess Capacity?

- Facility planning is usually for 20 year growth

- How much extra capacity do you have?
  - Hydraulic loading
  - Organic loading
    - Solid and Liquid

- How much are you willing to rent out?
Take Advantage of Current Infrastructure

- Fine Screens
  - Some wastes have foreign debris
- Flow Equalization
  - Metering in waste is always best
- Digestion
  - Anaerobic > Aerobic
- Biogas Utilization
  - Increased gas production
- Biological Nutrient Removal
  - Extra carbon and a good source of VFA’s
What is locally available
  ◦ Septage, Holding Tank, Leachate, Others?

Waste Haulers prefer WWTP’s
  ◦ Easier paperwork
  ◦ No liming needed
  ◦ No Trash clean up
  ◦ No environmental factors
Do your Homework

- Analytical Data for each waste
- Truck Routes in your municipality
- Utilize your capacity efficiently
- Check for competition from other facilities
How do you implement it?

- Develop a business plan
  - Lab data, tipping fees
- Get your governing body to agree to it
  - Discuss decisions with your board/commission
- Start small with trustworthy haulers
- Do a few weeks trial with reputable haulers
- Revisit plan regularly
Program Oversight

- How are records kept?
- Who does the billing paperwork?
- How do you set your fees? Full trucks/honor system/ key card system/administrative or laboratory fees
- Calculate fees, adjust to be competitive, choose wisely
### Record Keeping

**City of Stevens Point**

**Wastewater Treatment Facility**

**Hauled Waste Load Summary**

<table>
<thead>
<tr>
<th>Type of Waste</th>
<th>Time</th>
<th>Volume</th>
<th>Sample bottle #</th>
<th>Signature</th>
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<tbody>
<tr>
<td>Septic Tank</td>
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**Lab use only:**

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>BOD (20x Dilution, 10 ml of sample diluted up to 200ml)</th>
<th>TSS (5 ml sample on large pad)</th>
<th>COD</th>
<th>pH</th>
<th>Phos</th>
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Obstacles

- Heavy truck traffic
  - Possible complaints from residents
- Odors
  - Possible complaints from neighbors
- Foreign Debris
  - Can cause operational issues
- More variable waste stream
  - Harder to diagnose activated sludge problems
Opportunities

- **Tipping fees**
  - Utilize Economies of Scale for higher profit/gallon

- **Synergistic effects**
  - The added waste can help your facility
    - Nutrients, stability of loading

- **Increased Biogas production**
  - Utilize the biogas for heat or power

- **Environmentally friendly**
  - WWTPs aren’t looking to make a profit
Stevens Point WWTP Case Study

- **Plant Details**
  - 4.55 MGD (design)
    - 2.86 MGD (2016 average)
  - EBPR
    - A/O with RAS Denite
  - Anaerobic Digestion
    - Mesophilic (735,000 gal)
- **Service Area**
  - 27,000 Population
  - BOD Population Equivalent of 54,000
Motivating Factors

- Even out loadings
- Stabilize Bio–P process
- Increased biogas production
- Tipping Fee Revenue
- Best way as a region to handle the material
Digester Loadings 2008 – 2011

Annual Average Lbs VS/day

Recommended 80 Lbs VS/ kft³/day
Plant Loadings 2008 - 2011

- Daily Average
- Monthly Max Average
- Design loading BOD
- 90% Design BOD
2012 Start of Hauled waste program

- Capacity Re-rate
  - Converted secondary digester to a primary digester
    - 428,000 gallons to 735,000 gallons (Mesophilic)
    - 8,196 lbs BOD/day to 10,400 lbs BOD/day

- Biogas Utilization Project
  - 180 KW biogas powered CHP

- Multiuse areas scum box/grit pad
Digester Upgrade/Biogas Utilization
Multi-purposing Equipment
Treating Waste Efficiently

- Plant Loadings vs Digester Feed
  - Digester feed > 25,000 mg/L BOD
    - Septage = 7,800 mg/L BOD
    - Holding = 3,700 mg/L BOD
    - Leachate = 250 – 3,500 mg/L BOD
    - HSW = 57,000 mg/L BOD
    - FOG = 4,000 – 60,000 mg/L BOD
Digester Loading 2008–2014

Recommended 100 Lbs VS/kft³/ day

Annual Average Lbs VS/day
Growing Pains
Too Much of a Good Thing
2014 Brewery HSW project
Digester loadings 2008 – 2017

- **Recommended 100 lbs VS/kft³/day**
- **Annual Average Lbs VS/day**
Revisiting Our Plan

- Slug loading was causing loading rates in excess of 140 lbs VS/kft³/day
- Digester Hydraulic Detention time was dipping below 20 days (boilers reached maximum capacity at 17 days)
- HSW EQ tank stabilized loading
- FOG eliminated to increase detention time.
Learning Opportunities

Micrographs courtesy of MacDonald Environmental Services
Revisiting Our Plan

- 2014 Brewery HSW project
  - Removed over 500 lbs BOD/day

- 2016 Increased tipping fees
  - Increased septage fees by 36%
  - Increased holding tank fees by 86%
    - loadings changed less than 1%

- May 2017 limited haulers to single load/day
  - More allowed with permission
Plant Loadings 2008 – 2017

- Daily Average
- Monthly Max Average
- Design loading BOD
- 90% Design BOD
Received Wastes in 2017

- **Septage**
  - 4628 gallons/day
  - 280 lbs BOD/day
  - 396 lbs TSS/day

- **Holding**
  - 5288 gallons/day
  - 112 lbs BOD/day
  - 173 lbs TSS/day

- **High Strength**
  - 8415 gallons/day
  - 5085 lbs BOD/day
  - 3506 lbs TSS/day
Annual Financial Breakdown

- Leachate
- Holding
- Septage
- Digester Feed
Monthly kWh Usage 2008 – 2017

Average Monthly kWh Used

Average Monthly kWh Purchased
Meeting Goals

- Even out loadings
- Stabilize Bio–P process
- Increased biogas production
  - $50,000 \text{ ft}^3/\text{day}$ to $110,000 \text{ ft}^3/\text{day}$
- Tipping Fee Revenue
  - Estimate for 2017 = 7% of our Annual WWTP Budget
- Best way as a region to handle the material
Thank you

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