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WWTP Projects Build on Previous Work and Deliver Value and Cost Benefits

City of Chippewa Falls, WI

WWTP Needs

1. Biosolids (Sludge) Dewatering
2. Influent Screening & Hauled Waste Receiving
3. Biogas Reuse-Cogeneration
4. User Charge System Update
5. Funding – Grants and Low Interest Loans

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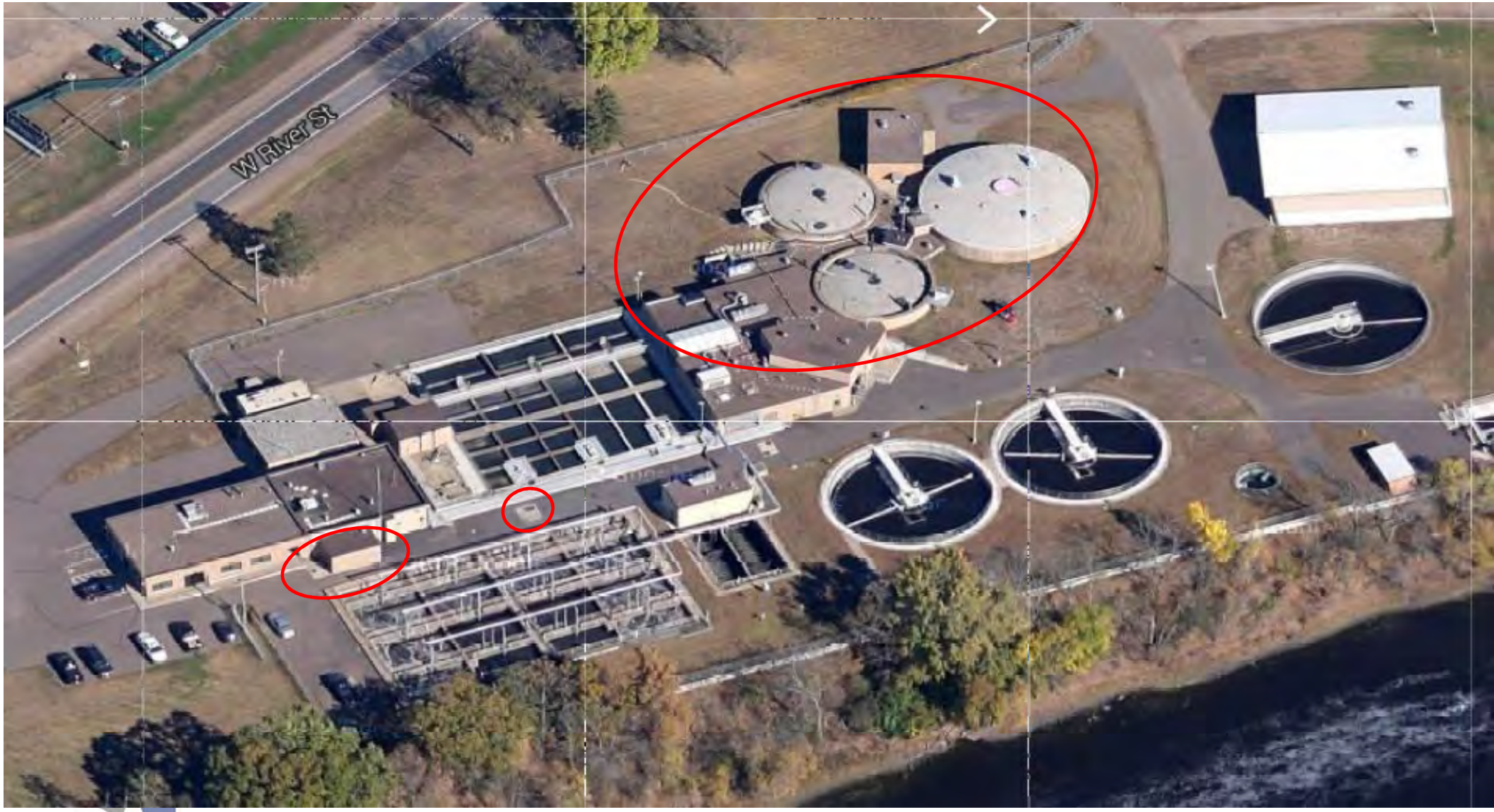

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Sludge Dewatering Project

- Sludge (Biosolids) are land applied as fertilizer
- Biosolids must be stored over the winter
- Existing equipment needs upgrading or replacement
- Planning report compared
  - Upgrading existing
  - Replacing with like equipment
  - Replacing with improved technology
- Replacing with new technology had lowest long-term costs

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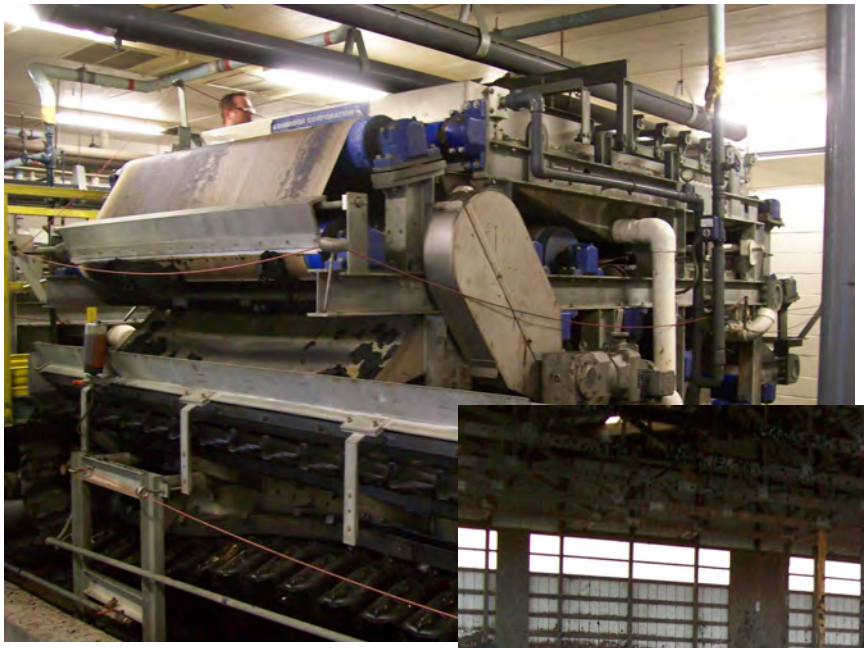
Sludge Dewatering Project



Existing Belt Filter Press (Dewatering Equipment)

Biosolids don't stack very well

Need more storage or drier biosolids

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Sludge Dewatering Project

Centrifuge Technology Will Produce Drier Biosolids)

Screening & Septage Receiving

- Influent screen is very old – well beyond normal life
- Screen openings are large – inefficient at protecting WWTP
- Bypassing screen is labor intensive and puts staff in potentially dangerous situation
- Septage and hauled wastes can provide significant revenue
- Need to provide an efficient drop-off facility to increase business
- Need to charge fairly; shouldn't continue to work on the "honor system"
- This planning project will address both screening and septage receiving

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Screening Facilities

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Screening Facilities

Material gets caught on top of screen

Screenings are not compacted, or dry.

Screening Facilities

Screen Structure is 30 Years Old;
Metal is Failing

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Septage and Hauled Waste Receiving

Septage and Hauled Waste Receiving

- Trucks cannot efficiently drop material off
- No storage at WWTP to protect plant
- No metering or auto-monitoring of wastes brought in
- Honor system – equitable?
- Zero interest financing available for these projects

Biogas Reuse – Cogeneration and Codigestion

- Existing microturbines have failed or are failing; normal life is only about 10 years
- Gas conditioning system is becoming more difficult to maintain
  - Media life has decreased
  - Equipment is becoming obsolete – expensive to custom build parts
  - Requires special electrical/HVAC rating (explosion potential)
- Can potentially increase gas production by bringing in high-strength wastes
- Could make more electricity
- Some grant funding is available on a case-by-case basis.

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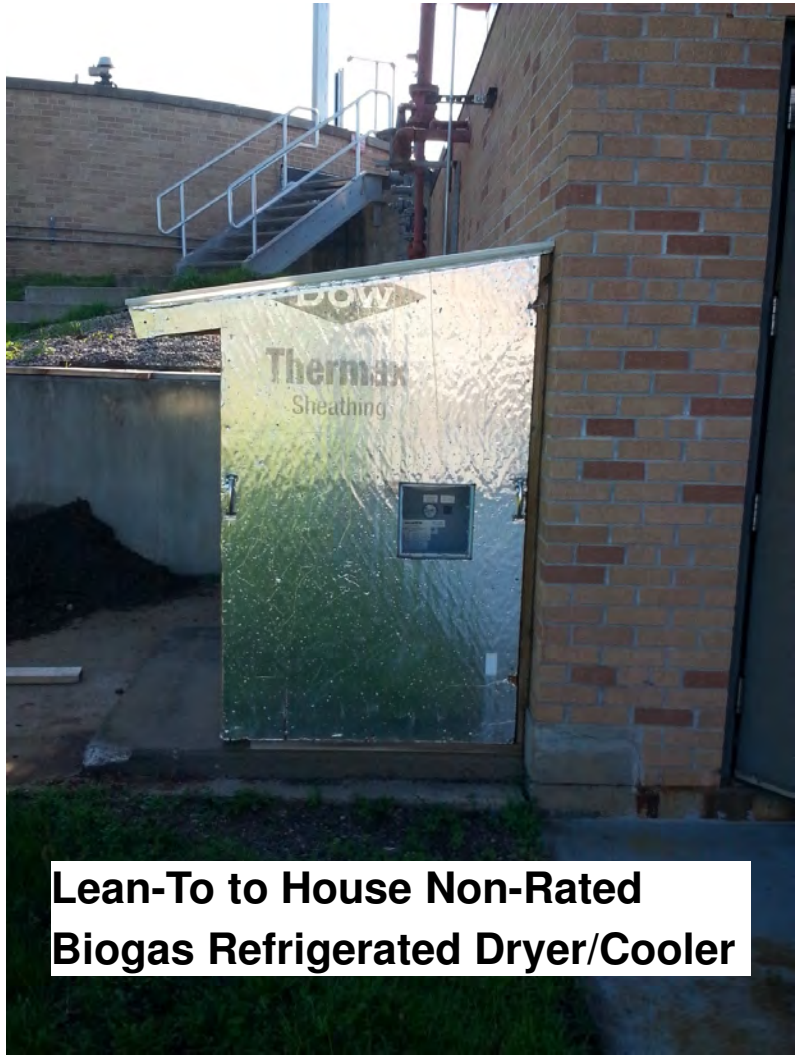
Biogas Reuse – Biogas Conditioning Equipment Requires Updates

Compressor (obsolete) and Conditioning Equipment



Lean-To to House Non-Rated Biogas Refrigerated Dryer/Cooler

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Biogas Reuse – Existing Microturbines Need Replacement

Biogas Reuse Will Look at Multiple Technologies

Microturbines

Engine Generator

CNG Compressing & Fueling

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Biogas Reuse - Codigestion

- High-Strength Industrial Wastes
  - Cheese/dairy plants
  - Beverage and bottling plants
  - Food plants
- Fats, Oils, and Grease (FOG)
  - Grease traps
- Glycerin - biodiesel plants

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Codigestion Benefits

- **Tipping Fees ~ $0.00 - $0.10/gal**
- **Higher biogas production**
- **Potential for COGEN at smaller plants (and larger plants)**

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Codigestion - How Much Gas?

Example:

Volume:	**5,000 gal/day**
COD:	**200,000 mg/L**
COD Load:	**8,340 lbs/day**
COD Removed (80%):	**6,700 lbs/day**
Methane (CH_4):	**37,520 ft^3/day**
Biogas (@ 60% CH_4):	**62,500 ft^3/day**

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Fond du Lac, WI – High-Strength Waste Receiving

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Dubuque, IA

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Project Engineering Budget

Dewatering Project - Design	$80,000
Screening/Septage - Planning	$20,000
Biogas-Cogeneration - Planning	$18,000
User Charge System Update	$8,000
Funding – Low Int. Loans and Grants	$20,000
Total	$146,000
Total if All Done Together	$141,000

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Project Schedule

Start Dewatering Design	June 2014
Start Planning Projects	June 2014*
Complete Design	Fall 2014
Bid/Award Projects	Late Fall 2014
Submit Loan/Grant Appl.	Winter 2014/15
Complete Construction	Late 2015/Early 2016**

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