Pretreatment Digester Benefits City's WWTP Upgrades

Kraft Foods

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Biocycle Renewable Energy from Organics Recycling Conference

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City of Beaver Dam

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Agenda

- Background
  - Beaver Dam WWTP
  - Kraft Foods
- Challenges
- Project timeline
- Benefits of combined treatment

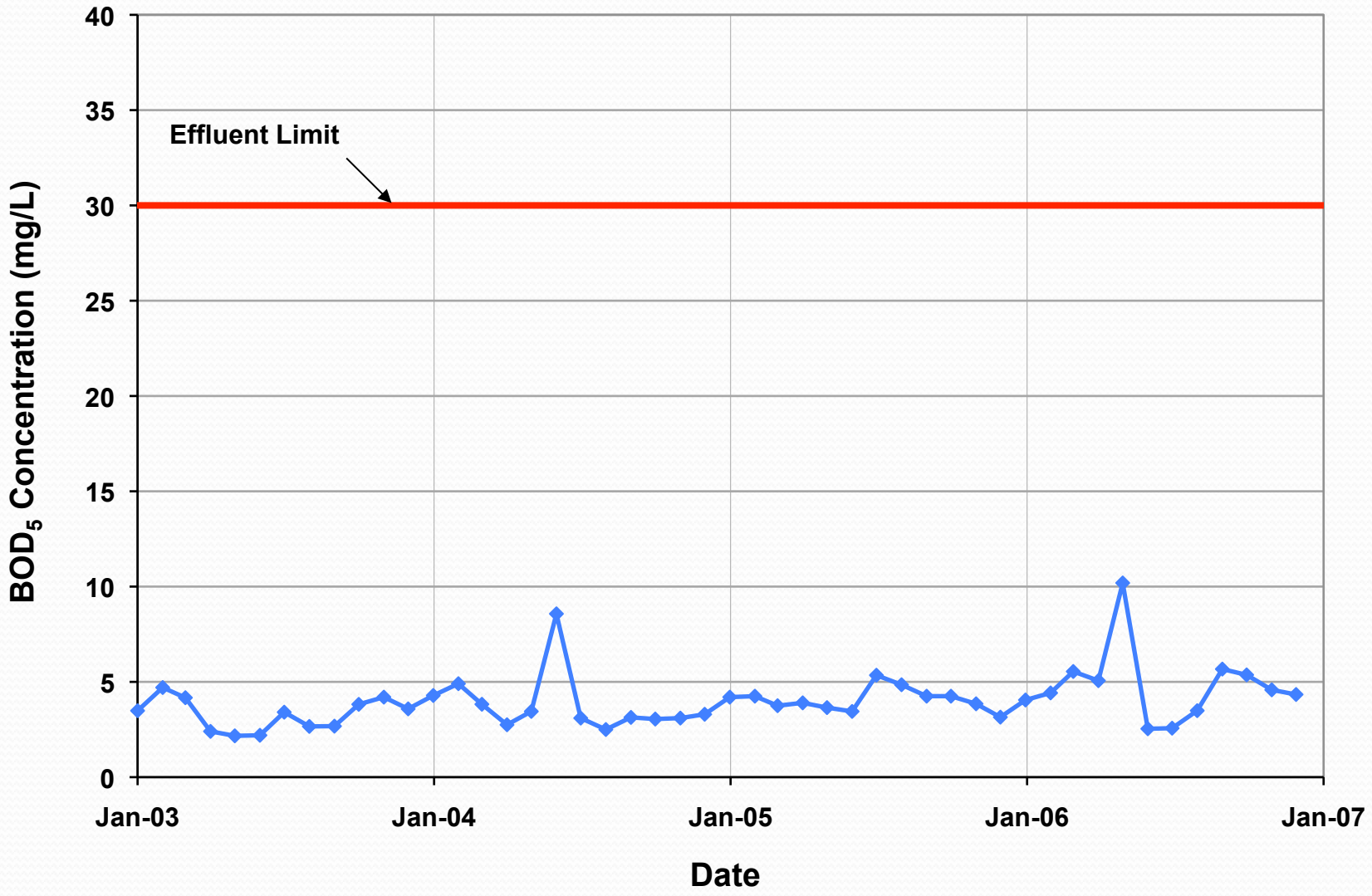
Beaver Dam WWTP

Beaver Dam, Wisconsin

- Plant History
  - 1934 – First plant on site
  - 1940, 1950, 1968 upgrades
    - Trickling filters
    - 4.35 mgd
  - 1985 – Activated sludge
    - 3.5 mgd

- Well maintained, with equipment replacements as needed
- Excellent operation and performance

Average Monthly Effluent BOD_5



Challenges at the Beaver Dam WWTP

- DNR proposed more stringent effluent limits
- Plant was beyond its 20-year design life
- Plant was at 140% to 170% of its design capacity
  - Kraft process wastewater was 25% of total organic load

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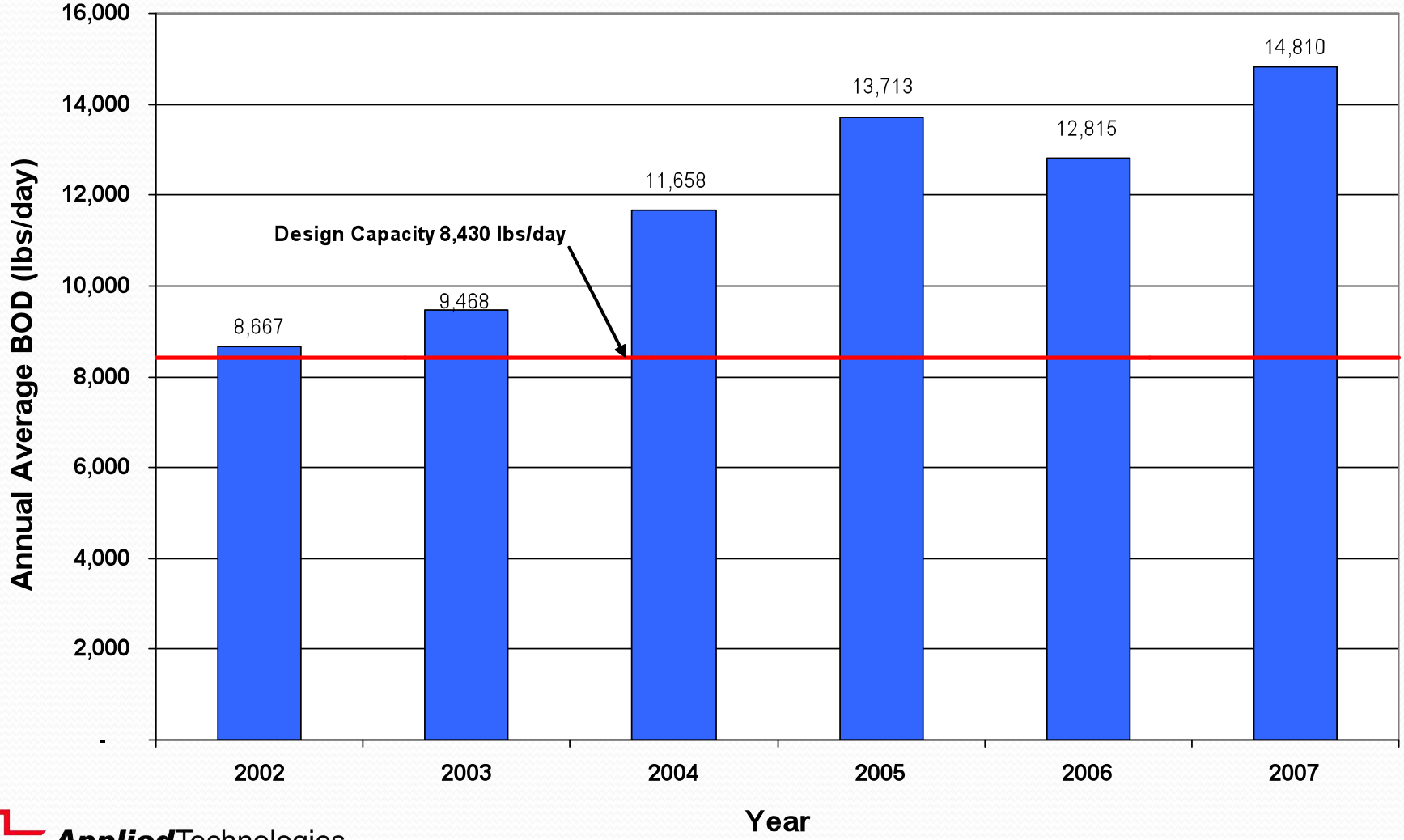
Existing WWTP BOD_5



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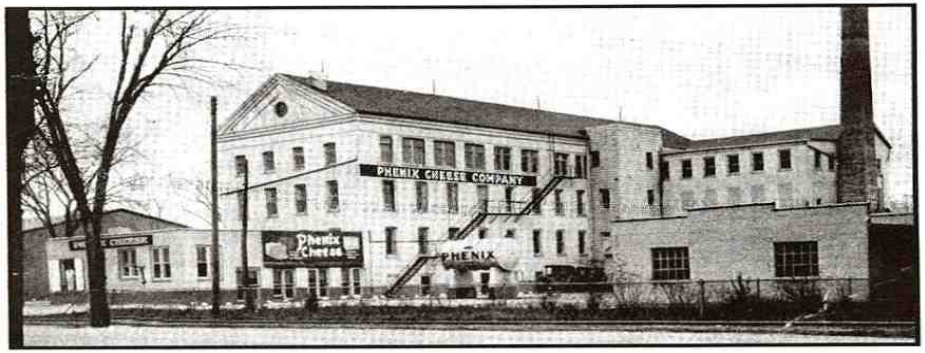
Kraft Foods in Beaver Dam

- 1867 – Upper Woolen Mill builds factory on site
- 1922 – Phenix Cheese purchases the factory to make Philadelphia Cream Cheese
- 1928 – Kraft purchases Phenix Cheese
- Currently produces 160-180 million pounds of cream cheese per year



Kraft's Challenges

- Increasing fuel costs for landspreading whey permeate
- Wisconsin DNR was becoming more restrictive on land application of food processing wastes
- Desire to eliminate land application of whey permeate and high strength wastewater at Beaver Dam
- Limited site space
- Sustainability is a major initiative
  - Biogas generation is a renewable resource

Project Timeline

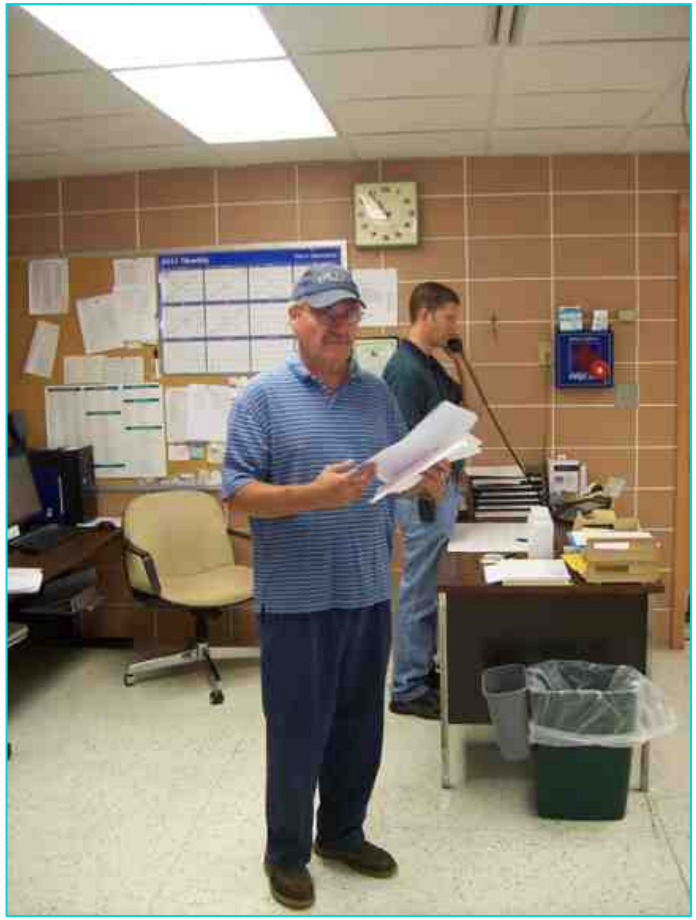
- 2006 – Beaver Dam WWTP began Facilities Plan
- 2007 – Kraft evaluates proposals for D/B anaerobic systems to produce biogas and burn it in its boilers
- September 2007 – Facilities Plan submitted to DNR
- November 2007 – DNR issues preliminary approval to upgrade and expand WWTP
- December 2007 – City approaches Kraft to construct a City-owned anaerobic pretreatment system

Project Timeline cont.

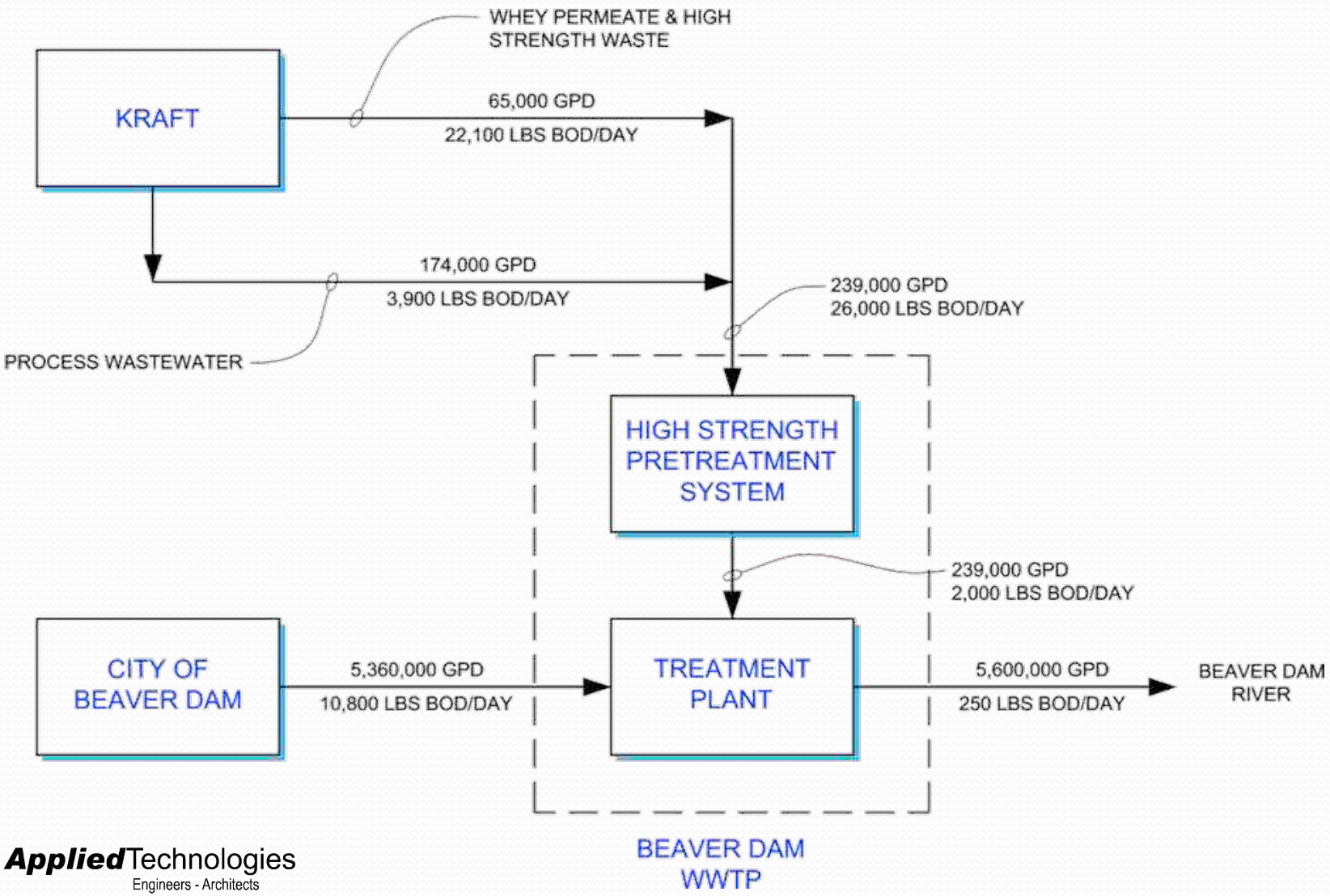
- May 2008 – Kraft sends the City a Letter of Intent
- July - August 2008 – Kraft sampling program
- January - March 2009 – Pilot testing
- May - July 2009 – Design
- August - Sept 2009 – Bidding
- Oct 2009 - June 2011 – Construction
- March 2011- July 2011 – Start-up

Benefits of Combined Treatment

- Eliminates land application of high strength whey
- Reduces concerns for odors in downtown Beaver Dam
- Operational labor savings for combined system
- Reduces process wasteloads from Kraft at the WWTP



Average Annual Design Loadings



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Benefits of Combined Treatment cont.

- Utilizes City's wastewater and biogas handling expertise
- Generates biogas to supply twice the power used by the WWTP
- Overall cost reduction

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Impact on Sewer Rates

- Total project cost: $20 million
- Stimulus grant (50%): $10 million
- Kraft pays $0.0209/gal for high strength waste plus normal City user charges for process wastewater
- Average residential quarterly sewer bill
  - 1985-1996 - $41
  - 1997-2009 - $37
  - 2007 Facilities Plan projection - $50
  - 2010 Sewer user charge - $39
  - 2010 Statewide average - $93 (Beaver Dam 5th lowest)

Additional WWTP Revenue Sources

- Whey Permeate: $495,000/year
- Bioenergy Production: $488,000/year
- Hauled-in Waste: $200,000/year

Questions?

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