

# Wastewater Treatment City of Rogers

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# Company Overview



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[www.mntap.umn.edu](http://www.mntap.umn.edu)



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Oxidation  
Ditch

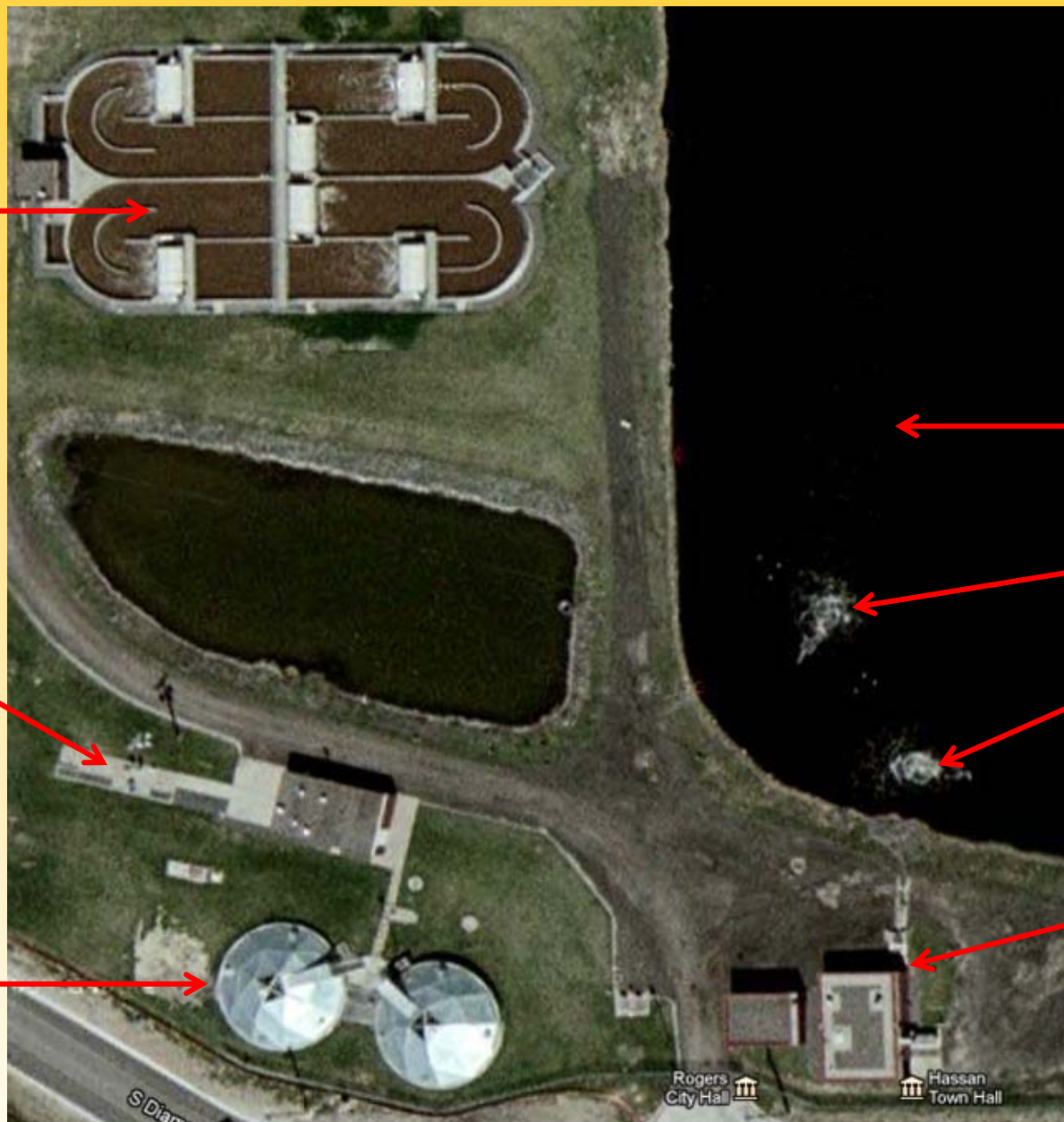
UV  
Disinfection

Solids  
Settling

Sludge  
Storage  
Pond

Floating  
Aerators

Influent and  
Filtering



# Goals & Motivations for Change

- Energy reduction and cost savings
- New technology for energy efficiency
- Identical process since 1996
- \$60,000/yr. on energy
- \$50,000/yr. on chemicals

# Approach



# Determining Inefficient Processes

- 50-60% of energy use from oxidation ditches
- Electrical controls
- Motor efficiency
  - NEMA Premium





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# Oxidation Ditches

- Problem – Over aeration
- Solution – VFDs and DO control
  - \$94,000 Capital Cost
  - \$75,000 with Xcel Energy rebates
- Savings – 3 year 9 month payback
  - 230,000 kWh/year
  - \$15,000/year

# Additional Ditch Projects

- Supplemental Mixers
  - No Energy Savings
- Biological Nitrogen removal
  - Savings – \$3,500/yr.
  - Capital Cost \$53,000

# Floating Pond Aerator

- Problem – Dying Inefficient Equipment
- Solution – NEMA Super Premium
  - \$14,900 Capital Cost
  - \$13,340 with Xcel Energy rebates
- Savings – 8 year payback
  - 28,000 kWh/year
  - \$1,700/year



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# Phosphorus Removal

- Problem – High Chemical Use
- Solution – BioP
  - \$750,000 Capital Cost
- Savings – 18.7 year payback
  - 250,000 lbs. chemicals
  - \$40,000

# Recommended Process Changes

- DO Control with VFDs
- Process Optimization
- Motor Replacement
- High Efficiency Floating Pond Aerator



# Personal Benefits



# Summary

Waste reduction option	Change Type	Waste Reduced (per year)	Cost	Cost Savings	Payback Period	Status
Process Optimization – No Capital	Procedure	13,000 kWh	NA	\$800	NA	Recommended
Oxidation Ditch Motor Replacement	Equipment	20,000 kWh	\$8,592	\$1,200	7.2	Recommended
Variable Frequency Drives	Equipment	230,000 kWh	\$75,000	\$15,000	5.0	Recommended
Floating Pond Aerator	Equipment	28,000 kWh	\$13,340	\$1,700	7.8	Implementation Scheduled for Sep '11
Biological Phosphorus Removal	Equipment Procedure	250,000 lbs.	\$750,000	\$40,000	18.8	Not Recommended

# Questions

