

# City of Oconomowoc Sustainable Energy Saving Design

2012 WWOA Annual Conference

October 10, 2012

Presented by:

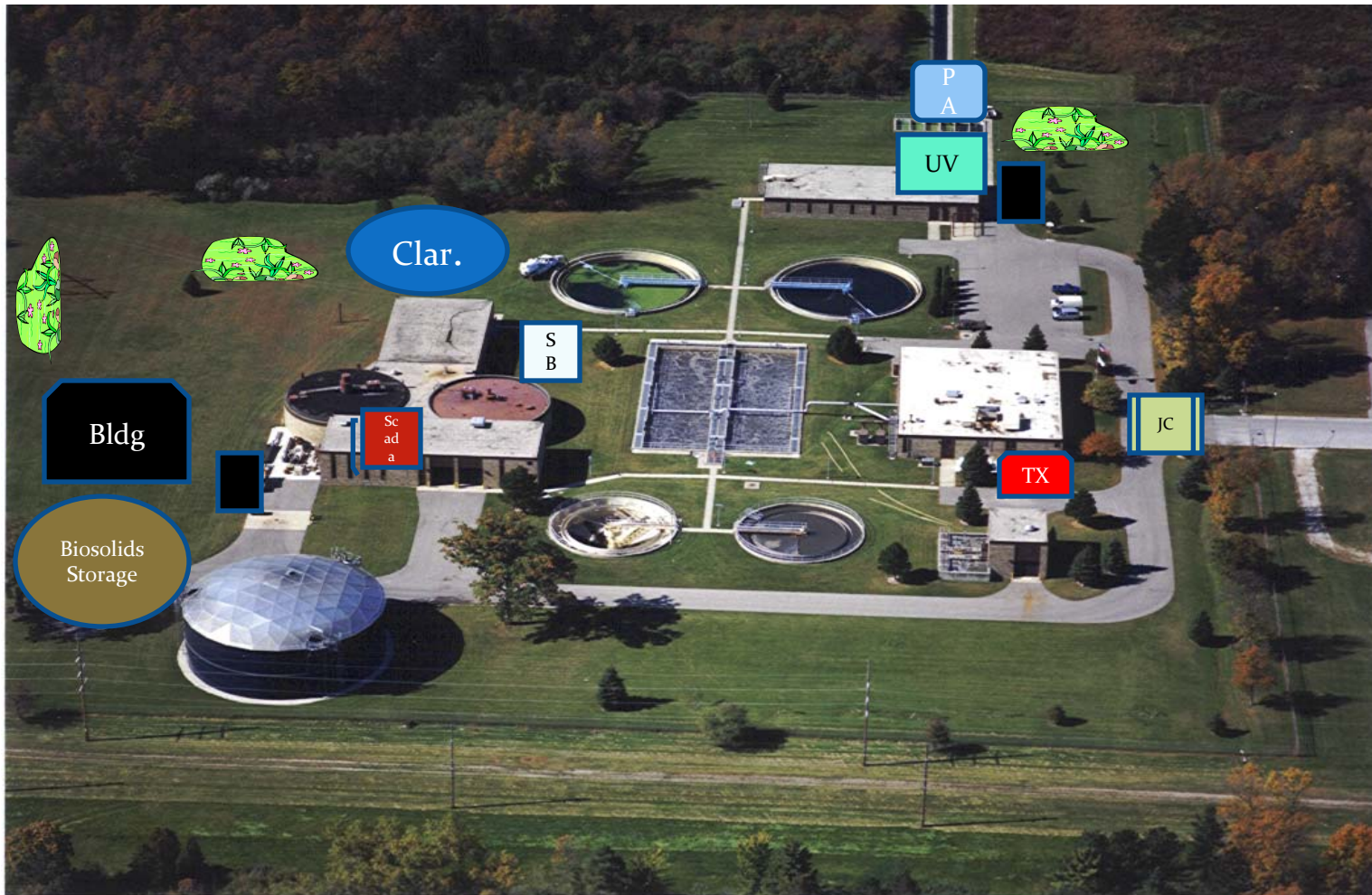
Ken Sedmak, Donohue & Associates

Tom Steinbach, City of Oconomowoc



# Oconomowoc Wastewater Treatment Facility Facility Upgrade Project

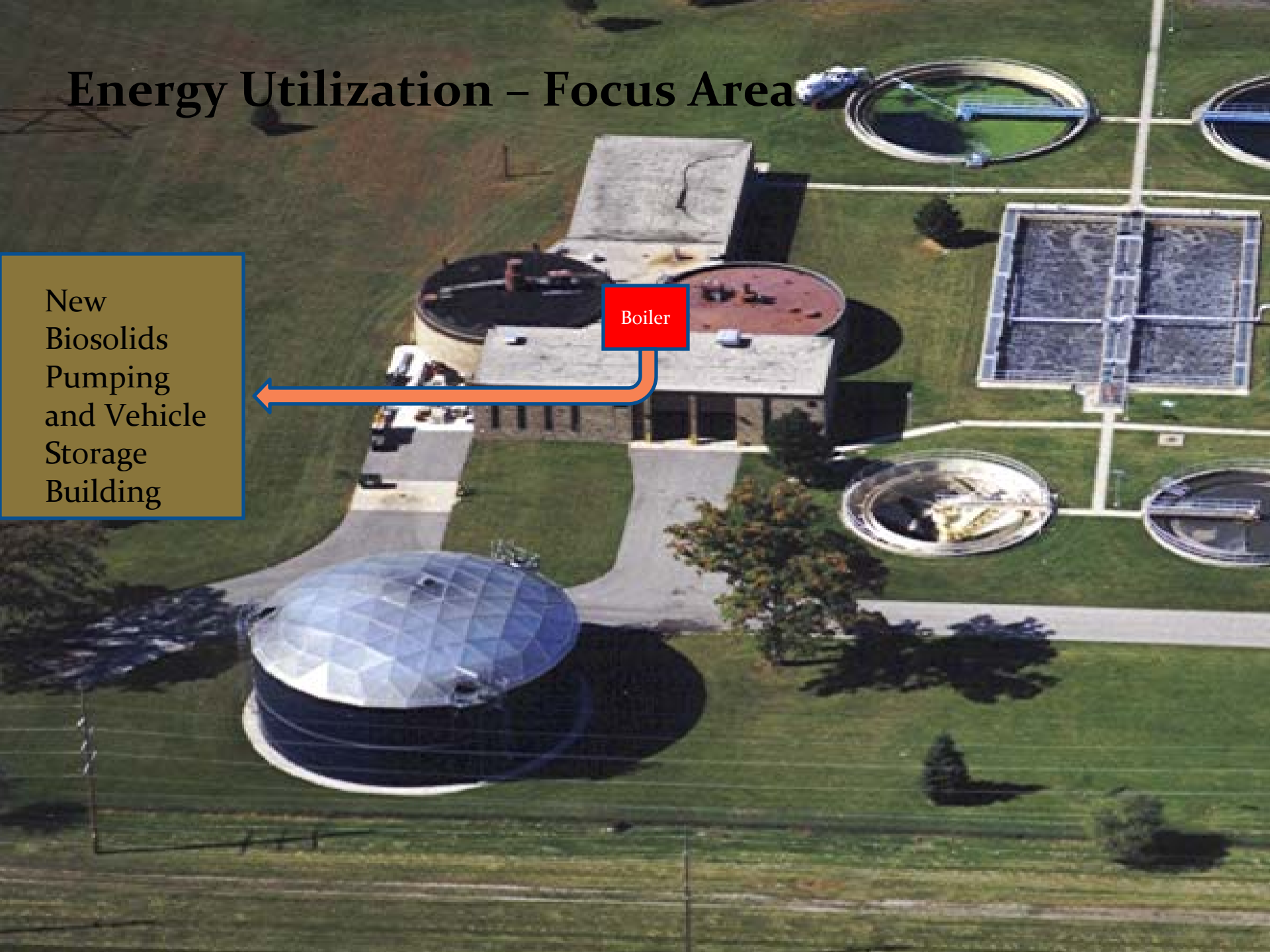
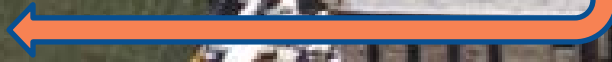
2011 – 2012



# Energy Utilization – Focus Area

New  
Biosolids  
Pumping  
and Vehicle  
Storage  
Building

Boiler

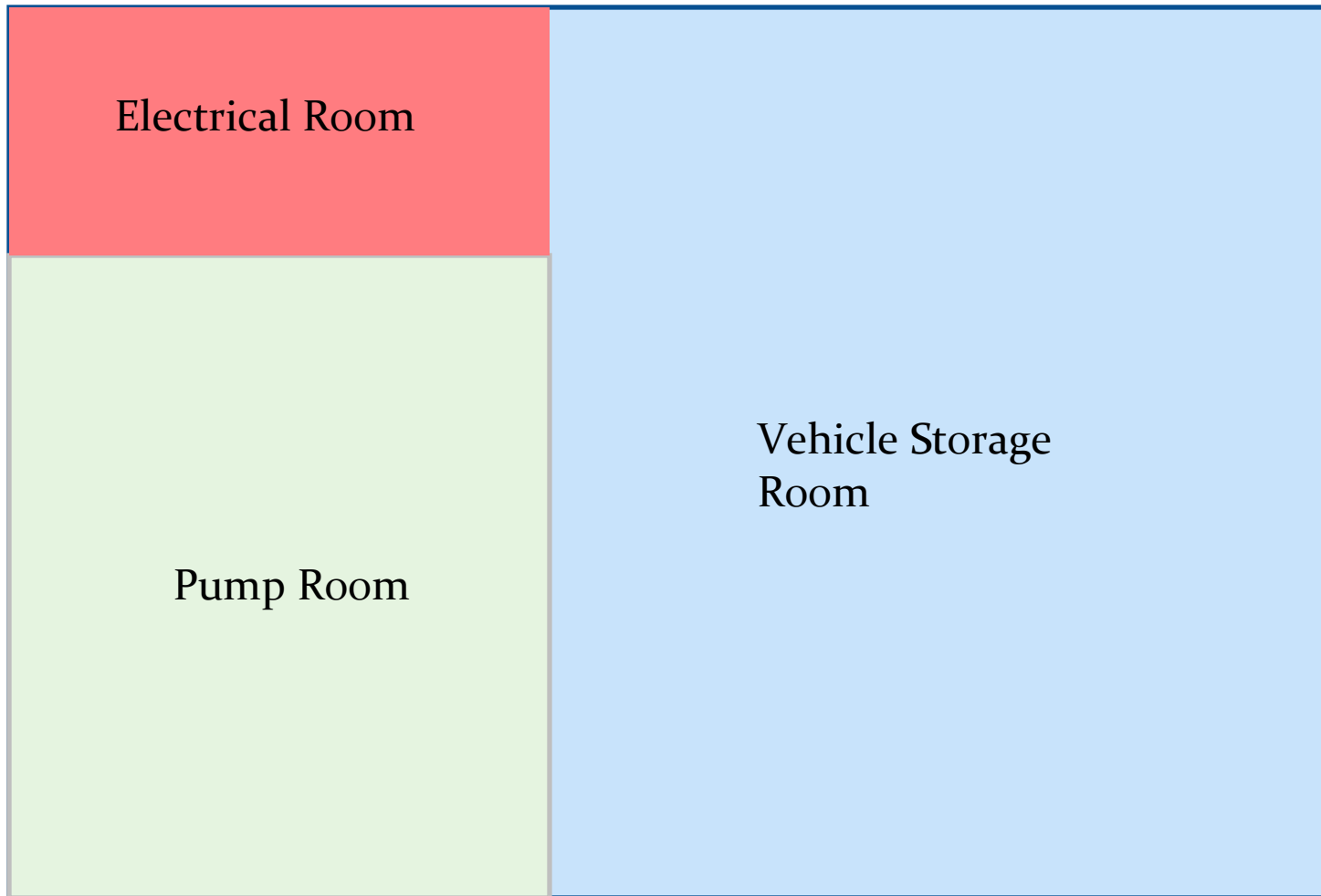


# Dual Fuel Boiler



# Building Layout

Building Size 75 ft x 67 ft x 18 ft





New Biosolids Pumping and Vehicle Storage Building

08.30.2012 10:16

# Vehicle Storage - HVAC

- Code – 0.5 cfm/sqft Requires 1,650 cfm - Continuous
- Alternative- Carbon Monoxide and Nitrous Oxide Detector
- Operation – 5 Hours per Day or When Detected

# Sludge Pump Room - HVAC

- Code – 6 Air Changes per Hour
  - 2,400 cfm-Continuous
- Alternative – Flush Pumps and Operate HVAC During Pumping Operation - Seasonal

# Building Heating Options

- Natural Gas Only
- Natural Gas with Exhaust Heat Recovery
- Digester Gas Heat Only
- Digester Gas Heat with Exhaust Heat Recovery
- Effluent Water to Water Heat Pump
- Ground Water to Water Heat Pump

# Alternative Analysis

System	Installation Cost Dollars	Annual Energy Cost Dollars/Year	Simple Payback Years
Natural Gas	129,000	2,039	NA
Natural Gas w/ Heat Recovery	253,000	1,820	566
Digester Gas	149,000	200	11
Digester Gas w/ Heat Recovery	295,000	943	152
Effluent Water Heat Pump	247,000	2,692	NA
Ground Water Heat Pump	391,000	2,487	NA

# Analysis Results

- Digester Gas Offered the Best Payback
- Heat Pump Alternative
  - 2.5 times less natural gas
  - High electrical operational cost-more energy
- Exhaust Heat Recovery
  - Low benefit because low room temperature and reduced ventilation run time.

# Additional Building Features

- Insulated Skylights
  - More natural daytime light – reduce electrical lighting
  - Insulated to reduce heat loss-R-9
- Outside lighting LED
  - Reduced energy
  - Low maintenance

# Rain Gardens

- Three Rain Gardens-4500 sqft
- Reduce Run Off
- Remove Suspended Solids
- Improve Water Recharge
- Esthetics



# Rain Garden Plantings



# Goals for the Future

- Develop consistent supply of high strength waste.
- Heat the existing Solids Handling Building and the new Biosolids Pumping Building without increasing natural gas usage.
- Utilize additional gas in the summer months for power generation, or absorption cooling.

Thanks for your attention!

