The Value of Using Benchmarking for Wastewater and City Operations
OVERVIEW

- City of St. Cloud & B3
- How is St. Cloud using B3
- Wastewater Utility & B3
“Site has insufficient meter data to calculate a continuous twelve month consumption period.”

“No meters defined.”
“Site has a suspiciously high actual to benchmark ratio. Make sure building and meter inputs are correct.”

“Heating source is targeted to natural gas, but no connected natural gas meters defined.”

“Warning. Site has meter readings prior to original occupancy date.”
City of St. Cloud & B3

Solar Initiative

Wastewater Energy Efficiency

Biofuel Recovery Project
## 2016 Electrical Consumption

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>2016 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electric</strong></td>
<td>27,806,971 kWh</td>
</tr>
</tbody>
</table>

(KILOWATT-HOURS)

### Municipal Facilities and Services

- **Wastewater & Liftstations**: 7,084,507 kWh
- **Water & Towers**: 5,100,368 kWh
- **Municipal Athletic Center**: 2,475,456 kWh
- **Street Lighting**: 2,348,855 kWh
- **Rivers Edge**: 1,893,159 kWh
- **Regional Library**: 1,667,229 kWh
- **Law Enforcement Center**: 1,499,921 kWh
- **Parking Ramps**: 1,123,199 kWh
- **City Hall**: 894,897 kWh
- **Traffic Signals**: 714,329 kWh
- **Central Services**: 699,821 kWh
- **St. Cloud Airport**: 579,561 kWh
- **Park Department**: 533,721 kWh
- **Emergency Mgmt Sirens**: 528,039 kWh
- **Traffic Signals**: 428,060 kWh
- **Park Department**: 348,039 kWh
- **City Hall**: 193,413 kWh
- **Municipal Athletic Center**: 134,641 kWh
- **Paramount Theater**: 116,170 kWh
- **Central Services**: 103,978 kWh
- **Traffic Signals**: 69,821 kWh
- **Whitney Senior Center**: 15,310 kWh
- **Central Services**: 13,410 kWh
- **Emergency Mgmt Sirens**: 10,000 kWh
- **Traffic Signals**: 5,000 kWh

Total Electric Consumption: 27,806,971 kWh

Cost: $2,871,286
You Can’t Manage What You Don’t Measure
WHY B3?

- MEASURE
  ENERGY EFFICIENCY ACTIONS

- OPTIMIZATION
  BUILDINGS & PROCESSES

- SAVE $

- BASELINE
  COMPARISONS

- REPORTS
SOLAR REWARDS

COMMUNITY SOLAR GARDENS

• Total Electrical Demand – 400+ Meters
• Small General Service vs. General Service Meters
• Annual Savings Calculations
St. Cloud & CSG’s

- City is currently subscribed to 20 million + kilowatt-hours
- Projected **Annual Savings** in Year 1 is $177,000 and over $28,000,000 over the next 25 years
WHY B3?
Why B3?

Guaranteed Savings Project

Monitoring & Verification Reports
Energy Efficiency

- Lighting
- HVAC
- Pneumatic System Upgrade
- Blower Optimization
BIOFUEL RECOVERY

- Hydrogen Sulfide Removal
- Siloxane Removal
- 633kW Generator
- Electrical Generation
Energy Savings & Production kWh (2013 Base Year)

January 2014 - October 2017
Total Energy Savings/Production: 6,907,143 kWh

2014 Savings: 364,730
2015 Savings: 895,459
2016 Savings: 1,372,047
2017 Savings (thru October): 4,274,906
Energy Cost Savings (2013 Base Year)

January 2014 - October 2017 Total O&M Cost Savings $699,461.08

<table>
<thead>
<tr>
<th>Year</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$75,402</td>
</tr>
<tr>
<td>2015</td>
<td>$154,210</td>
</tr>
<tr>
<td>2016</td>
<td>$156,749</td>
</tr>
<tr>
<td>2017 (thru October)</td>
<td>$313,100</td>
</tr>
</tbody>
</table>

2014 Savings 2015 Savings 2016 Savings 2017 Savings (thru October)

$200,000 $250,000 $300,000 $350,000
# B3 & WASTEWATER

## Buildings

(This site contains one building)

**Wastewater Treatment Plant**
525 60th St S Saint Cloud, MN 56301

## Meters

(8 meters)

<table>
<thead>
<tr>
<th>Meter Name</th>
<th>Status</th>
<th>Type</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biofuel Generator</td>
<td>✔️</td>
<td>PV Renewable Meter</td>
<td>Owner</td>
</tr>
<tr>
<td>Flow Meter</td>
<td>✔️</td>
<td>Flow Meter</td>
<td>(Unknown)</td>
</tr>
<tr>
<td>WWTF Boilers/Bio Solids Firm</td>
<td>✔️</td>
<td>Natural Gas Meter</td>
<td>Xcel Energy</td>
</tr>
<tr>
<td>WWTF Boilers/Bio Solids Interruptible</td>
<td>✔️</td>
<td>Natural Gas Meter</td>
<td>Xcel Energy</td>
</tr>
<tr>
<td>WWTF Electric</td>
<td>✔️</td>
<td>Electric Meter</td>
<td>Xcel Energy</td>
</tr>
<tr>
<td>WWTF Pilots/Lab</td>
<td>✔️</td>
<td>Natural Gas Meter</td>
<td>Xcel Energy</td>
</tr>
<tr>
<td>WWTF SOLAR PV 220KW</td>
<td>✔️</td>
<td>PV Renewable Meter</td>
<td>(Unknown)</td>
</tr>
<tr>
<td>WWTF SOLAR PV 20KW</td>
<td>✔️</td>
<td>PV Renewable Meter</td>
<td>(Unknown)</td>
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</tbody>
</table>
ENERGY STAR® includes a variety of additional property attributes to help refine a better score.

Wastewater Treatment Plant

**Wastewater Treatment Plant**

- **Plant Design Flow Rate (MGD):** 17.9
- **Average Influent Biological Oxygen Demand (BOD5):** 188.22
- **Average Effluent Biological Oxygen Demand (BOD5):** 2.28
- **Fixed Film Trickle Filtration Process:** No
- **Nutrient Removal:** Yes

Use Default Value options are available for each attribute.
### City of St. Cloud
**Wastewater Treatment Plant**
525 600th St S
Saint Cloud, MN 56301

#### Report: Custom Report
- **Chart Type:**
  - Monthly Continuous
  - Monthly Yr Over Yr
  - Annual
  - Rolling 12 Mo Avg
- **Measures & Units:**
  - Electric
  - Units: Native Units
- **Duration:**
  - Jan 2013 to Dec 2017
- **Options:**
  - Plant Flow Rate Normalize
  - Show Events
  - Show Completeness
  - Pilot Air Temperature

#### Monthly Year Over Year
**Electric, Plant Flow Rate Normalized**

#### Consumption Summary By Year

<table>
<thead>
<tr>
<th>Period</th>
<th>Days</th>
<th>Compress</th>
<th>SF</th>
<th>Actual kWh/MGal</th>
<th>Benchmark kWh/MGal</th>
<th>Change from Benchmark kWh/MGal</th>
<th>% Change</th>
<th>Ratio</th>
<th>Total Cost</th>
<th>Cost Rate $/kWh/MGal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 2013-Dec</td>
<td>365</td>
<td>100%</td>
<td>0</td>
<td>1,915.62</td>
<td>1,915.62</td>
<td>0.00</td>
<td>0.00%</td>
<td>1.00</td>
<td>$528,405.36</td>
<td>$275.841</td>
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<tr>
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<td>365</td>
<td>100%</td>
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<td>100%</td>
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<td>366</td>
<td>100%</td>
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<tr>
<td>Jan 2017-Dec</td>
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<td>0</td>
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<td>1,915.62</td>
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<td>-78.00%</td>
<td>0.22</td>
<td>$120,291.02</td>
<td>$205.397</td>
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</tbody>
</table>
B3 & WASTEWATER

City of St. Cloud
Wastewater Treatment Plant
325 60th St S
Saint Cloud, MN 56301

Report: Custom Report

Chart Type:
- Monthly Continuous
- Monthly Yr Over Yr
- Annual
- Rolling 12 Mo Avg

Meters & Units:
- Electric
- Units: Native Units

Duration:
- Jan 2012 TO Dec 2017

Options:
- BOD Removed Normalize
- SHOW Events
- SHOW Completeness
- Plot Air Temperature

Comparison:
- None
- Benchmark
- Baseline
- Target
- Event

Monthly Year Over Year
Electric BOD Removed Normalized

Consumption Summary By Year

<table>
<thead>
<tr>
<th>Period</th>
<th>Days</th>
<th>Complete</th>
<th>%P</th>
<th>Actual kWh/klg BOD Removed</th>
<th>Benchmark kWh/klg BOD Removed</th>
<th>Change From Benchmark kWh/klg BOD Removed</th>
<th>% Change</th>
<th>Ratio</th>
<th>Total Cost</th>
<th>Cost Rate $/kWh/klg BOD Removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 2013-Dec 2013</td>
<td>365</td>
<td>100%</td>
<td>0</td>
<td>2.50</td>
<td>2.50</td>
<td>0.00</td>
<td>0.00%</td>
<td>1.00</td>
<td>$528,405.36</td>
<td>$211,386.706</td>
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<tr>
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<td>First Reading</td>
<td>Last Reading</td>
<td>Conn</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>------</td>
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<tr>
<td>Biofuel Generator</td>
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<td>Owner</td>
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<td>WWTF Pilots/Lab</td>
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<td></td>
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</tr>
</tbody>
</table>

![Graph showing energy consumption over time with bars for different types of energy usage: Baseline, PV Renewable, Natural Gas, Electric.](image-url)
QUESTIONS?

Tracy Hodel
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City of St. Cloud
(320)255-7226
tracy.hodel@ci.stcloud.mn.us