If You Have a Problem:

“When all else fails, get a bigger sledge hammer.”
If You Have a Sludge Problem:

“When all else fails, get a bigger sledge SLUDGE hammer.”
Case Studies: Sludge Problems

- City of Niles WWTP
  - Huber Screw Press (2010)
- City of Mackinac Island WWTP
  - FKC Screw Press (2013)
Niles WWTP (circa 2005)

- Activated Sludge Plant
- 2.8 MGD Annual Average
- 8.0 MGD Max Day
Niles WWTP (circa 2005)

- Sludge Handling
  - Co-settled sludge (Primary & WAS)
  - 50/50 by volume, 85% Primary by wt
  - Influent: 2–4% solids
  - 8,700 dry pounds per day
The Problem

Low Pressure Oxidation & Vacuum Filter
- Old, Complex
The Problem

- High Cost (est. $250,000/yr)
  - Energy alone $113,000/yr
  - 85 HP Equipment
  - Natural Gas
The Challenge

- Stay with Landfilling
- Requires 20% solids
  - Pass paint filter test
Possible Solutions

- Centrifuge
- Belt Filter Press
- Dewatering Press
  - 45% Lower Cost for 20-yr Life Cycle
Possible Solutions

- Dewatering Presses
  - Screw Press
  - Rotary Press
# The Choice

<table>
<thead>
<tr>
<th>Screw Press</th>
<th>Rotary Press</th>
</tr>
</thead>
<tbody>
<tr>
<td>MORE SLUDGE</td>
<td></td>
</tr>
<tr>
<td>1,200 lbs per hour</td>
<td>900 lbs per hour</td>
</tr>
<tr>
<td>LESS ENERGY</td>
<td>26 HP total</td>
</tr>
<tr>
<td>9 HP total</td>
<td>15 lbs polymer/ton</td>
</tr>
<tr>
<td>LESS CHEMICAL</td>
<td>20–25% Cake Solids</td>
</tr>
<tr>
<td>12 lbs polymer/ton</td>
<td>20–25% Cake Solids</td>
</tr>
<tr>
<td>SAME RESULT</td>
<td></td>
</tr>
<tr>
<td>20–25% Cake Solids</td>
<td></td>
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</tbody>
</table>
The Design

Huber Press System ~1/4 footprint
The Difference

- Simple to operate
- No odor abatement

Operating Costs >50% Less
- BEFORE: $250,000/yr
- AFTER: $120,000/yr
Mackinac Island
Mackinac Island

- Seasonal Tourist Location
  - Hotels
  - Restaurants
- Small Year-round Population
- No Cars
Mackinac Island WWTP

- **Summer**: 0.6 MGD Avg
  Oxidation Tower w/ Activated Sludge

- **Winter**: 0.1 MGD (80% less)
  Extended Aeration
Seasonality

**PROCESS UNITS:** WINTER vs. SUMMER ONLY

- HEADWORKS
- PRIMARIES
- PUMPS, OX. TOWERS
- AERATION
- FINALS
- CHLORINE, FINAL PUMPS
The Problem

- Old System
  - Last upgrade 1990
  - Some original 1978
- Landfill biosolids – Off Island
  - $$$ Transportation Costs
The Challenges

- Small Space
- Real Estate premium
- No expansion option
Needs

- Drier Cake (Higher % Solids)
  - Reduce shipping costs
- Flexibility for future
- Composting on Island
  - Require Class A Biosolids to co-mingle
The Choice

FKC Screw Press

- Small, flexible footprint
- 1 press
- Expandable to Class A
  - Lime
  - Rotary Drum
  - Boiler
The Design

POLYMER

FLOC TANK

PUMP

PRESS

CONVEYOR
CLASS A UPGRADE (Future)

POLYMER → PUMP → FLOC TANK

LIME → PUMP

BOILER (STEAM) → PRESS

CONVEYOR → ROTARY DRUM
Construction

- Everything by Ferry Boat
Construction

- Then by Horse & Dray
Construction

- Winter Construction – avoid Tourists
The Difference

- Influent Sludge 16,000 gallons per day (Cosettled, 1–2% solids)
- BEFORE: Belt Filter Press (12% Solids)
- AFTER: Screw Press (20–25% Solids)
The Difference

Hauling Off Island

- BEFORE: 8 yards per day (8.5 tons)
- AFTER: 4 yards per day (4.0 tons)

- 50% REDUCTION Transportation $$
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Thank you!

Questions?

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