Company Overview

- Pickling Plant
  - Fermented
  - Fresh Pack
  - Relish, Condiments, Preservatives
Motivations for Change

- Doubled production in past two years
- Conserve well water
- Limited capacity wastewater disposal system
Reasons for MnTAP Assistance

- Audit water usage
- Investigate water/salt conservation methods
- Evaluate costs and be a part of implementation processes
- Investigate impact of salt on wastewater system
Approach

- Understand processes
- Talk with staff
- Discuss with other companies
- Monitor Processes
Pasteurizers

- A-line: Hot Water
- B-line: Steam
Pasteurizers (cont.)

• Opportunity
  – Large amount of hot overflow water from B-line

• Solution
  – Redirect B-line overflow to be used as makeup water for A-line

• Savings
  – 22,000 therms $10,600/year
  – 3,085,000 gallons water
Fermentation Tank Farm

- ~150 tanks/year
- 360,000 lbs. salt & 360,000 gallons of water sent to waste stream
Fermentation Tank Farm: Reuse

- Opportunity
  - Fresh brine made for each tank

- Solution
  - Reuse brine

- Savings
  - 213,400 lbs. salt
  - 214,500 gal. water
Current

Fresh Brine -> Fermentation & Storage -> Waste Brine
Cucumbers -> Production

Reuse

Lixate -> Reuse Brine
Cucumbers -> Fermentation & Storage
Cucumbers -> Production
Fermentation Tank Farm: Reduce

- **Opportunity**
  - Stored at a 12% salt level

- **Solution**
  - Modify tanking procedures so product can be stored at a 7% salt level

- **Savings**
  - 364,500 lbs. salt
  - 537,000 gal. water
## Recommended Changes

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Annual energy saved</th>
<th>Lbs. of salt reduced</th>
<th>Water savings (gpy)</th>
<th>Annual Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-line past. overflow to A-line</td>
<td>22,000 therms</td>
<td>N/A</td>
<td>3,085,000</td>
<td>$10,600</td>
</tr>
<tr>
<td>Reuse brine</td>
<td>N/A</td>
<td>213,400</td>
<td>214,500</td>
<td>$21,340</td>
</tr>
<tr>
<td>Reduce final salt in brine</td>
<td>N/A</td>
<td>364,000</td>
<td>383,000</td>
<td>$36,400</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>22,000 therms</strong></td>
<td><strong>460,500</strong></td>
<td><strong>543,200</strong></td>
<td><strong>$56,650</strong></td>
</tr>
</tbody>
</table>
Additional savings

• Water leaks
  - 2,220,000 gallons/year

• Water conservation culture
  - Sections in “The Crunch”
  - Communication
Personal Benefits

- Free pickles on Thursdays
- Real-world engineering experience
- Wastewater tests in lab
- Environmental regulation
- Data analysis
- Cost/benefit analysis
- Communication with staff
Questions?