PIERRE WASTEWATER TREATMENT PLANT SYSTEMS ANALYSIS
GOALS

- Ensure the WWTP is operating its current facilities at optimum performance
- Evaluate the current condition of the wastewater treatment plant
- Review current operating and maintenance procedures
- Review current staffing levels
- Determine future needs
• Review Current Operating Data
• Model the WWTP using BioWin Software
• Model Calibration
• Results - Plant operation is efficient and treatment goals are met
• Various treatment scenarios modeled
• Your WWTP is an expensive asset that should be properly operated and maintained
• Emphasis has been on permit compliance
• The plant condition is not typical of a facility this age
• Items recommended for immediate replacement
  • Primary Clarifier Mechanisms
  • Grit Removal Equipment
  • Buried Air Piping to Air Lift Pump Station
  • Estimated Cost $1.66 M
Primary Clarifier - Skimmer Arm
Primary Clarifier - Steel delamination on bridge structure
PLANT CONDITION

Housekeeping
PLANT CONDITION

Housekeeping - General Maintenance
General Pump Maintenance - Rust/Seals/etc.
PLANT CONDITION

General Maintenance - Pump Seals
PLANT CONDITION

Paint Peeling, etc.
REVIEW O&M PROCEDURES

- Visits
- Documents
- Record Keeping
- Comparisons
• Consistently meets limits
• Separation of duties
• Duty sheets not used
• Communication
- Lubrication done
- Little or no maintenance documentation
- No formal preventive maintenance program
- Comparisons with other plants
REVIEW STAFFING

- Talks
- Duty Assignments
- Training
- Absentee coverage
- Evaluation

Jkdhkljvh lkjglkja kjgkj

Ljkenla kajka jlfh
moenlf dfjhd kdfj dfuie
lsfow ivk fslkfk.
• Recommended staffing with 1991 upgrade
• Industry publication on estimating staff
• Comparison with other SD plants
### STAFFING

#### Table Summarizing WWTP Personnel Comparison

<table>
<thead>
<tr>
<th>City</th>
<th>Aberdeen</th>
<th>Brookings</th>
<th>Huron</th>
<th>Madison</th>
<th>Milbank</th>
<th>Pierre</th>
<th>Vermillion</th>
<th>Watertown</th>
<th>Yankton</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hours staffed</strong></td>
<td>24/7</td>
<td>24/7</td>
<td>8 M-F, 5 Sat-Sun and holidays</td>
<td>8/day year round</td>
<td>8/day year round</td>
<td>8 M-F, 4 Sat-Sun and holidays</td>
<td>8 M-F, 4 Sat-Sun and holidays</td>
<td>8/day year round</td>
<td>8/day year round</td>
</tr>
<tr>
<td><strong>Plant Design/Peak Flow</strong></td>
<td>4.5/8.0</td>
<td>3.0/6.0</td>
<td>2.3/2.3</td>
<td>2.0/4.0</td>
<td>1.5/3.5</td>
<td>2.2/4.4</td>
<td>2.0/4.0</td>
<td>4.0/NA</td>
<td>2.55/5.24</td>
</tr>
<tr>
<td><strong>Superintendent/Foreman</strong></td>
<td>1/1</td>
<td>1/2</td>
<td>1/1</td>
<td>0/1</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/0</td>
<td>1/1</td>
</tr>
<tr>
<td><strong>Assistant Superintendent</strong></td>
<td>.5¹</td>
<td>.5¹</td>
<td></td>
<td></td>
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<tr>
<td><strong>Pretreatment Coordinator</strong></td>
<td>.5¹</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td><strong>Pretreatment Assistant</strong></td>
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<tr>
<td><strong>Lab Technician</strong></td>
<td>.5¹</td>
<td>0.6²</td>
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<td></td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
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<tr>
<td><strong>Lead Operator</strong></td>
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<td>1</td>
<td></td>
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<tr>
<td><strong>Operators</strong></td>
<td>4</td>
<td>3.4³</td>
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<td>1</td>
<td></td>
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<tr>
<td><strong>Maintenance</strong></td>
<td>2</td>
<td>4</td>
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<tr>
<td><strong>Operator/Maintenance</strong></td>
<td></td>
<td></td>
<td>4</td>
<td>4</td>
<td>3⁴</td>
<td>3</td>
<td>4</td>
<td>3</td>
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<tr>
<td><strong>Biosolids Operator</strong></td>
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<td></td>
<td>1</td>
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<tr>
<td><strong>Total</strong></td>
<td>10</td>
<td>9 + 4.0</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>10</td>
<td>6 + 2³</td>
</tr>
</tbody>
</table>

1. One fulltime person holds the two listed positions in both Aberdeen and Watertown
2. Lab technicians – 0.6 FTE filled by SDSU CEE students
3. Plant is covered 24/7 – evening, overnight, weekend, holiday shifts all filled by 3.4 FTE SDSU CEE students
4. O & M plant personnel also collection workers
5. Two (2) part time operators alternate weekends and holidays with one of the full time staff
RECOMMENDATIONS

- O&M modifications
- Staffing level
O&M MODIFICATIONS

- Use operation daily duty sheets
- Communicate frequently
- Establish routine preventive maintenance program
STAFFING LEVEL

- Hire more staff
- Bring WWTP O&M staff up to eight (8)
RECOMMENDED STAFFING

1 - Wastewater Superintendent
1 - Plant Operator/Maintenance
1 - Biosolids (ATAD) Operator
1 - Lab Technician/Operator
1 - Lead Plant Operator
1 - Biosolids (ATAD) Operator (2 are needed)
2 - Maintenance/Operators
CONCLUSIONS

• We are recommending replacement of some key treatment equipment ($1.7M)

• Highly recommend plant staffing level be increased from the current staff of 4 to 8
QUESTIONS?