Rush Strong School
Wastewater Treatment Improvements

**Scope of Work:**
- Bring the system into compliance with TDEC regulations
- Perform engineering calculations and analysis
- Provide a cost-effective solution

**Water Chemistry:**
- Primary biochemical process is nitrification performed via bacteria to remove ammonia
- Limiting reagents are alkalinity and oxygen
- Current wastewater has an ammonia concentrations in excess of 100 mg/L (typical is 50 mg/L)
- Ammonia effluent concentration is 2-10X times TDEC limit

**Engineering Analysis and Calculations:**
- Analysis of Flow Data from monthly reports
- Filter Bed Analysis using Orenco design Manual
- Analyzed variety of options for implementation
- Cost analysis

**Final Design:**
- Implement 100% recirculation during summer
- Increase the recirculation ratio
- Reroute the recirculation line to the access risers
- Clean the filter laterals
- Separate zones
- Extend the flushing valve system

**Scope of Work Table:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Unit</th>
<th>Cost/Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot; check valves</td>
<td>6</td>
<td>Ea</td>
<td>11.50</td>
<td>69.00</td>
</tr>
<tr>
<td>1-1/2&quot; gate valves</td>
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<td>Ea</td>
<td>11.06</td>
<td>66.36</td>
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<tr>
<td>2&quot; pvc pipe</td>
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<td>20 LF</td>
<td>16.33</td>
<td>36.74</td>
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<td>2&quot; pvc 90deg elbow</td>
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<td>2&quot; pvc Tee</td>
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<td>0.70</td>
<td>0.70</td>
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</table>

**Total Cost:** $156.47
**Price (w/ Tax):** $164.33

**Team:**
- Kelli Grissom
- Sharon Counts
- Christina Sanford
- Katie Gipson