DECENTRALIZED AND INNOVATIVE NITROGEN AND PHOSPHORUS MANAGEMENT SOLUTIONS IN COASTAL COMMUNITIES – APPLICATION TO MEETING CAPE COD TMDL REQUIREMENTS

NITROGEN REMOVAL OPTIONS:
~Wastewater
-Individual On-Site Systems
-Cluster Systems
~Groundwater Treatment
~Water Reuse Capability

INDIVIDUAL ON-SITE SYSTEMS

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CLUSTER SYSTEMS

Effluent TN = 3.73 mg/l

Effluent TN = 4.65 mg/l

PHOSPHORUS REMOVAL

Effluent TP <0.5 mg/l

<table>
<thead>
<tr>
<th>Site</th>
<th>Total Phosphorus (mg/l)</th>
<th>Influent</th>
<th>Effluent</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA site #1</td>
<td>4.2</td>
<td>6.04</td>
<td>0.11</td>
</tr>
<tr>
<td>MA site #2</td>
<td>3.47</td>
<td>3.47</td>
<td>0.04</td>
</tr>
</tbody>
</table>

GROUNDWATER TREATMENT

Total Nitrate <0.1 mg/l
Total Phosphorus <0.5 mg/l
Total Perchlorate <0.2 mg/l

<table>
<thead>
<tr>
<th>Nitrex™ Technology Scenarios</th>
<th>Capital Cost</th>
<th>Nitrex™ Technology Capital Cost as % of Complete WW System w/ Sewers</th>
<th>Nitrex™ Technology Capital Cost as % of Sewers Connected to Existing WWTP &amp; Expansion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster Systems</td>
<td>$200,000,000+</td>
<td>$40,280</td>
<td>51%</td>
</tr>
<tr>
<td>Individual Systems</td>
<td>$180,747,000</td>
<td>$30,000+</td>
<td>16%</td>
</tr>
<tr>
<td>Stearns &amp; Wheler Scenario 1</td>
<td>$460,000,000+</td>
<td>$66,000+</td>
<td>117%</td>
</tr>
<tr>
<td>Stearns &amp; Wheler Scenario 2</td>
<td>$540,000,000+</td>
<td>$66,000+</td>
<td>117%</td>
</tr>
</tbody>
</table>

Nitrex™ Cost Savings = 50+%