Regulatory Trends in Water Reuse

NEWEA Annual Conference and Exhibit

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Moderators:
• Meredith Zona
• Nick Ellis

Panelists:
• Marybeth Chubb, MA DEP
• Dennis Greene, NH DES
• Bruce Douglas, VT DEC
Typical Drivers for Non-Potable Water Reuse

- Dispersal Capacity
- Potable Water Supply
- Costs of Alternatives
- Sustainability & Resiliency
### Locations & Uses: Representative Centralized Non-Potable Water Reuse in New England

<table>
<thead>
<tr>
<th>Location</th>
<th>State</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>UConn/Storrs</td>
<td>CT</td>
<td>Cooling Water</td>
</tr>
<tr>
<td>Lake of Isles</td>
<td>CT</td>
<td>Golf Course Irrigation</td>
</tr>
<tr>
<td>Cranston/Johnston</td>
<td>RI</td>
<td>Cooling Water</td>
</tr>
<tr>
<td>Jamestown</td>
<td>RI</td>
<td>Golf Course Irrigation</td>
</tr>
<tr>
<td>Yarmouth</td>
<td>MA</td>
<td>Golf Course Irrigation</td>
</tr>
<tr>
<td>UMass-Amherst</td>
<td>MA</td>
<td>CHP Steam &amp; Hot Water, Cooling Water, Dust Control, Irrigation</td>
</tr>
<tr>
<td>City of Manchester</td>
<td>NH</td>
<td>Cooling Water</td>
</tr>
</tbody>
</table>

*Locations & Uses: Representative Centralized Non-Potable Water Reuse in New England?*
Locations of Representative Distributed (Decentralized) Non-Potable Water Reuse in New England
Scale of Decentralized Non-Potable Water Reuse in New England Based on Capacity
Distributed Non-Potable Reuse Water Uses in New England

- Toilet Flushing
- Cooling Water
- Irrigation
- Toilet Flushing + Cooling
- Toilet Flushing + Landscape Irrigation
- Toilet Flushing + Carwash
- Laundry

Count
Decentralized Non-Potable Reuse Water Project Types in New England

Count

K-12 Schools
Shopping Malls
Resorts
Higher Education
Outpatient Hospital
Residential
Assisted Living
Travel Venue
Sports Venue/Mixed Use
Office/Mixed Use
Office/Light Industrial
Vermont Regulations

• Direct Discharges
• Indirect Discharges
<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>Irrigation, Toilet Water, Cooling Tower (Aerosols/Mist), Food crop Irrigation</td>
</tr>
<tr>
<td>Class B</td>
<td>Irrigation Limited Public access, Cooling tower (no aerosols), Non-food crop</td>
</tr>
<tr>
<td>Class C</td>
<td>Industrial Process Water (Closed Loop), Boiler Feed</td>
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**Water Quality limits based on Type of Reuse and potential for contact**

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**Indirect Potable Reuse (IPR)** – regulated under 314 CMR 5.00 Groundwater Discharge Permit Program

**Currently 12 permits in Massachusetts – Toilet Reuse, Irrigation, Cooling Tower water, Dust Control**

**Currently 99 permits in Massachusetts for IPR – Discharges into Zone II’s/IWPAs**

**Direct Potable Reuse not allowed under 314 CMR 20.00**
Reclaimed Water – New Trends

URINE DIVERSION

Nitrogen Impaired Embayments on Cape Cod

Need for effluent disposal options

DIRECT POTABLE REUSE
Star Island, NH – Water Scarcity

Rainwater
(fire suppression)

Bulk Water
(potable use)

Seawater
(toilet flushing)

Reverse Osmosis
(potable use)
Star Island, NH - Water Reuse

Reuse:
- Toilet Flushing
- Fire Suppression
- Landscape Irrigation
### NHDES – Regulatory Framework

<table>
<thead>
<tr>
<th>REUSE</th>
<th>LEAD</th>
<th>PERMITTING</th>
</tr>
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<tbody>
<tr>
<td><strong>GW Options:</strong></td>
<td><strong>NHDES Drinking Water and Groundwater Bureau (DWGB)</strong></td>
<td><strong>GW Discharge Permit</strong></td>
</tr>
<tr>
<td>➢ GW discharge</td>
<td></td>
<td>➢ GW standards</td>
</tr>
<tr>
<td>➢ Irrigation</td>
<td></td>
<td>➢ Reuse WQ (not by rule)</td>
</tr>
<tr>
<td><strong>Indoor Options:</strong></td>
<td><strong>NHDES Wastewater Engineering Bureau (WWEB)</strong></td>
<td>➢ Monitor/Report</td>
</tr>
<tr>
<td>➢ Industrial</td>
<td></td>
<td>➢ Compliance</td>
</tr>
<tr>
<td>➢ Toilet flushing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Type of permit?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>➢ Risk-based?</td>
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