EBC Rhode Island Chapter Program:

Update on Solid Waste Management in Rhode Island
Edward Summerly

Program Chair & Moderator
Principal, GZA GeoEnvironmental, Inc.
Waste Generation and Potential for Diversion

Michael McGonagle

Director of Information Systems
and Business Analysis

Rhode Island Resource Recovery Corporation

Environmental Business Council of New England
Energy Environment Economy
Waste Generation and Potential for Diversion

Presented To: Environmental Business Council of New England

Mike McGonagle, Interim Dir. Policy and Programs
Resource Recovery
September 12, 2017
Rhode Island Waste Generation

• Resource Recovery manages about 1.2M tons of materials each year including wastes, recycling and alternate cover materials

• About 10% is sold to processors for recycling and the rest is destined for landfill disposal

• Almost half (520K tons) is mixed solid waste from residential and Institutional/Commercial/Industrial (ICI) sources typically collected in packer trucks and compactor roll-offs
Waste Generation (cont...)

- About 50K tons is bulky wastes typically collected in open roll-off containers or small trucks from household and business cleanouts
- About 190K tons is unprocessed C&D
- The remaining 270K tons is primarily process residuals, soils, and ash
Waste Generation (cont...)  

• About 100K tons of soils and other recovered aggregate materials are used as alternate daily landfill cover.  

• Best guess is that another 250K to 350K tons of Rhode Island wastes are shipped directly out of state to disposal and recycling.
Potential Diversion – All Wastes Disposed
Percent of total

- Characterized Wastes: 583.4 tons (56%)
- From Other RIRRC Operations: 23.9 tons (2%)
- Other Roll-Off Loads: 35.1 tons (3%)
- C&D Roll-Off Loads: 196.2 tons (19%)
- Soils, Sludges, Residues and Rejected Recycling: 209.1 tons (20%)

Disposed MSW, Bulky and Small Vehicle Loads by Potential Management Category:
- Trash: 215.0 tons (21%)
- MRF: 108.8 tons (10%)
- Drop-off: 94.8 tons (9%)
- Compostable - Large Scale: 17.0 tons (2%)
- Compostable - Any Scale: 147.9 tons (14%)

Labels: Category; Tons (t); Share of Total Disposal
Rhode Island Resource Recovery Waste Received for Disposal c2015

<table>
<thead>
<tr>
<th>Wastes Disposed by Resource Recovery</th>
<th>Customer Type</th>
<th>Tons (1,000's)</th>
<th>Percent Of Wastes Managed</th>
<th>Potential for Diversion*</th>
<th>Tons (1,000's)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mixed Solid Waste</td>
<td>Municipal</td>
<td>Commercial</td>
<td>Total</td>
<td>%</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td>269</td>
<td>34</td>
<td>303</td>
<td>29%</td>
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<tr>
<td>Industrial/Commercial/Institutional</td>
<td></td>
<td>11</td>
<td>214</td>
<td>225</td>
<td>21%</td>
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<tr>
<td>Bulky Waste</td>
<td></td>
<td>10</td>
<td>45</td>
<td>55</td>
<td>5%</td>
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<tr>
<td>SubTotal of Wastes Characterized in 2015</td>
<td></td>
<td>290</td>
<td>293</td>
<td>583</td>
<td>56%</td>
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<tr>
<td>Other Wastes</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Unprocessed C&amp;D Waste</td>
<td></td>
<td>5</td>
<td>191</td>
<td>196</td>
<td>19%</td>
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<td>Processed C&amp;D/Bulky Waste</td>
<td></td>
<td>0</td>
<td>95</td>
<td>95</td>
<td>9%</td>
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<tr>
<td>Soils</td>
<td></td>
<td>0</td>
<td>70</td>
<td>70</td>
<td>7%</td>
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<td>Recycling Process Residue</td>
<td></td>
<td>0</td>
<td>29</td>
<td>29</td>
<td>3%</td>
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<tr>
<td>Sludge</td>
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<td>4</td>
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<td>1%</td>
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<tr>
<td>Ash</td>
<td></td>
<td>0</td>
<td>15</td>
<td>15</td>
<td>1%</td>
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<tr>
<td>Rejected Recycling</td>
<td></td>
<td>0</td>
<td>0</td>
<td>10</td>
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<tr>
<td>Other Waste</td>
<td></td>
<td>1</td>
<td>35</td>
<td>36</td>
<td>3%</td>
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<tr>
<td>Total Wastes Disposed</td>
<td></td>
<td>300</td>
<td>738</td>
<td>1,048</td>
<td>100%</td>
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</table>

<table>
<thead>
<tr>
<th>Materials Used Landfilled as Landfill Cover</th>
<th>Tons (1,000's)</th>
<th>% of Alternate Landfill Cover</th>
<th>Potential for Diversion*</th>
<th>Tons (1,000's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soils</td>
<td>31</td>
<td>33%</td>
<td>50%</td>
<td>0</td>
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<tr>
<td>Other Alternate Covers</td>
<td>24</td>
<td>25%</td>
<td>100%</td>
<td>0</td>
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<tr>
<td>Clean Street Sweepings</td>
<td>40</td>
<td>42%</td>
<td>100%</td>
<td>40</td>
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<tr>
<td>Total Materials Utilized as Landfill Cover</td>
<td>95</td>
<td>100%</td>
<td>42%</td>
<td>40</td>
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</tbody>
</table>

*Mixed Solid Waste and Bulky Waste based on 2015 Waste Characterization, C&D based on Massachusetts DEP reports, all other diversion potential assumptions are based on anecdotal information.
Paper and Packaging

• The residential waste stream is about 15% (45K tons) materials currently targeted in the single stream recycling program
• Rejected recycling (7-9K ton targeted material)
• Commercial generators potential for Cardboard
• Processing and Collection considerations
• Markets – mixed plastics 3467; mixed paper
Recycled Commodity Market Stability

RI Resource Recovery MRF Average Price Per Ton Output w/ Residue

Calendar 2007: $103
Calendar 2008: $113
Calendar 2009: $59
Calendar 2010: $103
Calendar 2011: $140
Calendar 2012: $107
Calendar 2013: $101
Calendar 2014: $104
Calendar 2015: $81
Calendar 2016: $87
Organics

- The mixed solid waste stream is almost 30% organic material that could be targeted for some form of decomposition process making it a prime target for diversion
- A significant portion of residential food waste could be readily composted at home
- Difference between digestion and composting
- End markets vary depending on source and process
# A Closer Look at Disposed Organics

<table>
<thead>
<tr>
<th>Category</th>
<th>Mixed Solid Waste</th>
<th>Bulky Wastes</th>
<th>Total Disposed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Residential</td>
<td>ICI</td>
<td></td>
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<tr>
<td>Vegetative food waste</td>
<td>51,466</td>
<td>33,361</td>
<td>84,828</td>
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<tr>
<td>Compostable Paper</td>
<td>22,199</td>
<td>11,849</td>
<td>34,048</td>
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<tr>
<td>Leaf and yard debris</td>
<td>22,535</td>
<td>5,144</td>
<td>28,870</td>
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<tr>
<td>Protein food waste*</td>
<td>9,111</td>
<td>6,092</td>
<td>15,202</td>
</tr>
<tr>
<td>Branches and stumps*</td>
<td>891</td>
<td>6</td>
<td>889</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>106,203</strong></td>
<td><strong>56,452</strong></td>
<td><strong>164,734</strong></td>
</tr>
</tbody>
</table>

*Compostable - Large Scale
Construction and Demolition

• MA ban achieving 25-30% recovery from disposal for building debris
  – Wood
  – Roofing shingles
  – Gypsum
  – Aggregates
  – Cardboard
  – Metal
Other Wastes

• Soils
• Sludge
• Street sweepings
• Process Residues
• Ash
Observations and Conclusions

• Only 56% of the total waste delivered to the RIRRC landfill is mixed solid waste and bulky waste typically targeted in traditional recycling and composting programs.

• Caution
  – There are no systems that divert 100% of available materials.
  – Many RI municipalities already have relatively high diversion rates for those materials accepted in recycling programs.
  – Organics processing systems, while showing promise, are constrained by the types of organics they can handle, and problems with contamination.
• There is potential to recover up to 40% of the materials currently landfilled with aggressive recycling and organics processing

• Organics offers a significant opportunity for diversion in the future but systems for collecting and processing will be costly

• Much of the materials managed by Resource Recovery are only suitable for combustion or land disposal

• High disposal fees will help to drive diversion of other materials to new uses
Disposal Capacity in Rhode Island & Southern New England

Brian Card

Director of Operations & Engineering
Rhode Island Resource Recovery Corporation
Disposal Capacity in RI and Southern New England

Presented To: Environmental Business Council

Brian N. Card, P.E., Director of Operations
RI Resource Recovery
September 12, 2017
RI Overview

- 2 Operating Landfills
- 5 Commercial Transfer Stations
- 1 C&D Processing Facility
- 3 Food Waste Composting Facilities
  - 1 under construction, 1 proposed, 1 in operation
- 1 Proposed rail transfer station
- 1 Materials Recycling Facility
- Numerous Leaf & Yard composting operations of various sizes
RI Overview

• Municipal waste flow controlled to RIRRC – ~25% of total waste generated in State
• Commercial sector waste open to market
• Out of State waste prohibited from disposal at Central Landfill
• RIRRC’s goal is to maximize disposal capacity for the residents of RI
Operations Overview

- Resource Recovery fiscal planning is to operate net neutral
- Composting Operation
  - Receives ~40,000 tons per year
  - Comprises <1% total revenue
  - Comprises 4% total expenses
- Recycling Operations and Programs
  - Receives ~120,000 tons per year
  - Comprises 18% total revenue
  - Comprises 25% total expenses
- Landfill Operation
  - Receives ~1,000,000 tons per year
  - Comprises 81% total revenue
  - Comprises 71% total expenses
# Materials Recycling Facility

<table>
<thead>
<tr>
<th></th>
<th>Inbound</th>
<th>Baled</th>
<th>Glass</th>
<th>Scrap Metal</th>
<th>Residue</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Fiscal Calendar 2014</td>
<td>130,772</td>
<td>82,038</td>
<td>7,053</td>
<td>792</td>
<td>35,454</td>
<td>125,337</td>
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<tr>
<td>Fiscal Calendar 2015</td>
<td>119,087</td>
<td>73,705</td>
<td>13,622</td>
<td>799</td>
<td>23,538</td>
<td>111,664</td>
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<tr>
<td>Fiscal Calendar 2016</td>
<td>118,261</td>
<td>74,021</td>
<td>18,297</td>
<td>891</td>
<td>18,497</td>
<td>111,862</td>
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<tr>
<td>Fiscal Calendar 2017</td>
<td>110,163</td>
<td>68,138</td>
<td>15,715</td>
<td>823</td>
<td>17,613</td>
<td>102,336</td>
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</table>

<table>
<thead>
<tr>
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<th>Glass</th>
<th>Scrap Metal</th>
<th>Residue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal Calendar 2014</td>
<td>63%</td>
<td>5%</td>
<td>1%</td>
<td>27%</td>
<td></td>
</tr>
<tr>
<td>Fiscal Calendar 2015</td>
<td>62%</td>
<td>11%</td>
<td>1%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>Fiscal Calendar 2016</td>
<td>63%</td>
<td>15%</td>
<td>1%</td>
<td>16%</td>
<td></td>
</tr>
<tr>
<td>Fiscal Calendar 2017</td>
<td>62%</td>
<td>14%</td>
<td>1%</td>
<td>16%</td>
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</table>
# Central Landfill

<table>
<thead>
<tr>
<th>Fiscal Calendar</th>
<th>SOLID WASTE LANDFILLED</th>
<th>ALTERNATIVE COVER LANDFILLED</th>
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<tbody>
<tr>
<td>Fiscal Calendar 2013</td>
<td>854,835</td>
<td>65,126</td>
</tr>
<tr>
<td>Fiscal Calendar 2014</td>
<td>934,838</td>
<td>54,600</td>
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<tr>
<td>Fiscal Calendar 2015</td>
<td>1,047,455</td>
<td>73,412</td>
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<tr>
<td>Fiscal Calendar 2016</td>
<td>1,042,411</td>
<td>71,315</td>
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<tr>
<td>Fiscal Calendar 2017</td>
<td>985,326</td>
<td>117,020</td>
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</table>
Annual Loading and Landfill Life

- Current (1,000,000 tpy) - 2033
- Planned (750,000 tpy) - 2039
- Municipal (400,000 tpy) - 2058

Year:
- 2015
- 2025
- 2035
- 2045
- 2055
- 2065
# Planning Issues

## Customer Base

<table>
<thead>
<tr>
<th>Customer Type</th>
<th>% Vehicle Total</th>
<th>% Solid Waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection Vehicles</td>
<td>25%</td>
<td>33%</td>
</tr>
<tr>
<td>Roll-off Vehicles</td>
<td>30%</td>
<td>22%</td>
</tr>
<tr>
<td>Transfer Trailers</td>
<td>11%</td>
<td>34%</td>
</tr>
<tr>
<td>Small Customers (pick ups, box trucks, etc.)</td>
<td>34%</td>
<td>11%</td>
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</tbody>
</table>
Planning Issues

• Legislative
  – Changes needed to RIRRC statute to allow for full analysis of alternatives
  – Volume controls?

• Regulatory
  – Facility expansion

• Financial
  – RIRRC self funded
Planning Strategy for Future

• **2017 through 2018** - Review of Technologies and Options

• **2019** - Engage stakeholder group to serve as Solid Waste Management Plan Advisory Committee and Recommend Future Course of Action

• **2020** - Prepare and approve a 20-Year System Development Plan
Disposal Capacity in Rhode Island & Southern New England

Christopher M. Koehler

Solid Waste Section Manager
HDR Engineering, Inc.

Environmental Business Council of New England
Energy Environment Economy
Chris Koehler, PE, BCEE
Solid Waste Section Manager

• 20+ Years of Solid Waste Experience
• Landfill Closure Design, Transfer Station/Drop-off Facility Design, Solid Waste Management Plans, CCR Impoundment Closures, Civil-Site Layout and Design
Active, Inactive or Closed Landfills
Active and Inactive Landfills

Map: Active and Inactive Landfills
Active and Closed Landfills

**Active and Closed Landfills in Connecticut**

- **Closed Landfills (Total = 178)**
- **Active Landfills (Total = 36)**

**Environmental Hazards in the State of Rhode Island**

- CERCLIS, TRI, Superfund Sites, and Landfills

Legend:
- TRI Facilities
- CERCLIS Sites
- Superfund Sites
- Number of Landfills by Municipality:
  - 1 - 2
  - 3 - 4
  - 5 - 6
  - 7 - 8

Source: All data were obtained from the CT DEP Bureau of Waste Management and the Engineering and Enforcement Division. The exact number of data points is unknown.
The Numbers by State

- MA – 6 Active MSW LF; 7 WTE
- CT – 1 Active MSW; 5 WTE
- RI – 2 Active MSW; 0 WTE
- NH – 6 Active MSW; 1 WTE
- VT – 1 Active MSW; 0 WTE
- ME – 42 Active Sites; 3 WTE
## Estimated Capacity in New England

<table>
<thead>
<tr>
<th>State</th>
<th>Capacity (TPY)</th>
<th>Waste Management</th>
<th>Capacity (TPY)</th>
<th>Year at Permit Capacity</th>
<th>Capacity (TPY)</th>
<th>Year at Permit Capacity</th>
<th>Capacity (TPY)</th>
<th>Year at Permit Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concord, NH</td>
<td>194,819</td>
<td>SEMASS, MA</td>
<td>1,250,000</td>
<td>2025 South Bridge, MA(1)</td>
<td>405,600</td>
<td>2018 Mid-CONN, CT(2)</td>
<td>886,888</td>
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<tr>
<td>Millbury, MA</td>
<td>429,575</td>
<td>Bristol, CT</td>
<td>225,500</td>
<td>2025 Coventry, VT(5)</td>
<td>600,000</td>
<td>2045 Nashua, NH LF(3)</td>
<td>100,000</td>
<td>2048</td>
</tr>
<tr>
<td>Saugus, MA</td>
<td>460,500</td>
<td>SECONN, CT</td>
<td>239,000</td>
<td>2027 Juniper Ridge, ME</td>
<td>700,000</td>
<td>2037 West Lebanon, NH</td>
<td>50,000</td>
<td>2037</td>
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<td>N. Andover, MA</td>
<td>460,500</td>
<td>Haverhill, MA</td>
<td>602,250</td>
<td>2020 Bethelham, NH(3)</td>
<td>175,000</td>
<td>2048 Bourne(4)</td>
<td>32,850</td>
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<tr>
<td>Lisbon, CT</td>
<td>192,946</td>
<td>Pittsfield, MA</td>
<td>84,000</td>
<td>2031</td>
<td></td>
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<td>175,000</td>
<td>EcoMaine</td>
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<tr>
<td>Bridgeport, CT</td>
<td>766,394</td>
<td>Springfield, MA</td>
<td>131,400</td>
<td>2018</td>
<td>60,000</td>
<td>2038</td>
<td>75,000</td>
<td>MMWAC, ME</td>
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<td>PERC, ME</td>
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<td>RIRRCE(6)</td>
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<td>35,000</td>
<td>Tri-Community (ME)</td>
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<td></td>
<td></td>
<td></td>
<td>100,000</td>
<td>Crapo Hill, MA</td>
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<tr>
<td>TOTAL</td>
<td>2,504,734</td>
<td></td>
<td>2,532,150</td>
<td></td>
<td>2,020,000</td>
<td></td>
<td>1,880,600</td>
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<tr>
<td></td>
<td>2,606,738</td>
<td></td>
<td>11,544,222</td>
<td></td>
<td>2,606,738</td>
<td></td>
<td>11,544,222</td>
<td></td>
</tr>
</tbody>
</table>

(1) Reduced tonnage as of 2016, Closing/Potentially Closing in 2018 - expansion permit pending.
(2) Assumes 365 days with 95% availability.
(3) Estimated.
(4) 219,000 TPY total: 85% Ash; 15% MSW Shown.
(5) Assumes Phase V expansion.
(6) Includes MSW & ICI & C&D.

## Estimated Generation in New England

<table>
<thead>
<tr>
<th>State</th>
<th>Population 2016</th>
<th>MSW Generated Tons/Year</th>
<th>MSW Recycled Tons/Year</th>
<th>C&amp;D Generated Tons/Year</th>
<th>C&amp;D Diverted Tons/Year</th>
<th>Net After Recycling Tons/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maine</td>
<td>1,331,500</td>
<td>1,069,195</td>
<td>294,643</td>
<td>364,498</td>
<td>171,314</td>
<td>967,735</td>
</tr>
<tr>
<td>NH</td>
<td>1,335,000</td>
<td>1,072,005</td>
<td>295,418</td>
<td>365,456</td>
<td>171,764</td>
<td>970,279</td>
</tr>
<tr>
<td>Vermont</td>
<td>624,500</td>
<td>501,474</td>
<td>138,194</td>
<td>170,957</td>
<td>80,350</td>
<td>453,887</td>
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<tr>
<td>MA</td>
<td>6,812,000</td>
<td>5,470,036</td>
<td>1,507,405</td>
<td>1,864,785</td>
<td>876,449</td>
<td>4,950,967</td>
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<tr>
<td>Connect</td>
<td>3,576,500</td>
<td>2,871,930</td>
<td>791,432</td>
<td>979,067</td>
<td>460,161</td>
<td>2,599,403</td>
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<tr>
<td>RI</td>
<td>1,056,500</td>
<td>848,370</td>
<td>233,789</td>
<td>289,217</td>
<td>135,932</td>
<td>767,865</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14,736,000</td>
<td>11,833,008</td>
<td>3,260,881</td>
<td>4,033,980</td>
<td>1,895,971</td>
<td>10,710,136</td>
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</table>

4.4 lbs/day-ppl USEPA MSW Estimate
1.51 lbs/day-ppl USEPA Recycling Rate Estimate
1.5 lbs/day-ppl 2008 NH Solid Waste Report; 47% Diversion
2016 US Census Estimate
# Estimated Generation/Capacity by State

<table>
<thead>
<tr>
<th>State</th>
<th>Capacity</th>
<th>Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NH</td>
<td>1,569,819</td>
<td>970,279</td>
</tr>
<tr>
<td>ME</td>
<td>1,450,000</td>
<td>967,737</td>
</tr>
<tr>
<td>RI</td>
<td>850,000</td>
<td>767,865</td>
</tr>
<tr>
<td>VT</td>
<td>600,000</td>
<td>453,887</td>
</tr>
<tr>
<td>MA</td>
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<td>4,950,967</td>
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<td>NH</td>
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<td>Rochester, NH</td>
<td>1,050,000</td>
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<tr>
<td>Bethlehem, NH(3)</td>
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<td>Nashua, NH LF(3)</td>
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<td>West Lebanon, NH</td>
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<td>NH</td>
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<tr>
<td>ME</td>
<td>1,450,000</td>
<td></td>
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<tr>
<td>RI</td>
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<td>VT</td>
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<tr>
<td>MA</td>
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<td></td>
</tr>
</tbody>
</table>
ANNUAL LOADING AND LANDFILL LIFE

- **Current (1,000,000 tpy)**: 2033
- **Planned (750,000 tpy)**: 2039
- **Municipal (400,000 tpy)**: 2058

Year:
- 2015
- 2025
- 2035
- 2045
- 2055
- 2065
Opportunities

Going from 1,150,000 TPY to 750,000 TPY
How to accomplish? Where does it go?

- Recycle, Reuse, Reduce (PAYT Programs; Source Separated Recyclables)
- Raise Rates to Restrict Flow
- Restrict Wastes (Residential Sector and ICI Sector MSW Only)
- Processing – Advanced Recycling Campus (MSW and C&D; MWPF/Dirty MRF)
- Biological Processing (Composting and A.D.)
  - Must be a market
- 400,000 TPY Available for Private Companies
  - Collect/Accept/Process/Recycle/Transfer/Haul
  - Emerging Technologies
What Happens after 2038?

- Transfer Stations
  - MSW and C&D
  - Rail and Truck
- Continued Landfilling/ New Landfill
- Composting and A.D.
- Waste-to-Energy
- Emerging Technologies
What Does the NE Future Look Like?

- Maintenance of WTE Facilities
- Development of Transfer Stations
  - Rail and Truck Hauling
  - Keep Options Open
- Expect an Out-of-State Tax for Disposal
- Expect $100/ton Tip Fees
Final Thoughts

- In U.S. - average of $35/ton Landfill Tipping Fee – 28 years of capacity.
- In EU and Japan tipping fees $250/ton
- More Scare Land; Higher Tip Fee
- Oil is at $47.50/barrel
- Must be a market for recyclables
- China will ban 24 more items
- NIMBY/NIMEY/NIMTO
Thank you.

Questions & Comments?

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Solid Waste Section Manager
Can Producer Responsibility Reduce the Green Waste?

Jamie Rhodes, Esq.

Program Director
Upstream Policy Institute
Designing Extended Producer Responsibility (EPR) Program to Reduce Waste

Jamie Rhodes
Program Director, UPSTREAM
EBC Rhode Island Program. September 12, 2017
Extended Producer Responsibility for Packaging

• Definition of EPR:
  “a mandatory form of product stewardship that includes, at a minimum, the requirement that the producer’s responsibility for their product extends to the post-consumer management of that product and its packaging.

• From taxpayer-funded recycling to producer responsibility for end of life (EOL) of products
Global movement from taxpayer-funded to EPR

Linear, taxpayer-funded waste management in most of the USA

V.S

Producer responsibility in most developed nations, and many others globally
Producers meet obligations

- Individually or collectively in as part of a Producer Responsibility Organization (PRO);

- PROs can be nonprofit (most), government (rarely), quasi govt’l, and for profit (occasionally);

- Municipalities may or may not have a role;

- Muni role could be collection and recycling, or taxation used to cover cost of EOL management
Some Updated EPR Schemes have Targeted Prevention (Too recent to evaluate impact)

by 2020, based on 2010:
- 5% reduction in the ratio of municipal solid waste (MSW) to gross domestic product unit (GDP);
- Focus on amount of MSW produced per household
- Promote sale of bulk products
- Encourage consumption of tap water

- 10% reduction below 2010 waste generated annually (tonnes) by 2020. Focuses on a reduction in marine litter from terrestrial sources by:
  - reducing the quantity of waste;
  - reusing products and extending their life;
  - reducing harmful substances in materials and products; and
  - reducing the environmental and human health impacts of waste.
With Target Rates Set- Producers have Options for Compliance

- Design for durability and reuse
- Eliminate excessive packaging
With Target Rates Set- Producers have Options for Compliance

- Change dimensions, volume or composition of the packaging
- Reduce void space/filler/material use
- Packing in bulk
- Refill packaging
- Reusable transport packaging
Can EPR be a Solution for Marine Plastic Pollution?

• Typically EPR for packaging designed to increase recycling;
• If it could reduce packaging -i.e. prevention- it could reduce littered products;
• NRDC model suggested financing cleanup;
• State-wide storm water regulations for trash are complimentary;
• Ongoing local efforts for product bans (straws, for example);
• Looking at fees on take out packaging, and no disposables for dine-in food service
Networking Break
Regulatory Challenges and Changes

Mark Dennen
Supervising Environmental Scientist
Rhode Island Department of Environmental Management
WASTE UPDATES FOR Rhode Island

Mark Dennen, CPG-
Supervising
Environmental Scientist

RIDEM/ Office of
Waste Management

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Providence, RI 02908
tel. 401.222.2797 ext. 7502
fax 401.222.3812
e-mail: mark.Dennen@dem.ri.gov
Solid Waste Topics

Solid Waste

- Re-promulgation of all RI Regulations
- Climate Change and its effect on Closed Landfills
- Solar Development at Landfills
- E-Waste
- Food Waste

Hazardous Waste

- Pharmaceutical Rule
- Federal E-manifest
- Generator Improvement Rule
Re-Promulgation of All State of RI Regulations

- Executive Order 15-07 and Amendments to Administrative Procedures Act
- All regulations must be in a codified system by December 2018 or they will be unenforceable.

- **250-RICR-140-05-1**
  - TITLE 250 - DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
  - CHAPTER 140 - WASTE AND MATERIALS MANAGEMENT
  - SUBCHAPTER 05 - SOLID WASTE
  - PART 1 - Rules and Regulations for Solid Waste Management Facilities and Organic Waste Management Facilities.
Climate Change and Closed Landfills

- Landfills built near the coast are being subjected to submersion by rising sea levels as well as increased frequency of severe storms.
Site was threatened by erosion caused by starving of sand due to dredging of salt pond

Erosion accelerated by Superstorm Sandy and Winter Storms in 2013

Slope collapsed sending solid waste across beaches north of the site.

Temporary volunteer cleanup while remedy was being designed.
Block Island Landfill
Western Slope of Landfill
Status of Site

- Approved Remedy funded by US HUD grant to build revetment
- Remedy was abandoned due to cost/uncertainty of addressing archaeological concerns
- May proposed more limited slope work without revetment
Solar Development at Landfills
SOLAR ENERGY AT SITES THAT HAVE NOT UNDERGONE CLOSURE

- Environmental Investigation to characterize risk and propose a remedy
- Landfill Gas- may affect buried lines, structures
- Impervious Area may raise storm water issues as well as wetland permitting
- Investigative work and remedy selection can be concurrent with Solar Studies
- The Department has not yet created specific guidance such as MA DEP.
E-Waste in RI
Cost / Weight Allocation

- EACH MANUFACTURER MUST:
  - Register and pay $5,000 fee/year to sell electronics
  - Must have a program to collect e-waste or pay RIRRC to join state program
  - May do program on their own to may band together
  - RIRRC Estimates total e-waste generated for state and assigns target weights:
    - Based on % of market/collected share
    - Currently 6 lbs./ person
2008
E-waste statute passed

2013
RIDEM E-Waste Regulations Promulgated
  • Split between RIDEM/RIRRC

2015
Economics of e-waste recycling changed
  • Collection # sites 27 - 5.

2015
RIDEM E-Waste Statute change

Summer 2016
Kaizen event/more inspection

January 2016
RIDEM puts in prohibition against mid year shutdowns

2017
Statute change

E-waste Kaizen Dec. 2016 - Jan 2017
Results of Joint Agency Kaizen Event

- Inspected collections and found
  - Discrepancies in quantities collected (over 1 million lbs)
  - Highly suspicious mid-year reporting (many manufacturers were at exactly ½ required quantity)
  - Major deviations from plan (charging consumers for televisions)
  - Some questionable quantities at collection facilities
  - Need for better reporting and oversight
Status of E-waste Legislation

- Expected to be passed this week.
- Incorporates changes recommended by agencies except printers are not being added as Covered Electronic Products.
- Allows 10% carry-over of under/over collection
- Establish de-minimis exemption from registration
- Establish minimum threshold to collect disposal fees (1%)
- Changes reporting requirements and frequency
EPA Generator Improvements Rule

- Allowing a hazardous waste generator to avoid increased burden of a higher generator status when generating episodic waste provided the episodic waste is properly managed, and

- Allowing a very small quantity generator (VSQG) to send its hazardous waste to a large quantity generator under control of the same person.

Source: USEPA
USEPA Pharmaceutical Draft Proposal

- Expected in Spring 2018
- Major re-write of 2008 proposal that used Universal Waste Rule
- Trying to address Pharmaceutical issues especially:
  - Reverse distribution
  - LQG status relative to nicotine gum
  - RCRA/DEA controlled substances overlaps
- Creates New Framework as subpart P in RCRA under 266
- Recognizes reverse distribution as allowable but says it is a waste
Additional Items in Pharm Proposal

- Does not add any new Pharmaceuticals Waste as Hazardous Waste
  - In spite of 2012 IG report
- Does not change P075 status of nicotine gum or patch
  - More data needed
- Prohibits Sewer Disposal of Pharmaceuticals
  - EPA would join other jurisdictions with sewer bans for pharmaceuticals, including IL, NJ, DC, WA and CT (proposed)
E-Manifest Rule and related changes

- MY RCRA ID, in new version of RCRA Info, allows regulated entities to maintain their own data
- Biennial reports will be produced online and transmitted to states and USEPA
- E-manifest will go live in June 2018
  - Generators, Transporters and Facilities will sign manifest electronically
  - USEPA will be warehouse for all manifest data
  - Handlers will register via Central Data Exchange (CDX). Test.epacdx.net
Composting

STAY TUNED!
Organics Management & Recycling – Rhode Island Requirements

Mark Dennen

Supervising Environmental Scientist
Rhode Island Department of Environmental Management

Environmental Business Council of New England
Energy Environment Economy
Organic Waste Management in Rhode Island

MARK DENNEN, SUPERVISING ENVIRONMENTAL SCIENTIST
RIDEM/OFFICE OF WASTE MANAGEMENT

401-222-2797 EXT. 7112 MARK.DENNEN@DEM.RI.GOV OR 401-222-2797 EXT. 7511 CHRISTOPHER.SHAFER@DEM.RI.GOV
Expansion of Organic Waste Management

- Small Scale Composting Facilities
- Medium Scale Composting Facilities
- Anaerobic Digestion Facilities
- Modification of Existing Composting Facilities Regulations
  - Leaf and Yard Waste (large scale)
  - Putrescible Waste (large scale)
Drivers of Organic Waste Management Regulations

1. Small and Medium Scale Composting Initiatives
   - Reuse Organic Wastes (leaf and yard + food)
   - Make compost
2. A.D. facility interest in RI
3. Waste Handling Hierarchy
4. Landfill finite life + future alternate disposal costs
5. Compost Law ("Food Waste Ban")
Food Waste Ban RIGL 23-19.9-17

- Effective 1/1/2016
- Commercial and Various Institutional Organic Waste Generators
- >104 tons/yr organic waste
  - Food scraps
  - Food processing waste
  - Soiled paper
  - Non-recyclable paper
- >52 tons/yr in 2018
Food Waste Ban RIGL 23-19.9-17 (continued)

- If within 15 miles of compost or A.D. Facility
- Waste Handling Options
  - Send to compost facility
  - Send to A.D. facility
  - For agricultural use (animal feed)
  - Recycle or treat on-site
- Waiver option: facility fee > RIRRC non-contract commercial tipping fee
RI Composting Facility Regulations

- Revised May 2016
- Office of Waste Management’s Solid Waste Regulation #8
- Rules 8.0-8.8 Applies to Compost Facilities
  - Small-Scale Leaf and Yard Waste and/or Putrescible Waste Composting Operations
  - Medium-Scale Leaf and Yard Waste and/or Putrescible Waste Composting Facilities
  - Rule 8.1-8.2 Large Scale Leaf and Yard Waste Composting Facilities
  - Rule 8.3-8.4 Large Scale Putrescible Waste Composting Facilities
## Composting Facility Comparison

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<th></th>
<th>Small-scale</th>
<th>Medium-scale</th>
<th>Large-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Quantity (yds³)</td>
<td>0-25</td>
<td>25-600</td>
<td>&gt;600</td>
</tr>
<tr>
<td><strong>Waste Types</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaf and Yard Waste?</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Putrescible Wastes</td>
<td>Limited types</td>
<td>More types (pilot program)</td>
<td>Extensive types</td>
</tr>
<tr>
<td>Buffer zone requirements</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Operating standards</td>
<td>No*</td>
<td>No*</td>
<td>Yes</td>
</tr>
<tr>
<td>Finished compost quality</td>
<td>Class A</td>
<td>Class A</td>
<td>Class A, B or C per defined markets</td>
</tr>
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*no adverse effects- surface groundwater, wetlands, odors, vectors, dust, litter*
<table>
<thead>
<tr>
<th>Registration Requirement</th>
<th>Small-scale</th>
<th>Medium-scale</th>
<th>Large-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Fee</td>
<td>n/a</td>
<td>No</td>
<td>Yes- putrescible waste ($3000)</td>
</tr>
<tr>
<td>Registration details</td>
<td>n/a</td>
<td>Moderate number</td>
<td>Larger number</td>
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RI A.D. Facilities Regulations

- Effective May 2016
- Office of Waste Management’s Solid Waste Regulation #8
- Rules 8.9-8.11 A.D. Facilities (all size facilities)
  - No size subsets
- Applies to A.D. Facilities accepting solid and liquid organics
  - Typically Food Waste and animal manure
  - No biosolids- OWR digestion facility regulations
$10,000 license fee
License application
License process:
  Approval of license application
  Public information workshop- per state law
  Public comment hearing- per state law
A.D. Licensing application

1. Radius plan
2. Site plan
3. Construction and engineering plans
4. Summary description facility design and operations
5. Odor/aesthetics consideration
6. Operating plan
7. Product storage and marketing plan
8. Facility closure plan
A.D. Regulation Details Basis:

1. Concepts employed in RI composting regulations
2. Review/ adoption of appropriate portions of other states AD regulations
3. Input from Regulated Community and State Food Policy Council
   1. AD applicant commented on draft regulations
   2. Provisional approval given under old regulations as Compost Facility
New Digester- Orbit Energy- Johnston, RI
History of A.D. Facility Regulation Usage

1. One facility is in licensing process
   - Currently preparing license application
2. No operating facilities, past or current
3. Current applicant:
   - Approx. 200 tons/day organic input
   - Wet digestion process
   - Methane- 3.2 MW combined with power production
   - Solid digestate- compost facility input
   - Currently ramping up for full scale operation
Organics Management & Recycling – Rhode Island Requirements

Catherine Conley

Microbiologist
Auspark, LLC
ORBIT ENERGY RHODE ISLAND
RECEPTION BUILDING

- Doors triggered by truck
- Reverse pressure for odor control
Hopper

- Grinds and moves food
- Screws rotate
- 80 ton capacity
- Hoppers delivery to conveyers
Tornados

- Washing machine effect
- separates non organic waste from organic
Bio Filter

- 870 feet long x 210 feet wide
- 8 feet deep
- Different size wood chips
- Organic odor control
BIO PUPLER

- Stomach of the system
- Holds 225,000 gallons
- Central transfer to digesters
The Digester

Mesophilic Process

Similar to human body

- Both require food
- Excess acids causes problems
- Average temp is 98.6F (37C)
- Digestive process: solids & liquids
- Both use food for cellular reproduction & energy
COLD DIGESTOR

- Gas collection as digestate cools, gas is collected
- Gas collected in low pressure, water sealed membrane
**Torches & Scrubbers**

**Torches:**
- Burns off excess gas
- Automatic, based on gas level

**Scrubbers:**
- Removes moisture
Co Generators

- Waiting for Commissioning
- 3.2 MW
- Power for plant and grid
On Going Construction...

- Finish Waste Water Treatment Area
- Complete installation of Centrifuge and Dryer
- Commissioning
- Hand off from Construction to Operations
- Finalization of Permits
Panel Discussion

Moderators: Ed Summerly, GZA

Panelists:

• Brian Card, RIRRC
• Catherine Conley, Auspark, LLC
• Mark Dennen, RIDEM
• Michael McGonagle, RIRRC
• Jamie Rhodes, Upstream Policy Institute