Residuals Management
Operator of the Roosevelt Regional Landfill, Ash Recovery Facility

&

Renewable Natural Gas Conversion Facility

Nick Ponce, General Manager
Jim Hutchinson, Director, Municipal Services

Presentation to Zero Waste Committee
July 12, 2019
Republic’s History in BC
Nearly 30 Years of Service

- Customers have included: Metro Vancouver, industrial generators, Newstech, Whistler, Cowichan Valley RD, qathet RD, Coastal First Nations and Northern Affairs Canada

- Gas-to-Energy Plant generates renewable natural gas, distributed by BP North America

- Approved for receipt of solid waste in the Pacific Northwest: BC, AB, WA, OR, ID, CA & AK

- Operates under the Klickitat County Comprehensive Solid Waste Management Plan approved by Washington State

Currently approved in BC Solid Waste Management Plans
Waste-by-rail network

Most carbon-efficient and economical means of transport
Roosevelt Regional Landfill
Residual Management Facility

- Accepted first load of waste in 1990
- Nearly 60 million tons of residuals in place
- Permitted for 245 million tons, 75 year life at current fill rate of 2.5m tons/year
- Only 6-9 inches of rain/year

Built for energy recovery from Day One
Metals Recovery: Ash Monofill

- Republic Services and Lab USA operate a metals recovery mining operation at Roosevelt Regional Landfill

- The facility will recover and recycle more than 46,200 tons of ferrous metals and 42,900 tons of non-ferrous metals

That’s enough ferrous metal to build SIX Eiffel Towers!
Landfill Gas-to-RNG Facility

1999 “LFG1” project
• 10.5 Mega-watt Reciprocating Engine Project (idled)

2010 “LFG2” (Turbine Project)
• 26 MW Combined Cycle Turbine plant
  Gas cleaning system to remove sulfur from gas (backup power)

2018 Renewable Natural Gas (RNG) Facility
• 5700 MMBTU/day (enough to fuel 1500 solid waste trucks a day!)

History of biogas recovery and innovation
ISWRM Plans Goals
Republic Services: Part of the Solution

1. **Minimize Solid Waste Generation**
   Solution: Contracts with Republic can be scaled based on residual volumes requiring responsible disposal

2. **Maximize Reuse, Recycling and Material Recovery**
   Solution: Regional districts & municipalities increase these programs when not financially committed to building new infrastructure

   Solution: Largest landfill RNG facility in North America generating 36,000 DGE (diesel gallon equivalent) each day. Able to recover metals from incinerator ash.

4. **Dispose of all Waste in Landfill After Material Recycling and Energy Recovery**
   Solution: Roosevelt is a cost effective and environmentally sound addition to Metro Vancouver’s disposal capacity
Fueling the Circular Economy

**FEEDSTOCK COLLECTION**
Residual material is collected and transported by rail to Roosevelt Regional Landfill.

**BIOGAS PRODUCTION**
Naturally occurring decomposition produces biogas.

**BIOGAS PROCESSING**
Biogas is piped to an on-site facility owned and operated by Klickitat County PUD.

**USE IN VEHICLES**
RNG is used in place of fossil fuels for transportation needs.

**TRANSMISSION & DISTRIBUTION**
Biogas is refined and injected in the Williams Pipeline for use by BP North America.

*BP North America services BC and other Canadian jurisdictions.*
Thank you!

Nick Ponce
General Manager

54 S. Dawson St.
Seattle, WA 98134
e nponce@republicservices.com
o 206-332-7701
c 206-939-1446
w www.RepublicServices.com
Appendix
Republic Services at a Glance

Fortune 500 / RSG

14 million customers
33,000+ employee
5 million Annual tons of recycling processed
2.5 million Annual tons of solid waste converted to Renewable Natural Gas at Roosevelt Regional Landfill in Washington State
2.4 percent From Metro Vancouver
Natural geology meets advanced engineering

- **1,500 feet** of separation from the bottom of the landfill to the closest regional aquifer
- Tests of the clay demonstrate it would take approximately **15,000 years** for water to move through the natural barrier
- **Engineered liners** include a two-foot thick, re-compacted natural clay layer and a 80 mil high-density, flexible membrane liner (FML) that exceeds the regulatory prescribed 60 mil primary FML, and a geotextile overlay
- **Comprehensive** leachate and methane collection and control systems
- The site receives **only 6-9 inches of precipitation** per year

At Republic, residuals continue to be recovered & recycled to a higher and best use
2019-2022 Board Strategic Plan
SOLID WASTE SERVICES

Ann Rowan
MANAGER, COLLABORATION & ENGAGEMENT, EXTERNAL RELATIONS

Megan Gerryts
CORPORATE PROJECTS COORDINATOR, CAO EXECUTIVE OFFICE

Zero Waste Committee Meeting: July 12, 2019

30388096
30-Year Planning Context
- Regional Growth
- Environmental Sustainability
- Financial Sustainability
- Regulatory and Legislative Environment
- System Stewardship

Visioning Exercise

Strategic Directions
2019-2022 Board Strategic Plan

- **Board Strategic Plan context**
- Organizational overview
- Vision and mission
- Strategic directions
  - Regional Federation
  - Water Services
  - Liquid Waste Services
  - Solid Waste Services
  - Regional Parks Services
  - Housing Services
  - Regional Planning
  - Air Quality & Climate Change
Common Themes

- Commitment to long-term financial planning
- The importance of infrastructure resilience
- Value of collaboration
- Leadership on climate action
- Innovation in projects and operations
Strategic Directions: Solid Waste Services

1. Managing our Solid Waste
2. Ensuring Financial Sustainability
3. Fostering Collaboration and Engagement
Next Steps

- Final document to Finance and Intergovernment Committee
  July 17, 2019
- Board approval July 26, 2019
- 2019 – 2022 Board Strategic Plan will guide development of annual budget and work plan and five-year financial plan
1. Managing Our Solid Waste

Reduce waste, increase recycling, and increase recovery of materials and energy from remaining waste. Dispose of residuals in a cost-effective and environmentally sustainable manner.

1.1 Expand actions that will reduce the amount of litter and waste that members manage.
   - Work with members, the provincial government, and the federal government on strategies to reduce single use items and other consumer products.

1.2 Continue to develop programs and related communication campaigns that increase diversion rates of materials that can be reused, repurposed or recycled.
   - Continue to expand and enhance the disposal ban program.
   - Identify upstream and recycling solutions with the region that will reduce the volume of solid waste generated in the region.
   - Focus on the multi-family residential and commercial/institutional sectors where recycling rates are lower.
   - Continue to expand recycling options at regional transfer stations.
1. Managing Our Solid Waste

1.3 Research opportunities to close the gaps and ensure sufficient capacity in the regional recycling and waste diversion system.

- Work with the private sector to innovate in the provision of recycling solutions, including micro-solutions.
- Assess Metro Vancouver’s role in processing organics and wood.

1.4 Identify future disposal alternatives and develop analysis for each, providing life cycle & full cost analysis including greenhouse gas emission estimates.
2. Ensuring Financial Sustainability

Develop and implement financial plans and policies that reflect a commitment to sound financial management and long-term planning, in consideration of current and future ratepayers.

2.1 Ensure Metro Vancouver is maximizing the recovery of materials and energy from the management of the regional solid waste system.
   - Assess the viability of implementing district heating at the waste-to-energy facility.
   - Seek out public and private partnerships to facilitate the recovery of materials and energy.

2.2 Perform on-going analysis of the impact of the tipping fee structure, both in terms of its ability to fund the system and to change behaviour.

2.3 Develop and implement a 30-year financial framework, providing members with financial projections associated with the regional solid waste system.
3. Fostering Collaboration & Engagement

Strengthen awareness and engagement with the public, members, other orders of government, and key stakeholders on a range of initiatives that will reduce waste generated in the region.

3.1 Utilize the potential of the National Zero Waste Council and the annual Zero Waste Conference to promote the importance of waste prevention and the value of transitioning to a circular economy.

• Facilitate cross-sector collaboration to design waste out of products and packaging and to harmonize policies across Canadian jurisdictions that will both reduce waste and create economies of scale in remanufacturing opportunities.

3.2 Work with the provincial government and key stakeholders to expand the products included in extended producer responsibility (EPR) programs.

3.3 Continue to expand public education and behaviour change campaigns consistent with the objectives of zero waste.
Organics and Paid Recyclables Management at Metro Vancouver Transfer Stations

Sarah Evanetz, MPA
DIVISION MANAGER SOLID WASTE PROGRAMS AND PUBLIC INVOLVEMENT
July 12, 2019
• 2011 Board approves Organics Strategy:
  • Development of organics processing capacity left to private sector and municipalities.
  • Receive yard trimmings and organics from municipalities when requested.
• 2017 RAAC/REAC Organics Management Workshop
• 2018 Board directs to report back with approach for paid recyclables
• 2019 RAAC/REAC Organics Management Workshop
• Serves region’s 2.5 million residents
• Convenient and accessible
• Full-service reuse, recycling and disposal facility
Paid Recycling

- Range of paid recycling services provided at all transfer stations
- Diverts 65,000 tonnes a year
- Fees typically cover operational costs
- Mattress fees lower than cost to help reduce illegal dumping
Organics Recycling

- 63% overall diversion rate; 68% organics diversion
- Achieved strong results through organics disposal ban and municipal organics collection programs
  - 60% increase in organics recycled from 2013 to 2017
- Challenges with odour and processing capacity
- Price increased significantly in past 2 years
Organics Transfer and Processing Infrastructure

Provincially Regulated Facilities
With Permit
- Enviro-Smart, Delta
- Pacific Substrate, Cache Creek
- Fisher Road Recycling, Cobble Hill
- Regional Biosolids Composting Facility, Vernon
- Coast Environmental, Chemainus

Permit Application Under Consideration
- Revolution Ranch, Lytton
- The Answer Garden Products, Abbotsford
- Net Zero Waste, Abbotsford
- Sea to Sky Soils, Pemberton

With Operational Certificate
- Nanaimo Organic Waste, Nanaimo
- Surrey Biofuel Facility, Surrey
Regional Organics Recycled

Tonnes

2013 2014 2015 2016 2017
<table>
<thead>
<tr>
<th>Sector</th>
<th>Composted (t)</th>
<th>Remaining in garbage (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yard Trimmings</td>
<td>110,000</td>
<td>&lt;1,000</td>
</tr>
<tr>
<td>Single-Family Organics</td>
<td>215,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Multi-Family Organics</td>
<td>30,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Commercial Organics*</td>
<td>85,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Total</td>
<td>440,000</td>
<td>210,000</td>
</tr>
</tbody>
</table>

* Includes institutional and commercial generators
• Provide paid recyclables services and charge operational costs
• Provide municipal organics transfer services upon request and under contract with full cost recovery
• Initiate procurement for processing services for municipal organics from the North Shore Transfer Station
• Develop business case for commercial organics transfer services at transfer stations
Thank you
Alternative Fuel and Recyclables Recovery Project

UPDATE

Terry Fulton, P.Eng.
PROJECT ENGINEER, SOLID WASTE SERVICES

Zero Waste Committee Meeting, July 12, 2019
Background/Purpose

• In March, Board approved developing a business case for material recovery pilot

• Presentation provides an update on project scope
Project Details

- Process waste to extract recyclable materials and create an alternative fuel
- Considering facility at Coquitlam Landfill
- 50,000 to 60,000 tonnes/year of small vehicle waste
- May include similar quantity construction and demolition waste
# Small Vehicle Waste Composition

<table>
<thead>
<tr>
<th>Material</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Wood</td>
<td>55%</td>
</tr>
<tr>
<td>Inert Materials</td>
<td>15%</td>
</tr>
<tr>
<td>Plastic</td>
<td>6%</td>
</tr>
<tr>
<td>Carpet Waste</td>
<td>6%</td>
</tr>
<tr>
<td>Green Waste</td>
<td>5%</td>
</tr>
<tr>
<td>Metals</td>
<td>4%</td>
</tr>
<tr>
<td>Paper</td>
<td>3%</td>
</tr>
<tr>
<td>Bulky Objects</td>
<td>3%</td>
</tr>
<tr>
<td>Other Materials</td>
<td>3%</td>
</tr>
</tbody>
</table>
Project Benefits

- Reduce waste disposal
- Reduce greenhouse gas emissions by 70,000 to 85,000 tonnes per year
- Provide private sector opportunities
Thank you
2018 Single Use Items Waste Composition

Karen Storry
SENIOR PROJECT ENGINEER

Zero Waste Committee, July 12, 2019

30380878
## Single-Use Items Disposed

Equivalent to 440 items per person a year

<table>
<thead>
<tr>
<th>Single-Use Item Type</th>
<th>Items Disposed (millions)</th>
<th>% by weight of overall composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Bags</td>
<td>256</td>
<td>0.9%</td>
</tr>
<tr>
<td>Disposable Cups</td>
<td>262</td>
<td>0.6%</td>
</tr>
<tr>
<td>Takeout Containers</td>
<td>179</td>
<td>0.7%</td>
</tr>
<tr>
<td>Straws</td>
<td>102</td>
<td>&lt;0.1%</td>
</tr>
<tr>
<td>Utensils</td>
<td>331</td>
<td>0.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.1 billion</strong></td>
<td><strong>2.4%</strong></td>
</tr>
</tbody>
</table>
Total Single Use Items Disposed By Sector (Millions)

- Single-Family: 158
- Multi-Family: 371
- Commercial: 495

Legend:
- Retail Bags (Paper and Plastic)
- Cups
- Takeout Containers
- Straws
- Utensils
Plastic Retail Bags

202 Million Plastic Retail Bags Disposed

- 64% Re-used
- 36% Empty

Cups

262 Million Cups Disposed

- Plastic-Lined Hot Paper Cups: 47%
- Plastic-Lined Cold Paper Cups: 22%
- Foam Cups: 11%
- Rigid Plastic Cups: 20%

262 Million CupsDisposed
Utensils

331 Million Utensils Disposed

- Wood Utensils: 66%
- Plastic Utensils: 34%
Thank You