



Summary of Conclusions

- Strategy's citizen-led source separation works and provides the most sustainable environmental protection
- Strategy's long-term financial goals can't be met with the current approach
- Municipality's long-term waste disposal predictability and security should be a priority
- Recommendations provide financial capacity for System infrastructure renewal

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System Outcomes

We believe the recommendations outlined in the report will result in the following:

- Efficient and environmentally sustainable long-term waste disposal security for HRM;
- Significantly improved financial performance of the waste program mitigating overall budget pressures for decades;
- Improves System adaptability and enables utilization of methane gas for energy through the use of a campus model;
- Per capita waste decreases from 393kg/person to less than 300kg/person (120,000 tonnes/year - year 5);
- HRM Diversion increases from 61% to over 65% within 5 years;
- Residential diversion would rise from current 52% to 64% by year 5;
- Deferral of the opening of Cell 7 by 20 years.

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Strategy Review and Council Direction

The Strategy Review project objective from September 20, 2011:

- To identify ways to improve fiscal performance and increase diversion from the landfill.

The Review process was based on three criteria from July 10, 2012:

- Assess system performance based on original 1995 strategy vision & objectives;
- Conduct industry benchmark analysis and comparative best practice assessments; and,
- Identify options and recommendations to enhance system effectiveness and efficiency.

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Community and Business Engagement

- 14 in-person meetings in two phases and online engagement
- Difficult to garner broad public interest or attendance despite promotions and media coverage
- Proposed landfill changes dominated discussions at community sessions
- Service costs and flow control were key messages from the business sessions
- Approximately 900 participants attended in-person events
- 454 surveys, 291 quick polls and 95 comments completed online

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Engagement outcomes

What we heard from Community and Business Sectors:

- Honour the 1999 CMC agreement
- Focus on diversion and source separation
- Protect the environment
- Improve compost quality
- Reconsider flow control to address service costs

What is included in the recommendations:

- Consult on the future of FEP / WSF
- Clear bags and bag reductions
- Reduced waste delivered to Otter Lake
- Increased education and monitoring
- Compost program changes

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Regional Council's Authority

HRM's Charter provides Council broad authority to:

- Make policies regulating the use of solid-waste facilities in HRM;
- Make expenditures on the solid-waste system generally including management facilities; and,
- Make all by-laws necessary respecting solid-waste and implementation of the integrated solid-waste resource strategy of HRM.

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Mass Balance of HRM Waste Streams & Diversion Rates

Waste/Resource System Mass Balance
by Facility and Waste Stream

Fiscal 2011/2012	Garbage	Organics	Recyclable Paper and Cardboard	Recyclable Containers	C&D Material	Other	System Total
Otter Lake	82,376	24,254	19,347	8,760	7,320	613	142,670
MRF			18,858	5,460			24,318
Private Recycling			43,000				43,000
Enviro Depots				7,500			7,500
Compost Facilities		51,328					51,328
Backyard Composting		5,000					5,000
C & D Facilities					92,268		92,268
HRW (Est)						500	500
Totals	82,376	80,582	81,205	21,720	99,588	1,113	366,584
Diversion (% of Totals)		70%	76%	60%	93%	45%	61%

- Overall diversion rate of 61% (Commercial = 66% & Residential = 52%)
- HRM 393 kg/capita disposal – national average >800kg/capita
- HRM needs to reduce garbage by just under 20,000 tonnes to reach 300kg/capita

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Community Stakeholders Committee Strategy 1995

The CSC Strategy Vision, 1995

The CSC Strategy vision for a municipal waste management regime was described as:

...an achievable vision which has:

1. The least possible negative impact on the natural environment;
2. The most effective methods of collecting, processing, recovering and reusing the material resources produced and consumed by our communities; and,
3. The most responsible format for minimizing the amount of inert residues which emerge as the final product of the resource management system.

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Community Stakeholders Committee Strategy 1995 Recommendation

Recommendation 1

Confirm the objectives of the Community Stakeholders Committee Integrated Resource Management Strategy 1995:

- Maximize reduction, reuse and recycling of waste resources;
- Maximize environmental and fiscal sustainability of the waste program;
- Foster public stewardship and conservation.

These were the objectives of the original strategy and they remain valid today.

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Revised System Plan 1997

The recommended system was focused on diversion through source separation with interim diversion support using the FEP / WSF for revenue generation.

Council revised the proposed System as follows:

- Diversion at landfill revised to processing of waste prior to disposal to negate impacts of gases, odours, vectors and leachate
- Interim FEP/WSF processing for diversion/revenues became treatment to achieve 'stabilization' of putrescible organics
- System capacity reduced to lower implementation costs

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Current System

- Citizen participation in source separation of organics has been a success – 93% participation rate (Statistics Canada 2013, #1 city in Canada);
- Recycling collection, processing and revenue generation has been successful;
- Organics processing and the resultant compost product quality and revenue generation have not met expectations;
- Source Separation is working but can be improved upon;
- The anticipated environmental benefits of the FEP and WSF have only been marginally achieved at a significant financial cost to the municipality;
- 97% of materials delivered to landfill are disposed in the landfill;
- HRM garbage generation is decreasing but landfill operating costs per tonne are increasing.

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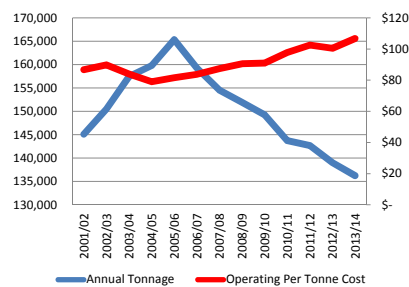
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Current System – Program Costs

OPERATING	2014	2015	2016	2017	2018	5 Year Total Cost	Total to 2024/25
Total Operating	\$34,200,000	\$32,300,000	\$34,700,000	\$37,100,000	\$39,800,000	\$178,100,000	\$479,500,000
Total Capital Funding	\$10,403,000	\$10,903,000	\$10,603,000	\$10,903,000	\$11,500,000	\$54,312,000	\$126,312,000
New Capital Total	\$0	\$8,500,000	\$10,000,000	\$25,440,000	\$100,000,000	\$143,940,000	\$143,940,000
ANNUAL FUNDING FOR SOLID WASTE	\$44,603,000	\$51,703,000	\$55,303,000	\$73,443,000	\$151,300,000	\$376,352,000	\$749,752,000

Tonnage vs. Operating Cost Per Tonne



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Organics Recommendations

Recommendation 2

Development of a business case for the source separated organics program to introduce an Anaerobic Digestion processing capability and other program changes to improve system cost performance and compost quality and return to Regional Council with a revised plan by 30 June, 2014.

Recommendation 3

By-law amendments to improve organics collection, processing and finished compost product quality for residential SSO and enable redistribution to residents by a) removing box board as a mandated green bin product {while still permitted as a kitchen scrap material catcher}, b) mandating use of kraft paper bags for separate collection of leaf and yard waste, and c) banning grass clippings from LYW collection.

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Current System - Organics

25,000 tonnes of putrescible organics remains in the garbage stream being delivered to Otter Lake landfill.

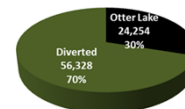
Two Compost facilities annual combined capacity of 48,000 tonnes.

- HRM currently receives over 51,000 tonnes
- \$160.00/tonne for organics processing program
- Commercial Tip fee = \$75.00/tonne
- Facilities are 15 years old and require re-investment

Program analysis identified system changes to meet regulatory requirements and improve fiscal performance:

- Capital upgrades of aerobic composting = \$5 M
- Secondary curing = \$3.5 M (*private or public)
- 11 year operating savings of \$23.5 M resulting from organics collection and processing changes

70% of Organics Source Separated 2011/2012



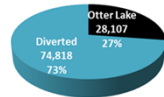
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Current System - Recycling

73% of Recyclables Source Separated
2011/2012



- 28,000 tonnes of recyclables remains in the garbage stream being delivered to Otter Lake landfill.
- Recycling plant was commissioned in 1991 and is approaching its end of functional life (replacement cost \$10,000,000 not currently budgeted).
- Recycling plant current contracted processing capacity is 28,000 tonnes/year. Annual collection and processing of recyclables is 26,000 tonnes.
- A new recycling plant will enable HRM to benefit from significant advancements in technology used to process, sort, screen, and manage recyclable materials.

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HSW Recommendation

Recommendation 4

Site a second depot and introduce annual district mobile household special handling waste events.



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Current System - HSW

One depot - \$360,000/year

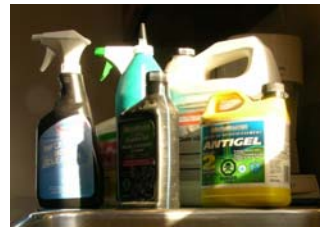
- 400,000 residents
- Voluntary drop off by 9,600-10,100 vehicles over a year

Two depots - \$700,000/year
(estimated)

Examine extending hours and
opening additional days

17 annual District events

- approximately \$150-200,000/yr.



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Residual Waste / Garbage Recommendations

Recommendation 5

Initiate by-law amendments to:

- mandate clear bags (with one nested opaque bag) for residential collections; and,
- reduce garbage bag limits from 6 to 4.

Recommendation 6

- Increase curb-side education and monitoring;
- Increase apartment tenant education and monitoring; and,
- Increase Commercial load monitoring and inspections and the landfill.

Recommendation 7

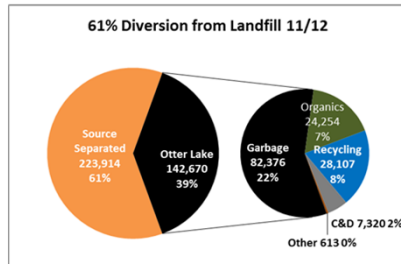
Amend By-law S-600 to allow Commercial residual waste (garbage) to be processed outside HRM, and amend Administrative Order number 16 to provide for an increase in fees for disposal of Commercial residual waste from \$125.00 per tonne to the assessed System cost of \$170.00 per tonne.

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Current System – Residual Waste / Garbage



- 97% of materials delivered to Otter Lake end up at the landfill cell.
- Otter Lake landfill operations currently cost \$170.00/tonne as of construction of Cell 6.
- 1995 Strategy projected a System cost of \$67.00/tonne (FY96). Equates to \$90.00/tonne (FY12)
- Investment Property Owners asked for examination of residential collection of investment properties.
- Waste Industry and commercial stakeholders asked for reconsideration of flow control of residual waste/garbage.

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Current System – Flow Control

2002 By-Law S-602 banned commercial waste materials generated in HRM from being shipped outside HRM

- 2014 – landfill cost = \$170.00/tonne vs. tip fee of \$125.00/tonne

Permitting commercial garbage to be sent outside HRM could reduce waste delivered to Otter Lake by 50%

- Potential to double cell life from 40 to 80 months
- Improve fiscal performance
- All landfill capital is funded from reserves and is not debt funded

Increase in fees for disposal of Commercial residual waste from \$125 per tonne to the assessed Otter Lake cost of \$170.00 per tonne.

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Impact of Diversion Measures and Flow Control on Waste Delivered to Otter Lake

Clear Bag & No Flow Control Effect on Waste Characterization							
at Otter Lake Waste Management Facility							
	Acceptable	Unacceptable					
Otter Lake	Garbage	Organics	Recyclable Paper and Cardboard	Recyclable Containers	C&D Material	Other	Otter Lake Total
1st Year Forecast	69,700	17,800	15,000	7,300	5,800	600	116,200
2nd Year Forecast	61,000	12,500	12,000	6,400	5,000	600	97,500
3rd Year Forecast	54,200	8,300	9,700	5,800	4,500	600	83,100
4th Year Forecast	48,800	5,000	8,000	5,500	4,200	600	72,100
5th Year Forecast	44,600	2,500	6,800	5,300	4,000	600	63,800

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FEP / WSF Recommendation

Recommendation 8

Direct staff to initiate consultation with MIRROR NS and the Community Monitoring Committee on options for changes in the operating model (front end processor facility, waste stabilization facility, residual disposal facility) at Otter Lake landfill site A, returning to Council with a transition plan for landfill operations at the site based on diversion outcomes resulting from the changes outlined in this report.

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Current System – FEP / WSF

Functional System challenges:

- Environmental impact of fugitive Greenhouse Gases (GHG)
- System Performance – Organics Capture Rate
- System Cost Benefit Analysis
- Average annual FEP and WSF operating and capital costs cost is \$11,000,000 leading to a total of \$136,400,000 over the 12 year period ending in 2024/25

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FEP / WSF Budget Implications (excluding RDF)

The FEP/WSF assessed ten year cost of \$136,400,000

Projected Isolated FEP/WSF Capital Equipment and Annual Operating Cost Estimates			
Year	FEP/WSF Operating Cost	FEP/WSF Capital	Total
2013/2014	\$8,500,000	\$1,600,000	\$10,100,000
2014/2015	\$8,700,000	\$1,300,000	\$10,000,000
2015/2016	\$9,000,000	\$900,000	\$9,900,000
2016/2017	\$9,200,000	\$1,600,000	\$10,800,000
2017/2018	\$9,400,000	\$1,600,000	\$11,000,000
2018/2019	\$9,700,000	\$1,900,000	\$11,600,000
2019/2020	\$9,900,000	\$2,500,000	\$12,400,000
2020/2021	\$10,100,000	\$2,100,000	\$12,200,000
2021/2022	\$10,400,000	\$1,300,000	\$11,700,000
2022/2023	\$10,700,000	\$1,300,000	\$12,000,000
2023/2024	\$10,900,000	\$1,300,000	\$12,200,000
2024/2025	\$11,200,000	\$1,300,000	\$12,500,000
Total	\$117,700,000	\$18,700,000	\$136,400,000

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Otter Lake Recommendations

Recommendation 9

Extend operations at Otter Lake beyond 2024 and direct staff to increase the vertical height of existing and future cells by 15 meters and establish an Integrated Solid Waste Management Campus at the site to support new facilities and alternative technologies as they become viable.



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Current System – Otter Lake

Recommendation for the extension of Otter Lake beyond 2024 is based on the following:

- Increasing cell height extends the life of the landfill's 9 cells from 2024 until 2059;
- These recommendations defer the need to begin a landfill siting process for decades;
- \$100 million in savings can be achieved by not siting a new landfill;
- The operating budget impact is \$10 million to \$15 million annually beginning in 2014/15;
- There is no increase in footprint, no increase in visibility and no quantifiable environmental benefit to maintaining the existing height restrictions.

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Otter Lake – Budget Implications

- Based on current reserve funding and past budgets, the immediate funding outcome of increasing cell height would be approximately \$11.5M surplus for FY2013/14.
- An additional \$6.3M savings can be generated by avoiding the reserve contribution for Cell 7 in 14/15.

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Otter Lake – Campus Implications

System campus site addresses System fiscal and environmental performance objectives.

- Co-location of System components would be cost efficient sharing existing and future operational infrastructure.
- The Otter Lake site represents sufficient property to support System facility component needs while maintaining the 3km buffer.
- Utilizing landfill gas to produce energy could generate sufficient electricity to support on-site power and heat requirements.
- Potential future repurposing of facilities could reduce capital cost investment requirements.
- A campus site increases Strategy adaptability for future technologies and materials usage.

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System Budget Implications

System total costs based on four developed scenarios:

Estimated Solid Waste Program Cost 2014/15 - 2024/25				
	Operating	Capital	New Capital	Total Cost to 2024/25
Option 1 - Status Quo	\$480,000,000	\$126,000,000	\$144,000,000	\$750,000,000
Option 2A - FEP/WSF Remain	\$453,000,000	\$60,000,000	\$44,000,000	\$557,000,000
Option 2B - FEP/WSF Phased out after 2016/17	\$379,000,000	\$46,000,000	\$44,000,000	\$469,000,000
Option 2C - FEP/WSF Removed	\$355,000,000	\$42,000,000	\$44,000,000	\$441,000,000

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Scenario 1

SCENARIO 1 STATUS QUO 2014/15 - 2024/25

Adjustments to Compost Program	(-\$24,000,000)
New Recycling Facility	\$10,000,000
Secondary Compost Curing Site	\$4,000,000
Increase Organics Capacity	\$5,000,000
Multiple Stream Collection Carts (Blue/Green)	\$25,000,000
New Landfill Site	\$100,000,000
Total	\$144,000,000
Net Cost Position	\$120,000,000

- No changes to operations at the Otter Lake Facilities
- Composting operations upgraded to enable AD (regulatory compliance and meet capacity needs)
- Secondary compost curing site - 2015
- New Recycling Facility - 2016.
- Procurement of recycling carts and replacement organics carts - 2017

2014/15 Budget Impact = \$10 to \$15 million capital reserve contribution increase

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Scenario 2A

SCENARIO 2A with FEP/WSF 2014/15 - 2024/25

Increase - Tip Fee Charge (\$170/t)	(-\$25,000,000)
Savings from No Flow Control	(-\$21,000,000)
Savings from Stacking	(-\$56,000,000)
Adjustments to Compost Program	(-\$24,000,000)
Total	(-\$101,000,000)
Increase - HHW Depots	\$8,000,000
New Recycling Facility	\$10,000,000
Secondary Compost Curing Site	\$4,000,000
Increase Organics Capacity	\$5,000,000
Multiple Stream Collection Carts (Blue/Green)	\$25,000,000
Total	\$52,000,000
Net Cost Position	(-\$49,000,000)

- FEP and WSF continue operations
- Cell height increases by 15 metres
- Flow control is eliminated
- Commercial Garbage tip fees increase to \$170/tonne
- HSW program expanded
- Composting operations upgraded to enable AD (regulatory compliance and meet capacity needs)
- Secondary compost curing site - 2015
- New Recycling Facility - 2016
- Procurement of recycling carts and replacement organics carts - 2017

Note: Tip Fee savings not included

2014/15 Budget Impact = \$18M available between what is currently in Q123 reserve and what is in 14/15 budget.

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Scenario 2B

SCENARIO 2B - FEP/WSF Phased out after 2016/17

Increase - Tip Fee Charge (\$170/t)	(-\$25,000,000)
Savings from No Flow Control	(-\$21,000,000)
Savings from Stacking	(-\$56,000,000)
Adjustments to Compost Program	(-\$24,000,000)
Remove FEP/WSF	(-\$86,000,000)
Total	(-\$187,000,000)
Increase - HHW Depots	\$8,000,000
New Recycling Facility	\$10,000,000
Secondary Compost Curing Site	\$4,000,000
Increase Organics Capacity	\$5,000,000
Multiple Stream Collection Carts (Blue/Green)	\$25,000,000
Total	\$52,000,000
Net Cost Position	(-\$135,000,000)

- FEP and WSF no longer operate after 2016/17
- Cell height increases by 15 metres
- Restrictions on HRM Commercial waste being processed within the Municipality are removed
- Commercial Garbage tip fees increase to \$170/tonne
- HSW program expanded
- Composting operations upgraded to enable AD (regulatory compliance and meet capacity needs)
- Secondary compost curing site - 2015
- New Recycling Facility - 2016.
- Procurement of recycling carts and replacement organics carts - 2017

Note: Tip Fee savings not included

2014/15 Budget Impact = \$18M

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Scenario 2C

SCENARIO 2C FEP/WSF REMOVED 2014/15 - 2024/25

Increase - Tip Fee Charge (\$170/t)	(-\$25,000,000)
Savings from No Flow Control	(-\$21,000,000)
Savings from Stacking	(-\$56,000,000)
Adjustments to Compost Program	(-\$24,000,000)
Remove FEP/WSF	(-\$114,000,000)
Total	(-\$215,000,000)
Increase - HHW Depots	\$8,000,000
New Recycling Facility	\$10,000,000
Secondary Compost Curing Site	\$4,000,000
Increase Organics Capacity	\$5,000,000
Multiple Stream Collection Carts (Blue/Green)	\$25,000,000
Total	\$52,000,000
Net Cost Position	(-\$163,000,000)

Note: Tip Fee savings not included

2014/15 Budget Impact = \$18M

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