



The Role of Non-Obligated Materials in Rising Residue Rates

Mike Birett, Moderator
June 14, 2016

Residue, An Evolving Concept

- Traditionally a measure of performance
 - “Process loss” vs “unsolicited materials”
- More recently, you’ve heard:
 - The term “non-obligated materials”
 - “Residue rates are rising”or are they?
- What is it all about & why now?

It's an Issue of Productivity vs. Net System Cost

- Moving from a 4 stream sort to single stream
 - 0.5 tonne/hr to 1.0 tonne/yr
 - Increased processing costs & residue
- Accuracy in promo and ed
 - Keeping it simple improves participation
 - Generalized P&E tends to lead to accuracy issues & increased residue
- Maximized recovery in the MRF
 - It's all possible but at what cost?



Today's Presenters

- Alec Scott
 - The Role of Non-Obligated Materials in Rising Residue Rates

- Nathiel Egosi, PE, RRT Design & Construction
 - Managing Residue: Is Technology a Viable Long-term Solution?

- David Johnstone, Region of Waterloo
 - Curbside Controls to Manage Residue

The Role of Non-Obligated Materials in Rising Residue Rates

Alec Scott

Residue – What do We Mean?

- ‘Residue’ means materials that we:
 1. Don’t want
 - Non obligated materials – close to BB but not steward materials
 - True garbage
 2. Won’t handle
 - BB materials not in our system
 3. Can’t Manage
 - Small or contaminated materials
- Obviously, a subjective definition

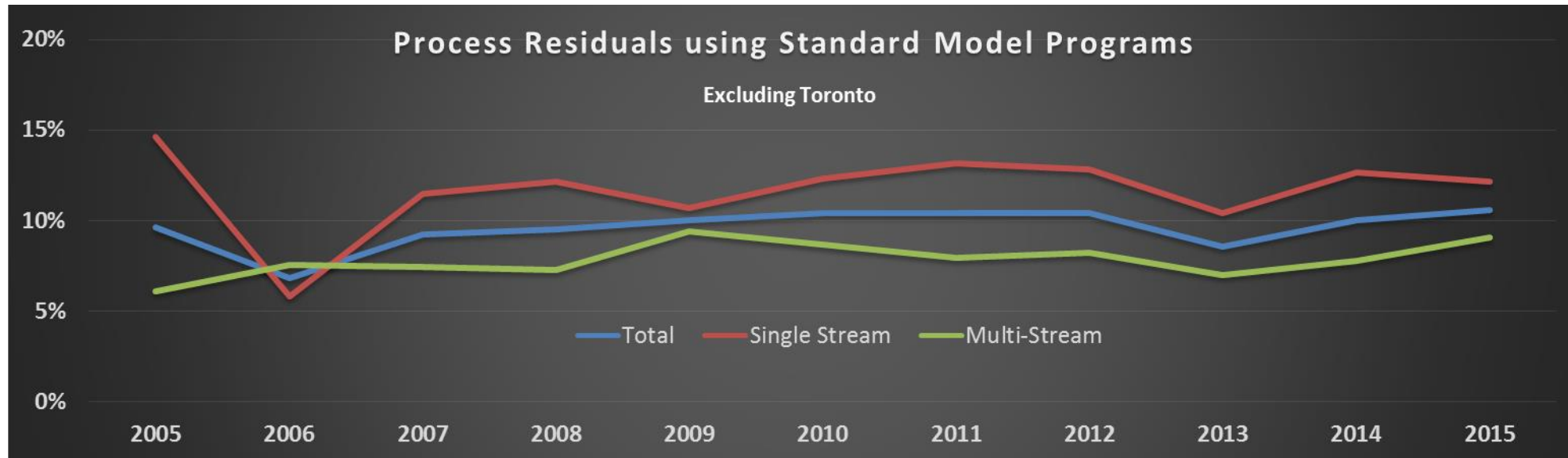
Residue Calculation

- Not all programs report Collected, Marketed & Residue tonnages
- WDO/SO & Municipal Teams agree on 'model' programs
 - Selection based on experience & confidence in data reported
 - Attention paid to recent program changes & process upsets
 - Single Stream & Multi Stream considered separately
- Weighted average residual rate calculated for program type
- Appropriate rate applied to reported collection tonnages for remaining programs
 - Yields calculated tonnages & calculated program residuals

How Much Do We Get?

- Of course, quantity depends on our definition of residual

Program Type	Residual
Total	9.6%
Single Stream	11.6%
Multi-Stream	7.8%



Factors Contributing to Changes

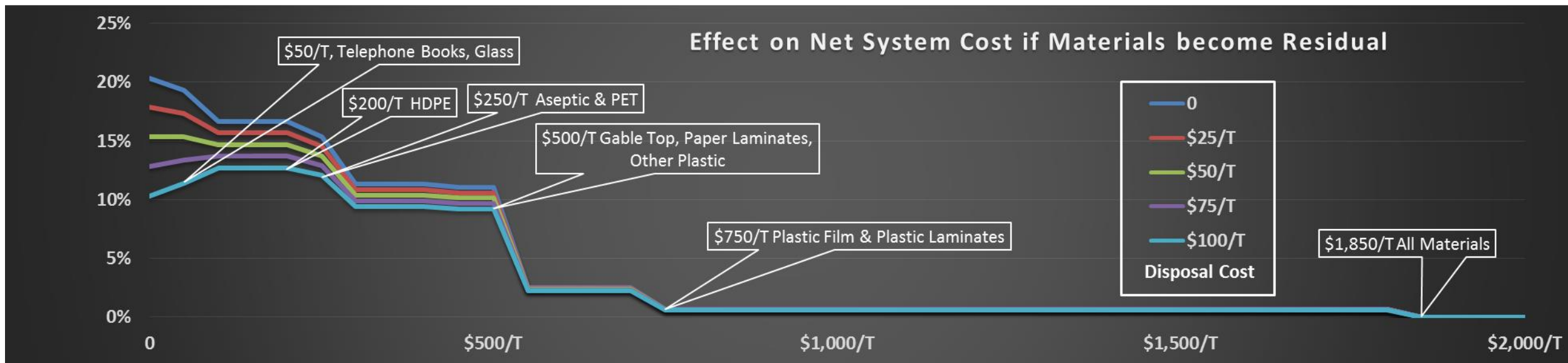
- Materials entering the system
 - Lightweight alternative packaging
 - Declining newsprint
 - Soiled or otherwise non-recyclable containers
- Consistency in material quality
 - Look-alike alternatives, i.e. 'biodegradable' PET
- Multi-material packaging
- Decreases in recovered materials due to scavenging

Decisions Contributing to Residual Changes

- Why sort if I can't sell the product?
- Post – processing of residual materials
 - Record shows them as products, e.g. ONP #6
 - Other records show them as residual sent for processing
 - Q. how much does the post-processor actually recover?
- Process upsets and once-off aberrations
 - MRF fires
 - Adjustments for 'questionable' contractor practices

Economics of Not Processing Materials

- If it's all about ROI, what would it cost us not to process legitimate materials?
- If we declare enough materials a residual, wouldn't the "residual" begin to have commodity value?

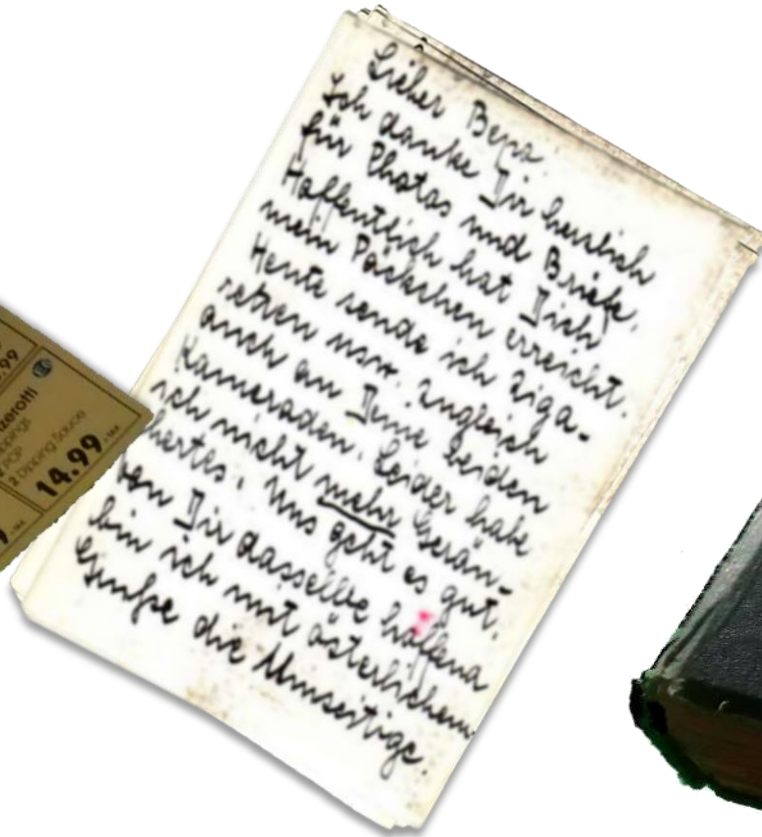


Obligated or Non-Obligated? (1)

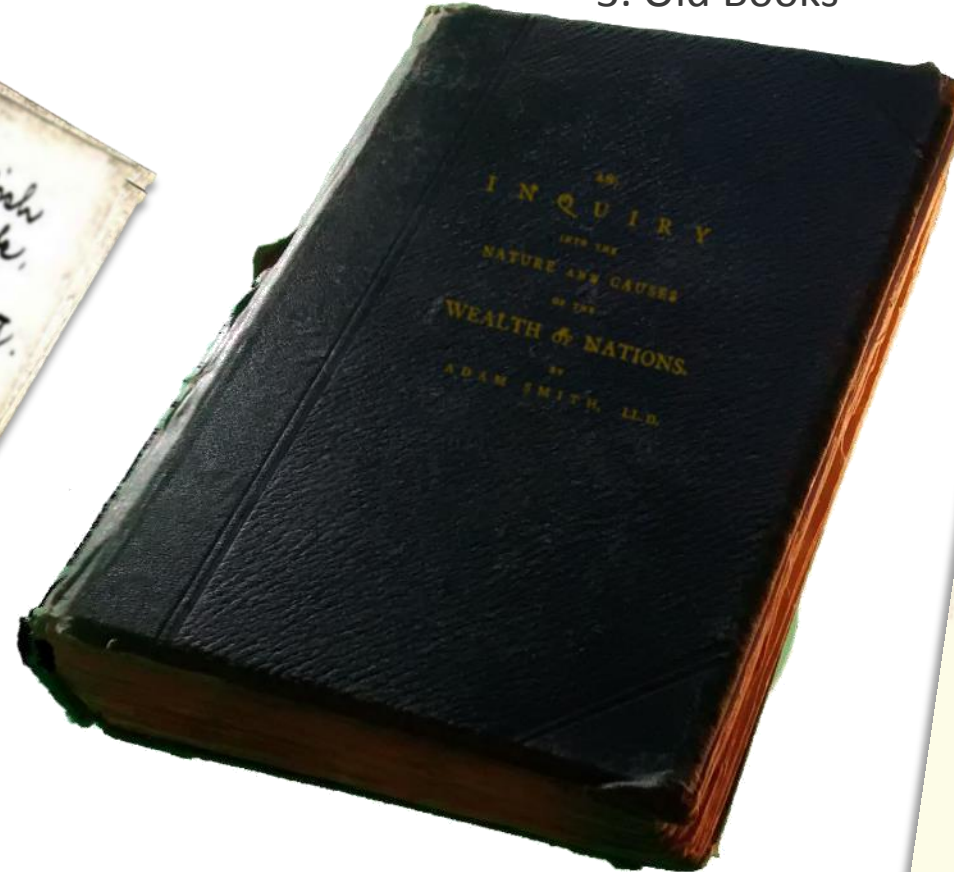
1. Fridge Magnets



2. Handwritten Notes



3. Old Books



4. Pamphlets



Obligated or Non-Obligated? (2)

1. Plastic Pouch Container



2. Post It Notes



3. Paper Towel

4. Pots & Pans



Considerations in Reducing Residual

- Trade offs:
 - Consumer understanding/confidence vs. detail of instructions
 - Residual & Non-Obligated % vs. sorter time per household
- We could do better
 - More attention to advertising to avoid non-obligated materials
 - Programs choosing to collect non-obligated materials need to ensure WDO submission clearly identifies non-BB tonnes, costs & revenues
- System could do more to define non-obligated materials
 - WDO currently clarifying new Datacall instructions & material definitions
 - CIF/AMO/MWA could consider revisiting standard advertising



Managing Residue: Is Technology a Viable Long-term Solution?

Nathiel Egosi, P.E.
RRT Design & Construction



- We build solid waste processing & recycling businesses
- 27 years of over 400 successful plants including over 80 complete greenfield operations
- Expertise: plant operations, MRF equipment, process engineering & construction
- Lines of business: everything but landfills (MRFs, Mixed Waste MRFs & EFW)
- Clients/customers: municipalities & private companies



Ocean County, NJ
Single Stream MRF



New York, NY
MRF

Mixed Waste MRF Defined (aka “Dirty MRF”)



- Processes municipal solid waste to recover recyclables
- Uses similar equipment, processes & techniques as single-stream
- Includes special equipment unique to dealing with garbage
- Liberates, rough separation by shape and size & then more precise separation into target commodity materials
- Offers opportunity for organics recovery & alternative energy

Mixed Waste MRF vs. Single Stream MRF (1)

Mixed Waste MRF

- Facilities may be used
 - to fill the void where curbside recycling programs do not exist or are not practical –
 - examples such as rural or multi-family
 - to enhance & complement curbside recycling programs to recover more
 - to recover recyclables from commercial waste net of traditional source separation
- Promotion & education (P&E) not needed; no sorting behaviour required

Traditional MRF

- Formalized recycling program
- Source separation by the generator
- P&E needed; sorting behaviour is required

Mixed Waste MRF vs. Single Stream MRF (2)

Mixed Waste MRF

- Extensive pre-sort
- Methods to open bags
- Can achieve high recovery of hard plastics, metals & nonferrous metals – difficulty with fiber-recovery; glass is impractical
- Profitability challenges to develop these facilities: high capital (capex) & operating costs (opex) & very high amount of remaining waste to landfill
- Revenues do not offset capex & opex
- Market understands that tipping fee is required & can be fairly stable

Traditional MRF

- Extensive pre-sort
- Methods to remove film due to wrapping
- Can achieve high recovery of hard plastics, metals, nonferrous metals & fibers; glass is difficult
- Profitability challenges to existing MRF infrastructure: high opex & contamination levels; model not 100% processing-fee based
- Revenues can offset capex & opex sometimes; not always
- Confused market understanding; processing fee highly variable

Pros & Cons of Technology Based Solution

Pros

- Can result in greater recycling for a community
- Can produce streams that have beneficial use potential
- Steers waste away from haulers & disposal sites

Cons

- Capital intensive
- More prone to health & safety problems
- Diminishes recycling ethic as we know it today; sends a confusing message (i.e., everything is recyclable)
- Consumer is less connected to the impact of their consumption habits
- Steers waste away from haulers & disposal sites

The “Dirty MRF” Quandary

Are 'dirty MRF's' a solution to combat rising contamination issues?

- Ontario's multi-family, depot & cart-based collection programs are challenged by high residue rates
- This compromises higher quality of incoming materials from single family homes using BB for collection

The Need for a Business Case (1)

Considerations	Mixed Waste	MRF
% Non-recyclables after processing	80-90%	10-20%
% Recyclables recovery	80-90%	95-98%
Recyclables from market area	95+%	25-50%
Sizing of plant (residential only)	3-4x	x

The Need for a Business Case (2)

The math at this time is complicated, unsupported, political & volatile

- Data is not real
- Variables from location to location is high, no standard
- This is really about garbage, not recycling. Garbage is about \$
- Tipping fees & economy affect flow, commodity prices affect everything

We are years away from knowing the costs....think back to MRFs & how long it took to understand those costs...

On the Other Hand...

Mixed waste processing vs. landfill is a compelling debate

	Landfill	Mixed Waste
% Recyclables recovered	0	10%
% Organics recovered for further processing into biogas	0	25-35%
% Materials recovered for further processing into RDF	0	45-55%
Remaining work	Minimal	Need: <ul style="list-style-type: none">■ AD plant with answers for digestate■ RDF plant with combustion component■ Landfill for residues

Additional Thoughts...

- Which is the true risk?
 - The impact of 'the evolving tonne' or the level of contamination in the program?
- Is MWP a viable option to supplement curbside programs
 - what is value proposition of MWP for multi-family
- Health & safety of workers is important consideration
- Don't underestimate value of effective public education on recycling
- Collection program improvements & hauler education are doable through conventional management techniques

Concluding Comments



- MWP is a high-value proposition for multi-family streams & rural communities
- MWP should not be thought of an alternative but rather as an incremental & complimentary tool for traditional source-separation, curbside recycling
- Be prepared: arguments about this subject often have little to do with recycling but rather with other institutional factors and of course, \$
- MWP is effective in producing a variety of rich streams suitable as inputs to other processes; contaminated organics, mixed plastics & a refuse derived fuel (RDF)
- Planners should focus on creating realistic recycling goals
- Industry focus should be on getting contamination levels under 10% at a MRF, it can be done!

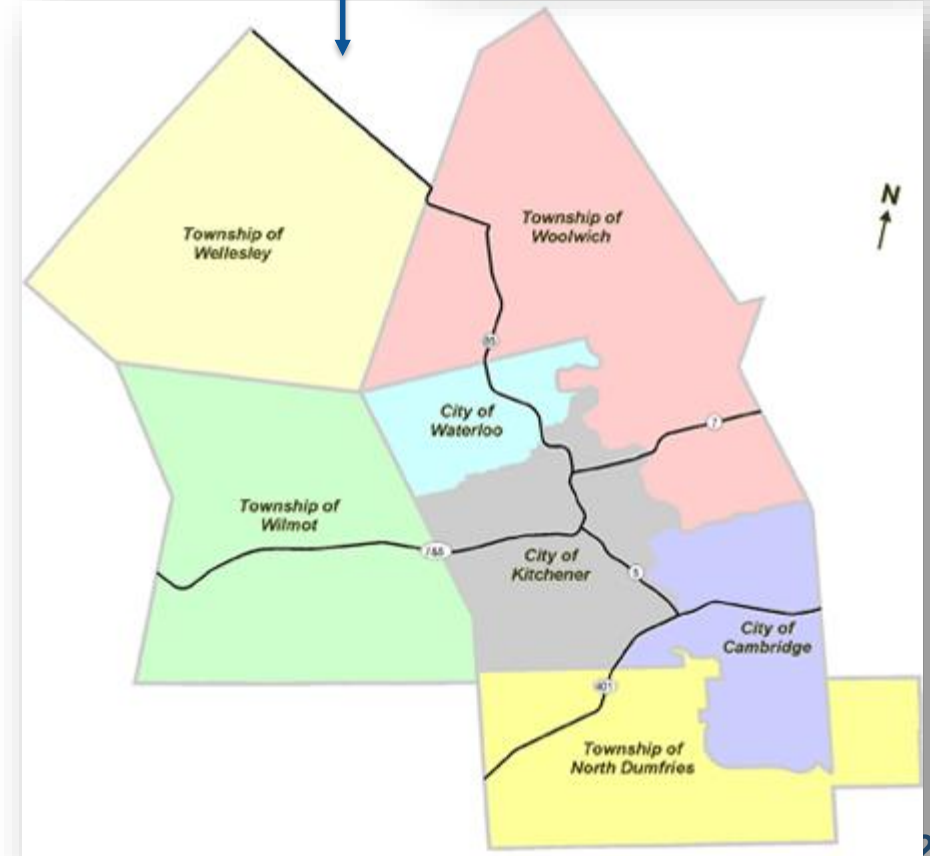


Curbside Controls to Manage Residue

David Johnstone, Region of Waterloo
Supervisor, Contracts & Service

Project Highlights

- Project goal: prevent & limit residue with introduction of new bag limit
- Impacts: maintaining processing costs of blue box material with a change in curbside service levels
- More information:
 - djohnstone@regionofwaterloo.ca
 - www.regionofwaterloo.ca/en/index.asp



Current vs. Future

Current

Curbside collection in the cities



Future

Standard Region-wide



Journey

- Waste Management Master Plan (2012)
- One operating landfill
- The Region's residential waste diversion rate has plateaued at approximately 53%
- Current contract ending March 2017

New Service Level

Garbage collection changes are coming March 2017

Starting March 6, 2017 all single family homes in Cambridge, Kitchener, Waterloo, North Dumfries, Wellesley, Wilmot and Woolwich will get:

Unlimited weekly collection



Green bin and blue box

Every two weeks



Garbage
Maximum 4 bags or cans
(23 kg/50 lbs.)

Every two weeks



Large/metal items
Maximum 3 items

Every two weeks (spring to fall)



Yard waste
Unlimited collection
(23 kg/50 lbs.)

We're here to help!

Frequently asked questions about the changes and other information to help you get ready is available on our website.

Recycling – 2 Stream (1)



Recycling – 2 Stream (2)



Recycling – 2 Stream (3)



Reduce Contamination – Blue Box (1)



Reduce Contamination – Blue Box (2)



Reduce Contamination – Cart Recycling



New Contract Preparation

- Free BB & green bin events
- Educate people on 2-stream sort
- Customer service staff for education
- Inspectors for on-street help
- Aligning collection practices at multi-residential properties (& some businesses)



By-Laws

- Required to reflect new curbside service
- New/improved clauses
- Simple to enforce & update

Waste Collection Guidelines

- Identifies criteria for service for locations other than single family homes
- Accessible for customers & Regional/City Planners

Expected Results

- Diversion  5-10%
- Service & value for Regional residents (net savings 2.6M/year)

